



Test report no. : 190154-4

Item tested : DB1

Type of equipment : UPCS Base

FCC ID : BXZDB1

Client : Ascom Sweden AB

FCC Part 15, subpart D

Isosynchronous UPCS Device
1920 - 1930 MHz

Industry Canada RSS-213, Issue 2

2 GHz Licence-exempt Personal
Communications Service Devices
(LE-PCS)

11 November 2011

Authorized by : 

G. Suhanthakumar
Technical Vericator



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1 GENERAL INFORMATION

1.1 Test house Info

Name : Nemko AS
Address : Nemko Kjeller
Instituttveien 6
N-2007 Kjeller, NORWAY
Telephone : +47 64 84 57 00
Fax : +47 64 84 57 05
E-mail: comlab@nemko.com
FCC test firm registration # : 994405
IC OATS registration # : 2040D-1
Total Number of Pages: 21

1.2 Client Information

Name : Ascom (Sweden) AB
Address : Grimbodalen 2, SE-40276 Gothenburg, Sweden

Contact:

Name : Lena Kindmark
Telephone : +46 31 559579
E-mail : +46 32 552031

1.3 Manufacturer (if other than client)

Same as client.

2 Test Information

2.1 Tested Item

| | |
|-------------------------------------|---|
| Name : | Ascom |
| Model name : | DB1 |
| FCC ID : | BXZDB1 |
| Industry Canada ID : | 3724B-DB1 |
| Serial number : | / |
| Hardware identity and/or version: | / |
| Software identity and/or version : | / |
| Tested to IC Radio Standard (RSS) : | RSS-213 Issue 2, RSS-GEN Issue 3 |
| Test Site IC Reg. Number : | 2040D-1 |
| Frequency Range : | 1921.536 – 1928.448 MHz |
| Number of Channels : | 5 RF Channels, 5x12 = 60 TDMA Duplex Channels |
| Type of Modulation : | Digital (Gaussian Frequency Shift Keying) |
| Peak Output Power : | 85 mW (Conducted) |
| Occupied Bandwidth (99%) : | 1.21 MHz |
| Emission Designator (TRC-43) : | 1M21F1E |
| Antenna Connector : | None |
| Number of Antennas : | 2 |
| Antenna Diversity Supported : | Yes |
| Desktop Charger : | None |
| Power Supply : | Powered from PBX or Power supply |

2.2 Description of Tested Device

The EUT is a UPCS Base station for connection to PBX, and is a responding device as described in ANSI C63.17 and is designed to operate together with a DECT portable part (i.e. a handset), which is the initiating device.

2.3 Exposure Evaluation

The EUT is designed to be fixed to a wall etc. and the user manual contains text that it shall be mounted with a separation distance of at least 20cm from any persons. For the purposes of exposure evaluation this EUT is a mobile or fixed device. MPE Calculation at 20cm satisfying FCC requirements is submitted as a separate document.

The EUT is exempted from RF Exposure Evaluation to Industry Canada SAR requirements since the output power is below the limit for General Public Use.

2.4 Test Environment

| | |
|----------------------|--------------------------------|
| Temperature: | 20.2 – 24.3 °C |
| Relative humidity: | 39.4 – 48.6 % |
| Normal test voltage: | 24 V DC (Power supply voltage) |

The values are the limit registered during the test period.

2.5 Test Period

| | |
|---------------------|-------------------------------|
| Item received date: | 2011-11-08 |
| Test period : | from 2011-11-08 to 2011-11-08 |

2.6 Test Engineer(s)

Frode Sveinsen / Tore Løvlien

2.7 Test Equipment

See list of test equipment in clause 6.

2.8 Other Comments

The radio part of this EUT is identical to the previously certified model IPBS2 (FCC ID: BXZIPBS2), see Nemko test report no. 177990-4.

This test report only covers limited tests, all other tests are covered by Nemko test report no. 177990-4.

All tests except Power-Line Conducted Emissions were performed in conducted mode with a temporary antenna connector.

3 TEST REPORT SUMMARY

3.1 General

Manufacturer: Ascom (Sweden) AB
Model No.: DB1

All measurements are traceable to national standards.

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR47 Part 15D for Isochronous UPCS Devices and Industry Canada RSS-213 Issue 2 / RSS-GEN Issue 3.

All tests were conducted in accordance with ANSI C63.4-2009 and ANSI C63.17-2006. Antenna Gain tests were made in a 3m fully-anechoic chamber.

A description of the test facility is on file with the FCC and Industry Canada.


- | | |
|---|---|
| <input checked="" type="checkbox"/> New Submission | <input checked="" type="checkbox"/> Production Unit |
| <input type="checkbox"/> Class II Permissive Change | <input type="checkbox"/> Pre-production Unit |
| PUB Equipment Code | <input type="checkbox"/> Family Listing |

THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".



TEST REPORT NO: 190154-4

TESTED BY : 
Frode Sveinsen, Chief engineer

DATE: 11 November 2011

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3.2 Test Summary

| Name of test | FCC CFR 47 Paragraph # | IC RSS-213 Paragraph # | Verdict |
|-----------------------------------|-------------------------------------|------------------------|-----------------------|
| Coordination with fixed microwave | 15.307(b) | N/A | Complies |
| Digital Modulation Techniques | 15.319(b) | 6.1 | Complies |
| Labeling requirements | 15.19(a)(3) | 3 RSS-GEN 5.2 | Complies |
| Antenna Requirement | 15.317, 15.203 | RSS-GEN 7.1.2 | Complies |
| Power Line Conducted Emissions | 15.107(a) 15.207(a) | 6.3 RSS-GEN 7.2.2 | Complies |
| Out-of-band emissions | 15.323(d) | 6.7.1 | Complies ¹ |
| Output Power and Antenna Gain | 15.319(c)(e), 15.31(e) | 6.5 and 4.1(e) | Complies ² |
| Carrier frequency stability | 15.323(f) | 6.2 | Complies |
| Spurious Emissions (Radiated) | 15.319(g) 15.109(a) 15.209(a) | 4.3.3 RSS-GEN 7.2.3 | N/A ³ |
| Receiver Spurious Emissions | N/A | 6.8 RSS-GEN 6 | Complies |

¹ Only Out-of-Band Emissions up to 1.92 GHz, for Emissions from 1.93 GHz see Nemko report no. 177990-4.

² Antenna gain is covered by Nemko test report no. 177990-4.

³ Not required if the Conducted Out-of-Band Emissions test is Passed

4 TEST RESULTS

4.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

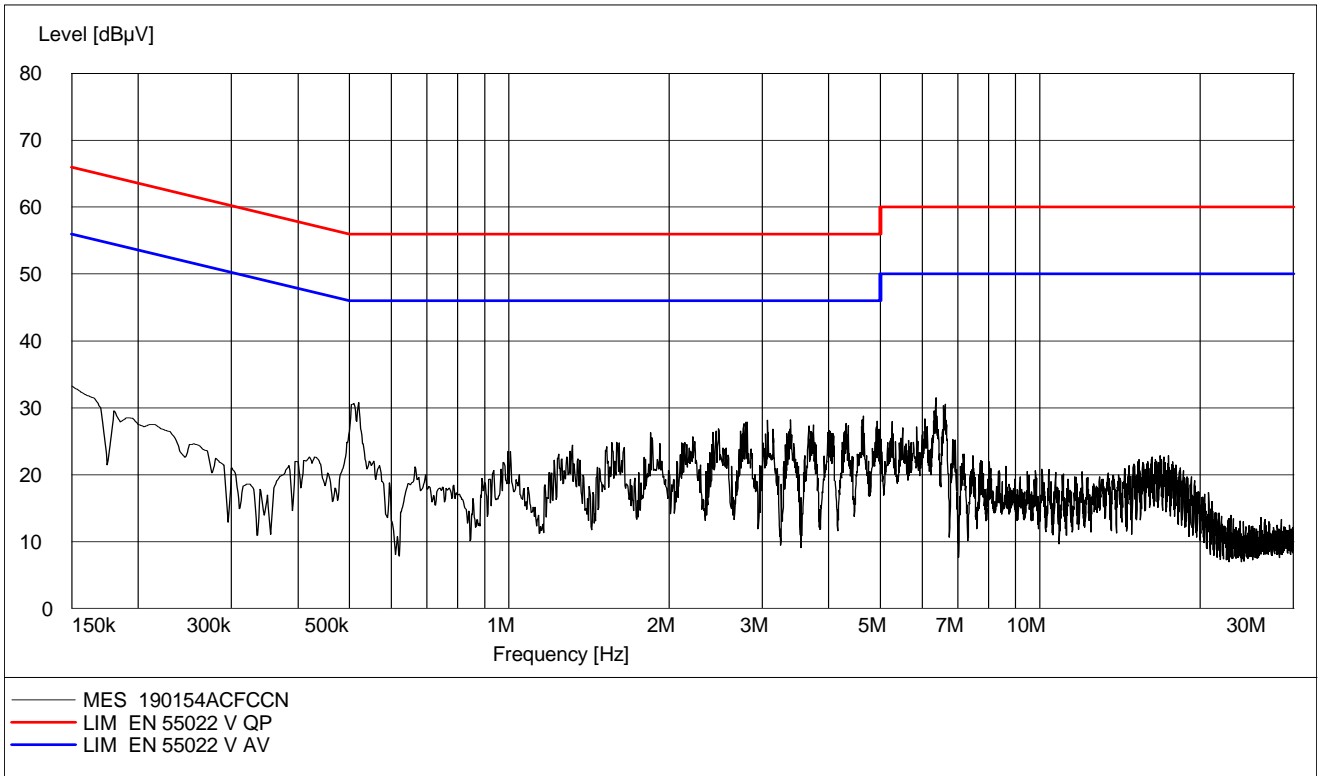
Test Performed By: Tore Løvlien

Date of Test: 8 Nov 2011

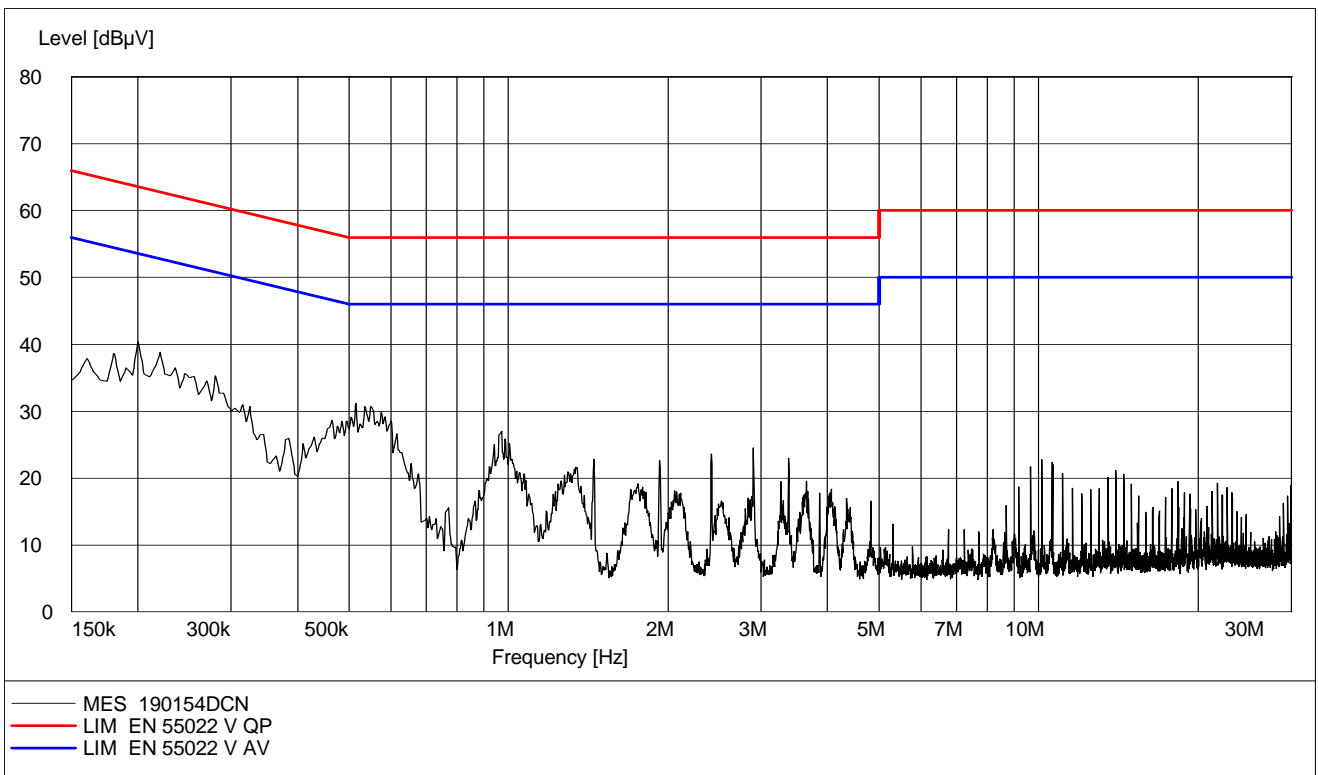
Measurement procedure: ANSI C63.4-2009 using 50 μ H/50 ohms LISN.

Test Results: Complies

Measurement Data: All emissions were below the Average Limit even when measured with Peak Detector. See attached plots (Peak detector).



Phase N and L1, 120 V AC, 60 Hz



24 V DC

4.2 Coordination with fixed microwave

The affidavit from UTAM, Inc. is included in the documentation supplied by the applicant:

Yes

No

Requirement, FCC 15.307 (b):

Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

4.3 Digital Modulation Techniques

The EUT used Multi Carrier / Time Division Multiple Access / Time Division Duplex and Digital GFSK modulation. For further details see the operational description provided by the applicant.

Requirement, FCC 15.319(b):

All transmissions must use only digital modulation techniques.

4.4 Labeling Requirements

See separate documents showing the label design and the placement of the label on the EUT.

Requirements FCC 15.19

The FCC Identifier shall be displayed on the label, and the device(s) shall bear the following statement in a conspicuous location on the device or in the user manual if the device is too small:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label itself shall be of a permanent type, not a paper label, and shall last the lifetime of the equipment.

4.5 Antenna Requirement

Does the EUT have detachable antenna(s)?

Yes No

If detachable, is the antenna connector(s) non-standard?

Yes No

The tested equipment has only integral antennas. The conducted tests were performed on a sample with a temporary antenna connector.

Requirement: FCC 15.203, 15.204, 15.317.

4.6 Channel Frequencies

| UPCS CHANNEL | FREQUENCY (MHz) |
|-----------------|-----------------|
| Upper Band Edge | 1930.000 |
| 0 (Highest) | 1928.448 |
| 1 | 1926.720 |
| 2 | 1924.992 |
| 3 | 1923.264 |
| 4 (Lowest) | 1921.536 |
| Lower Band Edge | 1920.000 |

Requirement: FCC 15.303 (d), (g)

Within 1920 -1930 MHz band for isochronous devices.

4.7 Peak Power Output

Test Method:

ANSI C63.17, clause 6.1.2.

Test Results: Complies

Measurement Data:

Maximum Conducted Output Power

| Channel No. | Frequency (MHz) | Maximum Conducted Output Power (dBm) | Maximum Radiated Output Power (dBm) | Maximum Antenna Gain (dBi) |
|-------------|-----------------|--------------------------------------|-------------------------------------|----------------------------|
| 4 | 1921.536 | 18.4 | / | / |
| 2 | 1924.992 | 19.3 | / | / |
| 0 | 1928.448 | 19.3 | / | / |

Antenna gain was not retested since the antennas are identical to IPBS2 (FCC ID: BXZIPBS2), see Nemko test report no. 177990-4.

For this test it was also checked that input voltage variation of 85 and 115% of nominal value did not have any effect on the measured output power,.

Limit:

Conducted: $100 \mu\text{W} \times \text{SQRT}(B)$ where B is the measured Emission Bandwidth in Hz

FCC 15.319(c)(e): 20.80 dBm (120 mW)

RSS-213, Issue 2: 20.41 dBm (110 mW)

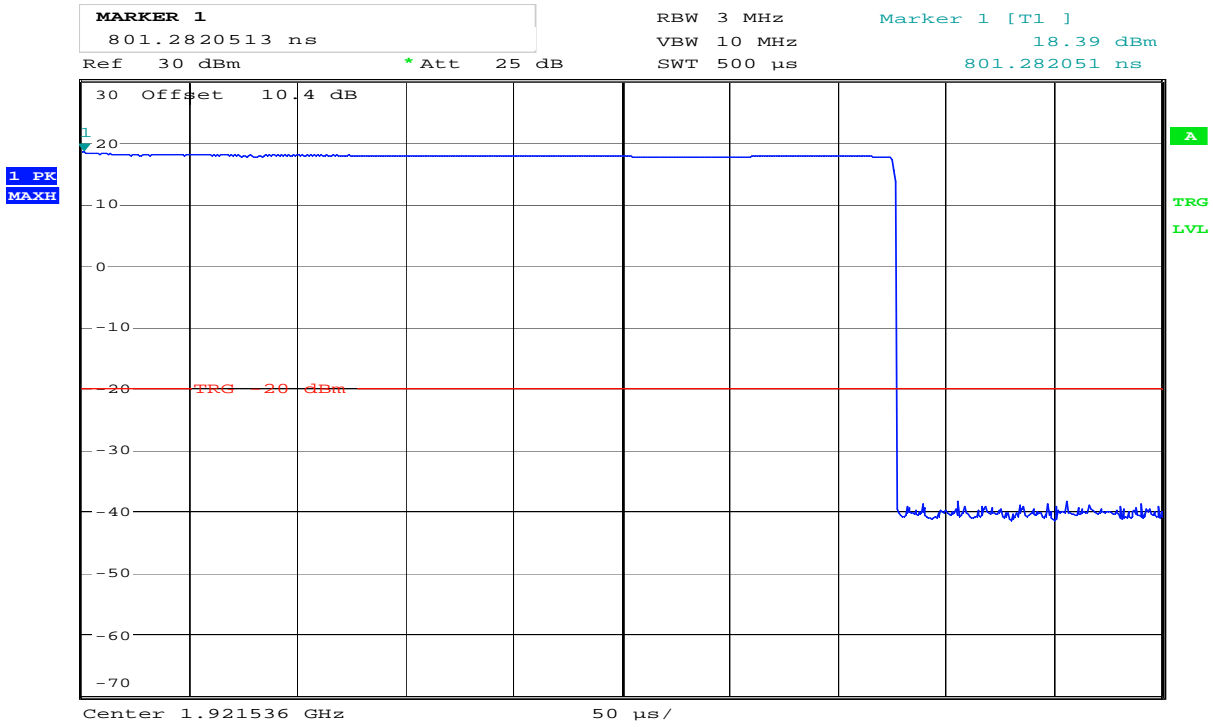
The antenna gain is below 3 dBi, no reduction in transmit power is necessary.

Requirements, FCC 15.319(c)(e), RSS-213, Issue 2

Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in Hertz.

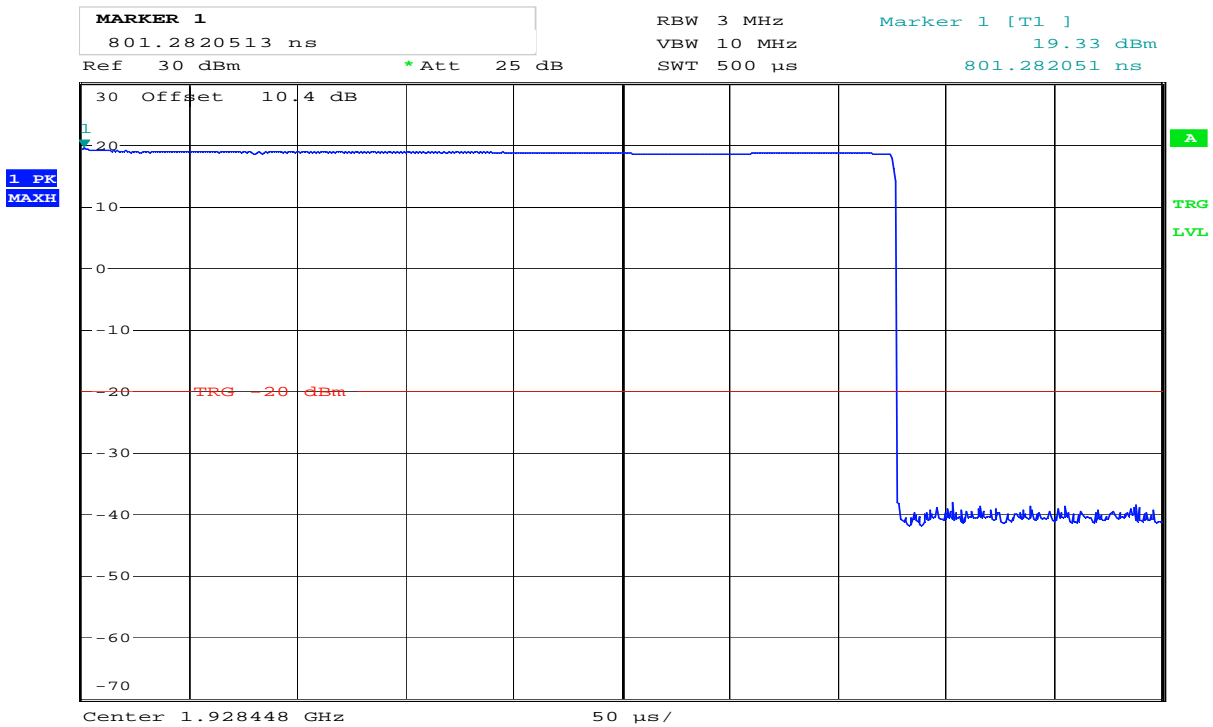
The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

Conducted Peak Output Power



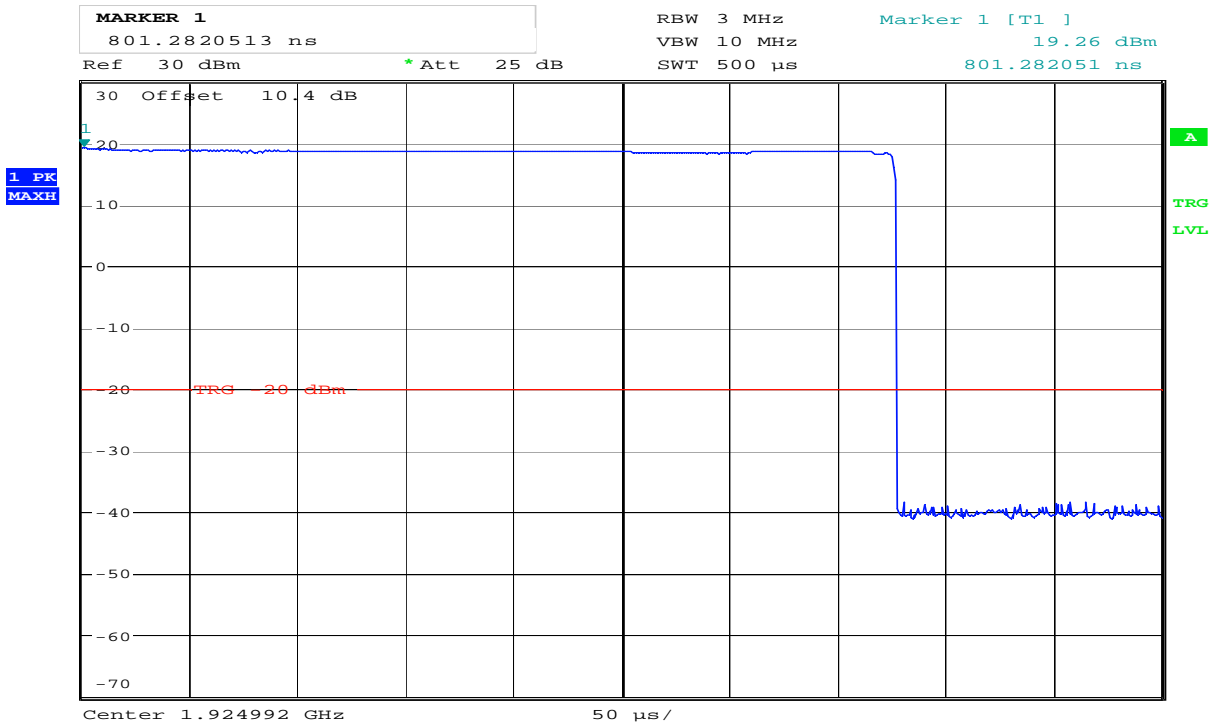
Date: 8.NOV.2011 09:41:28

Lower Channel



Date: 8.NOV.2011 10:03:04

Upper Channel



Date: 8.NOV.2011 10:01:53

Middle Channel

4.8 Out-of-band Emissions, Conducted

Test Method:

ANSI C63.17, clause 6.1.6.2.

Test Results: Complies

Measurement Data:

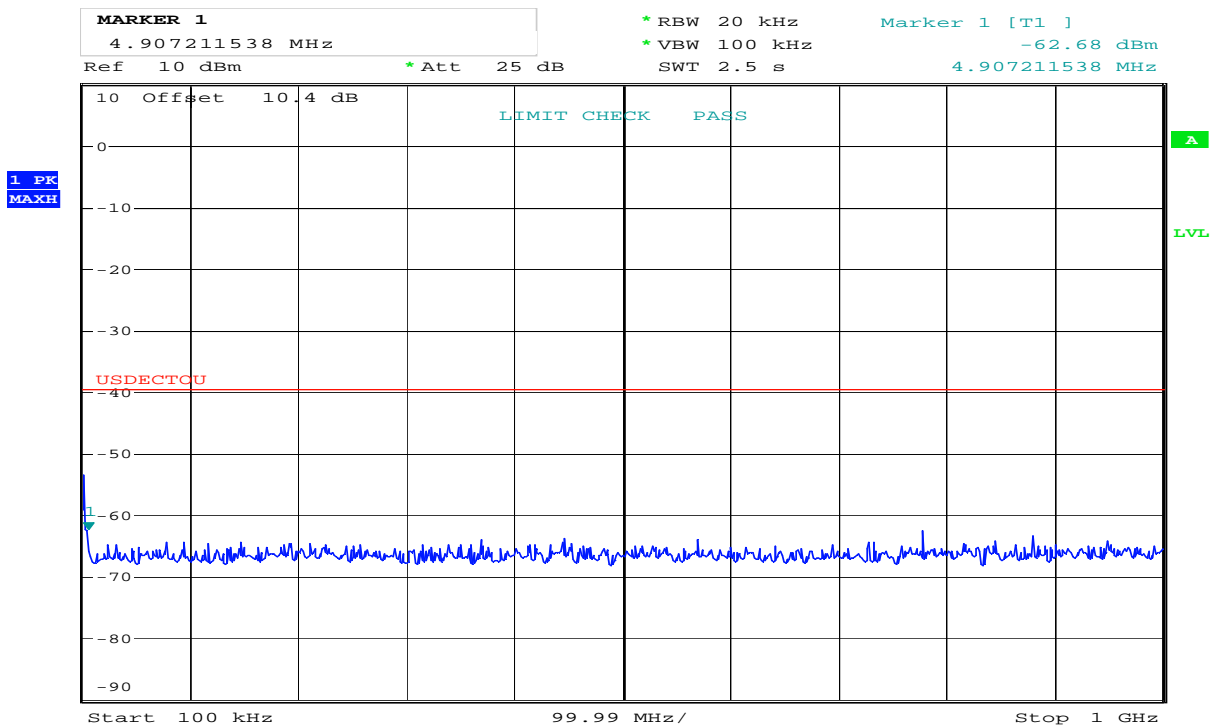
See plots.

Requirements, FCC 15.323(d):

$f \leq 1.25\text{MHz}$ outside UPCS band : ≤ -9.5 dBm
 $1.25\text{MHz} \leq f \leq 2.5\text{MHz}$ outside UPCS band : ≤ -29.5 dBm
 $f \geq 2.5\text{MHz}$ outside UPCS band : ≤ -39.5 dBm

Out-of-Band Emissions, Conducted

Lower Channel:



Date: 8.NOV.2011 09:50:45

4.9 Receiver Spurious Emissions

Measurement Procedure:

Industry Canada RSS-213 paragraph 6.8 and RSS-GEN paragraphs 4.10 and 6.

Test results:

| Frequency MHz | Carrier No. | Measured Value Conducted dBm | Conducted Limit dBm | Margin dB |
|---------------|-------------|------------------------------|---------------------|-----------|
| 30 – 1000 | all | < -70 | -57 | >13 |
| > 1000 | all | < -70 | -53 | >17 |

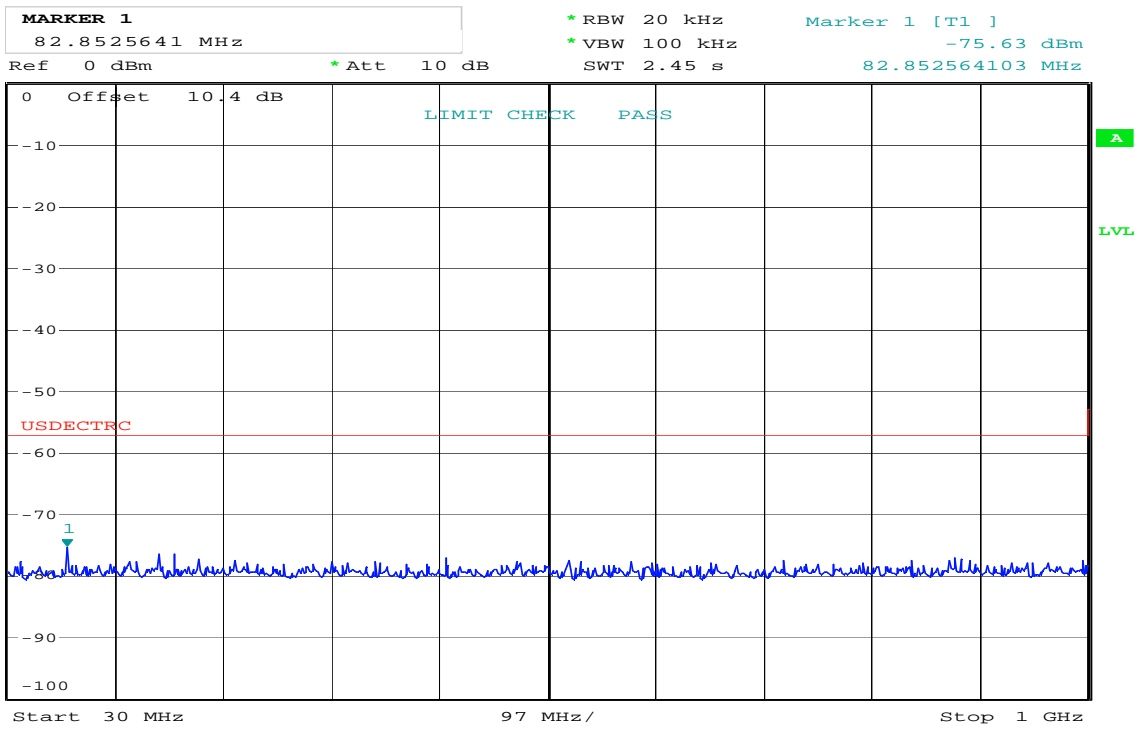
No spurious emissions from the receiver were seen.

Requirements, RSS-GEN Issue 3, clause 6

The measurement can be performed either radiated or conducted.

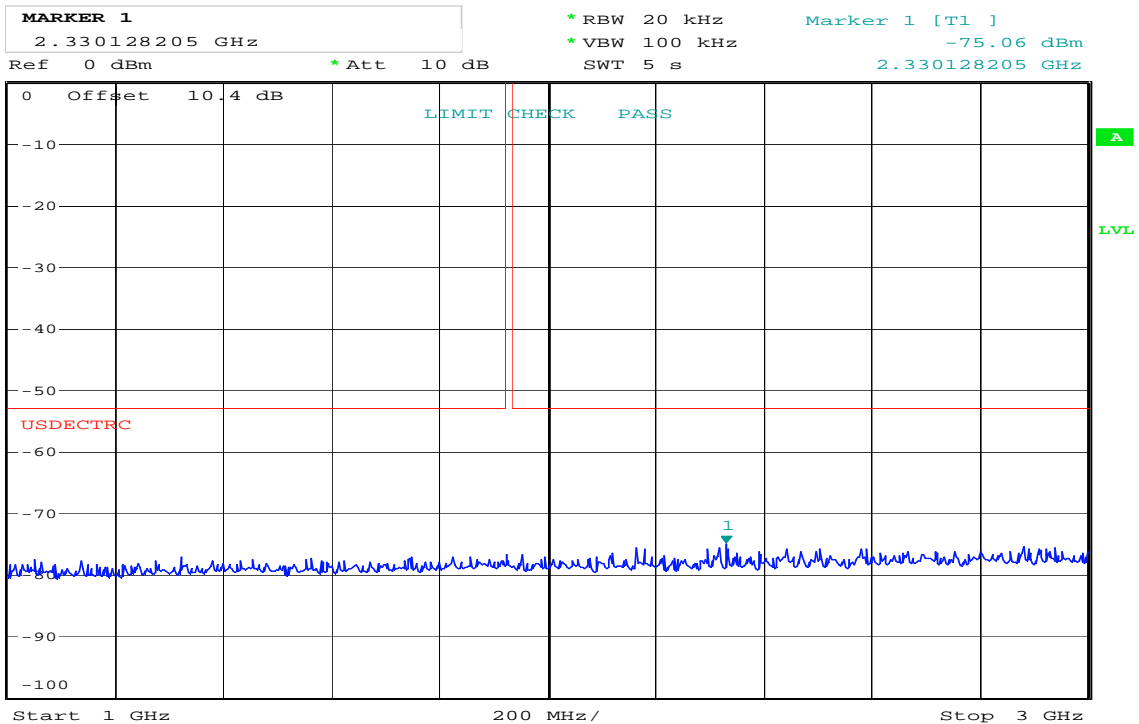
When measured Conducted: no spurious signals appearing at the antenna terminals shall exceed 2 nW per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nW above 1 GHz.

When measured Radiated: See Table 2 in RSS-GEN Issue 3, clause 6.



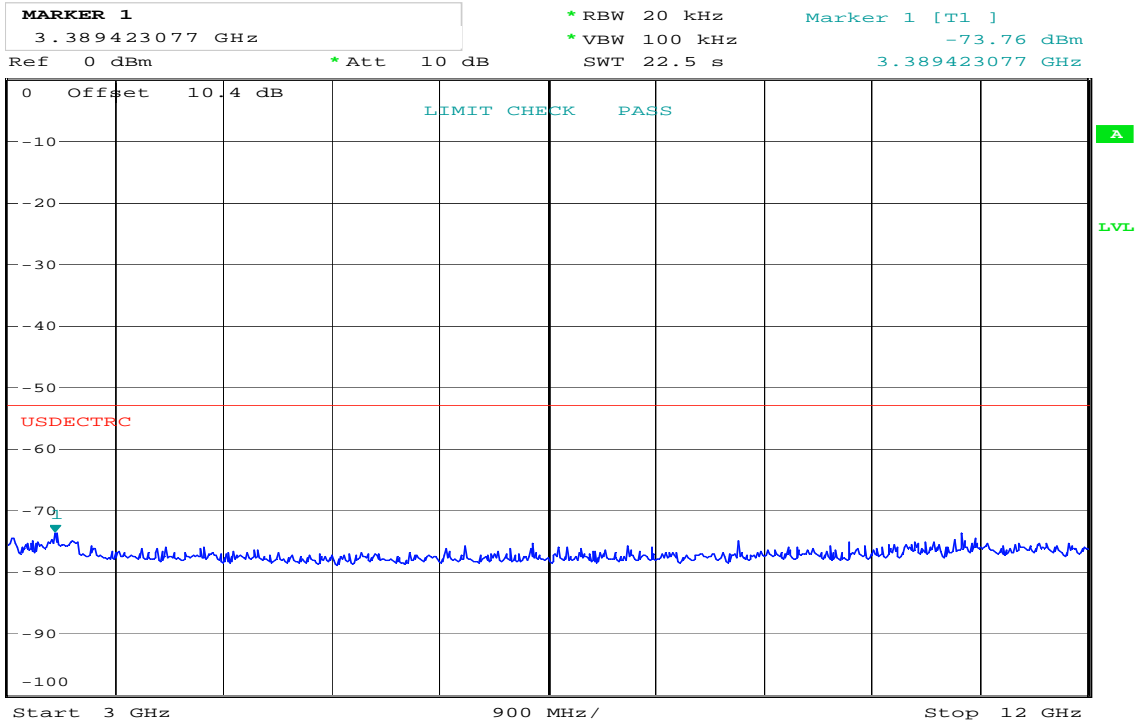
Date: 8.NOV.2011 09:56:19

Receiver Emissions 30 -1000 MHz



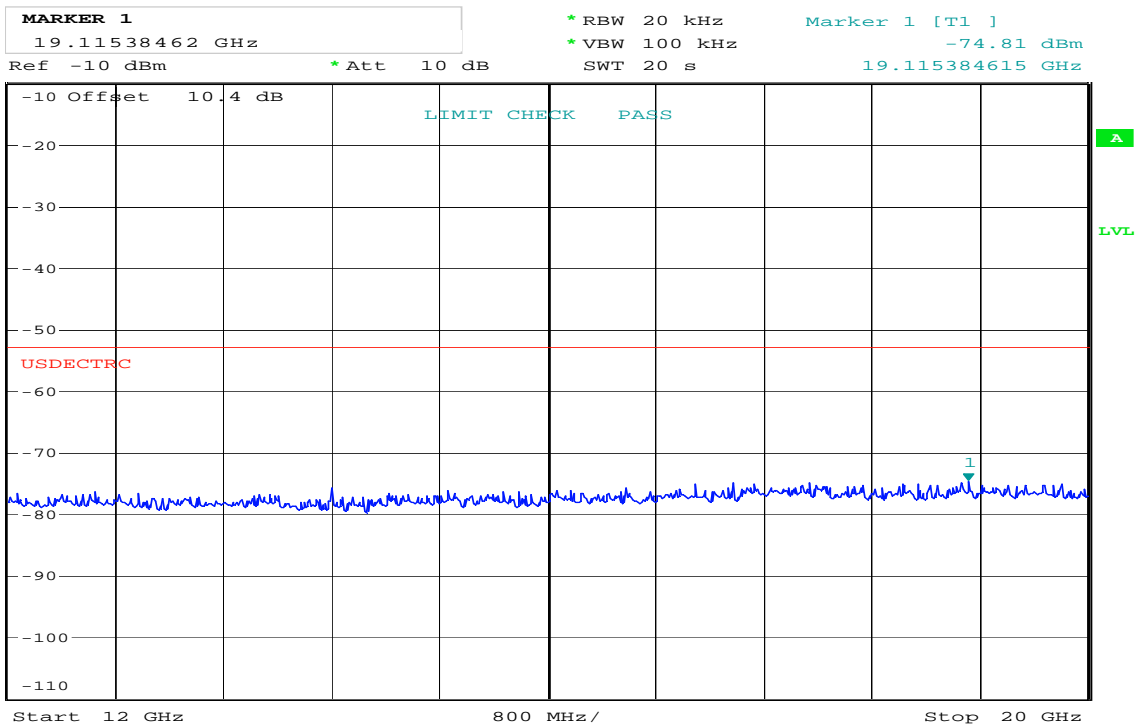
Date: 8.NOV.2011 09:56:47

Receiver Emissions 1000 -3000 MHz



Date: 8.NOV.2011 09:59:10

Receiver Emissions 3000 -12000 MHz

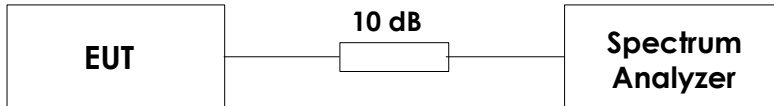


Date: 8.NOV.2011 10:00:33

Receiver Emissions 12000 -20000 MHz

5 Test Setups

5.1 Conducted Emission Test



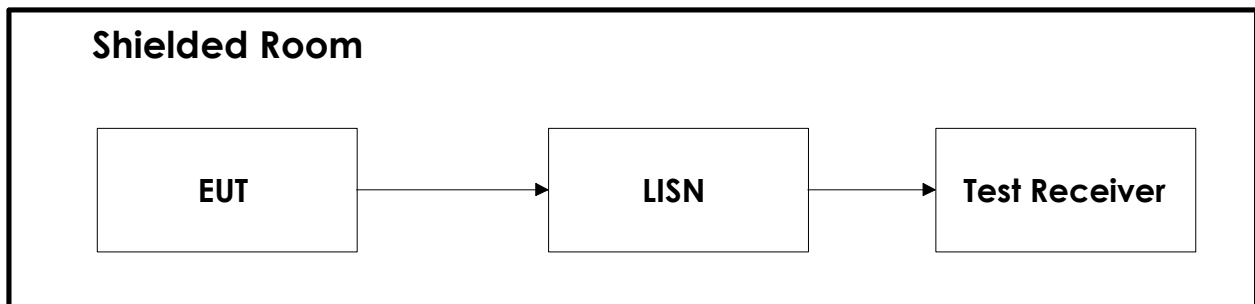
Test equipment included: 1, 3, 6, 7, 9

Test Set-up 3

This setup is used for all conducted emission tests.

The EUT was programmed to transmit continuously on a selected carrier and slot during this test.

5.2 Power Line Conducted Emissions Test



Test equipment: 2, 4, 5, 6, 8

Test Set-Up 5

6 Test Equipment Used

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test house.

| No. | Model number | Description | Manufacturer | Ref. no. | Cal. Date | Cal. Due |
|-----|--------------|--------------------|-----------------|----------|------------|------------|
| 1 | FSU26 | Spectrum Analyzer | Rohde & Schwarz | LR 1504 | 2011.11.03 | 2013.11.03 |
| 2 | ESHS10 | Measuring Receiver | Rohde & Schwarz | N- 3528 | 2011-06 | 2012-06 |
| 3 | 6810.17B | Attenuator | Suhner | LR 1212 | 2010.09.15 | 2012.09.15 |
| 4 | ESH3-Z5 | Two Line V-Network | Rohde & Schwarz | LR 1076 | 2011.11.03 | 2013.11.03 |
| 5 | 80S | Signal Generator | Powertron | LT 502 | Cal b4 use | |
| 6 | Model 87 V | Multimeter | Fluke | LR 1600 | 2010.12.15 | 2012.12.15 |
| 7 | U2000A | USB Power Sensor | Agilent | LR 1523 | 2011.03.26 | 2012.03.26 |
| 8 | ESH3-Z2 | Pulse Limiter | Rohde & Schwarz | N-3932 | 2010.11.04 | 2012.11.04 |
| 9 | Model 7200 | Signal generator | Gigatronics | LR 1188 | 2010.11.02 | 2012.11.02 |