

Test Site:
FCC Test Site No.:
IC OATS No.:

96997
IC3475A-1



ECL-TAL Test Report No.: 09-196

Equipment under test:

ION-M4/8 19"

FCC ID:

XS5- IONM4819I

Type of test:

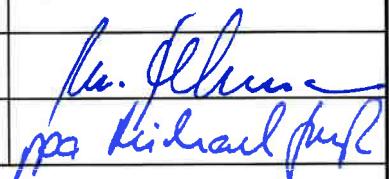
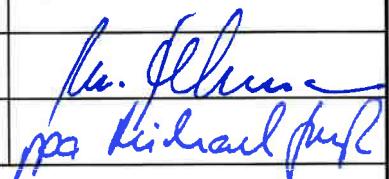
FCC 47 CFR Part 90 Subpart I
Private Land Mobile Repeater

Measurement Procedures:

ANSI C63.4 (2009)
ANSI/TIA 603-C-2004

Test result:

Passed

| | | | | |
|-------------------|----------------------|----------|--|---|
| Date of issue: | 08.12.09 | | | Signature: |
| Issue-No.: | 04 | Author: | M. Lehmann Test engineer |  |
| Date of delivery: | 24.11.09 | Checked: | M. Grytz Operational manager |  |
| Test dates: | 24.11. – 09.12.09 | | | |
| Pages: | 37 | | | |



Manufacturer: ANDREW Wireless Systems GmbH
Industriering 10

D-86675 Buchdorf

Tel.: +49 (0)9099 69 0
Fax: +49 (0)9099 69 140

Test Location: HERBERG Service Plus GmbH
European Compliance Laboratory (ECL)

Nordostpark 51
D-90411 Nürnberg
Tel.: +49 0911 59835 923
Fax: +49 0911 59835 90

General:

The purpose of this report is to show compliance to the FCC regulations for unlicensed devices operating under section 15.249 of the Code of Federal Regulations title 47.
This report informs about the results of the EMC tests, it only refers to the equipment under test. No part of this report may be reproduced in any form, without written permission.



Table of contents

| | | |
|---------|---|----|
| 1 | TEST RESULTS SUMMARY | 5 |
| 2 | EQUIPMENT UNDER TEST (E.U.T.) | 6 |
| 2.1 | DESCRIPTION | 6 |
| 2.1.1 | DLINK | 6 |
| 2.1.2 | UPLINK | 6 |
| 2.1.3 | DESCRIPTION OF EUT | 7 |
| 2.1.4 | SYSTEM DIAGRAMS | 7 |
| 2.1.5 | BLOCK DIAGRAM OF MEASUREMENT REFERENCE POINTS | 8 |
| 3 | TEST SITE | 9 |
| 3.1 | TEST ENVIRONMENT | 9 |
| 3.2 | TEST EQUIPMENT | 9 |
| 3.3 | INPUT AND OUTPUT LOSSES | 9 |
| 4 | RF POWER OUT: §90.635, §2.1046 | 10 |
| 4.1 | LIMIT | 10 |
| 4.2 | TEST METHOD | 10 |
| 4.3 | TEST RESULTS | 10 |
| 4.3.1 | DLINK | 11 |
| 4.3.1.1 | Analog | 12 |
| 4.3.1.2 | iDEN | 14 |
| 4.3.2 | UPLINK | 15 |
| 4.4 | SUMMARY TEST RESULT | 15 |
| 5 | OCCUPIED BANDWIDTH: §90.210, §2.1049 | 16 |
| 5.1 | LIMIT | 16 |
| 5.2 | TEST METHOD | 16 |
| 5.3 | TEST RESULTS | 16 |
| 5.3.1 | DLINK | 17 |
| 5.3.1.1 | Analog | 17 |
| 5.3.1.2 | iDEN | 18 |
| 5.3.2 | UPLINK | 19 |
| 5.4 | SUMMARY TEST RESULT | 19 |
| 6 | SPURIOUS EMISSIONS AT ANTENNA TERMINALS: §90.210, §2.1051 | 20 |
| 6.1 | LIMIT | 20 |
| 6.2 | TEST METHOD | 20 |
| 6.3 | TEST RESULTS | 21 |
| 6.3.1 | DLINK | 22 |
| 6.3.1.1 | Analog < 1MHz to band edge | 22 |
| 6.3.1.2 | iDEN < 1MHz to band edge | 24 |
| 6.3.1.3 | Analog > 1MHz to band edge | 25 |



| | |
|---|----|
| 6.3.1.4 iDEN > 1MHz to band edge..... | 28 |
| 6.3.2 UPLINK | 31 |
| 6.4 SUMMARY TEST RESULT..... | 31 |
| 7 RADIATED SPURIOUS EMISSIONS AT THE ECL: §90.210, §2.1053 | 32 |
| 7.1 EMISSION MASK LIMITS..... | 32 |
| 7.2 TEST METHOD | 32 |
| 7.3 TEST RESULTS..... | 33 |
| 7.3.1 SPURIOUS EMISSION WITHIN THE BAND 30 MHz TO 9 GHz. | 33 |
| 7.3.2 TEST DATA..... | 33 |
| 8 HISTORY..... | 34 |



1 Test Results Summary

| Name of Test | FCC Para. No. | FCC Method | FCC Spec. | Result |
|--|------------------|------------|--------------|----------|
| RF Power Output | 90.635 | 2.1046 | 1000 Watts | Complies |
| Occupied Bandwidth | 90.210 | 2.1049 | Input/Output | Complies |
| Spurious Emissions at Antenna Terminals | 90.210 | 2.1051 | Mask | Complies |
| Field Strength of Spurious Emissions | 90.210 | 2.1053 | Mask | Complies |
| Frequency Stability | 90.213 | 2.1055 | 1 ppm | NA |

Frequency stability is not applicable because the device uses a common oscillator to up convert and down convert the RF signal. The EUT does not contain modulation circuitry, or frequency generation, therefore the test was not performed.



2 Equipment under test (E.U.T.)

2.1 Description

| | | |
|-----------------------------------|---|--|
| Kind of equipment | ION M4/8 19" Repeater | |
| Andrew Ident. Number | Id.No. 7609239-0001 | |
| Serial no.(SN) | 10 | |
| Revision | 00 | |
| Software version and ID | RCM161RU19V01.00.00.09 Id.No. 7614712-00 | |
| Type of modulation and Designator | F3E (Voice) <input checked="" type="checkbox"/> | |
| | F1D <input checked="" type="checkbox"/> | |
| | F2D <input checked="" type="checkbox"/> | |
| | D7W (QAM) <input checked="" type="checkbox"/> | |
| Frequency Translation | F1-F1 <input checked="" type="checkbox"/> | |
| | F1-F2 <input type="checkbox"/> | |
| | N/A <input type="checkbox"/> | |
| Band Selection | Software <input type="checkbox"/> | |
| | Duplexer <input type="checkbox"/> | |
| | Fullband <input checked="" type="checkbox"/> | |

2.1.1 Downlink

| | |
|---|---|
| Pass band | 851MHz - 869MHz |
| Max. composite output power based on one carrier | 30 dBm = 1 W |
| If the number of carrier is doubled, the power per carrier has to be reduced by 3dB | 27dBm @ 2 carrier 24dBm @ 4 carrier 21dBm @ 8 carrier |
| Gain | -3 dB @ Pout BTS of 33dBm |

2.1.2 Uplink

| | |
|-----------|------------------|
| Pass band | 806MHz - 824 MHz |
| Gain | n.a. |

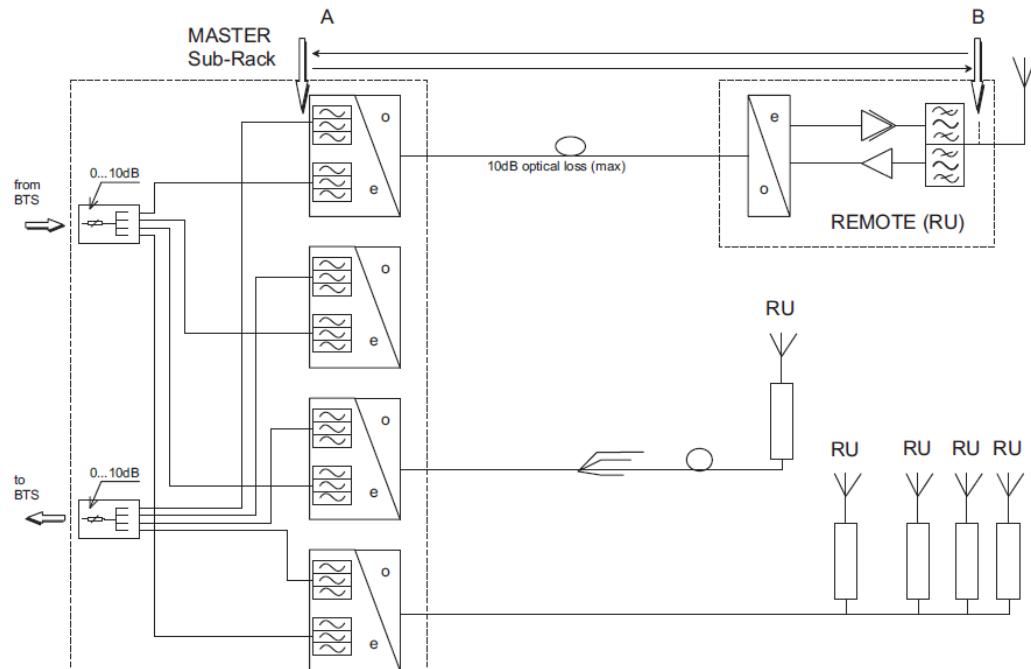
Note: The EUT does not transmit over the air in the uplink direction.

2.1.3 Description of EUT

Andrew ION-M4/8 is a multi-band, multi-operator remote unit with various extension units. It is used in conjunction with a master unit in the ION optical distribution system.

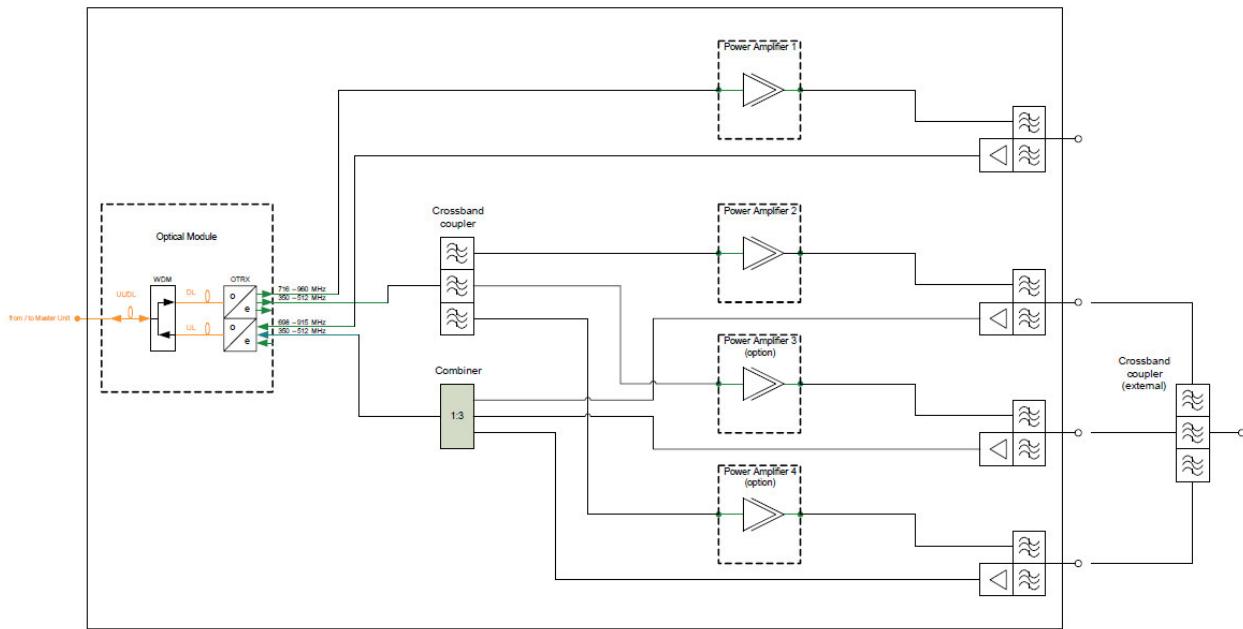
This Test Report describes only the approval of the 800 MHz Path (ION-M8).
The ION M4/8 19" Repeater consists of three 400 MHz paths and one 800 MHz path, with the intended use of simultaneous transmission

2.1.4 System diagrams



ION-M4/8 Design Principle Remote Unit

figure 2.1.4-#1 System diagrams: ION optical distribution system



Design Principle ION-M System (One Subrack)

figure 2.1.4-#2 System diagrams: EUT is Remote Unit

2.1.5 Block diagram of measurement reference points

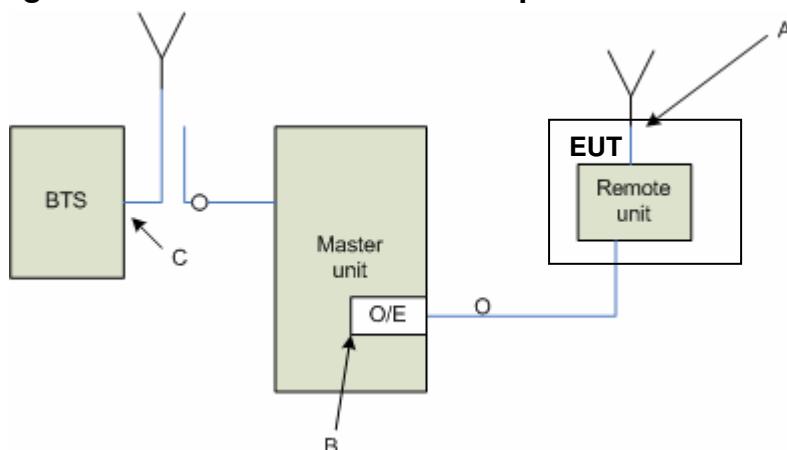


figure 2.1.5-#1 Block diagram of measurement reference points

Remote Unit is the EUT

O/E Optcal/Electrical converter

SRMU SubRackMaster Unit

Reference point A, Remote Unit DL output, UL input

Reference point B, SRMU UL output, DL input

Reference point C, BTS DL output, UL input



3 Test site

3.1 Test environment

All tests were performed under the following environmental conditions:

| Condition | Minimum value | Maximum value |
|---------------------|-----------------------|---------------|
| Barometric pressure | 86 kPa | 106 kPa |
| Temperature | 15 °C | 30 °C |
| Relative Humidity | 20 % | 75 % |
| Power supply range | ±5% of rated voltages | |

3.2 Test equipment

| ANDREW Inv. No. | Test equipment | Type | Manufacturer | Serial No. | Calibration |
|-----------------|-------------------|-------------------|----------------|------------|-------------|
| 8917 | Network Analyzer | ZVCE8 | R&S | 827712/009 | 01/10 |
| 8845 | Spectrum Analyzer | FSP13 | R&S | 100387 | 04/10 |
| 8877 | Signal Generator | E4438C | Agilent | MY42082954 | 01/10 |
| 8990 | Signal Generator | SMJ100A | R&S | 101288 | 11/10 |
| 8671 | Power Meter | E4418B | Agilent | GB39513094 | 06/10 |
| 8672 | Power Sensor | E9300H | Agilent | US41090179 | 06/10 |
| 7280 | Power Attenuator | 769-30 | Narda | 9395 | CIU |
| 7129 | Power Amplifier | 3-Band Amp | Andrew | --- | CIU |
| 7130 | Power Amplifier | 3-Band Amp | Andrew | --- | CIU |
| 7119 | Divider | 2way | Mikom | 3512 | CIU |
| 7363 | RF-Cable | 2,0m; N-N | Huber & Suhner | 28439/4PEA | CIU |
| 7295 | RF-Cable | 2,5m; N-N | Huber & Suhner | 28964/4PEA | CIU |
| 7299 | RF-Cable | 2,5m; N-N | Huber & Suhner | 28964/4PEA | CIU |
| 7364 | RF-Cable | 1,0m; SMA | Huber & Suhner | 36309/4P | CIU |
| 7365 | RF-Cable | 1,0m; SMA | Huber & Suhner | 36292/4P | CIU |
| 7366 | RF-Cable | 2,0m; SMA | Huber & Suhner | 36183/4P | CIU |
| 7367 | RF-Cable | 2,0m; SMA | Huber & Suhner | 36158/4P | CIU |
| 7373 | RF-Cable | Multiflex141 0,6m | Andrew | --- | CIU |
| 7374 | RF-Cable | Multiflex141 0,6m | Andrew | --- | CIU |

CIU = Calibrate in use

3.3 Input and output losses

All recorded power levels should be referenced to the input and output connectors of the repeater, unless explicitly stated otherwise.

The test equipment used in this test has to be calibrated, so that the functionality is also checked.

All cables, attenuators, splitter, isolator, circulator and combiner etc. must be measured before testing and used for compensation during testing.



4 RF Power Out: §90.635, §2.1046

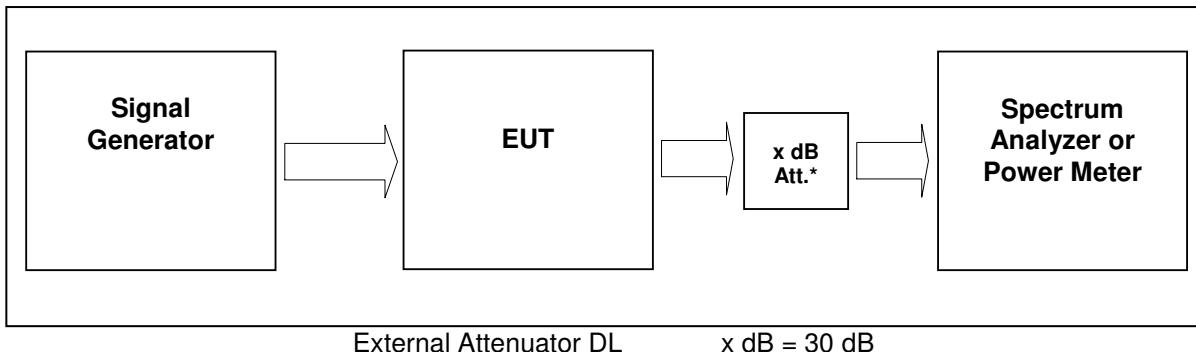


figure 3.3-#1 Test setup: RF Power Out: §90.635, §2.1046

| | |
|-------------------------|---|
| Measurement uncertainty | $\pm 0,38 \text{ dB}$ |
| Test equipment used | 8877, 8990, 7373, 7374, 7129, 7130, 7119, 7366, 7367, 7363, 7280, 7364 |

4.1 Limit

Minimum standard:

Para. No. 90.635 Limitations on power and antenna height.

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

4.2 Test method

§ 2.1046 Measurements required: RF power output.

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations

4.3 Test results

For peak power measurements: Detector peak max.

For average power measurements: Detector RMS.

Test signal Analog:

FM signal with 3.0 kHz deviation and 2.5 kHz rate and sine waveform



Test signal iDEN:

Signal waveform according to Motorola iden Technical Overview 68P81095E55-E

According to ANSI C63.4 section 13.1 Table 5 for operating frequencies more then 10MHz: The test shall be performed at Bottom, Middle, Top frequencies.

4.3.1 Downlink

| Modulation | Measured at | | RBW VBW Span | Average Power (dBm) | RF Power (W) | Plot - | |
|---|-------------|--------------|-----------------------|---------------------|--------------|------------|--|
| Analog | Bottom | 851,0125 MHz | 1kHz 3kHz 50kHz | 29,9 | 0,98 | 4.3.1.1 #1 | |
| | Bottom | 851,0125 MHz | | 30,2 | 1,05 | #2 | |
| | Middle | 860,0 MHz | | | | | |
| | Middle | 860,0 MHz | | | | | |
| | Top | 868,9875 MHz | | 29,7 | 0,93 | #3 | |
| | Top | 868,9875 MHz | | | | | |
| iDEN | Bottom | 851,0125 MHz | 1kHz 3kHz 50kHz | 29,9 | 0,98 | 4.3.1.2 #1 | |
| | Bottom | 851,0125 MHz | | 30,2 | 1,05 | #2 | |
| | Middle | 860,0 MHz | | | | | |
| | Middle | 860,0 MHz | | | | | |
| | Top | 868,9875 MHz | | 29,8 | 0,95 | #3 | |
| | Top | 868,9875 MHz | | | | | |
| Maximum output power = 30,2 dBm = 1,05 W | | | | | | | |
| Limit Maximum output power = 1000 W = 60dBm | | | | | | | |

table 4.3.1-#1 RF Power Out: §90.635, §2.1046 Test results Downlink

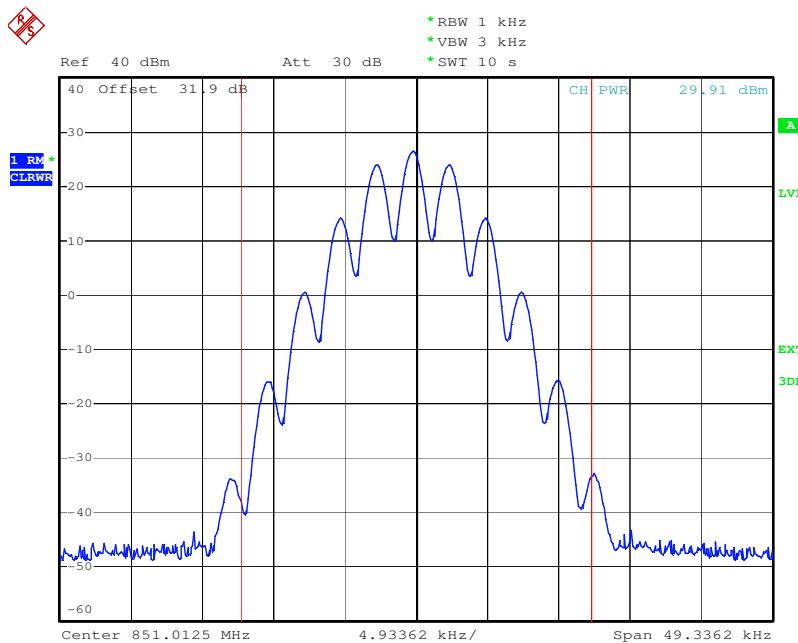
| Modulation | Pin / dBm (Ref. point B) |
|------------|-----------------------------|
| Analog | -5,0 |
| iDEN | -5,1 |

table 4.3.1-#2 RF Power Out: §90.635, §2.1046 Test results Downlink Input power



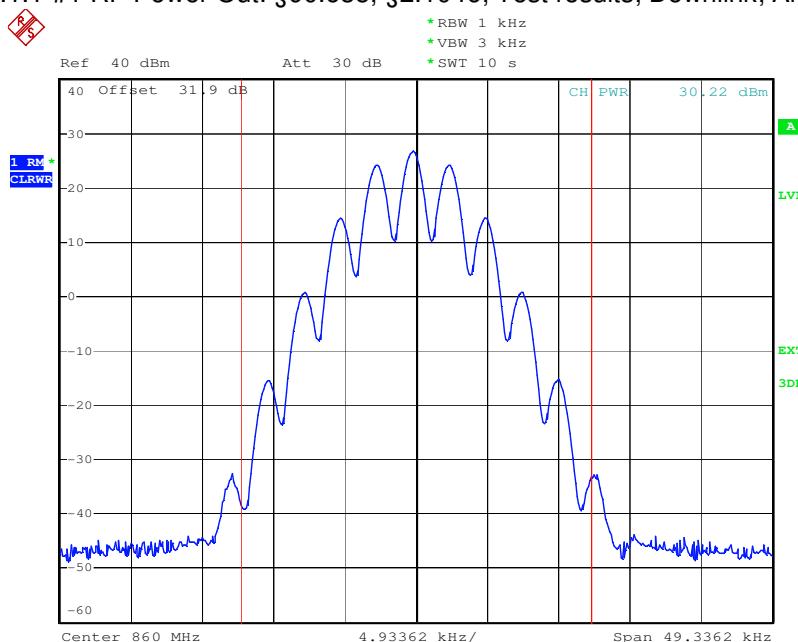
4.3.1.1 Analog

Limit 60 dBm



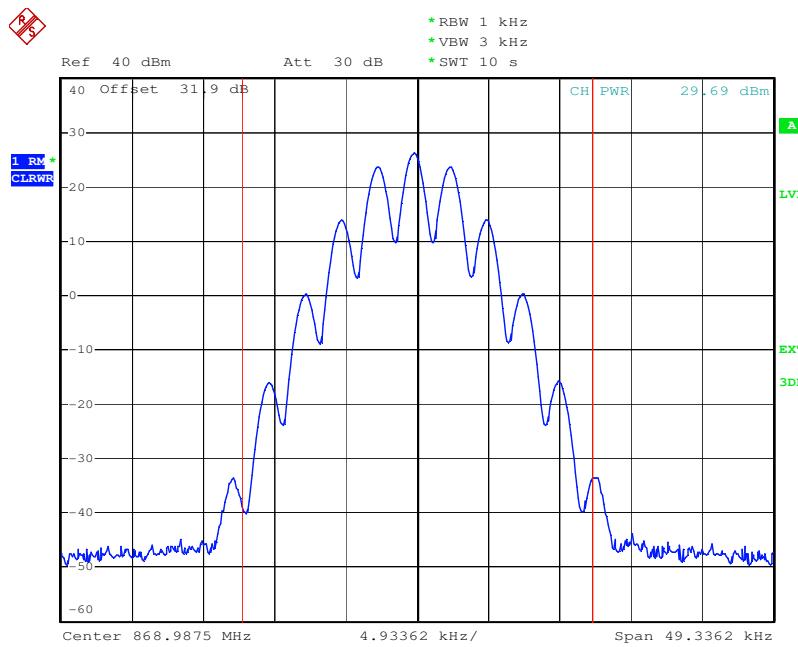
Date: 18.NOV.2009 10:36:30

plot 4.3.1.1-#1 RF Power Out: §90.635, §2.1046; Test results; Downlink; Analog Bottom RMS



Date: 18.NOV.2009 10:31:33

plot 4.3.1.1-#2 RF Power Out: §90.635, §2.1046; Test results; Downlink; Analog Middle RMS



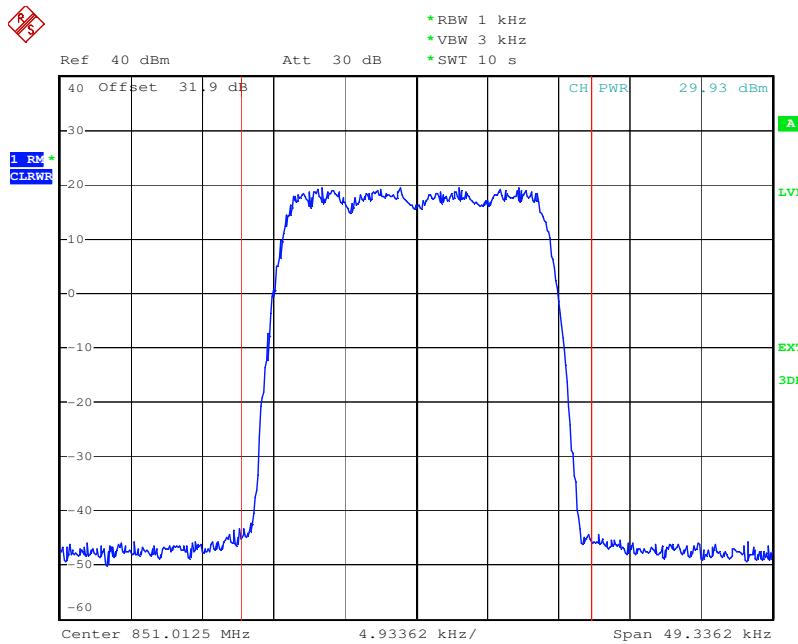
Date: 18.NOV.2009 10:41:04

plot 4.3.1.1-#3 RF Power Out: §90.635, §2.1046; Test results; Downlink; Analog Top RMS



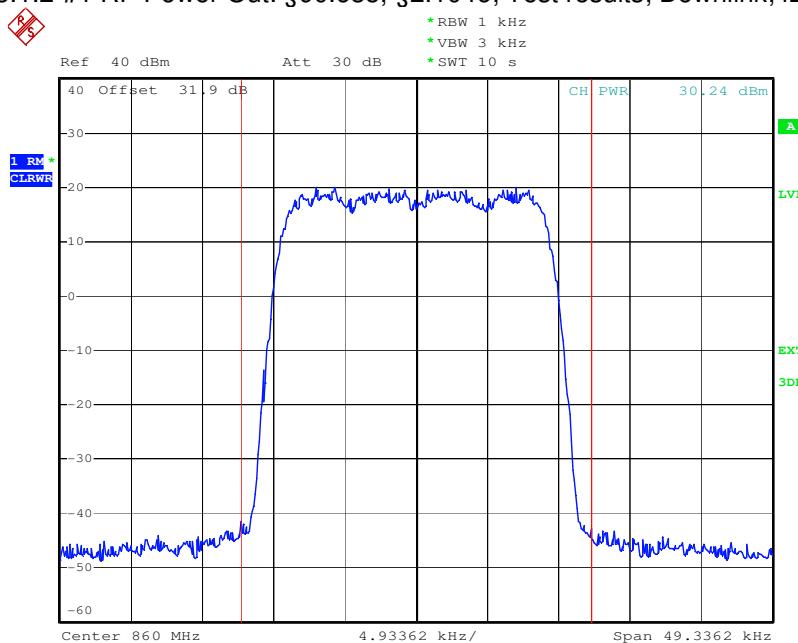
4.3.1.2 iDEN

Limit 60 dBm



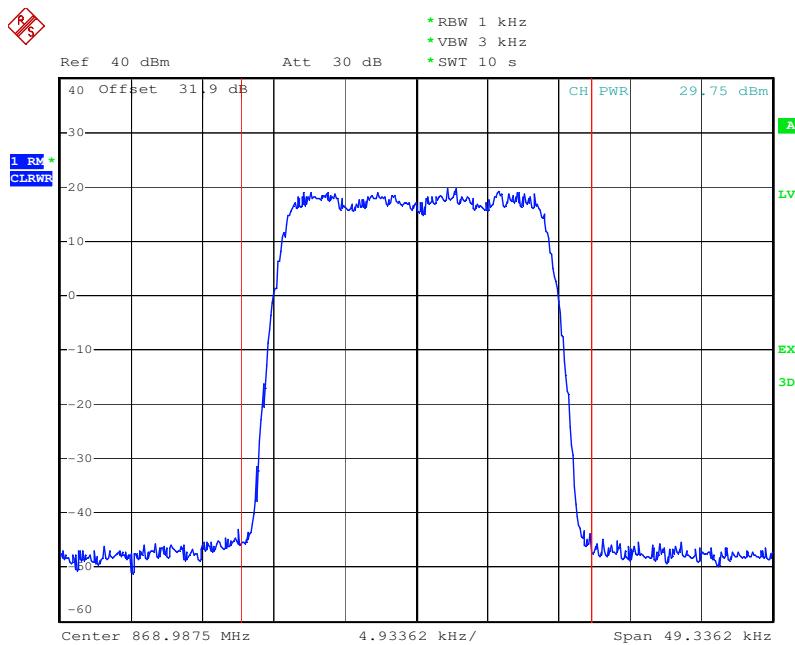
Date: 18.NOV.2009 10:37:54

plot 4.3.1.2-#1 RF Power Out: §90.635, §2.1046; Test results; Downlink; iDEN Bottom RMS



Date: 18.NOV.2009 10:04:15

plot 4.3.1.2-#2 RF Power Out: §90.635, §2.1046; Test results; Downlink; iDEN Middle RMS



Date: 18.NOV.2009 10:39:46

plot 4.3.1.2-#3 RF Power Out: §90.635, §2.1046; Test results; Downlink; iDEN Top RMS

4.3.2 Uplink

n.a.

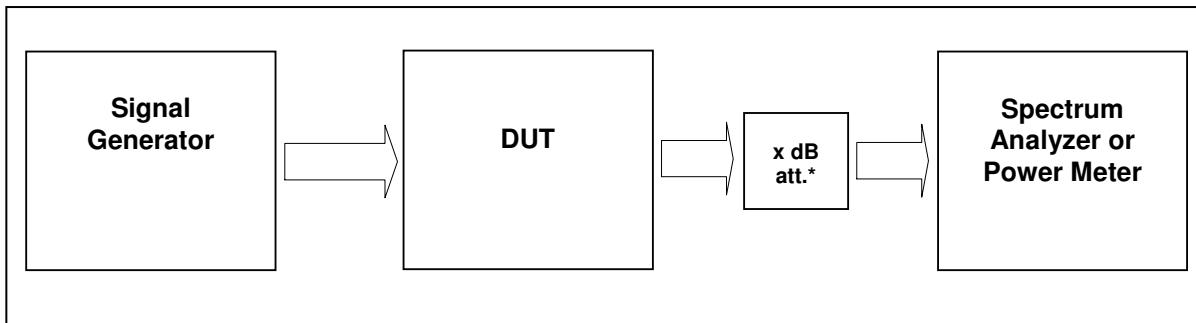
Note: The EUT does not transmit over the air in the uplink direction.

4.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Michael Leinfelder |
| Date: | 18.11.2009 |



5 Occupied Bandwidth: §90.210, §2.1049



External Attenuator DL $x \text{ dB} = 30 \text{ dB}$
 figure 4.4-#1 Test setup: Occupied Bandwidth: §90.210, §2.1049

| | |
|-------------------------|---|
| Measurement uncertainty | $\pm 0,38 \text{ dB}$ |
| Test equipment used | 8877, 8990, 7373, 7374, 7129, 7130, 7119, 7366, 7367, 7363, 7280, 7364 |

5.1 Limit

The spectral shape of the output should look similar to input for all modulations.

5.2 Test method

Para. No.2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

5.3 Test results

For average power measurements: Detector RMS

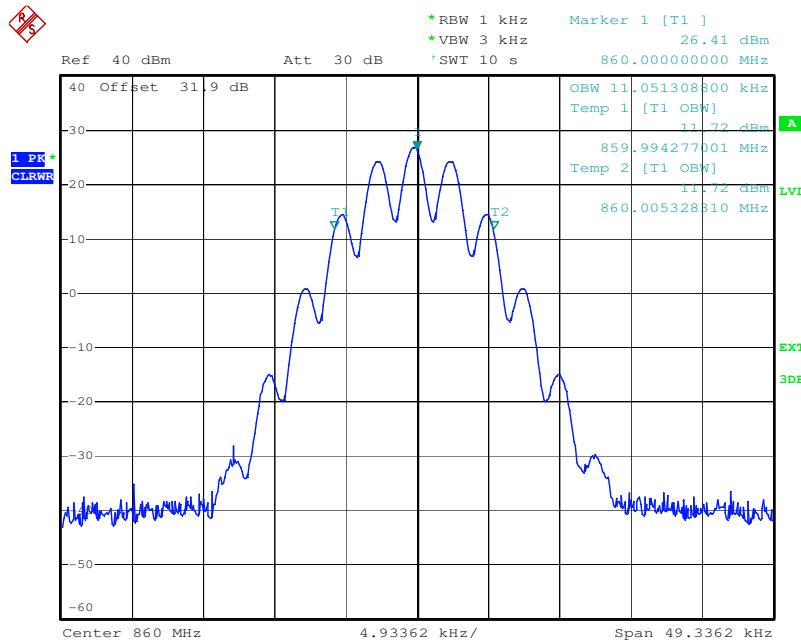
| Modulation | Link | Measured at | | RBW VBW Span | Occupied Bandwidth / kHz | Plot # |
|------------|----------|-------------|-----------|-----------------------|--------------------------|-------------------|
| Analog | Downlink | Middle | 860,0 MHz | 1kHz 3kHz 50kHz | 11,05 | 5.3.1.1 #1, #2 |
| iDEN | Downlink | Middle | 860,0 MHz | 1kHz 3kHz 50kHz | 18,16 | 5.3.1.2 #1, #2 |
| Analog | Uplink | n.a. | | | | |
| iDEN | Uplink | n.a. | | | | |

table 5.3-#1 Occupied Bandwidth: §90.210, §2.1049 Test results



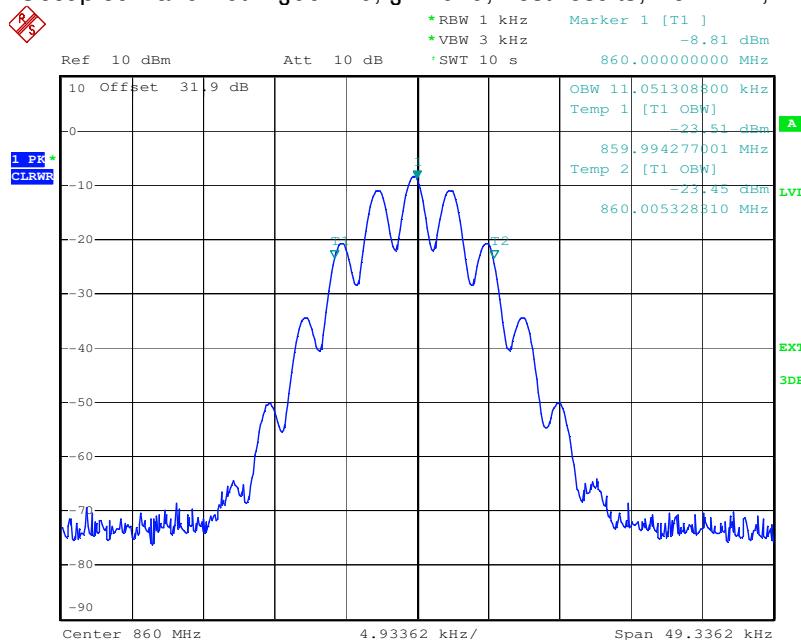
5.3.1 Downlink

5.3.1.1 Analog



Date: 18.NOV.2009 10:52:35

plot 5.3.1.1-#1 Occupied Bandwidth: §90.210, §2.1049; Test results; Downlink; Analog Output

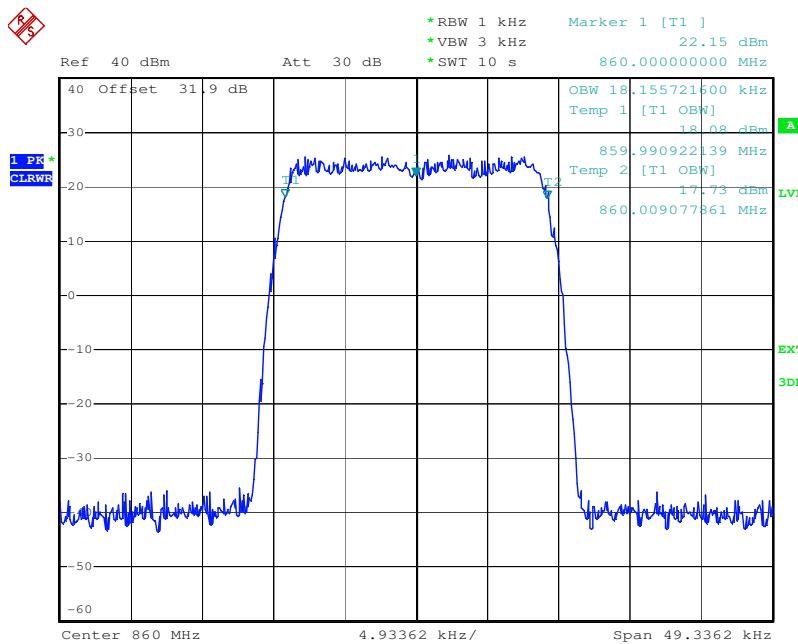


Date: 18.NOV.2009 10:53:28

plot 5.3.1.1-#2 Occupied Bandwidth: §90.210, §2.1049; Test results; Downlink; Analog Input

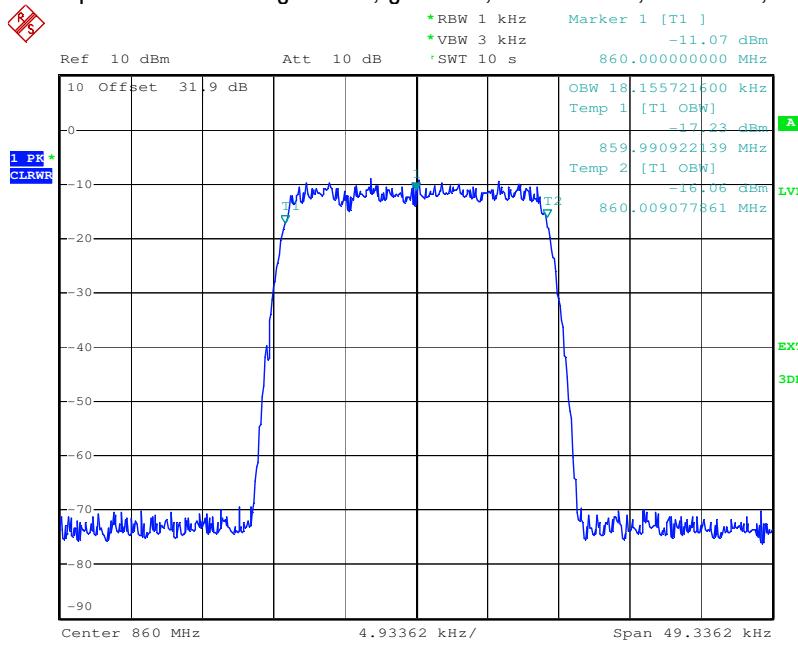


5.3.1.2 iDEN



Date: 18.NOV.2009 10:49:53

plot 5.3.1.2-#1 Occupied Bandwidth: §90.210, §2.1049; Test results; Downlink; iDEN Output



Date: 18.NOV.2009 10:51:15

plot 5.3.1.2-#2 Occupied Bandwidth: §90.210, §2.1049; Test results; Downlink; iDEN Input



5.3.2 Uplink

n.a.

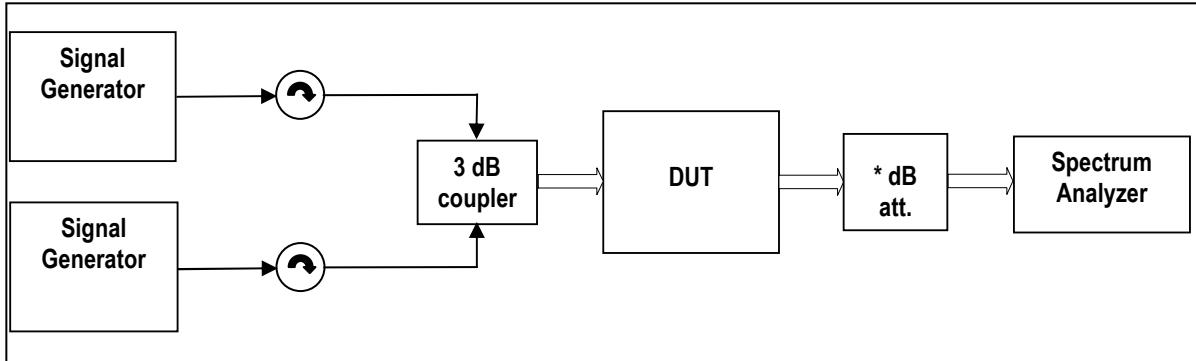
Note: The EUT does not transmit over the air in the uplink direction.

5.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Michael Leinfelder |
| Date: | 18.11.2009 |



6 Spurious Emissions at Antenna Terminals: §90.210, §2.1051



External Attenuator DL $x \text{ dB} = 20 \text{ dB}$

figure 5.4-#1 Test setup: Spurious Emissions at Antenna Terminals: §90.210, §2.1051

| | | |
|-------------------------|---|---|
| Measurement uncertainty | $\pm 0,54 \text{ dB}$ $\pm 1,2 \text{ dB}$ $\pm 1,5 \text{ dB}$ | 9 kHz to 3 GHz 3 GHz to 7 GHz 7 GHz to 26 GHz |
| Test equipment used | 8877, 8990, 7373, 7374, 7129, 7130, 7119, 7366, 7367, 7363, 7280, 7364 | |

6.1 Limit

Minimum standard: §90.210, Table "Application Emission Mask"

| Frequency Band (MHz) | Mask for equipment with Audio Low pass filter | Mask for Equipment without audio low pass filter |
|------------------------------|---|--|
| 806–809/851–854 | B | H |
| 809–824/854–869 ³ | B | G |

³ Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of § 90.691.

| MASK | Spurious Limit |
|-------------|----------------|
| A,B,C,G,H,I | -13dBm |

6.2 Test method

Para. No 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

[39 FR 5919, Feb. 15, 1974. Redesignated and amended at 63 FR 36599, July 7, 1998]



6.3 Test results

<1MHz from Band Edge

Detector: RMS.

| Modulation | Measured at Band Edge | | | RBW VBW Span | Max. level (dBm) | Plot - |
|------------|-----------------------|-----------|------|--------------------|---------------------|---------|
| Analog | Lower Edge | 851,1 MHz | 1kHz | -42 | #1 | 6.3.1.1 |
| | Upper Edge | 851,3 MHz | 3kHz | | #2 | |
| | | 868,7 MHz | 1MHz | | | |
| | | 868,9 MHz | | | | |
| iDEN | Lower Edge | 851,1 MHz | 1kHz | -47 | #1 | 6.3.1.2 |
| | Upper Edge | 851,3 MHz | 3kHz | | #2 | |
| | | 868,7 MHz | 1MHz | | | |
| | | 868,9 MHz | | | | |

table 6.3-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051 Test results <1MHz from Band Edge

>1MHz from Band Edge

Detector: RMS.

| Modulation | Measured at | | Max. level (dBm) | Frequency range | Plot - |
|------------|-------------|-----------|---------------------|-----------------|------------|
| Analog | Bottom | 851,1 MHz | -25 | 30MHz – 1GHz | 6.3.1.3 #1 |
| | Bottom | 851,3 MHz | | 1GHz – 22GHz | #2 |
| | Middle | 859,9 MHz | | 30MHz – 1GHz | #3 |
| | Middle | 860,1 MHz | | 1GHz – 22GHz | #4 |
| | Top | 868,7 MHz | | 30MHz – 1GHz | #5 |
| | Top | 868,9 MHz | | 1GHz – 22GHz | #6 |
| iDEN | Bottom | 851,1 MHz | -25 | 30MHz – 1GHz | 6.3.1.4 #1 |
| | Bottom | 851,3 MHz | | 1GHz – 22GHz | #2 |
| | Middle | 859,9 MHz | | 30MHz – 1GHz | #3 |
| | Middle | 860,1 MHz | | 1GHz – 22GHz | #4 |
| | Top | 868,7 MHz | | 30MHz – 1GHz | #5 |
| | Top | 868,9 MHz | | 1GHz – 22GHz | #6 |

table 6.3-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051 Test results

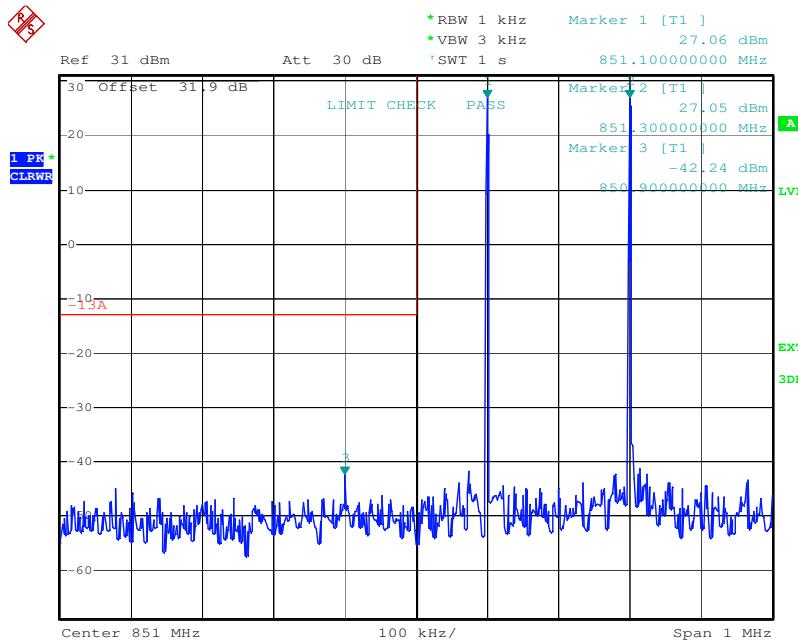
| Start | Stop | RBW | VBW |
|-------|-------|------|------|
| 30MHz | 1GHz | 1MHz | 3MHz |
| 1GHz | 10GHz | 1MHz | 3MHz |

table 6.3-#3 Spurious Emissions at Antenna Terminals: §90.210, §2.1051 Test results RBW, VBW Table



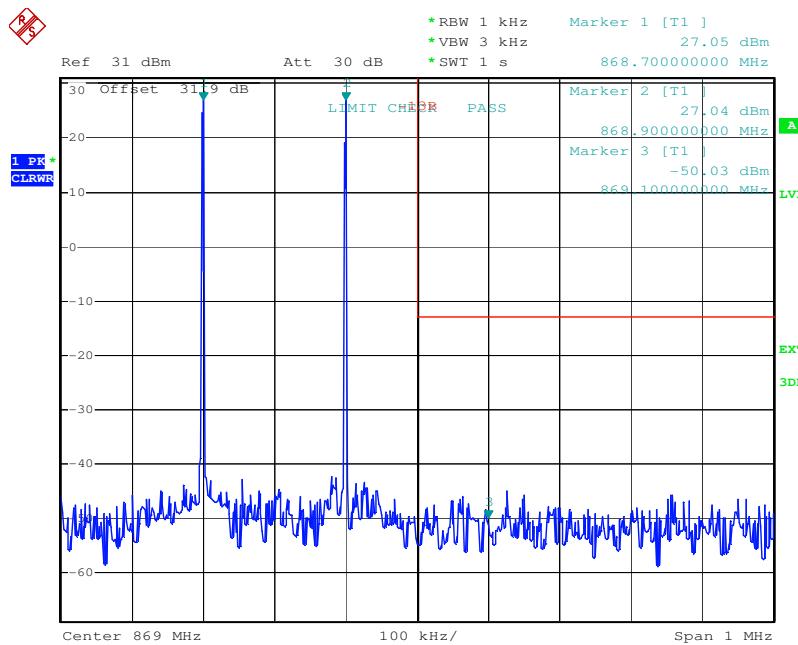
6.3.1 Downlink

6.3.1.1 Analog < 1MHz to band edge



Date: 18.NOV.2009 11:42:02

plot 6.3.1.1-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog < 1MHz to band edge Lower Band Edge

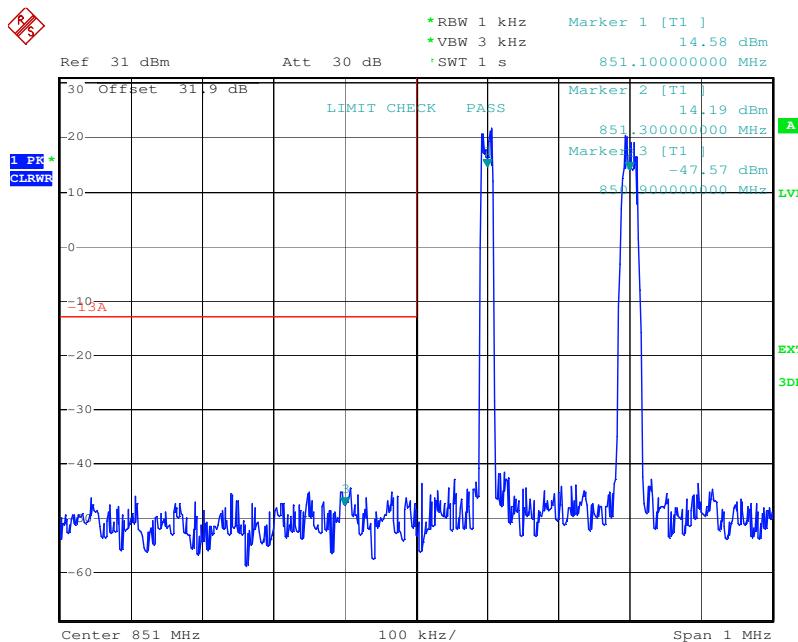


Date: 18.NOV.2009 11:46:02

plot 6.3.1.1-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog < 1MHz to band edge Upper Band Edge

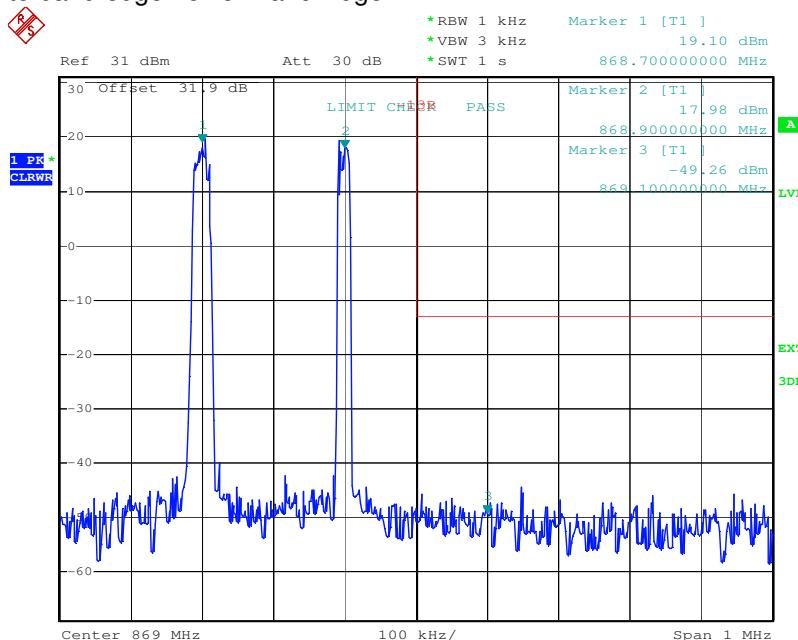


6.3.1.2 iDEN < 1MHz to band edge



Date: 18.NOV.2009 11:44:01

plot 6.3.1.2-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN < 1MHz to band edge Lower Band Edge

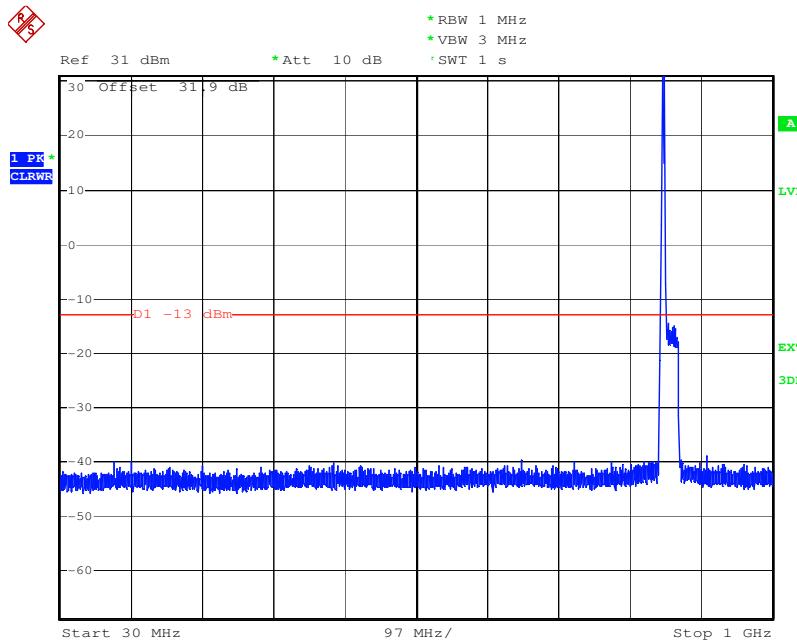


Date: 18.NOV.2009 11:46:19

plot 6.3.1.2-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN < 1MHz to band edge Upper Band Edge

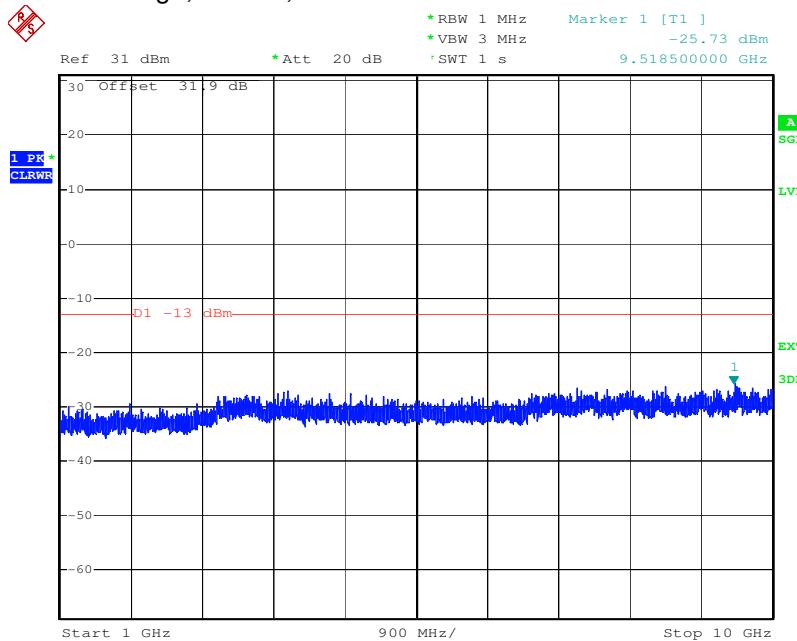


6.3.1.3 Analog > 1MHz to band edge



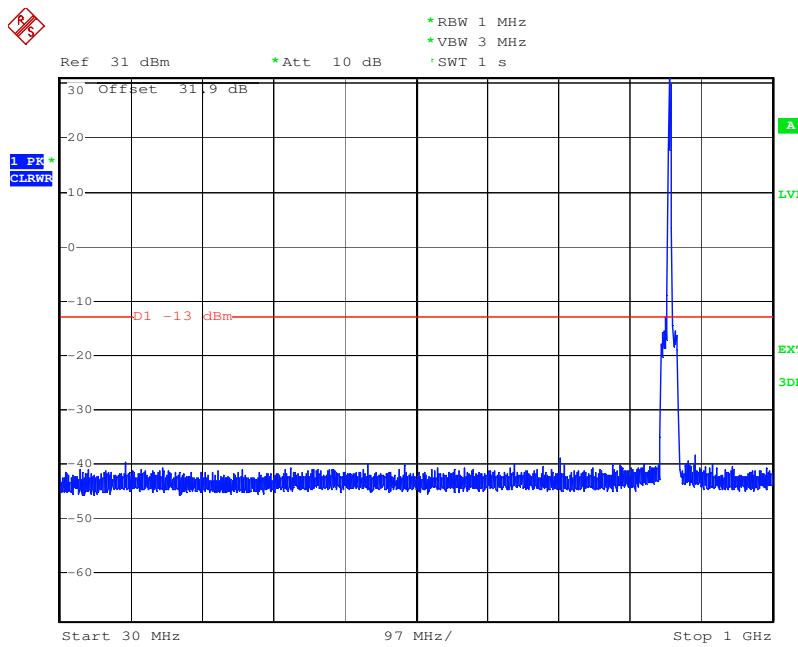
Date: 18.NOV.2009 11:53:30

plot 6.3.1.3-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Bottom; < 1 GHz



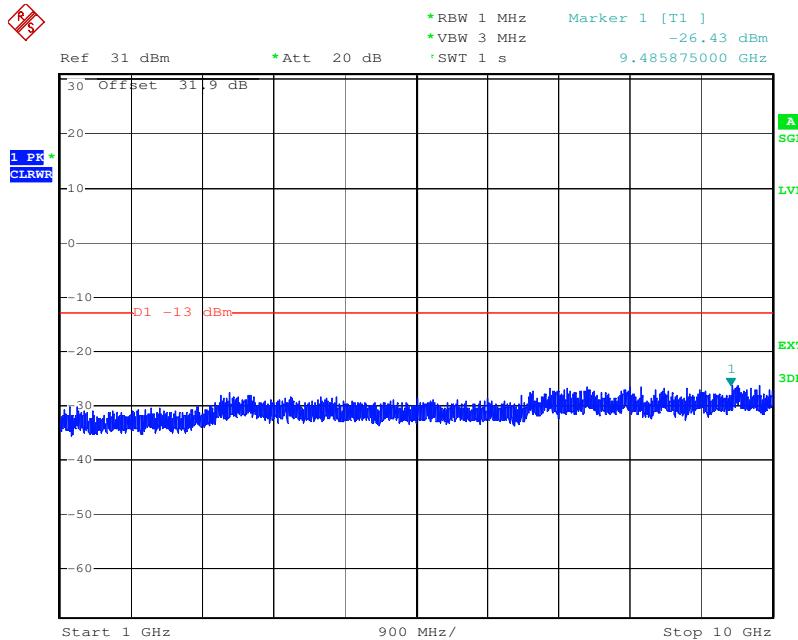
Date: 18.NOV.2009 11:52:14

plot 6.3.1.3-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Bottom; > 1 GHz



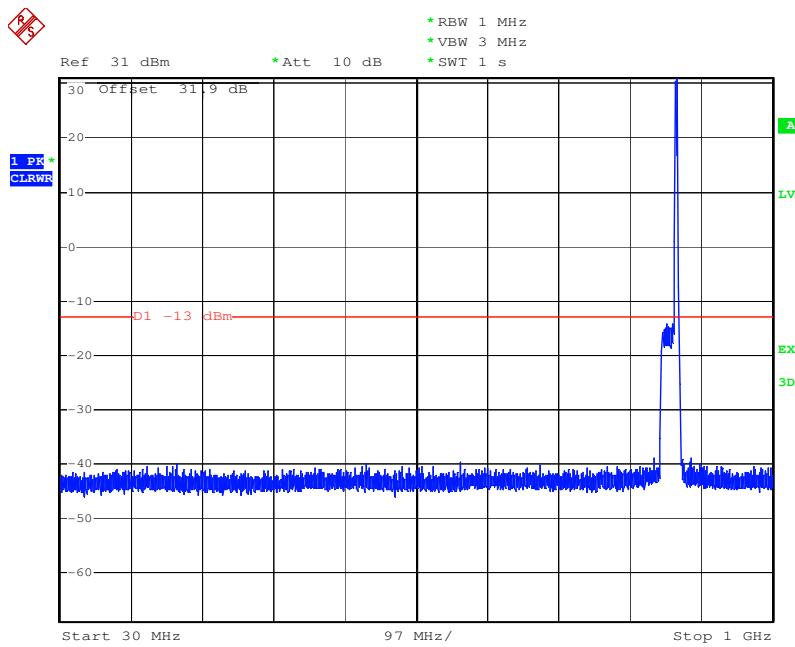
Date: 18.NOV.2009 11:54:01

plot 6.3.1.3-#3 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Middle; < 1GHz



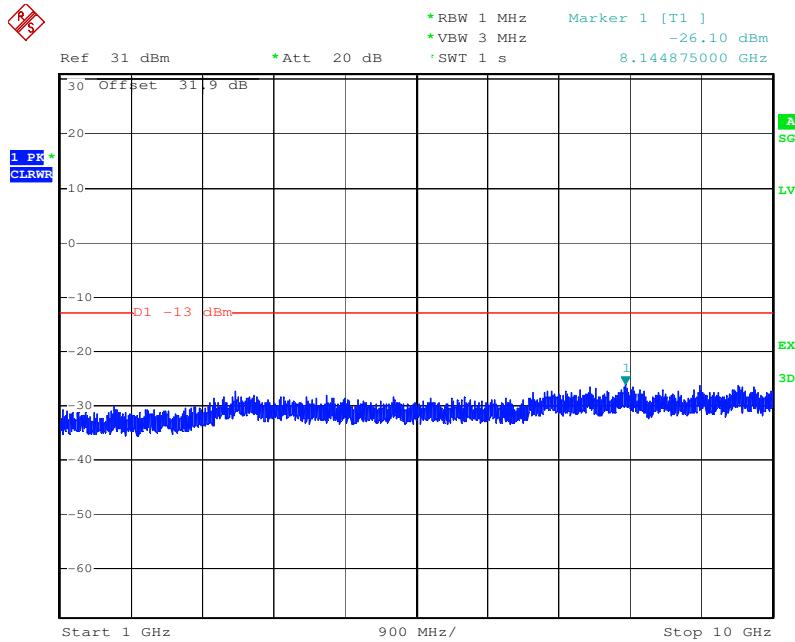
Date: 18.NOV.2009 11:55:10

plot 6.3.1.3-#4 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Middle; > 1 GHz



Date: 18.NOV.2009 11:50:17

plot 6.3.1.3-#5 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Top; < 1 GHz

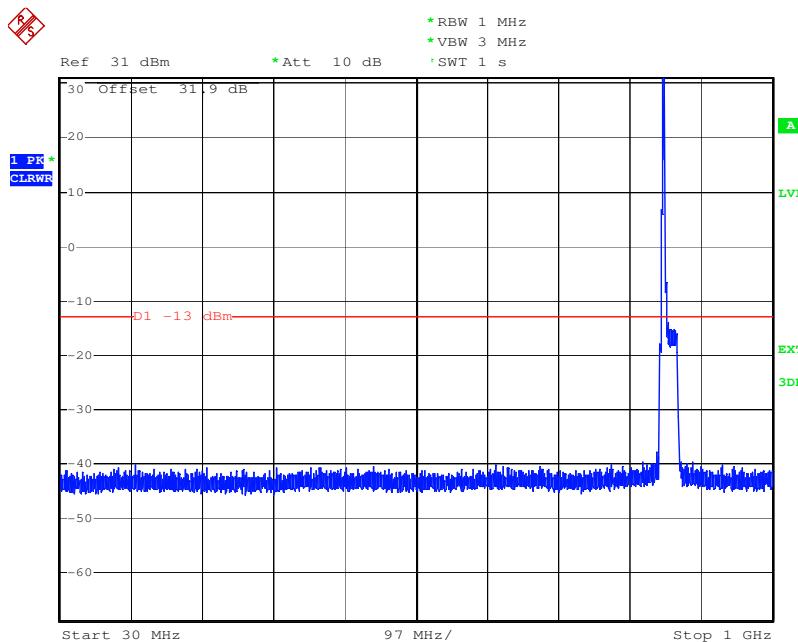


Date: 18.NOV.2009 11:51:27

plot 6.3.1.3-#6 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; Analog > 1MHz to band edge; Top; > 1 GHz

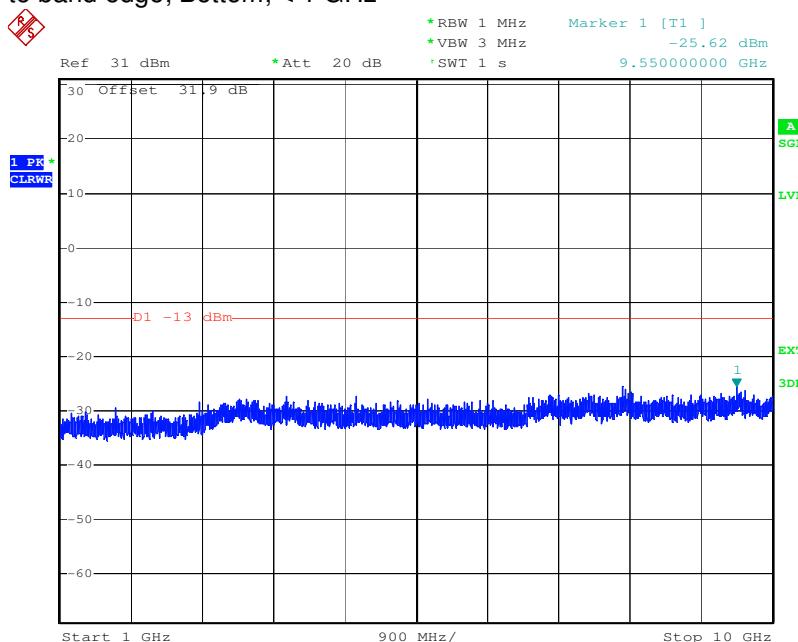


6.3.1.4 iDEN > 1MHz to band edge



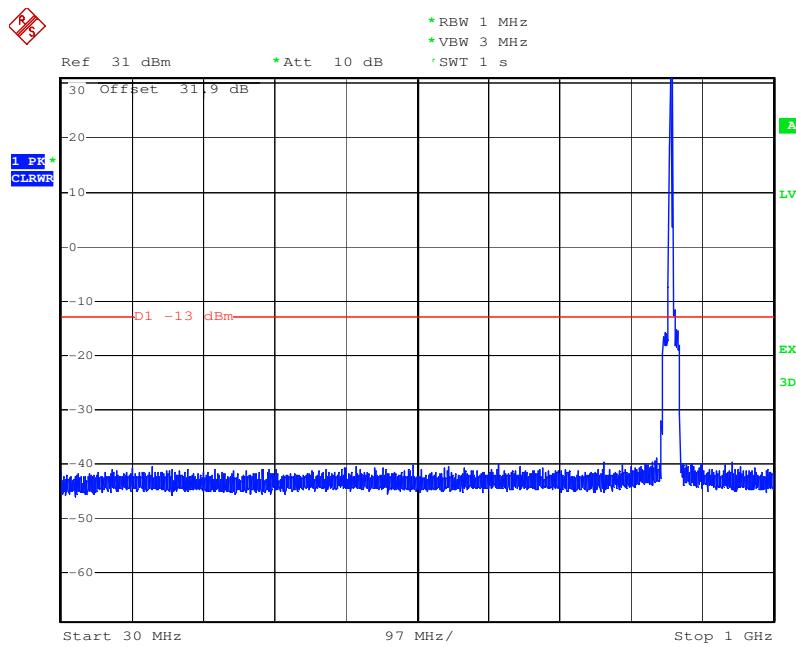
Date: 18.NOV.2009 11:53:10

plot 6.3.1.4-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Bottom; < 1 GHz



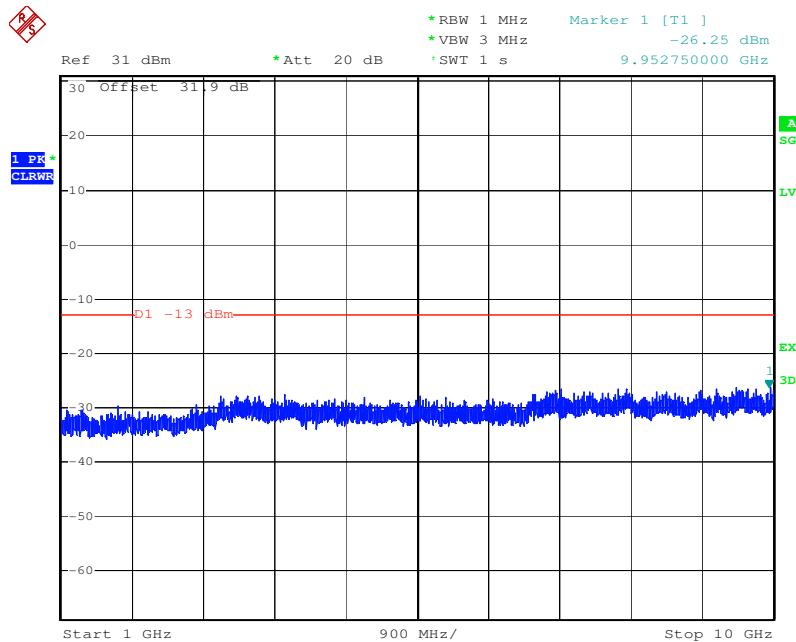
Date: 18.NOV.2009 11:52:43

plot 6.3.1.4-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Bottom; > 1 GHz



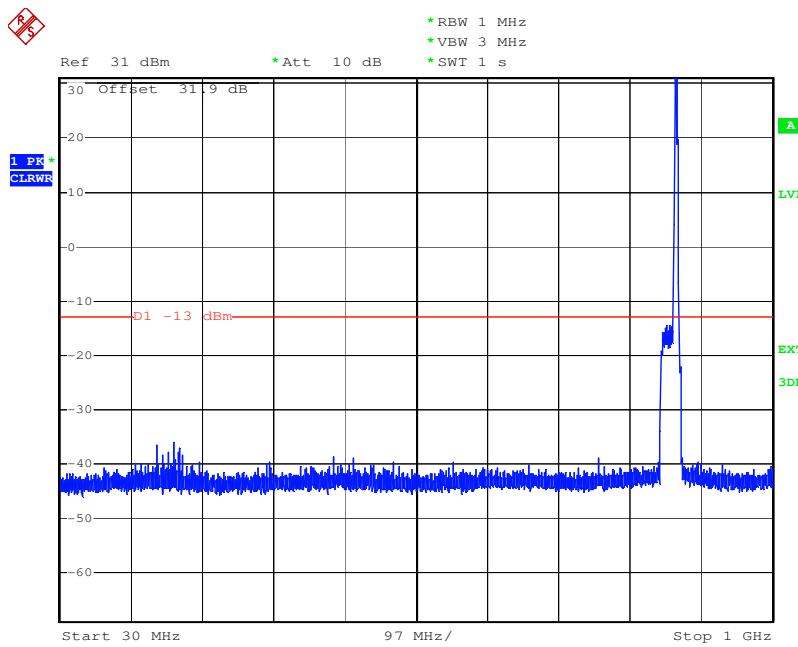
Date: 18.NOV.2009 11:54:21

plot 6.3.1.4-#3 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Middle; < 1 GHz



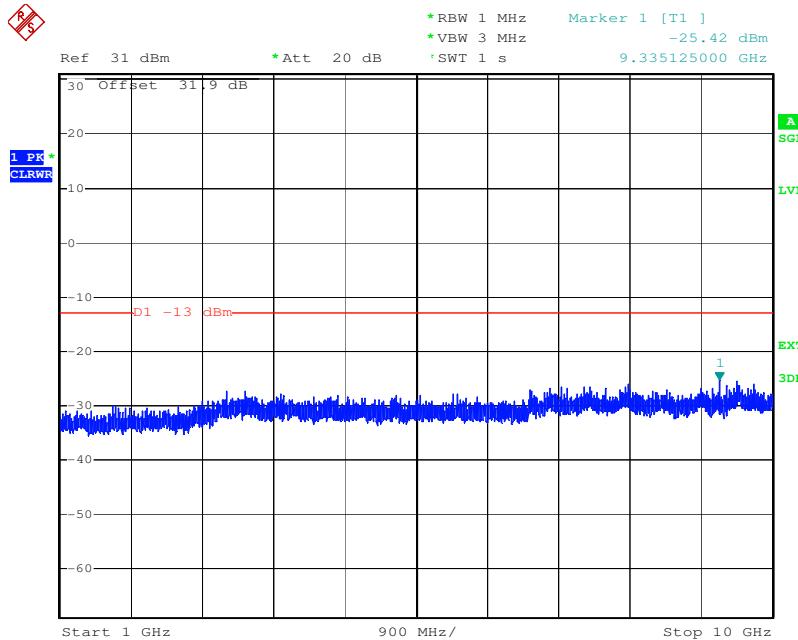
Date: 18.NOV.2009 11:54:45

plot 6.3.1.4-#4 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Middle; > 1 GHz



Date: 18.NOV.2009 11:50:35

plot 6.3.1.4-#5 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Top; < 1 GHz



Date: 18.NOV.2009 11:51:06

plot 6.3.1.4-#6 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; Test results; Downlink; iDEN > 1MHz to band edge; Top; > 1 GHz



6.3.2 Uplink

n.a.

Note: The EUT does not transmit over the air in the uplink direction.

6.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Michael Leinfelder |
| Date: | 18.11.2009 |



7 Radiated Spurious Emissions at the ECL: §90.210, §2.1053

7.1 Emission Mask Limits

| Mask | Spurious Limit |
|-------------|----------------|
| A,B,C,G,H,I | -13dBm |
| D,J | -20dBm |
| E,F,K | -25dBm |

§ 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

7.2 Test method

§ 2.1053 Measurements required: Field strength of spurious radiation .

From KDB (AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET):

Radiated spurs (enclosure) – Use of CW signal (low, mid. and high freq.) is acceptable rather than all modulations.

The maximum RFI field strength was determined during the premeasurement by rotating the turntable (± 180 degrees) and varying the height of the receive antenna ($h = 1 \dots 4$ m) as like defined in ANSI C63.4 and TIA-603. The final measurement has been performed by the substitution method as described in ANSI/TIA-603-C-2004 under sec. 2.2.12. A Peak detector has been used.

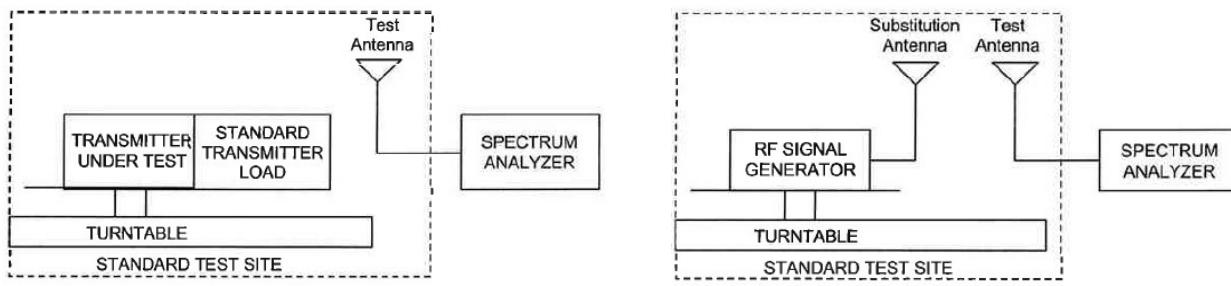


figure 8-#1 Test setup: Radiated Spurious Emissions at the ECL: §90.210, §2.1053



7.3 Test Results

7.3.1 Spurious emission within the band 30 MHz to 9 GHz.

This clause specifies requirements for the measurement of radiated emission.

| Frequency range | Distance: EUT <-> antenna | Limit | Test method | Measurement uncertainty |
|---------------------------------|---------------------------|---------------------------------------|---|-------------------------|
| 30 MHz - 1 GHz 1 GHz – 9 GHz | 10 metres 3 metres | CFR 47 Part §90.210 -13 dBm | ANSI C63.4 and ANSI TIA-603-C-2004 RBW=100kHz (< 1GHz) RBW=1MHz (>1GHz) Used detector: Peak | Max. 1.64dB |

Test equipment used:

| designation | Type | manufacurer. | invent.-no. | cal.-date | next cal.-date | used |
|-------------------|----------------|-----------------|-------------|------------|----------------|------|
| EMI test receiver | ESI40 | Rohde & Schwarz | E1607 | 04.03.2009 | 04.03.2010 | X |
| Antenna | CBL 6111 | Chase | K1149 | 14.09.2009 | 14.09.2010 | X |
| Antenna | CBL 6111 | Chase | K1026 | 14.09.2009 | 14.09.2010 | X |
| Antenna | HL025 | R & S | K809 | 06.11.2008 | 06.11.2009 | |
| Antenna | HL025 | R & S | K1114 | 04.06.2009 | 04.06.2010 | X |
| Antenna | STLP 9148-126 | Schwarzbeck | K1759 | 30.09.2009 | 30.09.2010 | X |
| Antenna | MWH-1826 / B | ARA Inc. | K1042 | 06.11.2008 | 06.11.2010 | X |
| Pre amplifier | AM1431 | Miteq | K1721 | 27.04.2009 | 27.04.2010 | X |
| Pre amplifier | AFS4-00102000 | Miteq | K817 | 11.11.2009 | 11.11.2010 | X |
| Pre amplifier | JS43-1800-4000 | Miteq | K1104 | 11.11.2009 | 11.11.2010 | X |
| RF Cable | RG214 | Frankonia | K1121 SET | 23.01.2009 | 23.01.2010 | X |
| RF Cable | Sucoflex 100 | Suhner | K1742 | 09.04.2009 | 09.04.2010 | X |

7.3.2 Test data

The spectrum was searched from 30 MHz to the tenth harmonic of the carrier. There were no emissions detected above the noise floor, which was at least 20dB below the specification limit.

24.11.2009
Leh



8 History

| Revision | Modification | Date | Name |
|----------|----------------------------------|---------------|---------------|
| 01.00 | Initial release | 17.Aug.2009 | |
| 02.00 | Test done | 18.Nov.2009 | M. Leinfelder |
| 03.00 | Radiated Spurious Emission added | 16.Dec. 2009 | M. Lehmann |
| 04.00 | Adress changed to Nordostpark 51 | 22. Dec. 2009 | M. Lehmann |

******* End of test report *******