TCC
Nokia

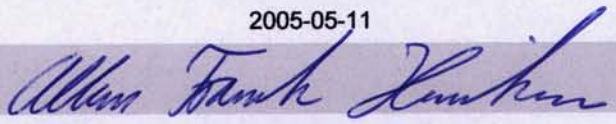
FINAS
Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

FCC Part 22/24 Compliance Test Report

Test Report no.:	Cph_FCC_0519_02.doc	**Date of Report:**	2005-05-11
Number of pages:	7	**Customer's Contact person:**	Thomas Reitmayer
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Client:**	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.: **IC recognition no.:**	99059 4820 and 4820-1		
Tested devices/ accessories:	**Phone; RM-77 (HW: V.9), Battery; BL-4C, Charger; AC-3, Headset; HS-23**		
FCC ID:	PPIRM-77X	**IC:**	661U-RM77
Supplement reports:			
Testing has been carried out in accordance with:	**CFR 47, FCC rules Parts 22 and 24, TIA-603-B-2002 and IC standards RSS-132 and RSS-133. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".**		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	**The EUT complies with the requirements in respect of all parameters subject to the test.** The test results relate only to devices specified in this document.		

Date and signature for the contents:

2005-05-11



Allan F. Henriksen
Test Engineer

1. Summary for FCC Part 22/24 Compliance Test Report

Date of receipt	2005-04-06
Testing completed	2005-06-02
The customer's contact person	Thomas Reitmayer
Test Plan referred to	\\satcc01nmp\tcc_salo\Projects\RM-77\testplans\EMC\TCC\HDJ12_RM77_official_EMC_test_plan.xls
Notes	Hw V.9
Document name	\\satcc01nmp\tcc_salo\Projects\RM-77\results\emc\FCC\Cph_FCC_0519_02.doc

1.1. EUT and Accessory Information

The EUT is a tri band (GSM850/1800/1900) mobile phone with GPRS and EGPRS and a camera. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RH-77	004400/63/179554/7	3830	-	3.03	28738
Battery	BL-4C	067038610717244311	-	-	-	28936
Headset	HS-23	0025	0.2	0.3	0.5	28941
Charger	AC-3	0675370409049 M02601 0000224	1.1	0.3	-	28736

1.2. Summary of Test Results

GSM 1900:

Section in CFR 47	Section in RSS-133	Name of the test	Result
§2.1046(a)	6.2	Conducted RF output power	NP
§24.232(b)	6.2	Radiated RF output power	PASSED
§2.1049(h)	5.6	99 % occupied bandwidth	NP
§24.238(a)	6.3	Band edge compliance	NP
§24.238(a), §2.1051	6.3	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.3	Spurious radiated emissions	NP
§2.1055(a)	7	Frequency stability, temperature variation	NP
§2.1055(d)	7	Frequency stability, voltage variation	NP

PASSED	The EUT complies with the essential requirements in the standard.
FAILED	The EUT does not comply with the essential requirements in the standard.
NP	The test was not performed by the TCC Nokia Copenhagen Laboratory.

TCC Nokia Copenhagen Laboratory
Frederikskaj
1790 COPENHAGEN V
DENMARK
Tel. +45 33 292929
Fax. +45 33 292934

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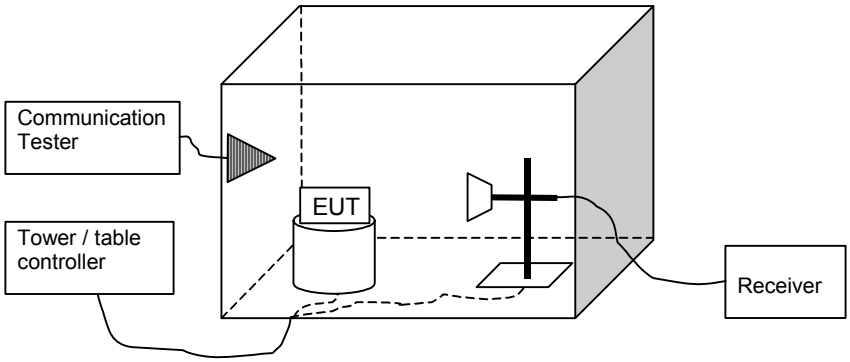
TCC Nokia Copenhagen Laboratory
Frederikskaj
1790 COPENHAGEN V
DENMARK
Tel. +45 33 292929
Fax. +45 33 292934

2. Radiated RF output power

(FCC §22.913(a), §24.232(b), RSS-132 6.4, RSS-133 6.2)

EUT with DUT number	RM-77 dut#28738
Accessories with DUT numbers	BL-4C dut#28936, AC-3 dut#28736, HS-23 dut#28941
Result	Passed
Remarks	V. 9
Temp °C / Humidity RH % / Air Pressure mbar	20.8 °C / 49.5 %RH / 1013 mbar
Date of measurements	2005-06-02
Measured by	Jesper Nielsen

2.1. Test setup



2.2. Test method and limit

The EUT was set on a non-conductive turntable, 80 cm high, in a semi-anechoic chamber with a reflective ground plane. In the corner of the chamber was a communication antenna, which was connected to the BS simulator located in the operators control room. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turntable were remotely controlled to turn the EUT, change the antenna polarization and hoist/lower the antenna. The scan height was from 1 to 4 meter. 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. The measuring distance was 3 meters.

The maximum power level was searched by moving the turntable and the measuring antenna and manipulating the EUT. The measurement was recorded. The worst-case radiated power (EIRP) was then calculated on the basis of a pre-calibrated power substitution measurement and reported.

TCC Nokia Copenhagen Laboratory
Frederikskaj
1790 COPENHAGEN V
DENMARK
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The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. P_{SUBST_TX} is signal generator level, P_{SUBST_RX} is receiver level, L_{SUBST_CABLES} is cable losses including both TX and RX cables and $G_{SUBST\_TX\_ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P\ [dBm] = P_{MEAS} + A_{CORRECTIONS}$$

Where P_{MEAS} is receiver reading in dBm and $A_{CORRECTIONS}$ is combined correction factor including cable loss and substitution correction ($A_{CORRECTIONS} = L_{CABLES} + A_{SUBST}$).

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
824 - 849	7	38.5
1850 - 1910	2	33

2.3. GSM 1900 Test results – phone open

GSM mode

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	30.10	1.023	42.80	HORIZONTAL	Passed
661	1880.000000	30.00	1.000	44.00	HORIZONTAL	Passed
810	1909.800000	29.30	0.851	44.00	HORIZONTAL	Passed

GPRS mode, 2 TX Slots

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	28.13	0.650	42.80	HORIZONTAL	Passed
661	1880.000000	28.90	0.776	44.00	HORIZONTAL	Passed
810	1909.800000	29.16	0.824	44.00	HORIZONTAL	Passed

EGPRS mode, 1 TX Slot

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	27.61	0.577	42.80	HORIZONTAL	Passed
661	1880.000000	28.25	0.668	44.00	HORIZONTAL	Passed
810	1909.800000	28.00	0.631	44.00	HORIZONTAL	Passed

TCC Nokia Copenhagen Laboratory
Frederikskaj
1790 COPENHAGEN V
DENMARK
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2.4. GSM 1900 Test results – phone closed

GSM mode – Phone closed

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	31.10	1.288	43.50	VERTICAL	Passed
661	1880.000000	31.10	1.288	43.30	VERTICAL	Passed
810	1909.800000	32.00	1.585	43.40	VERTICAL	Passed

GPRS mode, 2 TX Slots– Phone closed

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	30.10	1.023	43.50	VERTICAL	Passed
661	1880.000000	29.90	0.977	43.30	VERTICAL	Passed
810	1909.800000	29.70	0.933	43.40	VERTICAL	Passed

EGPRS mode, 1 TX Slot– Phone closed

Channel	Frequency [MHz]	EIRP [dBm]	EIRP [W]	$A_{CORRECTION}$ [dB]	Polarisation	Result
512	1850.200000	29.99	0.998	43.50	VERTICAL	Passed
661	1880.000000	29.80	0.955	43.30	VERTICAL	Passed
810	1909.800000	29.63	0.918	43.40	VERTICAL	Passed

TCC Nokia Copenhagen Laboratory
Frederikskaj
1790 COPENHAGEN V
DENMARK
Tel. +45 33 292929
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Test Equipment

2.5. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
14020	Programmable Relay Switching System	-	Pickering	15B,15C,22,24
18792	Multi Device Controller	2090	ETS-EMCO	15B,15C,22,24
13829	Turntable Controller	4630-100	Comtest	15B,15C,22,24
14963	RF Preamplifier 100MHz-4GHz (Metal Chassis)	AFS3-00100400	Miteq/NMP Cph	15B,15C,22,24
13668	BiLog Antenna 30-2000MHz	BiLog-CBL6112A	Chase	15B,15C,22,24
18861	EMI Test Receiver 20Hz-26,5GHz	ESI	Rohde&Schwarz	15B,15C,22,24
12679	Dual Log Periodic Antenna 1-18 GHz	HL025	Rohde&Schwarz	15B,15C,22,24
18860	Ultra Broadband Antenna Ultralog 30-3000MHz	HL562	Rohde&Schwarz	15B,15C,22,24
18773	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C,22,24
18774	Shielded Chamber	RFSD-F/A-100	ETS-Lindgren	15B,15C,22,24
18324	High Pass Filter 3GHz SMA f Conn	WHJS3000-10SS	Wainwright	15B,15C,22,24
14114	Highpass Filter 1000MHz-4500MHz	WHK1000-12SS	Wainwright	15B,15C,22,24
13918	Highpass Filter 2000-4000MHz 50OHM SMA Conn	WHKS2000-10SS	Wainwright Instruments	15B,15C,22,24
13937	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright Instruments	15B,15C,22,24
13936	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	15B,15C,22,24
13917	Highpass Filter 1000-3000MHz 50OHM SMA Conn	WHKS1000-10SS	Wainwright Instruments	15B,15C,22,24
14188	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright	15B,15C,22,24
14187	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright	15B,15C,22,24
16633	Ultra Stable Notch Filter 1880,0MHz	WRCD1880.0-0.2/40-10SS	Wainwright	15B,15C,22,24
18323	Band reject filter 1947-1953MHz 40dB	WRCG1947/1953-1940/1960-40/6SS	Wainwright	15B,15C,22,24
15190	Infra Red Remote Control Unit	4630	Emco	22,24,15B,15C
14993	EMI Test Receiver 9KHz-2750MHz	ESCS30	Rohde&Schwarz	22,24,15B,15C
15191	Turntable Contoller Unit	G-800SDX	YAESU	22,24,15B,15C
14900	Antenna Controller	HD100	HD GmbH	22,24,15B,15C

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DENMARK
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