



REPORT

issued by an FCC listed Laboratory Reg. no. 93866.
The test site complies with RSS 212, Issue 1, file no: IC 3482.

Date
2007-03-23

Reference
F700107-F22

Page
1 (2)



Handled by, department
Jonas Bremholt
Electronics
+46 10 516 54 38, jonas.bremholt@sp.se

ERICSSON AB
Pehr-Åke Bergström
PDU RBS WCDMA
164 80 Stockholm

Permissible change measurements on WCDMA Base Station 850 MHz Radio Unit with FCC ID: TA8AKRC11822-1 (2 appendices)

Test object

Radio Unit KRC 118 22/1

Summary

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

**SP Sveriges Tekniska Forskningsinstitut
Electronics - EMC**


Jan Welinder
Technical Manager


Jonas Bremholt
Technical Officer

SP Technical Research Institute of Sweden

Postal address
SP
Box 857
SE-501 15 Borås
SWEDEN

Office location
Västeråsen
Brinellgatan 4
SE-504 62 Borås
SWEDEN

Phone / Fax / E-mail
+46 10 516 50 00
+46 33 13 55 02
info@sp.se

Laboratories are accredited by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) under the terms of Swedish legislation. This report may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



REPORT

FCC ID: TA8AKRC11822-1

Date
2007-03-23

Reference
F700107-F22

Page
2 (2)

Table of contents

Description of the test object	Appendix 1
Operation mode during measurements	Appendix 1
Purpose of test	Appendix 1
Test setups	Appendix 1
Field strength of spurious radiation	Appendix 2

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 (40W)
Multi carrier: 2x43 dBm (2x20W)

Nominal power voltage: -48 VDC

Tested channels

UARFCN	Frequency
4357	871.4 MHz
4408	881.6 MHz
4458	891.6 MHz

Operation mode during measurements

Test models

All measurements were performed with the test object transmitting the test model 1 defined in 3GPP TS 25.141.

Radiated measurements

All radiated measurements were performed with the test object installed in a RBS 2106i cabinet powered with 3-phase 208/120 VAC, 60 Hz. The cabinet was equipped with radio units for both GSM and WCDMA during the measurements. The used configuration represents worst case configuration.

The RU units were activated for maximum transmit power. The RU units were activated as Single Carrier 3x1. The RF output power ports were terminated with 50 ohm loads.

The RU units were allocated to the following UARFCN:

RF configuration: Single Carrier 3x1 40W(3 RU, 1x46 dBm)
Transmission: CBU (T1)

RU	1	2	3
Downlink	4357 (871.4 MHz)	4408 (881.6 MHz)	4458 (891.6 MHz)
Uplink	4132 (826.4 MHz)	4183 (836.6 MHz)	4233 (846.6 MHz)
Test model	1	1	1

16 DPCHs at 30 ksps (SF=128)

GSM

Transmission: T1

dTRU	ARFCN	Tx frequency	Modulation	Configuration
No 1	512	1930.2 MHz	GMSK	Combined+TCC
				-
No 2	572	1942.2 MHz	GMSK	Combined
	661	1960.0 MHz	8-PSK	Combined
No 3	750	1977.8 MHz	GMSK	Uncombined
	810	1989.8 MHz	8-PSK	Uncombined

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in FCC CFR 47 with the test object is installed in an alternative RBS cabinet.

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: 2007-01-12

Manufacturer's representative

Larry Lindström, Ericsson AB

Test engineers

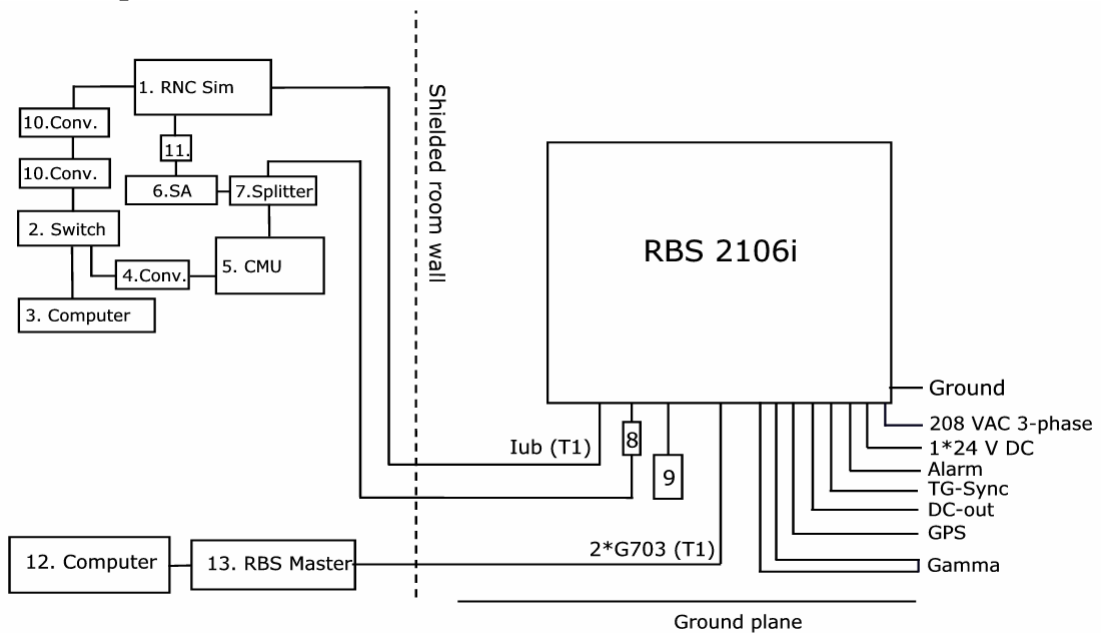
Jonas Bremholt, Nina Johansson and Jörgen Wassholm.

Test witnesses

Lars Hagbjörk, Christer Gustavsson and Behzad Nourparvar Ericsson AB

Appendix 1

Test set-up



More information about the RBS hardware units are shown in SP document F700107-H22

1. RNC Sim 4780 DA, mini-SIM#53, powered via isolation transformer
2. Fast Ethernet switch, Netgear
3. Computer SUN Microsystems Sun Blade 2500
4. Ethernet/GPIB converter, National Instrument
5. CMU 300, R & S, BAMS-1000290156
6. Spectrum analyzer, R & S, FSIQ 3, BAMS0000000401
7. Splitter, Mini circuit 15542, ZAPD-21
8. Attenuator
9. Dummy loads (50 ohm)
10. D-link media converter
11. Synchronization (10 MHz) with Isolation box
12. Computer, with software RBSMMI ver. R10A05 BAMS 1000208320
13. Ericsson RBS Master 2 LPY 107 1007/1 R1E/A 0000000104, software ver. R6A05

Interfaces:

Power: 208 VAC, 60 Hz
Antenna: Coaxial cables 50 ohm

GSM

G703: T1, shielded multi-wire with RJ-45 connector
TG-sync: Shielded multi-wire, 9-pin DSUB, terminated by DSUB
Alarm: Shielded multi-wire, 9-pin DSUB, unterminated
GPS: Shielded multi-wire, unterminated

WCDMA

Iub configured as T1 by CBU: Shielded multi-wire with RJ-45 connector (120 ohm)
Gamma: Shielded multi-wire
Mub: No cable
Test: No cable

Type of port:

AC mains
Antenna

Telecom
Signal
Signal
Signal

Telecom
Signal
Test purposes
Test purposes

Field strength of spurious radiation measurements according to 47 CFR 2.1053

Date 2007-01-30	Temperature 22 °C ± 3 °C	Humidity 22 % ± 5 %
--------------------	-----------------------------	------------------------

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 modulated with pseudorandom data 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 in the frequency range 30 MHz – 10 GHz.

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 average detector and the average value is reported, frequencies closer than 10 dB to the limit measured with the average detector was measured with the substitution method according to the standard.

Measurement equipment	Calibration Due	SP number
Test site, Tesla	2008-11	503 881
Spectrum analyzer R&S ESI 26	2007-07	503 292
Control computer, Fujitsu Siemens	-	-
Software: R&S ES-K1, ver. 1.60	-	503 423
Antenna Chase Bilog CBL 6111A	2008-11	503 182
Horn antenna EMCO 3115	2007-11	502 175
Std gain horn, model 16240-25	-	503 939
Preamplifier Miteq, 0.1-26 GHz	2007-08	503 285
Temperature and humidity meter Testo 615	2007-09	503 505

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



Results

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

§ 22.917 a) 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
-----------	-----