GSM1900 test report
For RH-37

TCC Beijing
Nokia tower Pacific century place,
chaoyang district, Beijing,
China,100027
Tel. +86 10 65392828
Fax. +86 10 65393824

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1 LABORATORY INFORMATION

Test laboratory:	TCC Beijing Nokia Tower, Pacific Century Place, Chaoyang district, Beijing, China, 100027 Tel. +86 10 65392828 Fax. +86 10 65393824
FCC registration number: IC file number:	FCC 884453 (Dec.11, 2003) IC 4917 (Feb 16, 2004)

2 CUSTOMER INFORMATION

Client:	Nokia Germany/Ulm Lise meither Strasse 10 89081 Ulm Tel: +49-731-1754-0 Fax: +49-731-1754-680
Contact person:	Jukka Pekkala
Receipt of EUT:	2004-09-24
Date of testing:	2004-09-29
Date of report:	2004-09-29

The tests listed in this report have been done to demonstrate compliance with the applicable requirements in FCC rules Part 24 and IC standard RSS-133.

Contents approved:

Tu Yuhua

Tu Yuhua
EMC Team leader

3 SUMMARY OF TEST RESULTS

Section in CFR 47	Section in RSS-133		Result
24.232 (b)	6.2	radiated RF output	PASS

PASS Pass
FAIL Fail
X Measured, but there is no applicable performance criteria
- Not done

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4 EUT INFORMATION

The EUT and accessries used in the tests are listed below. Later in this report only EUT numbers are used as reference.

	Device	Type	S/N	EUT number	HW version	SW version
EUT	GSM1900 mobile phone	RH-37	004400/46/162952/7	DUT0802	HW 6061	SW 4.01
Accessories	Battery	BL-5B	0670455363807	DUT0803	-	-

Notes: -

4.1 EUT description

The EUT is a GSM1900 mobile phone.

The EUT was not modified during the tests.

5 EUT TEST SETUPS

For each test the EUT was exercised to find out the worst case of operation modes and device configuration.

The test setup photographs are in the document referenced in section 9.

6 APPLICABLE STANDARDS

The tests were performed in guidance of CFR 47 part 24, part 2, ANSI/TIA/EIA-603-A and RSS-133. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method" for each test case.

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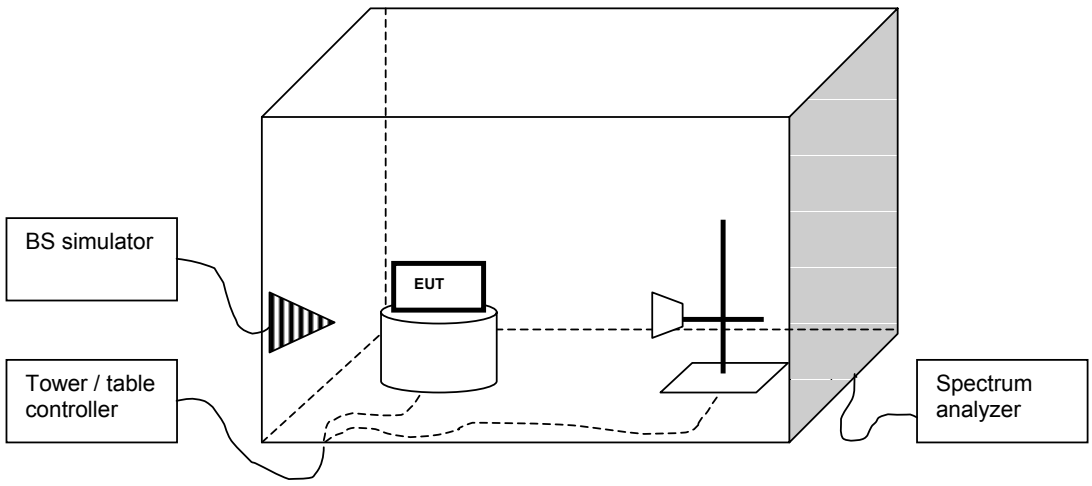
7 RADIATED RF OUTPUT POWER

EUT	D0802		
Accessories	D0803		
Temp, Humidity, Air Pressure	18.65 ºC	69.97RH%	1009mbar
Date of measurement	Oct.29.2004		
FCC rule part	§24.232 (b)		
RSS-133 section	6.2		
Measured by	Tu Yuhua		
Result	PASS		

7.1 Test setup

The EUT was set on a non-conductive turn table in a semi anechoic chamber. In the corner of the chamber there was a communication antenna, which was connected to the BS simulator located outside the chamber. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turn table were remotely controlled to turn the EUT and change the antenna polarization. The measured signal was routed from the measuring antenna to the spectrum analyzer. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



7.2 Test method

a) The maximum power level was searched by moving the turn table and measuring antenna and manipulating the EUT. This level (P_{EUT}) was recorded.

b) The EUT was replaced with a substituting antenna.

c) The substituting antenna was fed with the power (P_{Subst_TX}) giving a convenient reading on the spectrum analyzer. That reading (P_{Subst_RX}) on spectrum analyzer was recorded.

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7.3 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission, PRBS 2E9-1 data
EUT channel	512, 661, 810
EUT TX power level	0 (+30dBm)

7.4 Limit

EIRP [W]
≤ 2

7.5 Results

The formula below was used to calculate the EIRP of the EUT.

$$P_{EIRP[W]} = \frac{10^{(P_{Subst\_TX[dBm]}+(P_{EUT[dBm]}-P_{Subst\_RX[dBm]})+G_{Substitute\_antenna[dBi]}-L_{Cable[dB]})/10}}{1000}$$

where the variables are as follows:

$P_{EUT\ [dBm]}$	Measured power level (from step a in 7.2) from the EUT
$P_{Subst\_TX\ [dBm]}$	Power (from step c in 7.2) fed to the substituting antenna
$P_{Subst\_RX\ [dBm]}$	Power (from step c in 7.2) received with the spectrum analyzer
$G_{Substitute\_antenna\ [dBi]}$	Gain of the substitutive antenna over isotropic radiator
$L_{Cable\ [dB]}$	Loss of the cable between signal generator and the substituting antenna

EUT Channel	P_{EUT} [dBm]	P_{Subst_TX} [dBm]	P_{Subst_RX} [dBm]	Cable loss [dB]	Antenna gain [dBi]	EIRP [dBm]	EIRP [W]
512	-17.2	0	-47.12	5	3.05	27.97	0.626613865
661	-16.3	0	-47.31	5.1	2.93	28.84	0.765596607
810	-14.2	0	-47.25	4.9	2.95	31.1	1.288249552

7.6 EUT operation mode

EUT operation mode	GPRS call mode, 2 time slot transmission

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EUT channel	512, 661, 810
EUT TX power level	0 (+30dBm)

7.7 Limit

Watts, EIRP
≤ 2

7.8 Results

The formula below was used to calculate the EIRP of the EUT.

$$P_{EIRP[W]} = \frac{10^{(P_{Subst\_TX[dBm]}+(P_{EUT[dBm]}-P_{Subst\_RX[dBm]})+G_{Substitute\_antenna[dBi]}-Lcable(dB))/10}}{1000}$$

where the variables are as follows:

$P_{EUT\ [dBm]}$ Measured power level (from step a in 7.2) from the EUT

$P_{Subst\_TX\ [dBm]}$ Power (from step c in 7.2) fed to the substituting antenna

$P_{Subst\_RX\ [dBm]}$ Power (from step c in 7.2) received with the test receiver

$G_{Substitute\_antenna\ [dBi]}$ Gain of the substitutive antenna over isotropic radiator

EUT Channel	P_{EUT} [dBm]	P_{Subst_TX} [dBm]	P_{Subst_RX} [dBm]	Cable loss [dB]	Antenna gain [dBi]	EIRP [dBm]	EIRP [W]
512	-20.58	0	-47.12	5	3.05	24.59	0.287739841
661	-19.08	0	-47.31	5.1	2.93	26.06	0.403645393
810	-16.6	0	-47.25	4.9	2.95	28.7	0.741310241

7.9 EUT operation mode

EUT operation mode	EGPRS call mode, 2 time slot transmission
EUT channel	512, 661, 810
EUT TX power level	0 (+30dBm)

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7.10 Limit

Watts, EIRP
≤ 2

7.11 Results

The formula below was used to calculate the EIRP of the EUT.

$$P_{EIRP[W]} = \frac{10^{(P_{Subst\_TX[dBm]}+(P_{EUT[dBm]}-P_{Subst\_RX[dBm]})+G_{Substitute\_antenna[dBi]}-Lcable(dB))/10}}{1000}$$

where the variables are as follows:

$P_{EUT\ [dBm]}$ Measured power level (from step a in 7.2) from the EUT

$P_{Subst\_TX\ [dBm]}$ Power (from step c in 7.2) fed to the substituting antenna

$P_{Subst\_RX\ [dBm]}$ Power (from step c in 7.2) received with the test receiver

$G_{Substitute\_antenna\ [dBi]}$ Gain of the substitutive antenna over isotropic radiator

EUT Channel	P_{EUT} [dBm]	$P_{Subst\ TX}$ [dBm]	$P_{Subst\ RX}$ [dBm]	Lcable (dB)	Antenna gain [dBi]	EIRP [dBm]	EIRP [W]
512	-18.99	0	-47.12	5	3.05	26.18	0.414954043
661	-18.75	0	-47.31	5.1	2.93	26.39	0.435511874
810	-17.16	0	-47.25	4.9	2.95	28.14	0.651628394

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8 TEST EQUIPMENT

Each test equipment is calibrated once a year.

8.1 Radiated measurements

Equipment	Manufacturer	Model
AMPLIFIER	J52-00100400	ROHDE&SCHWARZ
AMPLIFIER	JS2-00100400	MITEQ
ANTENNA	HF906	ROHDE&SCHWARZ
ANTENNA	HF906	ROHDE&SCHWARZ
ANTENNA	VUBA 9117	SWARZBECK
DC SOURCE	66319B	AGILENT
FILTER	WRCD1800/2000-0	WAINWRIGHTINSTRUMENTS
REFERENCE GENERATOR	CG-520	COM-POWER
RELAY UNIT	TS-RSP	ROHDE&SCHWARZ
RELAY UNIT	TS-RSP	ROHDE&SCHWARZ
RELAY UNIT	512670	SPINNER
SIGNAL GENERATOR	SMR 20	ROHDE&SCHWARZ
TEST RECEIVER	ESI 26	ROHDE&SCHWARZ

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9 TEST SETUP PHOTOGRAPHS

See "RH-37_test_setup_photographs.doc".

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