FCC Part 22, 24 Test Report For QTLRH-60

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1 LABORATORY INFORMATION

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

2 CUSTOMER INFORMATION

Client:	Nokia Corporation Nokia Tower Pacific Century Place 2A, Gong Ti Bei Lu Chaoyang District, 100027 BEIJING, PRC Tel. +86 10 65392828 Fax. +86 10 65393838
Contact person:	Liu Haiping
Receipt of EUT:	18.05.2004
Date of testing:	19-20.05.2004
Date of report:	21.05.2004

The tests listed in this report have been done to demonstrate compliance with the applicable FCC rules in CFR 47 Part 24, Part 22.

Contents approved:

Tu Yuhua EMC Team Leader

3 SUMMARY OF TEST RESULTS

Section in CFR 47		Result
§24.232 (b)	Radiated RF output power	PASS
§22.913 (a)	Radiated RF output power	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	GSM850/GSM1900 mobile phone	RH-60	00100400/173551/4	D0783
Accessories	Battery	BL-5C	K422115070894	D0763

Notes: -

4.1 EUT description

The EUT is a dual band (850MHZ/1900MHZ) GSM 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 **Error! Reference source not found.**.

6 APPLICABLE STANDARDS

The tests were performed in guidance of CFR 47 part 24, part 22, part 2 and ANSI C63.4-1992. 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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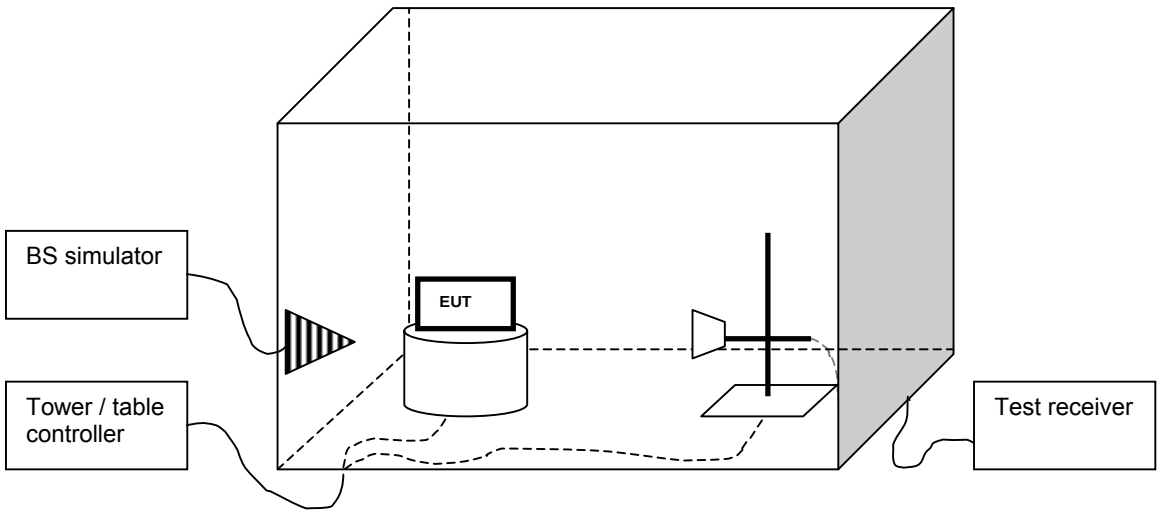
7 RADIATED RF OUTPUT POWER

EUT	D0783		
Accessories	D0763		
Temp, Humidity, Air Pressure	21-22 ºC	37-42RH%	984mbar
Date of measurement	05.19.2004		
FCC rule part	§24.232 (b)		
Measured by	Jia Dongsheng		
Result	Complies with FCC part 24.232 (b).		

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 spectrum analyzer was recorded.

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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)

7.3 Limit

Watts, EIRP
≤ 2

7.4 Results

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

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

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	Frequency [MHz]	Output power [dBm] (EIRP)	Output power [W](EIRP)
512	1850.2	30.45	1.1092
661	1880.0	32.45	1.7579
810	1909.7	31.35	1.3646

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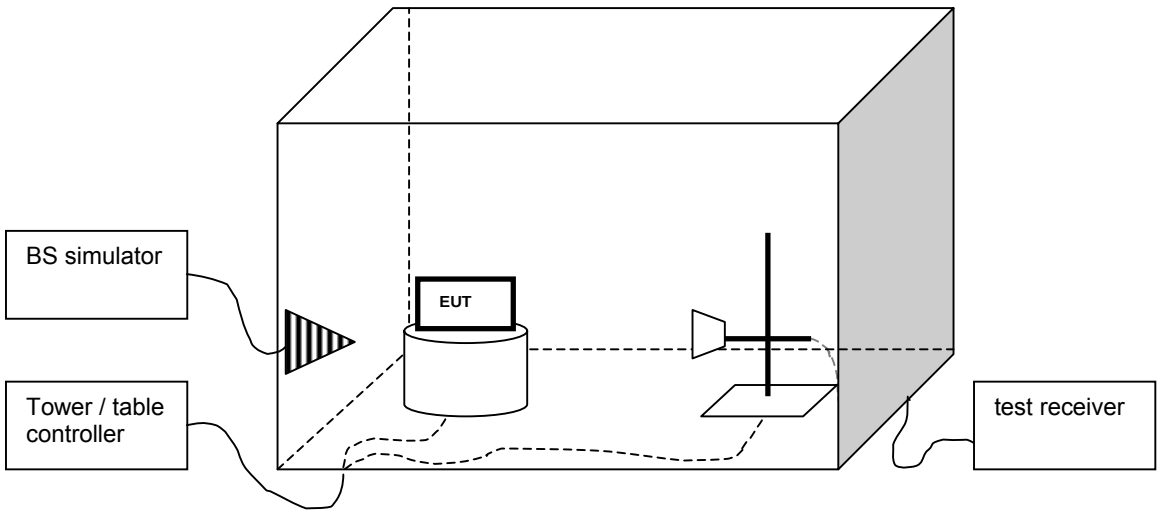
8 RADIATED RF OUTPUT POWER

EUT	D0783		
Accessories	D0763		
Temp, Humidity, Air Pressure	21-22 ºC	37-42RH%	984mbar
Date of measurement	05.19.2004		
FCC rule part	§22.913 (a)		
Measured by	Jia Dongsheng		
Result	Complies with FCC Part 22.913 (a).		

8.1 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.



8.2 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 spectrum analyzer was recorded.

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8.3 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission, PRBS 2E9-1 modulation
EUT channel	128,190,251
EUT TX power level	5 (+33dBm)

8.4 Limit

Watts, ERP
≤ 7

8.5 Results

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

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

where the variables are as follows:

$P_{EUT\ [dBm]}$ Measured power level (from step a in 8.2) from the EUT

$P_{Subst\_TX\ [dBm]}$ Power (from step c in 8.2) fed to the substituting antenna

$P_{Subst\_RX\ [dBm]}$ Power (from step c in 8.2) received with the test receiver

$G_{Substitute\_antenna\ [dB]}$ Gain of the substitutive antenna over dipole.

EUT Channel	Frequency [MHz]	Output power [dBm] (ERP)	Output power [W](ERP)
128	824.3	30.7	1.1749
190	836.6	31.0	1.2589
251	848.8	29.0	0.7943

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9 TEST EQUIPMENT

Each test equipment is calibrated once a year.

9.1 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

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TEST RECEIVER	ESI 26	ROHDE&SCHWARZ

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