

## SAR Compliance Test Report

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |                                                                                                                                           |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Test report no.:                                 | Cph_0449_2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Date of report:         | December 20, 2004                                                                                                                         |
| Template version:                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number of pages:        | 20                                                                                                                                        |
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| Measurements made by:                            | Leif Funch Klysner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                                                                                                                           |
| Tested device:                                   | RHV-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                                                                                                                                           |
| FCC ID:                                          | P7QRHV-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | IC:                     | 4299A-RHV5                                                                                                                                |
| Supplement reports:                              | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                                                                                                                           |
| Testing has been carried out in accordance with: | <p>47CFR §2.1093<br/>Radiofrequency Radiation Exposure Evaluation: Portable Devices</p> <p>FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)<br/>Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields</p> <p>RSS-102<br/>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</p> <p>IEEE 1528 - 2003<br/>IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques</p> |                         |                                                                                                                                           |
| 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: December 21, 2004

For the contents:

  
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Test Engineer

SAR Report  
Cph\_0449\_2  
Applicant: Nokia Corporation

Type: RHV-5

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## CONTENTS

|                                                                              |           |
|------------------------------------------------------------------------------|-----------|
| <b>1. SUMMARY OF SAR TEST REPORT.....</b>                                    | <b>3</b>  |
| 1.1 TEST DETAILS.....                                                        | 3         |
| 1.2 MAXIMUM RESULTS.....                                                     | 3         |
| 1.2.1 Head Configuration.....                                                | 3         |
| 1.2.2 Body Worn Configuration .....                                          | 3         |
| 1.2.3 Maximum Drift .....                                                    | 3         |
| 1.2.4 Measurement Uncertainty .....                                          | 3         |
| <b>2. DESCRIPTION OF THE DEVICE UNDER TEST .....</b>                         | <b>4</b>  |
| 2.1 PICTURE OF THE DEVICE.....                                               | 4         |
| 2.2 DESCRIPTION OF THE ANTENNA .....                                         | 4         |
| <b>3. TEST CONDITIONS .....</b>                                              | <b>5</b>  |
| 3.1 TEMPERATURE AND HUMIDITY .....                                           | 5         |
| 3.2 TEST SIGNAL, FREQUENCIES, AND OUTPUT POWER .....                         | 5         |
| <b>4. DESCRIPTION OF THE TEST EQUIPMENT .....</b>                            | <b>5</b>  |
| 4.1 MEASUREMENT SYSTEM AND COMPONENTS .....                                  | 5         |
| 4.1.1 Isotropic E-field Probe ET3DV6 .....                                   | 6         |
| 4.2 PHANTOMS .....                                                           | 7         |
| 4.3 SIMULATING LIQUIDS .....                                                 | 7         |
| 4.3.1 Liquid Recipes.....                                                    | 7         |
| 4.3.2 Verification of the System.....                                        | 8         |
| 4.3.3 Tissue Simulants used in the Measurements.....                         | 9         |
| <b>5. DESCRIPTION OF THE TEST PROCEDURE .....</b>                            | <b>11</b> |
| 5.1 DEVICE HOLDER.....                                                       | 11        |
| 5.2 TEST POSITIONS.....                                                      | 11        |
| 5.2.1 Against Phantom Head.....                                              | 11        |
| 5.2.2 Body Worn Configuration .....                                          | 12        |
| 5.3 SCAN PROCEDURES.....                                                     | 13        |
| 5.4 SAR AVERAGING METHODS.....                                               | 13        |
| <b>6. MEASUREMENT UNCERTAINTY .....</b>                                      | <b>14</b> |
| <b>7. RESULTS .....</b>                                                      | <b>15</b> |
| <b>APPENDIX A: VALIDATION SCANS .....</b>                                    | <b>17</b> |
| <b>APPENDIX B: MEASUREMENT SCANS.....</b>                                    | <b>18</b> |
| <b>APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S) .....</b>     | <b>19</b> |
| <b>APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S) .....</b> | <b>20</b> |

## 1. SUMMARY OF SAR TEST REPORT

### 1.1 Test Details

|                                        |                                                              |
|----------------------------------------|--------------------------------------------------------------|
| Period of test                         | November 16, 2004 – November 26, 2004                        |
| SN, HW and SW numbers of tested device | IMEI: 004400/12/179245/9 HW: B4 SW: 4.4300<br>DUT#28790      |
| Batteries used in testing              | BL-4V, DUT#28791, DUT#28792, DUT#28793, DUT#28794, DUT#28795 |
| Headsets used in testing               | HSL-4, DUT#28799                                             |
| Other accessories used in testing      | Leather case BH3-BL01, DUT#28789                             |
| State of sample                        | Prototype unit                                               |
| 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) | ERP/EIRP | Position     | SAR limit (1g avg) | Measured SAR value (1g avg) | Result        |
|---------|--------------|----------|--------------|--------------------|-----------------------------|---------------|
| GSM850  | 128 / 824.2  | 31.3 dBm | Right, Cheek | 1.6 W/kg           | 0.35 W/kg                   | <b>PASSED</b> |
| GSM1900 | 810 / 1909.8 | 30.9 dBm | Right, Tilt  | 1.6 W/kg           | 0.55 W/kg                   | <b>PASSED</b> |

#### 1.2.2 Body Worn Configuration

| Mode     | Ch / f (MHz) | ERP/EIRP | Separation distance | SAR limit (1g avg) | Measured SAR value (1g avg) | Result        |
|----------|--------------|----------|---------------------|--------------------|-----------------------------|---------------|
| GPRS850  | 190 / 836.6  | 32.6 dBm | 1.5 cm              | 1.6 W/kg           | 0.90 W/kg                   | <b>PASSED</b> |
| GPRS1900 | 810 / 1909.8 | 30.9 dBm | 1.5 cm              | 1.6 W/kg           | 0.79 W/kg                   | <b>PASSED</b> |

#### 1.2.3 Maximum Drift

|                                   |         |
|-----------------------------------|---------|
| Maximum drift during measurements | 0.28 dB |
|-----------------------------------|---------|

#### 1.2.4 Measurement Uncertainty

|                                |          |
|--------------------------------|----------|
| Extended Uncertainty (k=2) 95% | ± 29.8 % |
|--------------------------------|----------|

## 2. DESCRIPTION OF THE DEVICE UNDER TEST

|                      |                                 |
|----------------------|---------------------------------|
| Device category      | Portable                        |
| Exposure environment | General population/uncontrolled |

|                                   |               |                 |                                    |                                    |                 |
|-----------------------------------|---------------|-----------------|------------------------------------|------------------------------------|-----------------|
| Modes and Bands of Operation      | GSM 850       | GSM 1900        | GPRS (GSM)                         | EGPRS(EDGE)                        | BT              |
| Modulation Mode                   | GMSK          | GMSK            | GMSK                               | 8PSK                               | GFSK            |
| Duty Cycle                        | 1/8           | 1/8             | 1/8 or 2/8                         |                                    |                 |
| Transmitter Frequency Range (MHz) | 824.2 – 848.8 | 1850.2 - 1909.8 | 824.2 – 848.8 /<br>1850.2 - 1909.8 | 824.2 – 848.8 /<br>1850.2 - 1909.8 | 2400.0 – 2483.5 |

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

EGPRS mode was not measured, because maximum averaged output power is more than 3 dB lower in EGPRS mode than in GPRS mode.

### 2.1 Picture of the Device



### 2.2 Description of the Antenna

The device has an internal patch antenna.

### 3. TEST CONDITIONS

#### 3.1 Temperature and Humidity

|                                     |                         |
|-------------------------------------|-------------------------|
| Period of measurement (dd.mm.yyyy): | 16.11.2004 – 26.11.2004 |
| Ambient temperature (°C):           | 21.0 – 21.8             |
| Ambient humidity (RH %):            | 45 ±10                  |

#### 3.2 Test Signal, Frequencies, and Output Power

The device was put into operation by using a 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 lowest, middle and highest channels.

The power output was measured by a separate 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 4 software version 4.4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements on the device was the 'worst-case extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

| Test Equipment                 | Serial Number | Calibration interval | Calibration expiry |
|--------------------------------|---------------|----------------------|--------------------|
| DAE3                           | 339           | 12 months            | 08/2005            |
| DAE3                           | 573           | 12 months            | 09/2005            |
| E-field Probe ET3DV6           | 1813          | 12 months            | 09/2005            |
| E-field Probe ET3DV6           | 1808          | 12 months            | 06/2005            |
| Dipole Validation Kit, D835V2  | 476           | 24 months            | 02/2005            |
| Dipole Validation Kit, D1900V2 | 5d026         | 24 months            | 02/2005            |

Additional test equipment used in testing:

| Test Equipment          | Model    | Serial Number | Calibration interval | Calibration expiry |
|-------------------------|----------|---------------|----------------------|--------------------|
| Signal Generator        | SMIQ03B  | 826046/034    | 36 months            | 02/2007            |
| Amplifier               | ZHL-42W  | E012903       | -                    | -                  |
| Power Meter             | NRVD     | 840297/008    | 24 months            | 11/2005            |
| Power Sensor            | NRV-Z51  | 100184        | 24 months            | 11/2005            |
| Call Tester             | 4400M    | 0411216       | -                    | -                  |
| Call Tester             | CMU200   | 105900        | -                    | -                  |
| Vector Network Analyzer | AT8753ES | MY40001091    | 12 months            | 08/2005            |
| Dielectric Probe Kit    | HP85070B | US33020403    | -                    | -                  |

#### 4.1.1 Isotropic E-field Probe ET3DV6

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

|                      |                                                                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dynamic Range</b> | 5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm$ 0.2 dB                                                                                                                       |
| <b>Dimensions</b>    | Overall length: 330 mm<br>Tip length: 16 mm<br>Body diameter: 12 mm<br>Tip diameter: 6.8 mm                                                                              |
| <b>Application</b>   | Distance from probe tip to dipole centers: 2.7 mm<br>General dosimetry up to 3 GHz<br>Compliance tests of mobile phones<br>Fast automatic scanning in arbitrary phantoms |

## 4.2 Phantoms

The phantom used for all tests i.e. for both validation testing and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2003.

Validation tests were performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

## 4.3 Simulating Liquids

Recommended values for the dielectric parameters of the simulating liquids are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using liquids whose dielectric parameters were within  $\pm$  5% of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the liquid was  $15.0 \pm 0.5$  cm measured from the ear reference point during validation and device measurements.

### 4.3.1 Liquid Recipes

The following recipes were used for Head and Body liquids:

#### 800MHz band

| Ingredient      | Head<br>(% by weight) | Body<br>(% by weight) |
|-----------------|-----------------------|-----------------------|
| Deionised Water | 39.74                 | 55.97                 |
| HEC             | 0.25                  | 1.21                  |
| Sugar           | 58.31                 | 41.76                 |
| Preservative    | 0.15                  | 0.27                  |
| Salt            | 1.55                  | 0.79                  |

#### 1900MHz band

| Ingredient      | Head<br>(% by weight) | Body<br>(% by weight) |
|-----------------|-----------------------|-----------------------|
| Deionised Water | 54.88                 | 69.02                 |
| Butyl Diglycol  | 44.91                 | 30.76                 |
| Salt            | 0.21                  | 0.22                  |

#### 4.3.2 Verification of the System

The manufacturer calibrates the probes annually. Dielectric parameters of the simulating liquids were measured every day using the dielectric probe kit and the network analyser. A SAR measurement was made following the determination of the dielectric parameters of the liquids, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The validation results (dielectric parameters and SAR values) are given in the table below.

#### System verification, head tissue simulant

| f [MHz] | Description       | SAR [W/kg],<br>1g | Dielectric Parameters |                | Temp<br>[°C] |
|---------|-------------------|-------------------|-----------------------|----------------|--------------|
|         |                   |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 835     | Reference result  | 2.41              | 41.5                  | 0.89           | N/A          |
|         | ± 10% window      | 2.17 – 2.65       |                       |                |              |
|         | November 25, 2004 | 2.45              | 41.7                  | 0.89           | 21.3         |
| 1900    | Reference result  | 10.4              | 38.6                  | 1.46           | N/A          |
|         | ± 10% window      | 9.36 – 11.44      |                       |                |              |
|         | November 25, 2004 | 9.88              | 38.6                  | 1.48           | 21.4         |

### System verification, body tissue simulant

| f [MHz] | Description       | SAR [W/kg],<br>1g | Dielectric Parameters |                | Temp<br>[°C] |
|---------|-------------------|-------------------|-----------------------|----------------|--------------|
|         |                   |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 835     | Reference result  | 2.53              | 54.0                  | 0.96           | N/A          |
|         | ± 10% window      | 2.28 – 2.78       |                       |                |              |
|         | November 16, 2004 | 2.64              | 53.3                  | 0.95           | 21.8         |
|         | November 17, 2004 | 2.55              | 52.9                  | 0.95           | 21.0         |
|         | November 26, 2004 | 2.56              | 53.6                  | 0.95           | 21.2         |
| 1900    | Reference result  | 10.6              | 51.2                  | 1.59           | N/A          |
|         | ± 10% window      | 9.54 – 11.66      |                       |                |              |
|         | November 18, 2004 | 10.3              | 50.9                  | 1.62           | 21.0         |
|         | November 19, 2004 | 10.7              | 50.8                  | 1.60           | 21.1         |

Plots of the Verification scans are given in Appendix A.

### 4.3.3 Tissue Simulants used in the Measurements

#### Head tissue simulant measurements

| f [MHz] | Description       | Dielectric Parameters |                | Temp<br>[°C] |
|---------|-------------------|-----------------------|----------------|--------------|
|         |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 836     | Recommended value | 41.5                  | 0.90           | N/A          |
|         | ± 5% window       | 39.4 – 43.6           | 0.86 – 0.95    |              |
|         | November 25, 2004 | 41.7                  | 0.89           | 21.3         |
| 1880    | Recommended value | 40.0                  | 1.40           | N/A          |
|         | ± 5% window       | 38.0 – 42.0           | 1.33 – 1.47    |              |
|         | November 25, 2004 | 38.7                  | 1.46           | 21.4         |

### Body tissue simulant measurements

| $f$ [MHz] | Description       | Dielectric Parameters |                | Temp<br>[°C] |
|-----------|-------------------|-----------------------|----------------|--------------|
|           |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 836       | Recommended value | 55.2                  | 0.97           | N/A          |
|           | $\pm 5\%$ window  | 52.4 – 58.0           | 0.92 – 1.02    |              |
|           | November 16, 2004 | 53.3                  | 0.95           | 21.8         |
|           | November 17, 2004 | 52.9                  | 0.95           | 21.0         |
|           | November 26, 2004 | 53.6                  | 0.95           | 21.2         |
| 1880      | Recommended value | 53.3                  | 1.52           | N/A          |
|           | $\pm 5\%$ window  | 50.6 – 56.0           | 1.44 – 1.60    |              |
|           | November 18, 2004 | 51.0                  | 1.59           | 21.0         |
|           | November 19, 2004 | 50.9                  | 1.58           | 21.1         |

## 5. DESCRIPTION OF THE TEST PROCEDURE

### 5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

A Nokia designed spacer (illustrated below) was used to position the device within the SPEAG holder. The spacer positions the device so that the holder has minimal effect on the test results but still holds the device securely. The spacer was removed before the tests.



Nokia spacer

### 5.2 Test Positions

#### 5.2.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

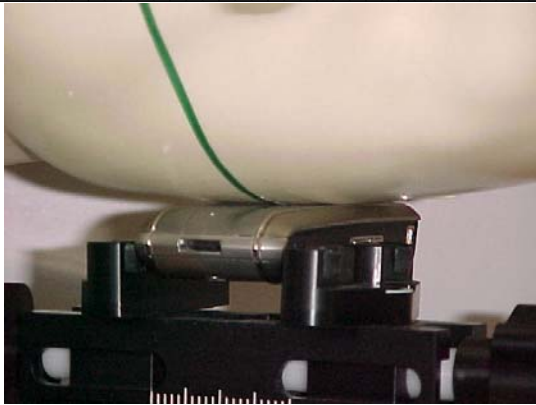


Photo of the device in "cheek" position



Photo of the device in "tilt" position

### 5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance indicated in the photo below using a separate flat spacer that was removed before the start of the measurements. The device was oriented with its antenna facing the phantom since this orientation gave higher results.



Photo of the device positioned for Body SAR measurement.  
The spacer was removed for the tests.

The device was also installed in the "Ascent Moulded Leather Case", type BH3-BL01, and placed against the flat phantom using the SPEAG holder. The "Ascent Moulded Leather Case" was placed with its attachment in contact with the phantom and the device was oriented with its display facing the phantom. The display side was facing the phantom since this was the only orientation possible.



Photo of the device in leather case positioned for Body SAR measurement.

### 5.3 Scan Procedures

First coarse scans were used for determination of the field distribution. Next a cube scan, a minimum of 5x5x7 points covering a volume of at least 30x30x30mm was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the coarse scan and again at the end of the cube scan.

### 5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy4 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the cube scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the cube scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

## 6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

| Uncertainty Component                                                           | Section in IEEE 1528 | Tol. (%) | Prob Dist | Div | $G_i$           | $G_i \cdot U_i$ (%) | $V_i$ |
|---------------------------------------------------------------------------------|----------------------|----------|-----------|-----|-----------------|---------------------|-------|
| <b>Measurement System</b>                                                       |                      |          |           |     |                 |                     |       |
| Probe Calibration                                                               | E2.1                 | ±5.8     | N         | 1   | 1               | ±5.8                | ∞     |
| 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                 | ±8.3     | R         | √3  | 1               | ±4.8                | ∞     |
| 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                 | ±3.9     | R         | √3  | 1               | ±2.3                | ∞     |
| <b>Test sample Related</b>                                                      |                      |          |           |     |                 |                     |       |
| 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                | ∞     |
| <b>Phantom and Tissue Parameters</b>                                            |                      |          |           |     |                 |                     |       |
| 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     |
| <b>Combined Standard Uncertainty</b>                                            |                      |          | RSS       |     |                 | ±14.9               | 206   |
| <b>Coverage Factor for 95%</b>                                                  |                      |          | k=2       |     |                 |                     |       |
| <b>Expanded Standard Uncertainty</b>                                            |                      |          |           |     |                 | ±29.8               |       |

## 7. RESULTS

The measured Head SAR values for the test device are tabulated below:

### GSM850, Head SAR results

| Position                                                           |       | SAR, averaged over 1g (W/kg) |                     |                     |
|--------------------------------------------------------------------|-------|------------------------------|---------------------|---------------------|
|                                                                    |       | Ch 128<br>824.2 MHz          | Ch 190<br>836.6 MHz | Ch 251<br>848.8 MHz |
| Power level                                                        |       | 31.3 dBm                     | 32.6 dBm            | 30.9 dBm            |
| Left                                                               | Cheek |                              | 0.27                |                     |
|                                                                    | Tilt  |                              | 0.15                |                     |
| Right                                                              | Cheek | 0.35                         | 0.28                | 0.26                |
|                                                                    | Tilt  |                              | 0.20                |                     |
| Highest SAR value measurement in this band repeated with BT active |       | 0.34                         |                     |                     |

### GSM1900, Head SAR results

| Position                                                           |       | SAR, averaged over 1g (W/kg) |                      |                      |
|--------------------------------------------------------------------|-------|------------------------------|----------------------|----------------------|
|                                                                    |       | Ch 512<br>1850.2 MHz         | Ch 661<br>1880.0 MHz | Ch 810<br>1909.8 MHz |
| Power level                                                        |       | 30.1 dBm                     | 30.3 dBm             | 30.9 dBm             |
| Left                                                               | Cheek |                              | 0.20                 |                      |
|                                                                    | Tilt  |                              | 0.28                 |                      |
| Right                                                              | Cheek |                              | 0.36                 |                      |
|                                                                    | Tilt  | 0.34                         | 0.40                 | 0.55                 |
| Highest SAR value measurement in this band repeated with BT active |       |                              |                      | 0.55                 |

The measured Body SAR values for the test device are tabulated below:

### 2-slot GPRS850, Body SAR results

| Body-worn location setup                                                 | SAR, averaged over 1g (W/kg) |                     |                     |
|--------------------------------------------------------------------------|------------------------------|---------------------|---------------------|
|                                                                          | Ch 128<br>824.2 MHz          | Ch 190<br>836.6 MHz | Ch 251<br>848.8 MHz |
| <b>Power level</b>                                                       | <b>31.3 dBm</b>              | <b>32.6 dBm</b>     | <b>30.9 dBm</b>     |
| Without headset                                                          | 0.87                         | <b>0.90</b>         | 0.86                |
| Headset HSV-A                                                            | 0.67                         | 0.68                | 0.55                |
| In leather case BH3-BL01,<br>without headset                             | 0.41                         | 0.37                | 0.34                |
| Highest SAR value<br>measurement in this band<br>repeated with BT active |                              | 0.87                |                     |

### 2-slot GPRS1900, Body SAR results

| Body-worn location setup                                                 | SAR, averaged over 1g (W/kg) |                      |                      |
|--------------------------------------------------------------------------|------------------------------|----------------------|----------------------|
|                                                                          | Ch 512<br>1850.2 MHz         | Ch 661<br>1880.0 MHz | Ch 810<br>1909.8 MHz |
| <b>Power level</b>                                                       | <b>30.1 dBm</b>              | <b>30.3 dBm</b>      | <b>30.9 dBm</b>      |
| Without headset                                                          | 0.58                         | 0.65                 | <b>0.79</b>          |
| Headset HSV-A                                                            | 0.53                         | 0.62                 | <b>0.77</b>          |
| In leather case BH3-BL01,<br>without headset                             |                              |                      | 0.38                 |
| Highest SAR value<br>measurement in this band<br>repeated with BT active |                              |                      | <b>0.78</b>          |

Plots of the Measurement scans are given in Appendix B.

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## APPENDIX A: VALIDATION SCANS

See the following pages.

# TCC

## Copenhagen

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 476**

Communication System: Continuous Wave; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Head 850 Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.892$  mho/m;  $\epsilon_r = 41.7$ ;  $\rho =$

$1000 \text{ kg/m}^3$  Medium temperature:  $21.3^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=15mm, Pin=250mW/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 2.67 mW/g

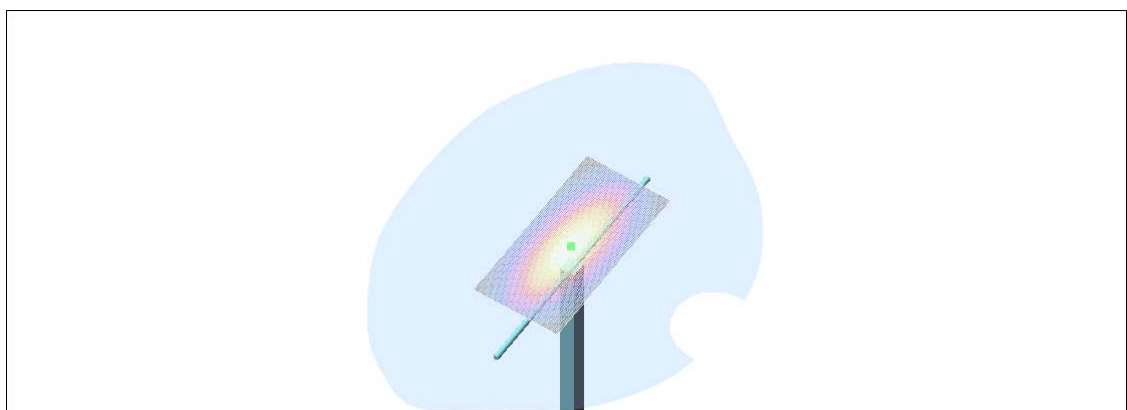
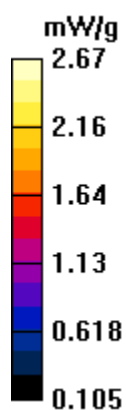
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.4 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 3.6 W/kg

**SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.65 mW/g



# TCC

## Copenhagen

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026**

Communication System: Continuous Wave; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900 Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.6$ ;  $\rho$

$= 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=10mm, Pin=250mW/Area Scan (71x71x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 11.3 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

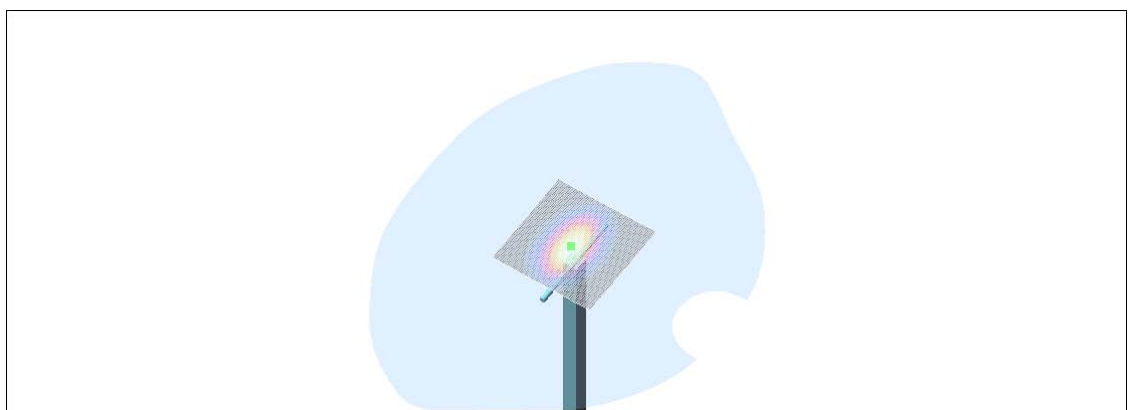
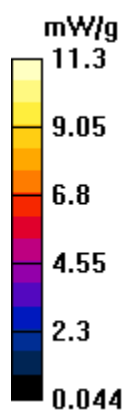
dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.6 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 17.2 W/kg

**SAR(1 g) = 9.88 mW/g; SAR(10 g) = 5.17 mW/g**

Maximum value of SAR (measured) = 11.3 mW/g



# TCC

## Copenhagen

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 476**

Communication System: Continuous Wave; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Body 850 Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.95 \text{ mho/m}$ ;  $\epsilon_r = 53.3$ ;  $\rho =$

$1000 \text{ kg/m}^3$  Medium temperature:  $21.8 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=15mm, Pin=250mW/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) =  $2.85 \text{ mW/g}$

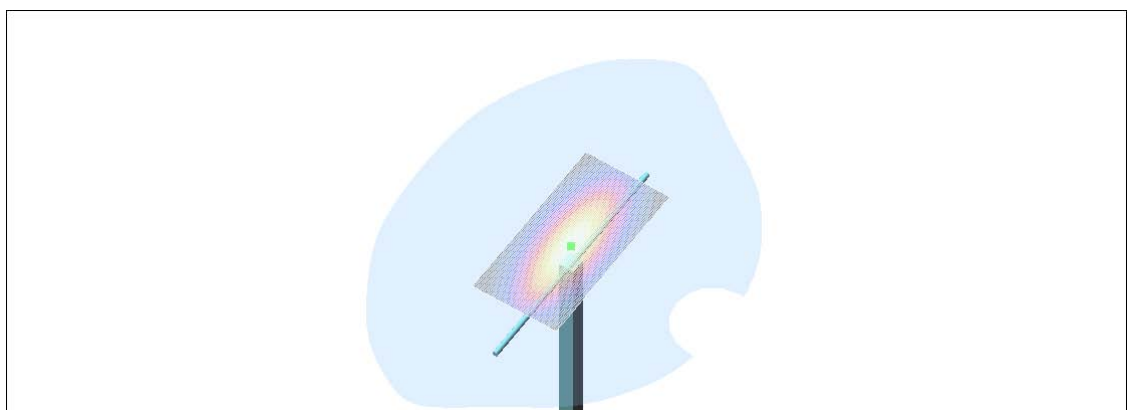
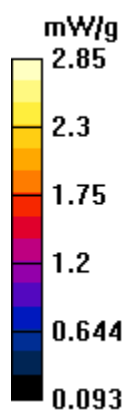
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value =  $56.7 \text{ V/m}$ ; Power Drift =  $0.0 \text{ dB}$

Peak SAR (extrapolated) =  $3.81 \text{ W/kg}$

**SAR(1 g) =  $2.64 \text{ mW/g}$ ; SAR(10 g) =  $1.74 \text{ mW/g}$**

Maximum value of SAR (measured) =  $2.86 \text{ mW/g}$



# TCC

## Copenhagen

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 476**

Communication System: Continuous Wave; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Body 850 Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.945$  mho/m;  $\epsilon_r = 52.9$ ;  $\rho =$

$1000 \text{ kg/m}^3$  Medium temperature:  $21.0^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=15mm, Pin=250mW/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 2.78 mW/g

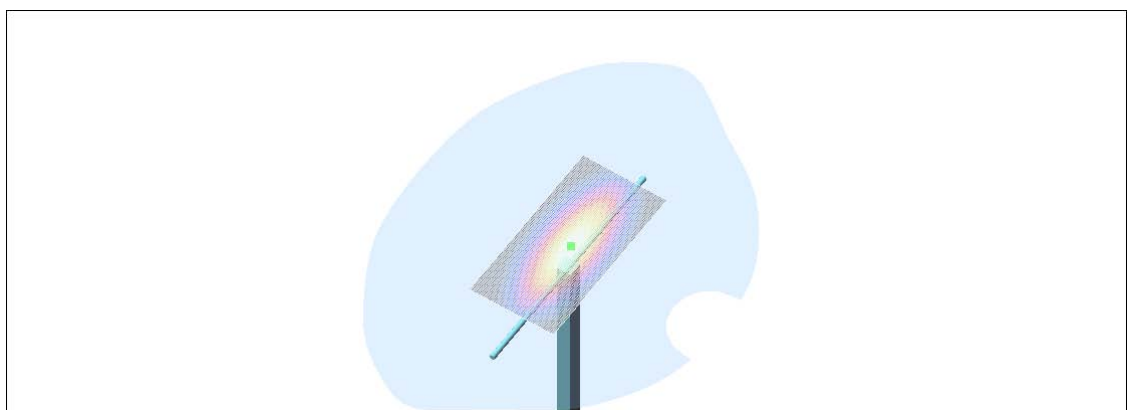
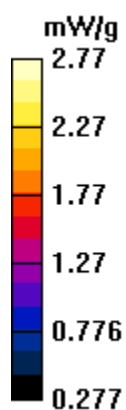
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.68 W/kg

**SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.69 mW/g**

Maximum value of SAR (measured) = 2.77 mW/g



# TCC

## Copenhagen

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 476**

Communication System: Continuous Wave; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Body 850 Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.951$  mho/m;  $\epsilon_r = 53.6$ ;  $\rho =$

$1000$  kg/m<sup>3</sup> Medium temperature: 21.2 °C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=15mm, Pin=250mW/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 2.76 mW/g

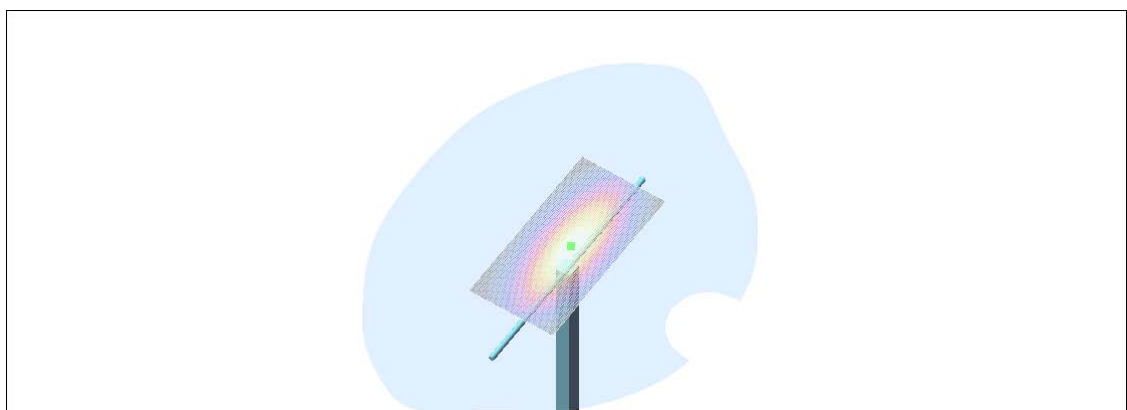
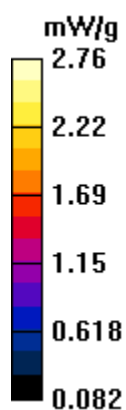
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.5 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 3.7 W/kg

**SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.69 mW/g**

Maximum value of SAR (measured) = 2.77 mW/g



Date/Time: 11/18/04 08:08:07

# TCC

## Copenhagen

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026**

Communication System: Continuous Wave; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Body 1900 Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.62$  mho/m;  $\epsilon_r = 50.9$ ;  $\rho$

$= 1000$  kg/m<sup>3</sup> Medium temperature: 21.0 °C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1808; ConvF(4.27, 4.27, 4.27); Calibrated: 02.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 24.09.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=10mm, Pin=250mW/Area Scan (71x71x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 12 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

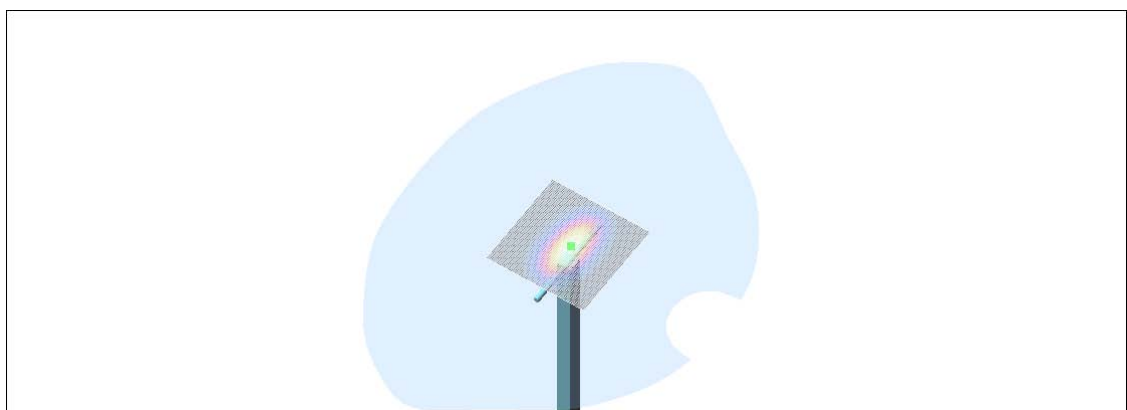
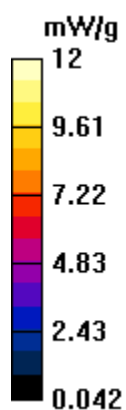
dx=5mm, dy=5mm, dz=5mm

Reference Value = 90 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 17.6 W/kg

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.43 mW/g**

Maximum value of SAR (measured) = 11.7 mW/g



# TCC

## Copenhagen

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026**

Communication System: Continuous Wave; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Body 1900 Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.6$  mho/m;  $\epsilon_r = 50.8$ ;  $\rho =$

$1000 \text{ kg/m}^3$  Medium temperature:  $21.1^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813; ConvF(4.41, 4.41, 4.41); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**d=10mm, Pin=250mW/Area Scan (71x71x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) =  $12.5 \text{ mW/g}$

**d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

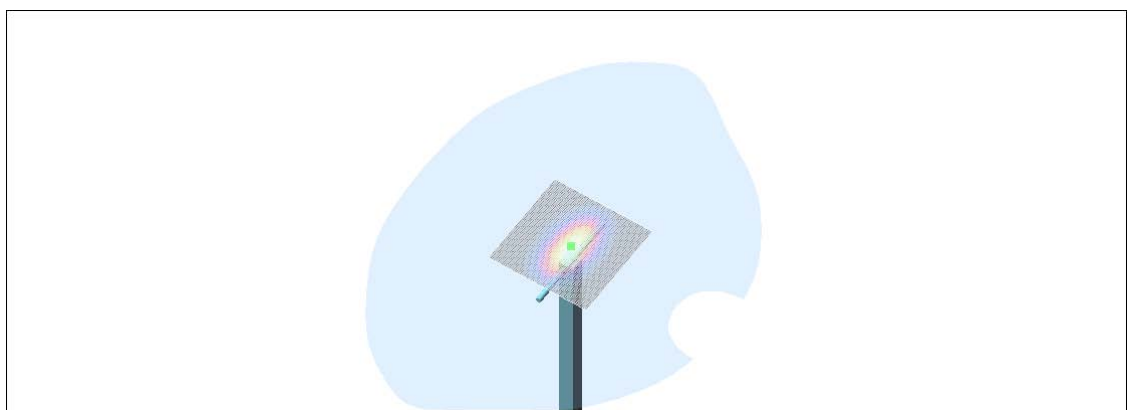
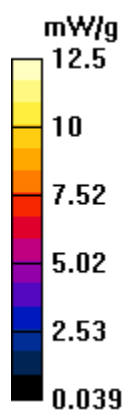
dx=5mm, dy=5mm, dz=5mm

Reference Value =  $92.8 \text{ V/m}$ ; Power Drift =  $0.0 \text{ dB}$

Peak SAR (extrapolated) =  $18.2 \text{ W/kg}$

**SAR(1 g) =  $10.7 \text{ mW/g}$ ; SAR(10 g) =  $5.63 \text{ mW/g}$**

Maximum value of SAR (measured) =  $12.2 \text{ mW/g}$



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## APPENDIX B: MEASUREMENT SCANS

See the following pages.

# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.896$

mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.3 °C

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Touch position - Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.280 mW/g

**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

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

Reference Value = 14.2 V/m; Power Drift = -0.1 dB

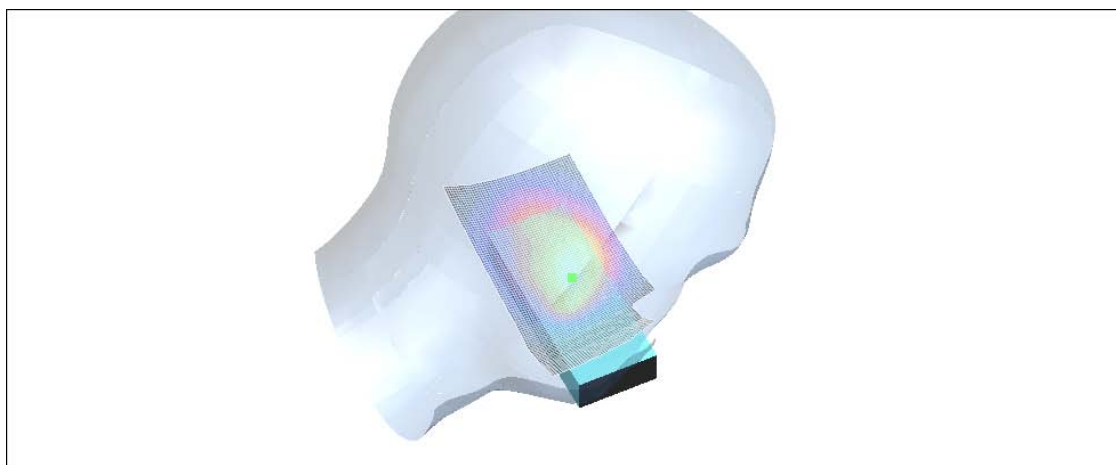
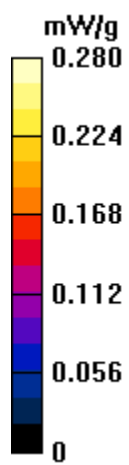
Peak SAR (extrapolated) = 0.472 W/kg

**SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.177 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 1 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) = 0.284 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.896$

mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.3 °C

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Tilt position - Middle/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.144 mW/g

**Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

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

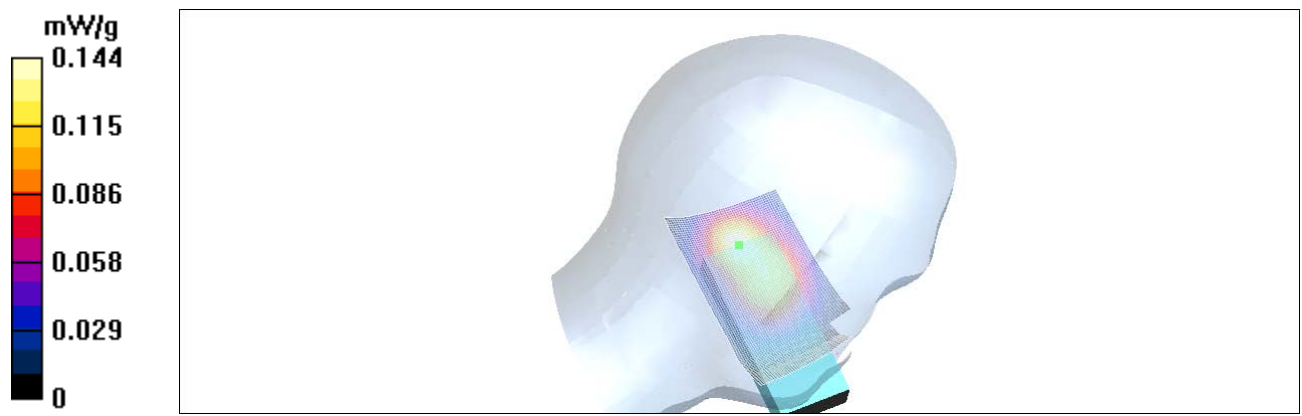
Reference Value = 12.5 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.289 W/kg

**SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.090 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.157 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium: Head 850 Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.884$

mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.3 °C

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Touch position - Low/Area Scan (81x131x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.395 mW/g

**Touch position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

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

Reference Value = 16.4 V/m; Power Drift = -0.1 dB

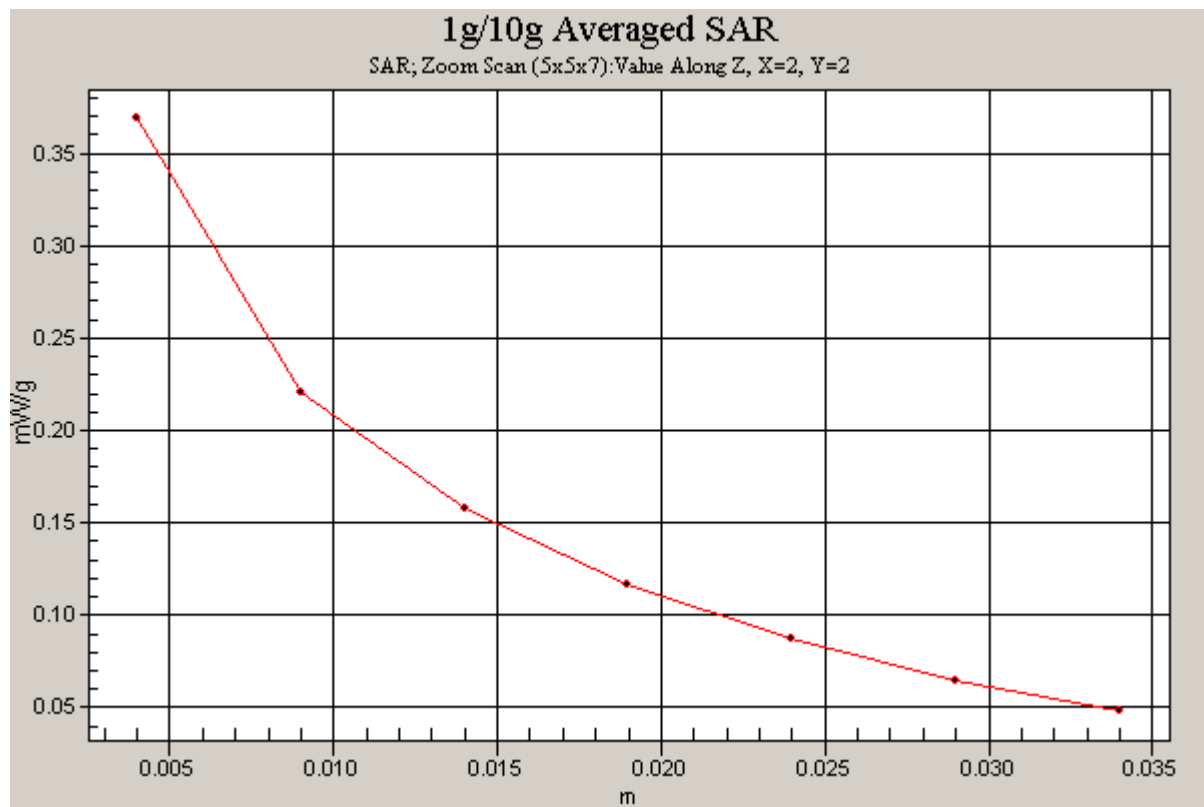
Peak SAR (extrapolated) = 0.655 W/kg

**SAR(1 g) = 0.349 mW/g; SAR(10 g) = 0.234 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) = 0.369 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.896$

mho/m;  $\epsilon_r = 41.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.3 °C

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Tilt position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.215 mW/g

**Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

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

Reference Value = 12.5 V/m; Power Drift = -0.1 dB

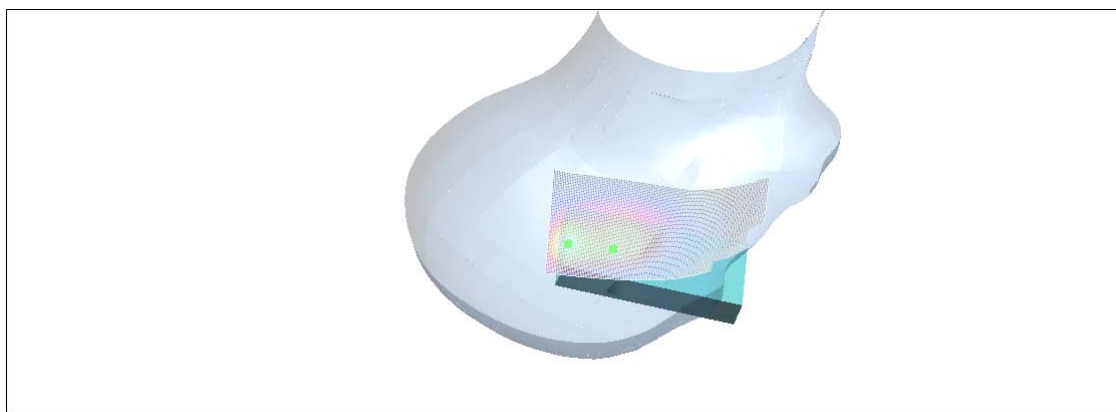
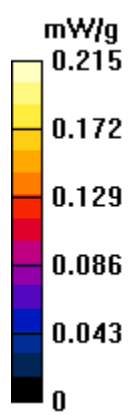
Peak SAR (extrapolated) = 0.419 W/kg

**SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.110 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) = 0.217 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium: Head 850 Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.884$

mho/m;  $\epsilon_r = 41.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.3 °C

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.37, 6.37, 6.37); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Touch position - Low - Bluetooth Active/Area Scan (81x131x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.384 mW/g

**Touch position - Low - Bluetooth Active/Zoom Scan (5x5x7) (5x5x7)/Cube 0:**

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 16.4 V/m; Power Drift = -0.0 dB

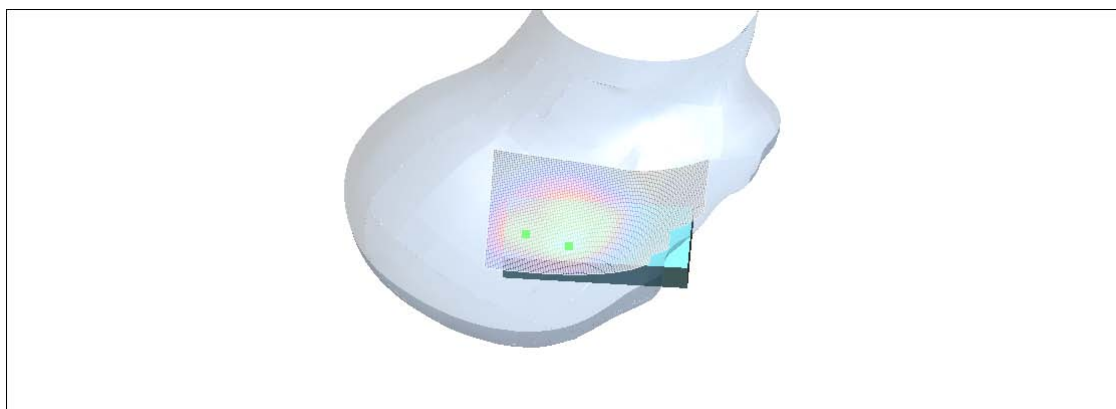
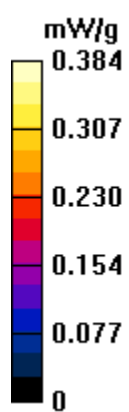
Peak SAR (extrapolated) = 0.638 W/kg

**SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.230 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) = 0.356 mW/g



Date/Time: 11/25/04 08:22:30

# TCC

**Copenhagen****DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

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

Medium: Head 1900 Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho$  $= 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.214 mW/g

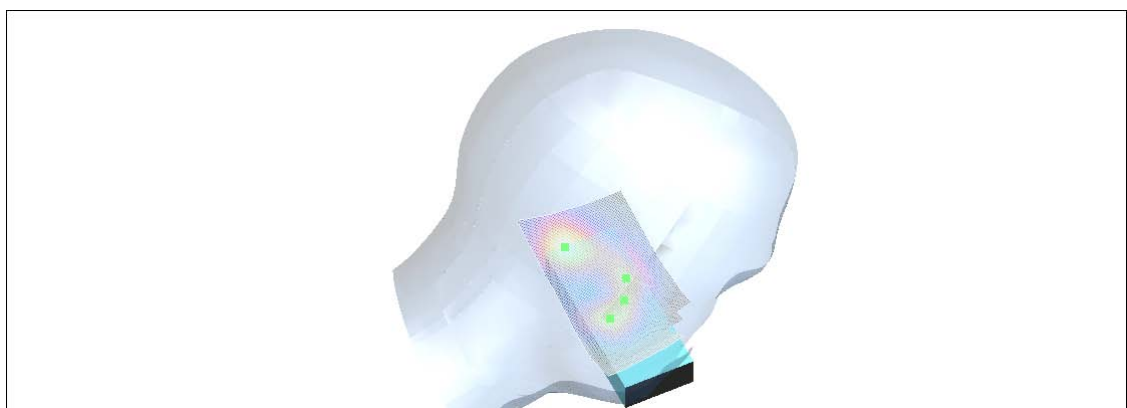
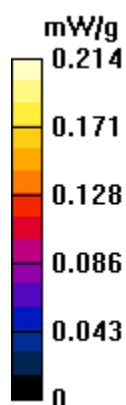
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.72 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 0.411 W/kg

**SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.106 mW/g**

Maximum value of SAR (measured) = 0.219 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

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

Medium: Head 1900 Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho$

$= 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Tilt position - Middle/Area Scan (71x131x1):** Measurement grid:  $dx=10$ mm,  $dy=10$ mm  
Maximum value of SAR (interpolated) = 0.301 mW/g

**Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

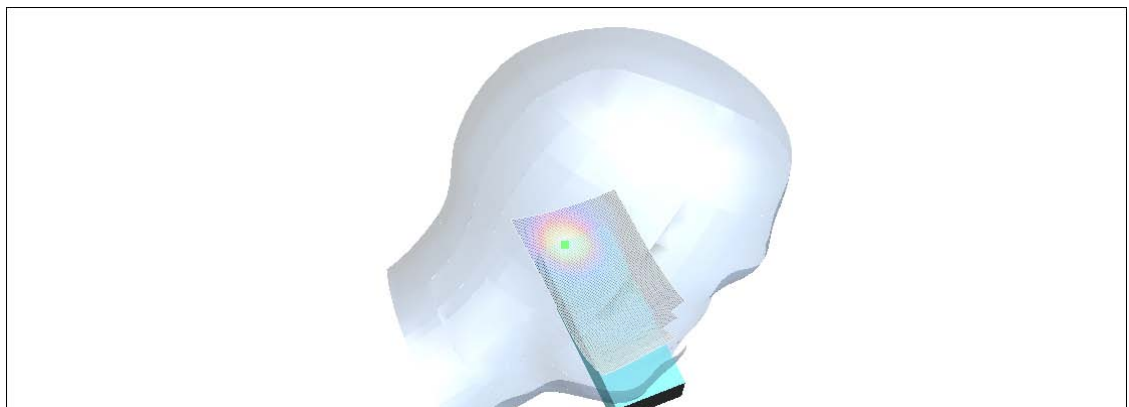
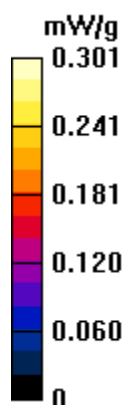
$dx=7.5$ mm,  $dy=7.5$ mm,  $dz=5$ mm

Reference Value = 12.7 V/m; Power Drift = -0.0 dB

Peak SAR (extrapolated) = 0.554 W/kg

**SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.149 mW/g**

Maximum value of SAR (measured) = 0.303 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

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

Medium: Head 1900 Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho$

$= 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.397 mW/g

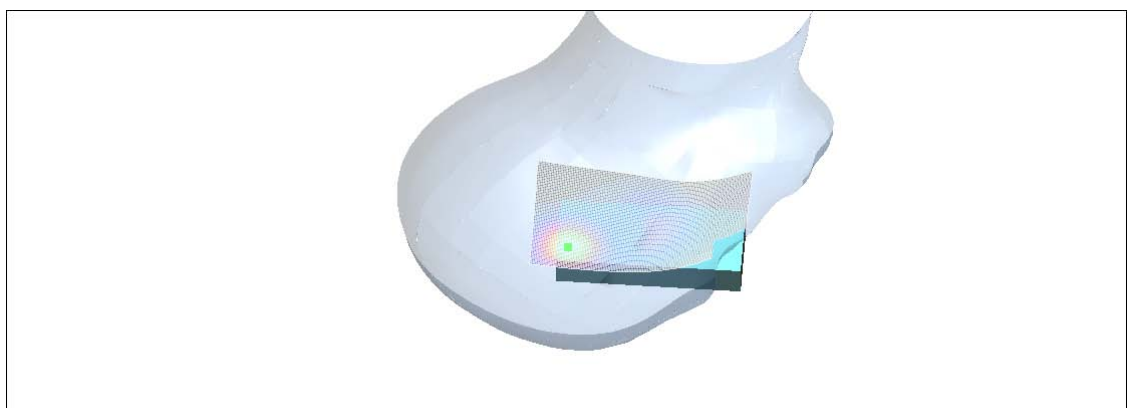
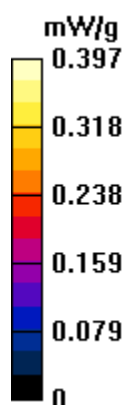
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.94 V/m; Power Drift = -0.0 dB

Peak SAR (extrapolated) = 0.799 W/kg

**SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.184 mW/g**

Maximum value of SAR (measured) = 0.397 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: DCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3  
Medium: Head 1900 Medium parameters used (interpolated):  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C  
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Tilt position - High/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.597 mW/g

**Tilt position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:

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

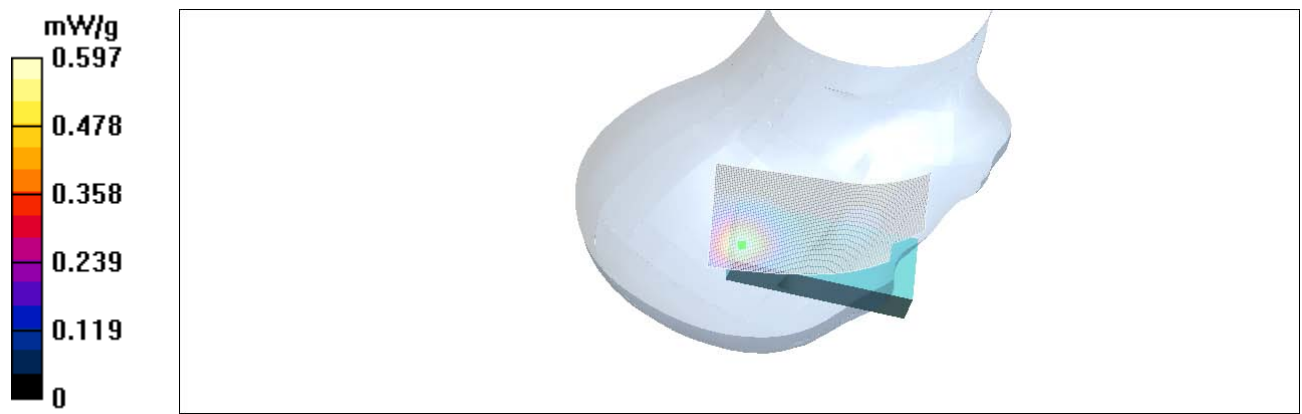
Reference Value = 13.9 V/m; Power Drift = -0.0 dB

Peak SAR (extrapolated) = 1.21 W/kg

**SAR(1 g) = 0.545 mW/g; SAR(10 g) = 0.275 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.599 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: DCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3  
Medium: Head 1900 Medium parameters used (interpolated):  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.4 °C  
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.96, 4.96, 4.96); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Tilt position - High - Bluetooth Active/Area Scan (71x131x1):** Measurement grid:  
dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.596 mW/g

**Tilt position - High - Bluetooth Active/Zoom Scan (5x5x7) (5x5x7)/Cube 0:**

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

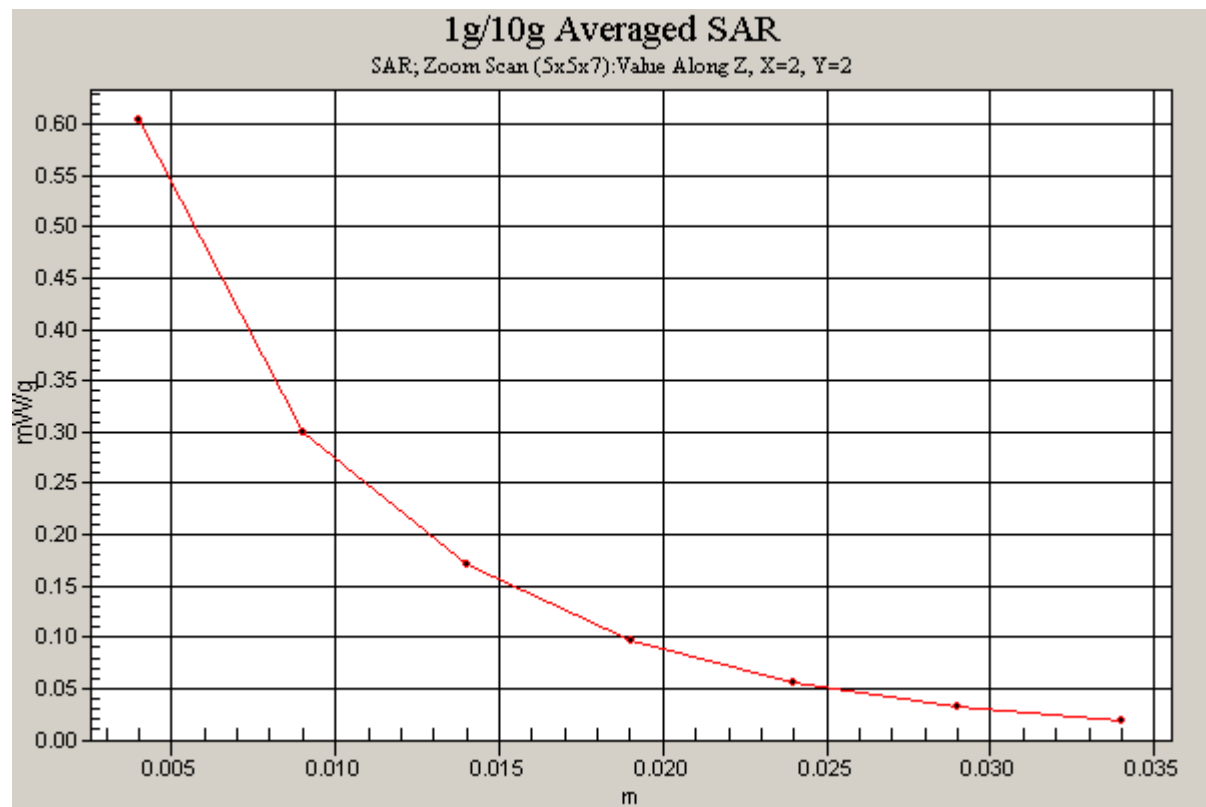
Reference Value = 13.6 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 1.24 W/kg

**SAR(1 g) = 0.552 mW/g; SAR(10 g) = 0.277 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.605 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: 850 - GPRS - Dual slot; Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850 Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.951$

mho/m;  $\epsilon_r = 53.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.8 °C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - Middle - No accessory/Area Scan (51x91x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.970 mW/g

**Body - Middle - No accessory/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30 V/m; Power Drift = -0.1 dB

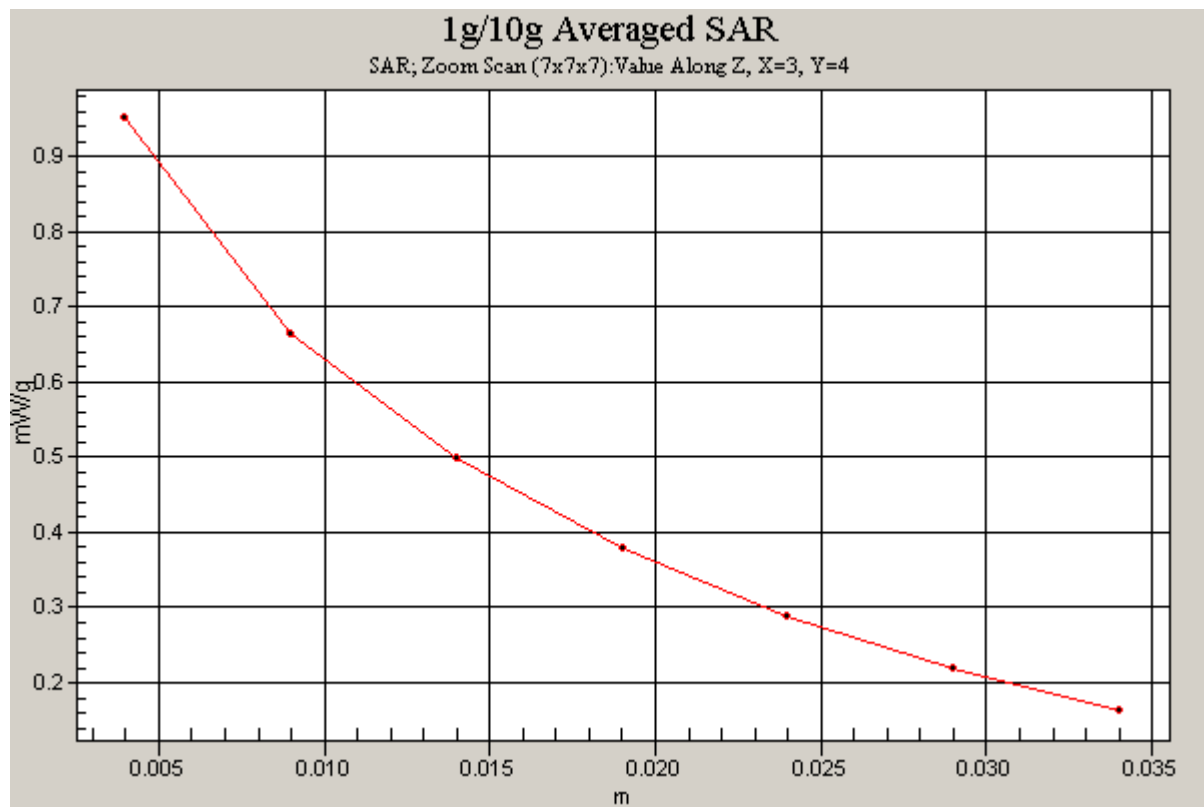
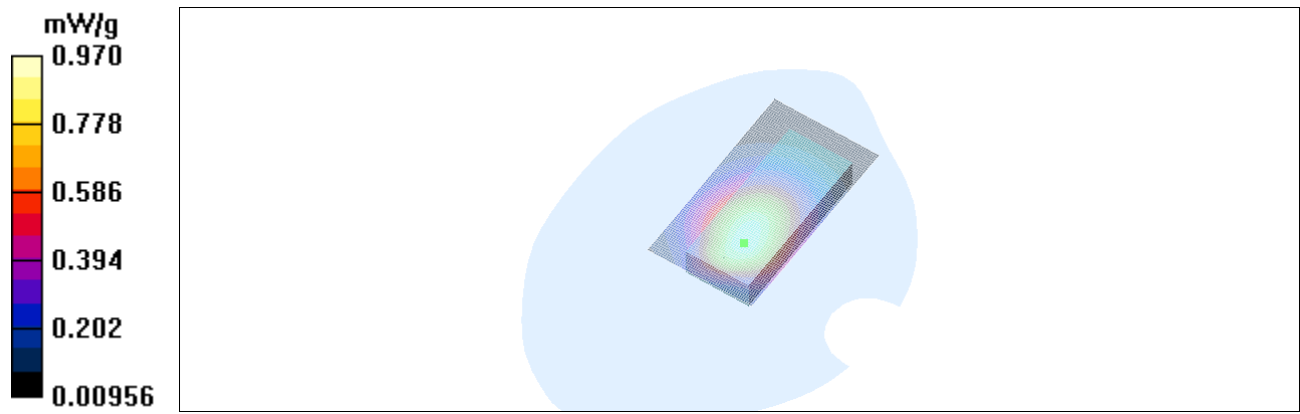
Peak SAR (extrapolated) = 1.37 W/kg

**SAR(1 g) = 0.902 mW/g; SAR(10 g) = 0.635 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) = 0.951 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: 850 - GPRS - Dual slot; Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850 Medium parameters used (interpolated):  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.946$

$\mu\text{ho/m}$ ;  $\epsilon_r = 52.9$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.0 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - Middle + HSV-A/Area Scan (71x141x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.712 \text{ mW/g}$

**Body - Middle + HSV-A/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

$dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $26.7 \text{ V/m}$ ; Power Drift =  $-0.1 \text{ dB}$

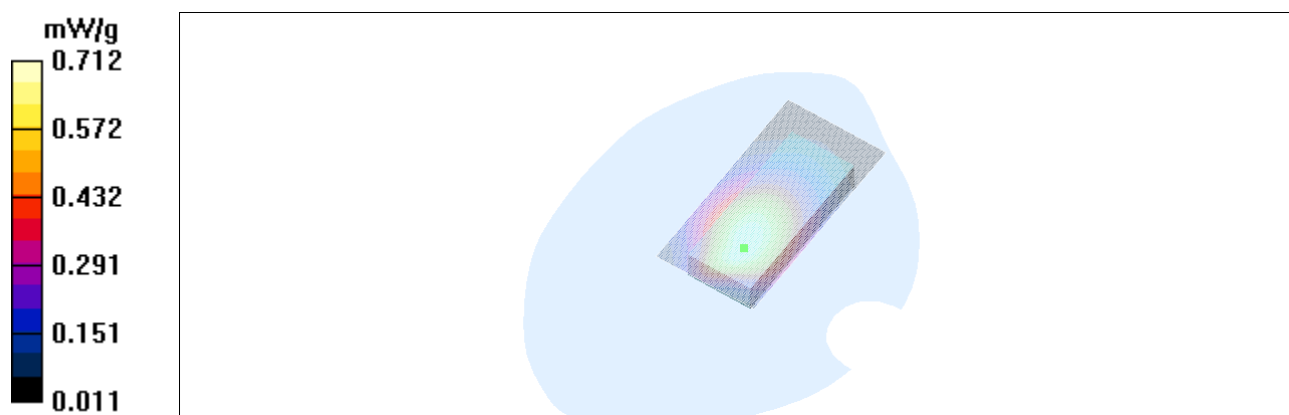
Peak SAR (extrapolated) =  $1.06 \text{ W/kg}$

**SAR(1 g) =  $0.677 \text{ mW/g}$ ; SAR(10 g) =  $0.477 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

**Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.**

Maximum value of SAR (measured) =  $0.711 \text{ mW/g}$



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: 850 - GPRS - Dual slot; Frequency: 824.2 MHz; Duty Cycle: 1:4.2

Medium: Body 850 Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.935$

mho/m;  $\epsilon_r = 53$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium temperature: 21.0 °C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - Low + Holster/Area Scan (71x141x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) = 0.440 mW/g

**Body - Low + Holster/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

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

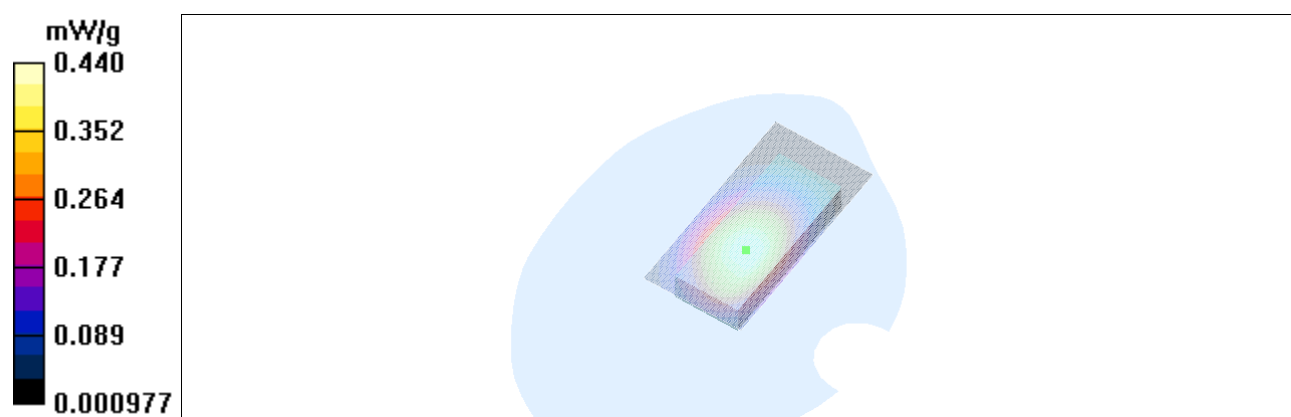
Reference Value = 18.7 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 0.628 W/kg

**SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.294 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.428 mW/g



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: 850 - GPRS - Dual slot; Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850 Medium parameters used (interpolated):  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.946$

$\mu\text{ho/m}$ ;  $\epsilon_r = 52.9$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.0 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(6.17, 6.17, 6.17); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM Body; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - Middle + Bluetooth active/Area Scan (71x141x1):** Measurement grid:

$dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.916 \text{ mW/g}$

**Body - Middle + Bluetooth active/Zoom Scan (7x7x7) (7x7x7)/Cube 0:**

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

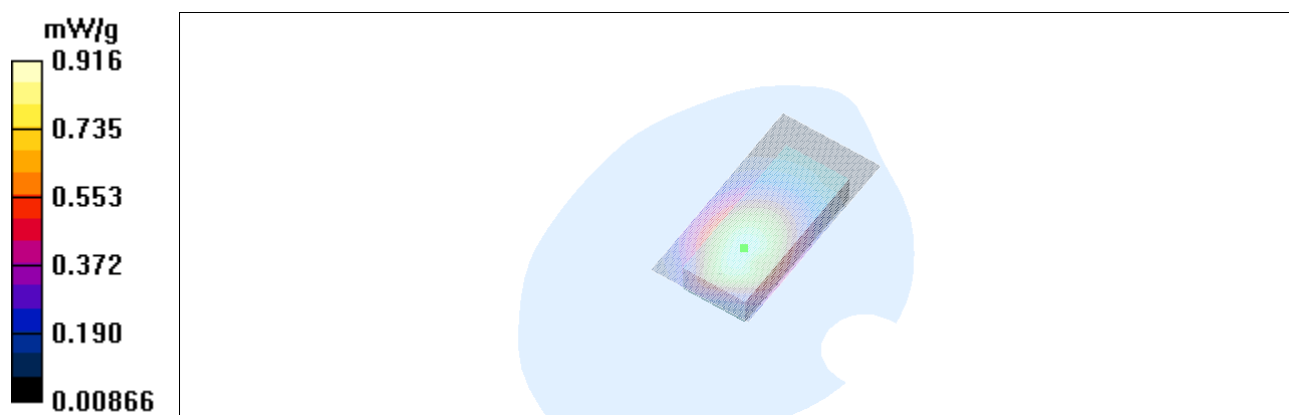
Reference Value =  $29.4 \text{ V/m}$ ; Power Drift =  $-0.1 \text{ dB}$

Peak SAR (extrapolated) =  $1.6 \text{ W/kg}$

**SAR(1 g) =  $0.868 \text{ mW/g}$ ; SAR(10 g) =  $0.609 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) =  $0.905 \text{ mW/g}$



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GPRS 1900 - Dual Slot; Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900 Medium parameters used (interpolated):  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.63$

$\text{mho/m}$ ;  $\epsilon_r = 50.8$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.0 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1808 - WCE; ConvF(4.27, 4.27, 4.27); Calibrated: 02.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 24.09.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - High - No Accessory/Area Scan (71x141x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.838 \text{ mW/g}$

**Body - High - No Accessory/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

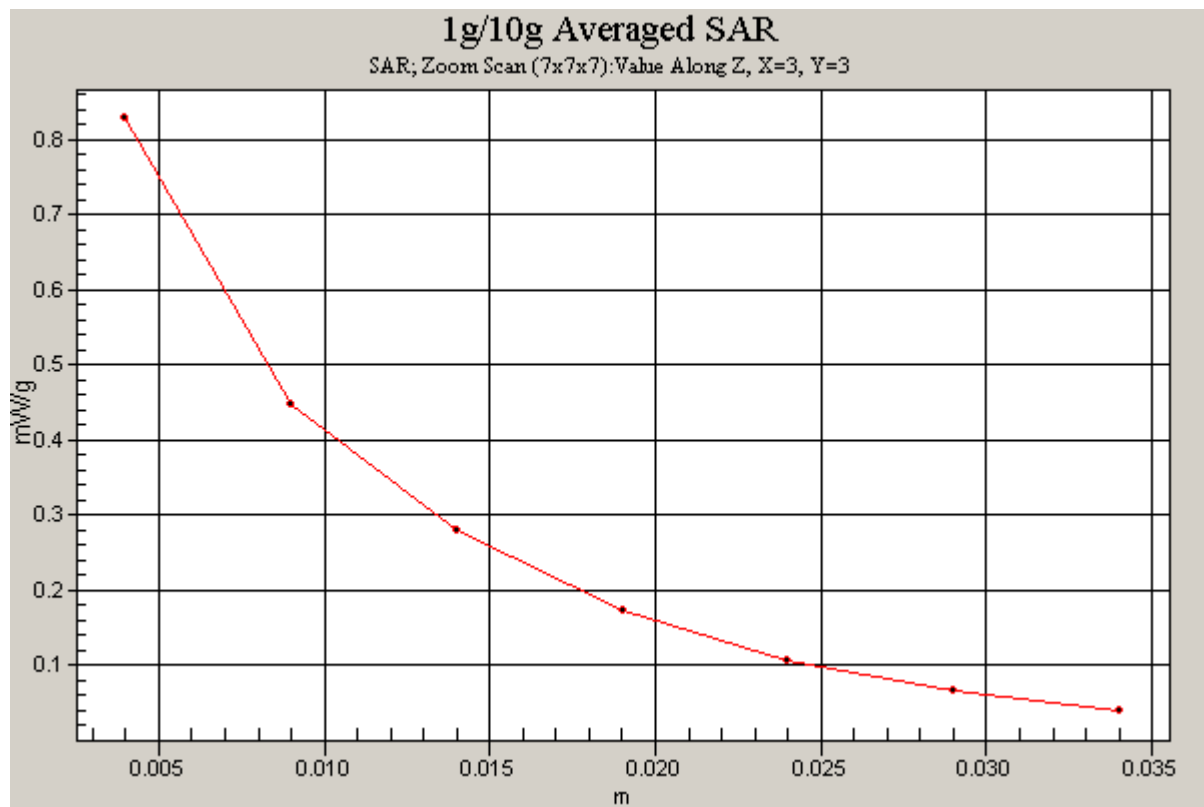
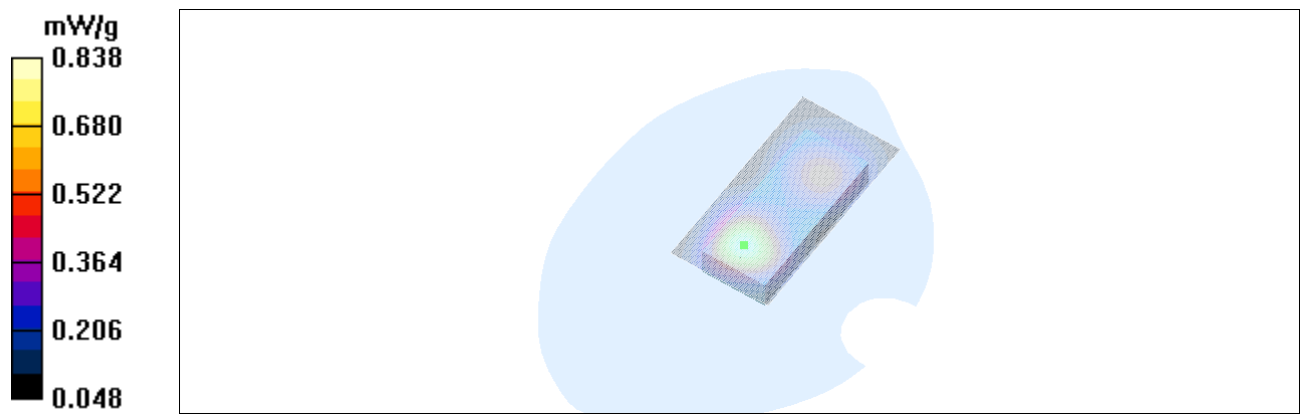
Reference Value =  $22.4 \text{ V/m}$ ; Power Drift =  $-0.0 \text{ dB}$

Peak SAR (extrapolated) =  $1.62 \text{ W/kg}$

**SAR(1 g) =  $0.786 \text{ mW/g}$ ; SAR(10 g) =  $0.450 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) =  $0.828 \text{ mW/g}$



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GPRS 1900 - Dual Slot; Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900 Medium parameters used (interpolated):  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.63$

$\text{mho/m}$ ;  $\epsilon_r = 50.8$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.0 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1808 - WCE; ConvF(4.27, 4.27, 4.27); Calibrated: 02.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 24.09.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - High + HSV-A/Area Scan (71x141x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.816 \text{ mW/g}$

**Body - High + HSV-A/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

$dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

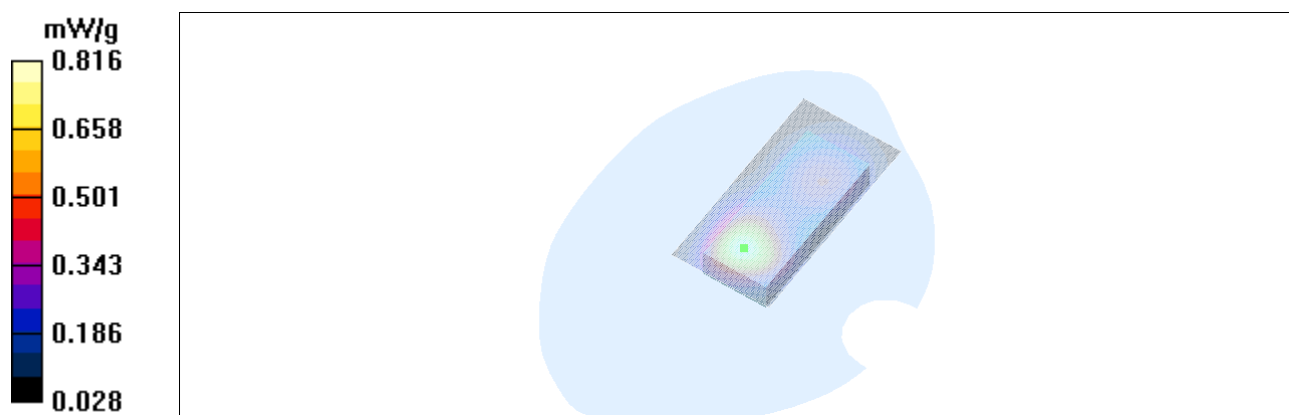
Reference Value =  $21.9 \text{ V/m}$ ; Power Drift =  $0.0 \text{ dB}$

Peak SAR (extrapolated) =  $1.57 \text{ W/kg}$

**SAR(1 g) =  $0.769 \text{ mW/g}$ ; SAR(10 g) =  $0.441 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) =  $0.807 \text{ mW/g}$



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GPRS 1900 - Dual Slot; Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900 Medium parameters used (interpolated):  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.62$

$\text{mho/m}$ ;  $\epsilon_r = 50.8$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.1 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.41, 4.41, 4.41); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - High + Lether holster/Area Scan (71x141x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.406 \text{ mW/g}$

**Body - High + Lether holster/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

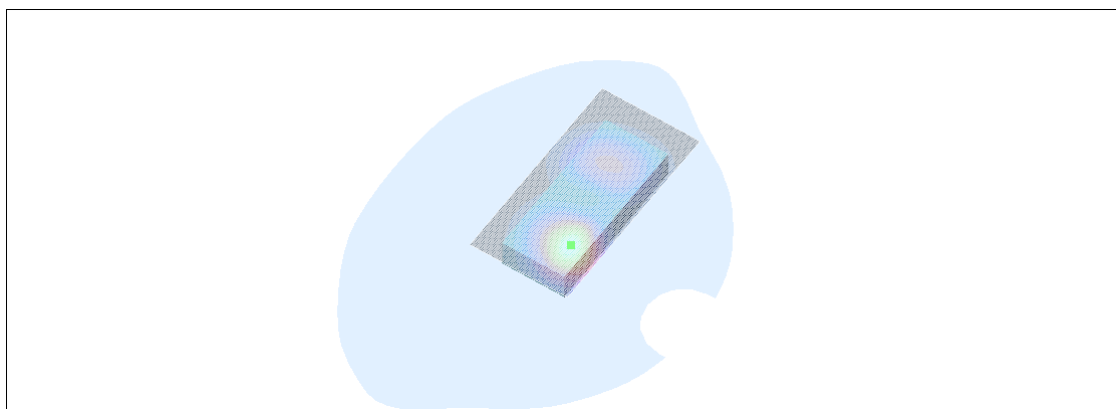
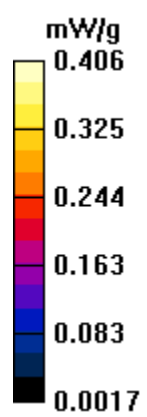
Reference Value =  $11.4 \text{ V/m}$ ; Power Drift =  $-0.1 \text{ dB}$

Peak SAR (extrapolated) =  $0.844 \text{ W/kg}$

**SAR(1 g) =  $0.377 \text{ mW/g}$ ; SAR(10 g) =  $0.202 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) =  $0.399 \text{ mW/g}$



# TCC

Copenhagen

**DUT: 28790; Type: RHV-5; Serial: 004400/12/179245/9**

Communication System: GPRS 1900 - Dual Slot; Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900 Medium parameters used (interpolated):  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.62$

$\text{mho/m}$ ;  $\epsilon_r = 50.8$ ;  $\rho = 1000 \text{ kg/m}^3$  Medium temperature:  $21.1 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1813 - WCE; ConvF(4.41, 4.41, 4.41); Calibrated: 30.09.2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 30.08.2004
- Phantom: SAM High band; Type: Twin Phantom; Serial: TP-1274
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

**Body - High + Bluetooth active/Area Scan (71x141x1):** Measurement grid:

$dx=10\text{mm}$ ,  $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (interpolated) =  $0.824 \text{ mW/g}$

**Body - High + Bluetooth active/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement

grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

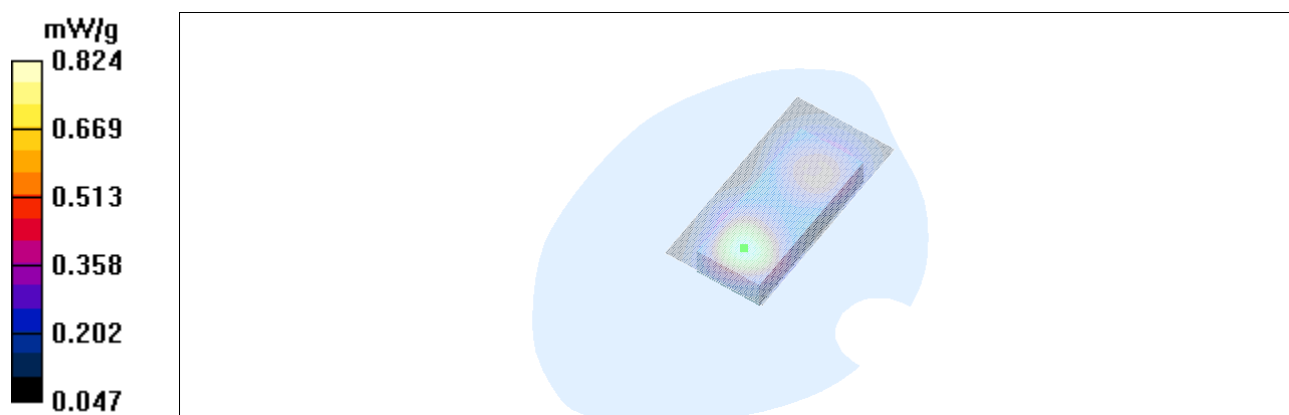
Reference Value =  $22.2 \text{ V/m}$ ; Power Drift =  $-0.1 \text{ dB}$

Peak SAR (extrapolated) =  $1.69 \text{ W/kg}$

**SAR(1 g) =  $0.776 \text{ mW/g}$ ; SAR(10 g) =  $0.441 \text{ mW/g}$**

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) =  $0.811 \text{ mW/g}$



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**APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)**

See the following pages.

19368

**Calibration Laboratory of**  
**Schmid & Partner**  
**Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation  
**The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates**

Accreditation No.: **SCS 108**

Client **Nokia (NMP / Copenhagen)**

Certificate No: **ET3-1813\_Sep04**

## CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1813**

Calibration procedure(s) **QA CAL-01.v5  
Calibration procedure for dosimetric E-field probes**

Calibration date: **September 30, 2004**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|-------------------------------------------|-----------------------|
| Power meter E4419B         | GB41293874      | 5-May-04 (METAS, No. 251-00388)           | May-05                |
| Power sensor E4412A        | MY41495277      | 5-May-04 (METAS, No. 251-00388)           | May-05                |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 3-Apr-03 (METAS, No. 251-00403)           | Aug-05                |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 3-May-04 (METAS, No. 251-00389)           | May-05                |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 3-Apr-03 (METAS, No. 251-00404)           | Aug-05                |
| Reference Probe ES3DV2     | SN:3013         | 8-Jan-04 (SPEAG, No. ES3-3013_Jan04)      | Jan-05                |
| DAE4                       | SN: 617         | 26-May-04 (SPEAG, No. DAE4-617_May04)     | May-05                |

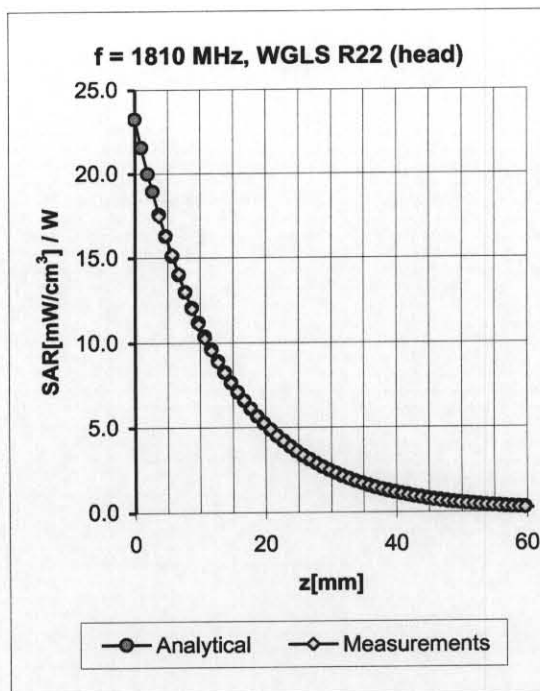
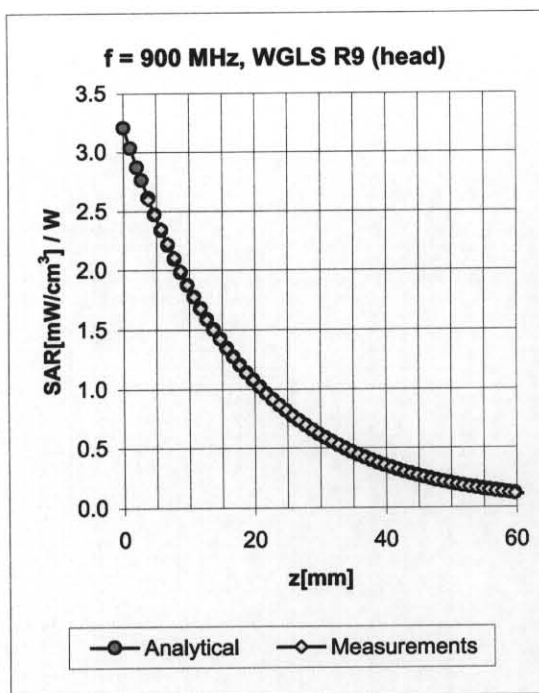
| Secondary Standards       | ID #         | Check Date (in house)                    | Scheduled Check        |
|---------------------------|--------------|------------------------------------------|------------------------|
| Power sensor HP 8481A     | MY41092180   | 18-Sep-02 (SPEAG, in house check Oct-03) | In house check: Oct 05 |
| RF generator HP 8648C     | US3642U01700 | 4-Aug-99 (SPEAG, in house check Dec-03)  | In house check: Dec-05 |
| Network Analyzer HP 8753E | US37390585   | 18-Oct-01 (SPEAG, in house check Nov-03) | In house check: Nov 04 |

|                |               |                       |           |
|----------------|---------------|-----------------------|-----------|
|                | Name          | Function              | Signature |
| Calibrated by: | Nico Vetterli | Laboratory Technician |           |
| Approved by:   | Katja Pokovic | Technical Manager     |           |

Issued: October 1, 2004

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

## Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 5%    | 1.02  | 1.53  | 6.37 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.96  | 1.59  | 6.17 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.58  | 2.33  | 5.13 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 101                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.55  | 2.52  | 4.96 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.50  | 2.77  | 4.75 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.62  | 2.37  | 4.50 ± 11.8% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.99  | 1.58  | 6.17 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.93  | 1.65  | 5.95 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.53  | 2.77  | 4.55 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 101                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.53  | 2.96  | 4.41 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.53  | 2.67  | 4.42 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.59  | 2.30  | 4.21 ± 11.8% (k=2) |

<sup>c</sup> The validity of ± 100 MHz only applies for DASY 4.3 B17 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

**Calibration Laboratory of**  
**Schmid & Partner**  
**Engineering AG**  
 Zeughausstrasse 43, 8004 Zurich, Switzerland

**Client**

**Nokia DK**

## CALIBRATION CERTIFICATE

Object(s)

**ET3DV6 - SN:1808**

Calibration procedure(s)

**QA CAL-01.v2**  
**Calibration procedure for dosimetric E-field probes**

Calibration date:

**June 14, 2004**

Condition of the calibrated item

**In Tolerance (according to the specific calibration document)**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type                        | ID #           | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------------|----------------|-------------------------------------------|------------------------|
| Power meter EPM E4419B            | GB41293874     | 5-May-04 (METAS, No 251-00388)            | May-05                 |
| Power sensor E4412A               | MY41495277     | 5-May-04 (METAS, No 251-00388)            | May-05                 |
| Reference 20 dB Attenuator        | SN: 5086 (20b) | 3-May-04 (METAS, No 251-00389)            | May-05                 |
| Fluke Process Calibrator Type 702 | SN: 6295803    | 8-Sep-03 (Sintrel SCS No. E-030020)       | Sep-04                 |
| Power sensor HP 8481A             | MY41092180     | 18-Sep-02 (SPEAG, in house check Oct-03)  | In house check: Oct 05 |
| RF generator HP 8684C             | US3642U01700   | 4-Aug-99 (SPEAG, in house check Aug-02)   | In house check: Aug-05 |
| Network Analyzer HP 8753E         | US37390585     | 18-Oct-01 (SPEAG, in house check Oct-03)  | In house check: Oct 05 |

Calibrated by:

Name  
**Nico Vetterli**

Function  
**Technician**

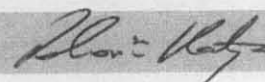
Signature



Approved by:

**Katja Pokovic**

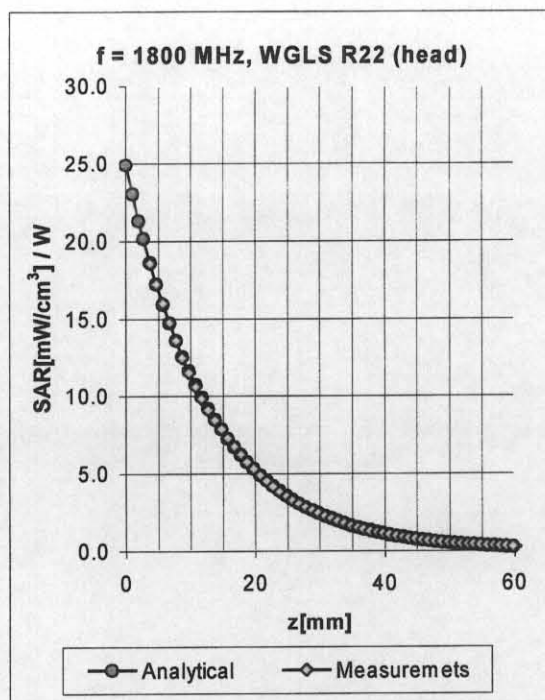
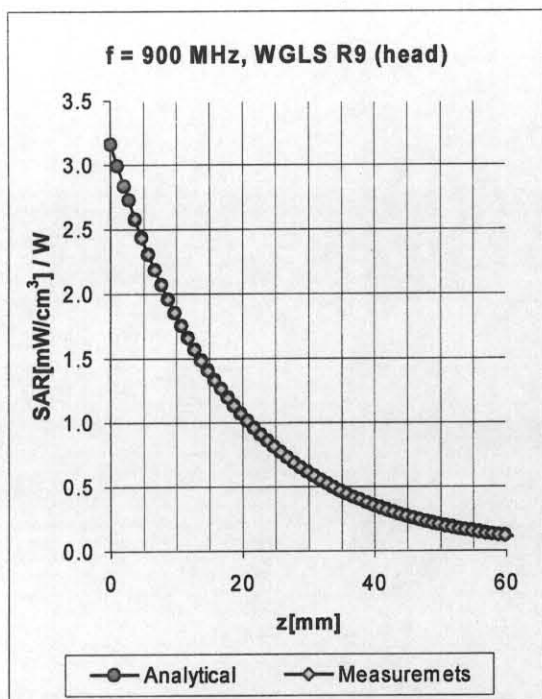
Laboratory Director



Date issued: June 15, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

## Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>B</sup> | Tissue | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|--------|--------------|--------------|-------|-------|--------------------|
| 900     | 800-1000                    | Head   | 41.5 ± 5%    | 0.97 ± 5%    | 0.66  | 1.75  | 6.06 ± 11.3% (k=2) |
| 1800    | 1710-1910                   | Head   | 40.0 ± 5%    | 1.40 ± 5%    | 0.49  | 2.67  | 4.93 ± 11.7% (k=2) |

<sup>B</sup> The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

**Client**

**Nokia DK**

## CALIBRATION CERTIFICATE

**Object(s)**

**ET3DV6 - SN 1808**

**Calibration procedure(s)**

**QA CAL-01.v2  
Calibration procedure for dosimetric E-field probes**

**Calibration date:**

**September 2, 2004 (Additional Conversion Factors)**

**Condition of the calibrated item**

**In Tolerance (according to the specific calibration document)**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

**Calibration Equipment used (M&TE critical for calibration)**

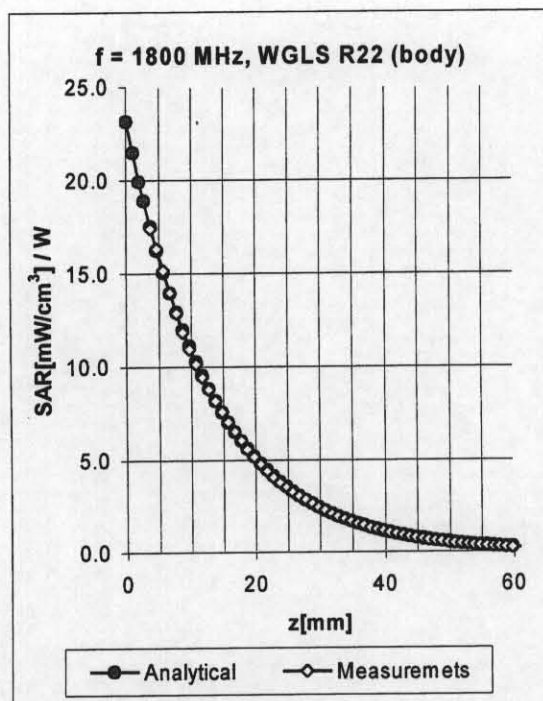
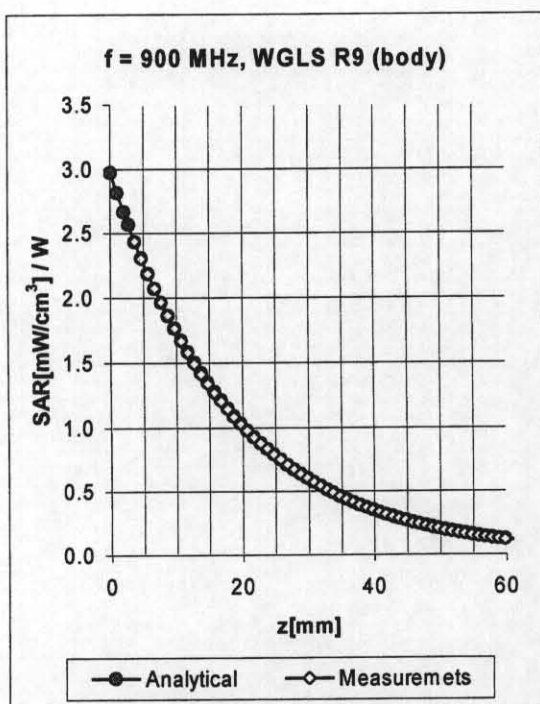
| Model Type                        | ID #           | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------------|----------------|-------------------------------------------|------------------------|
| Power meter EPM E4419B            | GB41293874     | 5-May-04 (METAS, No 251-00388)            | May-05                 |
| Power sensor E4412A               | MY41495277     | 5-May-04 (METAS, No 251-00388)            | May-05                 |
| Reference 20 dB Attenuator        | SN: 5086 (20b) | 3-May-04 (METAS, No 251-00389)            | May-05                 |
| Fluke Process Calibrator Type 702 | SN: 6295803    | 8-Sep-03 (Sintrel SCS No. E030020)        | Sep-04                 |
| Power sensor HP 8481A             | MY41092180     | 18-Sep-02 (SPEAG, in house check Oct03)   | In house check: Oct 05 |
| RF generator HP 8684C             | US3642U01700   | 4-Aug-99 (SPEAG, in house check Aug02)    | In house check: Aug05  |
| Network Analyzer HP 8753E         | US37390585     | 18-Oct-01 (SPEAG, in house check Oct03)   | In house check: Oct 05 |

|                | Name          | Function            | Signature                                                                             |
|----------------|---------------|---------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Nico Vetterli | Technician          |  |
| Approved by:   | Katja Pokovic | Laboratory Director |  |

Date issued: September 2, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

## Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>B</sup> | Tissue | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|--------|--------------|--------------|-------|-------|--------------------|
| 2450    | 2400-2500                   | Head   | 39.2 ± 5%    | 1.80 ± 5%    | 0.95  | 1.89  | 4.21 ± 9.7% (k=2)  |
| 900     | 800-1000                    | Body   | 55.0 ± 5%    | 1.05 ± 5%    | 0.52  | 2.20  | 5.62 ± 11.3% (k=2) |
| 1800    | 1710-1910                   | Body   | 53.3 ± 5%    | 1.52 ± 5%    | 0.55  | 2.76  | 4.27 ± 11.7% (k=2) |
| 2450    | 2400-2500                   | Body   | 52.7 ± 5%    | 1.95 ± 5%    | 1.31  | 1.52  | 4.01 ± 9.7% (k=2)  |

<sup>B</sup> The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

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## APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)

See the following pages.

**Calibration Laboratory of**  
**Schmid & Partner**  
**Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland

**Client**

**Nokia Danmark A/S**

## CALIBRATION CERTIFICATE

Object(s) **D835V2 - SN:476**

Calibration procedure(s) **QA CAL-05.v2**  
**Calibration procedure for dipole validation kits**

Calibration date: **February 25, 2003**

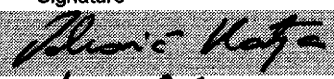
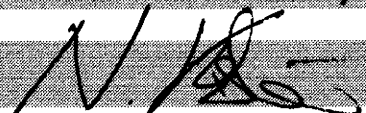
Condition of the calibrated item **In Tolerance (according to the specific calibration document)**

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type                | ID #       | Cal Date    | Scheduled Calibration  |
|---------------------------|------------|-------------|------------------------|
| RF generator R&S SML-03   | 100698     | 27-Mar-2002 | In house check: Mar-05 |
| Power sensor HP 8481A     | MY41092317 | 18-Oct-02   | Oct-04                 |
| Power sensor HP 8481A     | US37292783 | 30-Oct-02   | Oct-03                 |
| Power meter EPM E442      | GB37480704 | 30-Oct-02   | Oct-03                 |
| Network Analyzer HP 8753E | US38432426 | 3-May-00    | In house check: May 03 |

|                |               |                     |                                                                                       |
|----------------|---------------|---------------------|---------------------------------------------------------------------------------------|
|                | Name          | Function            | Signature                                                                             |
| Calibrated by: | Katja Pokovic | Laboratory Director |  |
| Approved by:   | Niels Kuster  | Quality Manager     |  |

Date issued: February 26, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Date/Time: 02/25/03 17:45:15

Test Laboratory: SPEAG, Zurich, Switzerland  
File Name: SN476\_SN1507\_HSL835\_250203.da4

**DUT: Dipole 835 MHz; Serial: D835V2 - SN476**  
**Program: Dipole Calibration**

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1  
Medium: HSL 835 MHz; ( $\sigma = 0.89$  mho/m,  $\epsilon_r = 41.5$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.7, 6.7, 6.7); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 23; Postprocessing SW: SEMCAD, V1.6 Build 105

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm

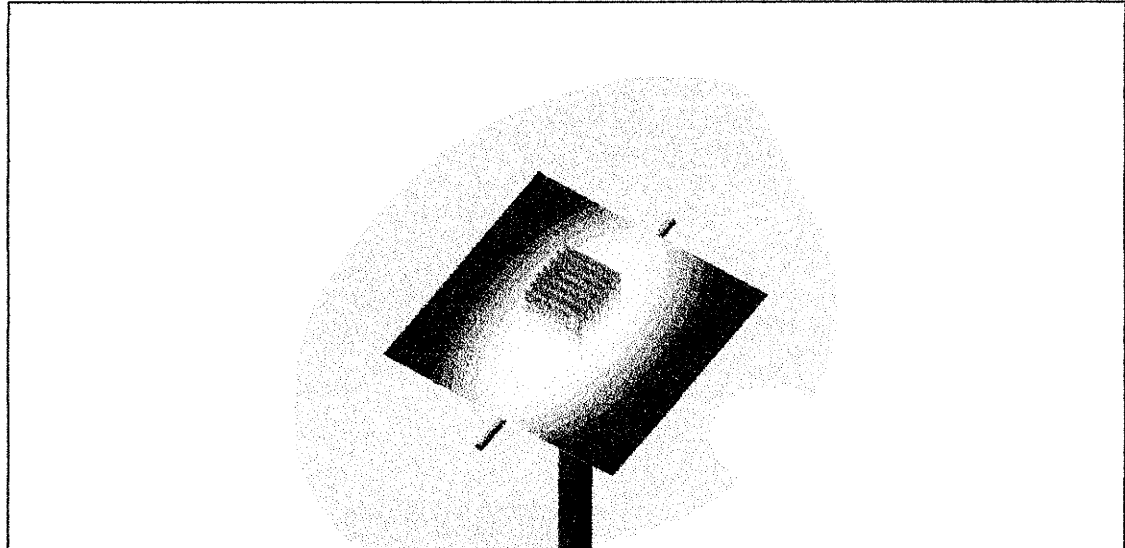
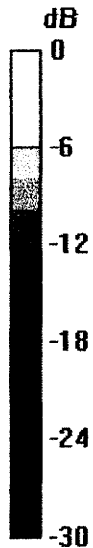
**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.2 V/m

Peak SAR = 3.57 W/kg

SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.55 mW/g

Power Drift = 0.03 dB



**Calibration Laboratory of**  
**Schmid & Partner**  
**Engineering AG**  
 Zeughausstrasse 43, 8004 Zurich, Switzerland

**Client**

**Nokia Danmark A/S**

## CALIBRATION CERTIFICATE

Object(s) **D835V2 - SN:476**

Calibration procedure(s) **QA CAL-05.v2  
Calibration procedure for dipole validation kits**

Calibration date: **April 7, 2003**

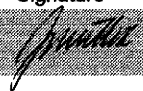
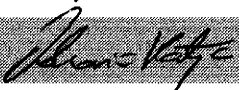
Condition of the calibrated item **In Tolerance (according to the specific calibration document)**

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type                | ID #       | Cal Date    | Scheduled Calibration  |
|---------------------------|------------|-------------|------------------------|
| RF generator R&S SML-03   | 100698     | 27-Mar-2002 | In house check: Mar-05 |
| Power sensor HP 8481A     | MY41092317 | 18-Oct-02   | Oct-04                 |
| Power sensor HP 8481A     | US37292783 | 30-Oct-02   | Oct-03                 |
| Power meter EPM E442      | GB37480704 | 30-Oct-02   | Oct-03                 |
| Network Analyzer HP 8753E | US38432426 | 3-May-00    | In house check: May 03 |

|                | Name           | Function            | Signature                                                                             |
|----------------|----------------|---------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Judith Mueller | Technician          |  |
| Approved by:   | Katja Pokovic  | Laboratory Director |  |

Date issued: April 11, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Date/Time: 04/07/03 13:58:59

Test Laboratory: SPEAG, Zurich, Switzerland  
File Name: SN476\_SN1507\_M835\_070403.da4

**DUT: Dipole 835 MHz; Serial: D835V2 - SN476**  
**Program: Dipole Calibration**

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1  
Medium: Muscle 835 MHz; ( $\sigma = 0.96$  mho/m,  $\epsilon_r = 54.03$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.3, 6.3, 6.3); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm

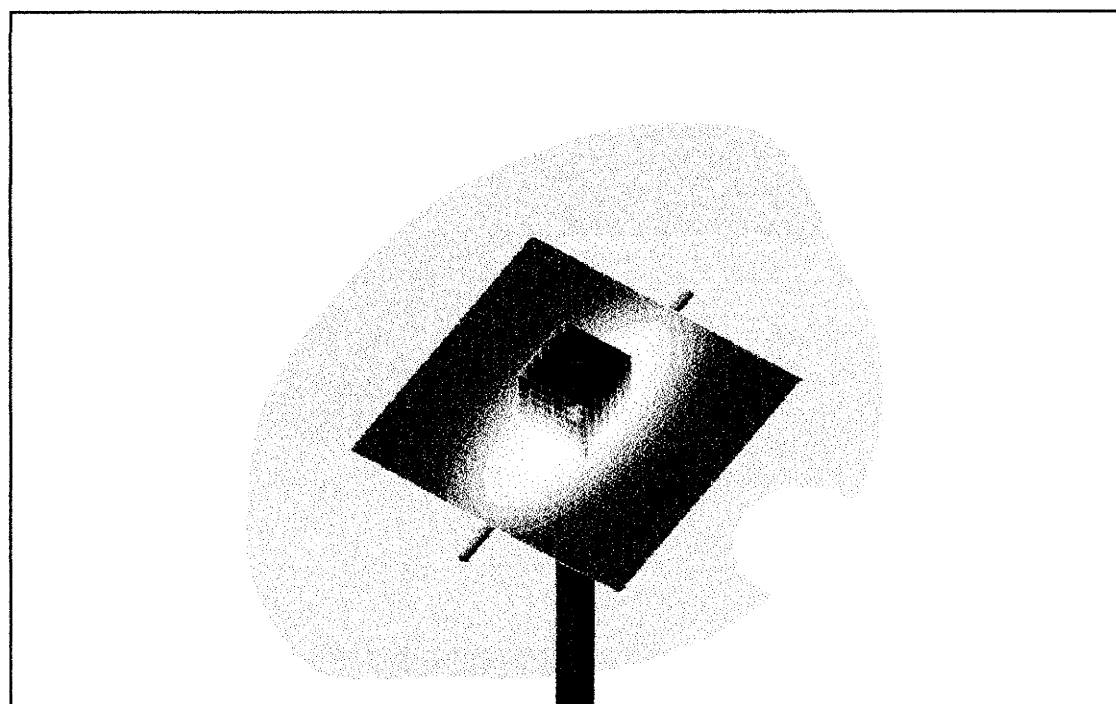
**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.4 V/m

Peak SAR = 3.6 W/kg

SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.67 mW/g

Power Drift = 0.02 dB



**Calibration Laboratory of**  
**Schmid & Partner**  
**Engineering AG**  
 Zeughausstrasse 43, 8004 Zurich, Switzerland

**Client**

**Nokia Danmark A/S**

## CALIBRATION CERTIFICATE

Object(s)

D1900V2 - SN:5d026

Calibration procedure(s)

QA CAL-05.v2  
 Calibration procedure for dipole validation kits

Calibration date:

February 26, 2003

Condition of the calibrated item

In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type                | ID #       | Cal Date    | Scheduled Calibration  |
|---------------------------|------------|-------------|------------------------|
| RF generator R&S SML-03   | 100698     | 27-Mar-2002 | In house check: Mar-05 |
| Power sensor HP 8481A     | MY41092317 | 18-Oct-02   | Oct-04                 |
| Power sensor HP 8481A     | US37292783 | 30-Oct-02   | Oct-03                 |
| Power meter EPM E442      | GB37480704 | 30-Oct-02   | Oct-03                 |
| Network Analyzer HP 8753E | US38432426 | 3-May-00    | In house check: May 03 |

Calibrated by:

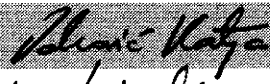
Name

Katja Pokovic

Function

Laboratory Director

Signature



Approved by:

Niels Kuster

Quality Manager



Date issued: February 26, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Date/Time: 02/26/03 17:17:26

Test Laboratory: SPEAG, Zurich, Switzerland  
File Name: SN5d026 SN1507 HSL1900 260203.da4

**DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d026**  
**Program: Dipole Calibration**

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

Medium: HSL 1900 MHz; ( $\sigma = 1.46$  mho/m,  $\epsilon_r = 38.6$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.2, 5.2, 5.2); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 25; Postprocessing SW: SEMCAD, V1.6 Build 105

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm

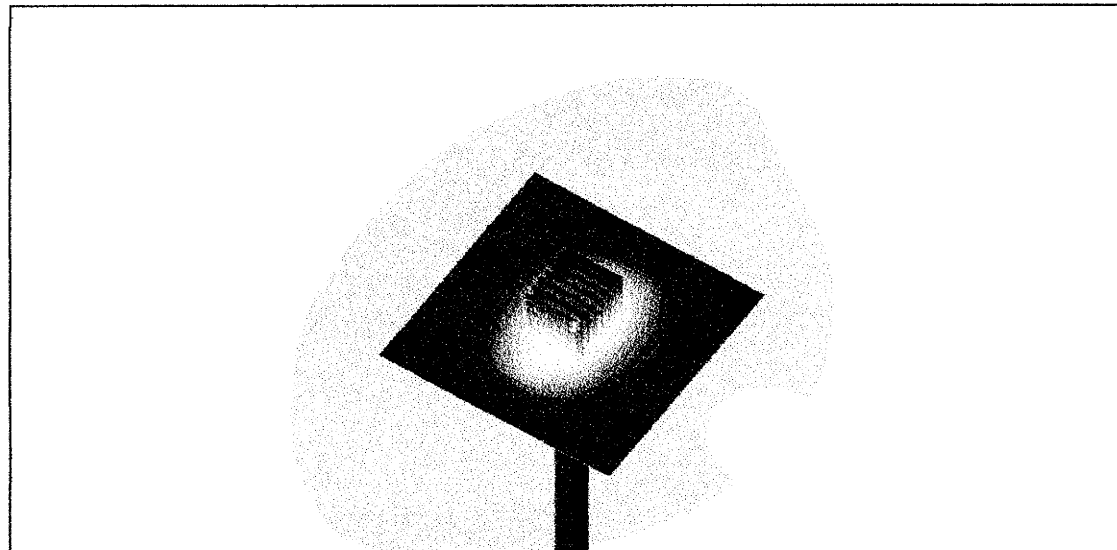
**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.2 V/m

Peak SAR = 18.6 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.31 mW/g

Power Drift = 0.04 dB



Calibration Laboratory of  
Schmid & Partner  
Engineering AG  
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client

Nokia Danmark A/S

## CALIBRATION CERTIFICATE

Object(s) D1900V2 - SN:5d026

Calibration procedure(s) QA CAL-05.v2  
Calibration procedure for dipole validation kits

Calibration date: April 8, 2003

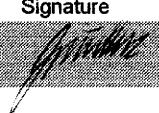
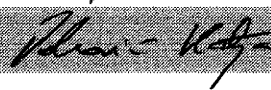
Condition of the calibrated item In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type                | ID #       | Cal Date    | Scheduled Calibration  |
|---------------------------|------------|-------------|------------------------|
| RF generator R&S SML-03   | 100698     | 27-Mar-2002 | In house check: Mar-05 |
| Power sensor HP 8481A     | MY41092317 | 18-Oct-02   | Oct-04                 |
| Power sensor HP 8481A     | US37292783 | 30-Oct-02   | Oct-03                 |
| Power meter EPM E442      | GB37480704 | 30-Oct-02   | Oct-03                 |
| Network Analyzer HP 8753E | US38432426 | 3-May-00    | In house check: May 03 |

|                | Name           | Function            | Signature                                                                             |
|----------------|----------------|---------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Judith Mueller | Technician          |  |
| Approved by:   | Katja Pokovic  | Laboratory Director |  |

Date issued: April 12, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Date/Time: 04/08/03 13:41:14

Test Laboratory: SPEAG, Zurich, Switzerland  
File Name: SN5d026 SN1507 M1900 080403.da4

**DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d026**  
**Program: Dipole Calibration**

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1  
Medium: Muscle 1900 MHz; ( $\sigma = 1.59$  mho/m,  $\epsilon_r = 51.2$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.8, 4.8, 4.8); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.2 V/m

Peak SAR = 18.6 W/kg

SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.51 mW/g

Power Drift = 0.09 dB

