



**TEST REPORT CONCERNING THE COMPLIANCE OF
WIRELESS NETWORK ADAPTOR MODULE
BRAND INTEL,
MODELS 7260NGW
WITH 47 CFR PART 15 (10-1-12 EDITION) AND THE
REQUIREMENTS OF INDUSTRY CANADA:
ICES-003 (ISSUE 5, AUGUST 2012)**

**12121201.fcc05
March 11, 2013**

FCC listed : 90828
Industry Canada : 2932G-2
VCCI Registered : R-1518, C-1598
R&TTE, LVD, EMC Notified Body : 1856

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MEASUREMENT/TECHNICAL REPORT

Intel Corporation

Brand: Intel
Model: 7260NGW
FCC ID: PD97260NG and PD97260NGU
IC: 1000M-7260NG

This report concerns: Original grant/certification ~~Class 2 change~~ Verification Verification

Equipment type: JBP Class B Computing Device Peripheral

| | |
|---------------------|---------------------------------------|
| Report prepared by: | Name : R. van der Meer |
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-12 Edition), RSS-GEN AND RSS-210 and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland EPS B.V. at Leek, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: March 11, 2013

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS B.V.

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

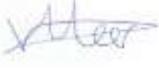
Description of test item

Test item (EUT) : Wireless Network Adapter Module
Manufacturer : Intel Corporation
Brand : Intel
Model : 7260NGW
MAC address : 001500B6698F
FCC ID : PD97260NG and PD97260NGU
IC : 1000M-7260NG
Receipt date : January 07, 2013

Applicant information

Applicant's representative : Steven Hackett
Company : Intel Corporation
Address : 100 Center Point Circle Suite 200
Postal code : SC 29210
City : Columbia
Country : USA
Telephone number : 803-216-2344
e-mail address : steven.c.hackett@intel.com

Test(s) performed

Location : Leek
Test(s) started : January 24, 2013
Test(s) completed : February 20, 2013
Purpose of test(s) : Equipment Authorization (Original grant/certification)
Test specification(s) : 47 CFR Part 15 (10-1-12 Edition) and ICES-003 ISSUE 5 AND ANSI C63.4-2009
Compliance statement : The test has demonstrated that this unit complies with stipulated standards.
Test engineer(s) : R. van der Meer 

Report written by : R. van der Meer 

Report date : March 11, 2013

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The test results relate only to the item(s) tested.

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The brand Intel model 7260NGW, hereafter referred to as EUT, is a PCIe small form factor IEEE 802.11a/b/g/n/ac + Bluetooth wireless network adapter module. The module will support MIMO (2x2) for 802.11n/ac modes and MISO (1x2) for 802.11a/b/g modes and utilizes DSSS and OFDM modulation techniques. Bluetooth operates with basic, EDR and BLE modes as SISO (1x1). When Bluetooth is operational wifi operates as SISO (1x1).

The module is sold under two different FCC ID numbers under the same model number (see table below). The FCC ID ending in "U" is intended to allow user installation conditions and host systems must be provided with a BiOS locking feature to provide mutual authentication between module and host devices.

| Brand | Model Number | Description | FCC/IC IDs |
|-------|--------------|---|---|
| Intel | 7260NGW | 802.11a/b/g/n/ac + BT wireless network adapter module | PD97260NG PD97260NGU 1000M-7260NG |

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original grant/certification in equipment authorization files under registration number. **FCC ID: PD97260NG and PD97260NGU and IC: 1000M-7260NG.**

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

| | | |
|-----------------------|---|--|
| EUT | : | Wireless Network Adapter Module |
| Manufacturer | : | Intel Corporation |
| Brand | : | Intel |
| Model | : | 7260NGW |
| MAC address | : | 001500B6698F |
| Voltage input rating | : | +3.3 V |
| Voltage output rating | : | -- |
| Current input rating | : | -- |
| Antenna | : | AUX3 |
| Remarks | : | See photos of the EUT on the next page |

The EUT was placed inside a host (laptop computer – AUX1), see photo 1c on the next page.



Photo 1a: EUT (front)

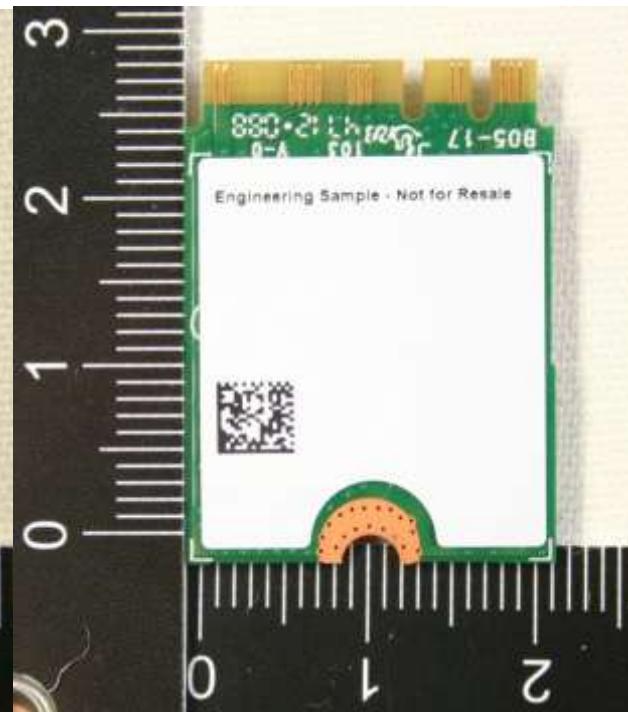


Photo 1b: EUT (back)

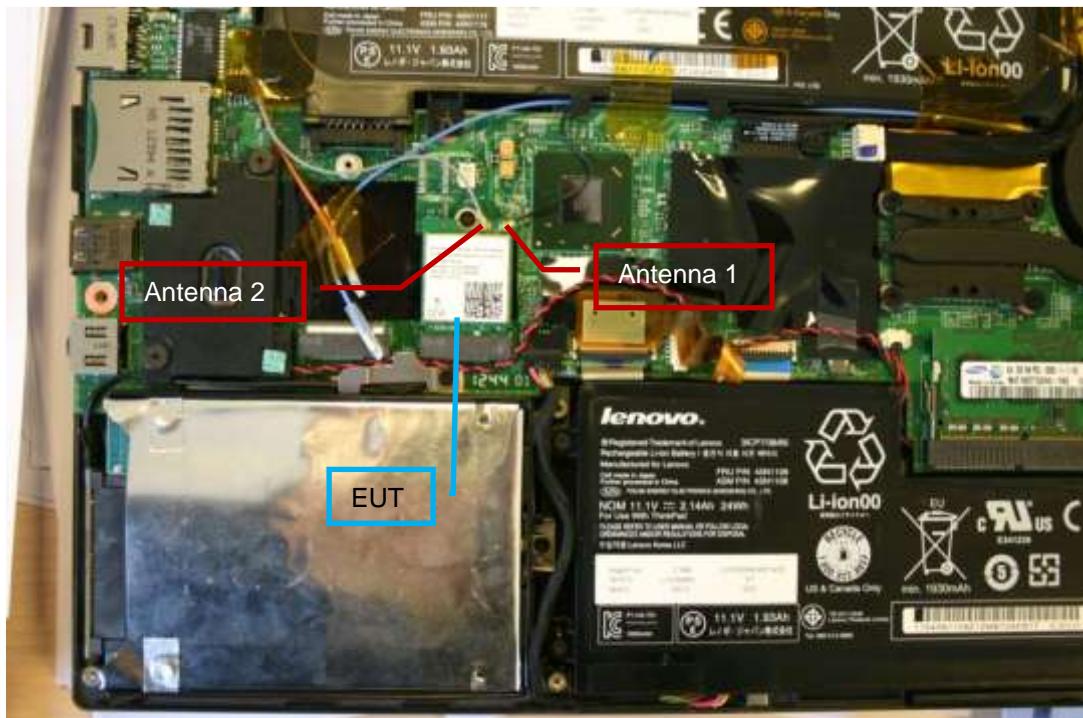


Photo 1c: EUT as placed in host (AUX1) (bottom cover of AUX1 removed)

1.3.1 Description of input and output ports.

| Number | Terminal | From | To | Remarks |
|--------|------------------|---------|-------------------------|---------|
| 1 | Mains | Mains | AUX1 | -- |
| 2 | Charging adapter | AUX1 | AUX2 (Host holding EUT) | -- |
| 3 | usb | Printer | AUX1 | -- |
| 4 | usb | mouse | AUX1 | -- |

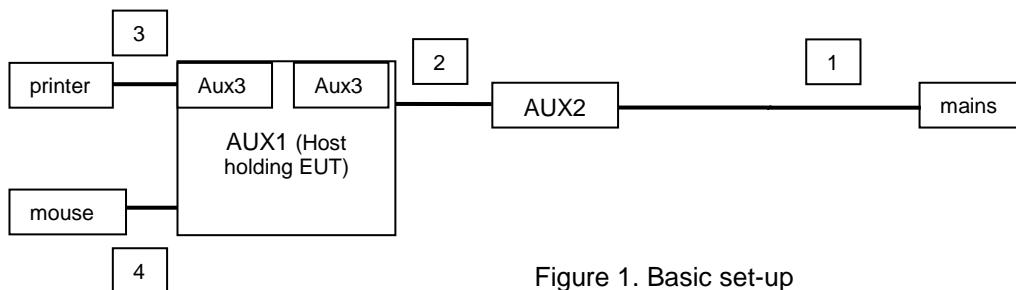
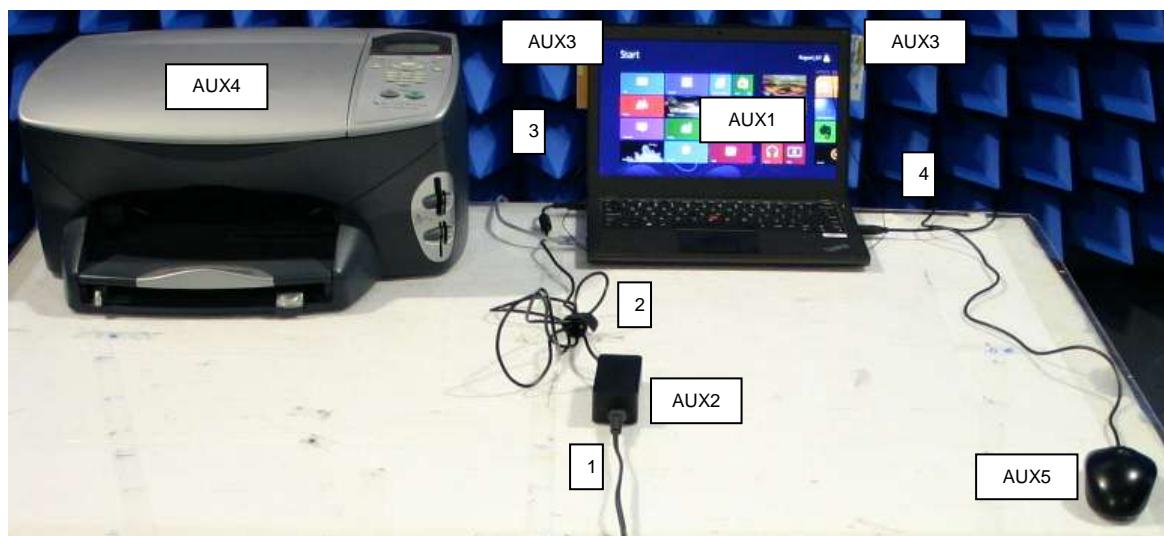


Figure 1. Basic set-up



1.3.2 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

1. AUX1

Product: Laptop Computer
Brand: Lenovo
Model: ThinkPad X231s
Serial Number: MP-27LMO 12/1i
Remark: property applicant, host for testsoftware and EUT

2. AUX2

Product: AC Adapter
Brand: Lenovo
Model: ADLX45NCC2A
Rated input Voltage: 100-240Vac 1.3A 50-60Hz
Rated output Voltage: 20Vdc 2.25A
Remarks: connects AUX1 to mains

3. AUX3

Product: Reference antennas
Manufacturer: SkyCross Electronics (Shenzen) Co.,Ltd
Brand: SkyCross Electronics (Shenzen) Co.,Ltd
Gain at 2G4: 3.0 dBi (declared by applicant)
Gain at 5G: 5.0 dBi (declared by applicant)
Remarks: connected to EUT and physically placed on lid of AUX1

4. AUX4

Product: Printer
Manufacturer: HP
Brand: HP
Remarks: connected to EUT and physically placed on lid of AUX1

5. AUX5

Product: Mouse
Manufacturer: Logitech
Brand: Logitech
Remarks: connected to EUT and physically placed on lid of AUX1

1.4 Test Summary

The EUT was tested in accordance with the specifications given in Table 1 below.

| Test Standard | | Description | Page | Pass / Fail |
|-------------------------------------|------------------------------------|---------------------|-------|-------------|
| 47 CFR Part 15 (10-1-12 Edition) | ICES-0003 Issue 5 (AUGUST 2012) | | | |
| 15.107(a) Class B | Section 5 Class B | Conducted emissions | 13-15 | Pass |
| 15.109(a) Class B | Section 6 Class B | Radiated emissions | 12 | Pass |

Table 1: Test specifications

Testmethods: ANSI C63.4:2009

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-12 Edition), sections 15.31, 15.35, 15.205, 15.107, 15.109 and ICES-003 Issue 5.

The test methods, which have been used, are based on ANSI C63.4: 2009.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.6 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS B.V., located at Eiberkamp 10, 9351 VT Leek, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

| | |
|----------------------|--|
| Temperature (*) | : +15°C to +35°C |
| Relative humidity(*) | : 20 % to 75 % |
| Supply voltage | : internal accu battery operated (fully charged) |
| Air pressure | : 950 – 1050 hPa |

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation as a customer would normally use it. The test sample was configured by software as described in section 2.3 to enable continuous transmit in various modes (described in section 2.2).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.10: 2009.

2.2 EUT mode of operation.

The EUT has been tested in the modes as described in table below

| Operation Mode | EUT Status | Description |
|----------------|------------|---|
| Mode 1 | On | Wifi transmitting in 2.4GHz band. Bluetooth in IDLE mode. |
| Mode 2 | On | Wifi transmitting in 5GHz band. Bluetooth in IDLE mode. |
| Mode 3 | On | Wifi in IDLE mode Bluetooth in transmission mode. |
| Mode 4 | On | Wifi in IDLE mode Bluetooth in IDLE mode |

2.3 Test Software

A continuous transmit or receive mode could be initiated by using test software as supplied by Intel Corporation. The test software was used to define various different operational modes of the EUT for the purpose of compliance testing. The version of the test software, as supplied by Intel Corporation and used during all tests is:

Test software : DRTU 1.6.0-0510
 Driver : 16.0.0.17

This software was running on a laptop computer (AUX1). It was used to enable the test operation modes listed in section 2.2 as appropriate.

2.4 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.5 Equipment modifications.

No modifications have been made to the equipment.

2.6 Product Labeling

The product labeling information is available in the technical documentation package.

2.7 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.8 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.9 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field)

| Freq. [MHz] | Antenna Orientation | Reading QP [dB μ V] | Factor [dB(1/m)] | Level QP [dB μ V/m] | Limit [dB μ V/m] | Margin QP [dB] |
|-------------|---------------------|-------------------------|------------------|-------------------------|----------------------|----------------|
| 66.86 | Vertical | 15.1 | 5.4 | 20.5 | 40.0 | 19.5 |
| 111.48 | Vertical | 13.6 | 11.4 | 25.0 | 43.5 | 18.5 |
| 253.10 | Vertical | 13.7 | 14.2 | 27.9 | 46.0 | 18.1 |
| 774.96 | Vertical | 14.7 | 24.8 | 39.5 | 46.0 | 6.5 |
| 844.80 | Vertical | 15.3 | 26.1 | 41.4 | 46.0 | 4.6 |
| 922.40 | Vertical | 15.4 | 27.6 | 43.0 | 46.0 | 3.0 |

Table 2 Radiated emissions of the EUT

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.205, 15.109(a) and ICES-003 are depicted in Table 2.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB.
3. The EUT was varied in three positions, the measuring antenna was varied in horizontal and vertical orientations and also around it's axis and height. The reported value is the worst case found at the reported frequency.
4. Tested with EUT in operation modes as described in section 2.2, worst case values noted.
5. A Quasi-peak detector was used with a bandwidth of 120 kHz.

3.1.1 Test equipment used (for reference see test equipment listing).

| | | | | | | |
|-------|-------|-------|-------|-------|--|--|
| 15633 | 99580 | 99609 | 99855 | 99699 | | |
|-------|-------|-------|-------|-------|--|--|

Test engineer

Signature : 

Name : R. van der Meer
 Date : 24-01-2013

4 Conducted emission data.

4.1 Conducted emission data of the EUT.

4.2 Conducted emission data of the EUT

| Frequency (MHz) | Measurement results dB(µV) Neutral/L2 | | Measurement results dB(µV) Line 1 | | Limits dB(µV) | | Result |
|--------------------|---|------|---|------|------------------|------|--------|
| | QP | AV | QP | AV | QP | AV | |
| 0.150 | <40 | <30 | 65.1 | 37.3 | 66.0 | 56.0 | PASS |
| 0.160 | 58.0 | 39.1 | 50.0 | 40.1 | 65.0 | 55.0 | PASS |
| 0.175 | <40 | <30 | 62.0 | 36.4 | 64.5 | 54.5 | PASS |
| 0.265 | <40 | <30 | 52.1 | 35.1 | 61.1 | 51.1 | PASS |
| 0.285 | <40 | <30 | 47.3 | 38.1 | 60.5 | 50.5 | PASS |
| 0.310 | 47.1 | 44.0 | 43.3 | 41.1 | 56.0 | 46.0 | PASS |
| 0.690 | 39.1 | 23.3 | 35.7 | 25.6 | 56.0 | 46.0 | PASS |
| 0.860 | 38.3 | 25.5 | 36.2 | 27.1 | 56.0 | 46.0 | PASS |
| 15.535 | 28.3 | 22.2 | 36.7 | 24.3 | 60.0 | 50.0 | PASS |
| 23.810 | 40.7 | 40.6 | 43.1 | 42.6 | 60.0 | 50.0 | PASS |

Table 3 Conducted emission measurements of the EUT

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.107(a) and ICES-003, at the 120 Volts/ 60 Hz AC mains connection terminals of the AC/DC adapter which was connected to the AUX1 which hosts the EUT, are depicted in Table 3. The system is tested as in whole, so with all equipment as shown in Figure 1 in place and functioning. Being the worst case situation.

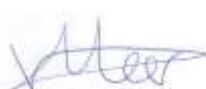
Notes:

1. Tests were performed with the, from pre/tests being the worst case sample.
2. Measurement uncertainty is ± 3.5 dB
3. The resolution bandwidth used was 9 kHz.
4. Tested with EUT in continuous transmit mode on 802.11 operation modes and Bluetooth mode and receive modes, worst case values noted.
5. Some plots are provided in section 5.

Used test equipment and ancillaries:

| | | | | | | |
|-------|-------|-------|-------|-------|-------|--|
| 13313 | 99161 | 12512 | 15667 | 99852 | 99855 | |
| | | | | | | |

Test engineer

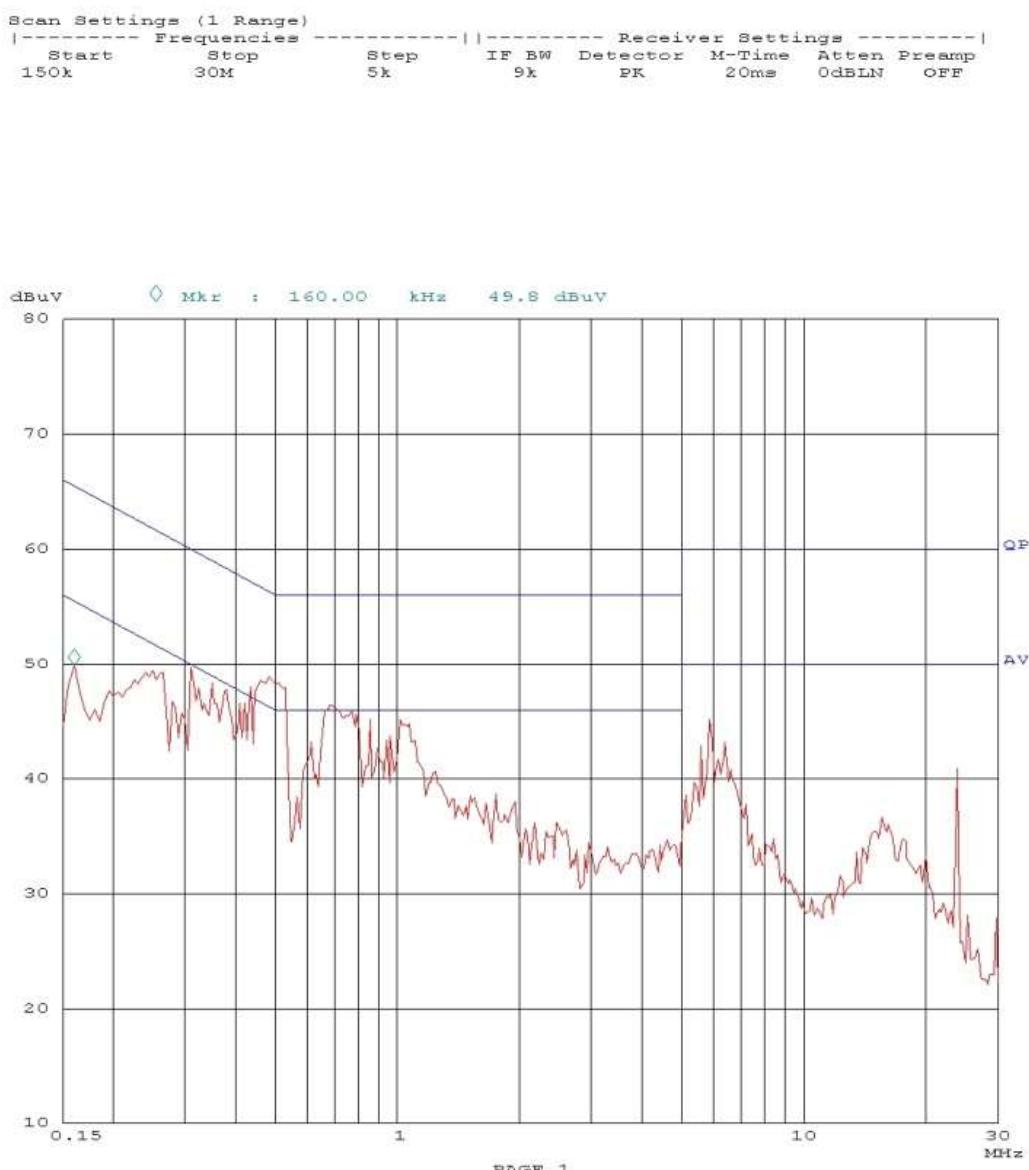
Signature : 

Name : R. van der Meer
 Date : 20-02-2013

5 Plots of measurement data

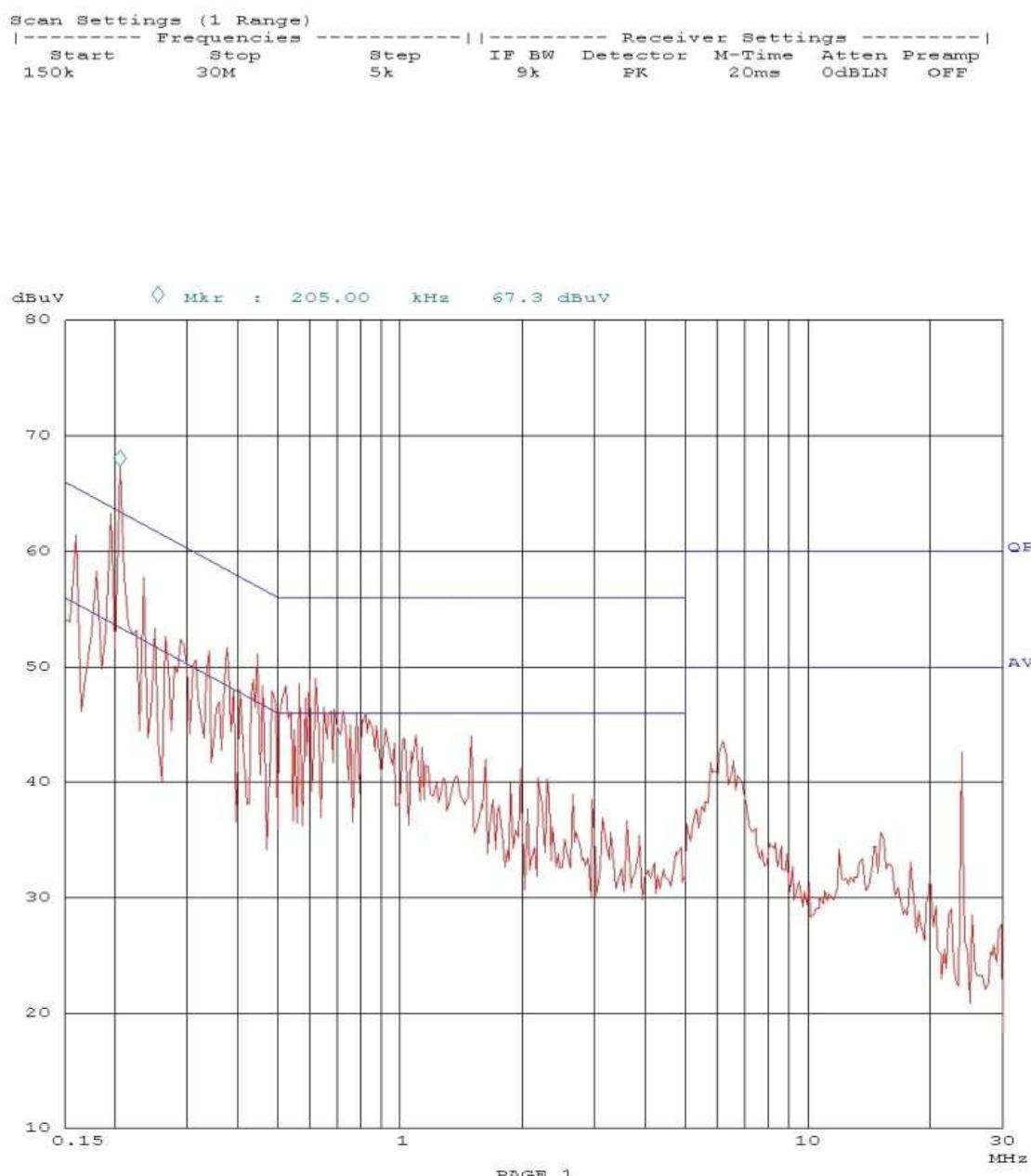
5.1 Conducted emissions

20. Feb 13 11:51



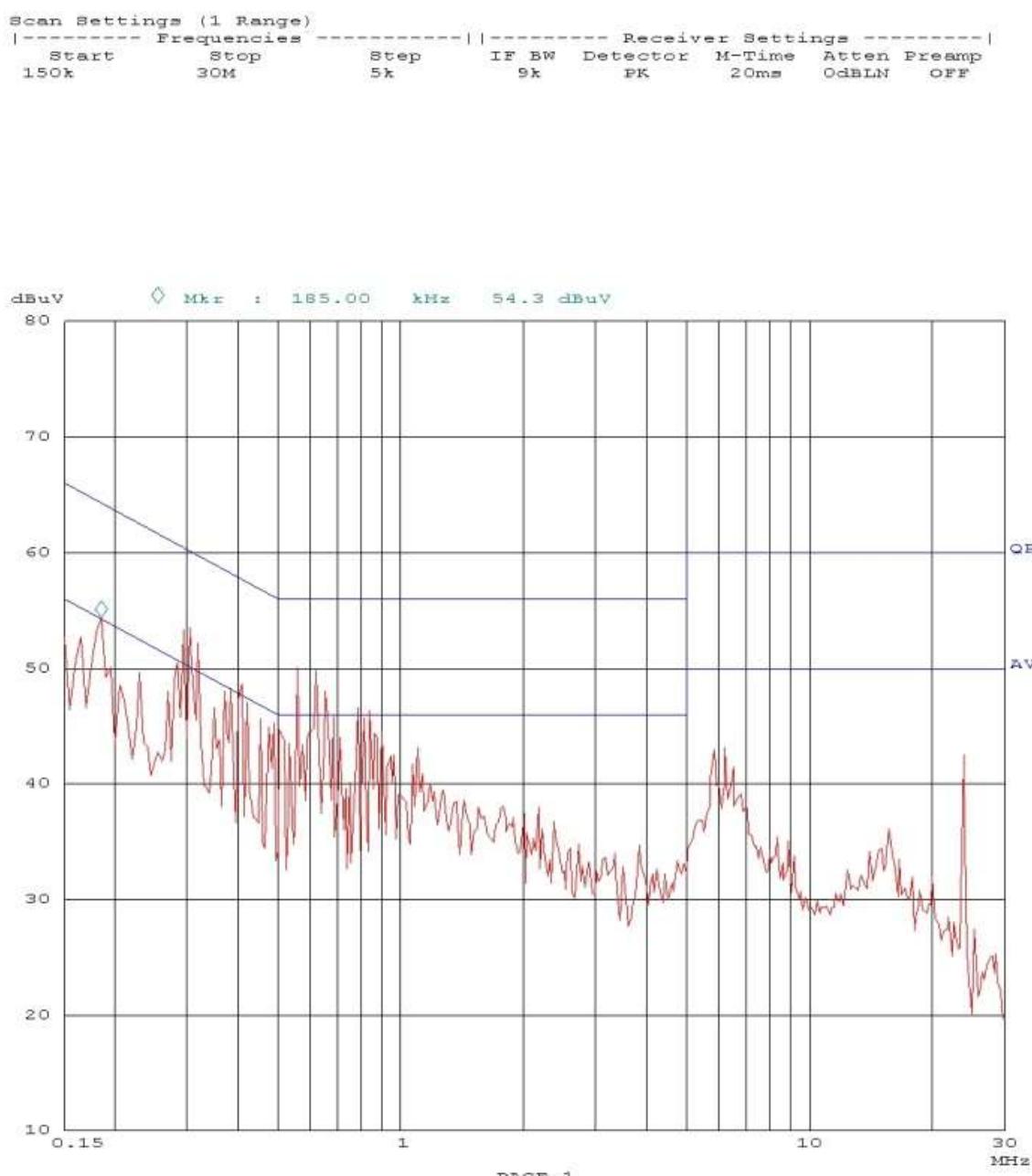
Plot1 Conducted emissions on L1 at 2G4 1Mb DSSS mode

20. Feb 13 13:16



Plot 2 Conducted emissions on L2 at 2G4 54Mb OFDM

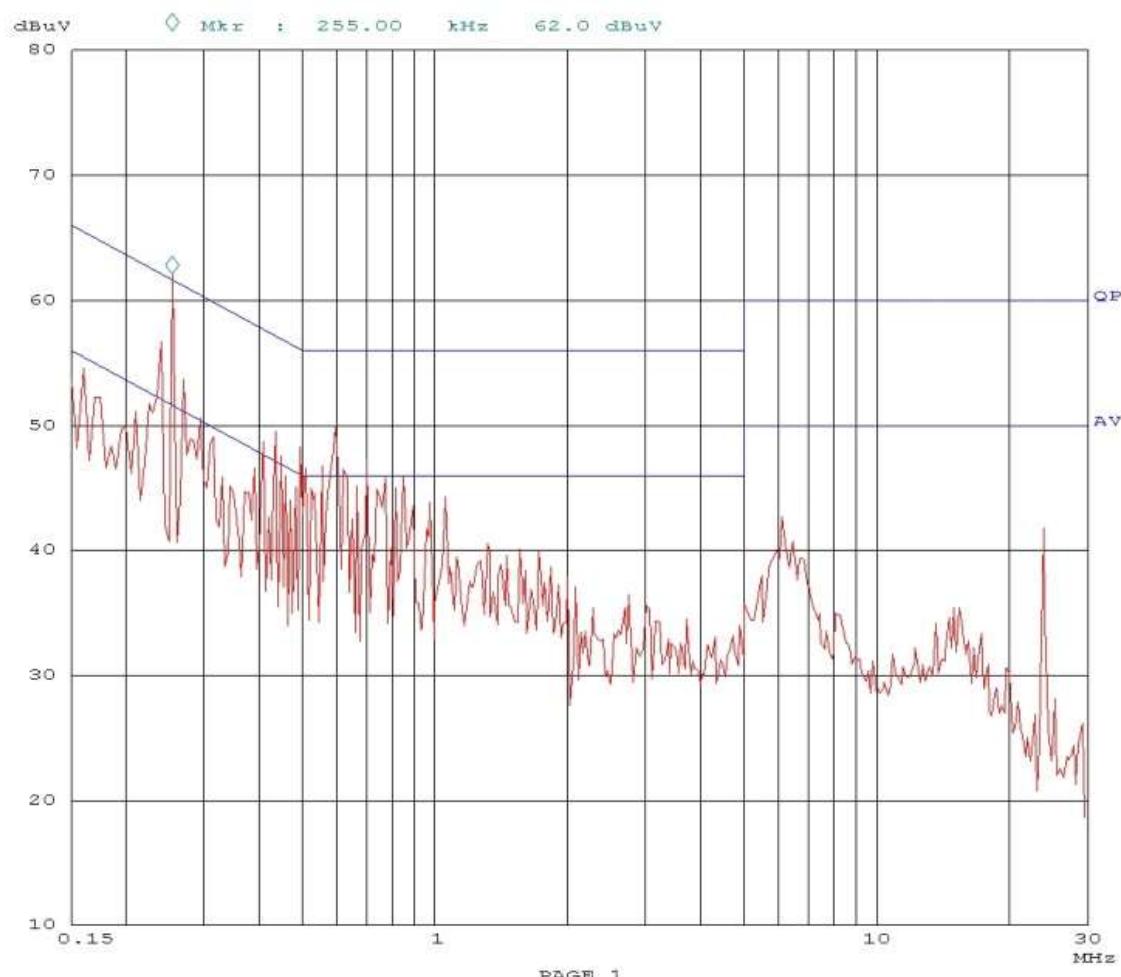
201 Feb 13 13:32



Plot3 Conducted emissions on L2 at 5G7 VHT6 80MHz mode

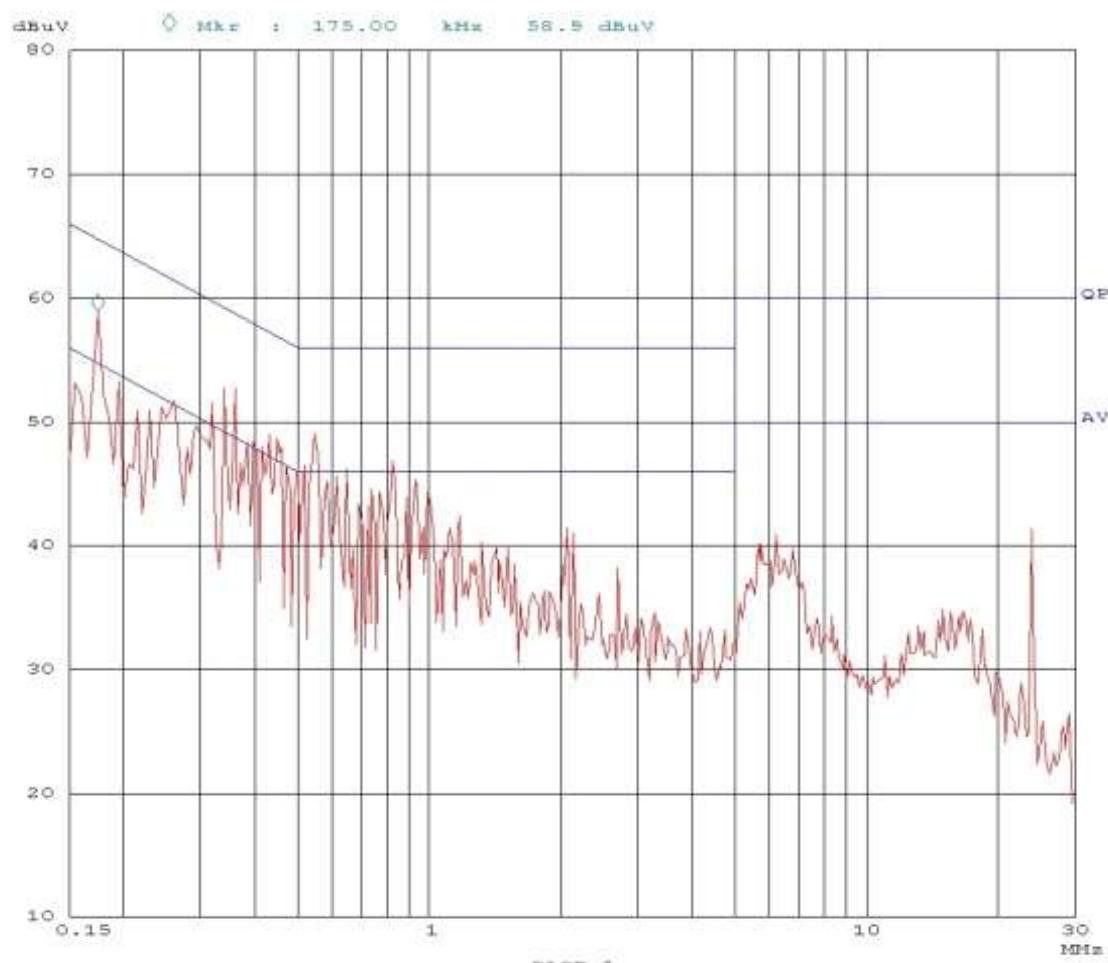
20. Feb 13 13:26

Scan Settings (1 Range)
Frequencies | Receiver Settings
Start Stop Step IF BW Detector M-Time Atten Preamp
150k 30M 5k 9k PK 20ms 0dBIN OFF



Plot 4 Conducted emissions on L2 at 5G7 HT4

20. Feb 13 13:37



Plot5 Conducted emissions on L2 at Bluetooth DH5 mode

6 List of utilized test equipment.

| Inventory number | Description | Brand | Model | Last cal. | Next cal. |
|------------------|-------------------------|--------|-------------------|------------|------------|
| 12512 | LISN | EMCO | 3625/2 | 01/2012 | 01/2014 |
| 13313 | Pulse limiter | R&S | ESH3-Z2 | 01/2013 | 01/2014 |
| 15633 | Biconilog Test antenna | Chase | CBL 6111B | 03-2012 | 03-2013 |
| 99161 | Variac 250V 6A | RFT | LTS006 | NA | NA |
| 99580 | Semi Anechoic Room | Siepel | FCC listed: 90828 | 12-2011 | 12-2014 |
| 99609 | Antenna mast | EMCS | AP-4702C | NA | NA |
| 99848 | Shielded room | -- | -- | NA | NA |
| 99852/ 99855 | Temperature-Humidymeter | Extech | SD500 | 02-2012 | 02-2014 |
| 99623 | Power Supply | EA | PS 2016-050 | 12-2012 | 12-2013 |
| 99699 | Measuring receiver | R&S | ESCI | 03-26-2012 | 03-26-2013 |

NA= Not Applicable