

Test Site:
FCC Test Site No.: 96997
IC OATS No.: IC3475A-1



ECL-EMC Test Report No.: 10-207

Equipment under test: **ION-M 80-85HP/19P (850MHz Path)**
FCC ID: **XS5-ION-M8085HP**
IC ID: **IC:2237E-IONM8085HP:**

Type of test: **FCC 47 CFR Part 22 Subpart H:2009**
Cellular Radiotelephone Service
RSS-Gen:2007, RSS-131:2003
Zone Enhancers for the Land Mobile Service

Measurement Procedures: 47 CFR Parts 2:2009 (*Frequency Allocations and Radio Treaty Matters; General Rules and Regulations*), Part 22:2009 (*Cellular Radiotelephone Service*), ANSI/TIA-603-C:2004, *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*
IC-GEN:2007 General Requirements and Information for the Certification of Radio communication Equipment

Test result: **Passed**

| | | | | |
|-------------------|----------------------|----------|--|------------|
| Date of issue: | 31.08.10 | | | Signature: |
| Issue-No.: | 01 | Author: | M. Lehmann Test engineer | |
| Date of delivery: | 14.07.10 | Checked: | M. Grytz Operational manager | |
| Test dates: | 14.07. – 05.08.10 | | | |
| Pages: | 30 | | | |

Test Site:
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IC OATS No.: IC3475A-1



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General:

The purpose of this report is to show compliance to the FCC regulations for unlicensed devices operating under section 22H 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.



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1 Test Results Summary

| Name of Test | FCC Para. No. | IC Para. No. | FCC Method | FCC Spec. | Result |
|--|---------------|-------------------------|------------|----------------------|----------|
| RF Power Output | 22.913 | RSS-Gen/ ANSI C63.4: | 2.1046 | 500 Watts | Complies |
| Occupied Bandwidth | | RSS-Gen/ ANSI C63.4 | 2.1049 | Input/Output | Complies |
| Spurious Emissions at Antenna Terminals | 22.917 | RSS 131 | 2.1051 | -13dBm | Complies |
| Field Strength of Spurious Emissions | 22.917 | RSS 131 | 2.1053 | -13dBm E.I.R.P | Complies |
| Frequency Stability | n.a. | RSS 131 | 2.1055 | Must stay in band | 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 M 80-85HP 19P Repeater | |
| Andrew Ident. Number | 7620304-0001 | |
| Serial no.(SN) | 11 | |
| Revision | 00 | |
| Software version and ID | V3.19.0.4; 7162793 | |
| Type of modulation and Designator | CDMA (F9W) | <input checked="" type="checkbox"/> |
| | W-CDMA (F9W) | <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 checked="" type="checkbox"/> |
| | Full band | <input type="checkbox"/> |

2.1.1 Downlink

| | |
|----------------------------|----------------------------|
| Pass band | 869 MHz – 894 MHz |
| Maximum rated output power | 46,0 dBm = 40 W |
| Gain | 13 dB @ Pout BTS of 33 dBm |

2.1.2 Uplink

| | |
|----------------------------|-------------------|
| Pass band | 824 MHz – 849 MHz |
| Maximum rated output power | n. a. |
| Gain | n. a. |

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

2.1.3 Description of EUT

Andrew ION-M80-85HP/19P 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 850 MHz Path (ION-M85HP).
 The ION-M8085HP19P Repeater consists of one 800/850 MHz remote unit and one 1900 MHz extension unit, with the intended use of simultaneous transmission

2.1.4 System diagram of EUT

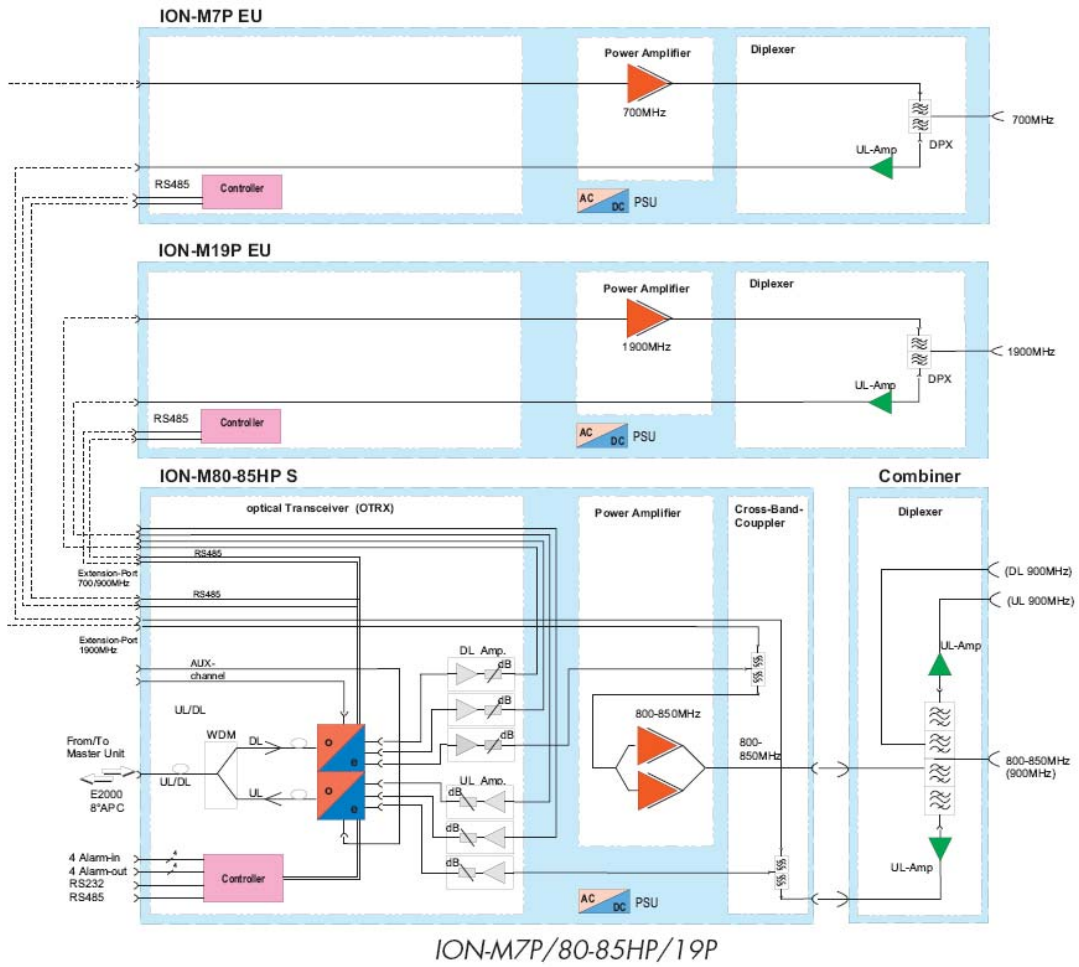


figure 2.1.4-#1 System diagram of EUT: ION optical distribution system

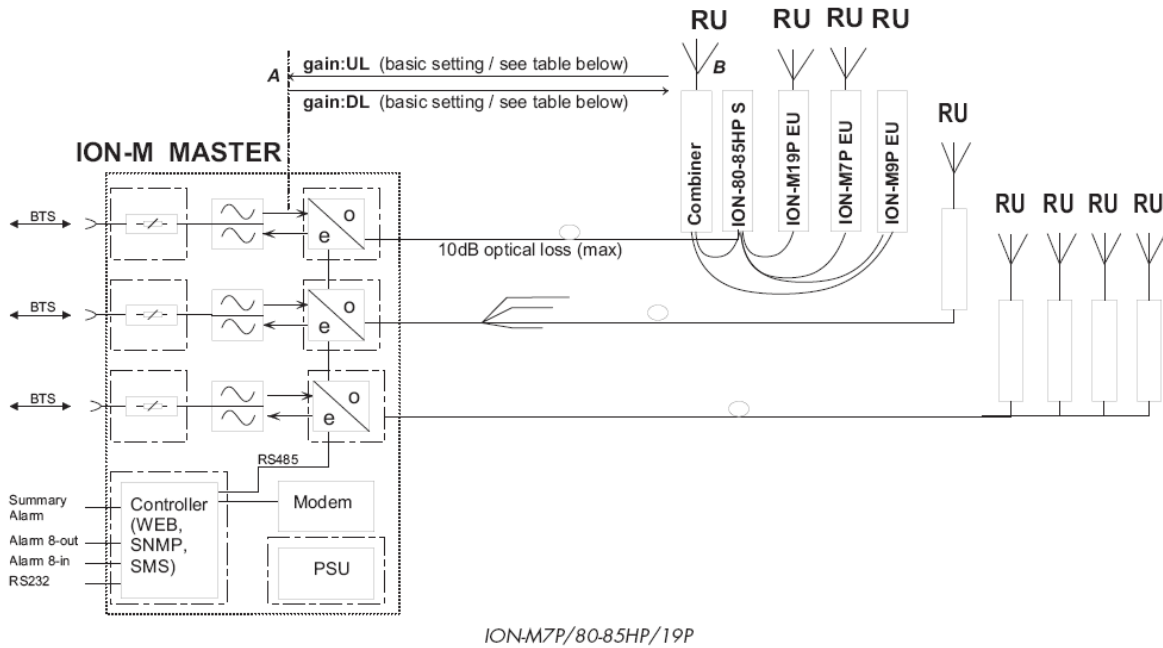


figure 2.1.4-#2 System diagram of EUT: ION-M

2.1.5 Block diagram of measurement reference points

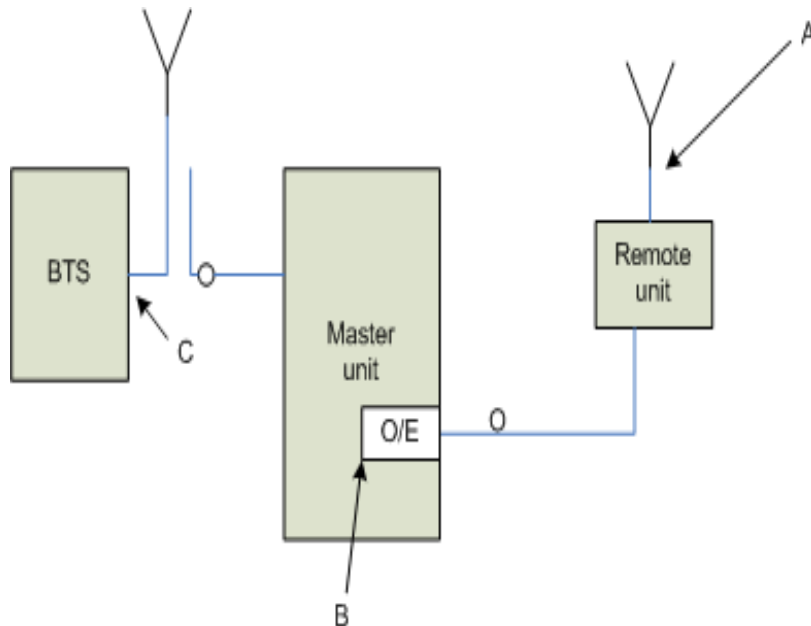


figure 2.1.5-#1 Block diagram of measurement reference points

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

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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 |
|-----------------|-------------------|-------------------|----------------|------------|-------------|
| 8961 | Spectrum Analyzer | FSP13 | R&S | 837747/023 | 10/10 |
| 8736 | Signal Analyzer | FSIQ26 | R&S | 100290 | 12/10 |
| 8984 | Signal Generator | E4438C | Agilent | MY45094089 | 11/10 |
| 8998 | Signal Generator | SMIQ06B | R&S | 100874 | 09/10 |
| 8689 | Power Meter | E4418B | Agilent | GB40203847 | 08/10 |
| 8670 | Power Sensor | E9300H | Agilent | MY41090174 | 08/10 |
| 7119 | Divider | 2way | Mikom | 3512 | CIU |
| 7323 | Circulator | E10-1FFF | AEROTEK | 25357 | CIU |
| 7315 | Circulator | E10-1FFF | AEROTEK | 25344 | 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.

3.4 Measurement uncertainty

The extended measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor $k=2$. The true value is located in the corresponding interval with a probability of 95 %.



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4 Test site (TEMPTON Service Plus GmbH)

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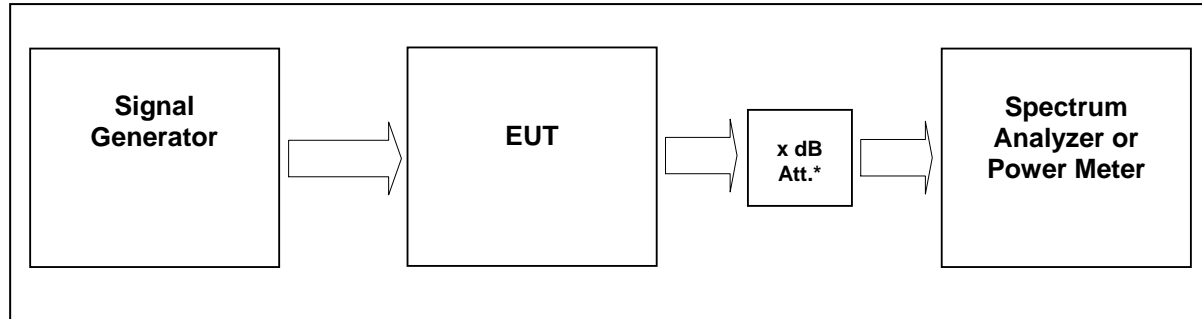
4.1 Test environment

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 | |

Measurements see section 8.

5 RF Power Out: §22.913, §2.1046



External Attenuator DL x dB = 30 dB
 figure 4.1-#1 Test setup: RF Power Out: §22.913, §2.1046

| | |
|-------------------------|------------------------------------|
| Measurement uncertainty | ± 0,38 dB |
| Test equipment used | 8984,8961,8689,8670,7363,7364,7365 |

5.1 Limit

Minimum standard:
 Para. No.22.913

The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(a) *Maximum ERP.* In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. However, for those systems operating in areas more than 72 km (45 miles) from international borders that:

(1) Are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census; or,

(2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in § 22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

5.2 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

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5.3 Test results

Detector RMS.

Test signal CDMA

Signal waveform according to table 6.2-1 of standard specification 3GPP2 C.p0051-0 v1.0

16.February 2006 pilot, sync, paging, 37 traffics, which is equal to the table 6.5.2.1 of 3GPP2 C.S0010-C v2.0 24.February 2006.

Test signal WCDMA

Signal waveform according to Test Model 1 of standard specification 3GPP TS25.141. Signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 64 DPCH.



5.3.1 Downlink

| Modulation | RBW VBW Span | Measured at f / (MHz) | | Power (dBm) | RF Power (W) | Plot - |
|---|--------------------|--------------------------|-------|-------------|-----------------|---------|
| CDMA | 3 MHz | | | | | 4.3.3.3 |
| | 10 MHz 15 MHz | Middle | 881,5 | 46,0 | 40 | #1 |
| WCDMA | 10 MHz | | | | | 4.3.3.4 |
| | 10 MHz 50 MHz | Middle | 881,5 | 46,0 | 40 | #1 |
| Maximum output power = 46,0 dBm = 46 W | | | | | | |
| Limit Maximum output power = 57 dBm = 500 W | | | | | | |

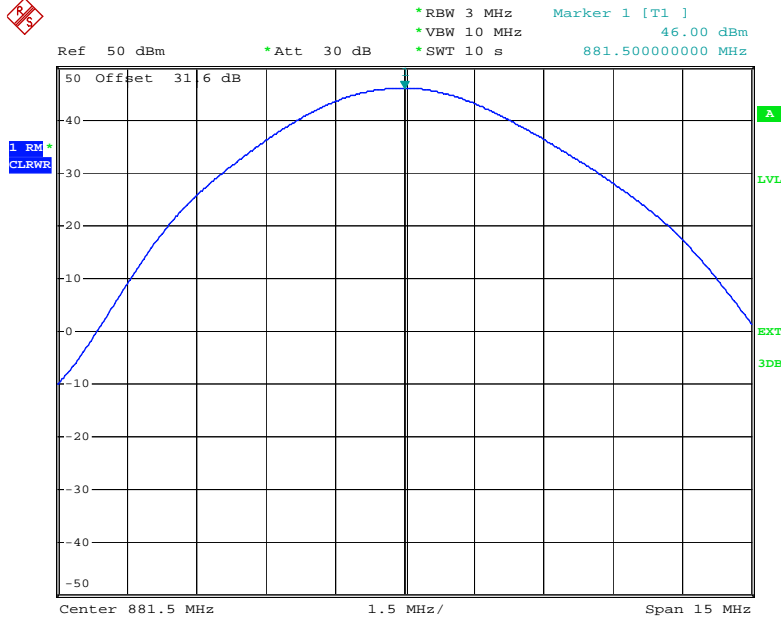
table 5.3.1-#1 RF Power Out: §22.913, §2.1046; Test results; Downlink

| Modulation | Pin / dBm (Ref. point B) |
|------------|-----------------------------|
| CDMA | 6 |
| WCDMA | 5,9 |

table 5.3.1-#2 RF Power Out: §22.913, §2.1046; Test results; Downlink; Input power



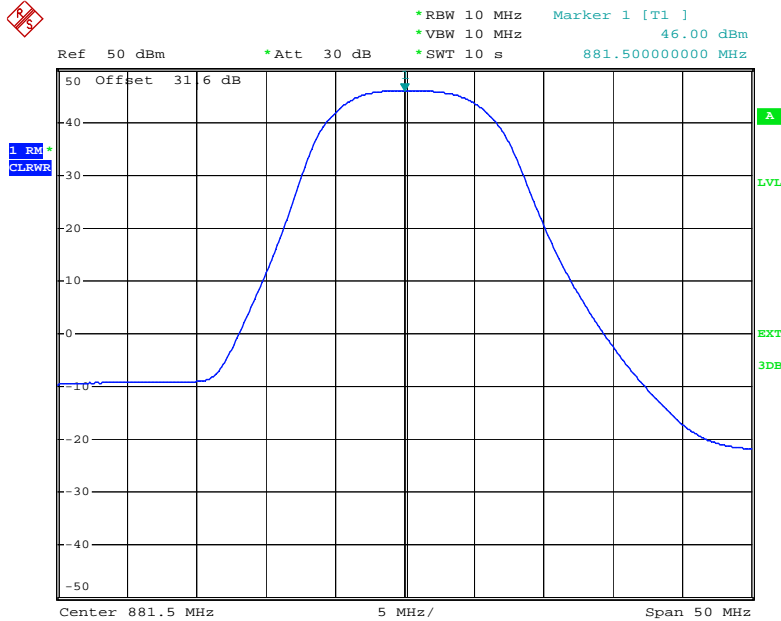
5.3.1.1 CDMA



Date: 16.JUL.2010 12:41:13

plot 5.3.1.1-#1 RF Power Out: §22.913, §2.1046; Test results; Downlink; CDMA Middle

5.3.1.2 W-CDMA



Date: 16.JUL.2010 12:37:34

plot 5.3.1.2-#1 RF Power Out: §22.913, §2.1046; Test results; Downlink; W-CDMA Middle



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5.3.2 Uplink

n.a.

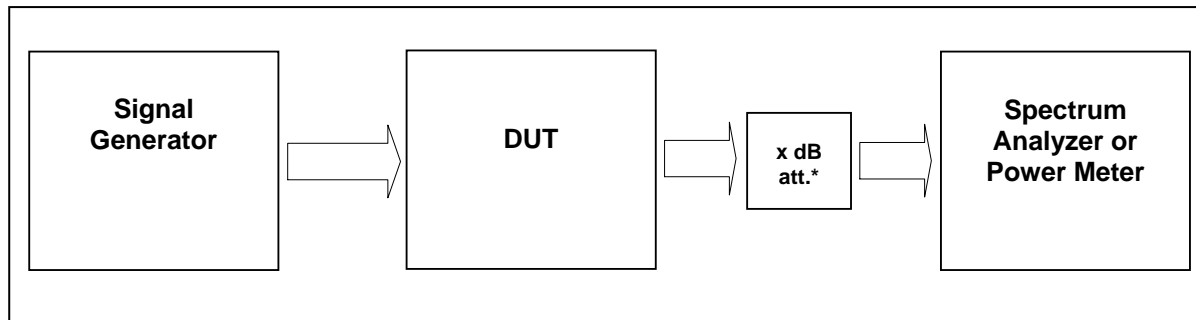
Note: The EUT does not transmit over the air in the uplink direction.

5.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Rainer Friedrichr |
| Date: | 16.07.2010 |



6 Occupied Bandwidth: §2.1049; RSS-GEN



External Attenuator DL x dB = 30 dB
 figure 5.4-#1 Test setup: Occupied Bandwidth: §2.1049; RSS-GEN

| | |
|-------------------------|------------------------------------|
| Measurement uncertainty | ± 0,38 dB |
| Test equipment used | 8984,8961,8689,8670,7363,7364,7365 |

6.1 Limit

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

6.2 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:

6.3 Test results

For composite power measurements: Detector RMS.

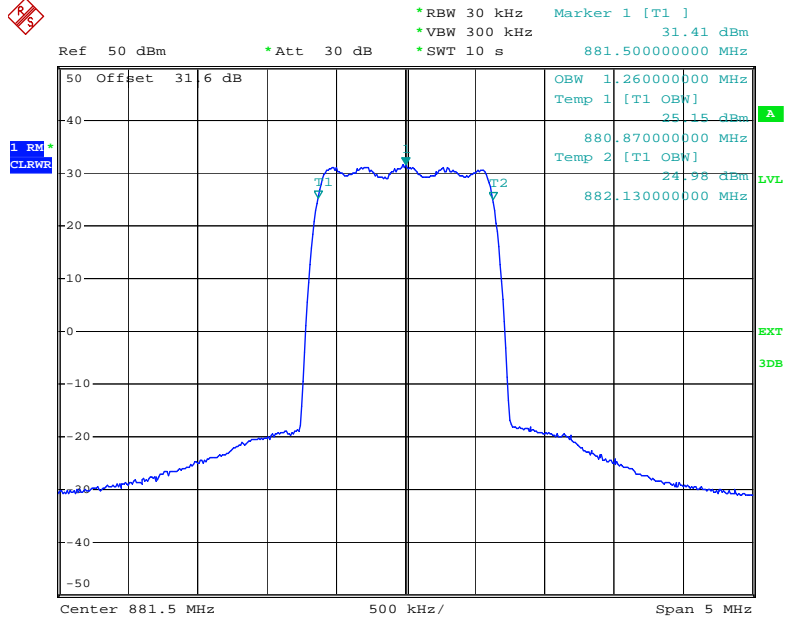
6.3.1 Downlink

| Modulation | Measured at f / MHz | | RBW VBW Span | Occupied Bandwidth / MHz | Plot # |
|------------|------------------------|-------|--------------------|--------------------------------|---------|
| CDMA | Middle | 881,5 | 30kHz | 1,260 | 5.3.1.3 |
| | | | 300kHz | | #1, #2 |
| WCDMA | Middle | 881,5 | 100kHz | 4,18 | 5.3.1.4 |
| | | | 1 MHz | | #1, #2 |
| | | | 10 MHz | | |

table 6.3-#1 Occupied Bandwidth: §2.1049; RSS-GEN Test results

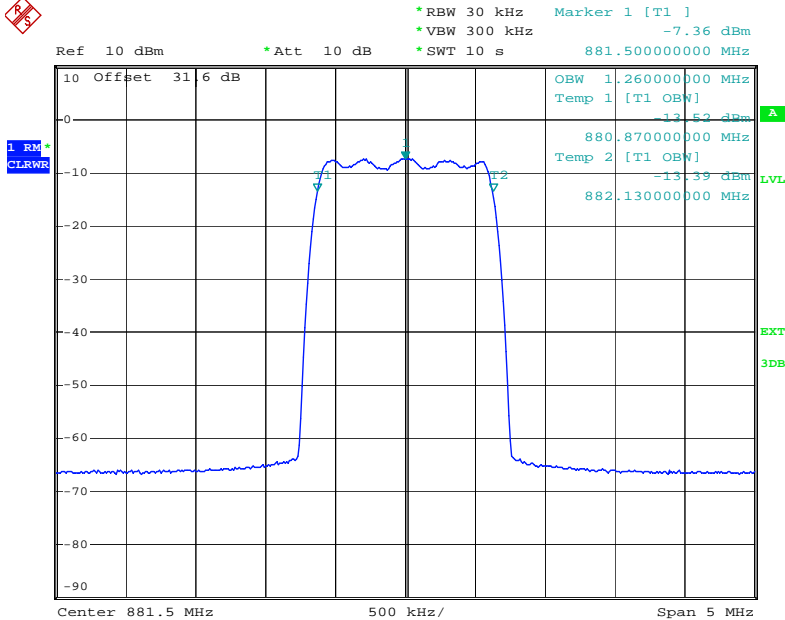


6.3.1.1 CDMA



Date: 16.JUL.2010 12:50:04

plot 6.3.1.1-#1 Occupied Bandwidth: §2.1049; RSS-GEN; Test results; Downlink; CDMA Output

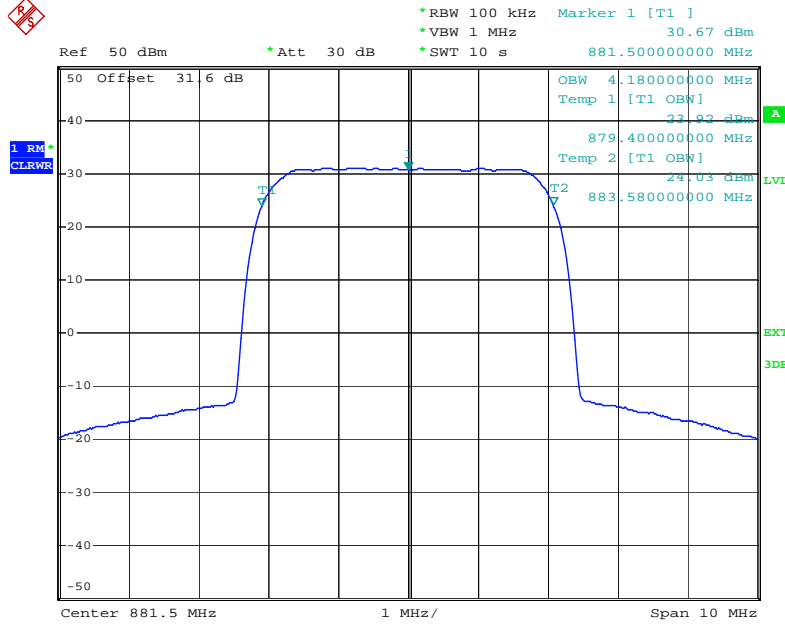


Date: 16.JUL.2010 12:24:51

plot 6.3.1.1-#2 Occupied Bandwidth: §2.1049; RSS-GEN; Test results; Downlink; CDMA Input

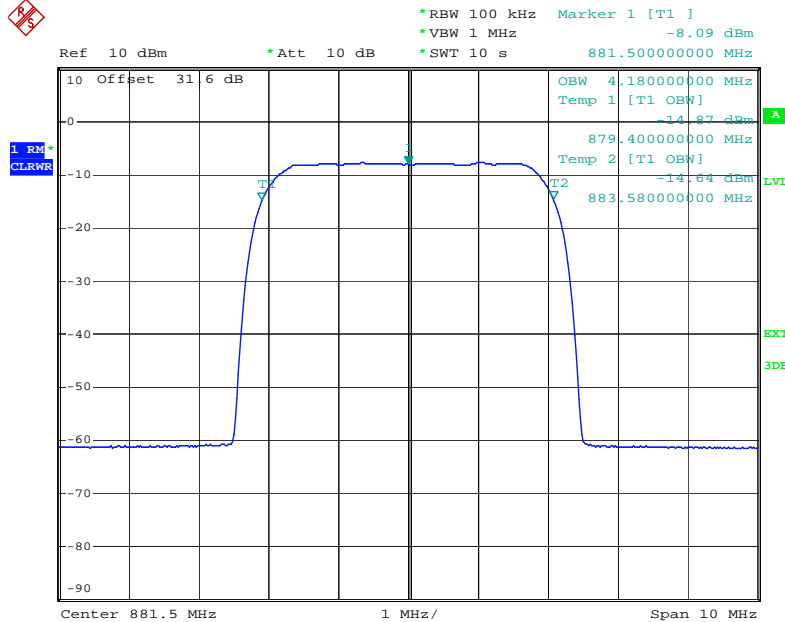


6.3.1.2 W-CDMA



Date: 16.JUL.2010 12:33:06

plot 6.3.1.2-#1 Occupied Bandwidth: §2.1049; RSS-GEN; Test results; Downlink; W-CDMA Output



Date: 16.JUL.2010 12:29:52

plot 6.3.1.2-#2 Occupied Bandwidth: §2.1049; RSS-GEN; Test results; Downlink; W-CDMA Input



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6.3.2 Uplink

n.a.

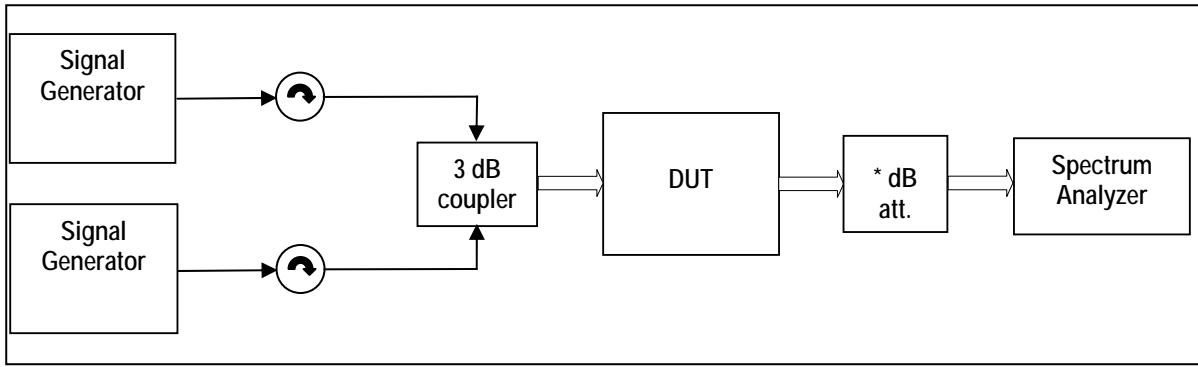
Note: The EUT does not transmit over the air in the uplink direction.

6.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Rainer Friedrich |
| Date: | 16.07.2010 |



7 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN



External Attenuator DL x dB = 30 dB

figure 6.4-#1 Test setup: Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN

| | | |
|-------------------------|---|---|
| Measurement uncertainty | ± 0,54 dB ± 1,2 dB ± 1,5 dB | 9 kHz to 3 GHz 3 GHz to 7 GHz 7 GHz to 26 GHz |
| Test equipment used | 8984,8961,8689,8670,7363,7364;7323, 7315,7119;8998 | |

7.1 Limit

Minimum standard:

Para. No.22.917

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

7.2 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]

7.3 Test results

7.3.1 Downlink

<1MHz from Band Edge

Detector: RMS.

| Modulation | RBW VBW Span | Measured at f / MHz | | Max. level (dBm) | Plot - |
|------------|----------------------------|------------------------|------------------|------------------------|---------|
| CDMA | 30 kHz 300 kHz 6 MHz | | | | 6.3.3.1 |
| | | Lower Edge | 869,76 870,99 | -19,1 | #1 |
| | | Upper Edge | 891,99 893,22 | -13,9 | #2 |
| WCDMA | 100 kHz 1 MHz 15 MHz | | | | 6.3.3.2 |
| | | Lower Edge | 871,4 876,4 | -14,4 | #1 |
| | | Upper Edge | 886,6 891,6 | -13,6 | #2 |

table 7.3-#1 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN Test results; Downlink; <1MHz from Band Edge

>1MHz from Band Edge

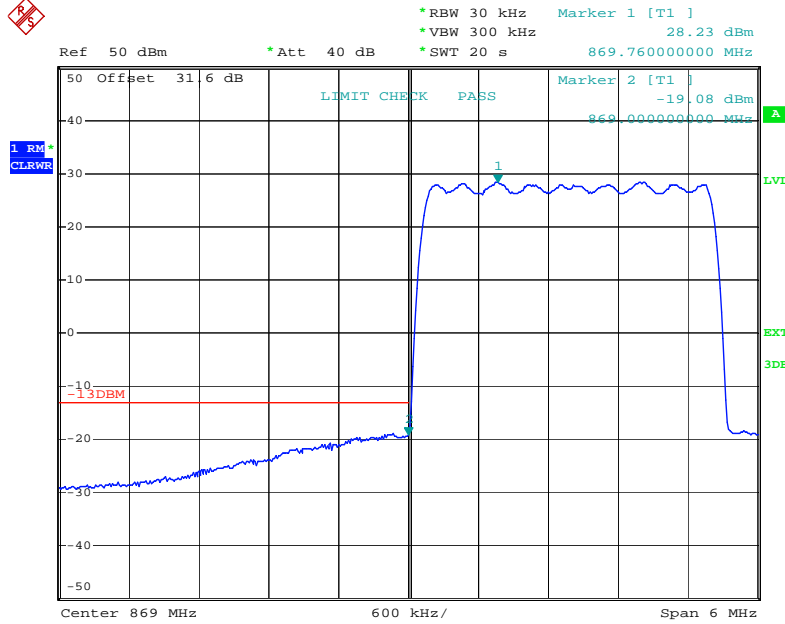
Detector: RMS.

| Modulation | Measured at f / MHz | | RBW VBW Span | Max. level (dBm) | Plot - |
|------------|------------------------|-------|----------------------------------|---------------------|---------|
| CDMA | | | | | 6.3.3.3 |
| | Middle | 881,5 | 1 MHz 3 MHz 30 MHz – 9 GHz | -24,6 | #1 |
| WCDMA | | | | | 6.3.3.4 |
| | Middle | 881,5 | 1 MHz 3 MHz 30 MHz – 9 GHz | -24,4 | #1 |

table 7.3-#2 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN Test results; Downlink;

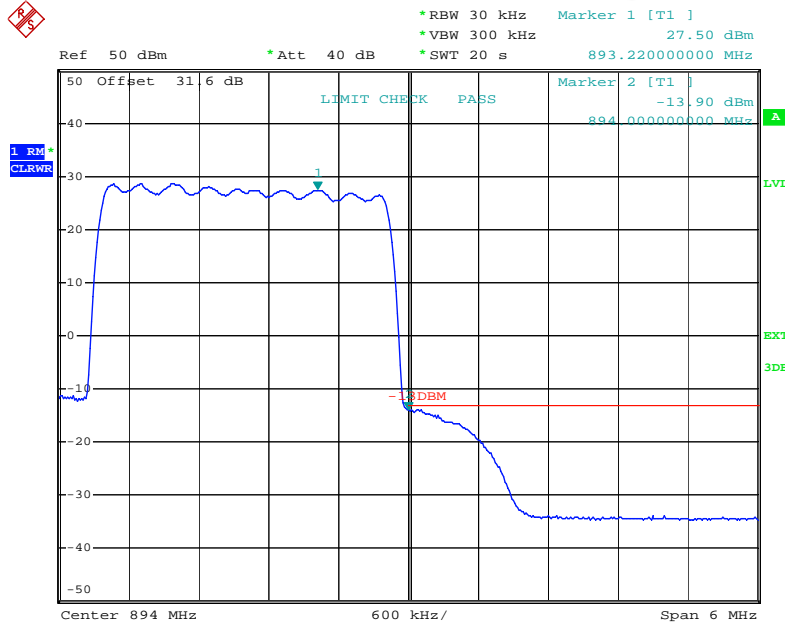


7.3.1.1 CDMA < 1MHz to band edge



Date: 15.JUL.2010 16:28:59

plot 7.3.1.1-#1 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge; Lower Edge

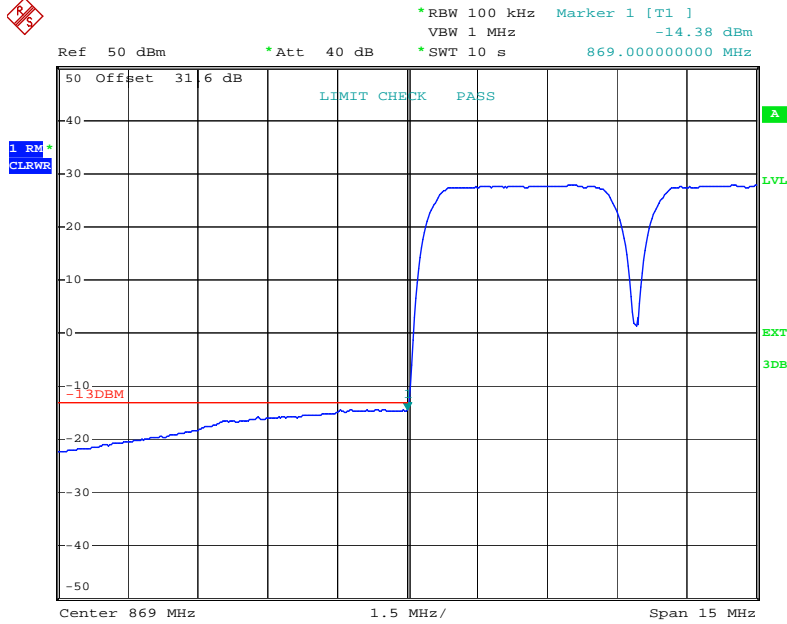


Date: 15.JUL.2010 16:25:26

plot 7.3.1.1-#2 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge; Upper Edge

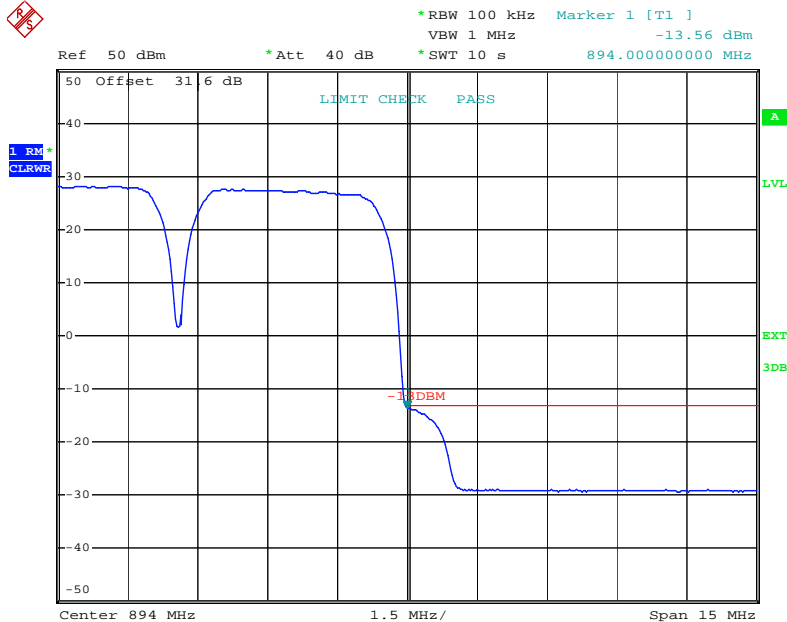


7.3.1.2 W-CDMA < 1MHz to band edge



Date: 16.JUL.2010 12:03:24

plot 7.3.1.2-#1 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA < 1MHz to band edge; Lower Edge

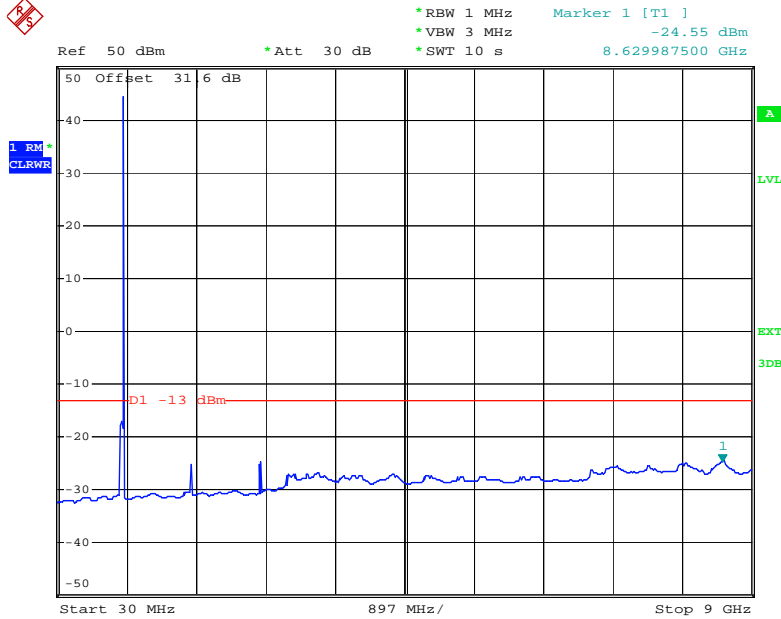


Date: 16.JUL.2010 12:06:13

plot 7.3.1.2-#2 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA < 1MHz to band edge; Upper Edge



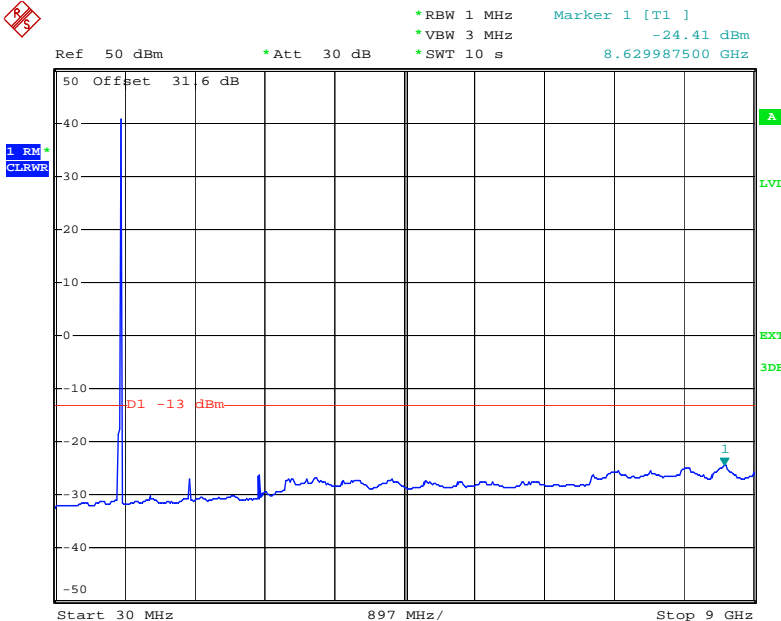
7.3.1.3 CDMA > 1MHz to band edge



Date: 16.JUL.2010 12:56:37

plot 7.3.1.3-#1 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA > 1MHz to band edge; Middle

7.3.1.4 W-CDMA > 1MHz to band edge



Date: 16.JUL.2010 12:57:49

plot 7.3.1.4-#1 Spurious Emissions at Antenna Terminals: §22.917, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA > 1MHz to band edge; Middle



Test Site:
FCC Test Site No.: 96997
IC OATS No.: IC3475A-1

7.3.2 Uplink

n.a.

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

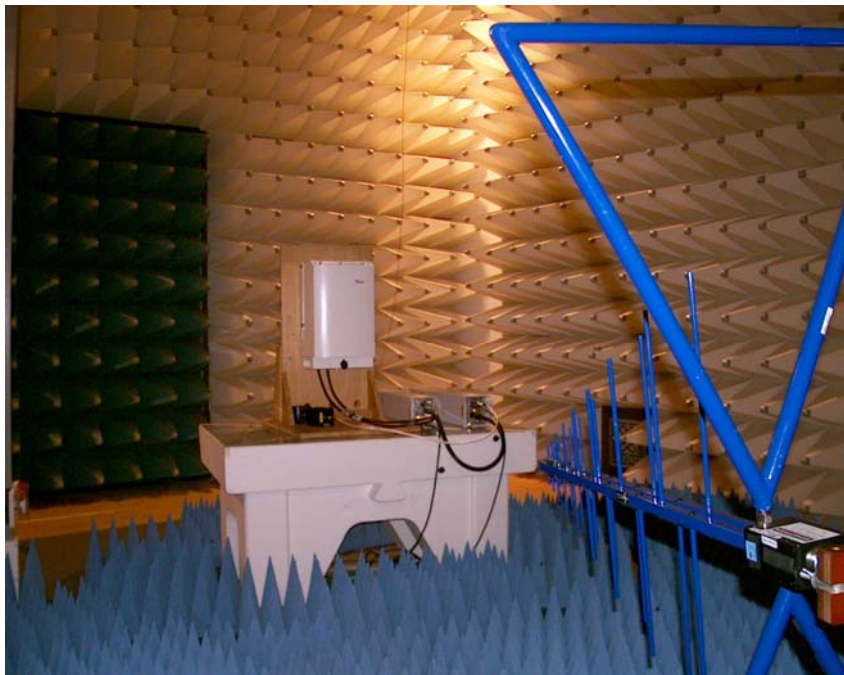
7.4 Summary test result

| | |
|-------------|-------------------------------------|
| Test result | complies, according the plots above |
| Tested by: | Rainer Friedrich |
| Date: | 16.07.2010 |

8 Field Strength of Spurious Emissions: §22.917, §2.1053; RSS-131, RSS-GEN



picture 7.1: Test setup: Field Strength Emission >1 GHz @3m in the FAC



picture 7.2: Test setup: Field Strength Emission <1 GHz @3m in the FAC

Test Site:
 FCC Test Site No.: 96997
 IC OATS No.: IC3475A-1

This clause specifies requirements for the measurement of radiated emission.

| Frequency range | Distance: EUT <-> antenna / location | Limit | Test method |
|-----------------|--|--------------------------------------|----------------|
| 30 MHz - 1 GHz | 3 metres / FAC | FCC 47 CFR Part 22.917 IC RSS-131 | TIA-603-C:2004 |
| 1 GHz – 9 GHz | 3 metres / FAC | FCC 47 CFR Part 22.917 IC RSS-131 | |

Test equipment used:

| Designation | Type | Manufacturer | Invent.-no. | Cal.-date | due Cal.- date | used |
|-------------------|----------------|-----------------|-------------|-------------|-------------------|------|
| EMI test receiver | ESI40 | Rohde & Schwarz | E1687 | 20.10.2009 | 20.10.2010 | X |
| EMI test receiver | ESI40 | Rohde & Schwarz | E1607 | 04.03.2009 | 04.03.2010 | |
| Antenna | CBL 6111 | Chase | K1149 | 14.09.2009 | 14.09.2010 | X |
| Antenna | CBL 6111 | Chase | K1026 | 14.09.2009 | 14.09.2010 | |
| RF Cable | | Frankonia | K1121 SET | 28.12.2009 | 28.12.2010 | X |
| Pre amplifier | AM1431 | Miteq | K1721 | 27.04.2009 | 27.04.2010 | |
| Antenna | HL 025 | R&S | K809 | 04.02.2010 | 04.02.2011 | X |
| Antenna | MWH-1826 / B | ARA Inc. | K1042 | 06.04.2009 | 06.04.2010 | |
| Antenna | MWH-2640 / B | ARA Inc. | K1043 | 06.04.2009 | 06.04.2010 | |
| Preamplifier | AFS4-00102000 | Miteq | K817 | 11.11.2009 | 11.11.2010 | X |
| Preamplifier | AFS4-00102000 | Miteq | K838 | 06.10.2009 | 06.10.2010 | |
| Preamplifier | JS43-1800-4000 | Miteq | K1104 | 26.08.2010 | 26.08.2011 | |
| RF Cable | Sucoflex 100 | Suhner | K1742 | 09.04.20010 | 09.04.2011 | X |

The REMI Version 2.135 has been used to maximize radiated emission from the EUT in the frequency area up to 1 GHz. Above 1 GHz the REMI version 2.135 has been used for max search.

Test set-up:

Test location: FAC
 Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

Type of EUT: Wall mounted

Measurement uncertainty:

| | |
|--|---|
| Measurement uncertainty expanded (95% or K=2) | ± 4,7 dB for ANSI C63.4 measurement ± 0,5 dB for TIA-603 measurement |
|--|---|

8.1 Limit

§22.917 Emission limitations for cellular equipment / RSS-GEN sec. 4.9; RSS-131

(a) Out of band emissions.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Limit = -13dBm

8.2 Test method

§22.917 Emission limitations for cellular equipment.

(b) Measurement procedure.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified).

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole (see Figure 7.2).

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 measurement by rotating the turntable (± 180 degrees) as like defined in ANSI C63.4.

Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

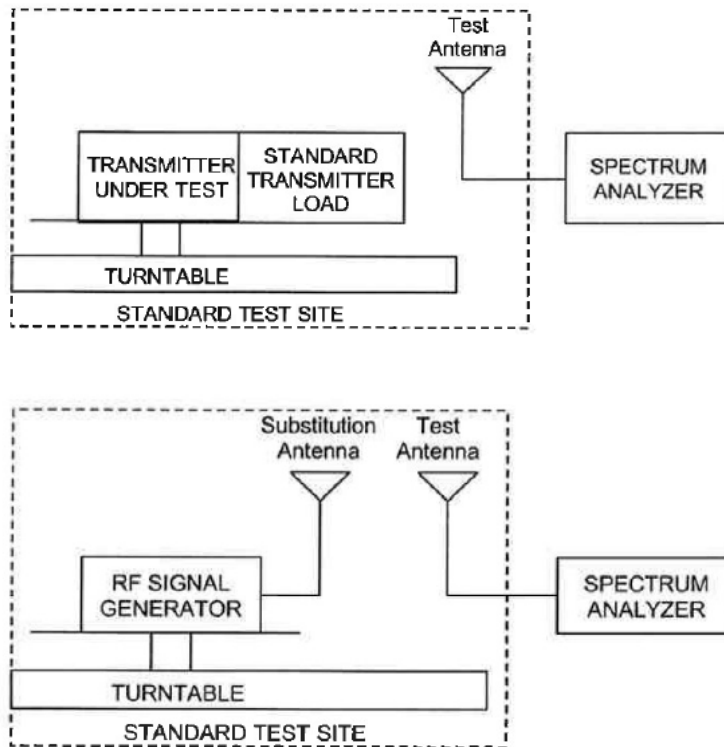


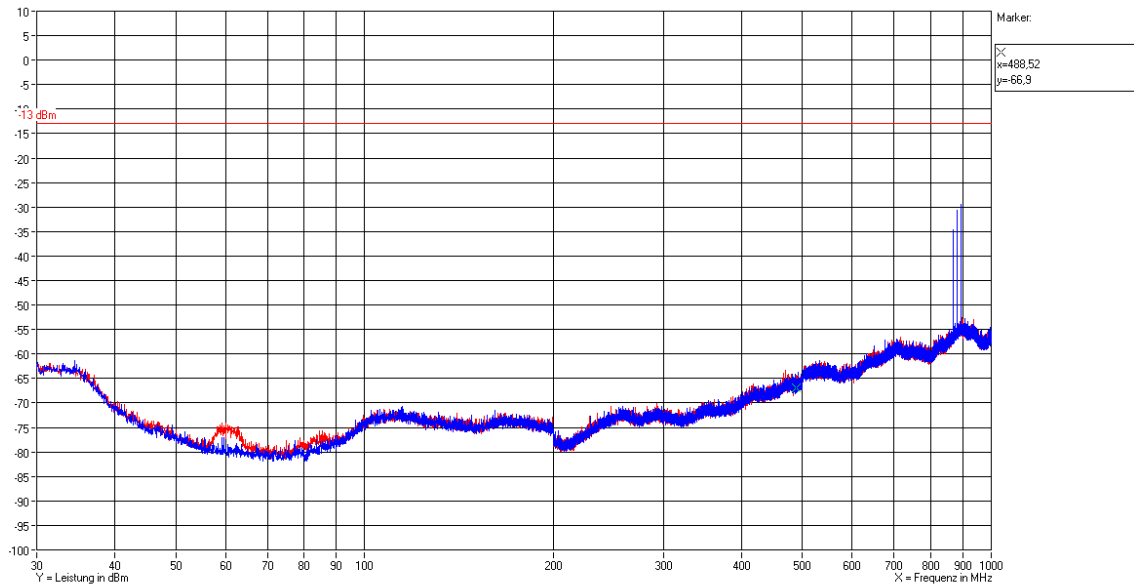
Figure #7.2 Substitution methods TIA-603-C

Test Site:
 FCC Test Site No.: 96997
 IC OATS No.: IC3475A-1

8.3 Test results

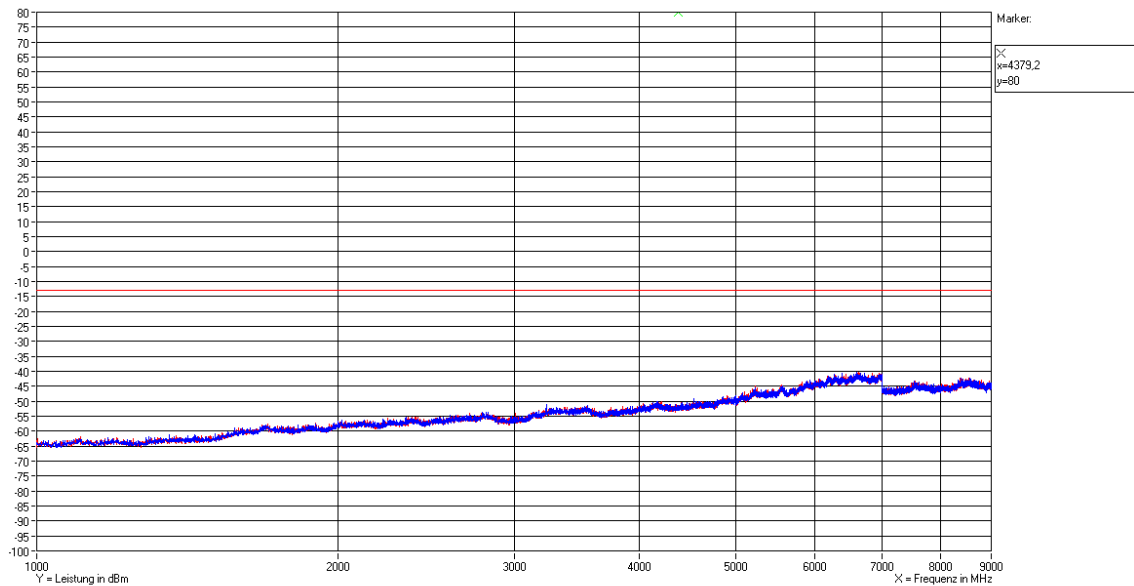
8.3.1 30 MHz to 1 GHz Downlink (Bottom – Middle – Top)

B/M/T: 869MHz – 881,5MHz – 894MHz
 Polarisation: horizontal/vertical
 Detector: Peak



8.3.2 1 GHz to 9 GHz Downlink (Bottom – Middle – Top)

B/M/T: 869MHz – 881,5MHz – 894MHz
 Polarisation: horizontal/vertical
 Detector: Peak



The EUT passed the limit

05.08.2010
 Leh

Test Site:
FCC Test Site No.: 96997
IC OATS No.: IC3475A-1



9 History

| Revision | Modification | Date | Name |
|----------|--------------|------------|---------|
| V01.00 | initial | 31.08.2010 | Lehmann |
| | | | |

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