TCC
Copenhagen

DANAK
Reg. Nr. 416

SAR Compliance Test Report

Test report no.:	DTX09206-EN	**Date of report:**	December 12, 2003
Template version:	1.0	**Number of pages:**	19
Testing laboratory:	TCC Copenhagen Nokia Danmark A/S Frederikskaj DK-1790 Copenhagen V Denmark Tel. +45 33 29 29 29 Fax. +45 33 29 20 01	**Client:**	Nokia Danmark A/S Frederikskaj DK-1790 Copenhagen V Denmark Tel. +45 33 29 29 29 Fax. +45 33 29 20 01
Responsible test engineer:	Leif Funch Klysner	**Product contact person:**	Anders Sv. Nielsen
Measurements made by:	Christian Andersen		
Tested devices:	RH-12		
FCC ID (USA):	QTKRH-12	**Industry Canada ID:**	661AD-RH12
Supplement reports:	-		

Testing has been carried out in accordance with:

47CFR §2.1093
Radiofrequency Radiation Exposure Evaluation: Portable Devices

FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)
Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

RSS-102
Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields

IEEE P1528/D1.2, April 21, 2003
Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques

Documentation: The documentation of the testing performed on the tested devices is archived for 15 years at TCC Copenhagen.

Test results: **The tested device complies with the requirements in respect of all parameters subject to the test.** The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.

Date and signatures: 12/12/2003

For the contents:

Ruben Chr. Hansen
Team Leader

Leif Funch Klysner
SAR Test Engineer

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	08/12/03 – 09/08/03
SN, HW, SW and DUT numbers of tested device	SN: 31160299 HW: 0420 SW: 1.75 DUT#232881
Accessories used in testing	Headset HDS-3, DUT#232400 Headset HDB-4, DUT#231980 MMC Card, DUT#232882
Notes	

1.2 Maximum Results

The maximum measured SAR values for Head configuration and Body Worn configuration are given in section 1.2.1 and 1.2.2 respectively. The device conforms to the requirements of the standard(s) when the maximum measured SAR value is less than or equal to the limit.

1.2.1 Head Configuration

Mode	Ch / f (MHz)	EIRP	Position	SAR limit (1g avg)	Measured SAR value (1g avg)	Result
GSM	661 / 1880.0	30.4 dBm	Left, Tilt Bluetooth active	1.6 W/kg	0.65 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / f (MHz)	EIRP	Separation distance	SAR limit (1g avg)	Measured SAR value (1g avg)	Result
GPRS	518 / 1851.4	30.4 dBm	1.5 cm Bluetooth active	1.6 W/kg	1.02 W/kg	PASSED

1.2.3 Maximum Drift

Maximum drift during measurements	-0.44 dB

1.2.4 Measurement Uncertainty

Extended Uncertainty (k=2) 95%	±29.1 %

2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

Device category	Portable
Exposure environment	General population
Unit type	Prototype unit

Modes and Bands of Operation	GSM 1900	GPRS (GSM)	BT
Modulation Mode	GMSK	GMSK	
Duty Cycle	1/8	2/8	
Transmitter Frequency Range (MHz)	1850.2 - 1909.8	1850.2 - 1909.8	2400.0 – 2483.5

Outside of USA and Canada, the transmitter of tested device is capable of operating also in GSM900 and GSM1800, which is not part of this filing.

2.1 Picture of Device

2.2 Description of the Antenna

The device has an internal PIFA antenna. (Plannar Inverted F Antenna)

2.3 Batteries

The device was measured with battery BL-5C.

2.4 Headsets

The device was measured with headsets HDS-3 and HDB-4.

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3. TEST CONDITIONS

3.1 Temperature and Humidity

Period of measurement:	08.12.2003 to 09.08.2003
Ambient temperature (°C):	22 ±1
Ambient humidity (RH %):	45 ±10

3.2 Test Signal, Frequencies, and Output Power

The device was put into operation by using Wavetek 4400 Call tester.
Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on low, middle and high channels.

Power output was measured by a separate accredited test laboratory on the same unit as used for SAR testing

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement system and components

The measurements were performed using an automated near-field scanning system, DASY 3 software version 3.1d, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements on the test device was the 'worst-case extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration expiry
DASY3 DAE3 V1	339	04/2004
E-field Probe ET3DV6R	1431	04/2004
Dipole Validation Kit, D1900V2 (Head)	5d026	02/2005
Dipole Validation Kit, D1900V2 (Body)	5d026	04/2005

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration expiry
Signal Generator	SME03	829444/023	10/2006
Amplifier	ZHL-42W	D091395-1	-
Power Meter	NRVD	833696/030	04/2004
Power Sensor	NRV-Z51	843275/004	12/2004
Call Tester	Wavetek 4400M	0411216	-
Vector Network Analyzer	AT8753ES	MY40001091	09/2004
Dielectric Probe Kit	HP85070B	US33020403	-

4.1.1 Isotropic E-field probe 1431

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix A
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms