

SAR Compliance Test Report

Test report no.:	Not numbered	Date of report:	2003-07-24
Number of pages:	45	Contact person:	Pentti Pärnänen
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Tested devices: **P7QNPM-7**
(Detailed information for each device is listed in section 1)

Supplement reports:

Testing has been carried out in accordance with:

47CFR §2.1093
Radiofrequency Radiation Exposure Evaluation: Portable Devices

IEEE P1528-200X Draft 6.4
Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques

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

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

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: 2003-07-24
For the contents:


Jorma Hanni
Process Development Manager


Kai Niskala
Test Engineer

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1. SUMMARY FOR SAR TEST REPORT

Date of test	2003-07-14, 2003-07-15
Contact person	Pentti Pärnänen
Test plan referred to	
FCC ID	P7QNPM-7
SN, HW and SW numbers of tested device	SN: 004400/06/178570/3, HW: B7, SW: 700.00
Accessories used in testing	Headset: HSV-A, battery BLZ-2, leather holster case – version 2 abs
Notes	
Document code	DTX 07770-EN
Responsible test engineer	Jorma Hanni
Measurement performed by	Kai Niskala

1.1 Maximum Results Found during SAR Evaluation

The equipment is deemed to fulfil the requirements if the measured values are less than or equal to the limit.

1.1.1 Head Configuration

Ch / f (MHz)	Power EIRP	Position	Limit	Measured	Result
661/1880.00	29.3 dBm	Left tilted	1.6 W/kg	0.41 W/kg	PASSED

1.1.2 Body Worn Configuration

Ch / f (MHz)	Power EIRP	Accessories	Limit	Measured	Result
512/1850.20	28.9 dBm	Leather holster case headset HSV-A	1.6 W/kg	0.11 W/kg	PASSED

1.1.3 Measurement Uncertainty

Combined Standard Uncertainty	± 13.6%
Expanded Standard Uncertainty (k=2)	± 27.1%

2. DESCRIPTION OF TESTED DEVICE

Device category	Portable device
Exposure environment	Uncontrolled exposure
Unit type	Prototype unit
Case type	Fixed case
Modes of Operation	GSM1900
Modulation Mode	Gaussian Minimum Shift Keying
Duty Cycle	1/8
Transmitter Frequency Range (MHz)	1850.2 - 1909.8

Outside of USA, transmitter of tested device is capable of operating also in GSM900 mode, which is not part of this filing.

2.1 Picture of Phone



2.2 Description of the Antenna

Type	Internal integrated antenna	
Dimensions (mm)	Maximum width	35.90 mm
	Maximum length	18.00 mm
Location	Inside the back cover, near the top of the device	

2.3 Battery Options

There is only one battery option, BLZ-2, available for tested device.

2.4 Body Worn Accessories

Compliance to the FCC body-worn RF exposure guidelines was measured using Twin SAM v4.0 flat phantom region. Following body worn accessory is available for P7QNPM-7: leather holster case - version 2 abs.



3. TEST CONDITIONS

3.1 Ambient Conditions

Ambient temperature (°C)	22±2
Tissue simulating liquid temperature (°C)	22±1
Humidity	43

3.2 RF characteristics of the test site

Tests were performed in an enclosed RF shielded environment.

3.3 Test Signal, Frequencies, and Output Power

The device was controlled by using a radio tester. Communication between the device and the tester was established by air link.

The measurements were performed on lowest, middle and highest channels.

The phone was set to maximum power level during the all tests and at the beginning of the each test the battery was fully charged. Power output was measured by A2LA accredited test laboratory, M.Flom Associates Inc., on the same unit used in SAR testing.

DASY4 system measures power drift during SAR testing by comparing e-field in the same location at the beginning and at the end of measurement. These records were used to monitor stability of power output.

4. DESCRIPTION OF THE TEST EQUIPMENT

The measurements were performed with an automated near-field scanning system, DASY4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland.

Test Equipment	Serial Number	Due Date
DAE V1	555	03/04
E-field Probe ET3DV6	1765	04/04
Dipole Validation Kit, D1900V2	5d030	04/05

E-field probe calibration records are presented in Appendix C.

Additional equipment needed in validation

Test Equipment	Model	Serial Number	Due Date
Signal Generator	HP 8657B	3630U08114	04/04
Amplifier	Amplifier Research 5S1G4	306024	-
Power Meter	R&S NRT	101143	03/04
Power Sensor	R&S NRT-Z43	100239	03/04
Thermometer	Fluke 52 II	82810048	-
Network Analyzer	HP 8753D	3410A08934	05/04
Dielectric Probe Kit	Agilent 85070D	US01440162	-

4.1 System Accuracy Verification

The probes are calibrated annually by the manufacturer. Dielectric parameters of the simulating liquids are measured using a dielectric probe kit and a network analyzer.

The SAR measurement of the DUT were done within 24 hours of system accuracy verification, which was done using the dipole validation kit.

The dipole antenna, which is manufactured by Schmid & Partner Engineering AG, is matched to be used near flat phantom filled with tissue simulating solution. Dipole length for 1900 MHz is 68 mm with overall height of 300mm. A specific distance holder is used in the positioning of antenna to ensure correct spacing between the phantom and the dipole. Manufacturer's reference dipole data is presented in Appendix C.

Power level of 250 mW was supplied to a dipole antenna placed under the flat section of SAM phantom. The validation results are in the table below and printout of the validation test is presented in Appendix A. All the measured parameters were within the specification.

Tissue	f (MHz)	Description	SAR (W/kg), 1g	Dielectric Parameters		Temp (°C)
				ϵ_r	σ (S/m)	
Head	1900	Measured 07/14/03	10.8	39.8	1.45	22
		Reference Result	10.5	38.8	1.44	N/A
Muscle	1900	Measured 07/15/03	10.1	52.3	1.55	22
		Reference Result	10.7	51.2	1.59	N/A

4.2 Tissue Simulants

All dielectric parameters of tissue simulants were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the ear reference point of the phantom was 15cm $\pm$ 5mm during all the tests. Volume for each tissue simulant was 26 liters.

4.2.1 Head Tissue Simulant

The composition of the brain tissue simulating for 1900MHz is

44.91% 2-(2-butoxyethoxy) Ethanol

54.88% De-Ionized Water

0.21% Salt

f (MHz)	Description	Dielectric Parameters		Temp (°C)
		ϵ_r	σ (S/m)	
1880	Measured 07/14/03	39.9	1.43	22
	Recommended Values	40.0	1.40	20-26

Recommended values are adopted from OET Bulletin 65 (97-01) Supplement C (01-01).

4.2.2 Muscle Tissue Simulant

The composition of the muscle tissue simulating liquid for 1900MHz is

69.02% De-Ionized Water

30.76% Diethylene Glycol Monobutyl Ether

0.22% Salt

f (MHz)	Description	Dielectric Parameters		Temp (°C)
		ϵ_r	σ (S/m)	
1880	Measured 07/15/03	52.4	1.53	22
	Recommended Values	53.3	1.52	20-26

Recommended values are adopted from OET Bulletin 65 (97-01) Supplement C (01-01).

4.3 Phantoms

"SAM v4.0" phantom", manufactured by SPEAG, was used during the measurement. It has fiberglass shell integrated in a wooden table. The shape of the shell corresponds to the phantom defined by SCC34-SC2. It enables the dosimetric



evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

The thickness of phantom shell is 2 mm except for the ear, where an integrated ear spacer provides a 6 mm spacing from the tissue boundary. Manufacturer reports tolerance in shell thickness to be $\pm 0.1\text{mm}$.

4.4 Isotropic E-Field Probe ET3DV6

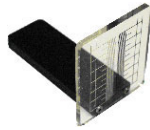
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 $\mu\text{W/g}$ 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



5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Test Positions

The device was placed in holder using a special positioning tool, which aligns the bottom of the device with holder and ensures that holder contacts only to the sides of the device. After positioning is done, tool is removed. This method provides standard positioning and separation, and also ensures free space for antenna.



Device holder was provided by SPEAG together with DASY4.

5.1.1 Against Phantom Head

Measurements were made on both the "left hand" and "right hand" side of the phantom.

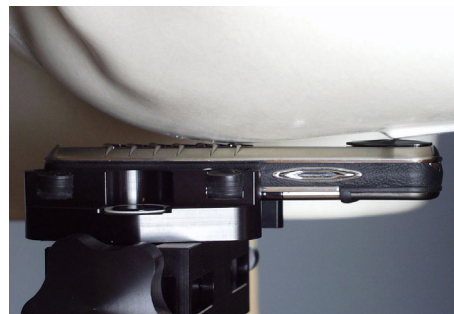
The device was positioned against phantom according to OET Bulletin 65 (97-01) Supplement C (01-01) . Definitions of terms used in aligning the device to a head phantom are available in IEEE Draft Standard P1528-2001 "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

5.1.1.1 Initial Ear Position

The device was initially positioned with the earpiece region pressed against the ear spacer of a head phantom parallel to the "Neck-Front" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".

5.1.1.2 Cheek Position

"Initial ear position" alignments are maintained and the device is brought toward the mouth of the head phantom by pivoting along the "Neck-Front" line until any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom or when any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.



5.1.1.3 Tilt Position

In the “Cheek Position”, if the earpiece of the device is not in full contact with the phantom’s ear spacer and the peak SAR location for the “cheek position” is located at the ear spacer region or corresponds to the earpiece region of the handset, the device is returned to the “initial ear position” by rotating it away from the mouth until the earpiece is in full contact with the ear spacer. Otherwise, the device is moved away from the cheek perpendicular to the line passes through both “ear reference points” for approximate 2-3 cm. While it is in this position, the device is tilted away from the mouth with respect to the “test device reference point” by 15°. After the tilt, it is then moved back toward the head perpendicular to the line passes through both “ear reference points” until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process is repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously.



5.1.2 Body Worn Configuration

Body worn accessory “leather holster case – version 2 abs” was tested for the FCC RF exposure compliance. P7QNPM-7 was positioned into holster case and placed below the flat phantom. Headset HSV-A was connected during measurements. Holster case is designed so that phone fits in only one position when headset is connected, i.e. the antenna facing away from the phantom. Backside of the holster case is in touch with the phantom.



5.2 Scan Procedures

First coarse scans are used for quick determination of the field distribution. Next a cube scan, 5x5x7 points; spacing between each point 7.5x7.5x5 mm, is performed around the highest E-field value to determine the averaged SAR-distribution over 1g.

5.3 SAR Averaging Methods

The maximum SAR value is averaged over its volume using interpolation and extrapolation.

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot" -condition [W. Gander, Computermathematik, p. 141-150] (x, y and z -directions) [Numerical Recipes in C, Second Edition, p 123].

The extrapolation is based on least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 30 mm in all z-axis, polynomials of order four are calculated. This polynomial is then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1mm from one another.

6. MEASUREMENT UNCERTAINTY

6.1 Description of Individual Measurement Uncertainty

6.1.1 Assessment Uncertainty

Uncertainty Component	P1528 Sec	Tol. (%)	Prob Dist	Div	c_i	u_i (%)	v_i
Measurement System							
Probe Calibration	E2.1	±4.8	N	1	1	±4.8	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±1.0	R	√3	1	±0.6	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Readout Electronics	E2.6	±1.0	N	1	1	±1.0	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.4	R	√3	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	E6.3	±2.9	R	√3	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5.2	±1.0	R	√3	1	±0.6	∞
Test sample Related							
Test Sample Positioning	E4.2.1	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±10.0	R	√3	1	±5.8	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Liquid Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Liquid Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Liquid Permittivity Target tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Liquid Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			±13.6	161
Coverage Factor for 95%			k=2				
Expanded Standard Uncertainty						±27.1	

7. RESULTS

Corresponding SAR distribution printouts of maximum results in every position are shown in Appendix B. It also includes Z-plots of maximum measurement results in head and body worn configurations. The SAR distributions are substantially similar or equivalent to the plots submitted regardless of used channel in each mode and position. The coarse scans used in the head configuration measurements cover the whole head region.

7.1 Head Configuration

Mode	Channel/ f (MHz)	Power EIRP (dBm)	SAR, averaged over 1g (W/kg)			
			Left-hand		Right-hand	
			Cheek	Tilted	Cheek	Tilted
GSM 1900	512/1850.20	28.9		0.39		
	661/1880.00	29.3	0.37	0.41	0.33	0.31
	810/1909.80	30.0		0.40		

7.2 Body Worn Configuration

Mode	Channel/ f (MHz)	Power EIRP (dBm)	SAR, averaged over 1g (W/kg)
			Leather holster case
GSM 1900	512/1850.20	28.9	0.11
	661/1880.00	29.3	0.07
	810/1909.80	30.0	0.04

APPENDIX A.

Validation Test Printouts

Date/Time: 07/14/03 08:26:45

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d030

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900 ($\sigma = 1.45415$ mho/m, $\epsilon_r = 39.7664$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Head 1900, t=21.5 C/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 96.4 V/m

Power Drift = 0.003 dB

Maximum value of SAR = 12.6 mW/g

Head 1900, t=21.5 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

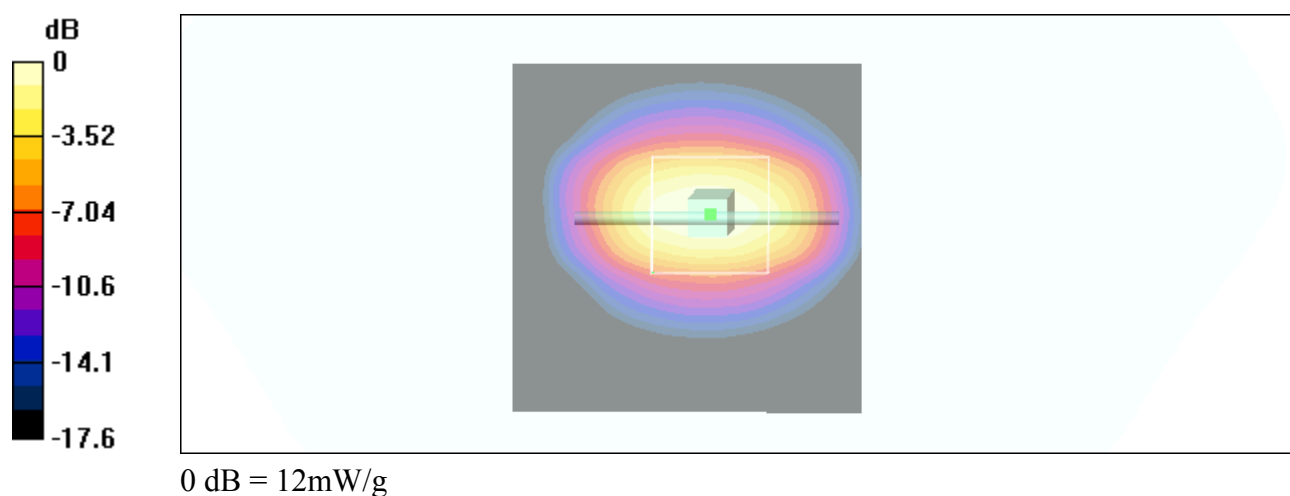
Peak SAR (extrapolated) = 19.2 W/kg

SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.59 mW/g

Reference Value = 96.4 V/m

Power Drift = 0.003 dB

Maximum value of SAR = 12 mW/g



Date/Time: 07/15/03 08:25:17

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d030

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: BSL1900 ($\sigma = 1.54687$ mho/m, $\epsilon_r = 52.3246$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(4.9, 4.9, 4.9); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Muscle 1900, t=22.2 C/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 91.2 V/m

Power Drift = 0.0003 dB

Maximum value of SAR = 11.9 mW/g

Muscle 1900, t=22.2 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

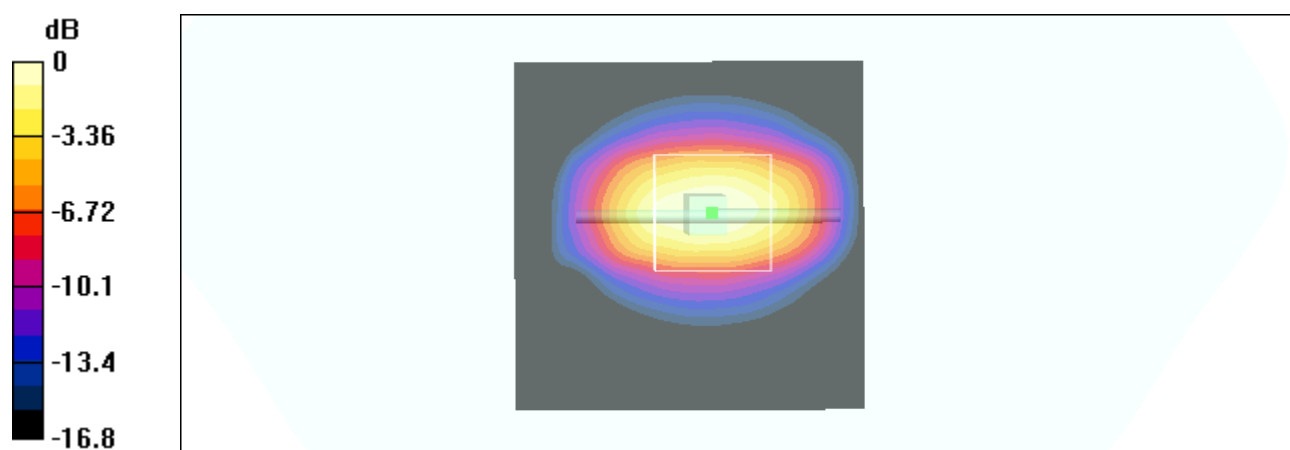
Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.28 mW/g

Reference Value = 91.2 V/m

Power Drift = 0.0003 dB

Maximum value of SAR = 11.4 mW/g



0 dB = 11.4mW/g

APPENDIX B.

SAR Distribution Printouts

Date/Time: 07/14/03 09:57:14

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type: NPM-7; Serial: 004400/06/178570/3

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900 ($\sigma = 1.43358$ mho/m, $\epsilon_r = 39.8925$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek, t= 21.2 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 16.7 V/m

Power Drift = -0.3 dB

Maximum value of SAR = 0.375 mW/g

Cheek, t= 21.2 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

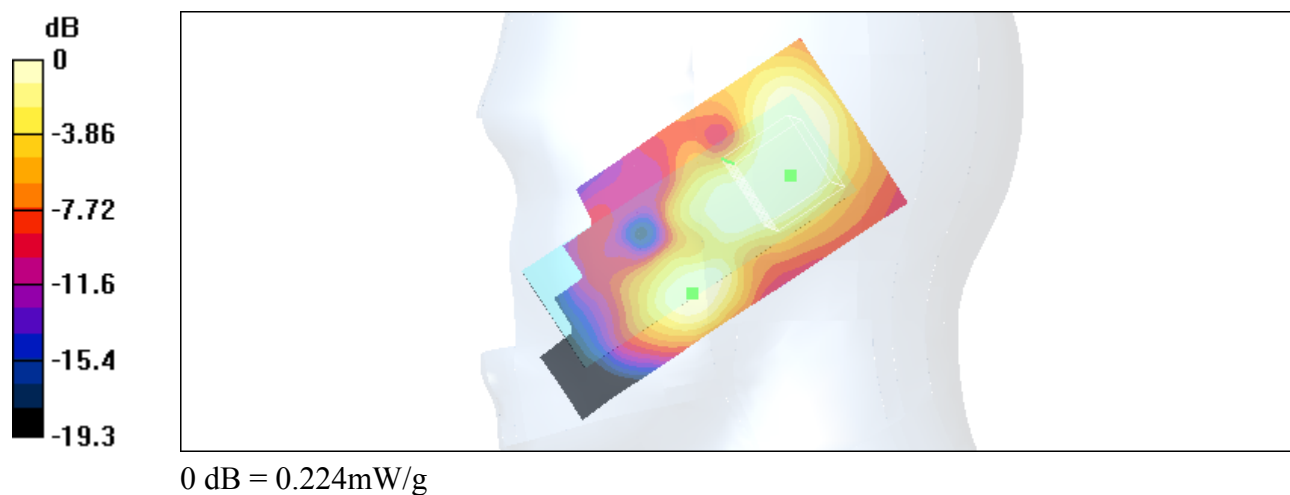
Peak SAR (extrapolated) = 0.811 W/kg

SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.186 mW/g

Reference Value = 16.7 V/m

Power Drift = -0.3 dB

Maximum value of SAR = 0.377 mW/g



Date/Time: 07/14/03 10:54:24

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type: NPM-7; Serial: 004400/06/178570/3

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900 ($\sigma = 1.43358$ mho/m, $\epsilon_r = 39.8925$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilted, t= 21.4 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 14.4 V/m

Power Drift = -0.004 dB

Maximum value of SAR = 0.456 mW/g

Tilted, t= 21.4 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

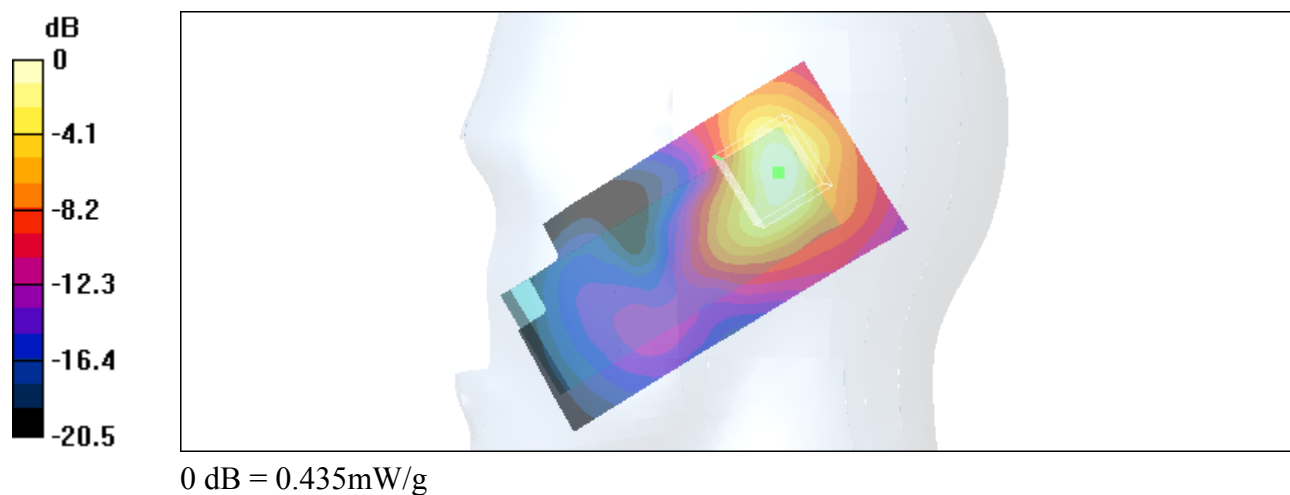
Peak SAR (extrapolated) = 0.927 W/kg

SAR(1 g) = 0.406 mW/g; SAR(10 g) = 0.195 mW/g

Reference Value = 14.4 V/m

Power Drift = -0.004 dB

Maximum value of SAR = 0.435 mW/g



Date/Time: 07/14/03 13:57:26

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type: NPM-7; Serial: 004400/06/178570/3

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900 ($\sigma = 1.43358$ mho/m, $\epsilon_r = 39.8925$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek, t= 21.7 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.2 V/m

Power Drift = -0.05 dB

Maximum value of SAR = 0.337 mW/g

Cheek, t= 21.7 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

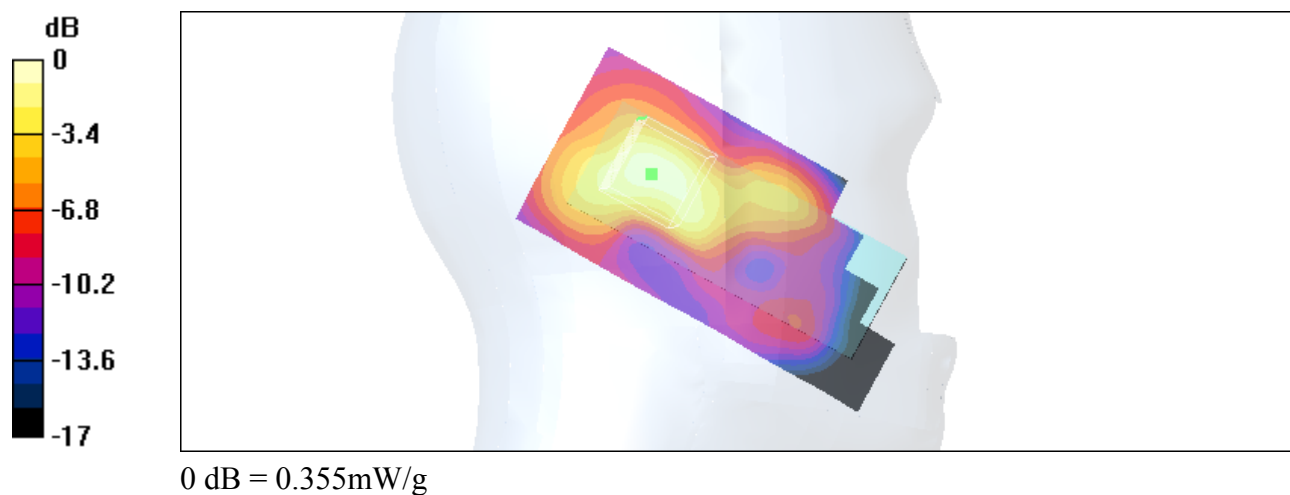
Peak SAR (extrapolated) = 0.631 W/kg

SAR(1 g) = 0.329 mW/g; SAR(10 g) = 0.174 mW/g

Reference Value = 15.2 V/m

Power Drift = -0.05 dB

Maximum value of SAR = 0.355 mW/g



Date/Time: 07/14/03 12:11:01

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P/QNPM-7; Type: NPM-7; Serial: 004400/06/178570/3

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900 ($\sigma = 1.43358$ mho/m, $\epsilon_r = 39.8925$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilted, t= 21.6 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 13.9 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.336 mW/g

Tilted, t= 21.6 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

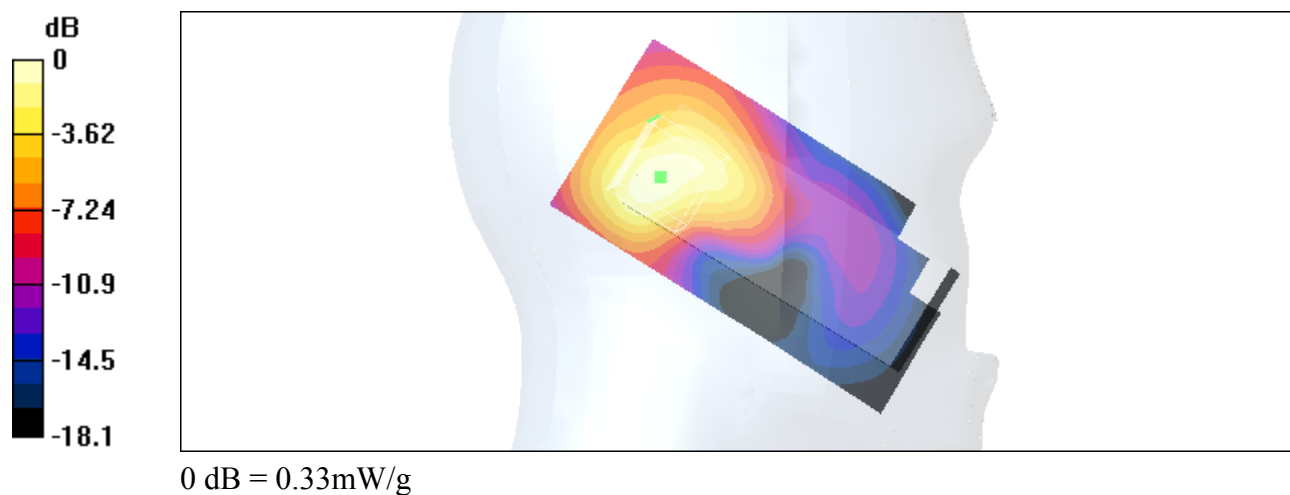
Peak SAR (extrapolated) = 0.703 W/kg

SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.161 mW/g

Reference Value = 13.9 V/m

Power Drift = -0.1 dB

Maximum value of SAR = 0.33 mW/g



Date/Time: 07/15/03 09:13:01

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type:NPM-7; Serial: 004400/06/178570/3; Headset: HSV-A; Leather holster case - version 2 abs

Communication System: DCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: BSL1900 ($\sigma = 1.49546$ mho/m, $\epsilon_r = 52.5549$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(4.9, 4.9, 4.9); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body worn, t=22.1 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid:

dx=15mm, dy=15mm

Reference Value = 8.71 V/m

Power Drift = 0.009 dB

Maximum value of SAR = 0.127 mW/g

Body worn, t=22.1 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

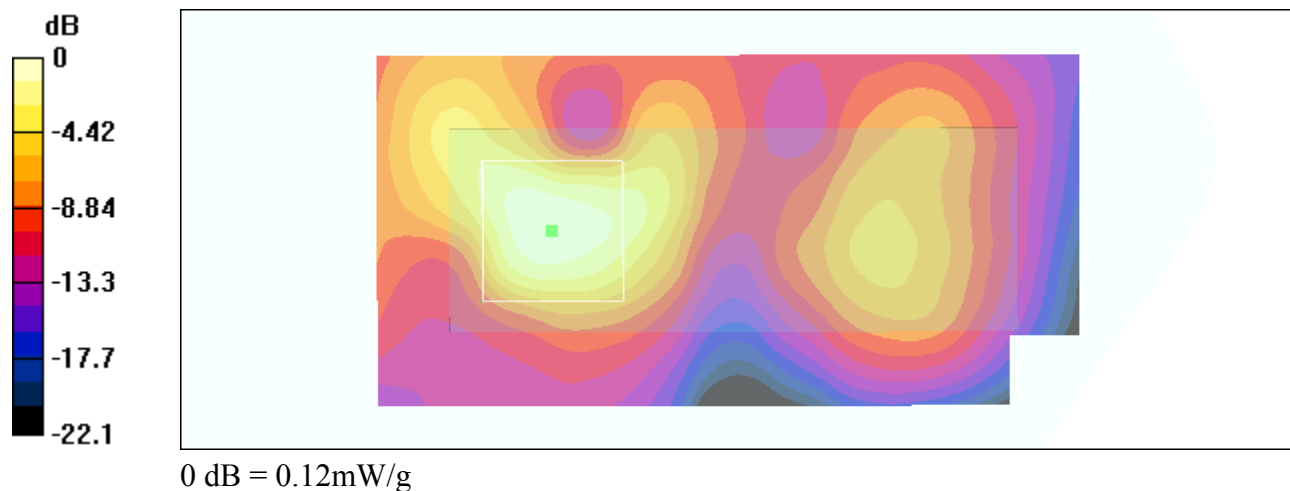
Peak SAR (extrapolated) = 0.231 W/kg

SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.057 mW/g

Reference Value = 8.71 V/m

Power Drift = 0.009 dB

Maximum value of SAR = 0.12 mW/g



Date/Time: 07/14/03 10:54:24

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type: NPM-7; Serial: 004400/06/178570/3

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900 ($\sigma = 1.43358$ mho/m, $\epsilon_r = 39.8925$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(5.2, 5.2, 5.2); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilted, t= 21.4 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 14.4 V/m

Power Drift = -0.004 dB

Maximum value of SAR = 0.456 mW/g

Tilted, t= 21.4 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

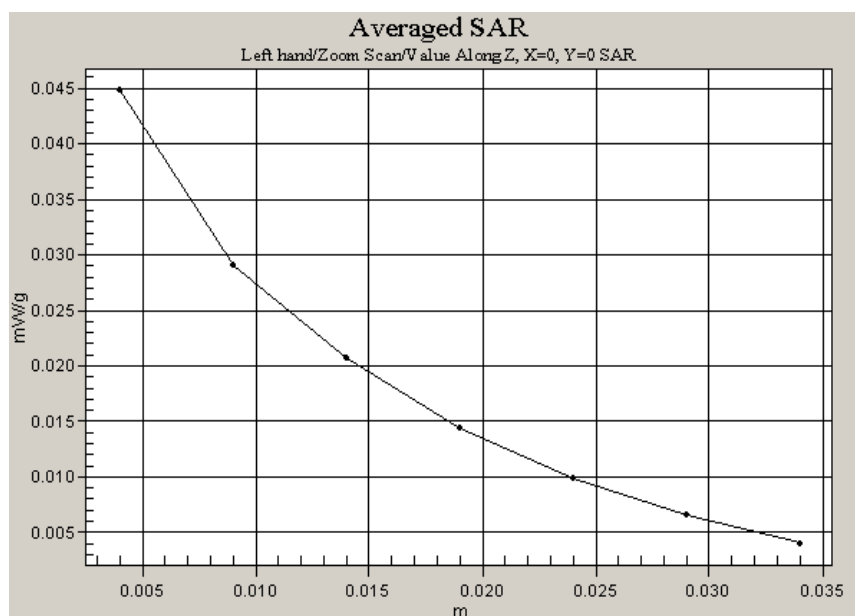
Peak SAR (extrapolated) = 0.927 W/kg

SAR(1 g) = 0.406 mW/g; SAR(10 g) = 0.195 mW/g

Reference Value = 14.4 V/m

Power Drift = -0.004 dB

Maximum value of SAR = 0.435 mW/g



Date/Time: 07/15/03 09:13:01

Test Laboratory: Nokia Mobile Phones, Oulu; DTX07770-EN

DUT: P7QNPM-7; Type:NPM-7; Serial: 004400/06/178570/3; Headset: HSV-A; Leather holster case - version 2 abs

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3

Medium: BSL1900 ($\sigma = 1.49546$ mho/m, $\epsilon_r = 52.5549$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1765; ConvF(4.9, 4.9, 4.9); Calibrated: 16.04.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn555; Calibrated: 06.03.2003
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1215
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body worn, t=22.1 C, worst case extrapolation/Area Scan (51x101x1): Measurement grid:

dx=15mm, dy=15mm

Reference Value = 8.71 V/m

Power Drift = 0.009 dB

Maximum value of SAR = 0.127 mW/g

Body worn, t=22.1 C, worst case extrapolation/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Peak SAR (extrapolated) = 0.231 W/kg

SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.057 mW/g

Reference Value = 8.71 V/m

Power Drift = 0.009 dB

Maximum value of SAR = 0.12 mW/g

