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Permissible change measurements on WCDMA Base Station 850 MHz Radio Unit with FCC ID: TA8AKRC11822-1 (3 appendices)

Test object

Radio Unit KRC 118 22/1 rev R1D/B

Summary

Standard	Compliant	Appendix	Remarks
FCC CFR 47			
2.1053 Field strength of spurious radiation	Yes	2	-

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REPORT

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2007-08-27

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F711818-F22

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Description – Test object

Equipment: WCDMA Transceiver unit 850 MHz, single and multi carrier

Tx Frequency range: 871.4 – 891.6 MHz

Modulations: QPSK and 16QAM

Maximum output power: Single carrier: 1x46 dBm (1x40W)
Multi carrier: 2x43 dBm (2x20W)

Nominal power voltage: -48 VDC

Tested channels

UARFCN	Frequency
4357	871.4 MHz
4407	881.4 MHz
4458	891.6 MHz

Operation mode during measurements

Test models

All measurements were performed with the test object configured with the test models 1 and 5 as defined in 3GPP TS 25.141. Test model 1 uses the QPSK modulation only, and test model 5 includes the 16QAM modulation.

The settings below were found to be representative for all traffic scenarios when several settings were tested to find the setting for worst case.

Radiated measurements

All radiated measurements were performed with the test object installed in a wooden rack without EMC shielding. This configuration represents worst case for radiated spurious emission measurements. The test object was powered with 48 VDC.

The RU unit were activated as Single Carrier 1x1 (1x46 dBm) and Multi Carrier 2x1 (2x43 dBm). The RF output power port were terminated with 50 ohm loads.

The RU unit were allocated to the following UARFCN:

Downlink	4357 (871.4 MHz)	4357 (871.4 MHz)	4458 (891.6 MHz)	4458 (891.6 MHz)
Uplink	4132 (826.4 MHz)	4132 (826.4 MHz)	4233 (846.6 MHz)	4233 (846.6 MHz)
Test model	1	5	1	5

Test model 1: 64 DPCHs at 30 ksps (SF=128)

Test model 5: 30 DHCPs at 30 ksps (SF=128) and 8 HS-PDSCHs at 240 ksps (SF=16)

Multi Carrier:

Cell	1	2
Downlink	4357 (871.4 MHz)	4407 (881.4 MHz)
Uplink	4132 (826.4 MHz)	4182 (836.4 MHz)
Test model	1	5

Test model 1: 32 DPCHs at 30 ksps (SF=128)

Test model 5: 30 DHCPs at 30 ksps (SF=128) and 8 HS-PDSCHs at 240 ksps (SF=16)

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in FCC CFR 47.

References

Measurements were done according to relevant parts of the following standards:

ANSI/TIA/EIA-603-B-2002

3GPP TS 25.141

Reservation

The test results in this report apply only to the particular test object as declared in the report.

Delivery of test object

The test object was delivered: 2007-06-25

Manufacturer's representative

Larry Lindström, Ericsson AB

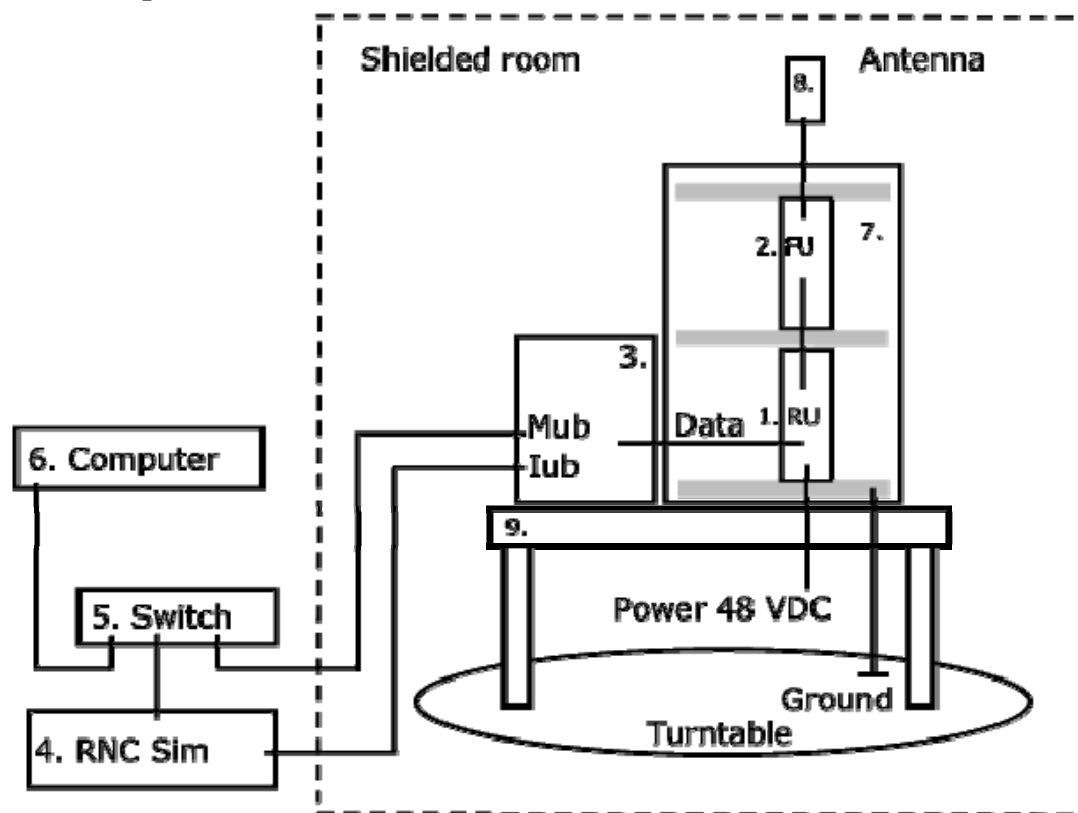
Test engineers

Jonas Bremholt and Jörgen Wassholm

Test witness

Larry Lindström, Ericsson AB

Test set-up, radiated measurements



Test object

1. RU KRC 118 22/1 Rev. R1D/B, Serial No: AE52945088 (FCC ID: TA8AKRC11822-1)
2. FU KRC 118 21/1 Rev. R1E, Serial No: TU8F135202

Functional test equipment

3. BB subrack with software CXP 901 1610/1 rev. P11AD02
4. RNC Sim CES 4780BA Mini-sim #33
5. Switch, Netgear Ethernet switch DS108
6. Computer, SunBlade (IOV S1)
7. Wooden rack
8. Terminator (50 ohn)
9. Non conductive table

Field strength of spurious radiation measurements according to 47 CFR 2.1053

Date 2007-06-27 to 2007-06-28	Temperature 22-23 °C ± 3 °C	Humidity 56-58 % ± 5 %
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Test set-up and procedure

The test site is listed at FCC, Columbia with registration number: 93866. The test site also complies with RSS 212, Issue 1, Industry Canada file no.:IC 3482.

The transmitter was set up according to Test model 1 and Test model 5 during the measurements. The antenna ports were terminated with 50 ohm loads.

The measurements were performed with both horizontal and vertical polarisation of the antenna. The antenna distance was 3 m.

A pre-measurement was first performed:

In the frequency range 30 MHz-10 GHz the measurement was performed in power with a RBW of 1 MHz. A propagation loss in free space was calculated. The used formula was,

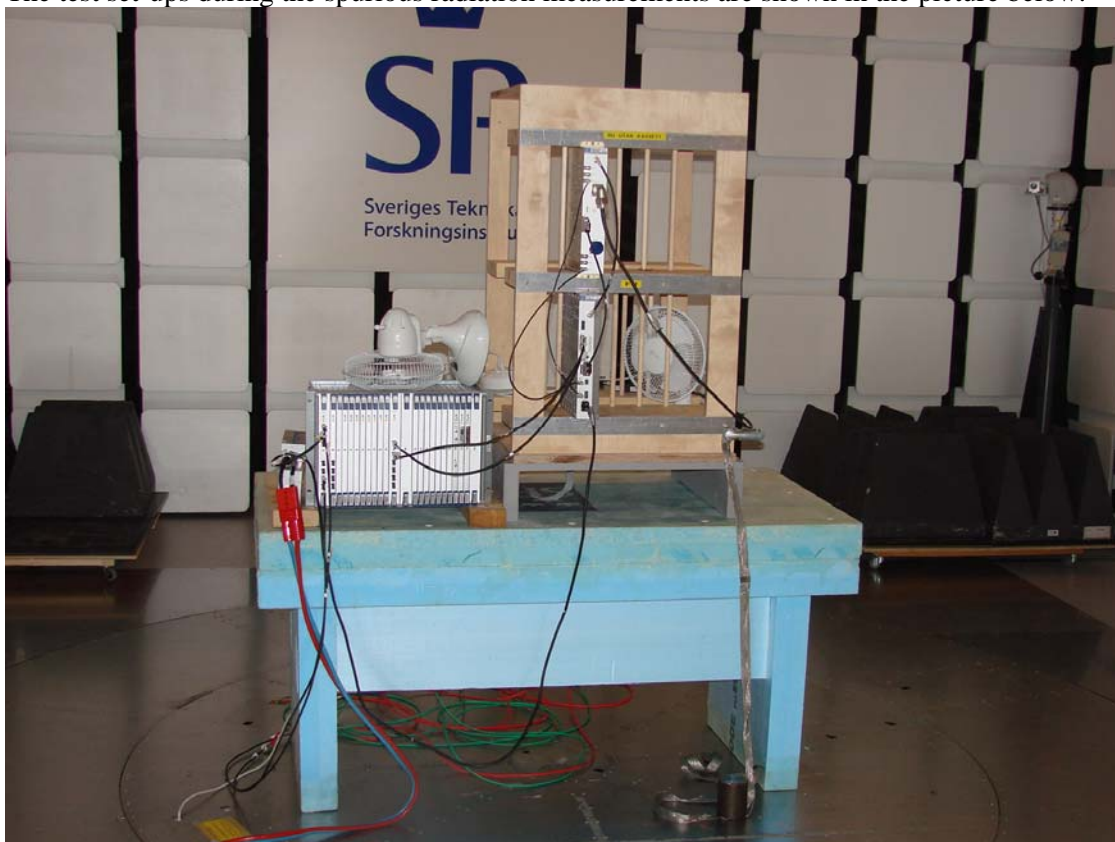
$$\gamma = 20 \log \left(\frac{4\pi D}{\lambda} \right), \gamma \text{ is the propagation loss and } D \text{ is the antenna distance.}$$

The measurement procedure was as the following:

1. The pre-measurement was first performed with peak detector. The EUT was measured in eight directions and with the antenna at three heights, 1.0 m, 1.5 m and 2.0 m.
2. Spurious radiation on frequencies closer than 20 dB to the limit is scanned 0-360 degrees and the antenna is scanned 1-4 m for maximum response. The emission is then measured with the RMS detector and the RMS value is reported, frequencies closer than 10 dB to the limit measured with the RMS detector was measured with the substitution method according to the standard.

Measurement equipment	Calibration Due	SP number
Test site	2008-11	503 881
R&S ESI 26	2007-09	503 292
Control computer	-	503 479
Software: R&S ES-K1, ver. 1.60	-	-
Chase Bilog antenna CBL 6111A	2008-11	503 182
EMCO Horn Antenna 3115	2007-11	502 175
MITEQ Low Noise Amplifier	2007-08	503 285
Testo 615, Temperature and humidity meter	2007-09	503 505

The test set-ups during the spurious radiation measurements are shown in the picture below.



Results

Single carrier

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Multi carrier

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

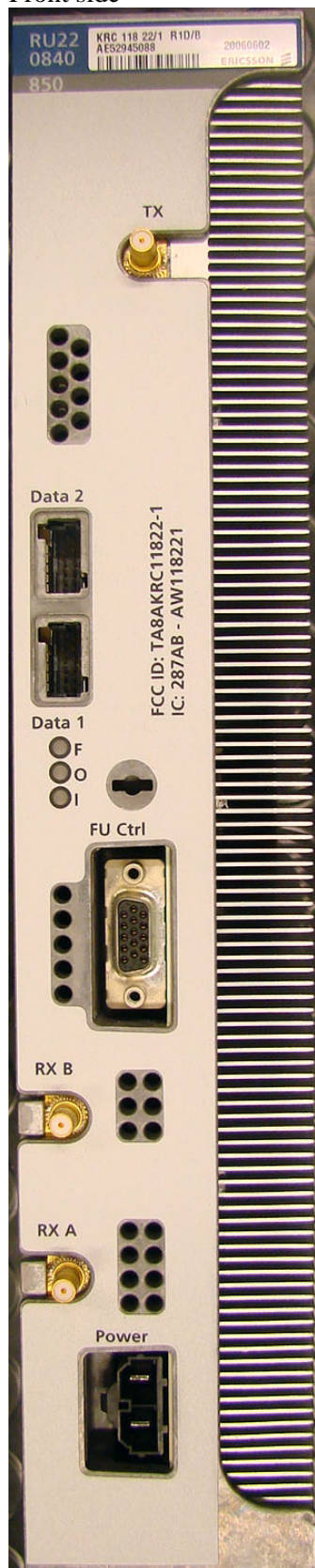
Complies?	Yes
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Appendix 3

Photos Radio Unit KRC 118 22/1

Front side



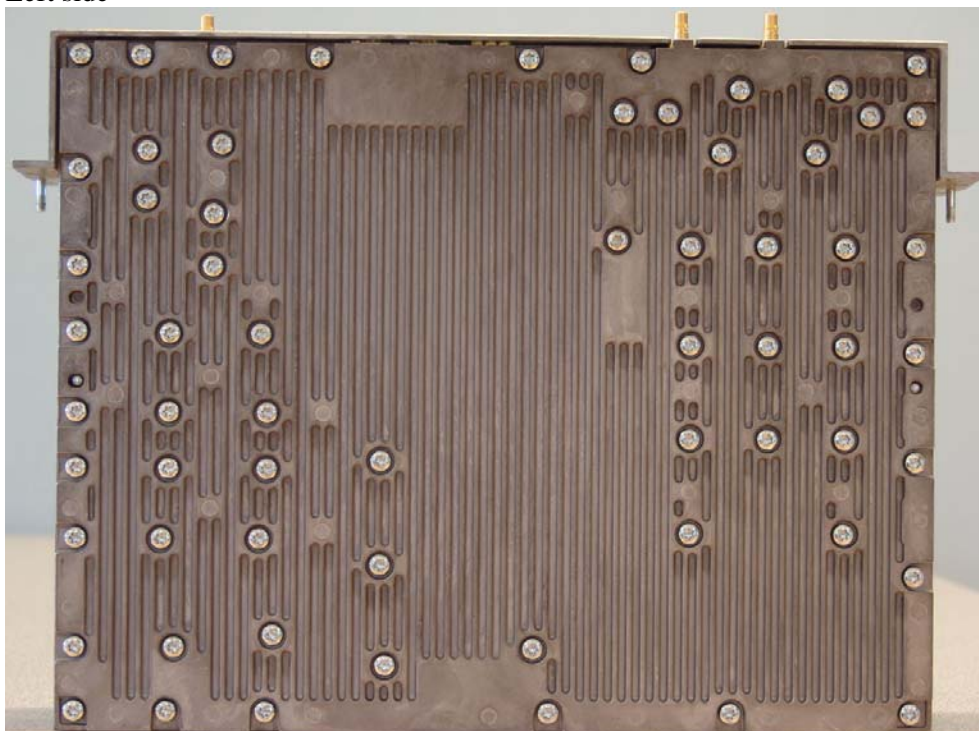
Rear side



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Appendix 3

Left side



Right side

