GSM1900 Test Report
For RM-1

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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 Finland/Tampere PL/P.O.Box 68 Visiokatu 6 FIN-33720 TAMPERE Tel: +358718040947 Fax: +358718046880
Contact person:	Tero Huhtala
Receipt of EUT:	2004-08-25
Date of testing:	2004-08-27
Date of report:	2004-08-27

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

Contents approved:

Heikki Keranen TCC manager

3 SUMMARY OF TEST RESULTS

Section in CFR 47	Section in RSS-133		Result
Error! Not a valid link.	6.2	**Error! Not a valid link.**	Pass

PASS The EUT passed that particular test
FAIL The EUT failed that particular test
X The measurement was done, 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
EUT	GSM1900 mobile phone	RM-1	004400271747394	D0795
Accessories	Battery	BL-5C	067040010717236414	D0797

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 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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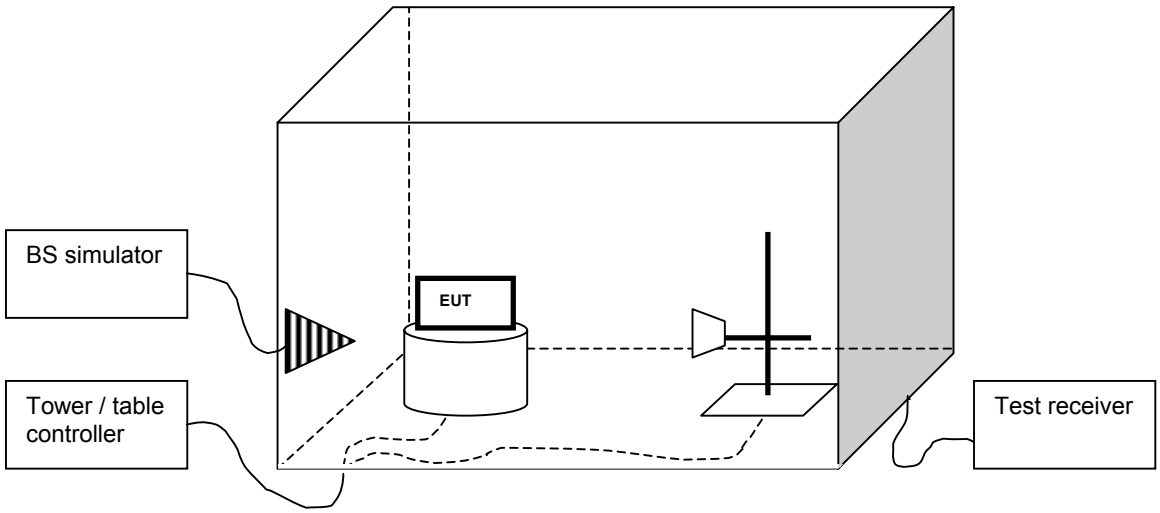
7 RADIATED RF OUTPUT POWER

EUT	D0795		
Accessories	D0797		
Temp, Humidity, Air Pressure	19.8 ºC	70RH%	999mbar
Date of measurement	2004-08-27		
FCC rule part	§24.232 (b)		
RSS-133 section	6.2		
Measured by	Tu Yuhua		
Result	PASS		

7.1 Test setup

The test setup was as in the block diagram below. 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 test receiver. 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 test receiver. That reading (P_{Subst_RX}) on test receiver was recorded.

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7.3 EUT operation mode

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

7.4 Limit

Watts, EIRP
≤ 2

7.5 Results

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

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

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]	Output power [dBm]	Output power [W]
512	-15	5	-37.54	5.34	8.78	30.98	1.247
661	-14.6	5	-37.16	5.44	8.80	30.92	1.235
810	-16.5	5	-37.39	5.48	8.83	29.24	0.839

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7.6 EUT operation mode

EUT operation mode	GPRS call mode, 2 time slot transmission
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]	Lcable(dB)	Antenna gain [dBi]	Output power [dBm]	Output power [W]
512	-16.05	5	-37.54	5.34	8.78	29.93	0.984
661	-17.23	5	-37.16	5.44	8.80	28.29	0.674
810	-18.95	5	-37.39	5.48	8.83	26.79	0.477

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7.9 EUT operation mode

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

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]	Output power [dBm]	Output power [W]
512	-23.10	5	-37.54	5.34	8.78	22.98	0.198
661	-23.16	5	-37.16	5.44	8.80	22.36	0.172
810	-23.90	5	-37.39	5.48	8.83	21.54	0.142

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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	WHKS2145-10SS	WAINWRIGHTINSTRUMENTS
FILTER	WHKS1000-3SS	WAINWRIGHTINSTRUMENTS
FILTER	WRCD1800/2000-0	WAINWRIGHTINSTRUMENTS
FILTER	WRCD1700/2000	WAINWRIGHTINSTRUMENTS
FILTER	WRCD900	WAINWRIGHTINSTRUMENTS
FILTER	WRCT2402	WAINWRIGHTINSTRUMENTS
FILTER	WRCA400/500	WAINWRIGHTINSTRUMENTS
FILTER	WRCD824	WAINWRIGHTINSTRUMENTS
FILTER	WRCD1750/1780	WAINWRIGHTINSTRUMENTS
FILTER	WRCD1850/1910	WAINWRIGHTINSTRUMENTS
FILTER	2*1 A	EPOCS
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 "RM-1_test_setup_photographs.doc".

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