# RADIO TEST REPORT

## No. 1101225-1

### EQUIPMENT UNDER TEST

| | |
|---|---|
| Equipment: | IEEE 802.11b+g WLAN Chipset on a reference platform |
| Type / model: | Chipset: HDG104<br>Reference platform: SPB104 |
| Manufacturer: | H&D Wireless AB |
| Tested by request of: | H&D Wireless AB |

### SUMMARY

The equipment complies with the requirements of the following standards:

47 CFR, Part 15, Subpart B (2010) and Subpart C (2010);

RSS-GEN, Issue 3 (December 2010)
RSS-210, Issue 8 (December 2010)

Industry Canada listed test facility No. IC 2042G-2

Date of issue: 2011-03-18

Tested by: Niklas Boström Approved by: Stefan Andersson

Niklas Boström Stefan Andersson



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## 1. CLIENT INFORMATION

The EUT has been tested by request of

| | |
|---|---|
| Company: | H&D Wireless<br>Sjövägen 17<br>169 55 Solna<br>Sweden |
| Name of contact: | Pär Bergsten |

## 2. EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification of the EUT according to the manufacturer/client declaration

| | |
|---|---|
| Equipment: | IEEE 802.11b+g WLAN Chipset on a reference platform |
| Type / Model: | Chipset: HDG104<br>Reference platform: SPB104 |
| Brand name: | -- |
| Serial number: | 0543 |
| Manufacturer: | H&D Wireless |
| Rating/Supplying voltage: | 3.3 V DC (HDG104 chip)<br>120 VAC, 60 Hz (Peripheral host computer) |
| Rating RF output power: | 18 dBm |
| Antenna gain: | max 2 dBi |
| External antenna connector: | Yes |
| Operating temperature range: | -20 to +55 °C |
| Frequency range: | 2400 - 2483,5 MHz |
| Number of channels: | 11 |
| Modulation characteristics: | 802.11 b/g |
| Stand by mode supported: | Yes |
| Low channel = 1 | 2412 MHz |
| Mid channel = 7 | 2442 MHz |
| High channel = 11 | 2462 MHz |



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### 2.2 Peripheral equipment

Peripheral equipment is defined as equipment needed for correct operation of the EUT, but not included as part of the EUT.

| Equipment | Manufacturer / Type | Serial number |
|---|---|---|
| PC | Dell Dimension 5100 | -- |
| PCMCIA-card | SPB479 | R2A #28 |

### 2.3 Modifications during the test

No modifications have been made during the tests.

### 2.4 Additional information about the EUT

The EUT (HDG104) was mounted on a reference SD-card (SPB104). The SD-card was connected to a PCMCIA-card (SPB479) that was connected to a computer.



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## 3. TEST SPECIFICATIONS

### 3.1 Standards

FCC 47 CFR part 15 (2010) Subpart B – Unintentional radiators

FCC 47 CFR part 15 (2010) Subpart C – Intentional Radiators; §15.247 Operation within the bands 902-928 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz.

RSS-Gen, Issue 3 (December 2010): General Requirements and Information for the Certification of Radiocommunication Equipment

RSS-210, Issue 8 (December 2010): Low Power Licence-Exempt Radio communication Devices (All Frequency Bands): Category I Equipment.

Measurements methods according to

ANSI C63.4-2009 - Methods of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

and

ANSI C63.10-2009 - Standard for Testing Unlicensed Wireless Devices

### 3.2 Additions, deviations and exclusions from standards

No other additions, deviations or exclusions have been made from standards.

### 3.3 Justification

Preliminary testing was performed for all channels and data rates (modulations). After that the highest and lowest data rate for 802.11b (1 and 11 Mbps) and for 802.11g (6 and 54 Mbps) were considered worst case and were selected for final measurements. Radiated measurements were done for the 802.11g 6Mbps mode since this mode had the highest conducted output power.

### 3.4 Test set-up

Measurement set-ups for the test of out-of-band spurious emissions test are described in corresponding sections. During other tests the EUT was connected to the spectrum analyzer or peak power meter by cable.

During all tests the EUT was powered with 3.3 V DC from the computer. The computer was powered with 120 V AC, 60 Hz.

### 3.5 Operating environment

If not additionally specified, the tests were performed under the following environmental conditions:

| | | |
|---|---|---|
| Air temperature: | 20-25 | °C |
| Relative humidity: | 25-40 | % |



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## 4. TEST SUMMARY

The results in this report apply only to the sample tested.

| FCC reference | IC reference | Test | Result | Note |
|---|---|---|---|---|
| 15.247(b) | RSS-210 A8.4 (4) | Peak output power | PASS | |
| 15.247(a) | RSS-210 A8.2 (a) | 6 dB Bandwidth | PASS | |
| 15.247(a) | RSS-210 A8.2 (b) | Spectral power density | PASS | |
| 15.247(d) | RSS-210 A8.5 | Band edge compliance | PASS | |
| 15.247(d) | RSS-210 A8.5 | Out of band spurious emissions, radiated | PASS | |
| 15.247(d) | RSS-210 A8.5 | Out of band spurious emissions, conducted | PASS | |
| 15B | RSS-Gen Table 2 | Out of band spurious emissions, radiated | PASS | |
| 15B | RSS-Gen Table 4 | Conducted emission at AC port | PASS | |

NT = Not Tested
NA = Not Applicable



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## 5. PEAK OUTPUT POWER

### 5.1 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Power Meter | Rhode & Schwarz | NRVD | 8745 | 2011-07 |
| Peak Power Sensor | Rhode & Schwarz | NRV-Z31 | 7411 | 2011-07 |
| Cable | Huber + Suhner | Sucoflex 104 | 5188 | 2011-07 |
| RF attenuator | Hewlett Packard | 8491A | 30088 | 2011-07 |

### 5.2 Test protocol

Date of test: 2011-01-27

802.11b, 1 Mbps data rate

| Channel (MHz) | Peak power dBm | Limit value (dBm) |
|---|---|---|
| 2412 | 18.2 | 30 |
| 2442 | 16.8 | |
| 2462 | 17.1 | |

802.11b, 11 Mbps data rate

| Channel (MHz) | Peak power dBm | Limit value (dBm) |
|---|---|---|
| 2412 | 18.2 | 30 |
| 2442 | 16.9 | |
| 2462 | 17.1 | |

802.11g, 6 Mbps data rate

| Channel (MHz) | Peak power dBm | Limit value (dBm) |
|---|---|---|
| 2412 | 18.6 | 30 |
| 2442 | 18.9 | |
| 2462 | 18.4 | |

802.11g, 54 Mbps data rate

| Channel (MHz) | Peak power dBm | Limit value (dBm) |
|---|---|---|
| 2412 | 18.3 | 30 |
| 2442 | 18.7 | |
| 2462 | 18.1 | |

Measurement results are corrected for attenuation in the set-up configuration.

Example calculation:

Peak output power [dBm] = Power meter reading [dBm] + cable loss [dB] + Attenuator [dB]



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## 6. 6 dB BANDWIDTH

### 6.1 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Signal Analyzer | Rhode & Schwarz | FSIQ | 12793 | 2011-07 |
| Cable | Huber + Suhner | Sucoflex 104 | 5188 | 2011-07 |
| RF attenuator | Hewlett Packard | 8491A | 30088 | 2011-07 |

### 6.2 Test protocol

Date of test: 2011-03-18

Spectrum analyzer display is corrected for attenuation in the set-up configuration.

802.11b, 1 Mbps data rate

| Channel (MHz) | 6 dB Bandwidth (MHz) | Plot | Limit value (MHz) |
|---|---|---|---|
| 2412 | 10.040 | plot P6.1 | > 0.5 |
| 2442 | 10.100 | plot P6.2 | |
| 2462 | 10.120 | plot P6.3 | |

802.11b, 11 Mbps data rate

| Channel (MHz) | 6 dB Bandwidth (MHz) | Plot | Limit value (MHz) |
|---|---|---|---|
| 2412 | 9.078 | plot P6.4 | > 0.5 |
| 2442 | 9.438 | plot P6.5 | |
| 2462 | 9.920 | plot P6.6 | |

802.11g, 6 Mbps data rate

| Channel (MHz) | 6 dB Bandwidth (MHz) | Plot | Limit value (MHz) |
|---|---|---|---|
| 2412 | 16.533 | plot P6.7 | > 0.5 |
| 2442 | 16.653 | plot P6.8 | |
| 2462 | 16.673 | plot P6.9 | |

802.11g, 54 Mbps data rate

| Channel (MHz) | 6 dB Bandwidth (MHz) | Plot | Limit value (MHz) |
|---|---|---|---|
| 2412 | 16.669 | plot P6.10 | > 0.5 |
| 2442 | 16.593 | plot P6.11 | |
| 2462 | 16.553 | plot P6.12 | |



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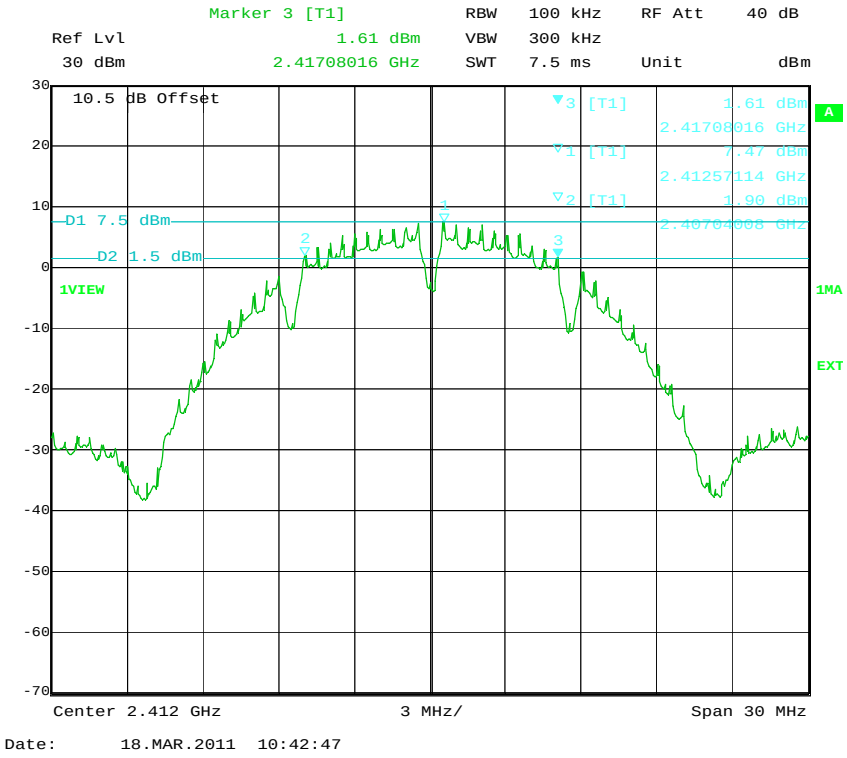
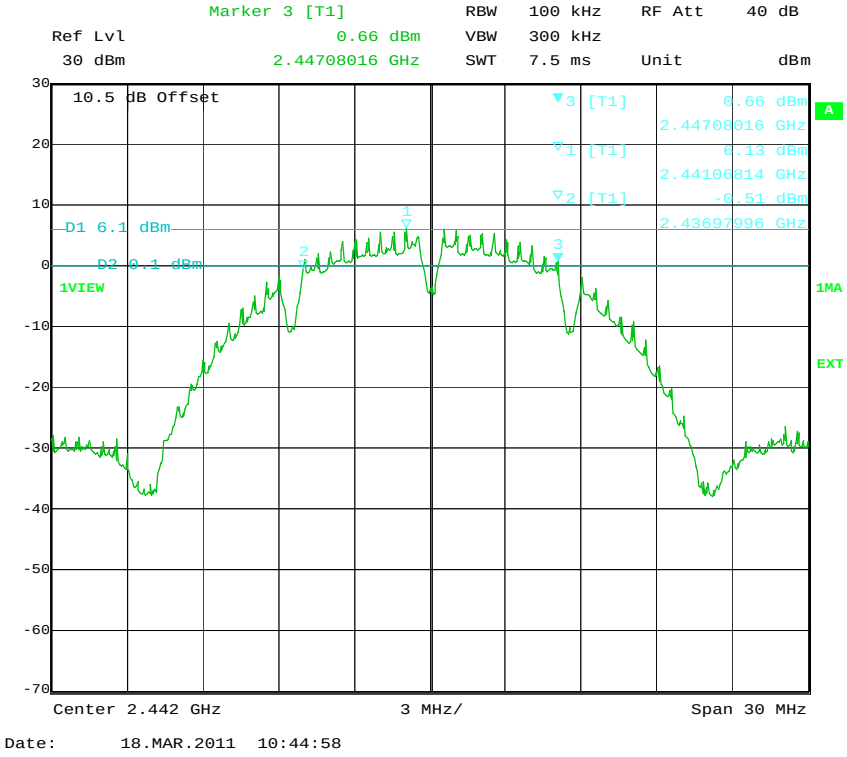
## Plot P6.1




## Plot P6.2



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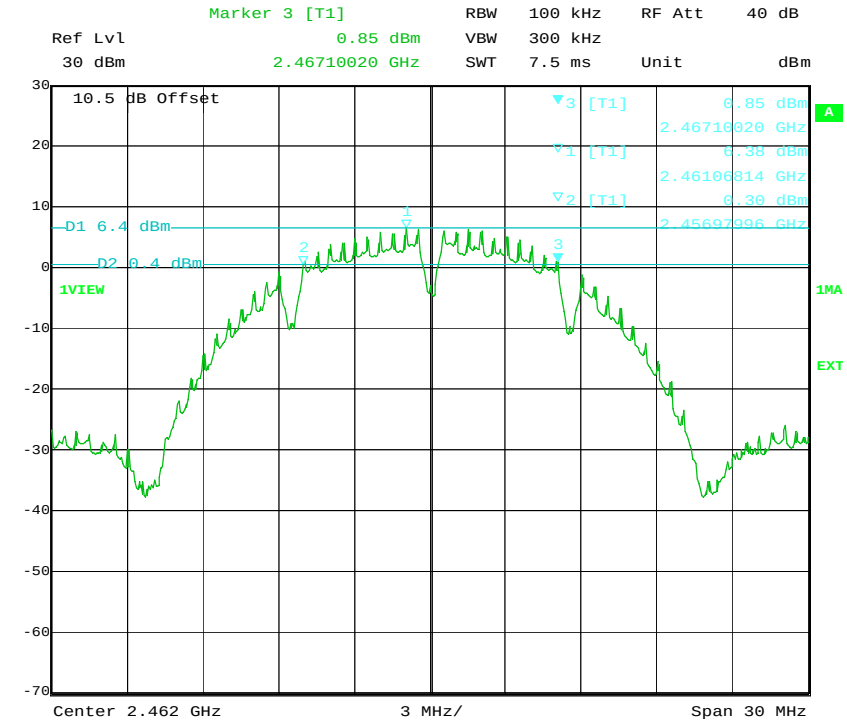
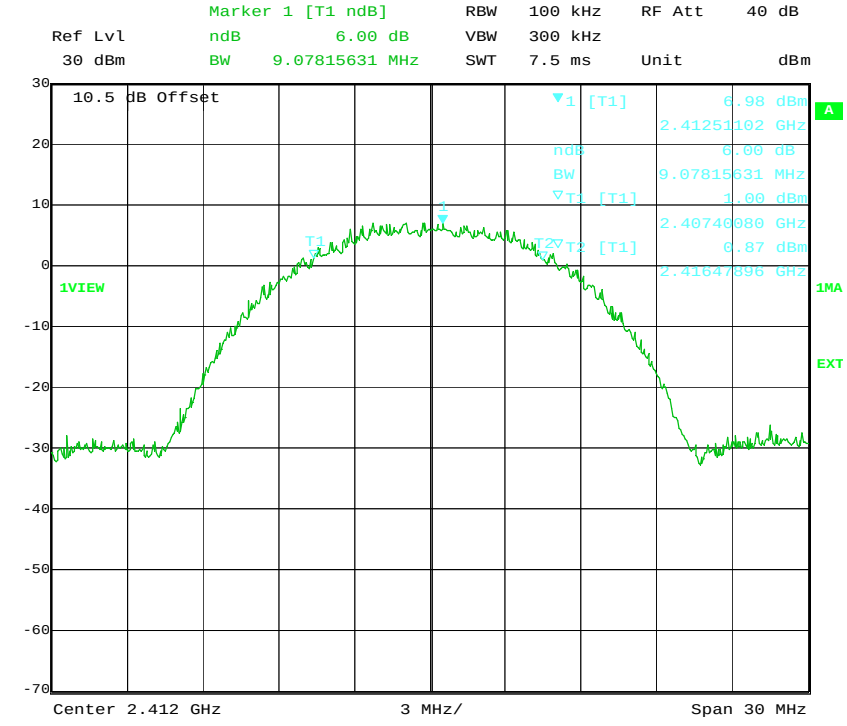
## Plot P6.3




Date: 18.MAR.2011 10:49:21

## Plot P6.4




Date: 18.MAR.2011 10:54:45



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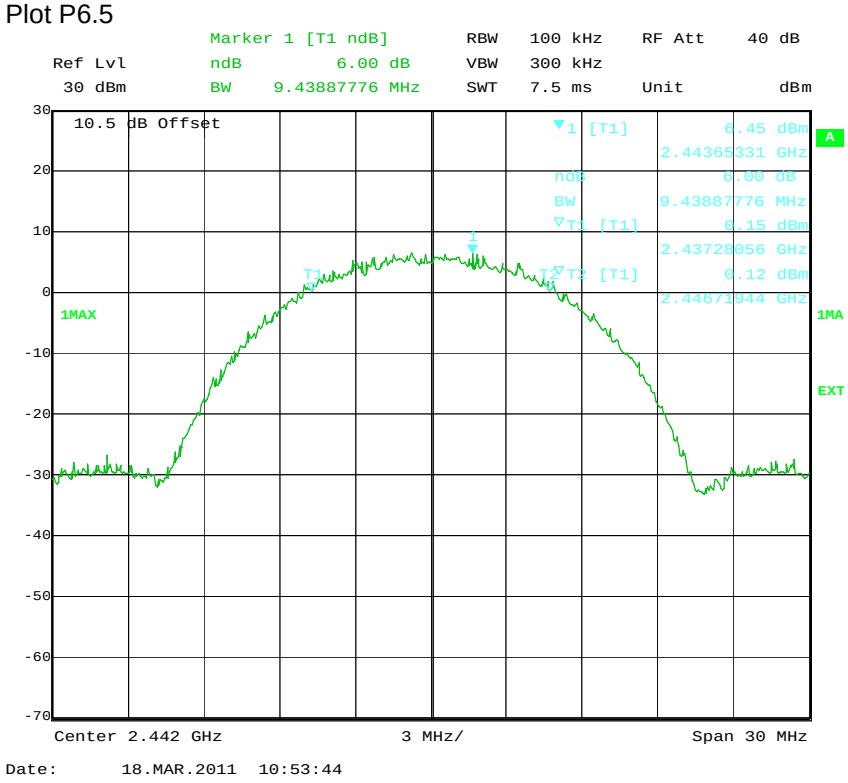
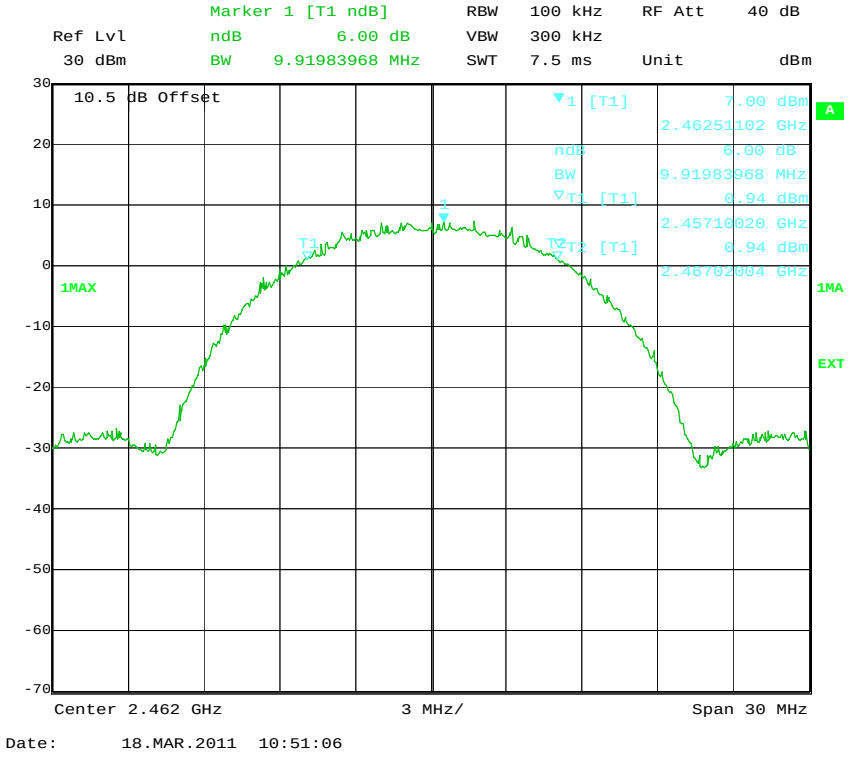
## Plot P6.5




Date: 18.MAR.2011 10:53:44

## Plot P6.6




Date: 18.MAR.2011 10:51:06



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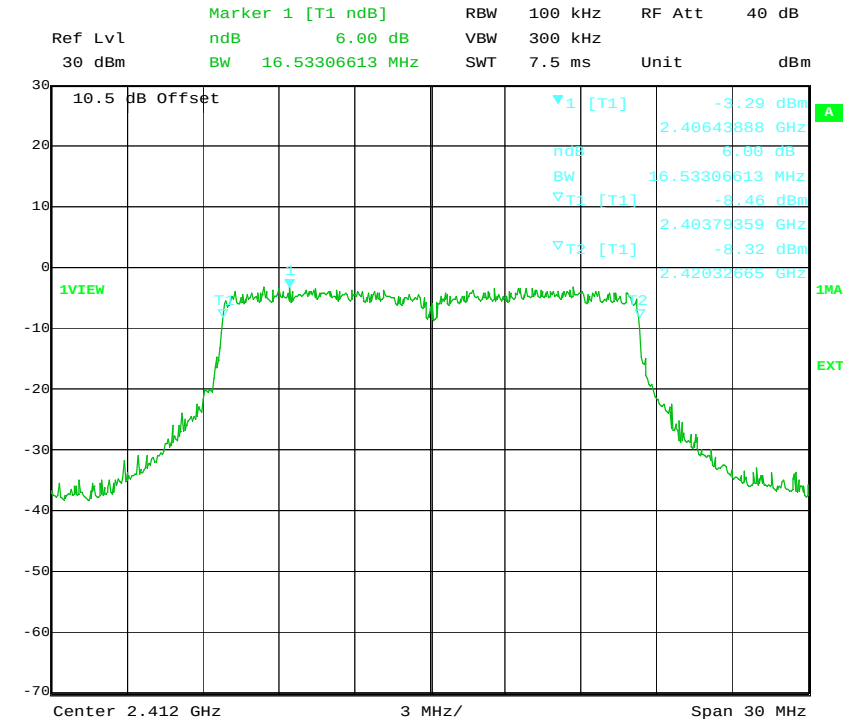
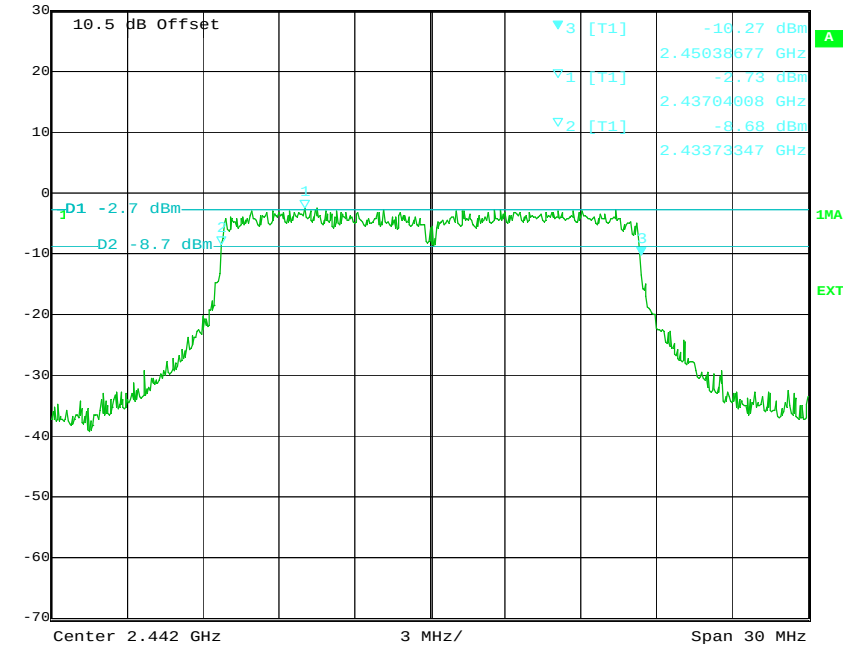
## Plot P6.7




Date: 18.MAR.2011 10:55:53

## Plot P6.8




Date: 18.MAR.2011 10:59:05



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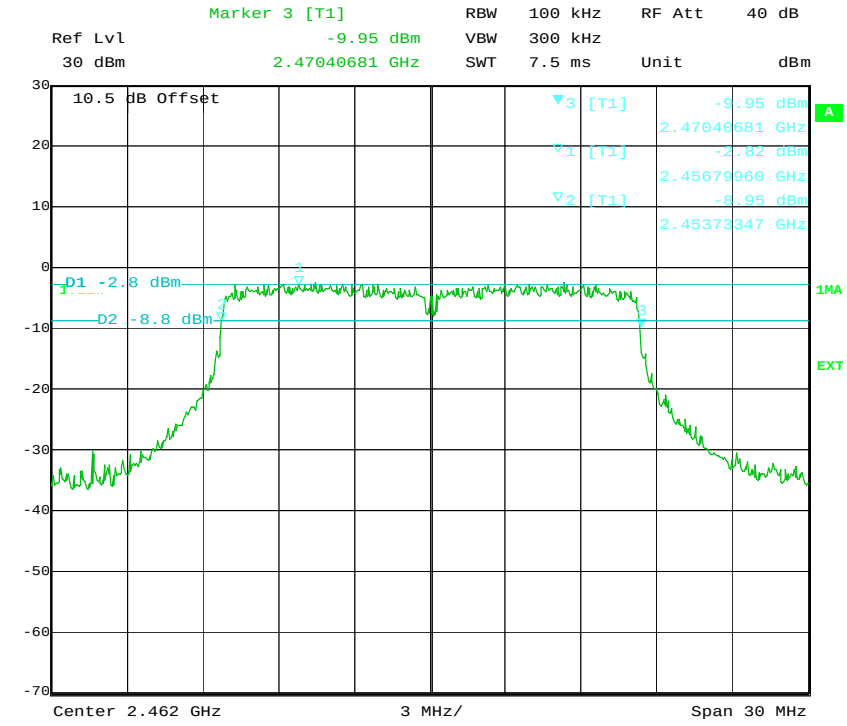
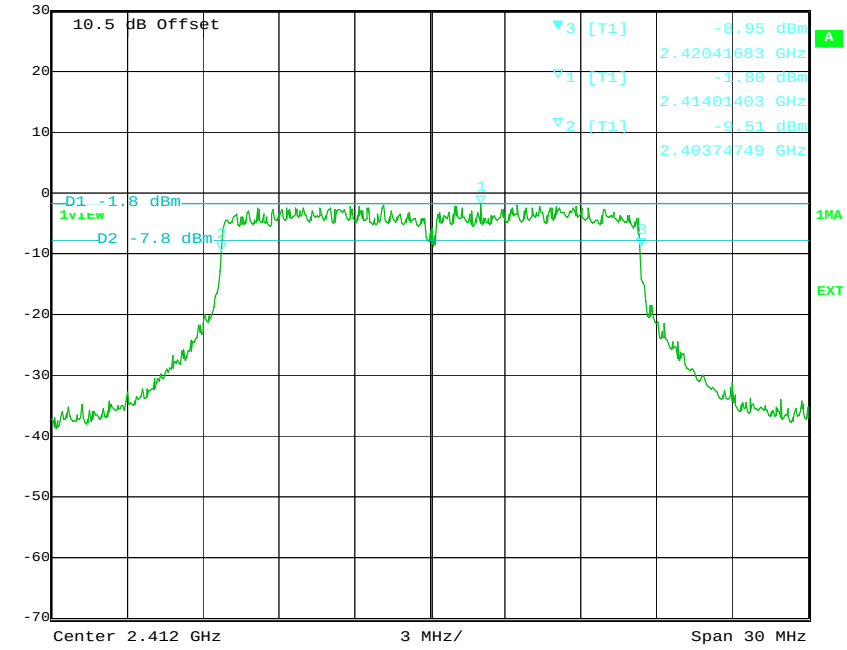
## Plot P6.9




Date: 18.MAR.2011 11:02:04

## Plot P6.10




Date: 18.MAR.2011 11:11:50



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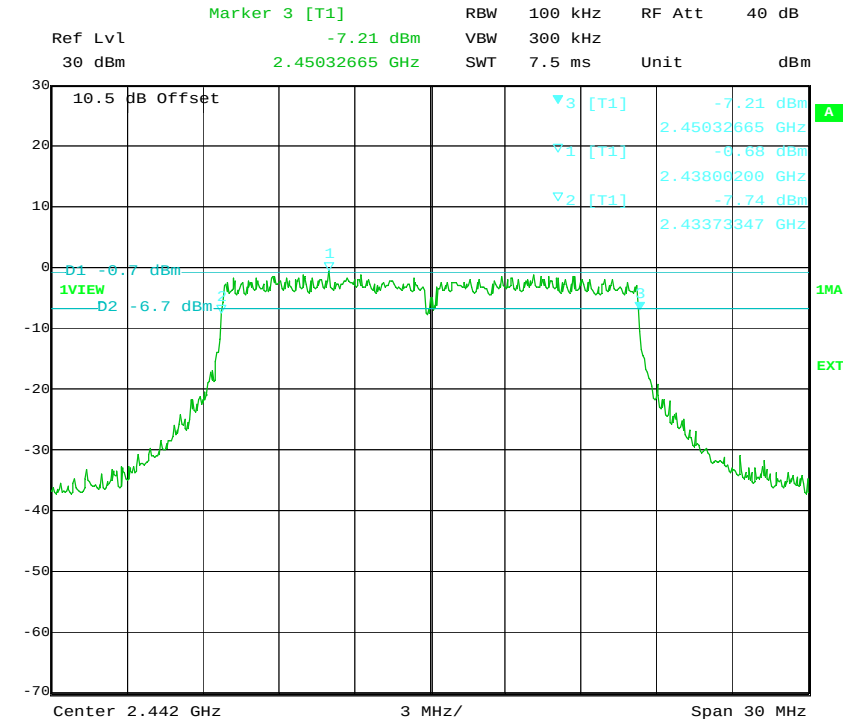
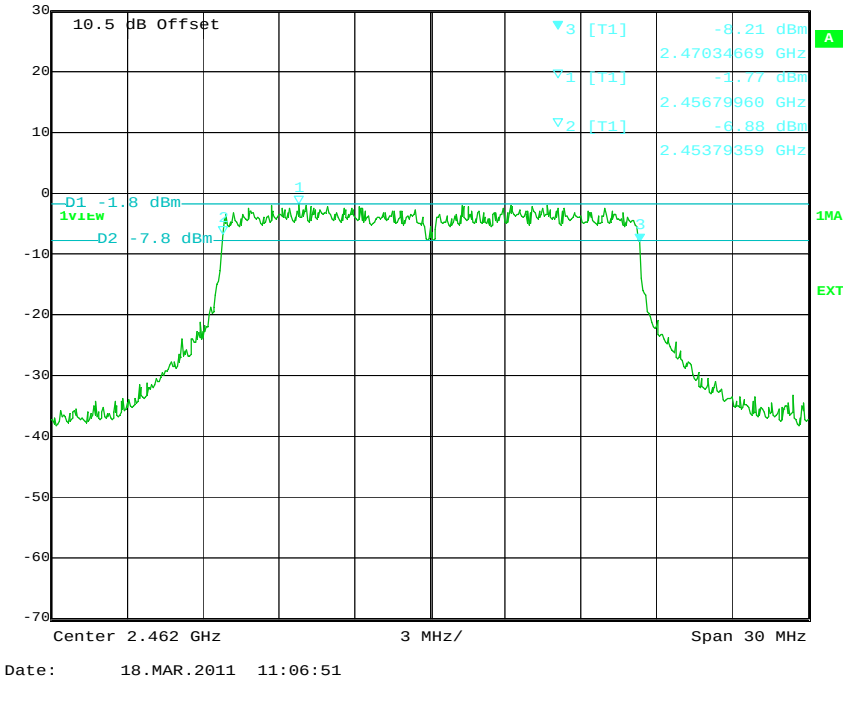
## Plot P6.11




Date: 18.MAR.2011 11:09:07

## Plot P6.12




Date: 18.MAR.2011 11:06:51



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## 7. BAND EDGE COMPLIANCE, CONDUCTED

### 7.1 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Signal Analyzer | Rhode & Schwarz | FSIQ | 12793 | 2011-07 |
| Cable | Huber + Suhner | Sucoflex 104 | 5188 | 2011-07 |
| RF attenuator | Hewlett Packard | 8491A | 30088 | 2011-07 |

### 7.2 Test protocol

Date of test: 2011-01-27

802.11b, 1 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | plot P7.1 | PASS | 20 |
| High | plot P7.2 | PASS | 20 |

802.11b, 11 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | plot P7.3 | PASS | 20 |
| High | plot P7.4 | PASS | 20 |

802.11g, 6 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | plot P7.5 | PASS | 20 |
| High | plot P7.6 | PASS | 20 |

802.11g, 54 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | plot P7.7 | PASS | 20 |
| High | plot P7.8 | PASS | 20 |

Measurement results are corrected for attenuation in the set-up configuration.



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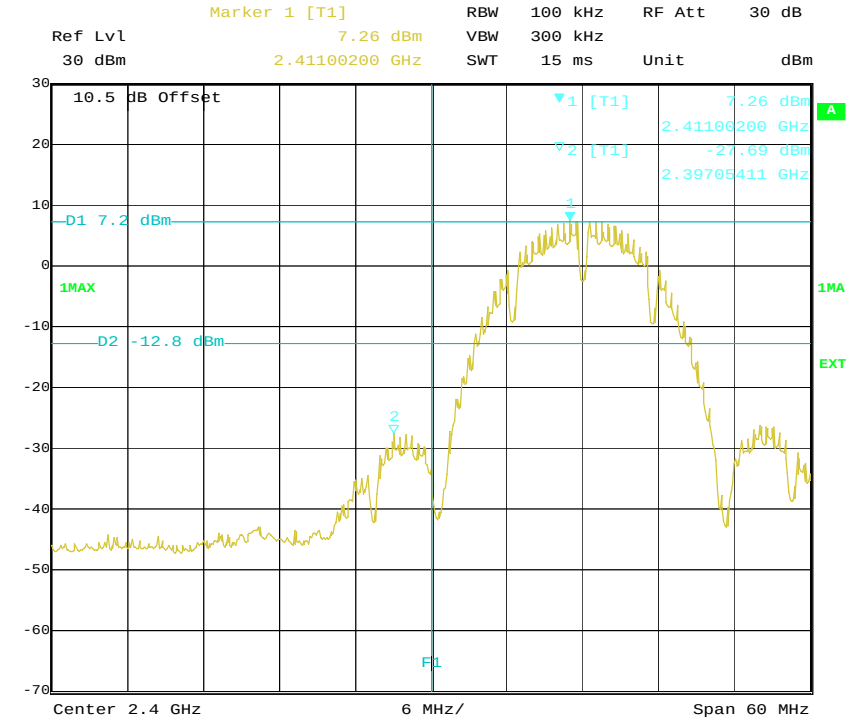
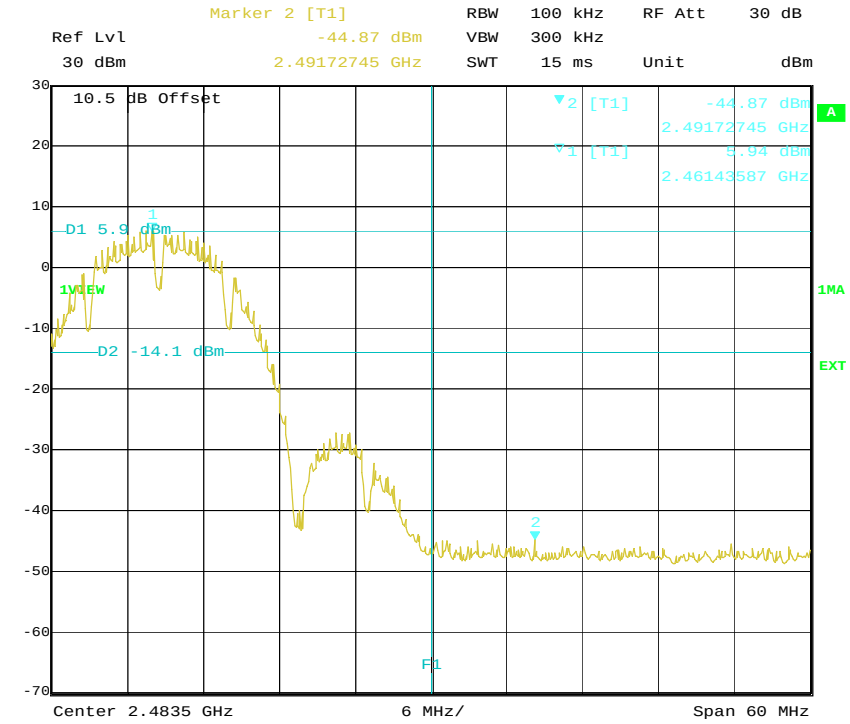
## Plot P7.1




Date: 27.JAN.2011 16:02:32

## Plot P7.2




Date: 27.JAN.2011 16:21:16



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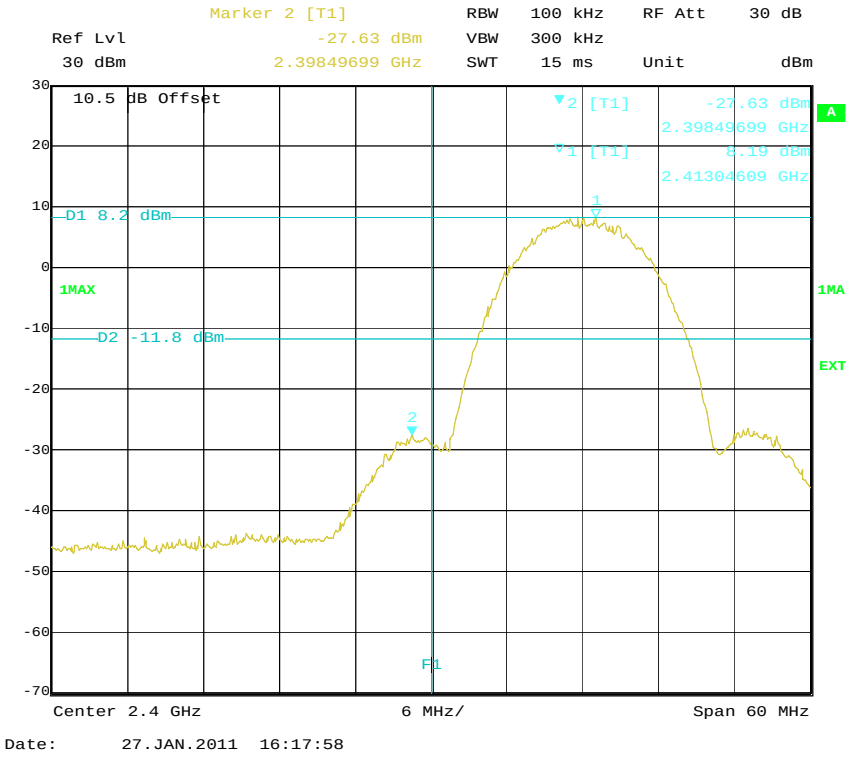
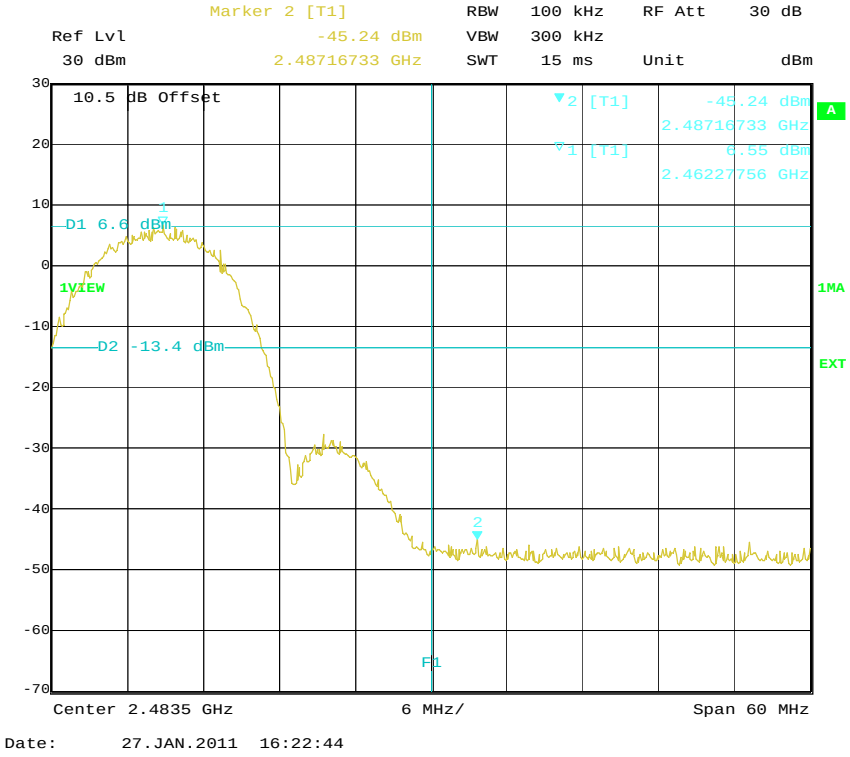
## Plot P7.3




Date: 27.JAN.2011 16:17:58

## Plot P7.4




Date: 27.JAN.2011 16:22:44



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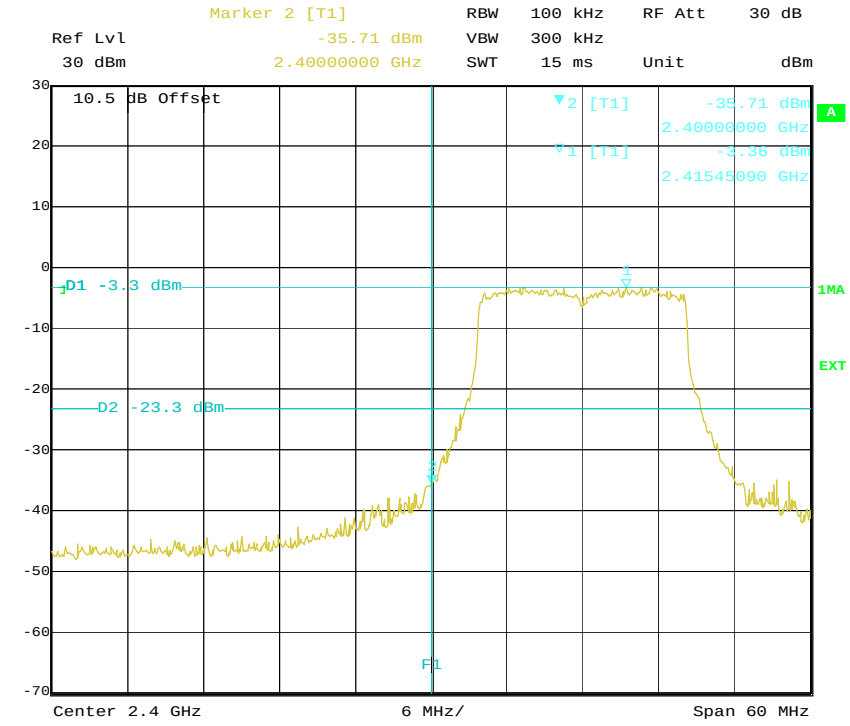
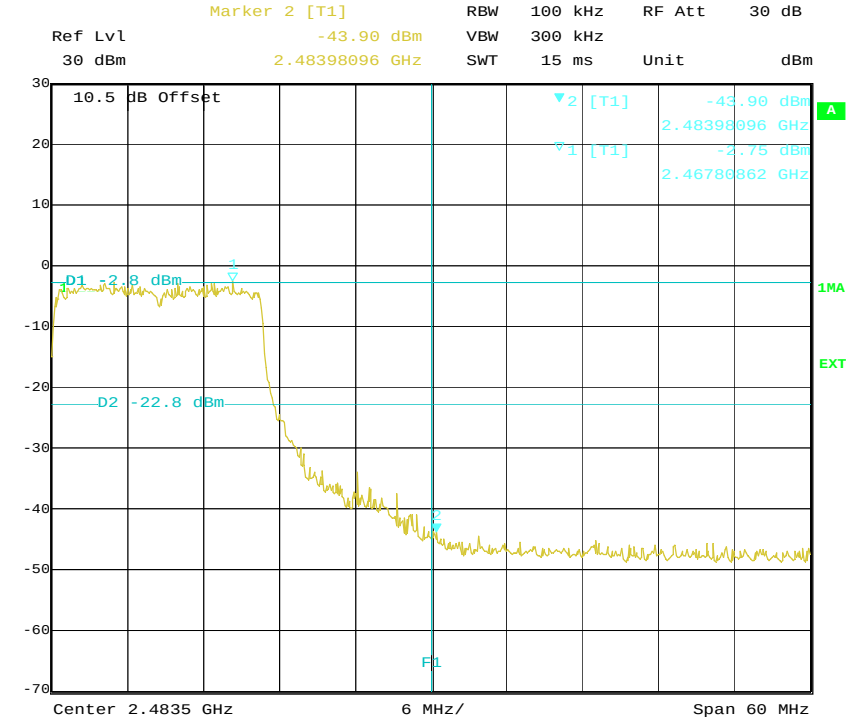
## Plot P7.5




Date: 27.JAN.2011 16:19:03

## Plot P7.6




Date: 27.JAN.2011 16:23:49



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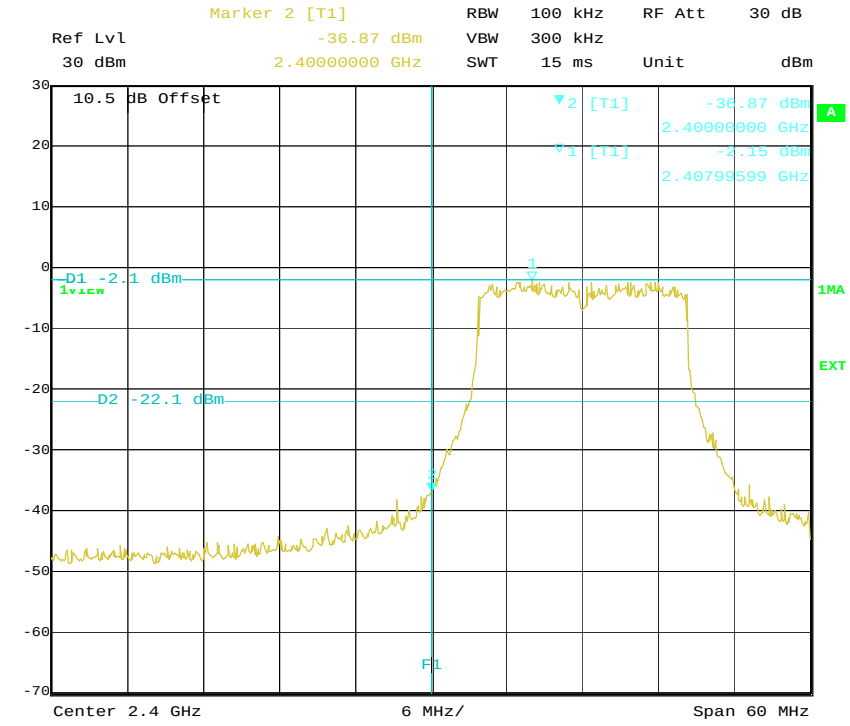
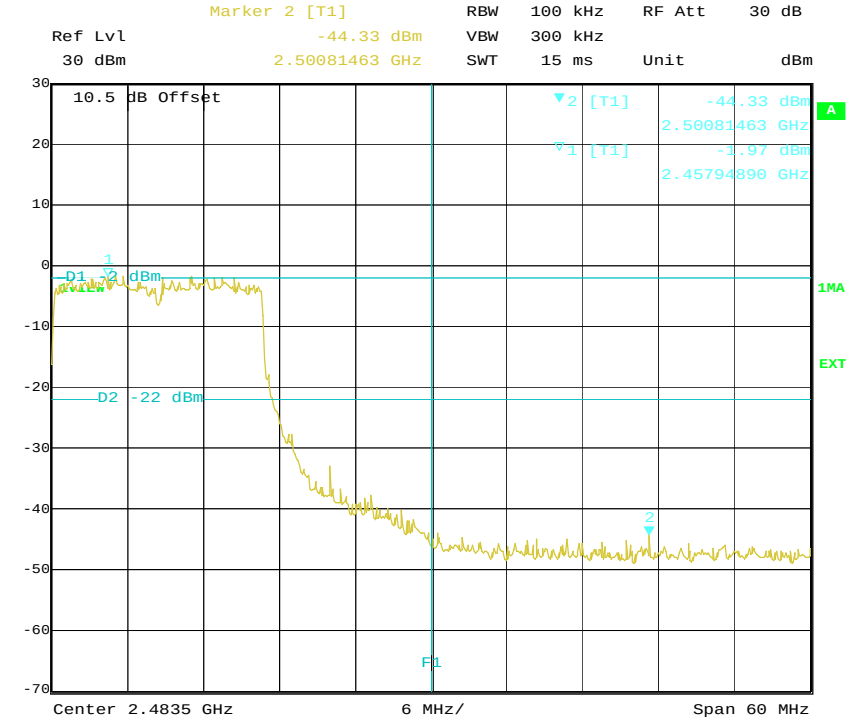
## Plot P7.7




Date: 27.JAN.2011 16:19:47

## Plot P7.8




Date: 27.JAN.2011 16:24:58



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## 8. POWER SPECTRAL DENSITY

### 8.1 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Signal Analyzer | Rhode & Schwarz | FSIQ | 12793 | 2011-07 |
| Cable | Huber + Suhner | Sucoflex 104 | 5188 | 2011-07 |
| RF attenuator | Hewlett Packard | 8491A | 30088 | 2011-07 |

### 8.2 Test protocol

Date of test: 2011-01-27

802.11b, 1 Mbps data rate

| Channel | Power spectral density (dBm) | Plot | Limit value (dBm) |
|---|---|---|---|
| Low | -6.1 | plot P8.1 | 8 |
| Mid | -7.3 | plot P8.2 | 8 |
| High | -7.1 | plot P8.3 | 8 |

802.11b, 11 Mbps data rate

| Channel | Power spectral density (dBm) | Plot | Limit value (dBm) |
|---|---|---|---|
| Low | -6.7 | plot P8.4 | 8 |
| Mid | -7.3 | plot P8.5 | 8 |
| High | -7.5 | plot P8.6 | 8 |

802.11g, 6 Mbps data rate

| Channel | Power spectral density (dBm) | Plot | Limit value (dBm) |
|---|---|---|---|
| Low | -9.8 | plot P8.7 | 8 |
| Mid | -8.9 | plot P8.8 | 8 |
| High | -9.4 | plot P8.9 | 8 |



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802.11g, 54 Mbps data rate

| Channel | Power spectral density (dBm) | Plot | Limit value (dBm) |
|---|---|---|---|
| Low | -9.8 | plot P8.10 | 8 |
| Mid | -9.0 | plot P8.11 | 8 |
| High | -9.4 | plot P8.12 | 8 |

Measurement results are corrected for attenuation in the set-up configuration.



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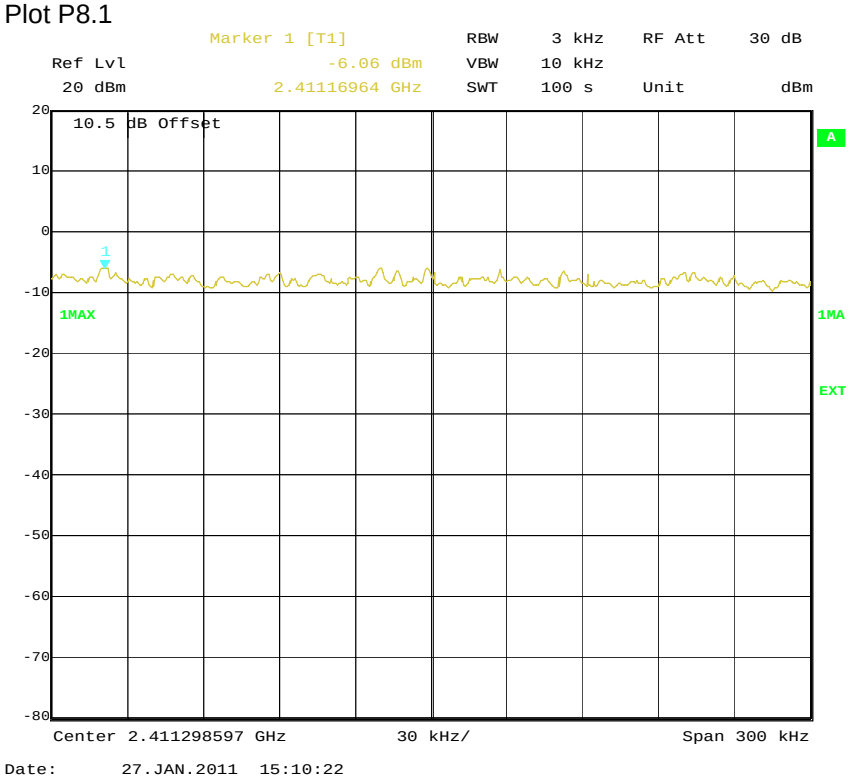
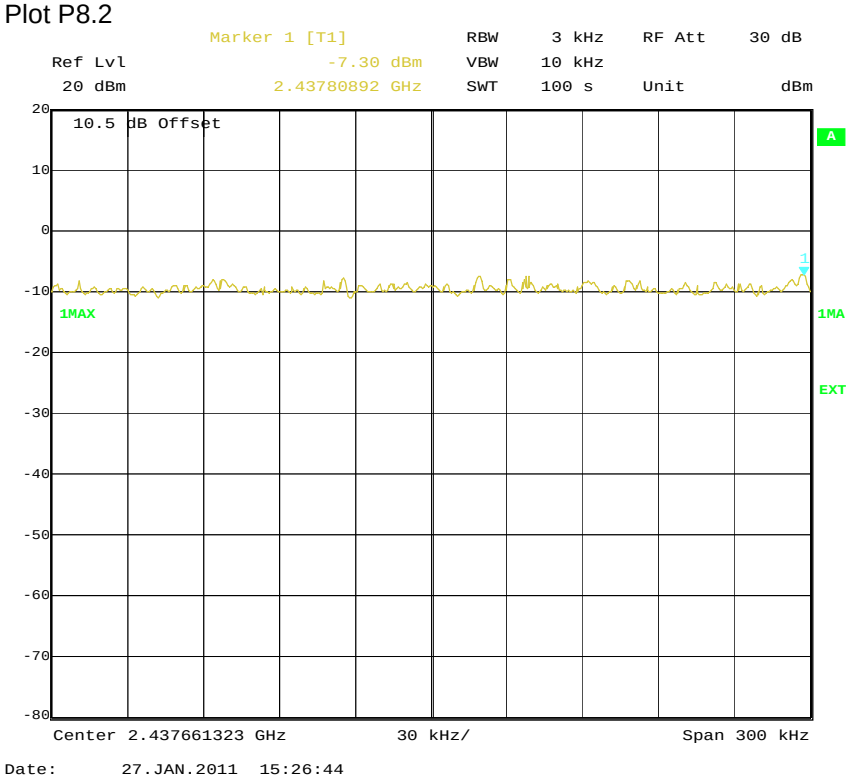
## Plot P8.1




Date: 27.JAN.2011 15:10:22

## Plot P8.2




Date: 27.JAN.2011 15:26:44



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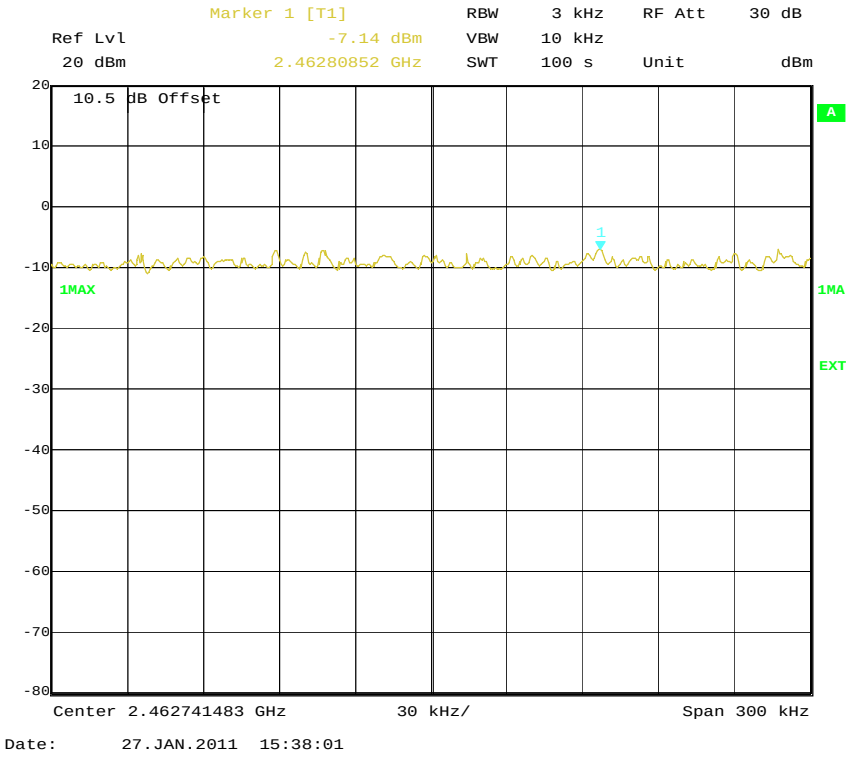
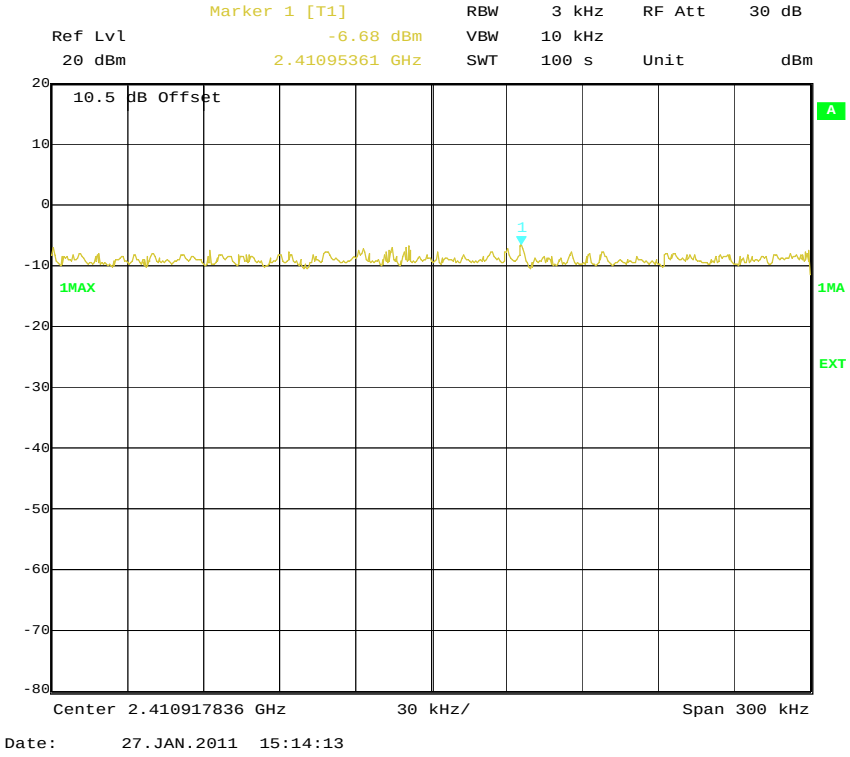
## Plot P8.3




Date: 27.JAN.2011 15:38:01

## Plot P8.4




Date: 27.JAN.2011 15:14:13



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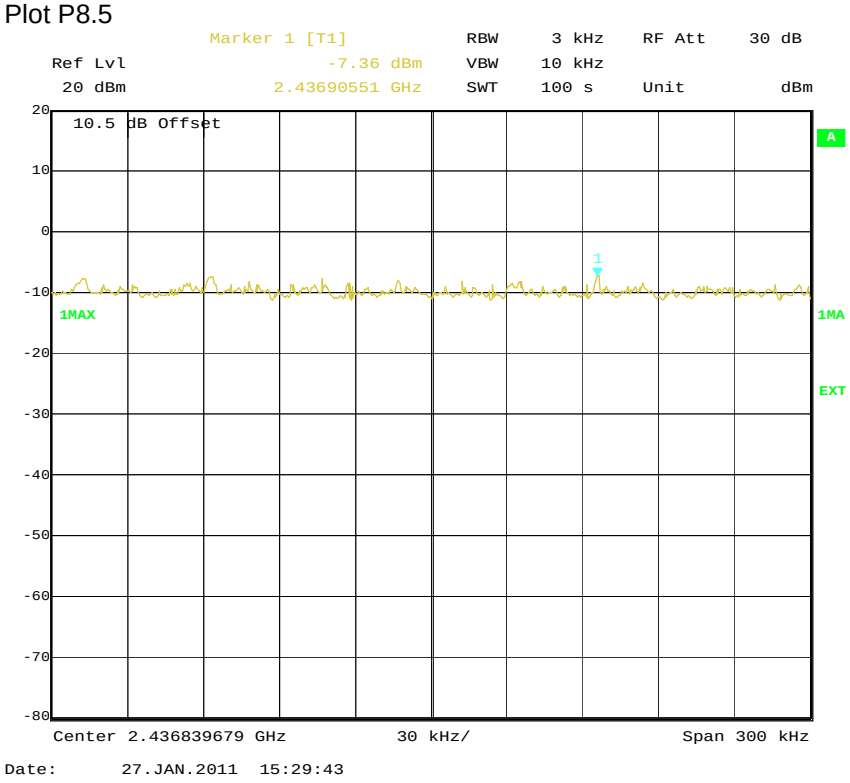
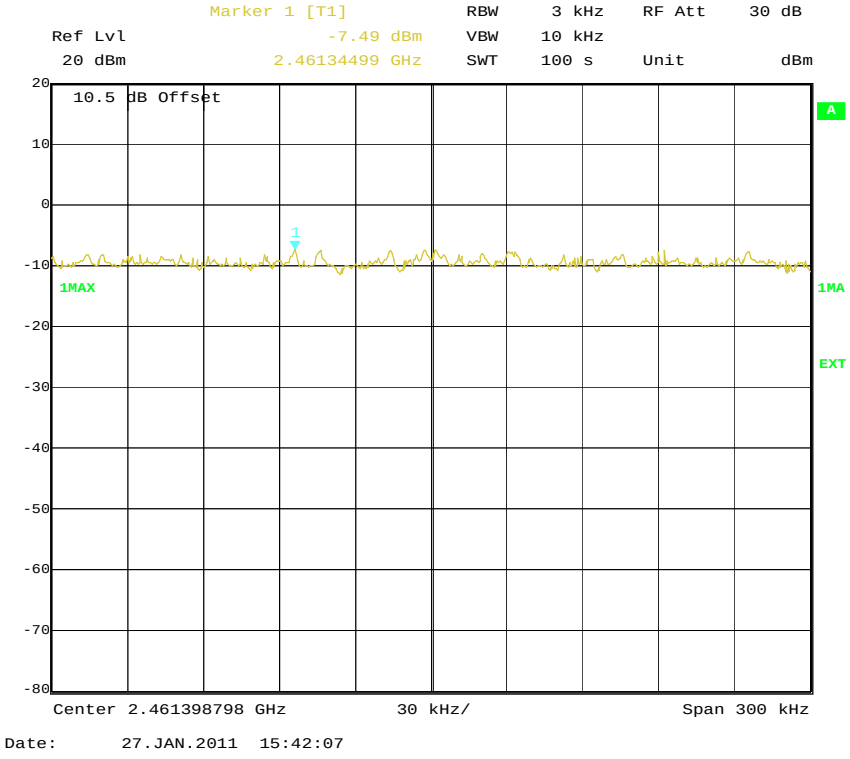
## Plot P8.5




Date: 27.JAN.2011 15:29:43

## Plot P8.6




Date: 27.JAN.2011 15:42:07



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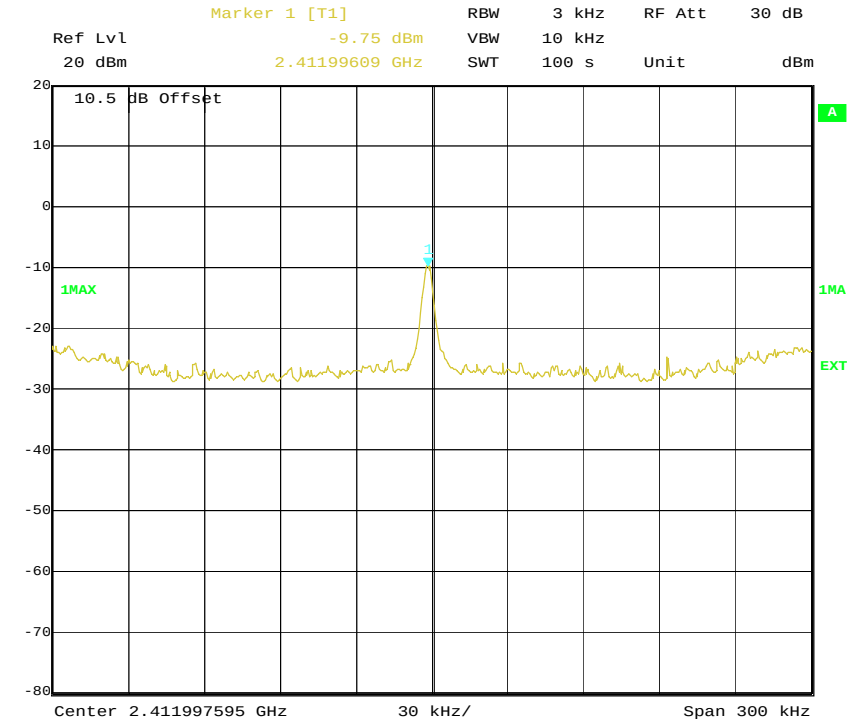
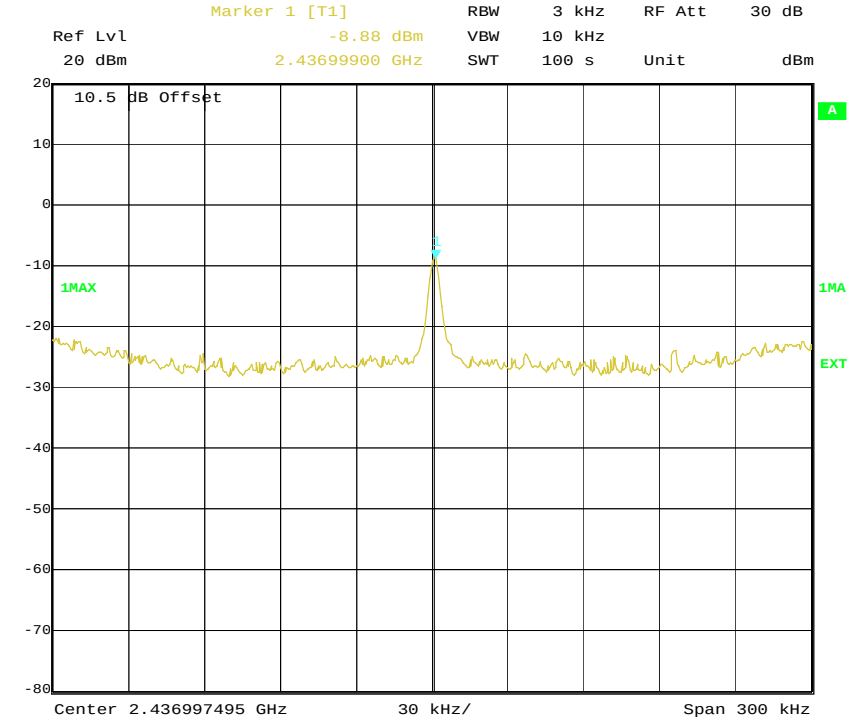
## Plot P8.7




Date: 27.JAN.2011 15:19:25

## Plot P8.8




Date: 27.JAN.2011 15:32:12



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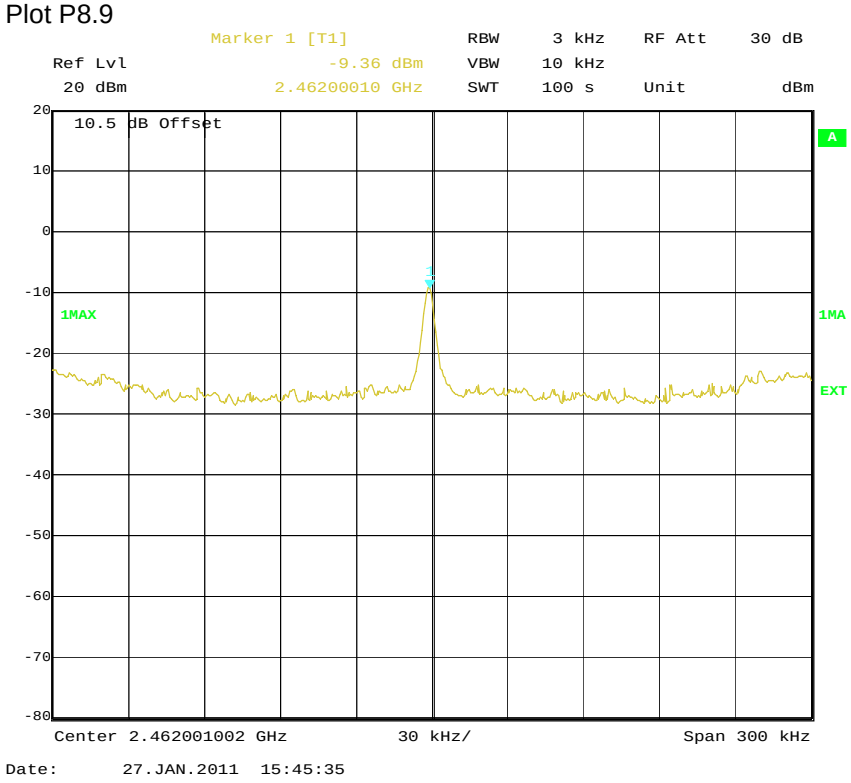
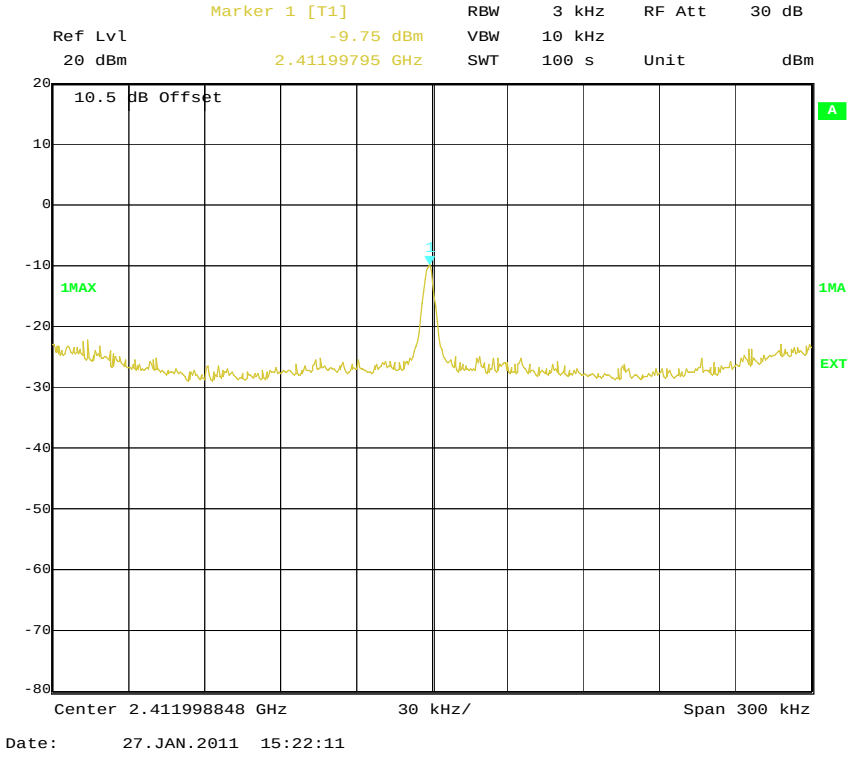
## Plot P8.9




Date: 27.JAN.2011 15:45:35

## Plot P8.10




Date: 27.JAN.2011 15:22:11



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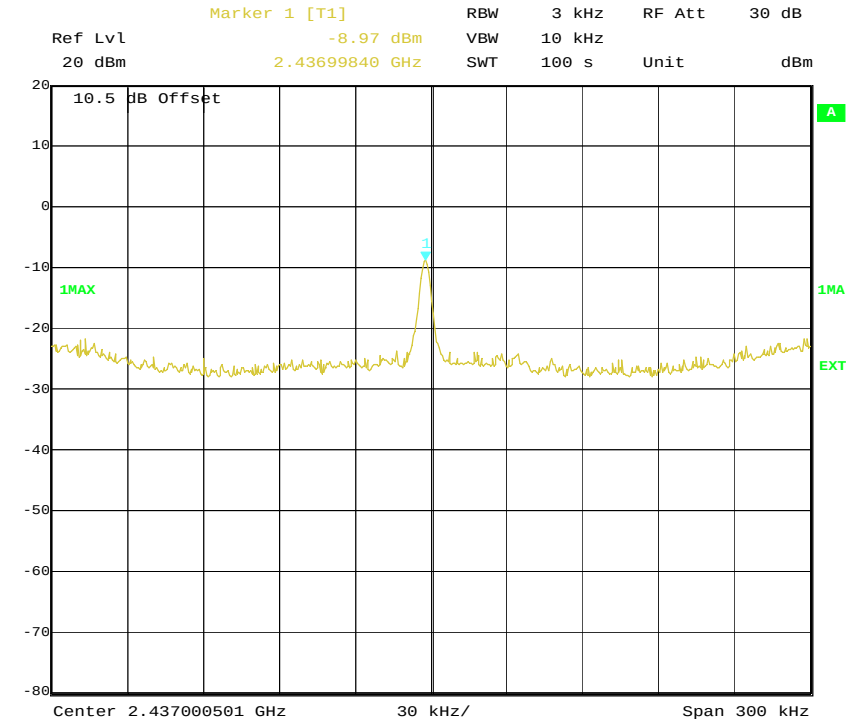
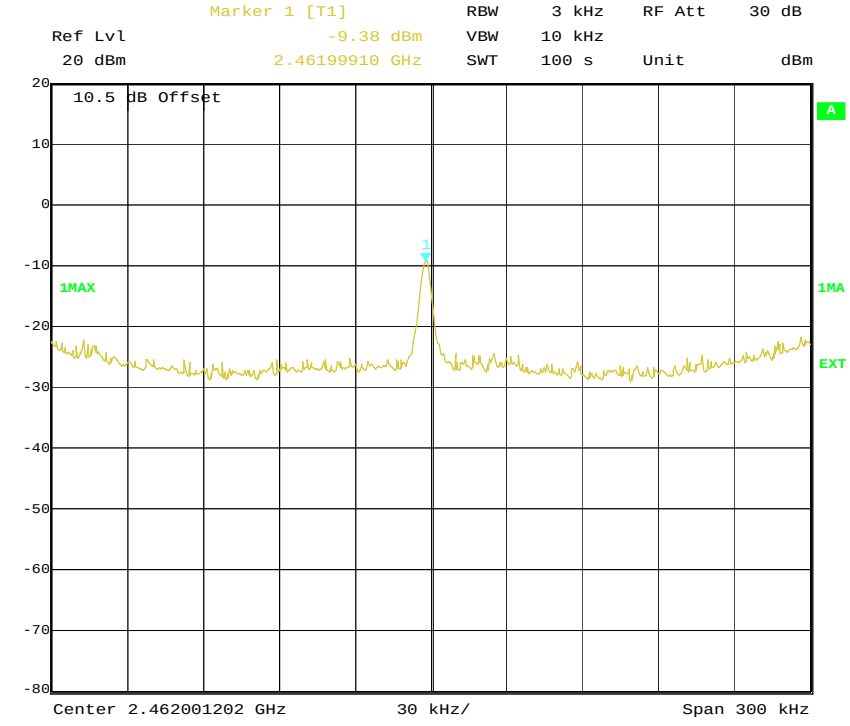
## Plot P8.11




Date: 27.JAN.2011 15:34:38

## Plot P8.12




Date: 27.JAN.2011 15:48:00



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## 9. RADIATED SPURIOUS EMISSIONS

### 9.1 Measurement uncertainty

Radiated disturbance electric field intensity, 30 – 1000 MHz: ± 4,6 dB
Radiated disturbance electric field intensity, 1000 – 26000 MHz: ± 6,0 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT. Measurement uncertainty is calculated in accordance with EA-4/02-1997. The uncertainty is given with a level of confidence of approximately 95% (k=2).

### 9.2 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| *Test site: Semi-anechoic shielded chamber, Stora Hallen* | | | 30300 | |
| Software | Rohde & Schwarz | EMC 32 | | |
| Measurement receiver | Rohde & Schwarz | ESU 8 | 12866 | 2011-06 |
| Measurement receiver | Rohde & Schwarz | ESU 40 | 13178 | 2011-07 |
| Antenna, bilog | Chase | CBL6111 | 8578 | 2011-09 |
| Preamplifier | Semko | AM1331 | 7992 | 2011-07 |
| Cable | Suhner | Sucoflex 104PEA | 40035 | 2011-07 |
| Cable | Suhner | RG214 | 30224 | 2011-07 |
| Horn antenna | Rohde & Schwarz | HF907 | 31245 | 2013-11 |
| Preamplifier | BONN Elektronik | BLMA 0118-M | 31246 | 2011-07 |
| Cable | Rosenberger | Utiflex FA142A | 9747 | 2011-07 |
| Horn antenna with preamplifier | BONN Elektronik | BLMA 1826-5A | 31247 | 2013-12 |
| Horn antenna with preamplifier | BONN Elektronik | BLMA 2640-5A | 31248 | 2013-12 |
| Cable | Rosenberger | Utiflex FB311A | 9748 | 2011-07 |
| High pass filter | K & L Microwave Inc. | 4410-X4500/18000-0 | 5133 | 2011-07 |
| Band rejection filter | K & L Microwave Inc. | 6N45-2450/T 100-0/0 | 12389 | 2011-07 |



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### 9.3 Measurement set-up

Test site Semi-anechoic shielded chamber

The radiated disturbance electric field intensity was measured in a semi-anechoic chamber at a distance of 3 m and the EUT was placed on a non-metallic table, 0,8 m above the reference ground plane. The specified test mode was enabled. Test set-up photos are given below.

An overview sweep with peak detection of the electric field intensity was performed with the measurement receiver in max-hold and with the antenna placed 1,5 m above the floor. The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements with the correct detector(s) were carried out.

The EUT was supplied with 3.3 VDC from the computer during the test.
The computer was supplied by 120 VAC (60 Hz) during the test.

Example calculation
Measured level [dBμV/m] = Analyser reading [dBμV] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]



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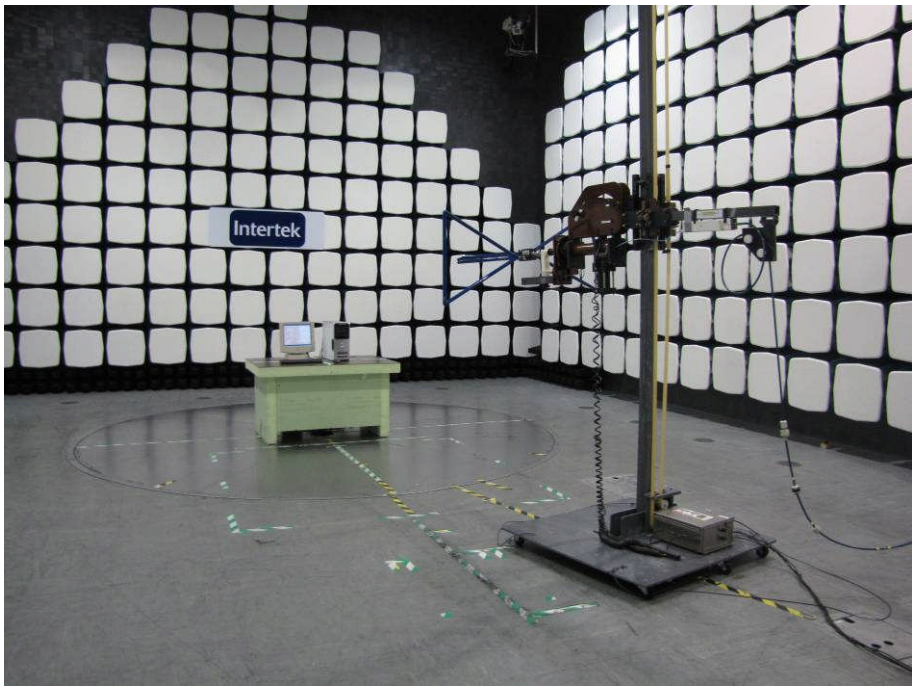
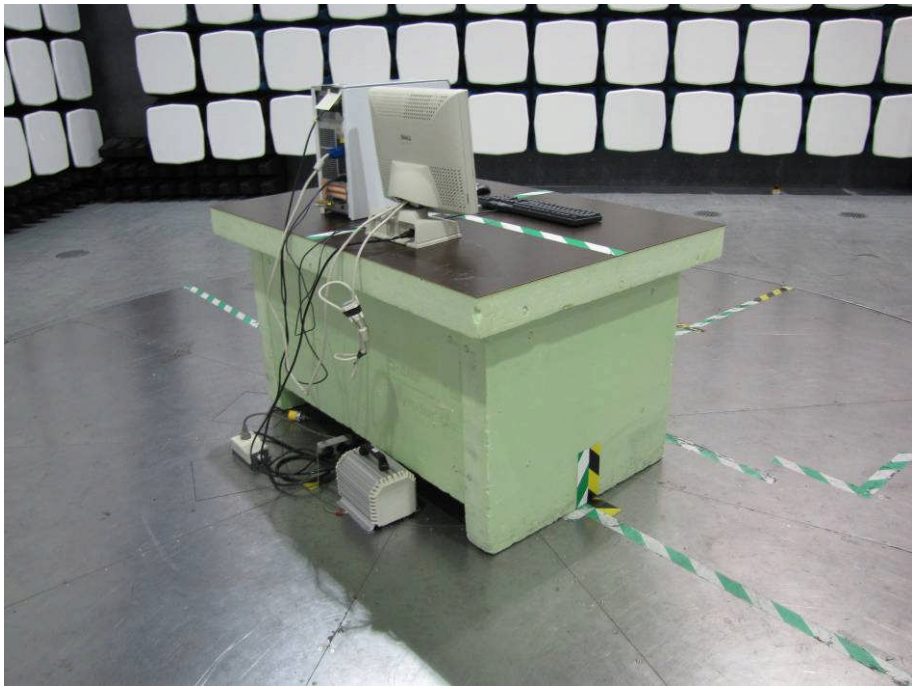
Test set-up photos 30 -1000 MHz





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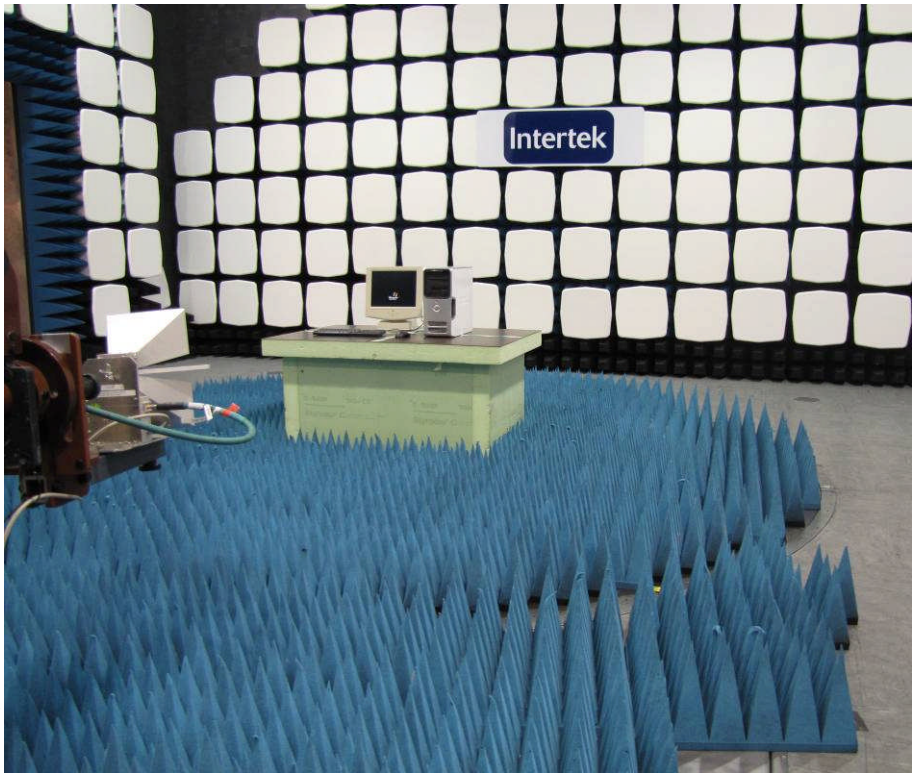
Test set-up photo above 1 GHz



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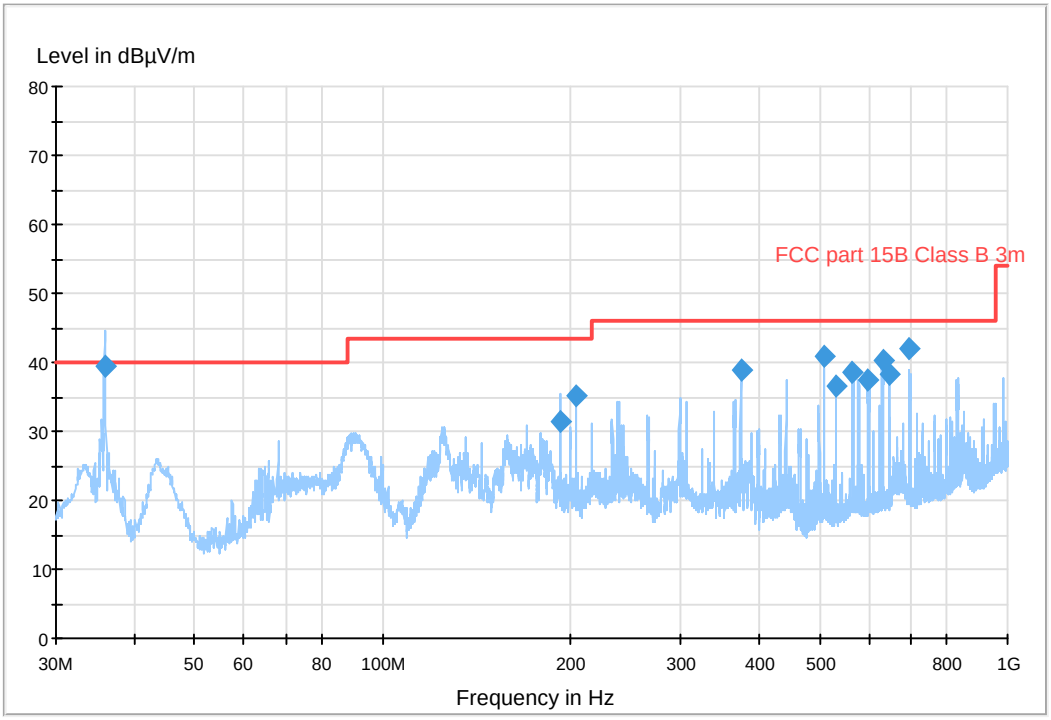
### 9.4 Test protocol

Semi-anechoic shielded chamber

Dates of test 2011-01-05, 2011-01-10 and 2011-01-12

30 – 1000 MHz, max peak at a distance of 3 m on the lowest TX channel, 802.11g, 6 Mbps




**Final Result lowest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 35.967800 | 39.4 | 120.000 | 100.0 | V | 91.0 | -17.3 | 40.0 | 0.6 |
| 192.016800 | 31.4 | 120.000 | 124.0 | H | 228.0 | -22.5 | 43.5 | 12.1 |
| 203.967800 | 35.2 | 120.000 | 123.0 | H | 244.0 | -21.7 | 43.5 | 8.3 |
| 373.995000 | 38.9 | 120.000 | 138.0 | V | 320.0 | -15.6 | 46.0 | 7.1 |
| 510.002600 | 40.9 | 120.000 | 167.0 | V | 296.0 | -10.8 | 46.0 | 5.1 |
| 533.104800 | 36.4 | 120.000 | 173.0 | H | 49.0 | -10.6 | 46.0 | 9.6 |
| 564.112800 | 38.5 | 120.000 | 150.0 | H | 60.0 | -8.7 | 46.0 | 7.5 |
| 597.277200 | 37.4 | 120.000 | 155.0 | H | 51.0 | -8.9 | 46.0 | 8.6 |
| 632.985600 | 40.2 | 120.000 | 148.0 | H | 50.0 | -8.1 | 46.0 | 5.8 |
| 645.985600 | 38.3 | 120.000 | 149.0 | V | -6.0 | -7.8 | 46.0 | 7.7 |
| 696.800800 | 42.0 | 120.000 | 123.0 | H | 51.0 | -7.2 | 46.0 | 4.0 |

Note None of these emissions are in a restricted band listed in §15.205.



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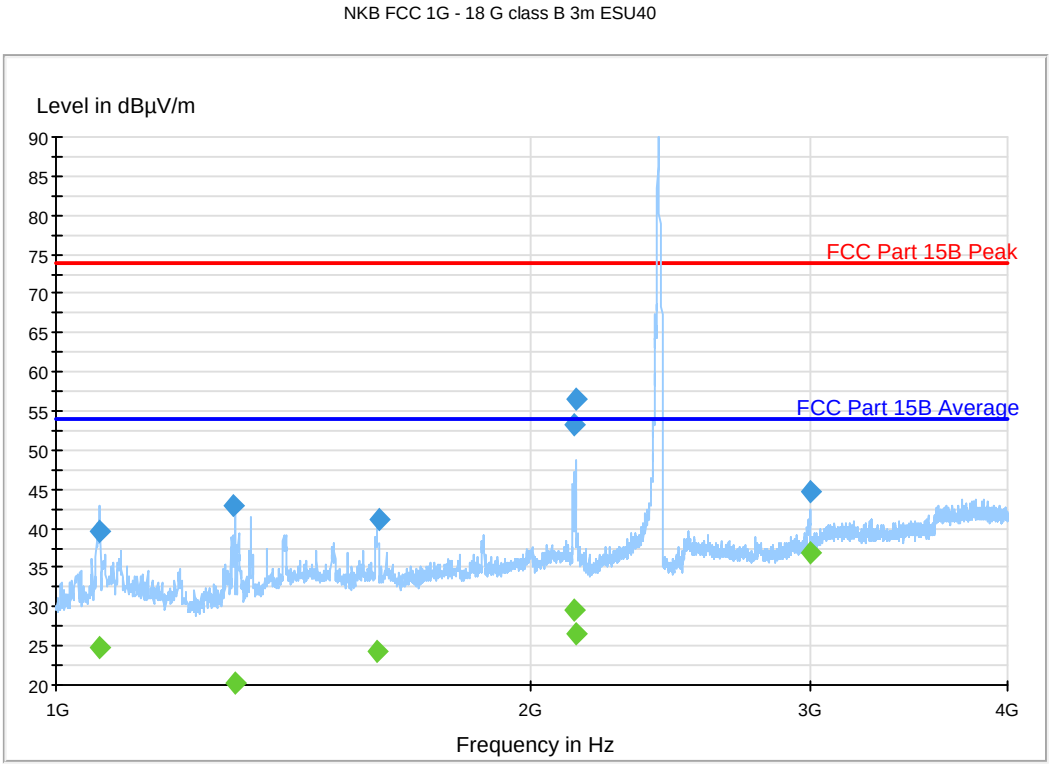
1 – 4 GHz, max peak at a distance of 3 m on the lowest TX channel, 802.11g, 6 Mbps
Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0




**Final Result Peak lowest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 1065.400000 | 39.5 | 1000.000 | 100.0 | H | 211.0 | -17.7 | 34.5 | 74.0 |
| 1294.800000 | 43.0 | 1000.000 | 136.0 | V | 28.0 | -17.3 | 31.0 | 74.0 |
| 1599.200000 | 41.1 | 1000.000 | 100.0 | H | 185.0 | -15.0 | 32.9 | 74.0 |
| 2126.000000 | 53.2 | 1000.000 | 266.0 | V | 177.0 | -13.2 | 20.8 | 74.0 |
| 2132.000000 | 56.5 | 1000.000 | 143.0 | H | 49.0 | -13.3 | 17.5 | 74.0 |
| 2999.800000 | 44.7 | 1000.000 | 100.0 | H | -16.0 | -10.0 | 29.3 | 74.0 |

**Final Result Average lowest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 1064.400000 | 24.9 | 1000.000 | 177.0 | H | 187.0 | -17.7 | 29.1 | 54.0 |
| 1297.800000 | 20.3 | 1000.000 | 248.0 | V | 12.0 | -17.2 | 33.7 | 54.0 |
| 1598.200000 | 24.2 | 1000.000 | 300.0 | H | 146.0 | -15.0 | 29.8 | 54.0 |
| 2125.000000 | 29.5 | 1000.000 | 136.0 | V | 173.0 | -13.2 | 24.5 | 54.0 |
| 2132.000000 | 26.6 | 1000.000 | 135.0 | H | -5.0 | -13.3 | 27.4 | 54.0 |
| 2999.800000 | 36.9 | 1000.000 | 149.0 | H | -34.0 | -10.0 | 17.1 | 54.0 |

Note None of these emissions are in a restricted band listed in §15.205.



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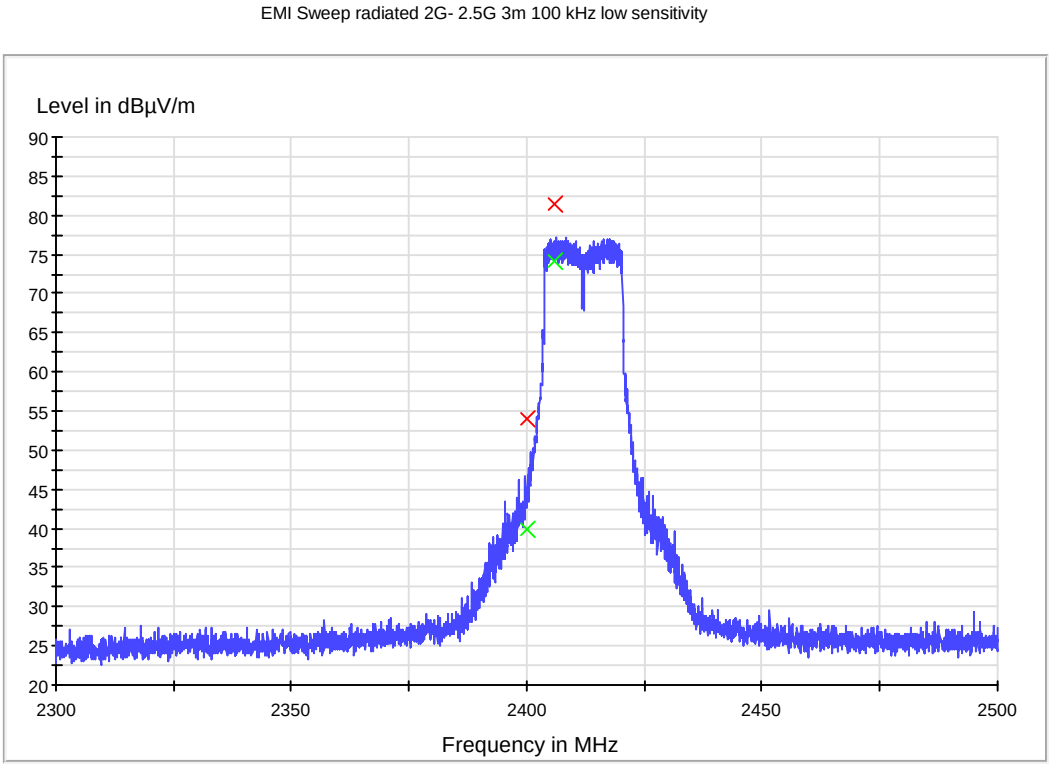
Emissions at the lower band edge at a distance of 3 m on the lowest TX channel, 802.11g, 6 Mbps




**Result**

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) |
|---|---|---|---|---|---|---|---|
| 2400.000000 | 54.0 | 40.0 | 100.000 | 210.0 | H | 196.0 | -12.7 |
| 2406.000000 | 81.4 | 74.0 | 100.000 | 200.0 | H | 196.0 | -12.7 |

The out of band emissions are attenuated by more than 20 dB from the highest emission in the TX band in a 100 kHz measurement bandwidth



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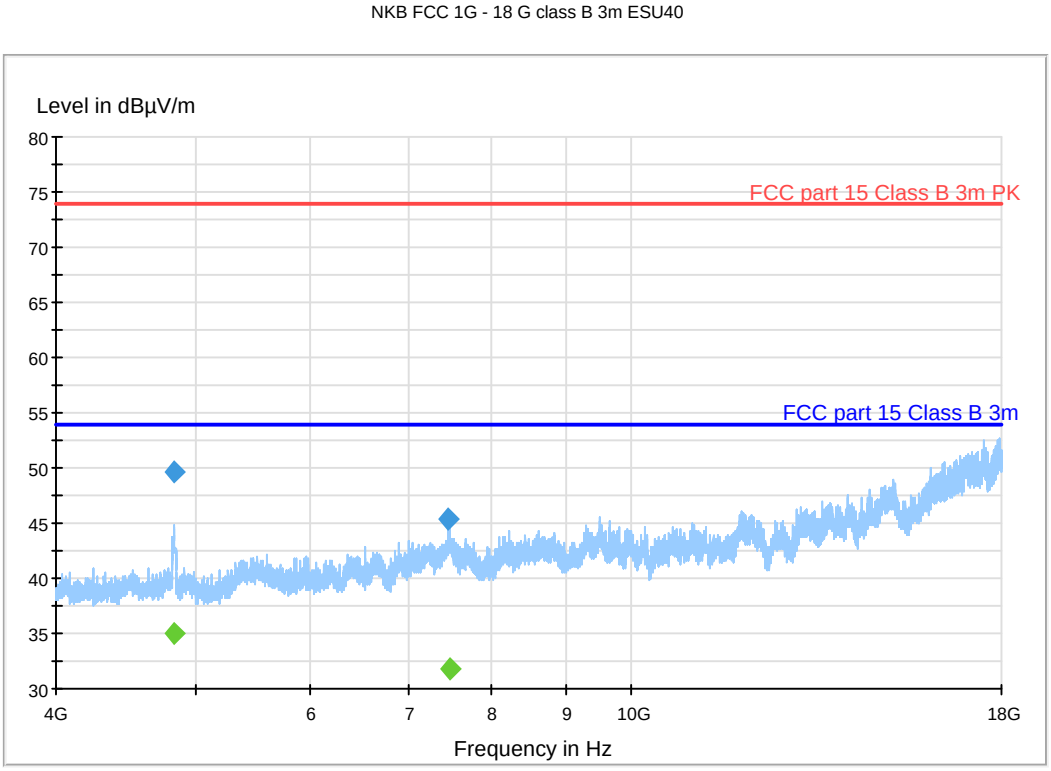
4 – 18 GHz, max peak at a distance of 3 m on the lowest TX channel, 802.11g, 6 Mbps
Emissions below 4 GHz are attenuated by high-pass filter K&L 4410-X4500/18000-0




**Final Result Peak lowest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4821.600000 | 49.7 | 1000.000 | 174.0 | H | 171.0 | -6.5 | 24.3 | 74.0 |
| 7468.000000 | 45.3 | 1000.000 | 161.0 | H | 2.0 | -2.6 | 28.7 | 74.0 |

**Final Result Average lowest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4824.600000 | 35.1 | 1000.000 | 169.0 | H | 177.0 | -6.5 | 18.9 | 54.0 |
| 7476.000000 | 31.8 | 1000.000 | 155.0 | H | 5.0 | -2.6 | 22.2 | 54.0 |



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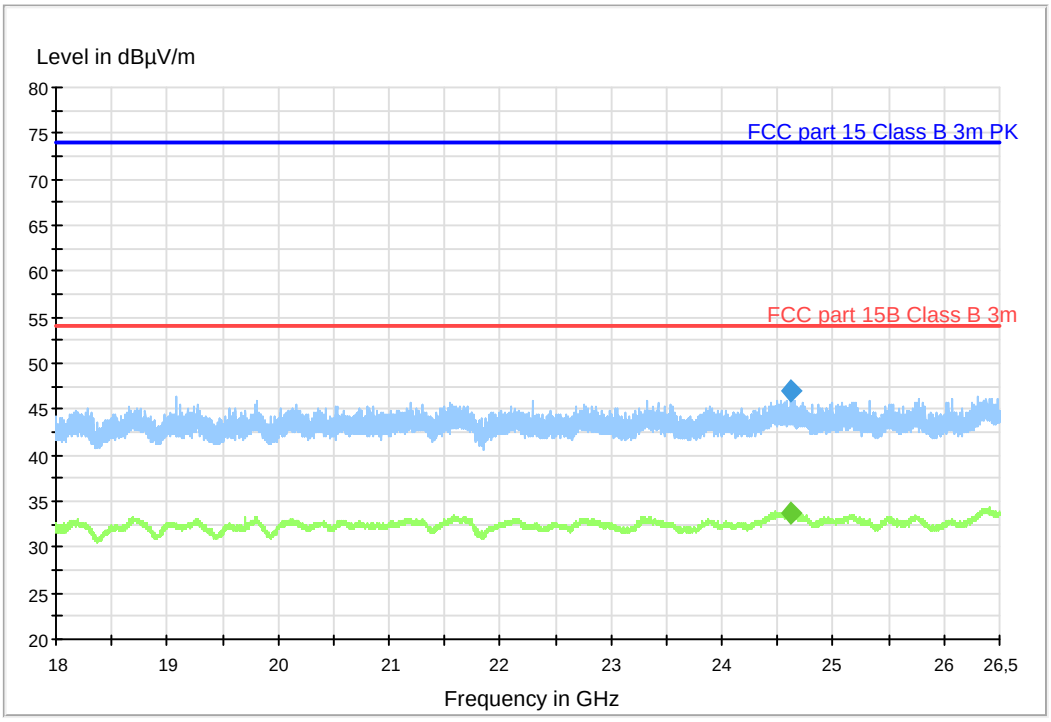
18 – 26 GHz, max peak at a distance of 3 m on the lowest TX channel, 802.11g, 6 Mbps

NKB FCC 18 G - 26,5 G class B 3m pre-sweep ESU40




No significant emissions, Noise floor (peak) below 47 dBµV/m.



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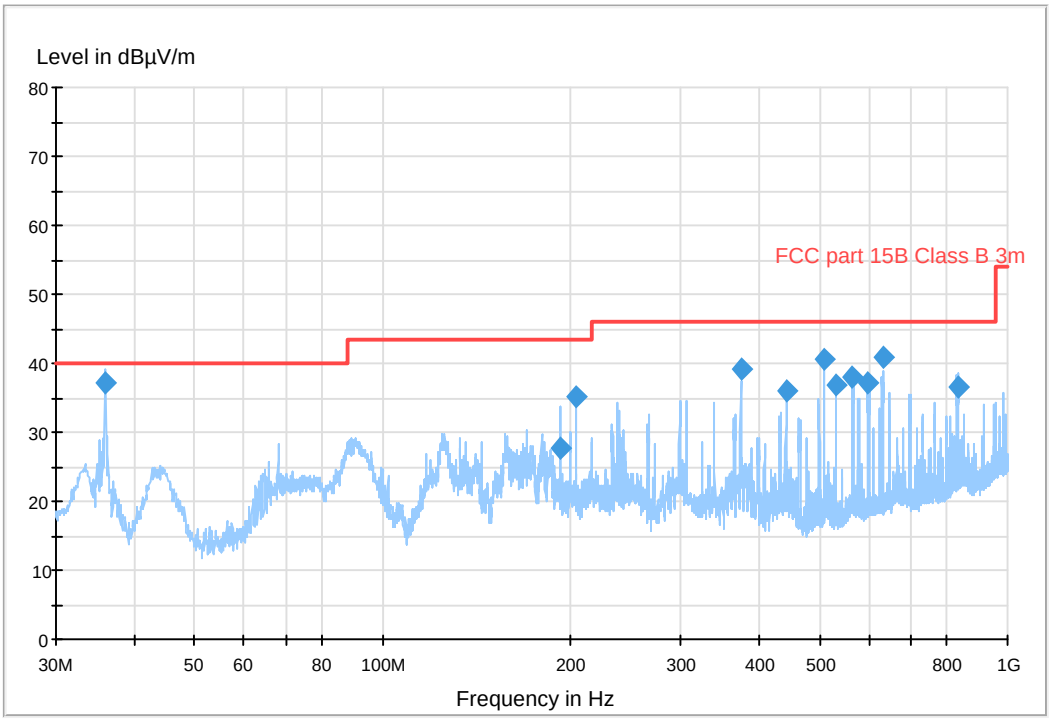
30 – 1000 MHz, max peak at a distance of 3 m on the middle TX channel, 802.11g, 6 Mbps




**Final Result middle TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 35.992400 | 37.0 | 120.000 | 100.0 | V | 143.0 | -17.4 | 40.0 | 3.0 |
| 191.992200 | 27.6 | 120.000 | 100.0 | H | 192.0 | -22.5 | 43.5 | 15.9 |
| 203.967800 | 35.2 | 120.000 | 100.0 | H | 247.0 | -21.7 | 43.5 | 8.3 |
| 373.995000 | 39.3 | 120.000 | 124.0 | V | 322.0 | -15.6 | 46.0 | 6.7 |
| 441.978800 | 35.9 | 120.000 | 161.0 | H | 332.0 | -13.4 | 46.0 | 10.1 |
| 510.002600 | 40.7 | 120.000 | 149.0 | V | 284.0 | -10.8 | 46.0 | 5.3 |
| 533.040200 | 36.8 | 120.000 | 159.0 | H | 47.0 | -10.6 | 46.0 | 9.2 |
| 564.112800 | 38.0 | 120.000 | 144.0 | H | 58.0 | -8.7 | 46.0 | 8.0 |
| 597.277200 | 37.1 | 120.000 | 142.0 | H | 49.0 | -8.9 | 46.0 | 8.9 |
| 633.041000 | 40.7 | 120.000 | 119.0 | H | 52.0 | -8.1 | 46.0 | 5.3 |
| 832.930400 | 36.5 | 120.000 | 156.0 | V | 9.0 | -4.0 | 46.0 | 9.5 |

Note None of these emissions are in a restricted band listed in §15.205.



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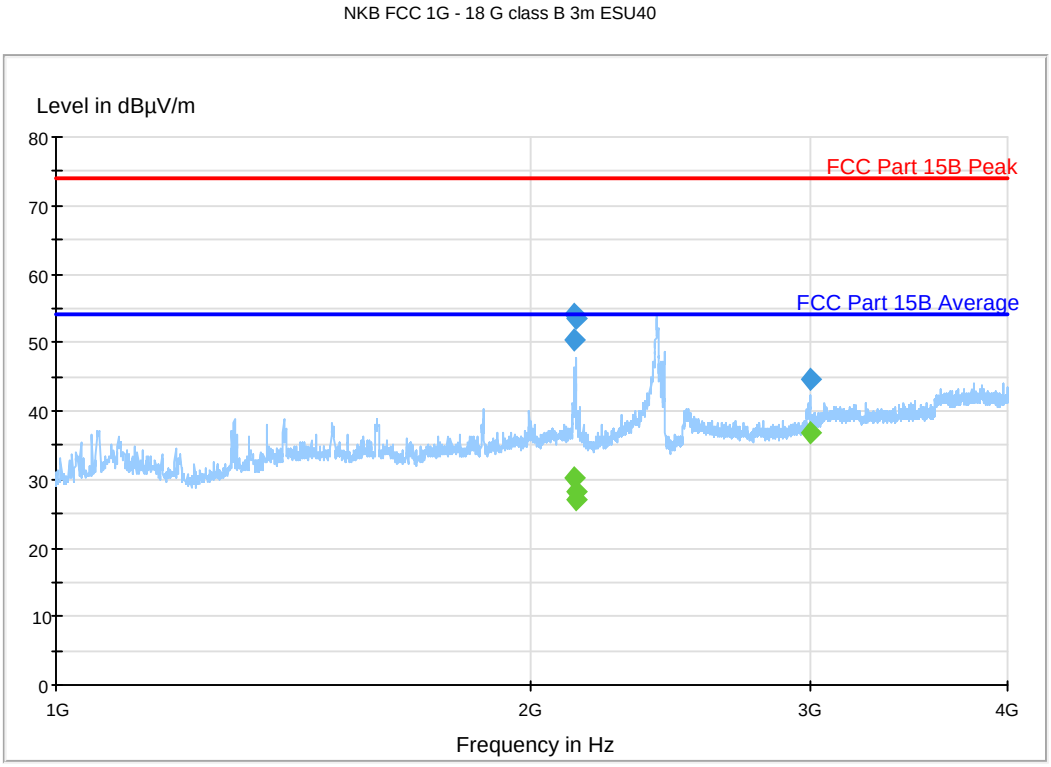
1 – 4 GHz, max peak at a distance of 3 m on the middle TX channel, 802.11g, 6 Mbps
Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0




**Final Result Peak middle TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2124.800000 | 50.5 | 1000.000 | 100.0 | V | 176.0 | -13.2 | 23.5 | 74.0 |
| 2127.600000 | 54.2 | 1000.000 | 181.0 | H | 171.0 | -13.2 | 19.8 | 74.0 |
| 2130.800000 | 53.6 | 1000.000 | 149.0 | H | 56.0 | -13.3 | 20.4 | 74.0 |
| 2999.800000 | 44.6 | 1000.000 | 143.0 | H | -13.0 | -10.0 | 29.4 | 74.0 |

**Final Result Average middle TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2129.800000 | 30.2 | 1000.000 | 143.0 | V | 175.0 | -13.2 | 23.8 | 54.0 |
| 2132.600000 | 27.1 | 1000.000 | 155.0 | H | 228.0 | -13.3 | 26.9 | 54.0 |
| 2134.800000 | 28.2 | 1000.000 | 119.0 | H | 50.0 | -13.3 | 25.8 | 54.0 |
| 2999.800000 | 36.8 | 1000.000 | 142.0 | H | -33.0 | -10.0 | 17.2 | 54.0 |

Note None of these emissions are in a restricted band listed in §15.205.



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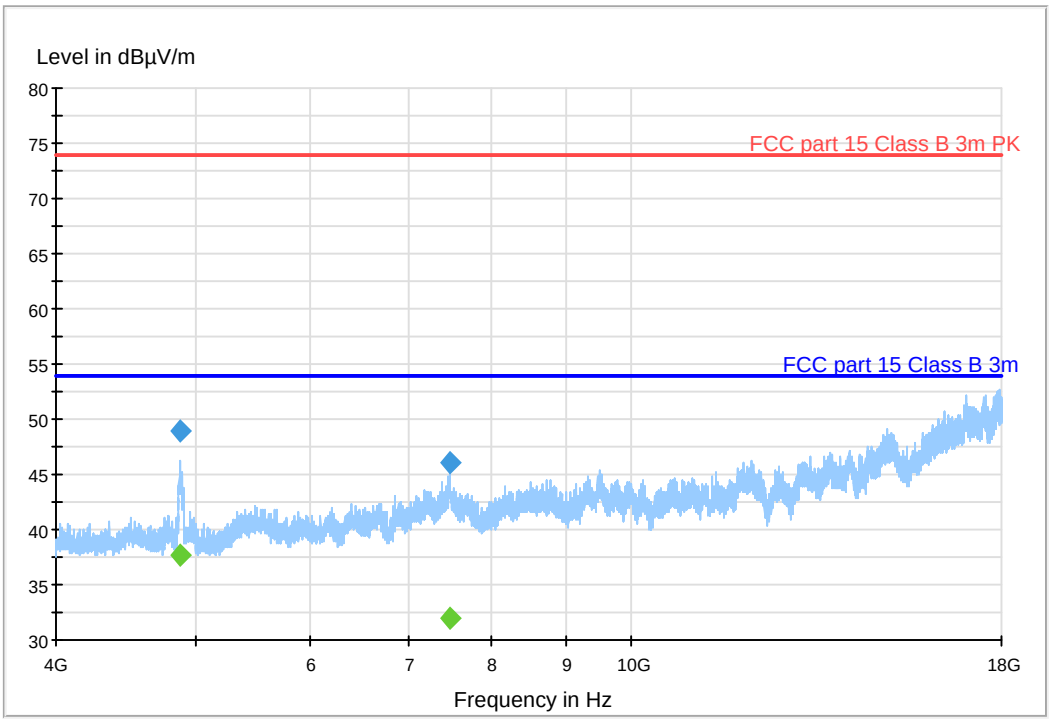
4 – 18 GHz, max peak at a distance of 3 m on the middle TX channel, 802.11g, 6 Mbps
Emissions below 4 GHz are attenuated by high-pass filter K&L 4410-X4500/18000-0

NKB FCC 1G - 18 G class B 3m ESU40




**Final Result Peak middle TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4879.200000 | 48.9 | 1000.000 | 136.0 | H | 181.0 | -6.4 | 25.1 | 74.0 |
| 7482.400000 | 46.1 | 1000.000 | 150.0 | H | 8.0 | -2.6 | 27.9 | 74.0 |

**Final Result Average middle TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4877.200000 | 37.7 | 1000.000 | 192.0 | H | 147.0 | -6.4 | 16.3 | 54.0 |
| 7485.400000 | 31.9 | 1000.000 | 100.0 | H | 9.0 | -2.6 | 22.1 | 54.0 |



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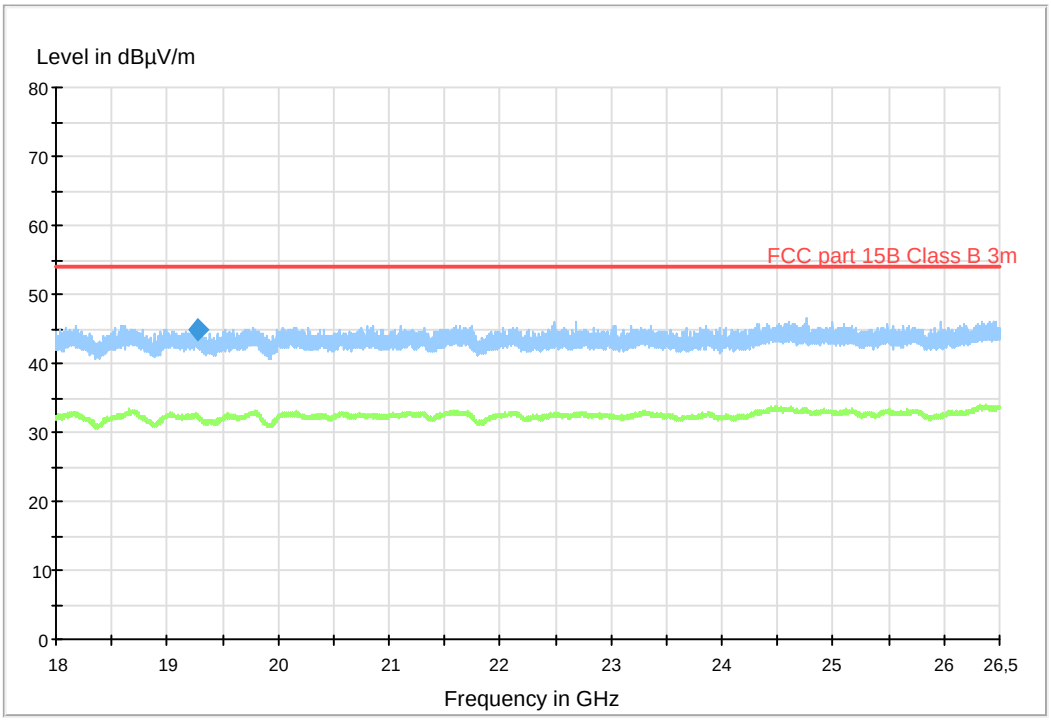
18 – 26 GHz, max peak at a distance of 3 m on the middle TX channel, 802.11g, 6 Mbps

NKB FCC 18 G - 26,5 G class B 3m pre-sweep ESU40




No significant emissions, Noise floor (peak) below 47 dBµV/m.



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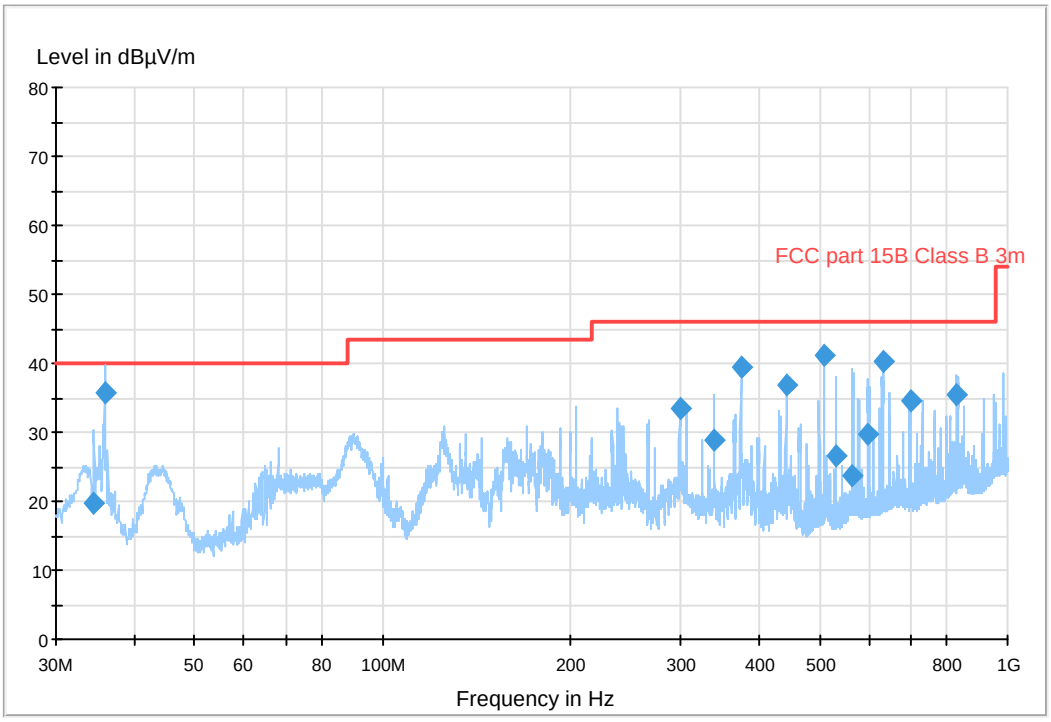
30 – 1000 MHz, max peak at a distance of 3 m on the highest TX channel, 802.11g, 6 Mbps




**Final Result highest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 34.457400 | 19.8 | 120.000 | 100.0 | V | 90.0 | -16.7 | 40.0 | 20.2 |
| 35.983200 | 35.7 | 120.000 | 100.0 | V | 56.0 | -17.3 | 40.0 | 4.3 |
| 299.834200 | 33.4 | 120.000 | 130.0 | V | 154.0 | -17.0 | 46.0 | 12.6 |
| 339.960000 | 28.7 | 120.000 | 149.0 | V | 323.0 | -16.1 | 46.0 | 17.3 |
| 373.995000 | 39.5 | 120.000 | 118.0 | V | 323.0 | -15.6 | 46.0 | 6.5 |
| 441.994200 | 37.0 | 120.000 | 149.0 | H | 327.0 | -13.4 | 46.0 | 9.0 |
| 510.002600 | 41.0 | 120.000 | 149.0 | V | 290.0 | -10.8 | 46.0 | 5.0 |
| 533.064800 | 26.4 | 120.000 | 100.0 | H | 57.0 | -10.6 | 46.0 | 19.6 |
| 564.112800 | 23.8 | 120.000 | 150.0 | H | 12.0 | -8.7 | 46.0 | 22.2 |
| 597.277200 | 29.6 | 120.000 | 100.0 | H | 50.0 | -8.9 | 46.0 | 16.4 |
| 633.041000 | 40.3 | 120.000 | 119.0 | H | 52.0 | -8.1 | 46.0 | 5.7 |
| 699.652000 | 34.5 | 120.000 | 135.0 | V | 142.0 | -7.2 | 46.0 | 11.5 |
| 829.576000 | 35.4 | 120.000 | 157.0 | V | 1.0 | -4.0 | 46.0 | 10.6 |

Note None of these emissions are in a restricted band listed in §15.205.



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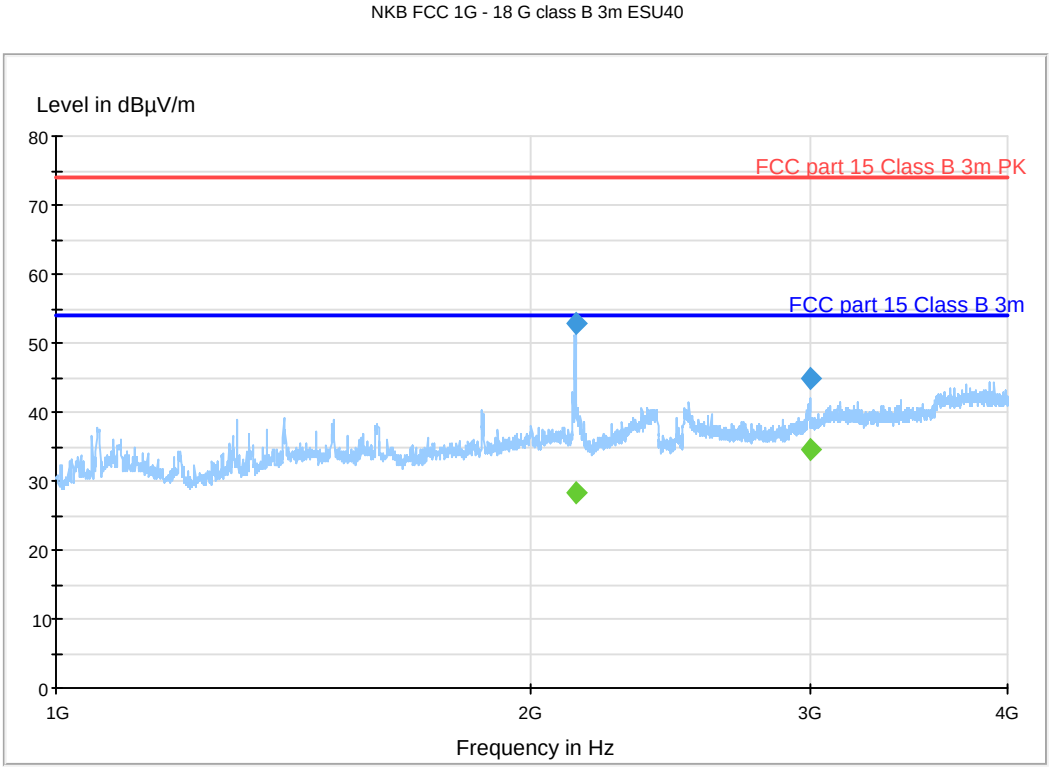
1 – 4 GHz, max peak at a distance of 3 m on the highest TX channel, 802.11g, 6 Mbps
Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0




**Final Result Peak highest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2132.200000 | 52.7 | 1000.000 | 231.0 | H | 56.0 | -13.3 | 21.3 | 74.0 |
| 2999.600000 | 44.8 | 1000.000 | 130.0 | H | 1.0 | -10.0 | 29.2 | 74.0 |

**Final Result Average highest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2132.200000 | 28.2 | 1000.000 | 242.0 | H | 56.0 | -13.3 | 25,8 | 54.0 |
| 2999.600000 | 34.7 | 1000.000 | 136.0 | H | -33.0 | -10.0 | 19,3 | 54.0 |



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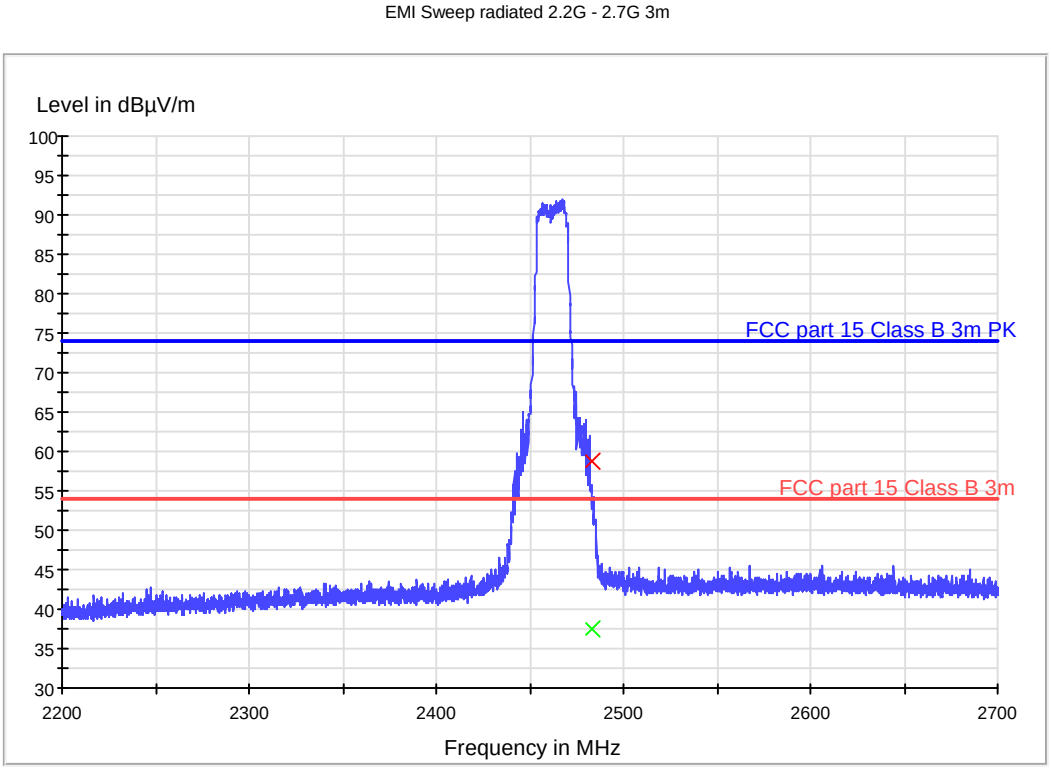
Emissions at the higher band edge at a distance of 3 m on the highest TX channel, 802.11g, 6 Mbps




**Results Peak at band edge**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2483.500000 | 58.8 | 1000.000 | 250.0 | H | 197.0 | -12.0 | 15.2 | 74.0 |

**Results Average at band edge**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 2483.500000 | 37.5 | 1000.000 | 250.0 | H | 197.0 | -12.0 | 16.5 | 74.0 |



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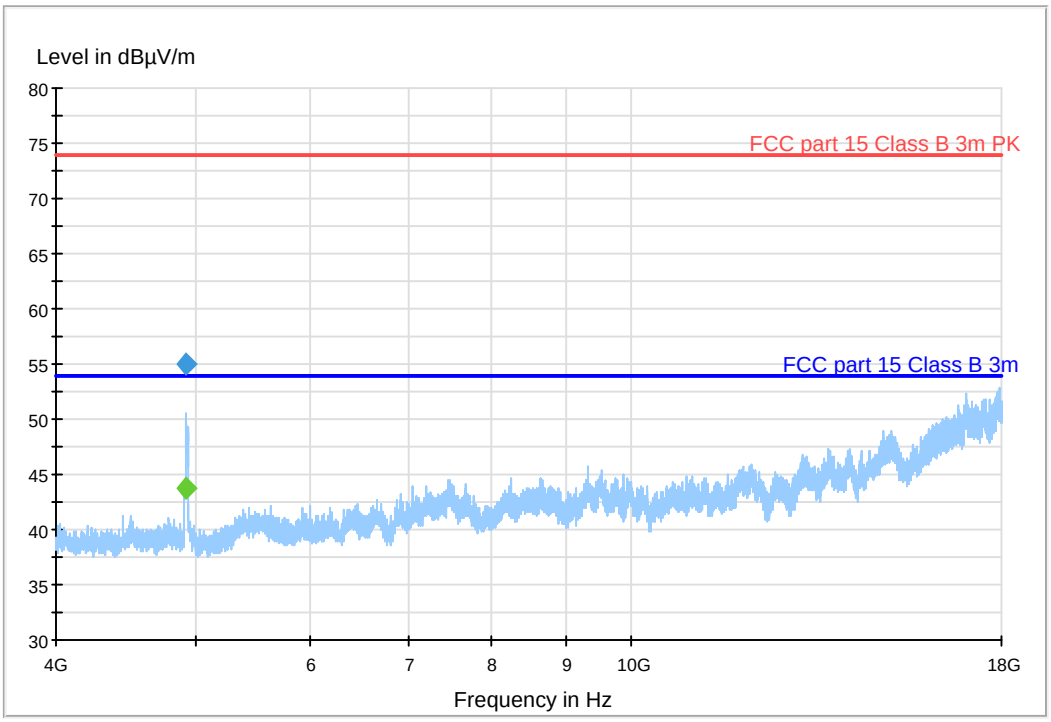
4 – 18 GHz, max peak at a distance of 3 m on the highest TX channel, 802.11g, 6 Mbps
Emissions below 4 GHz are attenuated by high-pass filter K&L 4410-X4500/18000-0

NKB FCC 1G - 18 G class B 3m ESU40




**Final Result Peak highest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4922.200000 | 55.0 | 1000.000 | 180.0 | H | 185.0 | -6.2 | 19.0 | 74.0 |

**Final Result Average highest TX channel, 802.11g, 6 Mbps**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 4924.200000 | 43.7 | 1000.000 | 186.0 | H | 147.0 | -6.2 | 10.3 | 54.0 |



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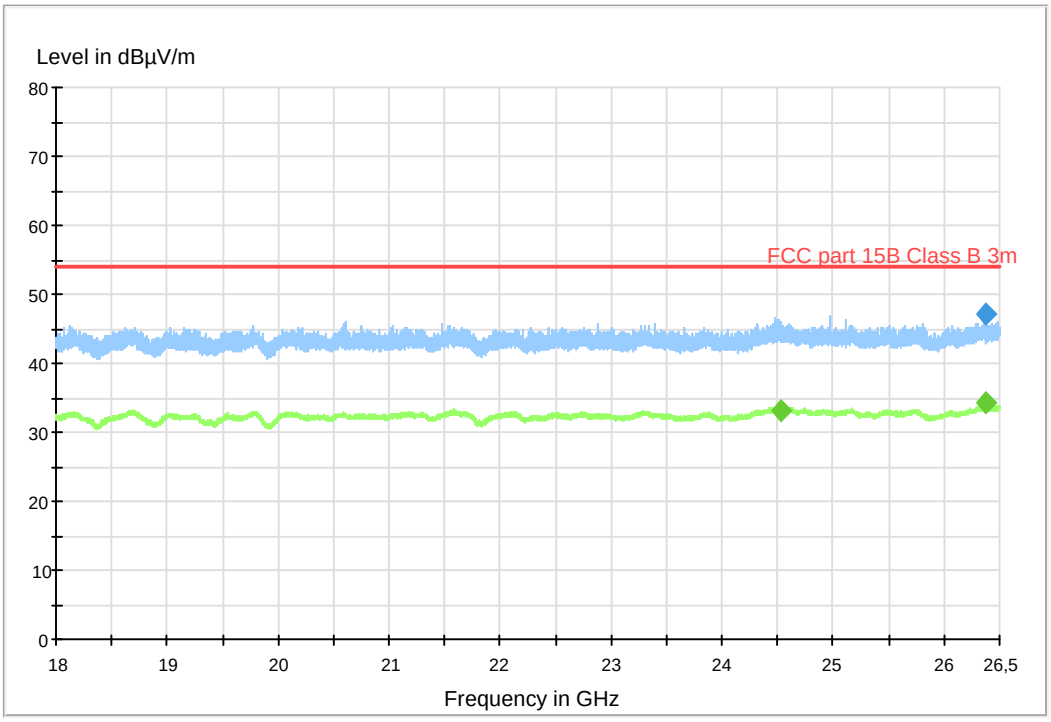
18 – 26 GHz, max peak at a distance of 3 m on the highest TX channel, 802.11g, 6 Mbps

NKB FCC 18 G - 26,5 G class B 3m pre-sweep ESU40




No significant emissions, Noise floor (peak) below 47 dBµV/m.



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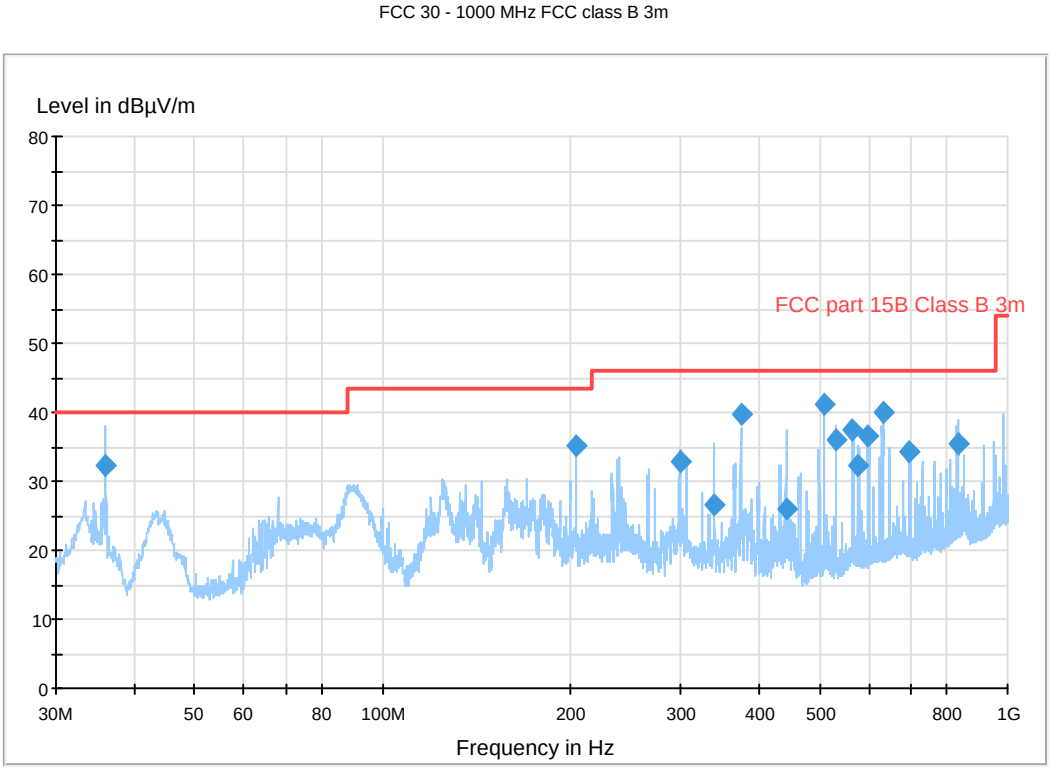
30 – 1000 MHz, max peak at a distance of 3 m in Rx mode




**Final Result Rx mode**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 35.983200 | 32.3 | 120.000 | 100.0 | V | 91.0 | -17.3 | 40.0 | 7.7 |
| 203.967800 | 35.2 | 120.000 | 124.0 | H | 227.0 | -21.7 | 43.5 | 8.3 |
| 298.671400 | 32.9 | 120.000 | 157.0 | V | 155.0 | -17.1 | 46.0 | 13.1 |
| 339.960000 | 26.6 | 120.000 | 100.0 | V | 319.0 | -16.1 | 46.0 | 19.4 |
| 373.995000 | 39.6 | 120.000 | 119.0 | V | 328.0 | -15.6 | 46.0 | 6.4 |
| 441.994200 | 26.1 | 120.000 | 100.0 | H | 329.0 | -13.4 | 46.0 | 19.9 |
| 510.002600 | 41.1 | 120.000 | 154.0 | V | 292.0 | -10.8 | 46.0 | 4.9 |
| 533.024800 | 36.0 | 120.000 | 149.0 | H | 75.0 | -10.6 | 46.0 | 10.0 |
| 564.112800 | 37.5 | 120.000 | 142.0 | H | 57.0 | -8.7 | 46.0 | 8.5 |
| 578.001800 | 32.3 | 120.000 | 180.0 | H | -34.0 | -8.8 | 46.0 | 13.7 |
| 597.252600 | 36.7 | 120.000 | 148.0 | H | 54.0 | -8.9 | 46.0 | 9.3 |
| 632.985600 | 40.0 | 120.000 | 124.0 | H | 47.0 | -8.1 | 46.0 | 6.0 |
| 696.840800 | 34.4 | 120.000 | 137.0 | V | 143.0 | -7.2 | 46.0 | 11.6 |
| 833.050400 | 35.5 | 120.000 | 155.0 | V | 11.0 | -4.0 | 46.0 | 10.5 |



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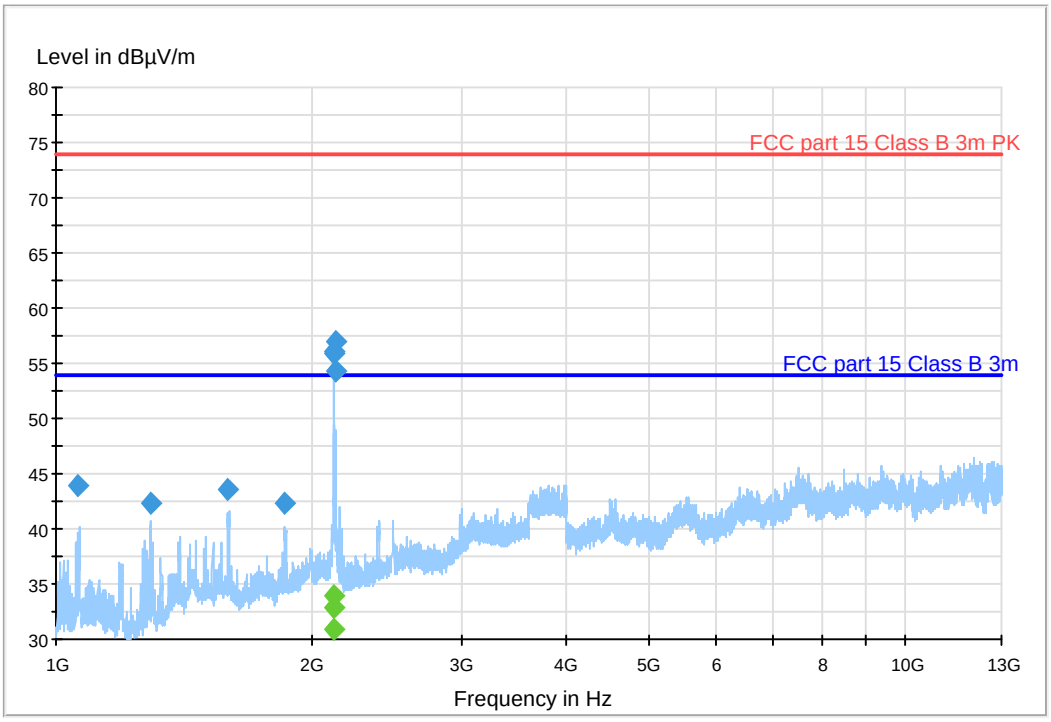
1 – 13 GHz, max peak at a distance of 3 m in the RX mode

NKB FCC 1G - 18 G class B 3m ESU40




**Final Result Peak RX mode**

| Frequency (MHz) | MaxPeak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 1062.000000 | 43.9 | 1000.000 | 170.0 | V | 4.0 | -17.7 | 30.1 | 74.0 |
| 1294.200000 | 42.4 | 1000.000 | 148.0 | V | 13.0 | -17.3 | 31.6 | 74.0 |
| 1595.600000 | 43.6 | 1000.000 | 151.0 | H | 192.0 | -15.0 | 30.4 | 74.0 |
| 1862.800000 | 42.4 | 1000.000 | 100.0 | V | 36.0 | -14.3 | 31.6 | 74.0 |
| 2126.400000 | 56.0 | 1000.000 | 100.0 | V | -29.0 | -13.2 | 18.0 | 74.0 |
| 2128.800000 | 56.1 | 1000.000 | 100.0 | V | -5.0 | -13.2 | 17.9 | 74.0 |
| 2131.200000 | 56.9 | 1000.000 | 160.0 | V | -3.0 | -13.3 | 17.1 | 74.0 |
| 2133.200000 | 54.2 | 1000.000 | 100.0 | V | 170.0 | -13.3 | 19.8 | 74.0 |

**Final Result Average RX mode**

| Frequency (MHz) | Average (dBµV/m) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|---|---|---|---|---|---|---|---|---|
| 1058.000000 | 25.9 | 1000.000 | 163.0 | V | 12.0 | -17.8 | 28.1 | 54.0 |
| 1292.200000 | 26.5 | 1000.000 | 187.0 | V | -8.0 | -17.3 | 27.5 | 54.0 |
| 1597.600000 | 24.3 | 1000.000 | 100.0 | H | 194.0 | -15.0 | 29.7 | 54.0 |
| 1859.800000 | 25.5 | 1000.000 | 202.0 | V | 13.0 | -14.3 | 28.5 | 54.0 |
| 2128.400000 | 32.9 | 1000.000 | 116.0 | V | -18.0 | -13.2 | 21.1 | 54.0 |
| 2128.800000 | 34.0 | 1000.000 | 100.0 | V | -21.0 | -13.2 | 20.0 | 54.0 |
| 2129.200000 | 30.9 | 1000.000 | 100.0 | V | 177.0 | -13.2 | 23.1 | 54.0 |



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## 10. CONDUCTED SPURIOUS EMISSIONS AT ANTENNA PORT

### 10.1 Measurement uncertainty

Measurement uncertainty for conducted disturbances at the antenna port ± 3,6 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT. Measurement uncertainty is calculated in accordance with EA-4/02-1997. The uncertainty is given with a level of confidence of approximately 95% (k=2).

### 10.2 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Signal Analyzer | Rhode & Schwarz | FSIQ | 12793 | 2011-07 |
| Cable | Huber + Suhner | Sucoflex 104 | 5188 | 2011-07 |
| RF attenuator | Hewlett Packard | 8491A | 30088 | 2011-07 |

### 10.3 Test protocol

Date of test 2011-01-27 and 2011-01-28

802.11b, 1 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | 10.1 – 10.3 | PASS | 20 |
| Middle | 10.4 – 10.6 | PASS | 20 |
| High | 10.7 – 10.9 | PASS | 20 |

802.11b, 11 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | 10.10 – 10.12 | PASS | 20 |
| Middle | 10.13 – 10.15 | PASS | 20 |
| High | 10.16 – 10.18 | PASS | 20 |

802.11g, 6 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | 10.19 – 10.21 | PASS | 20 |
| Middle | 10.22 – 10.24 | PASS | 20 |
| High | 10.25 – 10.27 | PASS | 20 |



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802.11g, 54 Mbps data rate

| Channel | Plot | Results | Limit value (dBc) |
|---|---|---|---|
| Low | 10.28 – 10.30 | PASS | 20 |
| Middle | 10.31 – 10.33 | PASS | 20 |
| High | 10.34 – 10.37 | PASS | 20 |

Limit In any 100 kHz bandwidth outside the operating frequency band (2400 – 2483.5 MHz), 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.



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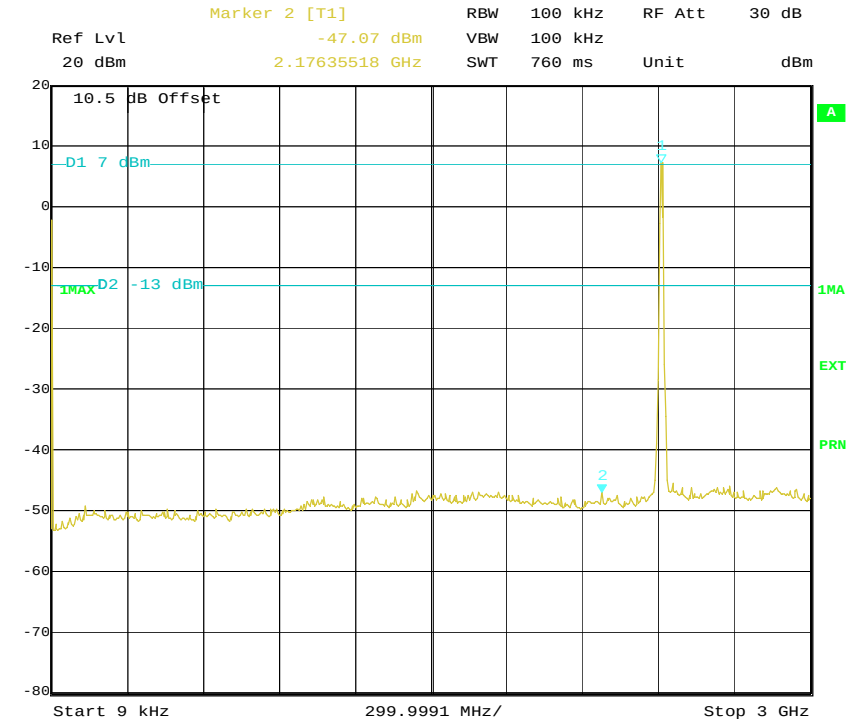
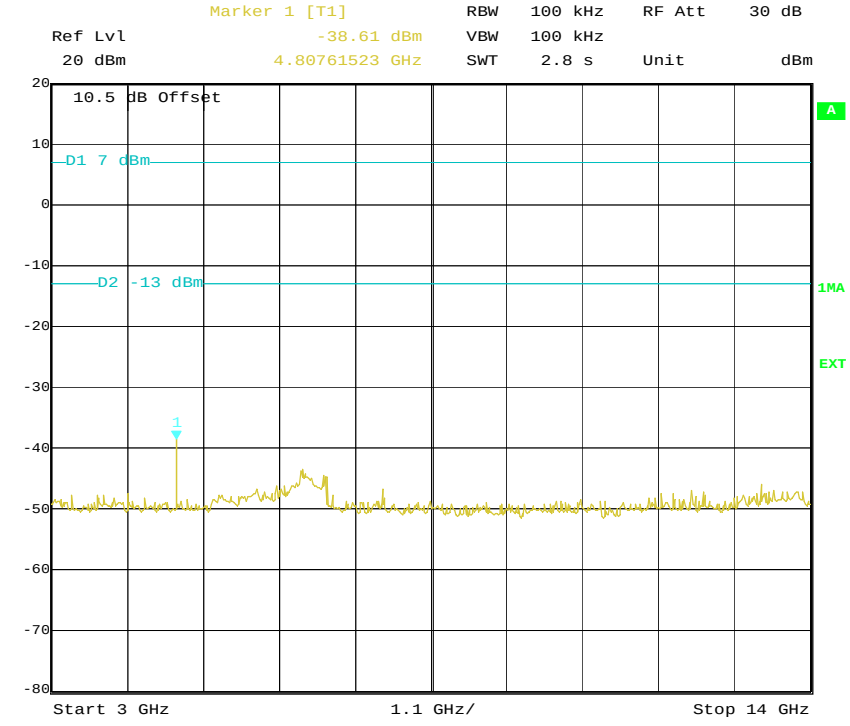
## Plot P10.1




Date: 28.JAN.2011 08:24:47

## Plot P10.2




Date: 28.JAN.2011 08:38:21



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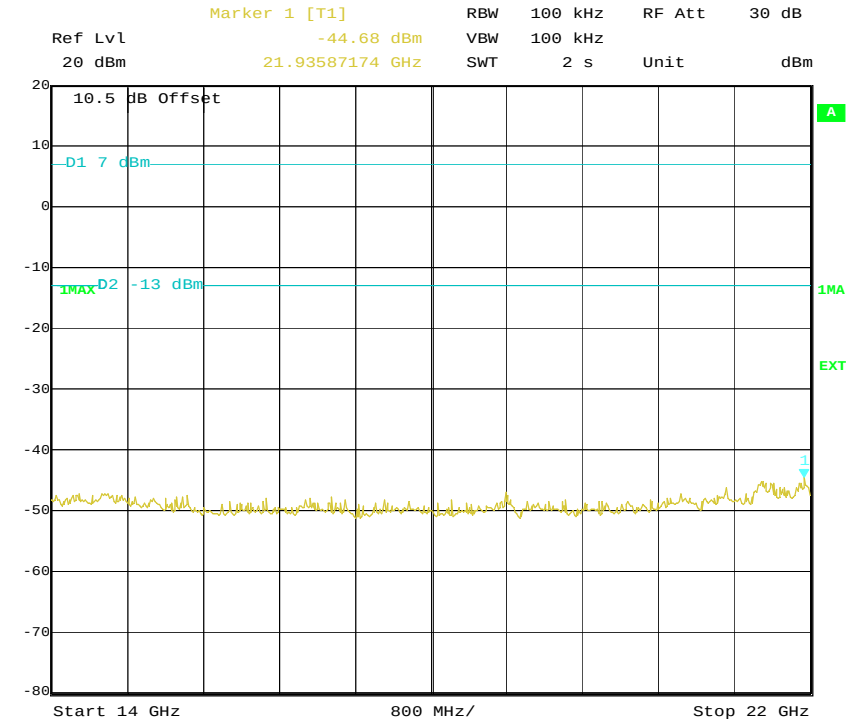
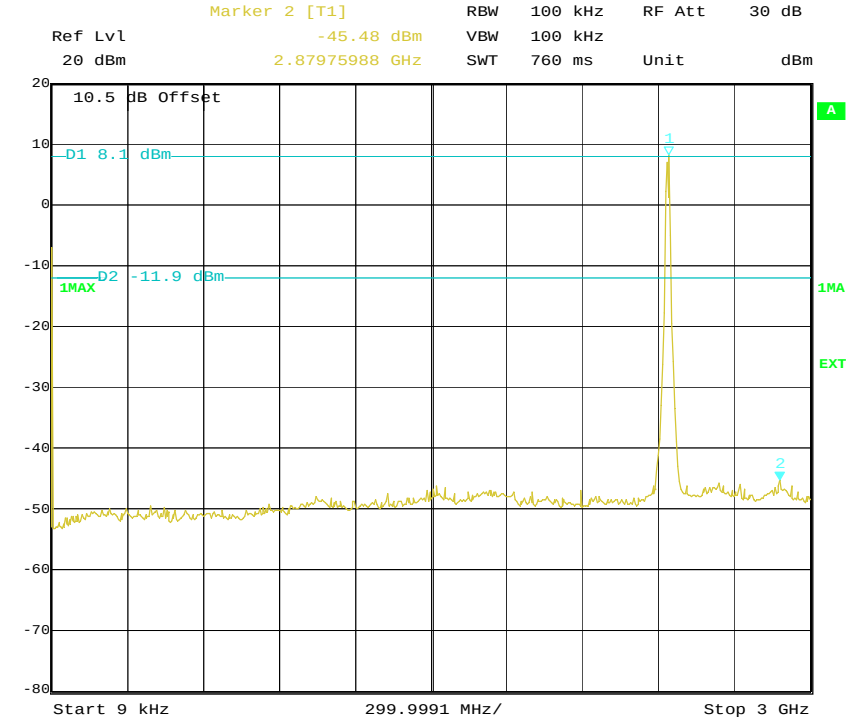
## Plot P10.3




Date: 28.JAN.2011 08:34:56

## Plot P10.4




Date: 28.JAN.2011 15:00:52



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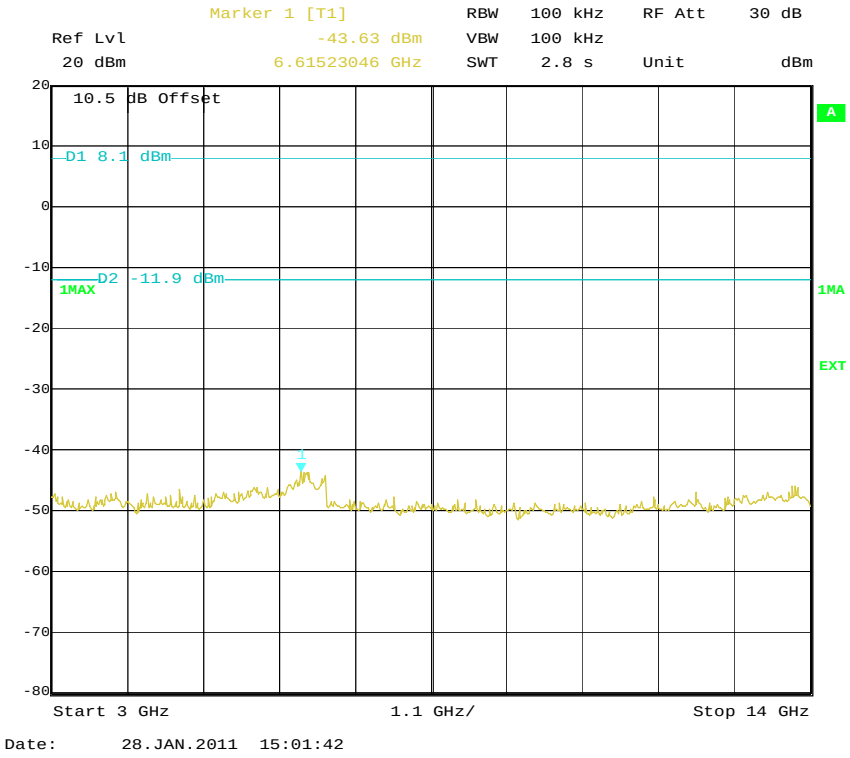
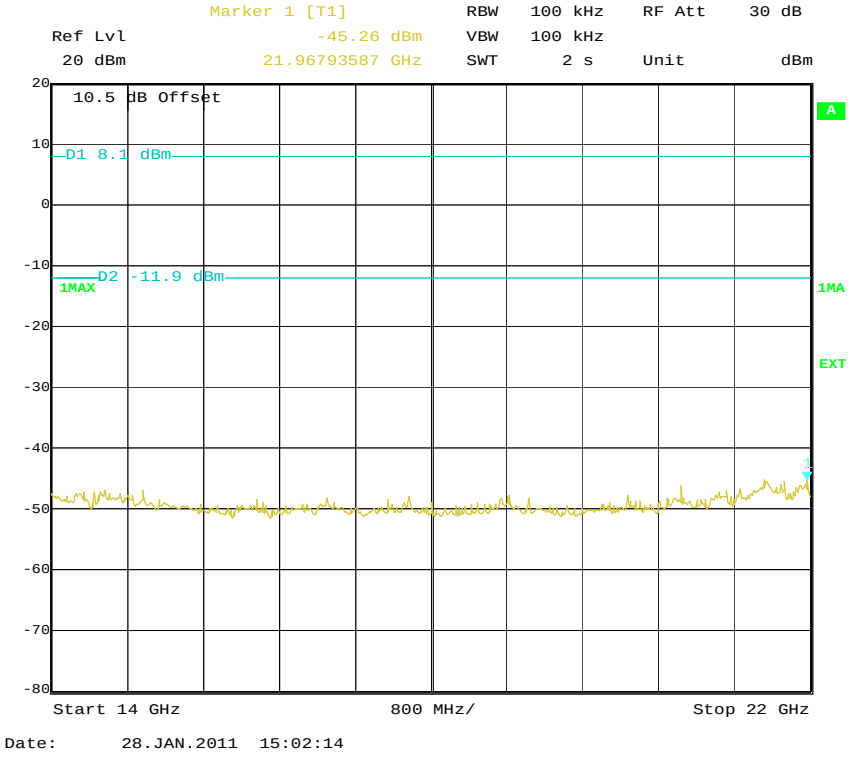
## Plot P10.5




Date: 28.JAN.2011 15:01:42

## Plot P10.6




Date: 28.JAN.2011 15:02:14



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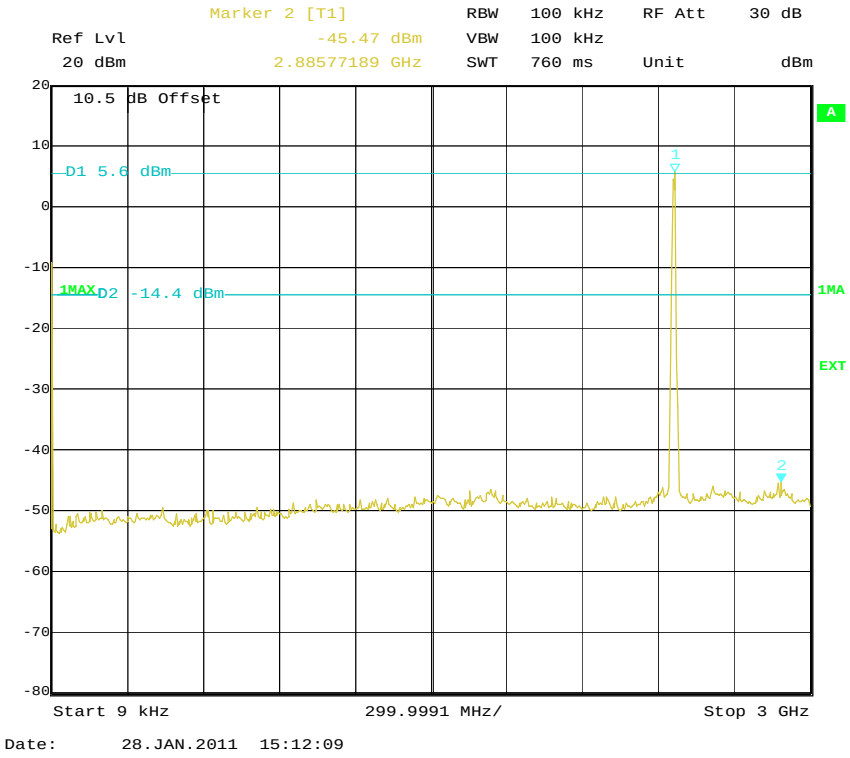
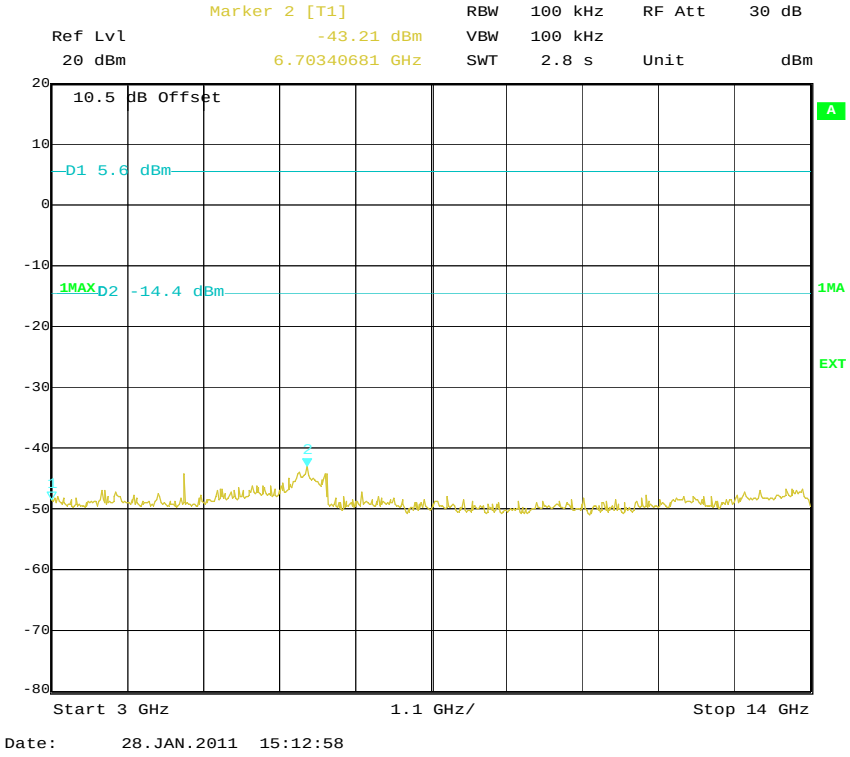
## Plot P10.7




Date: 28.JAN.2011 15:12:09

## Plot P10.8




Date: 28.JAN.2011 15:12:58



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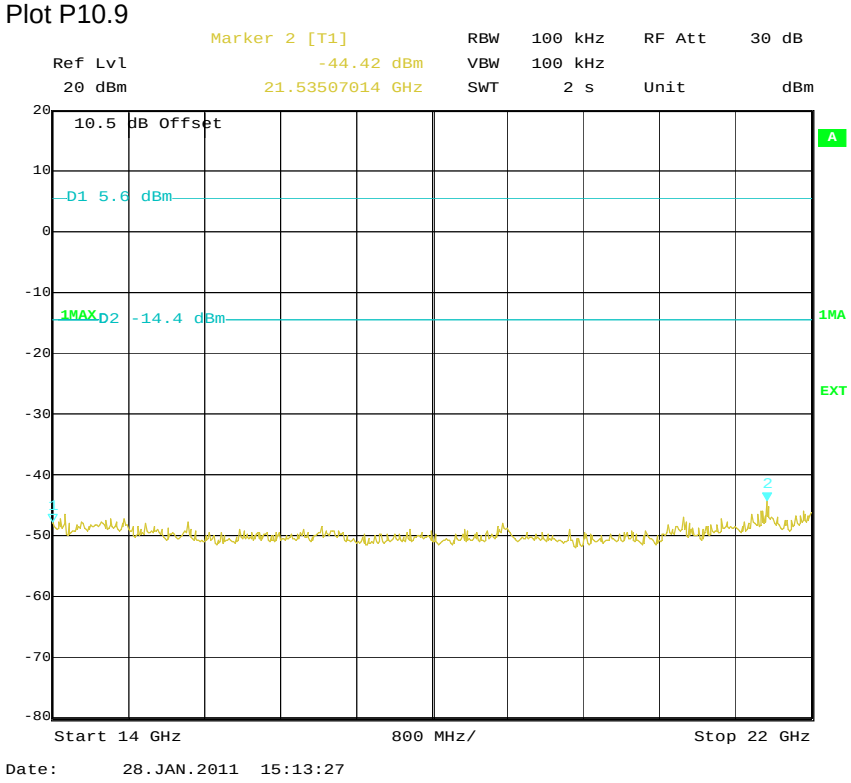
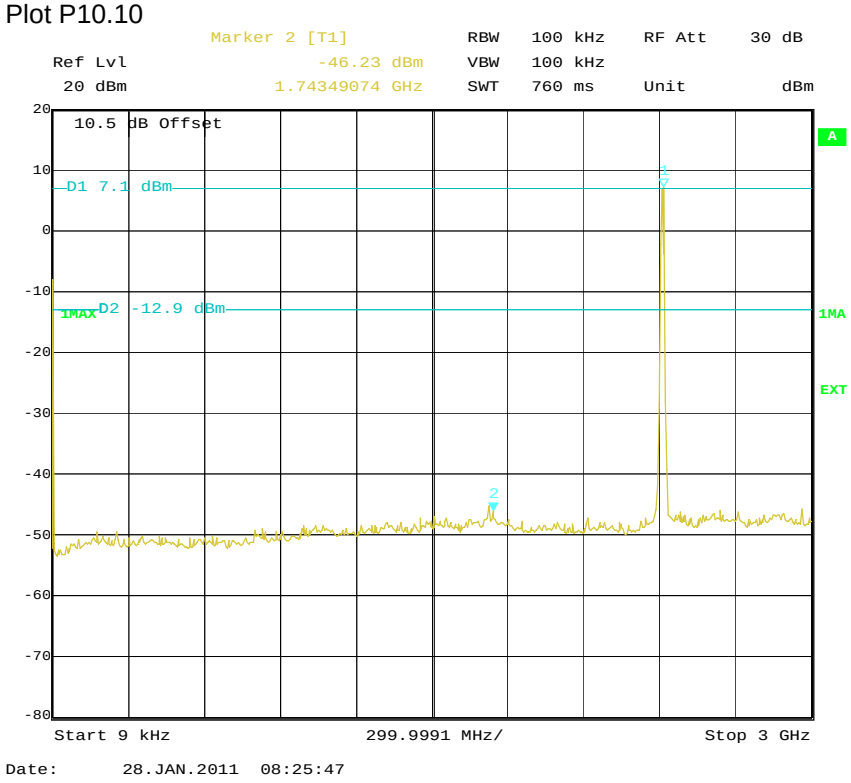
## Plot P10.9




Date: 28.JAN.2011 15:13:27

## Plot P10.10




Date: 28.JAN.2011 08:25:47



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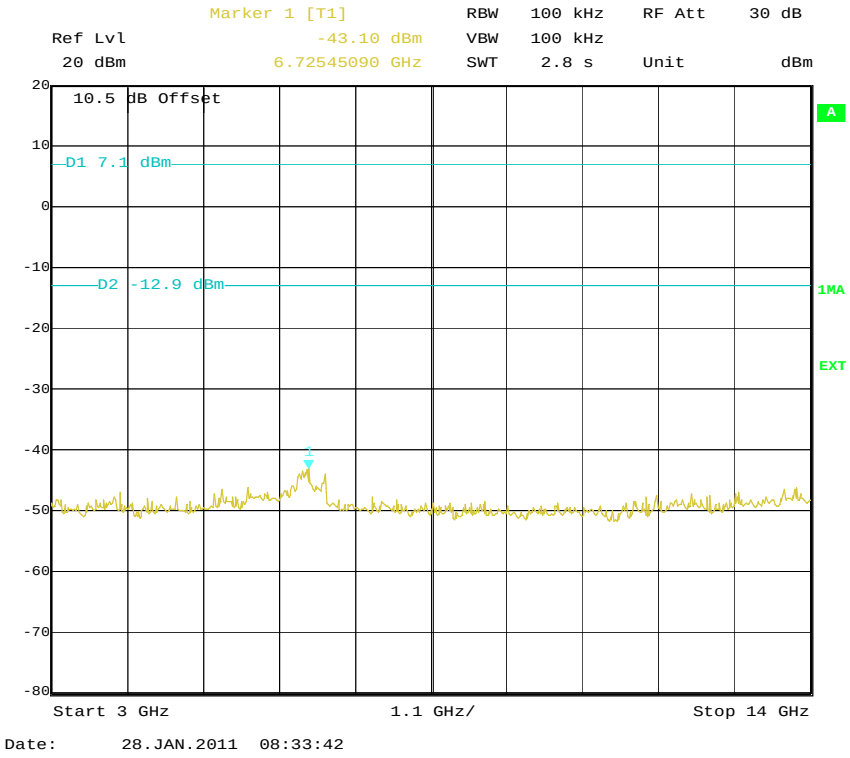
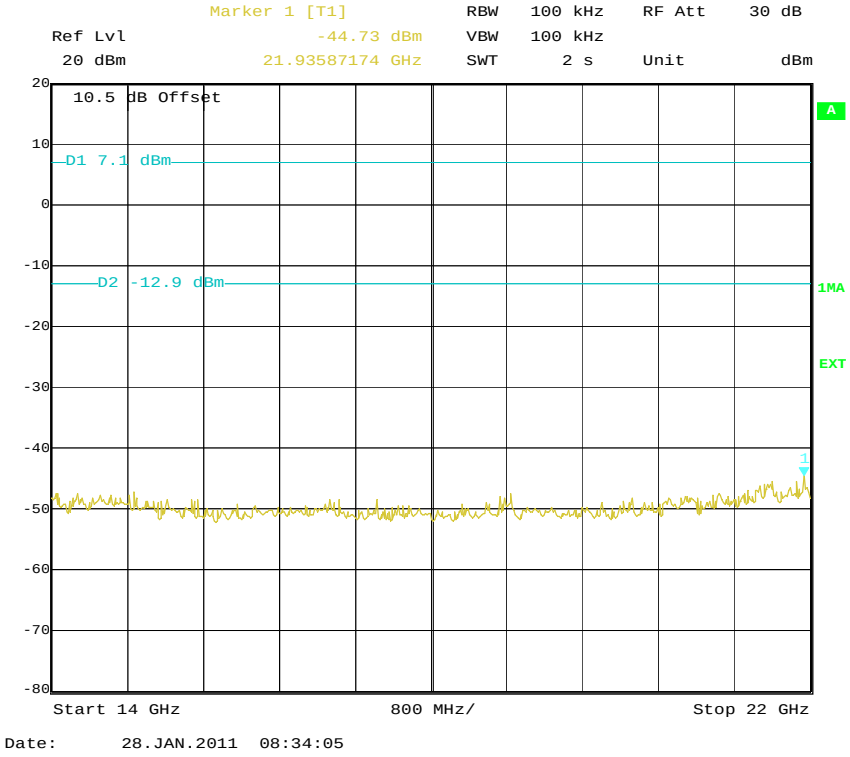
## Plot P10.11




Date: 28.JAN.2011 08:33:42

## Plot P10.12




Date: 28.JAN.2011 08:34:05



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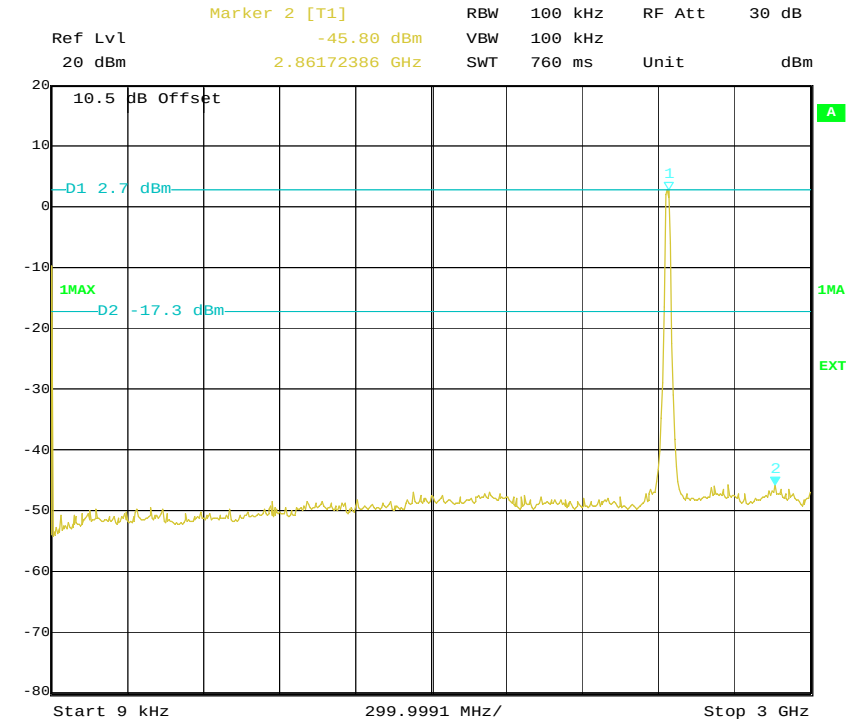
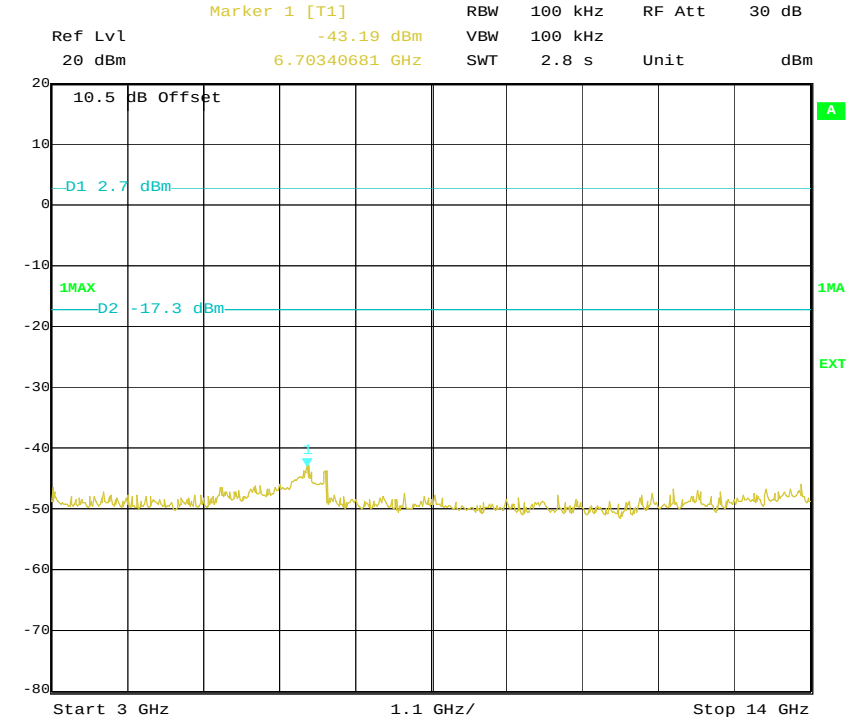
## Plot P10.13




Date: 28.JAN.2011 15:03:28

## Plot P10.14




Date: 28.JAN.2011 15:04:11



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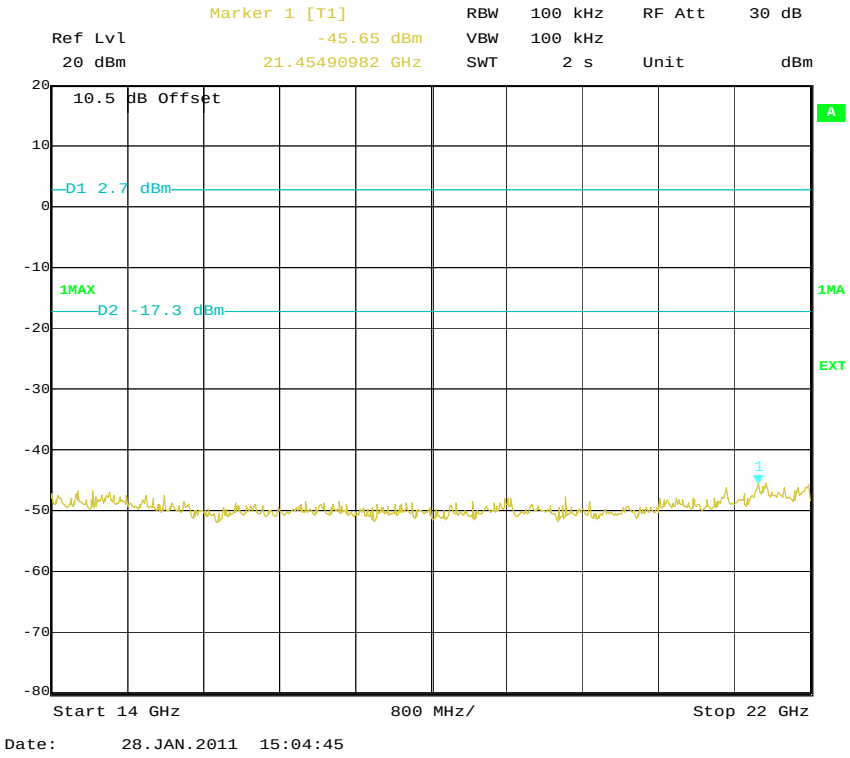
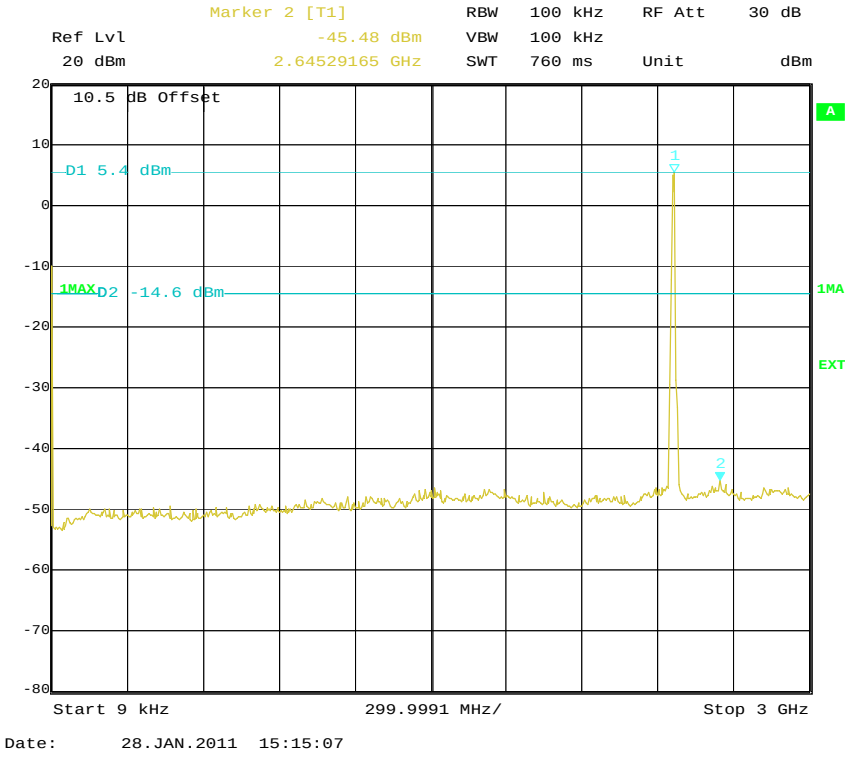
## Plot P10.15




Date: 28.JAN.2011 15:04:45

## Plot P10.16




Date: 28.JAN.2011 15:15:07



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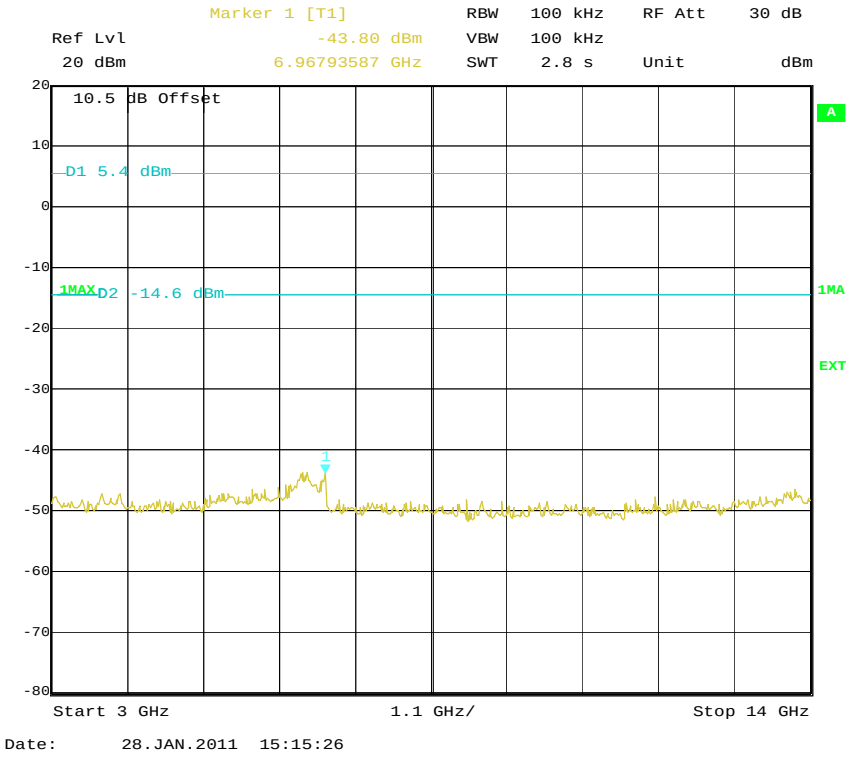
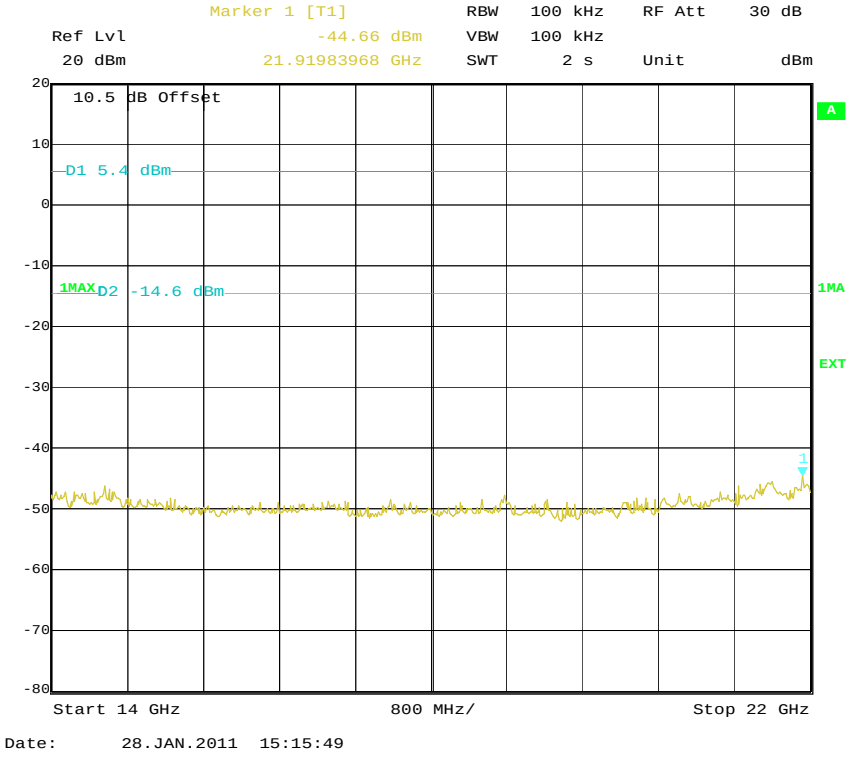
## Plot P10.17




Date: 28.JAN.2011 15:15:26

## Plot P10.18




Date: 28.JAN.2011 15:15:49



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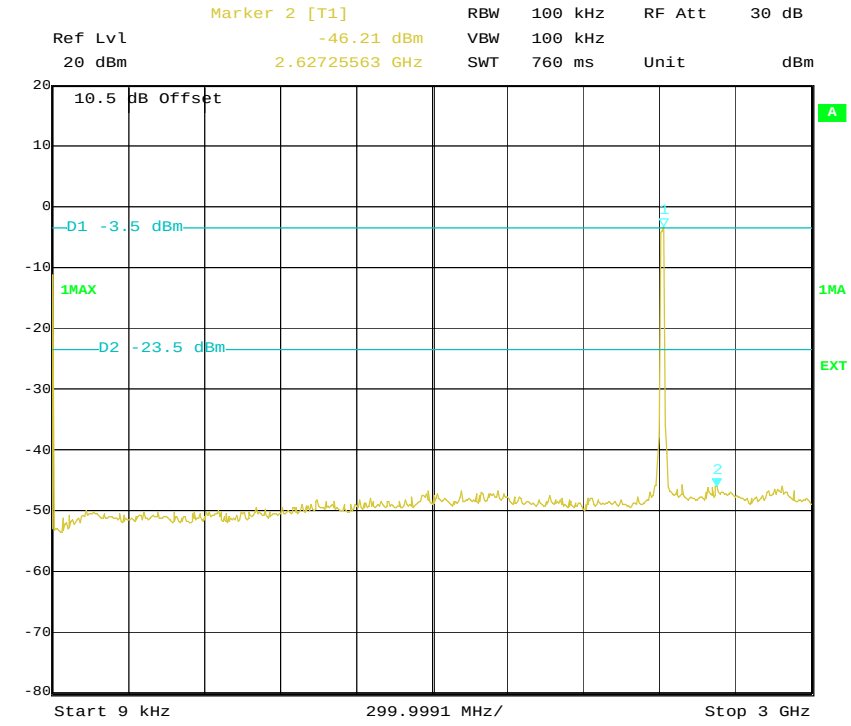
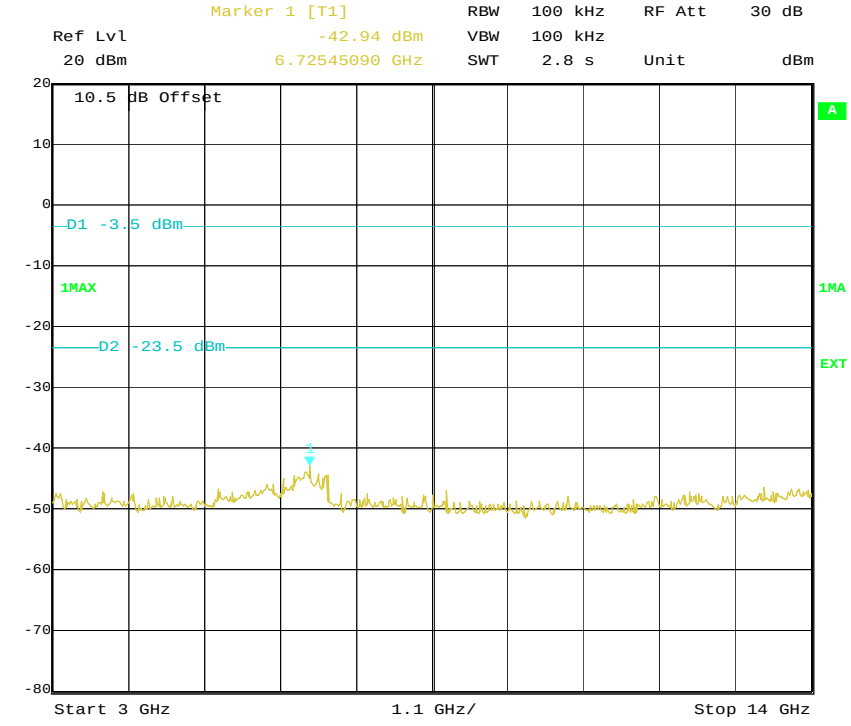
## Plot P10.19




Date: 28.JAN.2011 08:26:53

## Plot P10.20




Date: 28.JAN.2011 08:32:14



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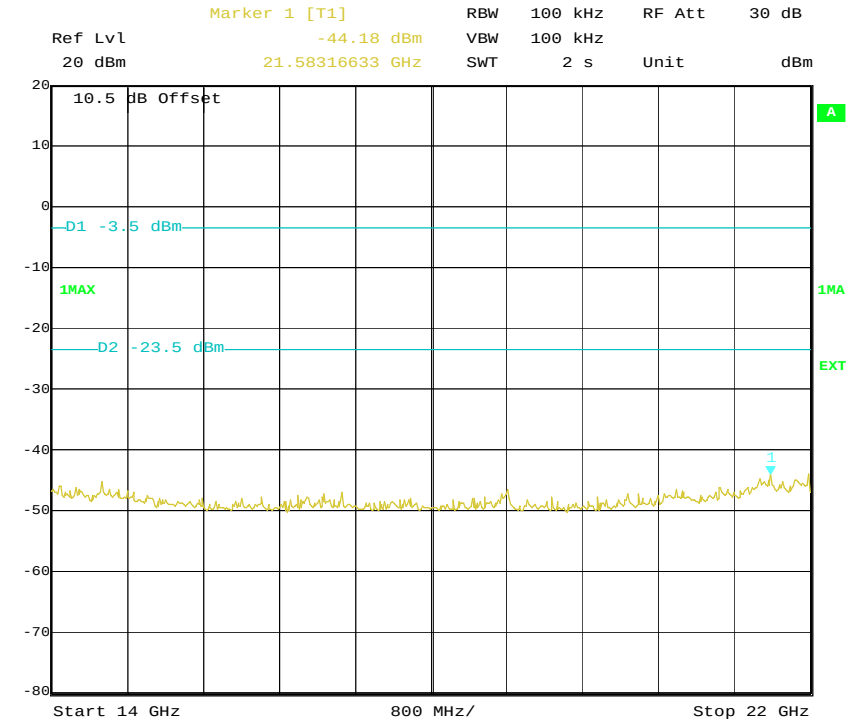
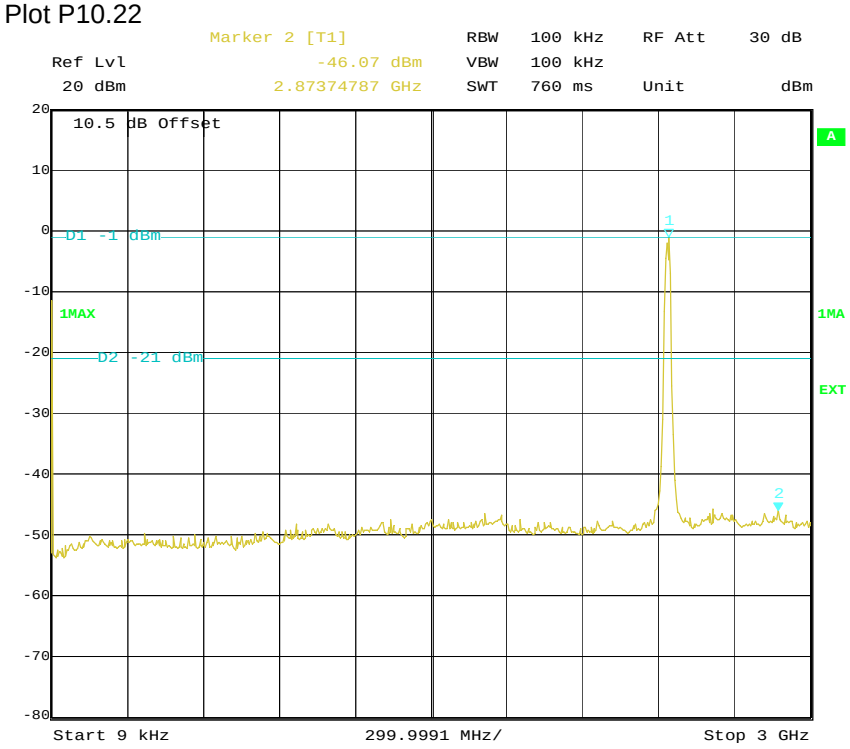
## Plot P10.21




Date: 28.JAN.2011 08:31:44

## Plot P10.22




Date: 28.JAN.2011 15:06:38



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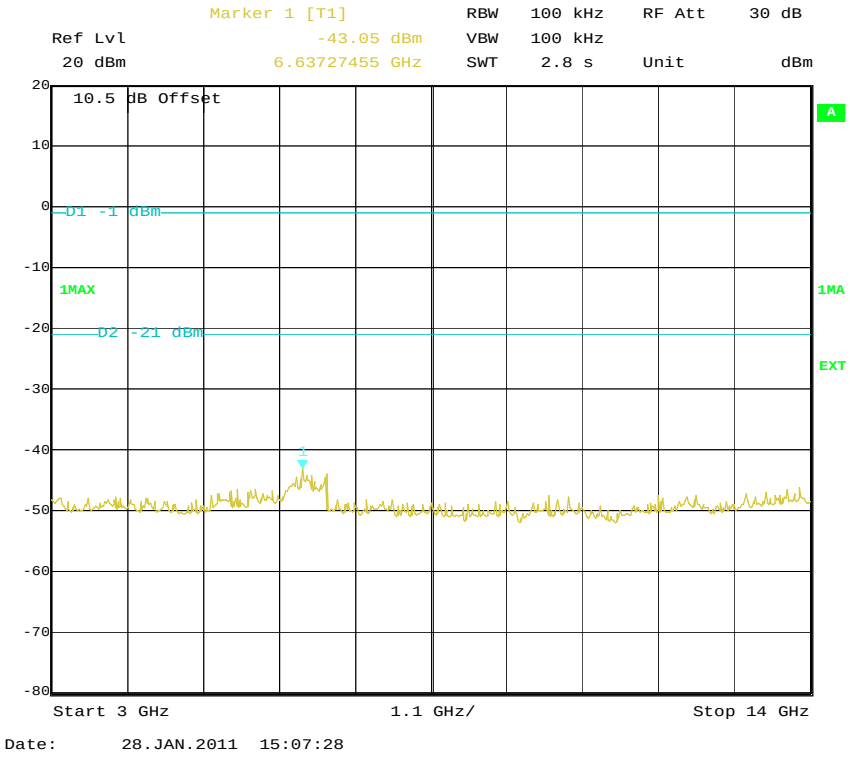
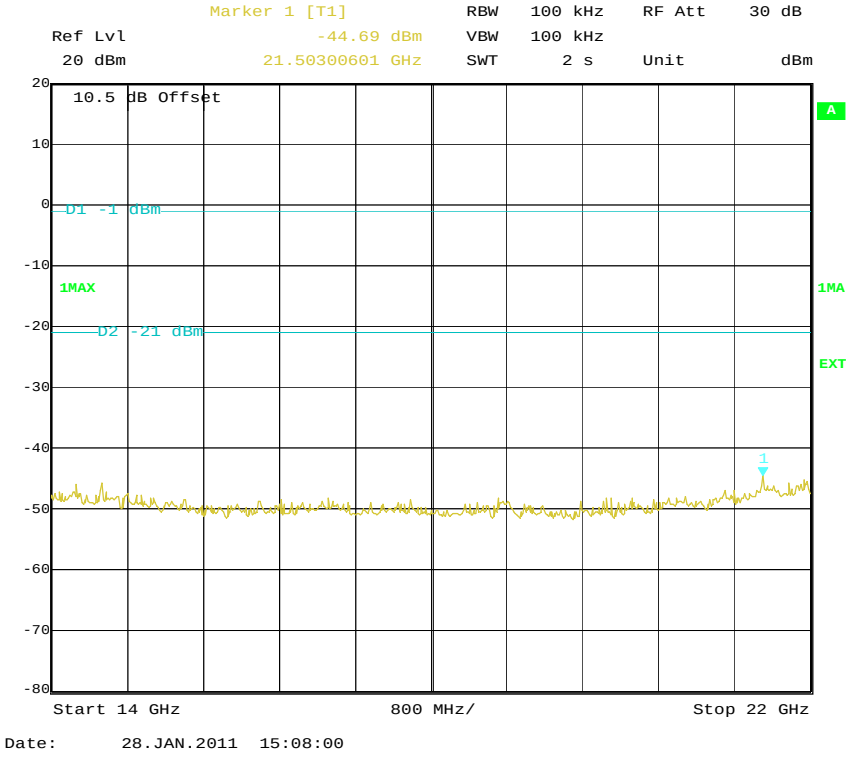
## Plot P10.23




Date: 28.JAN.2011 15:07:28

## Plot P10.24




Date: 28.JAN.2011 15:08:00



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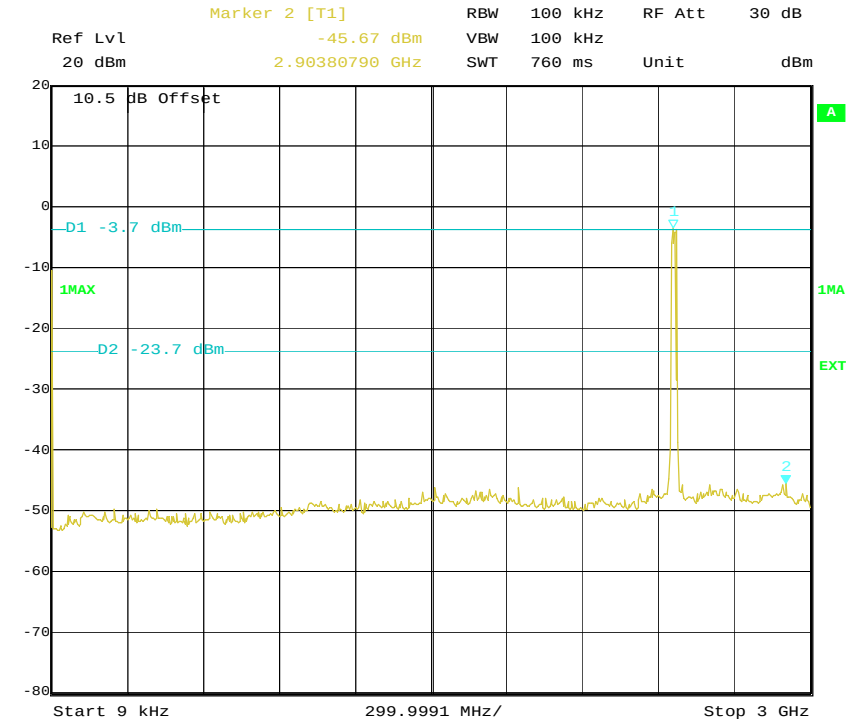
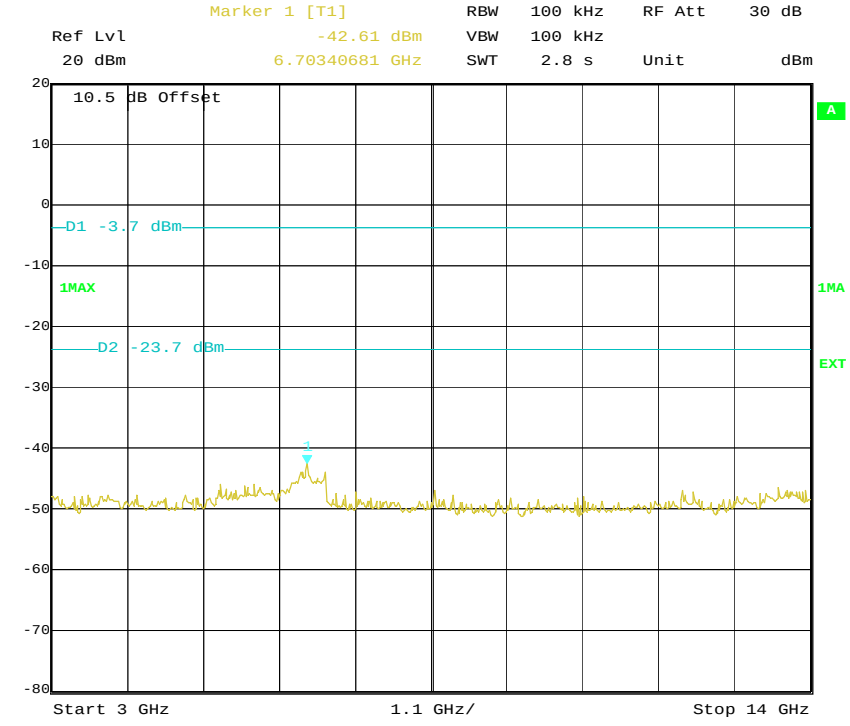
## Plot P10.25




Date: 28.JAN.2011 15:16:57

## Plot P10.26




Date: 28.JAN.2011 15:17:18



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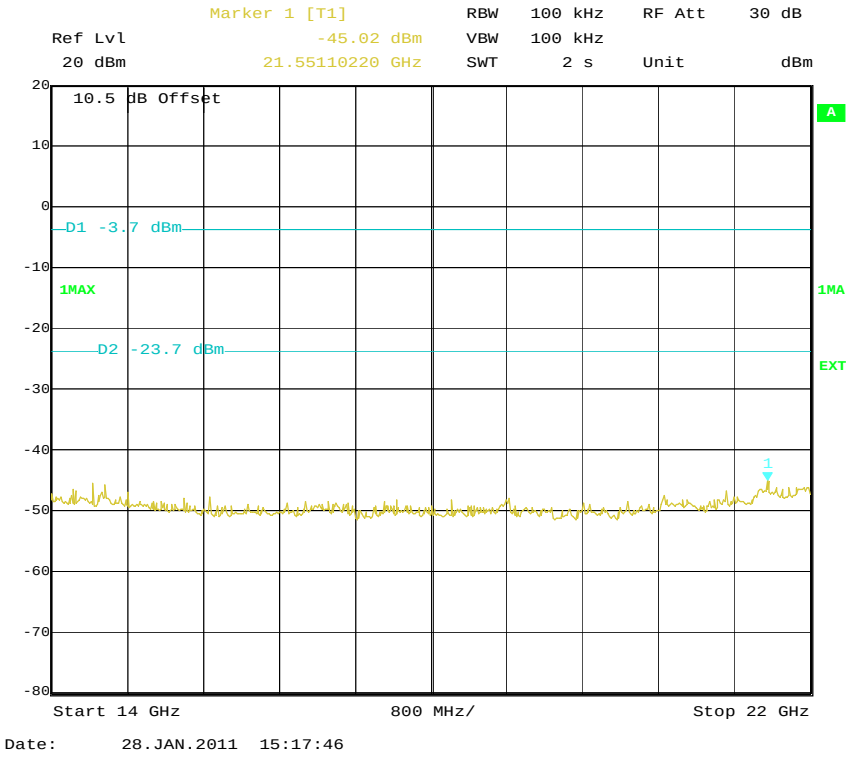
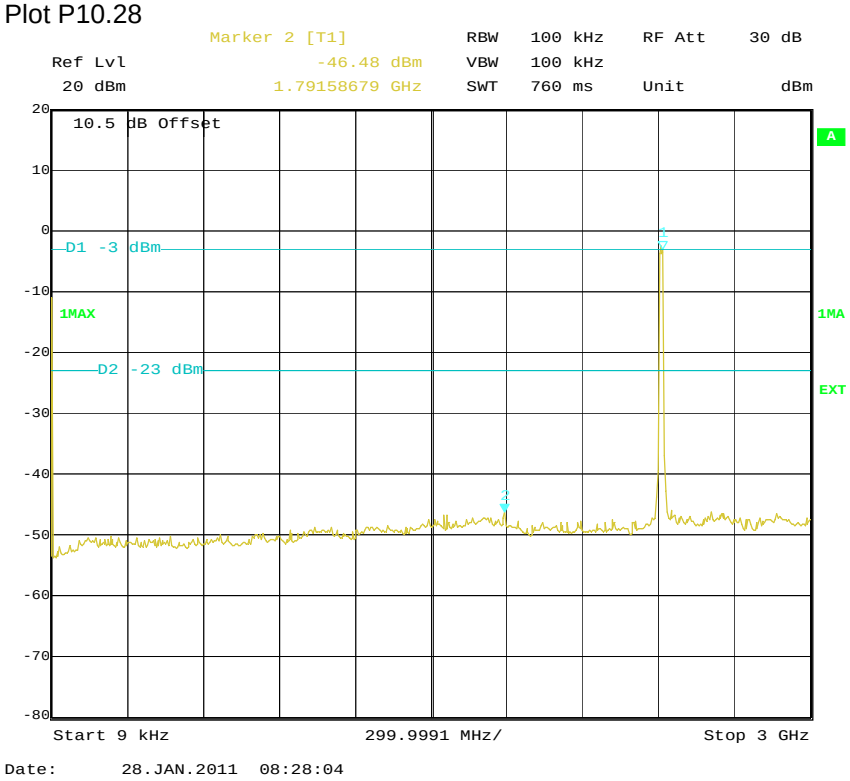
## Plot P10.27




Date: 28.JAN.2011 15:17:46

## Plot P10.28




Date: 28.JAN.2011 08:28:04



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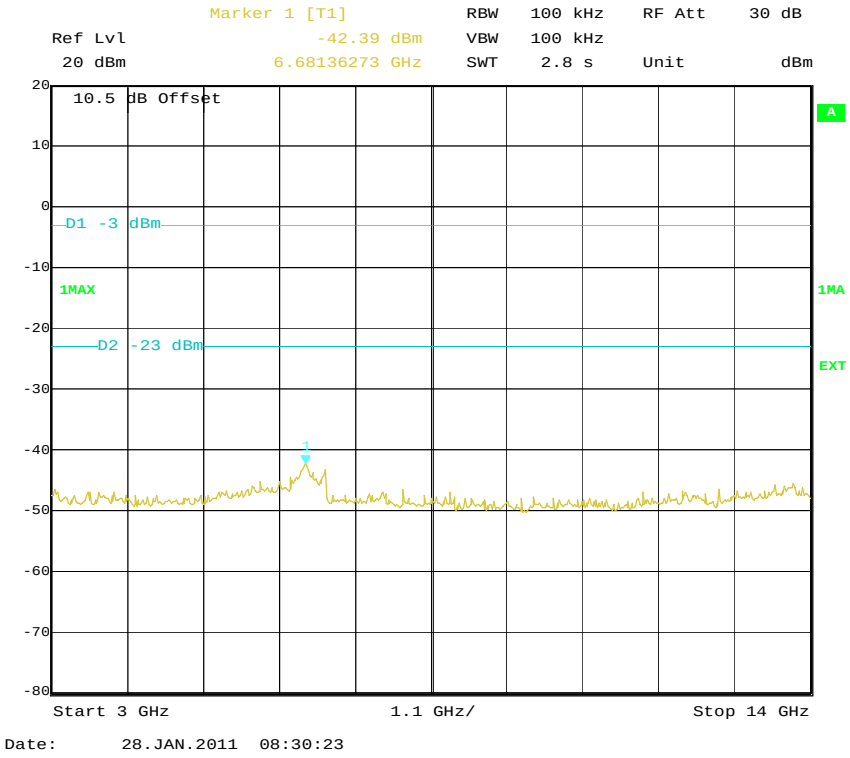
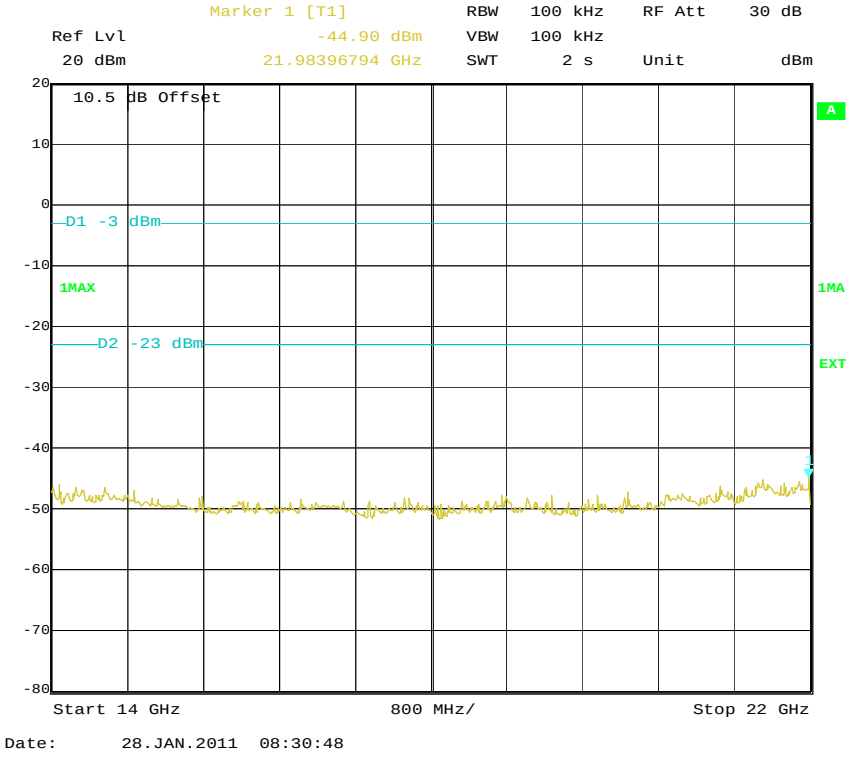
## Plot P10.29




Date: 28.JAN.2011 08:30:23

## Plot P10.30




Date: 28.JAN.2011 08:30:48



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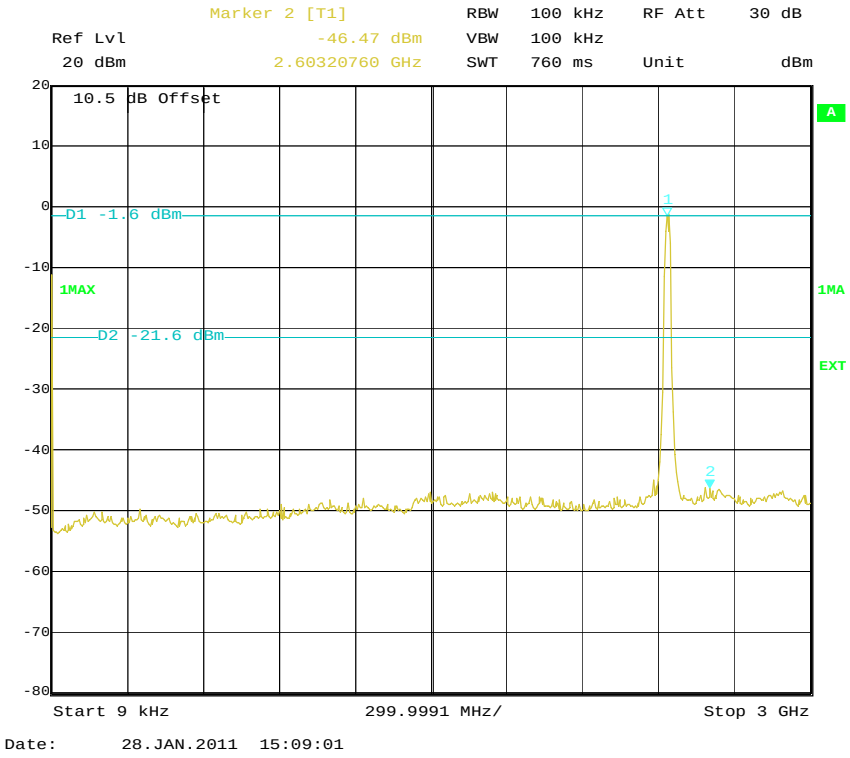
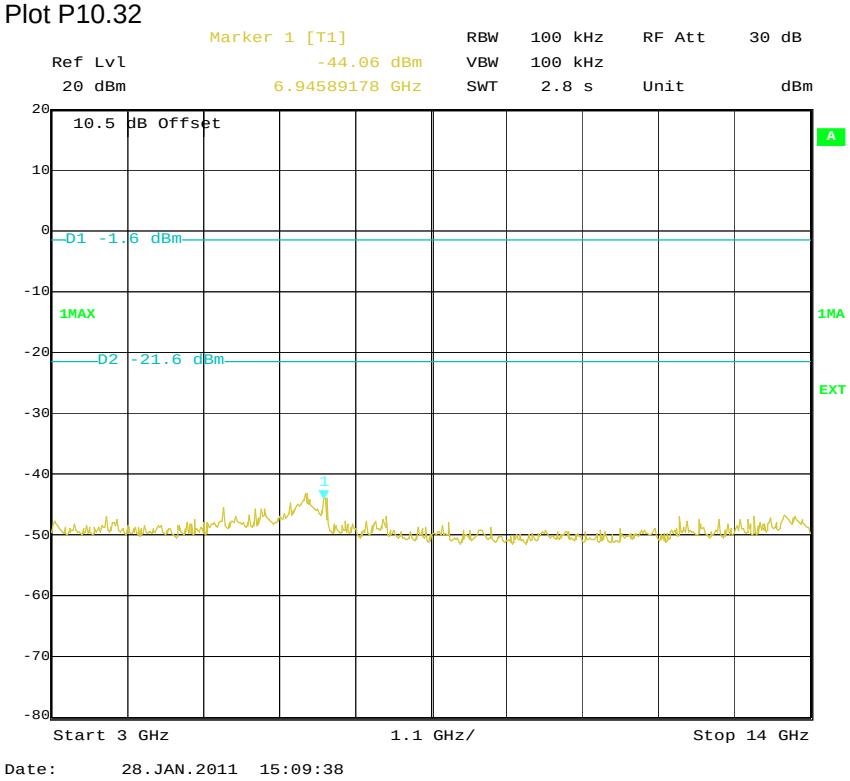
## Plot P10.31




Date: 28.JAN.2011 15:09:01

## Plot P10.32




Date: 28.JAN.2011 15:09:38



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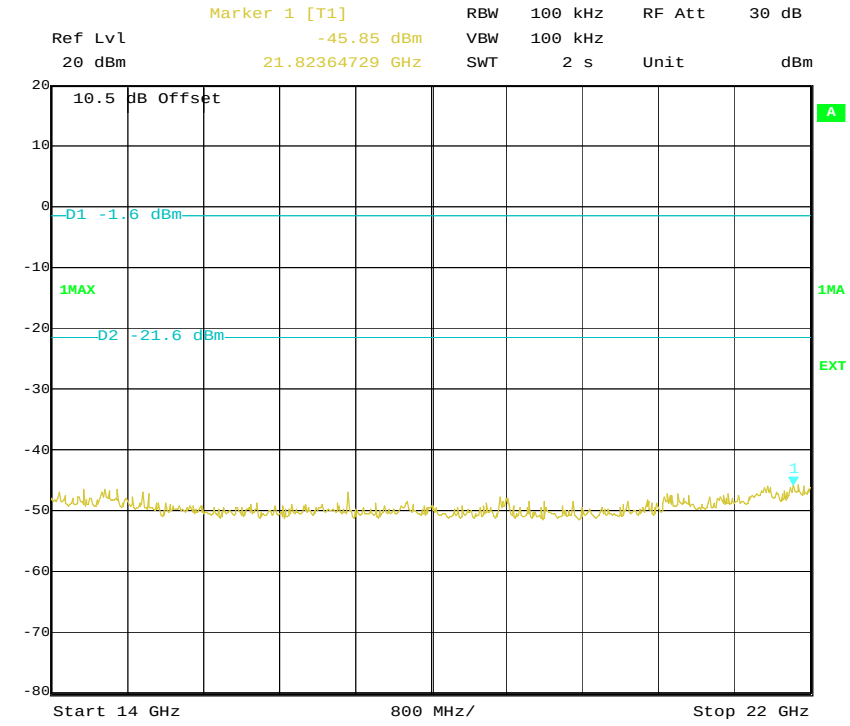
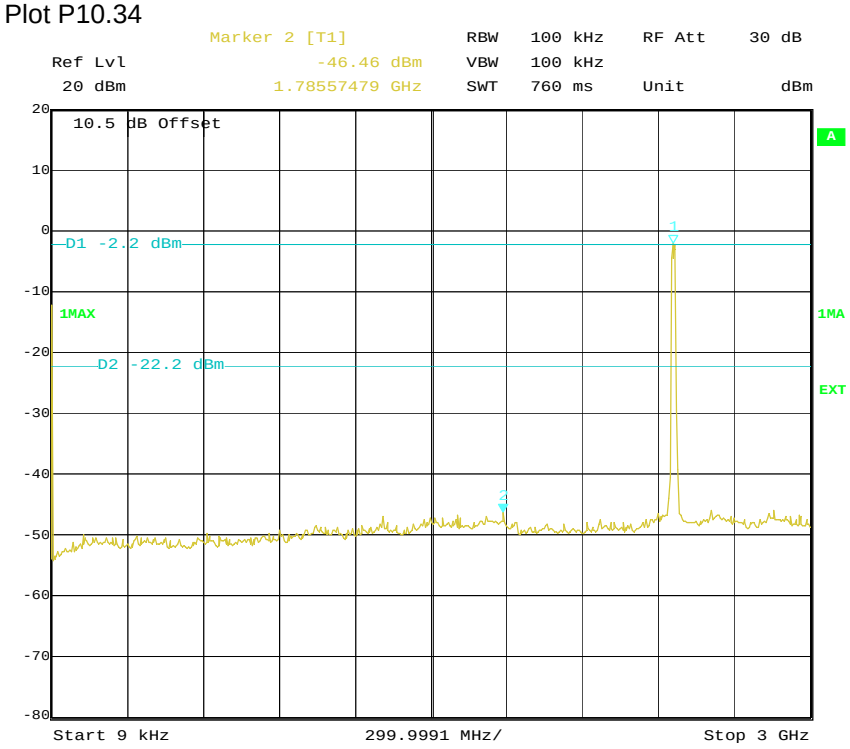
## Plot P10.33




Date: 28.JAN.2011 15:10:03

## Plot P10.34




Date: 28.JAN.2011 15:21:49



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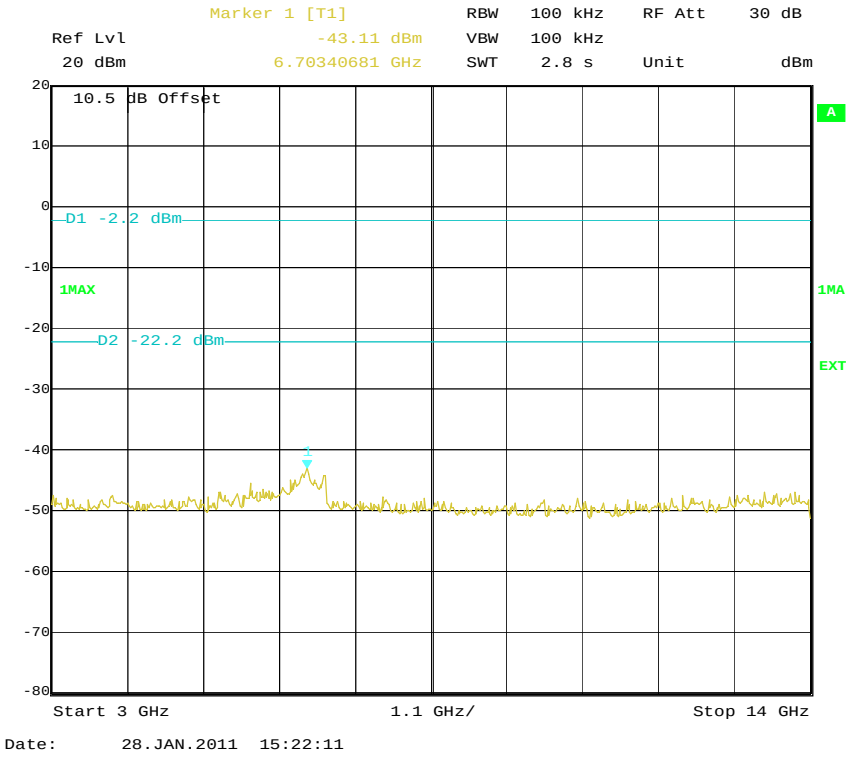
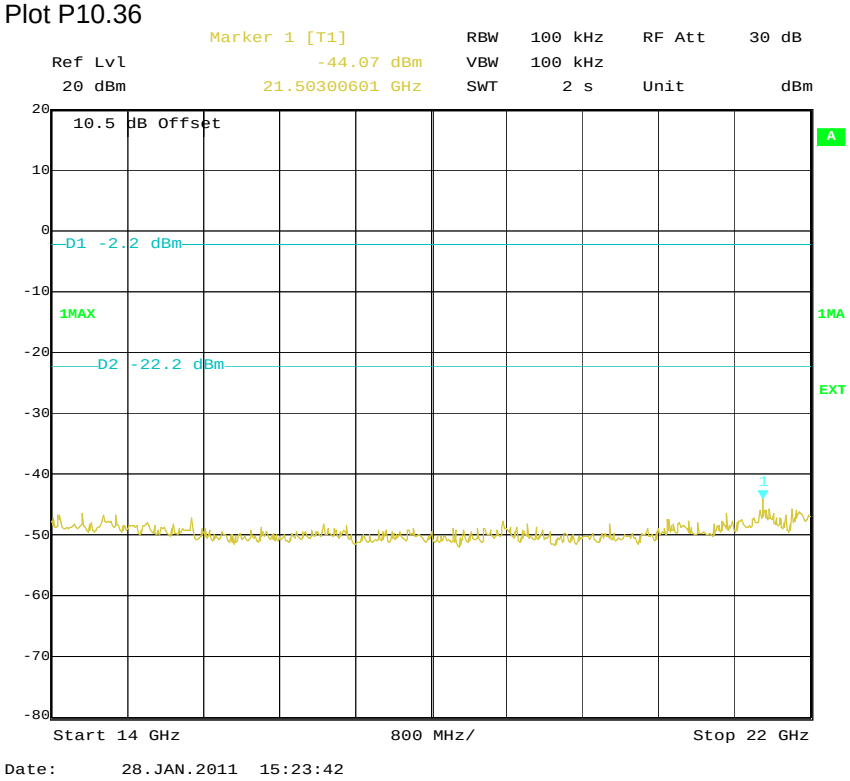
## Plot P10.35




Date: 28.JAN.2011 15:22:11

## Plot P10.36




Date: 28.JAN.2011 15:23:42



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## 11. CONDUCTED DISTURBANCE VOLTAGE IN THE FREQUENCY RANGE 0,15 - 30 MHZ

### 11.1 Measurement uncertainty

Conducted disturbance voltage, quasi-peak detection ±3.6 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT. Measurement uncertainty is calculated in accordance with EA-4/02-1997. The uncertainty is given with a level of confidence of approximately 95% (k=2).

### 11.2 Test equipment

| Equipment | Manufacturer | Type | Inv. No. | Calibration due date |
|---|---|---|---|---|
| Software | Rhode & Schwarz | ES-K1 V1.60 | | |
| Measurement Receiver | Rohde & Schwarz | ESHS 30 | 4946 | 2011-05 |
| Artificial mains network | Rohde & Schwarz | ESH3-Z5 | 2727 | 2011-07 |

### 11.3 Measurement set-up

During this test the HDG104 module was supplied by the computer and the disturbance was measured on the AC port of the computer.

The mains terminal disturbance voltage was measured with the EUT located 0,8 m above the ground plane and 0,4 m from the vertical ground plane. The EUT was connected to an artificial mains network (AMN). The AMN was placed on the ground plane. Amplitude measurements were performed with a quasi-peak and average detector. The EUT was supplied by 120 VAC (60 Hz) during the test.



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Test set-up photos



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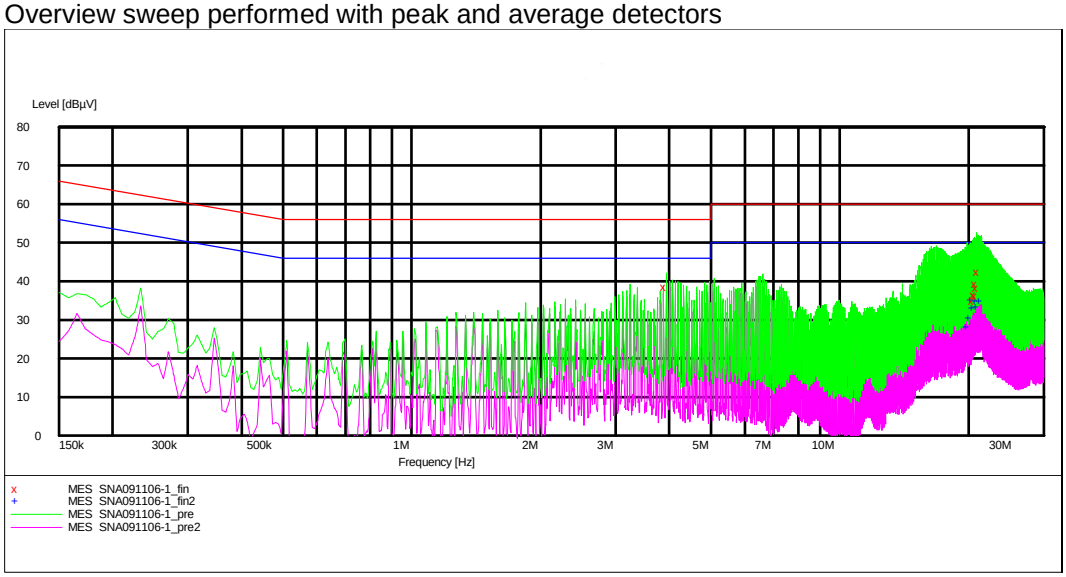
### 11.4 Test protocol

Date of test 2009-11-06

Overview sweep performed with peak and average detectors




Data summary

| Frequency /MHz | Quasi-Peak Disturbance Level /dB(µV) | Quasi-Peak Permitted limit /dB(µV) |
|---|---|---|
| 3.940 | 38.6 | 56.0 |
| 20.670 | 34.8 | 60.0 |
| 20.905 | 36.6 | 60.0 |
| 21.020 | 36.3 | 60.0 |
| 21.025 | 39.4 | 60.0 |
| 21.140 | 38.4 | 60.0 |
| 21.260 | 42.3 | 60.0 |

| Frequency /MHz | Average Disturbance Level /dB(µV) | Average Permitted limit /dB(µV) |
|---|---|---|
| 20.095 | 28.2 | 50.0 |
| 20.330 | 30.6 | 50.0 |
| 20.565 | 35.1 | 50.0 |
| 20.680 | 33.2 | 50.0 |
| 21.030 | 34.8 | 50.0 |
| 21.145 | 33.3 | 50.0 |
| 21.495 | 34.8 | 50.0 |



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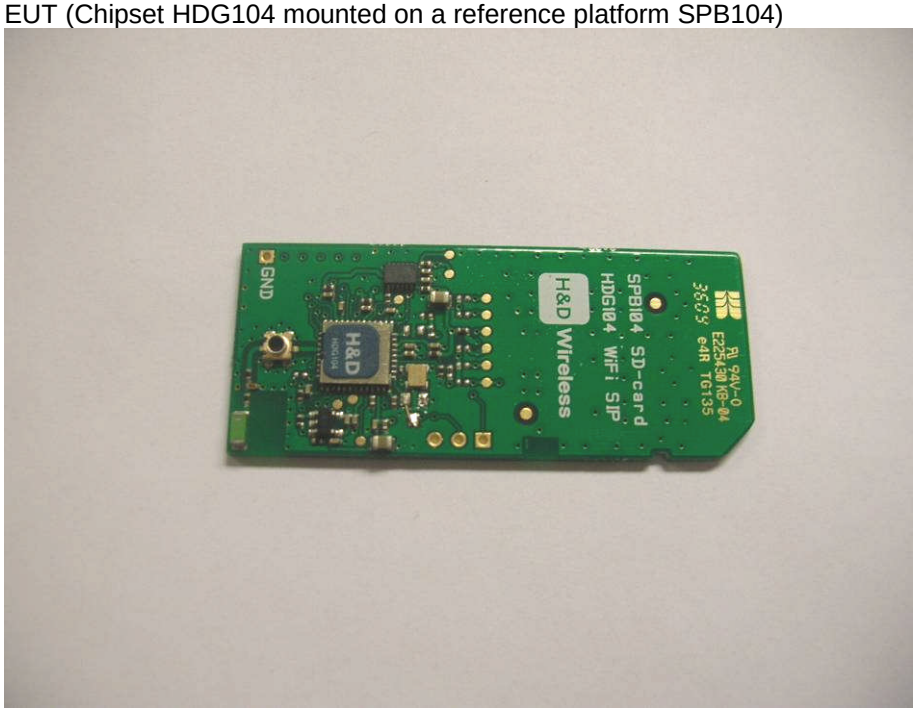
## APPENDIX I – PHOTOS OF THE EUT

EUT (Chipset HDG104 mounted on a reference platform SPB104)




EUT (Chipset HDG104 and SD-card SPB104) together with PCMCIA-card (SPB479)

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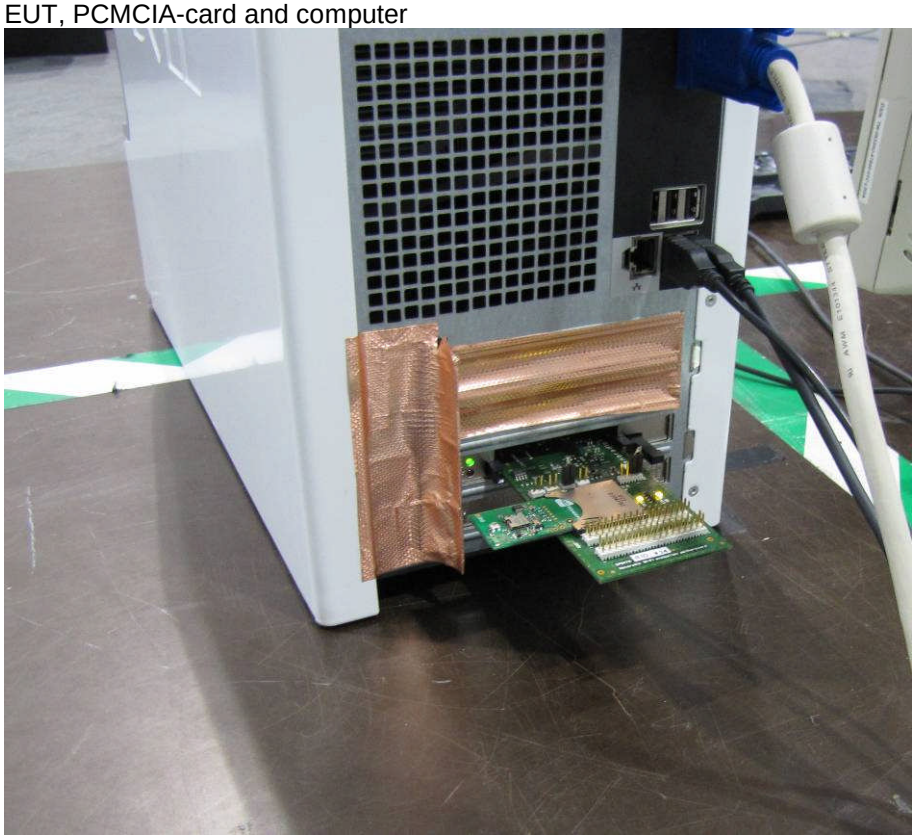
EUT, PCMCIA-card and computer





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