

## SAR Compliance Test Report

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                                                                                                               |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------|
| Test report no.:                                 | FCC_RM-627_06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Date of report:         | 2010-07-02                                                                                                    |
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| Tested device:                                   | RM-627                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                                                                                               |
| FCC ID:                                          | QTKRM-627                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | IC:                     | -                                                                                                             |
| Supplement reports:                              | SAR_Photo_RM-627_07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |                                                                                                               |
| Testing has been carried out in accordance with: | <b>47CFR §2.1093</b><br>Radiofrequency Radiation Exposure Evaluation: Portable Devices<br><b>FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)</b><br>Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields<br><b>RSS-102</b><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<br><b>IEEE 1528 - 2003</b><br>IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique |                         |                                                                                                               |
| Documentation:                                   | The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                                                                                                               |
| 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:                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                                                                                                               |
| For the contents:                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                                                                                                               |

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SAR Report

Type: RM-627

FCC\_RM-627\_06

Applicant: Nokia Corporation

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## 1. SUMMARY OF SAR TEST REPORT

### 1.1 Test Details

|                                        |                                                           |
|----------------------------------------|-----------------------------------------------------------|
| Period of test                         | 2010-06-22 to 2010-07-02                                  |
| SN, HW and SW numbers of tested device | SN: 352713/04/000957/5, HW: 0300, SW: 041.017, DUT: 24226 |
| Batteries used in testing              | BL-5F, DUT: 24401, 24406, 24407, 24409, 24410             |
| Headsets used in testing               | HS-125, DUT: 24400                                        |
| Other accessories used in testing      | -                                                         |
| 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)  | Conducted power | Position     | Measured SAR value (1g avg) | Scaled* SAR value (1g avg) | SAR limit (1g avg) | Result        |
|---------------------------|---------------|-----------------|--------------|-----------------------------|----------------------------|--------------------|---------------|
| 2-slot GPRS 850           | 128 / 824.4   | 29.5 dBm        | Right, Cheek | 0.838 W/kg                  | <b>0.94 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| GSM 1900                  | 661 / 1880.0  | 30.0 dBm        | Left, Cheek  | 0.605 W/kg                  | <b>0.68 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| WCDMA 1900                | 9538 / 1907.6 | 22.0 dBm        | Left, Cheek  | 0.720 W/kg                  | <b>0.81 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| WLAN 2450                 | 7 / 2442.0    | 16.0 dBm        | Left, Cheek  | 0.274 W/kg                  | <b>0.31 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| 2-slot GPRS850 + WLAN2450 | -             | -               | Left, Cheek  | 1.01 W/kg                   | <b>1.13 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| GSM 1900 + WLAN2450       | -             | -               | Left, Cheek  | 0.605 W/kg                  | <b>0.68 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |
| WCDMA 1900 + WLAN2450     | -             | -               | Left, Cheek  | 0.767 W/kg                  | <b>0.86 W/kg</b>           | 1.6 W/kg           | <b>PASSED</b> |

### 1.2.2 Body Worn Configuration

| Mode                         | Ch /<br>f (MHz)  | Conducted<br>power | Separation<br>distance | Measured<br>SAR value<br>(1g avg) | Scaled*<br>SAR value<br>(1g avg) | SAR limit<br>(1g avg) | Result        |
|------------------------------|------------------|--------------------|------------------------|-----------------------------------|----------------------------------|-----------------------|---------------|
| 2-slot GPRS 850              | 251 /<br>848.8   | 29.5 dBm           | 1.5 cm                 | 0.602 W/kg                        | <b>0.67 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| GSM 1900                     | 512 /<br>1850.2  | 30.0 dBm           | 1.5 cm                 | 0.706 W/kg                        | <b>0.79 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| WCDMA 1900                   | 9262 /<br>1852.4 | 22.0 dBm           | 1.5 cm                 | 0.782 W/kg                        | <b>0.88 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| WLAN 2450                    | 1 /<br>2412.0    | 16.0 dBm           | 1.5 cm                 | 0.067 W/kg                        | <b>0.08 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| 2-slot GPRS850<br>+ WLAN2450 | -                | -                  | 1.5 cm                 | 0.631 W/kg                        | <b>0.71 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| GSM 1900<br>+ WLAN2450       | -                | -                  | 1.5 cm                 | 0.706 W/kg                        | <b>0.79 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |
| WCDMA 1900<br>+ WLAN2450     | -                | -                  | 1.5 cm                 | 0.782 W/kg                        | <b>0.88 W/kg</b>                 | 1.6 W/kg              | <b>PASSED</b> |

\* SAR values are scaled up by 12% to cover measurement drift. As a consequence of this upwards correction of the SAR values, the contribution of measurement drift to the overall measurement uncertainty (Section 6) is reduced to zero.

### 1.2.3 Maximum Drift

| Maximum drift covered by<br>12% scaling up of the SAR values | Maximum drift during measurements |
|--------------------------------------------------------------|-----------------------------------|
| 0.5dB                                                        | 0.48 dB                           |

### 1.2.4 Measurement Uncertainty

|                                |         |
|--------------------------------|---------|
| Expanded Uncertainty (k=2) 95% | ± 25.8% |
|--------------------------------|---------|

## 2. DESCRIPTION OF THE DEVICE UNDER TEST

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

| Modes of Operation | Bands          | Modulation Mode | Duty Cycle | Transmitter Frequency Range (MHz) |
|--------------------|----------------|-----------------|------------|-----------------------------------|
| GSM                | 850<br>1900    | GMSK            | 1/8        | 824 – 849<br>1850 – 1910          |
| GPRS               | 850<br>1900    | GMSK            | 1/8 to 3/8 | 824 – 849<br>1850 – 1910          |
| EGPRS              | 850<br>1900    | GMSK / 8PSK     | 1/8 to 3/8 | 824 – 849<br>1850 – 1910          |
| WCDMA              | 1900 (Band II) |                 | 1          | 1852 – 1908                       |
| HSUPA              | 1900 (Band II) |                 | 1          | 1852 – 1908                       |
| BT                 | 2450           | GFSK            | 1          | 2402 – 2480                       |
| WLAN               | 2450           | 11Mbps QPSK     | 1          | 2412 – 2462                       |

Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800, WCDMA900 and WCDMA2100 bands which are not part of this filing.

This device has Voice-over-IP/Dual Transfer Mode capability for use at the ear. Therefore, SAR for multi slot GPRS mode was evaluated against the head profile of the phantom. Dual Transfer Mode is a feature that utilises the multi-slot GPRS capability in this device; it allows simultaneous transmission of voice and data during the same call, using the same transmitter and antenna.

This is a WCDMA HSUPA device, but SAR tests for HSUPA mode have not been performed as no HSUPA Sub-test mode has an average power > 0.25dB above the basic WCDMA 12.2kbps RMC mode. Appendix C of this report gives a summary of the measured WCDMA and HSUPA average powers; a detailed report of these WCDMA and HSUPA conducted power tests is submitted separately.

This device mutes the internal earpiece when the slide is closed. Head SAR testing has therefore been limited to slide-open configuration only as Voice calls cannot be made with the slide closed.

## 2.1 Description of the Antenna

The device has internal antennas for both cellular and WLAN use. The cellular antenna is located at the bottom in the back section of the keypad slide. The WLAN antenna is located at the top in the back section of the keypad slide.

## 3. TEST CONDITIONS

### 3.1 Temperature and Humidity

|                           |              |
|---------------------------|--------------|
| Ambient temperature (°C): | 20.8 to 22.8 |
| Ambient humidity (RH %):  | 35 to 55     |

### 3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester except for testing WLAN2450 where control software was used. 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.

The transmission mode of the device in all WCDMA tests was configured to 12.2kbps RMC with all TPC bits set as “1”.

In all operating bands the measurements were performed on lowest, middle and highest channels.

The radiated output power of the device was measured by a separate test laboratory on the same unit(s) as used for SAR testing. The results are given in the EMC report supporting this application.

The transmission mode of the device in all WLAN tests was DSSS QPSK 11Mbps. This mode has the highest (or equal highest) time-averaged output power of all the WLAN modulation modes in Nokia devices.

### 3.3 Test Cases and Test Minimisation

The tested device examined in this report may not incorporate all of the features described in the text that follows, but its SAR evaluation will have been subjected to the same considerations and test logic described below.

Whilst it's possible to identify the maximum SAR test cases from inspection of the conducted power levels given in the Results tables (Section 7), different modes in the same band and multi-slot transmit GSM/GPRS modes can create some difficulties. Therefore the sequence of the SAR tests made in evaluating this device has used test logic that is based on measured SAR values. Comparison of measured SAR values in this way, can also allow some test minimization (i.e. test elimination) to be made.

For example, when SAR testing multi-slot GSM/GPRS/EGPRS modes, it is an inefficient use of test resources to fully SAR test every test configuration in each of the different modes as these modes have a fixed power relationship between them that is the same, irrespective of the test configuration. In the case of multi-slot GSM/GPRS modes, a single comparative SAR test - using the same test channel and test configuration - is made in each of the n-slot modes; the mode with the highest measured SAR value is then subjected to full SAR testing in all test configurations. These comparative SAR tests (same frequency, same test configuration) are regarded as extremely accurate as they are relative tests in which the tested device changes neither its frequency nor its position between tests. For different modes that operate in the same band and use the same antenna e.g. GSM/GPRS850 and WCDMA850, full SAR testing is carried out in the GSM/GPRS850 mode but WCDMA850 testing is limited to 3 channel testing in the maximum SAR test configuration for GSM/GPRS850.

Multi-slot SAR testing against the Head is always performed whenever such a device offers Push to Talk over cellular with the internal earpiece active, Dual Transfer Mode (i.e. the ability to transmit voice and data simultaneously using the same transmitter) or has WLAN (which enables a Voice over IP call to take place whilst the device can simultaneously transmit data on a cellular band). Whenever a device has an intended multi-slot use against the head, it is also Head SAR tested in EGPRS mode. It should be noted that EGPRS transmit modes can have either GMSK or 8PSK modulation but, when tested, only 8PSK EGPRS will appear explicitly in the results tables, as GMSK EGPRS mode has identical time-averaged power to the reported GPRS mode.

Devices that have flips or slides are fully SAR tested in all device configurations consistent with their intended usage. For example, flip phones that can receive a call in closed mode are SAR tested against the head in both open and closed configurations. Similarly, slide phones are fully SAR tested in all slide configurations in which calls are intended to be made or received.

In the results tables in Section 7, the maximum SAR value for the ‘basic’ tests (i.e. left cheek, left tilt, right cheek and right tilt in Head SAR testing; with and without headset with the back &/or display side facing the flat phantom in Body SAR testing) is bolded for each band. In some cases, after full testing of the basic SAR test configurations has been completed, additional checking SAR tests are made. These checking tests are always based on the bolded result from the ‘basic’ testing. When the SAR value of a checking test exceeds the maximum value from the basic tests, it is also bolded and used as the basis for any further checking tests that might be needed.

Checking tests are largely voluntary and can cover optional batteries, different camera slide positions, optional covers, etc. In the case of optional batteries, if the construction of the optional battery is significantly different to the battery used in the full testing e.g. if the outer can is floating electrically rather than grounded, then the maximum SAR test configuration in each band is tested with the optional battery in 3 channels. For camera slides, if the slide material is metal, then checking tests in 3 channels are again run for the maximum SAR test configuration in each band. For plastic camera slides, SAR checking is only carried out in the channel that provided the maximum SAR value for the original. Optional front and back covers are tested if their shape differs significantly from the original or if their metallic content varies by more than 15% from the original; in the former case, the testing depends on the extent of the physical differences, whereas in the latter case, 3 channel SAR testing is performed in every band in the max SAR test configuration.

#### 4. DESCRIPTION OF THE TEST EQUIPMENT

##### 4.1 Measurement System and Components

The measurements were performed using an automated near-field scanning system, DASY4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

| Test Equipment                 | Serial Number | Calibration interval | Calibration expiry |
|--------------------------------|---------------|----------------------|--------------------|
| DAE4                           | 682           | 12 months            | 2010-07            |
| DAE3                           | 573           | 12 months            | 2010-07            |
| E-field Probe ES3DV3           | 3117          | 12 months            | 2010-07            |
| E-field Probe ES3DV3           | 3118          | 12 months            | 2010-09            |
| Dipole Validation Kit, D835V2  | 4d042         | 24 months            | 2010-09            |
| Dipole Validation Kit, D1900V2 | 5d063         | 24 months            | 2012-02            |
| Dipole Validation Kit, D2450V2 | 790           | 24 months            | 2010-09            |
| DASY4 software                 | Version 4.7   | -                    | -                  |

Additional test equipment used in testing:

| Test Equipment          | Model          | Serial Number | Calibration interval | Calibration expiry |
|-------------------------|----------------|---------------|----------------------|--------------------|
| Signal Generator        | SME06          | 829445/008    | 36 months            | 2012-02            |
| Signal Generator        | SME06          | 848650/011    | 36 months            | 2012-08            |
| Amplifier               | ZHL-42W        | E012903       | -                    | -                  |
| Amplifier               | 2100-BBS3Q8CCJ | 1003          | -                    | -                  |
| Power Meter             | NRP            | 100808        | 24 months            | 2012-04            |
| Power Meter             | NRP            | 101293        | 24 months            | 2011-08            |
| Power Sensor            | NRP-Z51        | 100410        | 24 months            | 2012-04            |
| Power Sensor            | NRP-Z51        | 100830        | 24 months            | 2011-08            |
| Call Tester             | CMU200         | 110735        | -                    | -                  |
| Call Tester             | CMU200         | 105900        | -                    | -                  |
| Vector Network Analyzer | AT8753ES       | MY40001091    | 12 months            |                    |
| Dielectric Probe Kit    | HP85070B       | US33020403    | -                    | -                  |

#### 4.1.1 Isotropic E-field Probe Type ES3DV3

|                      |                                                                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction</b>  | Symmetrical design with triangular core<br>Interleaved sensors<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 D                                                                                                                                                        |
| <b>Frequency</b>     | 10 MHz to 4 GHz (dosimetry); Linearity: $\pm 0.2$ dB (30 MHz to 4 GHz)                                                                                                                       |
| <b>Directivity</b>   | $\pm 0.2$ dB in HSL (rotation around probe axis)<br>$\pm 0.3$ 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: 20 mm<br>Body diameter: 12 mm<br>Tip diameter: 3.9 mm<br>Distance from probe tip to dipole centers: 2.0 mm                                             |
| <b>Application</b>   | General dosimetry up to 4 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 system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2003.

System checking was 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 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using simulants 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 tissue simulant was at least 15.0 cm measured from the ear reference point during system checking and device measurements.

#### 4.3.1 Tissue Simulant Recipes

The following recipe(s) were used for Head and Body tissue simulant(s):

##### 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                  |

##### 2450MHz band

| Ingredient      | Head<br>(% by weight) | Body<br>(% by weight) |
|-----------------|-----------------------|-----------------------|
| Deionised Water | 56.0                  | 70.20                 |
| Tween 20        | 44.0                  | 29.62                 |
| Salt            | -                     | 0.18                  |

#### 4.3.2 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, 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 system checking results (dielectric parameters and SAR values) are given in the table below.

**System checking, head tissue simulant**

| <b>f [MHz]</b> | <b>Description</b> | <b>SAR [W/kg],<br/>1g</b> | <b>Dielectric Parameters</b> |                | <b>Temp<br/>[°C]</b> |
|----------------|--------------------|---------------------------|------------------------------|----------------|----------------------|
|                |                    |                           | $\epsilon_r$                 | $\sigma$ [S/m] |                      |
| 835            | Reference result   | 2.38                      | 41.4                         | 0.90           |                      |
|                | ± 10% window       | 2.14 - 2.62               |                              |                |                      |
|                | 2010-06-22         | 2.37                      | 40.2                         | 0.89           | 22.4                 |
| 1900           | Reference result   | 9.98                      | 39.2                         | 1.42           |                      |
|                | ± 10% window       | 8.98 - 10.98              |                              |                |                      |
|                | 2010-06-23         | 10.9                      | 38.5                         | 1.48           | 22.5                 |
|                | 2010-06-24         | 10.8                      | 38.6                         | 1.49           | 20.8                 |
| 2450           | Reference result   | 13.2                      | 39.8                         | 1.80           |                      |
|                | ± 10% window       | 11.9 - 14.5               |                              |                |                      |
|                | 2010-06-30         | 13.6                      | 39.0                         | 1.88           | 22.4                 |
|                | 2010-07-01         | 14.3                      | 38.8                         | 1.89           | 22.5                 |

Plots of the system checking scans are given in Appendix A.

#### 4.3.3 Tissue Simulants used in the Measurements

**Head tissue simulant measurements**

| f<br>[MHz] | Description       | Dielectric Parameters |                | Temp<br>[°C] |
|------------|-------------------|-----------------------|----------------|--------------|
|            |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 836        | Recommended value | 41.5                  | 0.90           |              |
|            | $\pm 5\%$ window  | 39.4 – 43.6           | 0.86 – 0.95    |              |
|            | 2010-06-22        | 40.2                  | 0.89           | 22.4         |
| 1880       | Recommended value | 40.0                  | 1.40           |              |
|            | $\pm 5\%$ window  | 38.0 – 42.0           | 1.33 – 1.47    |              |
|            | 2010-06-23        | 38.5                  | 1.46           | 22.5         |
|            | 2010-06-24        | 38.7                  | 1.47           | 20.8         |
| 2442       | Recommended value | 39.2                  | 1.79           |              |
|            | $\pm 5\%$ window  | 37.3 – 41.2           | 1.70 – 1.88    |              |
|            | 2010-06-30        | 39.0                  | 1.88           | 22.4         |

**Body tissue simulant measurements**

| f<br>[MHz] | Description       | Dielectric Parameters |                | Temp<br>[°C] |
|------------|-------------------|-----------------------|----------------|--------------|
|            |                   | $\epsilon_r$          | $\sigma$ [S/m] |              |
| 836        | Recommended value | 55.2                  | 0.97           |              |
|            | $\pm 5\%$ window  | 52.4 – 58.0           | 0.92 – 1.02    |              |
|            | 2010-06-22        | 54.0                  | 0.97           | 22.4         |
| 1880       | Recommended value | 53.3                  | 1.52           |              |
|            | $\pm 5\%$ window  | 50.6 – 56.0           | 1.44 – 1.60    |              |
|            | 2010-06-24        | 52.3                  | 1.57           | 22.8         |
| 2442       | Recommended value | 52.7                  | 1.94           |              |
|            | $\pm 5\%$ window  | 50.1 – 55.3           | 1.85 – 2.04    |              |
|            | 2010-07-01        | 51.8                  | 1.92           | 22.8         |

---

## 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".

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### 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 Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with both sides facing the phantom to find the highest results.

### 5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom 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 area scan and again at the end of the zoom 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 zoom 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 zoom 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 | $C_i$           | $C_i \cdot U_i$ (%) | $V_i$ |
|---------------------------------------------------------------------------------|----------------------|----------|-----------|-----|-----------------|---------------------|-------|
| <b>Measurement System</b>                                                       |                      |          |           |     |                 |                     |       |
| Probe Calibration                                                               | E2.1                 | ±5.9     | N         | 1   | 1               | ±5.9                | ∞     |
| Axial Isotropy                                                                  | E2.2                 | ±4.7     | R         | √3  | $(1-c_p)^{1/2}$ | ±1.9                | ∞     |
| Hemispherical Isotropy                                                          | E2.2                 | ±9.6     | R         | √3  | $(c_p)^{1/2}$   | ±3.9                | ∞     |
| Boundary Effect                                                                 | E2.3                 | ±1.0     | R         | √3  | 1               | ±0.6                | ∞     |
| Linearity                                                                       | E2.4                 | ±4.7     | R         | √3  | 1               | ±2.7                | ∞     |
| System Detection Limits                                                         | E2.5                 | ±1.0     | R         | √3  | 1               | ±0.6                | ∞     |
| Readout Electronics                                                             | E2.6                 | ±1.0     | N         | 1   | 1               | ±1.0                | ∞     |
| Response Time                                                                   | E2.7                 | ±0.8     | R         | √3  | 1               | ±0.5                | ∞     |
| Integration Time                                                                | E2.8                 | ±2.6     | R         | √3  | 1               | ±1.5                | ∞     |
| RF Ambient Conditions - Noise                                                   | E6.1                 | ±3.0     | R         | √3  | 1               | ±1.7                | ∞     |
| RF Ambient Conditions - Reflections                                             | E6.1                 | ±3.0     | R         | √3  | 1               | ±1.7                | ∞     |
| Probe Positioner Mechanical Tolerance                                           | E6.2                 | ±0.4     | R         | √3  | 1               | ±0.2                | ∞     |
| Probe Positioning with respect to Phantom Shell                                 | E6.3                 | ±2.9     | R         | √3  | 1               | ±1.7                | ∞     |
| Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | E5                   | ±3.9     | R         | √3  | 1               | ±2.3                | ∞     |
| <b>Test sample Related</b>                                                      |                      |          |           |     |                 |                     |       |
| Test Sample Positioning                                                         | E4.2                 | ±6.0     | N         | 1   | 1               | ±6.0                | 11    |
| Device Holder Uncertainty                                                       | E4.1                 | ±5.0     | N         | 1   | 1               | ±5.0                | 7     |
| Output Power Variation - SAR drift measurement                                  | 6.6.3                | ±0.0     | R         | √3  | 1               | ±0.0                | ∞     |
| <b>Phantom and Tissue Parameters</b>                                            |                      |          |           |     |                 |                     |       |
| Phantom Uncertainty (shape and thickness tolerances)                            | E3.1                 | ±4.0     | R         | √3  | 1               | ±2.3                | ∞     |
| Conductivity Target - tolerance                                                 | E3.2                 | ±5.0     | R         | √3  | 0.64            | ±1.8                | ∞     |
| Conductivity - measurement uncertainty                                          | E3.3                 | ±5.5     | N         | 1   | 0.64            | ±3.5                | 5     |
| Permittivity Target - tolerance                                                 | E3.2                 | ±5.0     | R         | √3  | 0.6             | ±1.7                | ∞     |
| Permittivity - measurement uncertainty                                          | E3.3                 | ±2.9     | N         | 1   | 0.6             | ±1.7                | 5     |
| <b>Combined Standard Uncertainty</b>                                            |                      |          | RSS       |     |                 | ±12.9               | 116   |
| <b>Coverage Factor for 95%</b>                                                  |                      |          | k=2       |     |                 |                     |       |
| <b>Expanded Uncertainty</b>                                                     |                      |          |           |     |                 | ±25.8               |       |

## 7. RESULTS

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

### 850MHz Head SAR results

| Option used                  | Test configuration     |       | 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>GSM</b>                   | <b>Conducted Power</b> |       | -                            | 32.5 dBm            | -                   |
| Slide open                   | Left                   | Cheek | -                            | 0.735               | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |
|                              | Right                  | Cheek | -                            | -                   | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |
| <b>2-slot GPRS</b>           | <b>Conducted Power</b> |       | 29.5 dBm                     | 29.5 dBm            | 29.5 dBm            |
| Slide open                   | Left                   | Cheek | 0.830                        | 0.805               | 0.798               |
|                              |                        | Tilt  | -                            | 0.376               | -                   |
|                              | Right                  | Cheek | <b>0.838</b>                 | 0.835               | 0.838               |
|                              |                        | Tilt  | -                            | 0.356               | -                   |
| <b>3-slot GPRS</b>           | <b>Conducted Power</b> |       | -                            | 27.7 dBm            | -                   |
| Slide open                   | Left                   | Cheek | -                            | 0.805               | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |
|                              | Right                  | Cheek | -                            | -                   | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |
| <b>2-slot 8PSK<br/>EGPRS</b> | <b>Conducted Power</b> |       | 23.5 dBm                     | -                   | -                   |
| Slide open                   | Left                   | Cheek | -                            | -                   | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |
|                              | Right                  | Cheek | 0.104                        | -                   | -                   |
|                              |                        | Tilt  | -                            | -                   | -                   |

### 1900MHz Head SAR results

| Option used                  | Test configuration     |       | 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>GSM</b>                   | <b>Conducted Power</b> |       | <b>30.0 dBm</b>              | <b>30.0 dBm</b>       | <b>30.0 dBm</b>       |
| Slide open                   | Left                   | Cheek | 0.592                        | <b>0.605</b>          | 0.542                 |
|                              |                        | Tilt  | -                            | 0.092                 | -                     |
|                              | Right                  | Cheek | -                            | 0.471                 | -                     |
|                              |                        | Tilt  | -                            | 0.135                 | -                     |
| <b>2-slot GPRS</b>           | <b>Conducted Power</b> |       | <b>-</b>                     | <b>27.0 dBm</b>       | <b>-</b>              |
| Slide open                   | Left                   | Cheek | -                            | 0.599                 | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
|                              | Right                  | Cheek | -                            | -                     | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
| <b>3-slot GPRS</b>           | <b>Conducted Power</b> |       | <b>-</b>                     | <b>25.2 dBm</b>       | <b>-</b>              |
| Slide open                   | Left                   | Cheek | -                            | 0.587                 | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
|                              | Right                  | Cheek | -                            | -                     | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
| <b>1-slot 8PSK<br/>EGPRS</b> | <b>Conducted Power</b> |       | <b>-</b>                     | <b>25.5 dBm</b>       | <b>-</b>              |
| Slide open                   | Left                   | Cheek | -                            | 0.124                 | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
|                              | Right                  | Cheek | -                            | -                     | -                     |
|                              |                        | Tilt  | -                            | -                     | -                     |
| Option used                  | Test configuration     |       | Ch 9262<br>1852.4 MHz        | Ch 9400<br>1880.0 MHz | Ch 9538<br>1907.6 MHz |
| <b>WCDMA</b>                 | <b>Conducted Power</b> |       | <b>22.0 dBm</b>              | <b>22.0 dBm</b>       | <b>22.0 dBm</b>       |
| Slide open                   | Left                   | Cheek | 0.711                        | 0.672                 | <b>0.720</b>          |
|                              |                        | Tilt  | -                            | 0.109                 | -                     |
|                              | Right                  | Cheek | -                            | 0.669                 | -                     |
|                              |                        | Tilt  | -                            | 0.102                 | -                     |

### 2450MHz Head SAR results

| Option used | Test configuration     |       | SAR, averaged over 1g (W/kg) |                    |                     |
|-------------|------------------------|-------|------------------------------|--------------------|---------------------|
|             |                        |       | Ch 1<br>2412.0 MHz           | Ch 7<br>2442.0 MHz | Ch 11<br>2462.0 MHz |
| <b>WLAN</b> | <b>Conducted Power</b> |       | <b>16.0 dBm</b>              | <b>16.0 dBm</b>    | <b>16.0 dBm</b>     |
| Slide open  | Left                   | Cheek | 0.231                        | <b>0.274</b>       | 0.247               |
|             |                        | Tilt  | -                            | 0.134              | -                   |
|             | Right                  | Cheek | -                            | 0.158              | -                   |
|             |                        | Tilt  | -                            | 0.135              | -                   |

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

**850MHz Body SAR results**

| Option used  | Device orientation     | Test configuration | SAR, averaged over 1g (W/kg) |                     |                     |
|--------------|------------------------|--------------------|------------------------------|---------------------|---------------------|
|              |                        |                    | Ch 128<br>824.2 MHz          | Ch 190<br>836.6 MHz | Ch 251<br>848.8 MHz |
| 2-slot GPRS  |                        | Conducted Power    | 29.5 dBm                     | 29.5 dBm            | 29.5 dBm            |
| Slide closed | Display facing phantom | Without headset    | -                            | 0.382               | -                   |
|              |                        | Headset HS-125     | -                            | 0.273               | -                   |
|              | Back facing phantom    | Without headset    | 0.382                        | 0.553               | <b>0.602</b>        |
|              |                        | Headset HS-125     | -                            | 0.397               | -                   |

**1900MHz Body SAR results**

| Option used  | Device orientation     | Test configuration | SAR, averaged over 1g (W/kg) |                       |                       |
|--------------|------------------------|--------------------|------------------------------|-----------------------|-----------------------|
|              |                        |                    | Ch 512<br>1850.2 MHz         | Ch 661<br>1880.0 MHz  | Ch 810<br>1909.8 MHz  |
| GSM          |                        | Conducted Power    | 30.0 dBm                     | 30.0 dBm              | 30.0 dBm              |
| Slide closed | Display facing phantom | Without headset    | -                            | 0.229                 | -                     |
|              |                        | Headset HS-125     | -                            | 0.236                 | -                     |
|              | Back facing phantom    | Without headset    | 0.706                        | 0.665                 | 0.589                 |
|              |                        | Headset HS-125     | -                            | 0.661                 | -                     |
| Option used  | Device orientation     | Test configuration | Ch 9262<br>1852.4 MHz        | Ch 9400<br>1880.0 MHz | Ch 9538<br>1907.6 MHz |
| WCDMA        |                        | Conducted Power    | 22.0 dBm                     | 22.0 dBm              | 22.0 dBm              |
| Slide closed | Display facing phantom | Without headset    | -                            | 0.293                 | -                     |
|              |                        | Headset HS-125     | -                            | 0.297                 | -                     |
|              | Back facing phantom    | Without headset    | 0.782                        | 0.768                 | 0.607                 |
|              |                        | Headset HS-125     | -                            | 0.729                 | -                     |

### 2450MHz Body SAR results

| Option used  | Device orientation     | Test configuration | SAR, averaged over 1g (W/kg) |                    |                     |
|--------------|------------------------|--------------------|------------------------------|--------------------|---------------------|
|              |                        |                    | Ch 1<br>2412.0 MHz           | Ch 7<br>2442.0 MHz | Ch 11<br>2462.0 MHz |
| WLAN         |                        | Conducted Power    | 16.0 dBm                     | 16.0 dBm           | 16.0 dBm            |
| Slide closed | Display facing phantom | Without headset    | 0.067                        | 0.060              | 0.054               |
|              |                        | Headset HS-125     | -                            | 0.055              | -                   |
|              | Back facing phantom    | Without headset    | -                            | 0.059              | -                   |
|              |                        | Headset HS-125     | -                            | 0.052              | -                   |

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product. The Combined SAR data given in the tables below has been voluntarily calculated.

### Simultaneous transmissions: Combined SAR results – Individual band Max results

| Test configuration    | Max. 1g SAR results |                 |          |            |
|-----------------------|---------------------|-----------------|----------|------------|
|                       | WLAN                | 2-slot GPRS 850 | GSM 1900 | WCDMA 1900 |
| Head: Left, Cheek     | 0.274               | 0.830           | 0.605    | 0.720      |
| Head: Left, Tilt      | 0.134               | 0.376           | 0.092    | 0.109      |
| Head: Right, Cheek    | 0.158               | 0.838           | 0.471    | 0.669      |
| Head: Right, Tilt     | 0.135               | 0.356           | 0.135    | 0.102      |
| Body: Without Headset | 0.067               | 0.602           | 0.706    | 0.782      |
| Body: Headset HS-125  | 0.055               | 0.397           | 0.661    | 0.729      |

### Simultaneous transmissions: Combined SAR results – Max + Max combined results

| Test configuration    | Combined 1g SAR values    |                    |                      |
|-----------------------|---------------------------|--------------------|----------------------|
|                       | WLAN +<br>2-slot GPRS 850 | WLAN +<br>GSM 1900 | WLAN +<br>WCDMA 1900 |
| Head: Left, Cheek     | <b>1.104</b>              | <b>0.879</b>       | <b>0.994</b>         |
| Head: Left, Tilt      | 0.510                     | 0.226              | 0.243                |
| Head: Right, Cheek    | 0.996                     | 0.629              | 0.827                |
| Head: Right, Tilt     | 0.491                     | 0.270              | 0.237                |
| Body: Without Headset | <b>0.669</b>              | <b>0.773</b>       | <b>0.849</b>         |
| Body: Headset HS-125  | 0.452                     | 0.716              | 0.784                |

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values for WLAN2450 and the cellular bands point-by-point and c) calculates the combined average SAR values.

**Simultaneous transmissions: Combined SAR results –  
SPEAG Combined Multiband algorithm results**

| Test configuration    | Combined 1g SAR values    |                    |                      |
|-----------------------|---------------------------|--------------------|----------------------|
|                       | WLAN +<br>2-slot GPRS 850 | WLAN +<br>GSM 1900 | WLAN +<br>WCDMA 1900 |
| Head: Left, Cheek     | <b>1.01</b>               | <b>0.564</b>       | <b>0.767</b>         |
| Head: Left, Tilt      | -                         | -                  | -                    |
| Head: Right, Cheek    | -                         | -                  | -                    |
| Head: Right, Tilt     | -                         | -                  | -                    |
| Body: Without Headset | <b>0.631</b>              | <b>0.673</b>       | <b>0.734</b>         |
| Body: Headset HS-125  | -                         | -                  | -                    |

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular band.

Plots of the Measurement scans are given in Appendix B.

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## APPENDIX A: SYSTEM CHECKING SCANS

See the following pages

Date/Time: 2010-06-22 15:57:35

Test Laboratory: TCC Nokia  
Type: D835V2; Serial: 4d042

**Communication System: CW835**

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.888$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 2.57 mW/g

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

Reference Value = 51.7 V/m

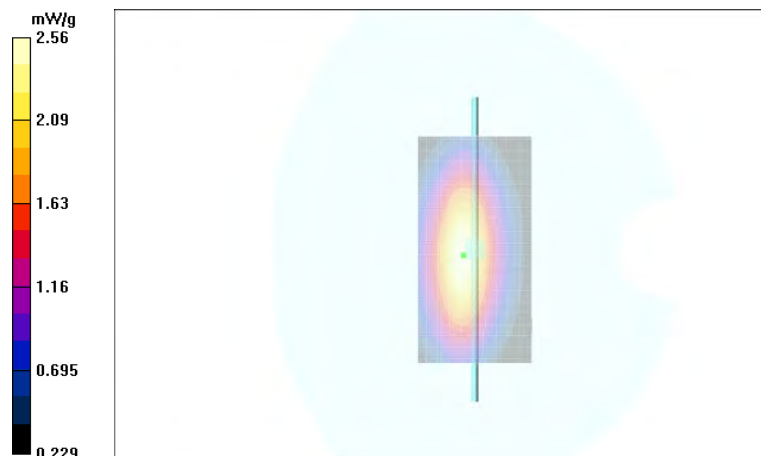
Peak SAR (extrapolated) = 3.59 W/kg

**SAR(1 g) = 2.37 mW/g**

**SAR(10 g) = 1.54 mW/g**

**Power Drift = 0.000 dB**

Maximum value of SAR (measured) = 2.56 mW/g



Date/Time: 2010-06-23 13:17:00

Test Laboratory: TCC Nokia  
Type: D1900V2; Serial: 5d063

**Communication System: CW1900**

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 12.5 mW/g

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

Reference Value = 88.9 V/m

Peak SAR (extrapolated) = 20.2 W/kg

**SAR(1 g) = 10.9 mW/g**

**SAR(10 g) = 5.62 mW/g**

**Power Drift = -0.019 dB**

Maximum value of SAR (measured) = 12.2 mW/g



Date/Time: 2010-06-24 11:40:49

Test Laboratory: TCC Nokia  
Type: D1900V2; Serial: 5d063

**Communication System: CW1900**

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.49$  mho/m;  $\epsilon_r = 38.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 12.3 mW/g

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

Reference Value = 89.8 V/m

Peak SAR (extrapolated) = 20.2 W/kg

**SAR(1 g) = 10.8 mW/g**

**SAR(10 g) = 5.54 mW/g**

**Power Drift = 0.052 dB**

Maximum value of SAR (measured) = 12.2 mW/g



Date/Time: 2010-06-30 10:58:18

Test Laboratory: TCC Nokia  
Type: D2450V2; Serial: 790

**Communication System: CW2450**

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 14.0 mW/g

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

Reference Value = 91.4 V/m

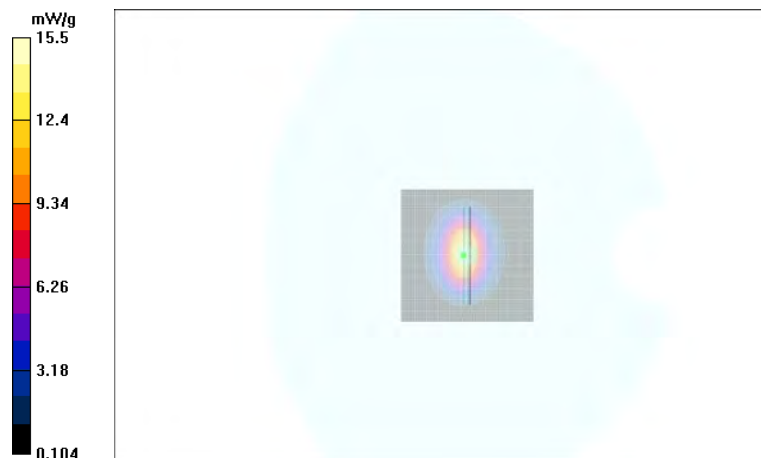
Peak SAR (extrapolated) = 27.9 W/kg

**SAR(1 g) = 13.6 mW/g**

**SAR(10 g) = 6.32 mW/g**

**Power Drift = 0.008 dB**

Maximum value of SAR (measured) = 15.5 mW/g



Date/Time: 2010-07-01 13:39:03

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: D2450V2 – SN 790

**Communication System: CW2450**

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.89$  mho/m;  $\epsilon_r = 38.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2009-09-18
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 17.0 mW/g

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

Reference Value = 85.7 V/m

Peak SAR (extrapolated) = 29.2 W/kg

**SAR(1 g) = 14.3 mW/g**

**SAR(10 g) = 6.64 mW/g**

**Power Drift = -0.151 dB**

Maximum value of SAR (measured) = 16.3 mW/g



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## APPENDIX B: MEASUREMENT SCANS

See the following pages

Date/Time: 2010-06-22 17:31:28

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM850**

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.891$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek – Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.806 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (6x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.5 V/m

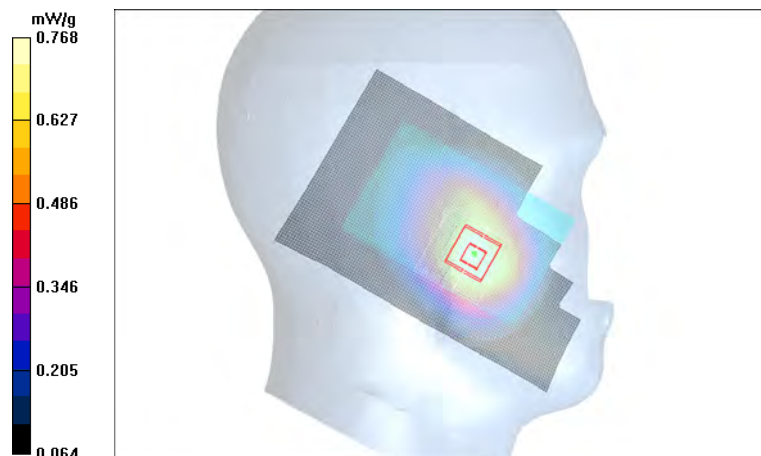
Peak SAR (extrapolated) = 0.981 W/kg

**SAR(1 g) = 0.735 mW/g**

**SAR(10 g) = 0.522 mW/g**

**Power Drift = -0.226 dB**

Maximum value of SAR (measured) = 0.768 mW/g



Date/Time: 2010-06-22 19:14:30

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 824.2 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.879$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Low - Slide Open/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm**

Maximum value of SAR (interpolated) = 0.899 mW/g

**Cheek - Low - Slide Open/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm**

Reference Value = 13.0 V/m

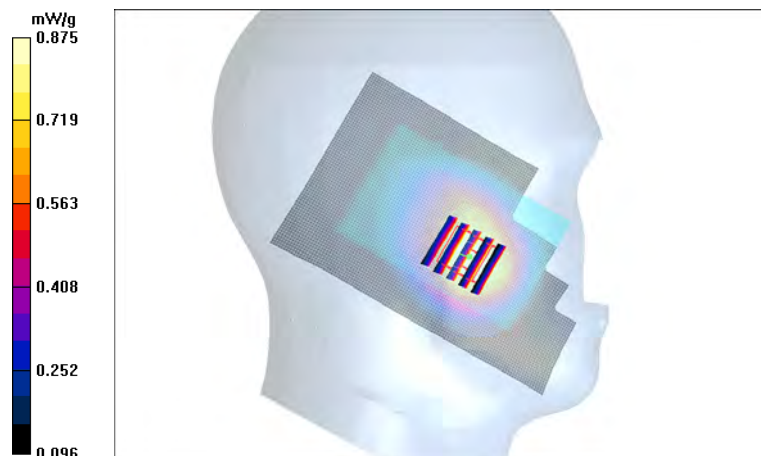
Peak SAR (extrapolated) = 1.12 W/kg

**SAR(1 g) = 0.830 mW/g**

**SAR(10 g) = 0.592 mW/g**

**Power Drift = -0.141 dB**

Maximum value of SAR (measured) = 0.875 mW/g



Date/Time: 2010-06-22 19:33:50

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.891$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.392 mW/g

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

Reference Value = 16.4 V/m

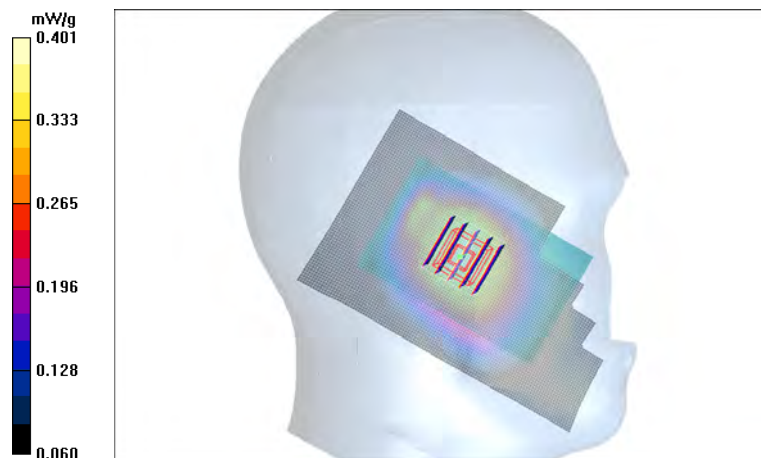
Peak SAR (extrapolated) = 0.475 W/kg

**SAR(1 g) = 0.376 mW/g**

**SAR(10 g) = 0.285 mW/g**

**Power Drift = -0.118 dB**

Maximum value of SAR (measured) = 0.401 mW/g



Date/Time: 2010-06-22 20:10:55

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 824.2 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.879$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Low - Slide Open/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm**

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

**Cheek - Low - Slide Open/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm**

Reference Value = 13.4 V/m

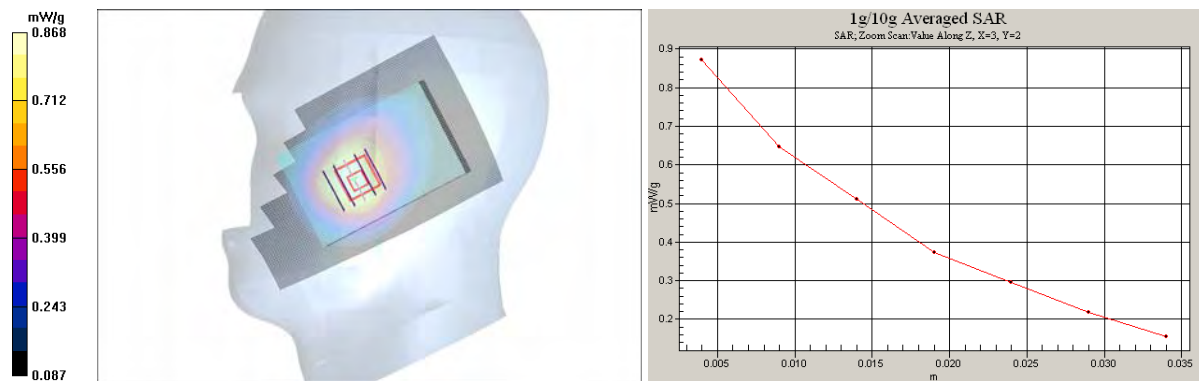
Peak SAR (extrapolated) = 1.15 W/kg

**SAR(1 g) = 0.838 mW/g**

**SAR(10 g) = 0.605 mW/g**

**Power Drift = -0.051 dB**

Maximum value of SAR (measured) = 0.868 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-22 20:38:50

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.891$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.382 mW/g

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

Reference Value = 15.8 V/m

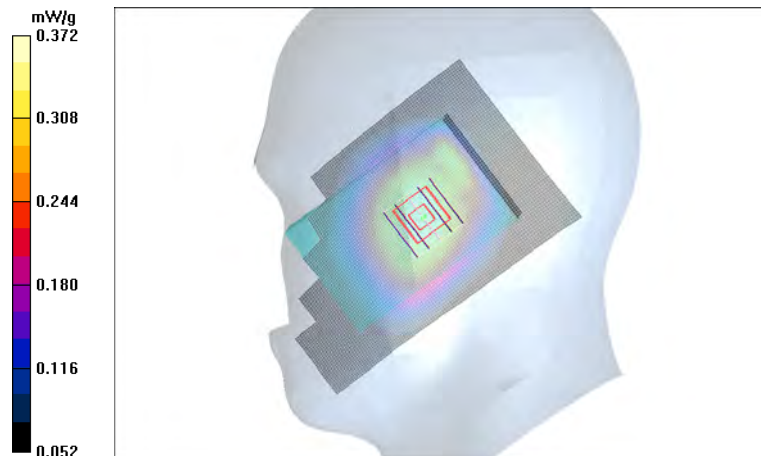
Peak SAR (extrapolated) = 0.443 W/kg

**SAR(1 g) = 0.356 mW/g**

**SAR(10 g) = 0.273 mW/g**

**Power Drift = -0.057 dB**

Maximum value of SAR (measured) = 0.372 mW/g



Date/Time: 2010-06-22 18:18:54

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 3-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.891$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle - Slide Open/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm**

Maximum value of SAR (interpolated) = 0.885 mW/g

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

Reference Value = 12.4 V/m

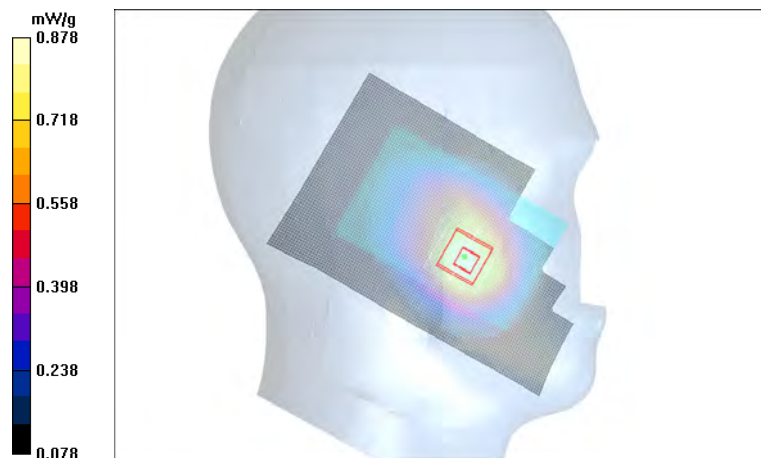
Peak SAR (extrapolated) = 1.06 W/kg

**SAR(1 g) = 0.805 mW/g**

**SAR(10 g) = 0.569 mW/g**

**Power Drift = 0.384 dB**

Maximum value of SAR (measured) = 0.878 mW/g



Date/Time: 2010-06-22 20:53:44

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot 8PSK EGPRS850**

Frequency: 824.2 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.879$  mho/m;  $\epsilon_r = 40.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Low – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.117 mW/g

**Cheek - Low – Slide Open/Zoom Scan (6x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 4.88 V/m

Peak SAR (extrapolated) = 0.422 W/kg

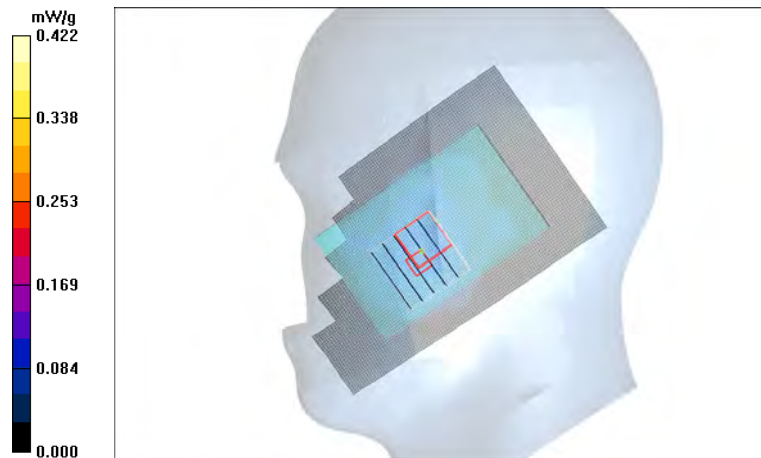
**SAR(1 g) = 0.104 mW/g**

**SAR(10 g) = 0.072 mW/g**

**Power Drift = 0.053 dB**

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) = 0.422 mW/g



Date/Time: 2010-06-24 16:20:35

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.606 mW/g

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

Reference Value = 5.89 V/m

Peak SAR (extrapolated) = 0.892 W/kg

**SAR(1 g) = 0.528 mW/g**

**SAR(10 g) = 0.295 mW/g**

**Power Drift = -0.094 dB**

Maximum value of SAR (measured) = 0.583 mW/g

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

Reference Value = 5.89 V/m

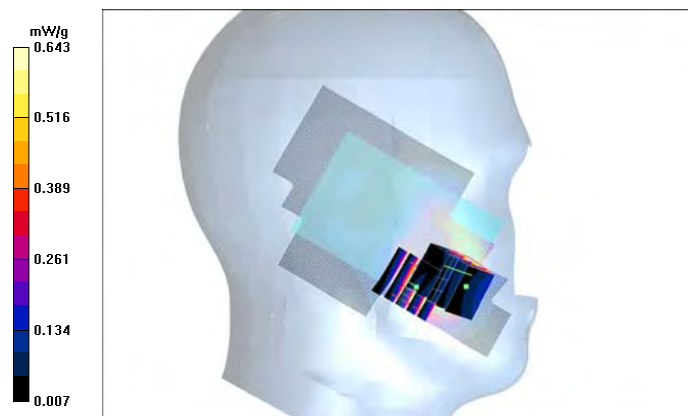
Peak SAR (extrapolated) = 1.07 W/kg

**SAR(1 g) = 0.605 mW/g**

**SAR(10 g) = 0.332 mW/g**

**Power Drift = -0.094 dB**

Maximum value of SAR (measured) = 0.643 mW/g



Date/Time: 2010-06-24 17:37:19

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.107 mW/g

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

Reference Value = 8.00 V/m

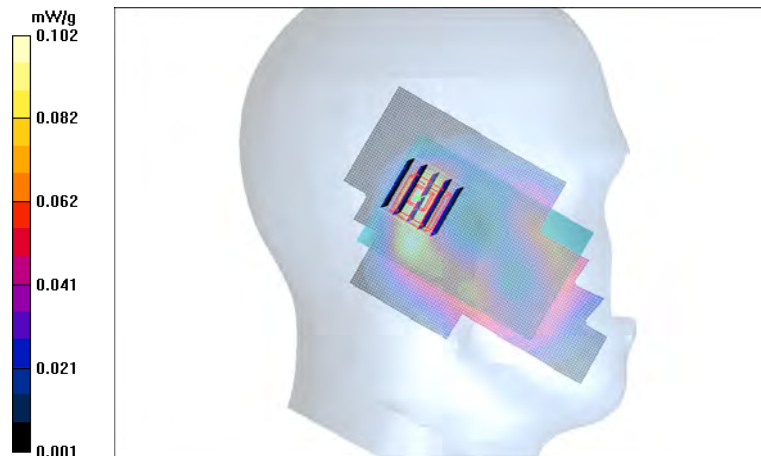
Peak SAR (extrapolated) = 0.151 W/kg

**SAR(1 g) = 0.092 mW/g**

**SAR(10 g) = 0.052 mW/g**

**Power Drift = -0.033 dB**

Maximum value of SAR (measured) = 0.102 mW/g



Date/Time: 2010-06-24 18:19:31

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.418 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 6.45 V/m

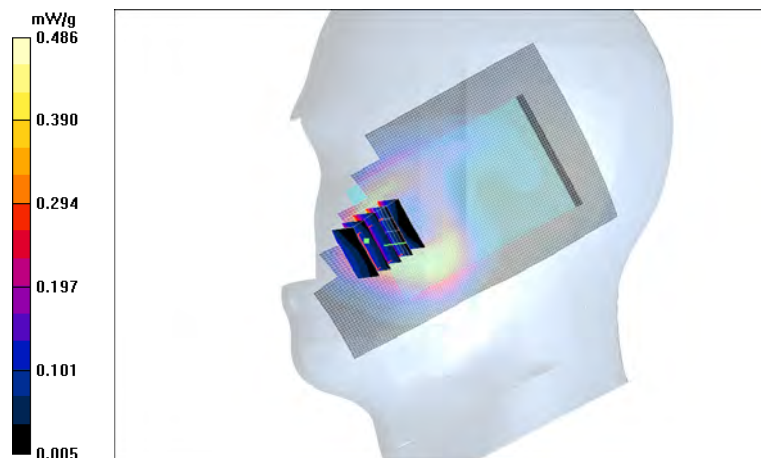
Peak SAR (extrapolated) = 0.792 W/kg

**SAR(1 g) = 0.471 mW/g**

**SAR(10 g) = 0.267 mW/g**

**Power Drift = -0.318 dB**

Maximum value of SAR (measured) = 0.486 mW/g



Date/Time: 2010-06-24 18:37:11

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.128 mW/g

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

Reference Value = 8.53 V/m

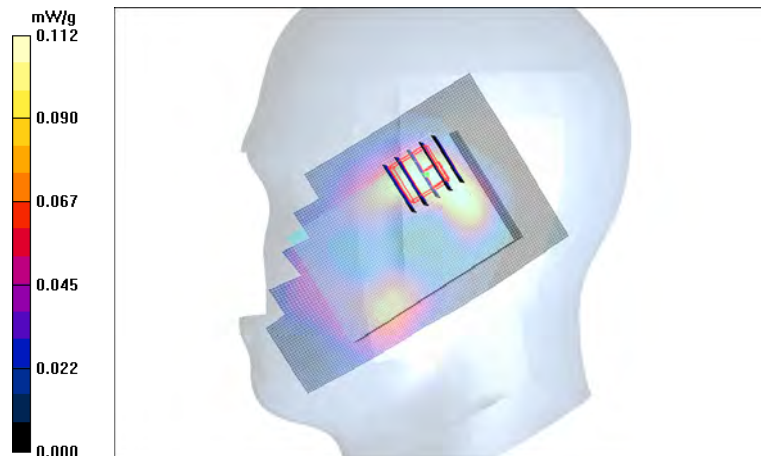
Peak SAR (extrapolated) = 0.296 W/kg

**SAR(1 g) = 0.135 mW/g**

**SAR(10 g) = 0.068 mW/g**

**Power Drift = -0.098 dB**

Maximum value of SAR (measured) = 0.112 mW/g



Date/Time: 2010-06-24 16:51:26

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.606 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.77 V/m

Peak SAR (extrapolated) = 0.834 W/kg

**SAR(1 g) = 0.527 mW/g**

**SAR(10 g) = 0.295 mW/g**

**Power Drift = 0.005 dB**

Maximum value of SAR (measured) = 0.573 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.77 V/m

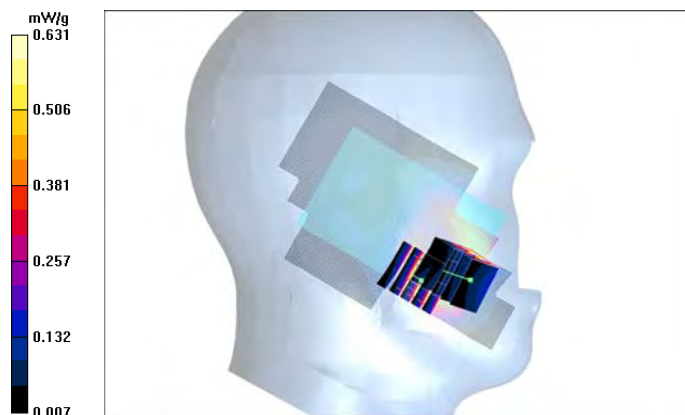
Peak SAR (extrapolated) = 1.05 W/kg

**SAR(1 g) = 0.599 mW/g**

**SAR(10 g) = 0.331 mW/g**

**Power Drift = 0.005 dB**

Maximum value of SAR (measured) = 0.631 mW/g



Date/Time: 2010-06-24 17:13:51

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 3-slot GPRS1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:2.8

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.604 mW/g

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

Reference Value = 5.88 V/m

Peak SAR (extrapolated) = 0.879 W/kg

**SAR(1 g) = 0.536 mW/g**

**SAR(10 g) = 0.300 mW/g**

**Power Drift = -0.213 dB**

Maximum value of SAR (measured) = 0.581 mW/g

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

Reference Value = 5.88 V/m

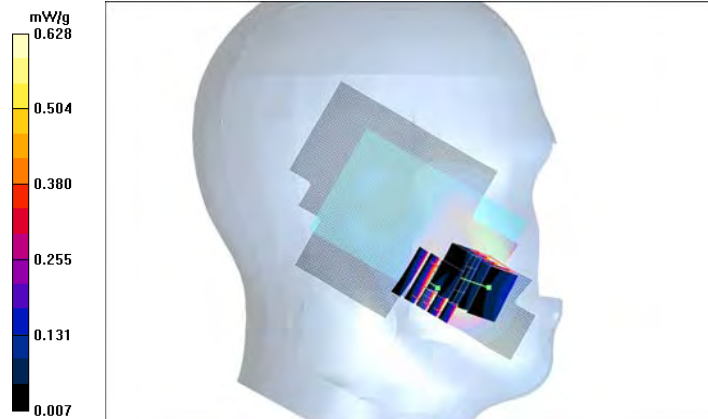
Peak SAR (extrapolated) = 0.997 W/kg

**SAR(1 g) = 0.587 mW/g**

**SAR(10 g) = 0.326 mW/g**

**Power Drift = -0.213 dB**

Maximum value of SAR (measured) = 0.628 mW/g



Date/Time: 2010-06-24 20:18:51

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 1-slot 8PSK EGPRS 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: 20.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle - Slide Open/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm**

Maximum value of SAR (interpolated) = 0.116 mW/g

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

Reference Value = 2.79 V/m

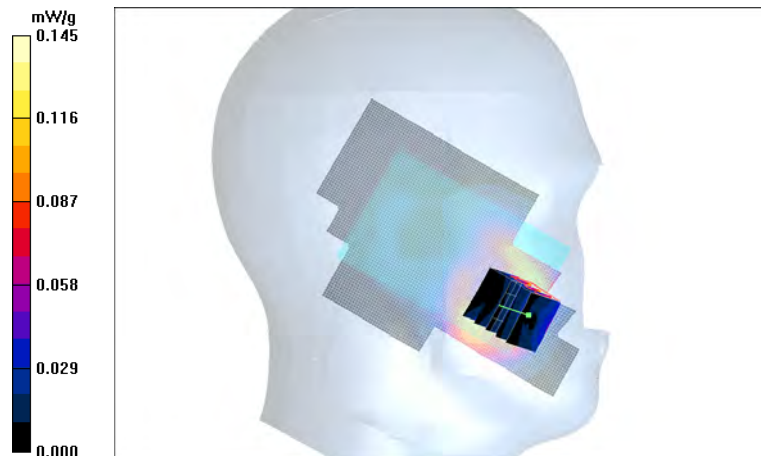
Peak SAR (extrapolated) = 0.222 W/kg

**SAR(1 g) = 0.124 mW/g**

**SAR(10 g) = 0.067 mW/g**

**Power Drift = -0.263 dB**

Maximum value of SAR (measured) = 0.145 mW/g



Date/Time: 2010-06-23 23:21:25

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - High – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.660 mW/g

**Cheek - High – Slide Open/Zoom Scan (6x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.58 V/m

Peak SAR (extrapolated) = 1.13 W/kg

**SAR(1 g) = 0.608 mW/g**

**SAR(10 g) = 0.366 mW/g**

**Power Drift = -0.477 dB**

Maximum value of SAR (measured) = 0.762 mW/g

**Cheek - High – Slide Open/Zoom Scan(5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.58 V/m

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.720 mW/g**

**SAR(10 g) = 0.388 mW/g**

**Power Drift = -0.477 dB**

**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) = 0.756 mW/g

**Cheek - High – Slide Open/Zoom Scan(6x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.58 V/m

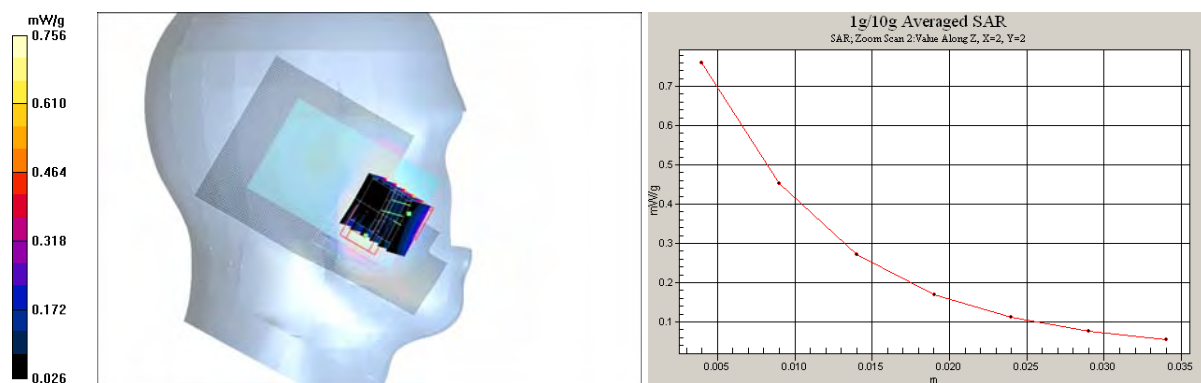
Peak SAR (extrapolated) = 1.13 W/kg

**SAR(1 g) = 0.683 mW/g**

**SAR(10 g) = 0.381 mW/g**

**Power Drift = -0.477 dB**

Maximum value of SAR (measured) = 0.730 mW/g



Date/Time: 2010-06-23 17:46:28

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.131 mW/g

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

Reference Value = 9.01 V/m

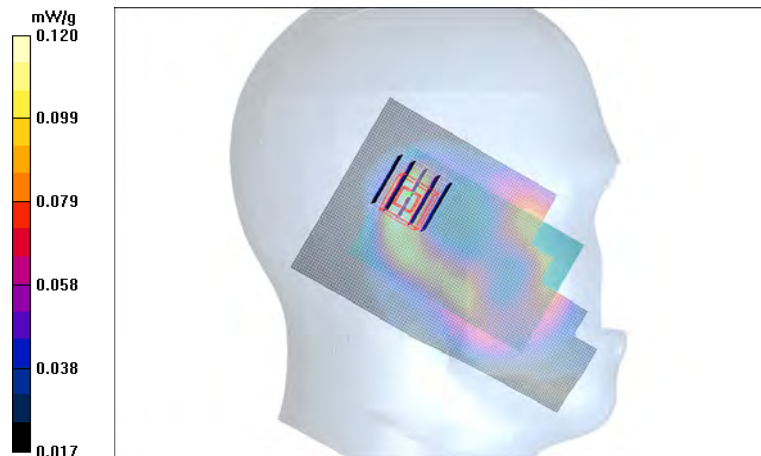
Peak SAR (extrapolated) = 0.173 W/kg

**SAR(1 g) = 0.109 mW/g**

**SAR(10 g) = 0.067 mW/g**

**Power Drift = -0.023 dB**

Maximum value of SAR (measured) = 0.120 mW/g



Date/Time: 2010-06-23 18:38:26

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.637 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.73 V/m

Peak SAR (extrapolated) = 1.16 W/kg

**SAR(1 g) = 0.669 mW/g**

**SAR(10 g) = 0.369 mW/g**

**Power Drift = 0.234 dB**

Maximum value of SAR (measured) = 0.696 mW/g

**Cheek - Middle – Slide Open/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.73 V/m

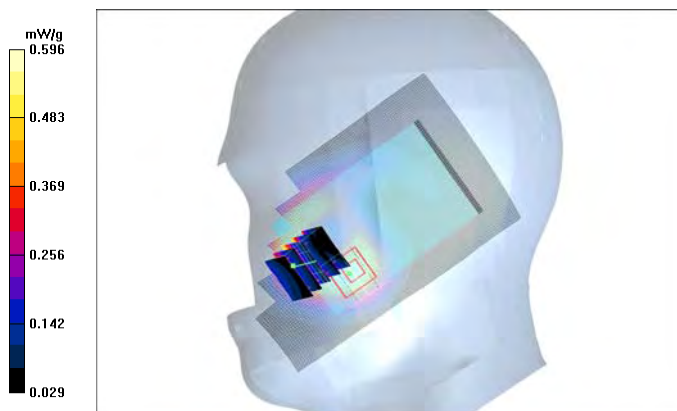
Peak SAR (extrapolated) = 0.873 W/kg

**SAR(1 g) = 0.549 mW/g**

**SAR(10 g) = 0.342 mW/g**

**Power Drift = 0.234 dB**

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



Date/Time: 2010-06-23 19:04:10

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.119 mW/g

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

Reference Value = 7.94 V/m

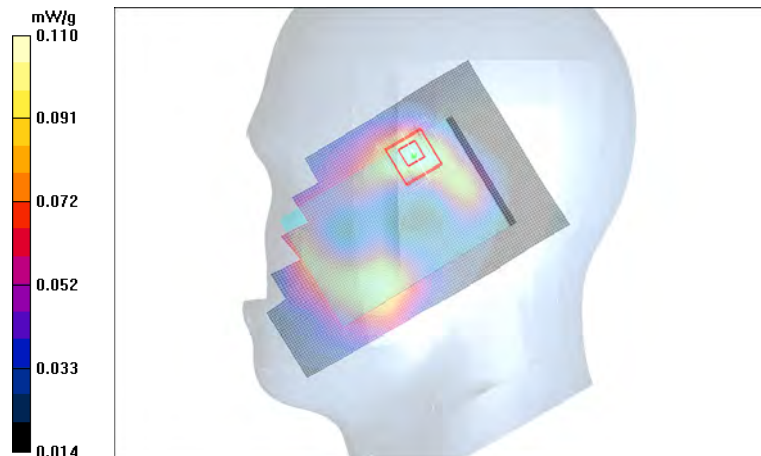
Peak SAR (extrapolated) = 0.153 W/kg

**SAR(1 g) = 0.102 mW/g**

**SAR(10 g) = 0.066 mW/g**

**Power Drift = -0.014 dB**

Maximum value of SAR (measured) = 0.110 mW/g



Date/Time: 2010-06-30 13:17:07

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek position - Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.291 mW/g

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

Reference Value = 5.04 V/m

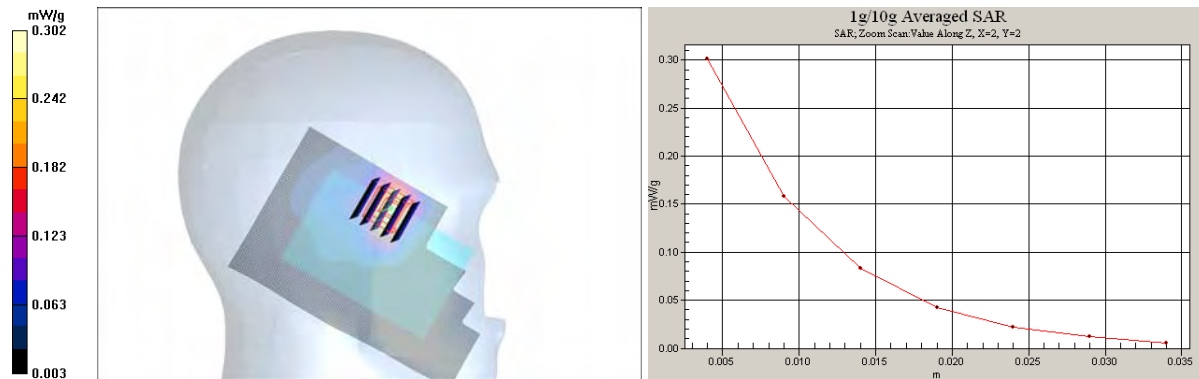
Peak SAR (extrapolated) = 0.528 W/kg

**SAR(1 g) = 0.274 mW/g**

**SAR(10 g) = 0.139 mW/g**

**Power Drift = -0.150 dB**

Maximum value of SAR (measured) = 0.302 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

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Date/Time: 2010-06-30 13:43:24

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt position - Middle – Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.145 mW/g

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

Reference Value = 8.23 V/m

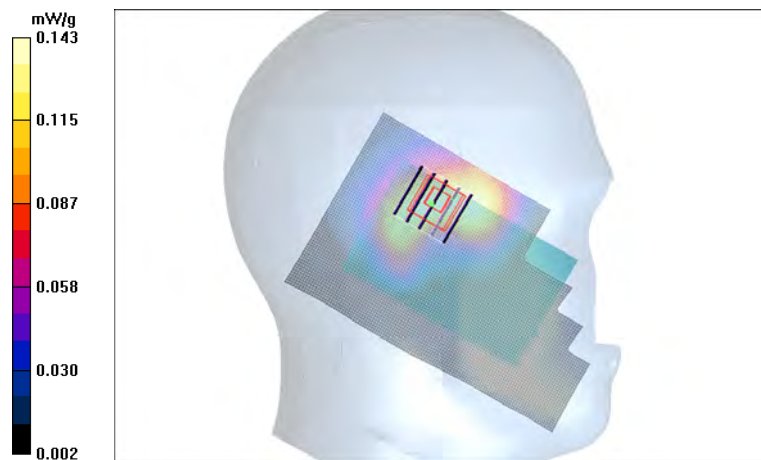
Peak SAR (extrapolated) = 0.234 W/kg

**SAR(1 g) = 0.134 mW/g**

**SAR(10 g) = 0.076 mW/g**

**Power Drift = -0.136 dB**

Maximum value of SAR (measured) = 0.143 mW/g



Date/Time: 2010-06-30 14:05:38

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

**Cheek - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.198 mW/g

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

Reference Value = 5.86 V/m

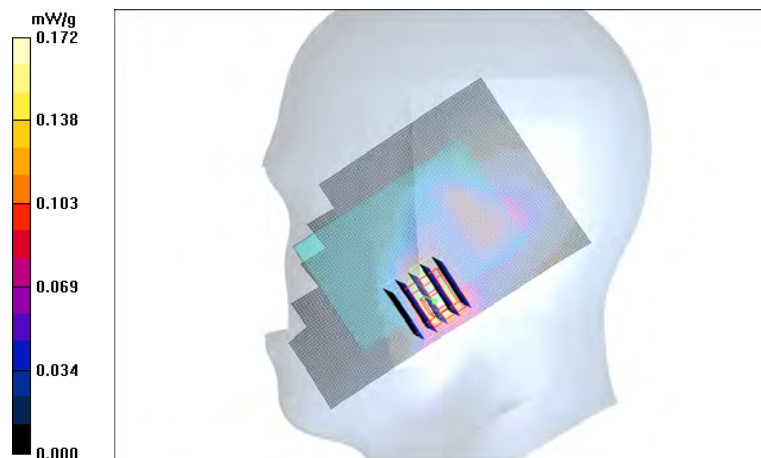
Peak SAR (extrapolated) = 0.286 W/kg

**SAR(1 g) = 0.158 mW/g**

**SAR(10 g) = 0.082 mW/g**

**Power Drift = 0.029 dB**

Maximum value of SAR (measured) = 0.172 mW/g



Date/Time: 2010-06-30 14:25:17

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

**Tilt - Middle - Slide Open/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 8.67 V/m

Peak SAR (extrapolated) = 0.245 W/kg

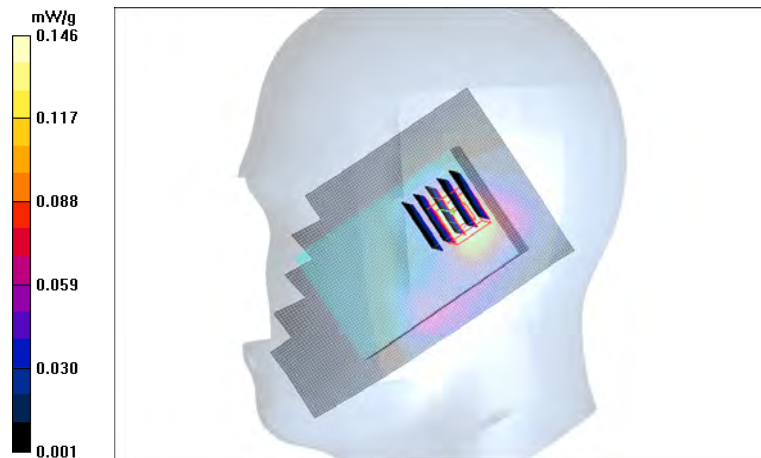
**SAR(1 g) = 0.135 mW/g**

**SAR(10 g) = 0.072 mW/g**

**Power Drift = -0.200 dB**

**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) = 0.146 mW/g



Date/Time: 2010-06-22 21:33:50

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.974$  mho/m;  $\epsilon_r = 54$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.65, 5.65, 5.65); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (71x101x1): Measurement**

grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.411 mW/g

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement**

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

Reference Value = 8.48 V/m

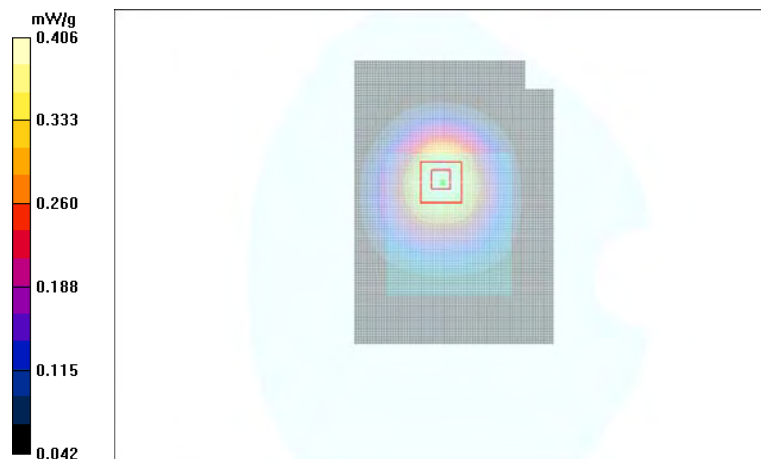
Peak SAR (extrapolated) = 0.548 W/kg

**SAR(1 g) = 0.382 mW/g**

**SAR(10 g) = 0.262 mW/g**

**Power Drift = -0.292 dB**

Maximum value of SAR (measured) = 0.406 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-22 21:49:51

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.974$  mho/m;  $\epsilon_r = 54$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.65, 5.65, 5.65); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.292 mW/g

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 8.26 V/m

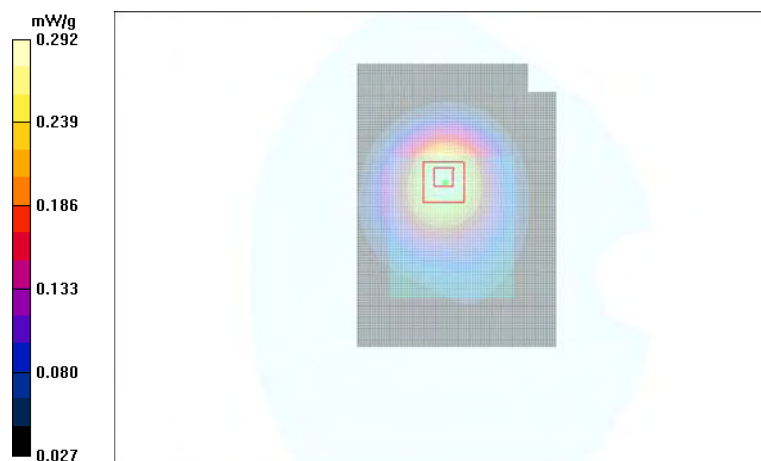
Peak SAR (extrapolated) = 0.408 W/kg

**SAR(1 g) = 0.273 mW/g**

**SAR(10 g) = 0.185 mW/g**

**Power Drift = 0.054 dB**

Maximum value of SAR (measured) = 0.292 mW/g



Date/Time: 2010-06-22 22:27:14

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Body 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.985$  mho/m;  $\epsilon_r = 53.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.65, 5.65, 5.65); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - High - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (71x101x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.668 mW/g

**Body - High - No Accessory - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.1 V/m

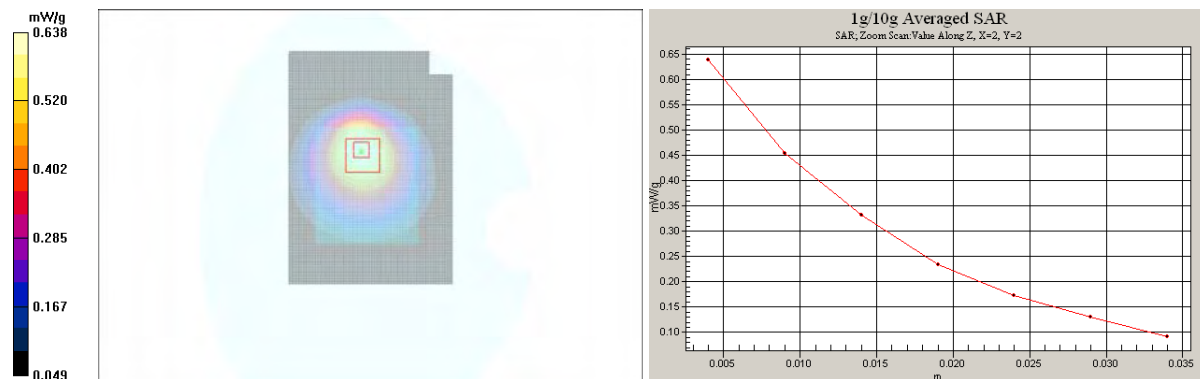
Peak SAR (extrapolated) = 0.885 W/kg

**SAR(1 g) = 0.602 mW/g**

**SAR(10 g) = 0.415 mW/g**

**Power Drift = 0.028 dB**

Maximum value of SAR (measured) = 0.638 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-22 22:52:14

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: 2-slot GPRS850**

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.974$  mho/m;  $\epsilon_r = 54$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.65, 5.65, 5.65); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.437 mW/g

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 10.8 V/m

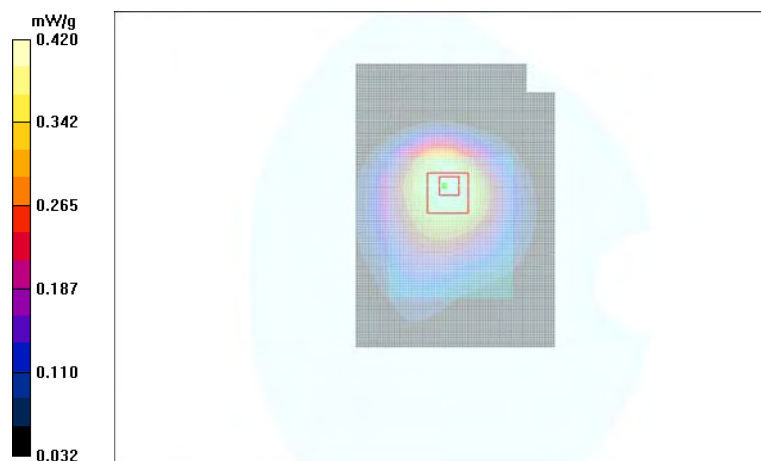
Peak SAR (extrapolated) = 0.563 W/kg

**SAR(1 g) = 0.397 mW/g**

**SAR(10 g) = 0.277 mW/g**

**Power Drift = -0.071 dB**

Maximum value of SAR (measured) = 0.420 mW/g



Date/Time: 2010-06-24 21:28:23

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (71x101x1):** Measurement grid:  
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.251 mW/g

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 6.76 V/m

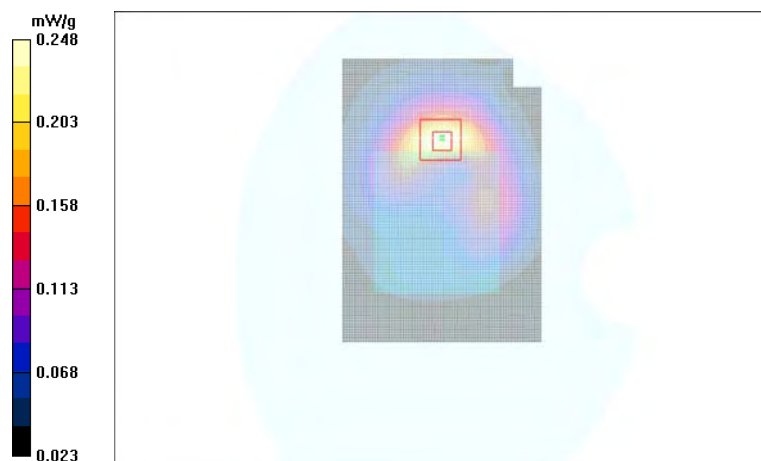
Peak SAR (extrapolated) = 0.323 W/kg

**SAR(1 g) = 0.229 mW/g**

**SAR(10 g) = 0.147 mW/g**

**Power Drift = -0.079 dB**

Maximum value of SAR (measured) = 0.248 mW/g



Date/Time: 2010-06-24 21:44:43

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.265 mW/g

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 6.24 V/m

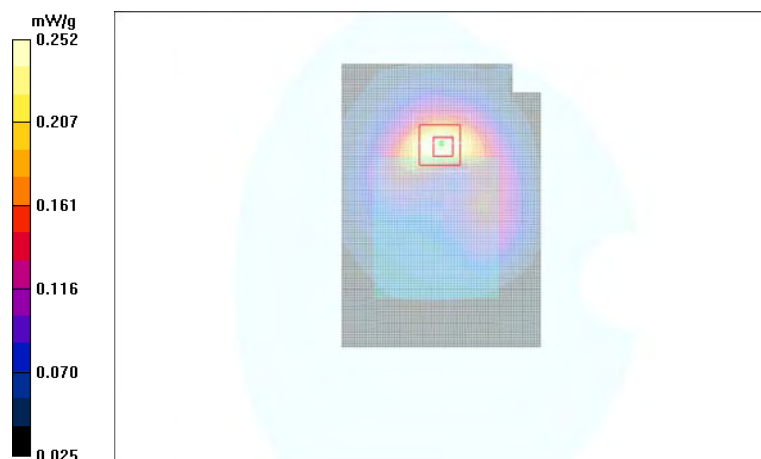
Peak SAR (extrapolated) = 0.328 W/kg

**SAR(1 g) = 0.236 mW/g**

**SAR(10 g) = 0.153 mW/g**

**Power Drift = 0.009 dB**

Maximum value of SAR (measured) = 0.252 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-24 22:22:39

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

$dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.804 mW/g

**Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 9.74 V/m

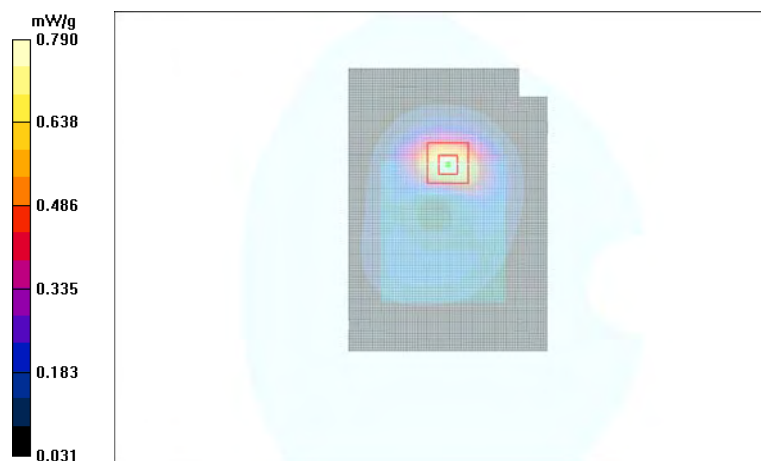
Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.706 mW/g**

**SAR(10 g) = 0.405 mW/g**

**Power Drift = -0.074 dB**

Maximum value of SAR (measured) = 0.790 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-24 22:08:27

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:8.3

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.742 mW/g

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 8.64 V/m

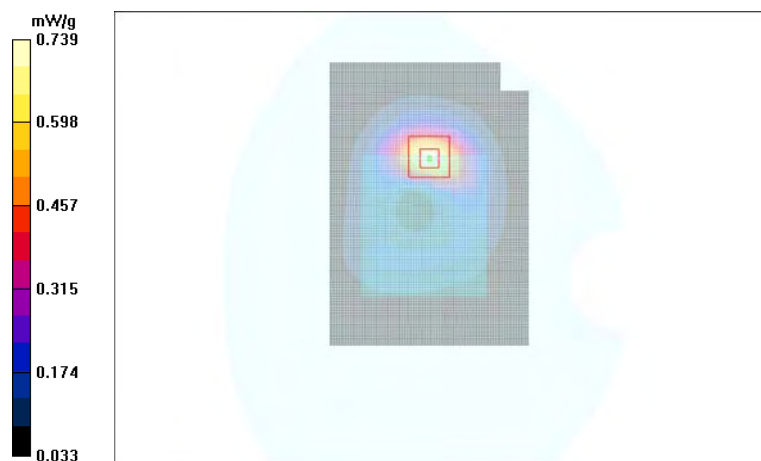
Peak SAR (extrapolated) = 1.01 W/kg

**SAR(1 g) = 0.661 mW/g**

**SAR(10 g) = 0.379 mW/g**

**Power Drift = -0.042 dB**

Maximum value of SAR (measured) = 0.739 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-24 22:51:12

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (71x101x1):** Measurement grid:  
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.333 mW/g

**Body - Middle - No Accessory - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.40 V/m

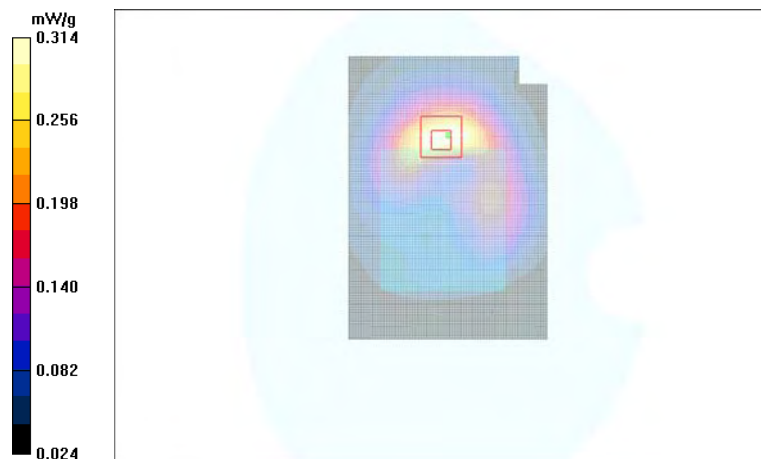
Peak SAR (extrapolated) = 0.420 W/kg

**SAR(1 g) = 0.293 mW/g**

**SAR(10 g) = 0.186 mW/g**

**Power Drift = -0.109 dB**

Maximum value of SAR (measured) = 0.314 mW/g



Date/Time: 2010-06-24 23:06:15

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.340 mW/g

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 6.82 V/m

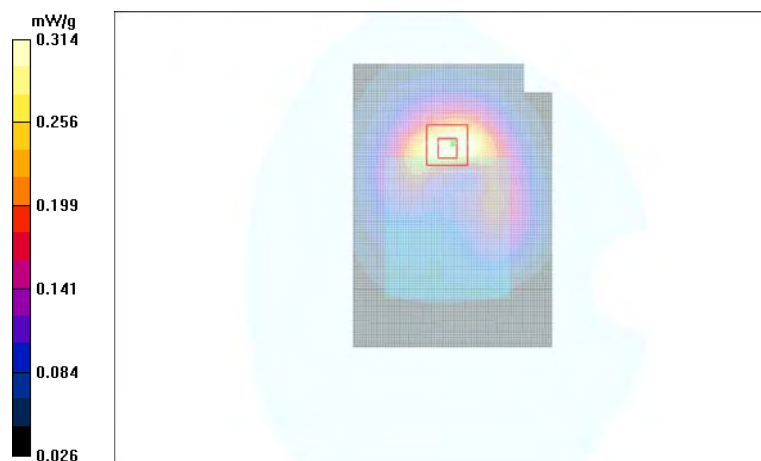
Peak SAR (extrapolated) = 0.424 W/kg

**SAR(1 g) = 0.297 mW/g**

**SAR(10 g) = 0.188 mW/g**

**Power Drift = -0.412 dB**

Maximum value of SAR (measured) = 0.314 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-24 23:44:46

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

$dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.848 mW/g

**Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 10.2 V/m

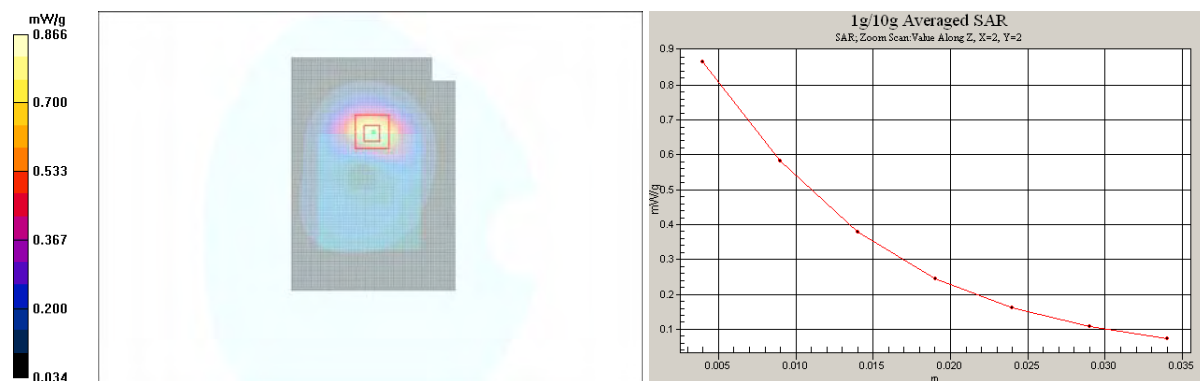
Peak SAR (extrapolated) = 1.18 W/kg

**SAR(1 g) = 0.782 mW/g**

**SAR(10 g) = 0.453 mW/g**

**Power Drift = 0.101 dB**

Maximum value of SAR (measured) = 0.866 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-24 23:30:56

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WCDMA1900**

Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.41, 4.41, 4.41); Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2009-07-21
- Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.784 mW/g

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 8.88 V/m

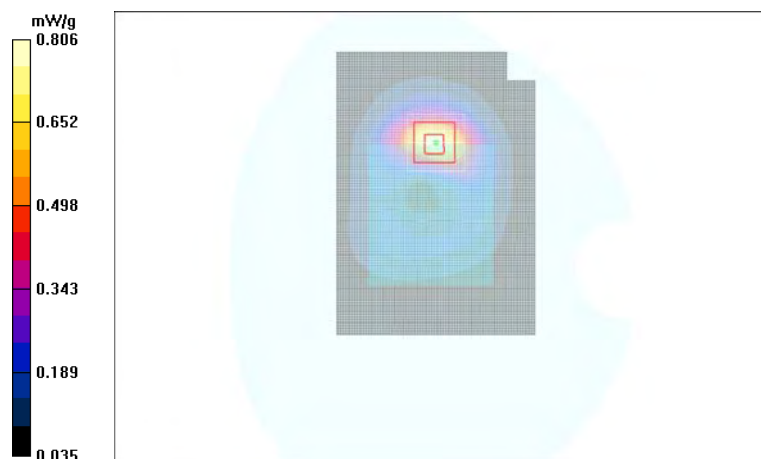
Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.729 mW/g**

**SAR(10 g) = 0.422 mW/g**

**Power Drift = 0.004 dB**

Maximum value of SAR (measured) = 0.806 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-07-02 00:36:57

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2412.0 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2009-09-18
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Low - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (71x101x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.072 mW/g

**Body - Low - No Accessory - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.33 V/m

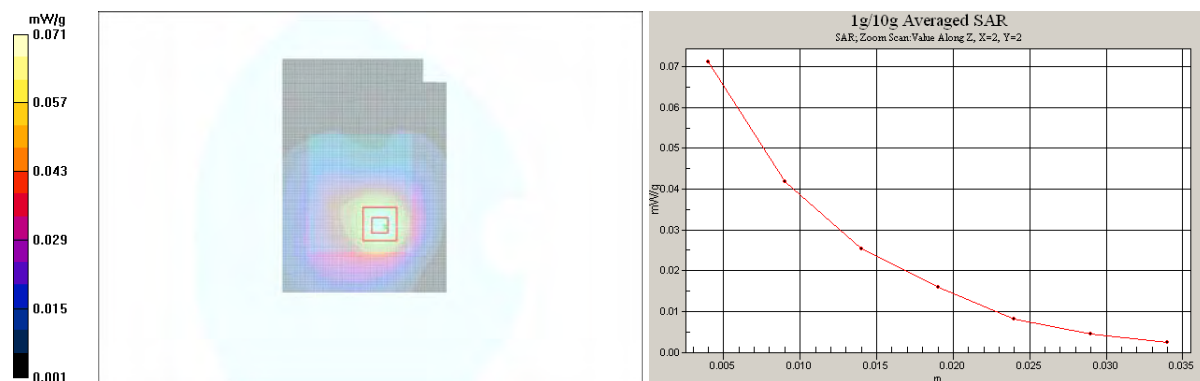
Peak SAR (extrapolated) = 0.117 W/kg

**SAR(1 g) = 0.067 mW/g**

**SAR(10 g) = 0.040 mW/g**

**Power Drift = 0.057 dB**

Maximum value of SAR (measured) = 0.071 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-07-01 23:04:37

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2009-09-18
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.059 mW/g

**Body - Middle - HS-125 - Slide Closed - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 4.81 V/m

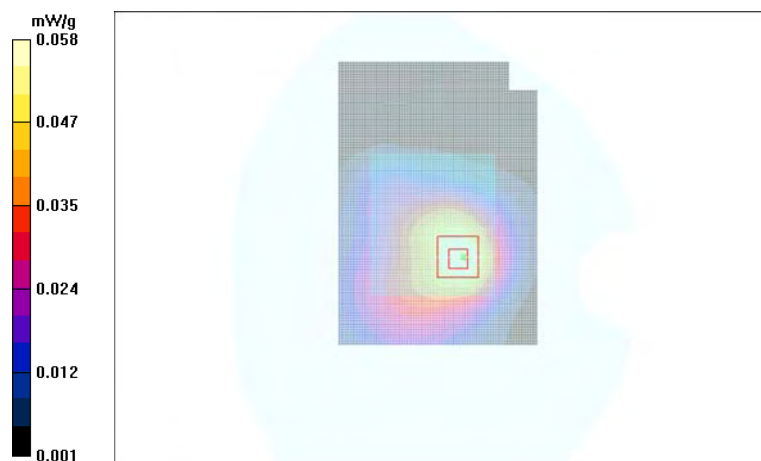
Peak SAR (extrapolated) = 0.094 W/kg

**SAR(1 g) = 0.055 mW/g**

**SAR(10 g) = 0.033 mW/g**

**Power Drift = 0.031 dB**

Maximum value of SAR (measured) = 0.058 mW/g



Date/Time: 2010-07-01 23:22:29

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2009-09-18
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (71x101x1):** Measurement grid:  
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.063 mW/g

**Body - Middle - No Accessory - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.31 V/m

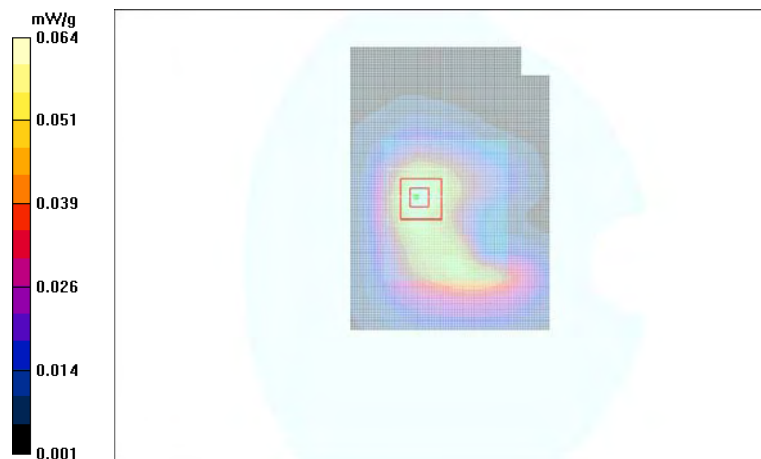
Peak SAR (extrapolated) = 0.103 W/kg

**SAR(1 g) = 0.059 mW/g**

**SAR(10 g) = 0.035 mW/g**

**Power Drift = -0.011 dB**

Maximum value of SAR (measured) = 0.064 mW/g



Date/Time: 2010-07-01 23:37:57

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450**

Frequency: 2442.0 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

**DASY4 Configuration:**

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2009-09-18
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Area Scan (71x101x1): Measurement grid:**

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.058 mW/g

**Body - Middle - HS-125 - Slide Closed - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:**

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

Reference Value = 4.64 V/m

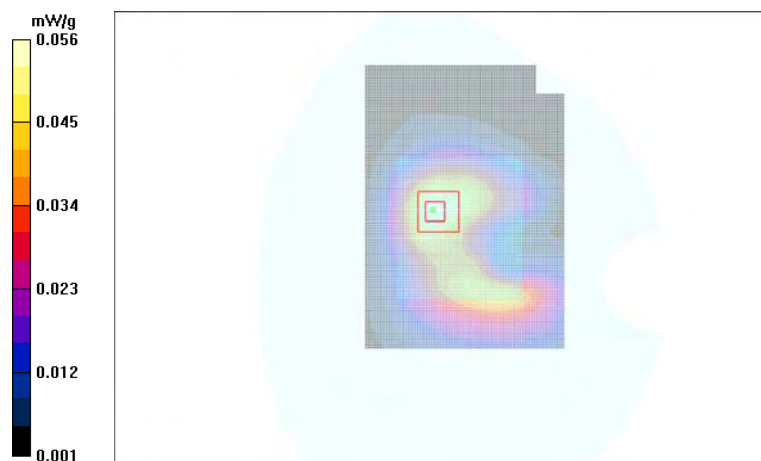
Peak SAR (extrapolated) = 0.090 W/kg

**SAR(1 g) = 0.052 mW/g**

**SAR(10 g) = 0.031 mW/g**

**Power Drift = 0.039 dB**

Maximum value of SAR (measured) = 0.056 mW/g



SAR Report

FCC\_RM-627\_06

Applicant: Nokia Corporation

Type: RM-627

Copyright © 2010 TCC Nokia

Date/Time: 2010-06-30 13:17:07, Date/Time: 2010-06-22 17:47:52

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450, Communication System: 2-slot GPRS850**

Frequency: 2442.0 MHz, Frequency: 836.6 MHz; Duty Cycle: 1:1, Duty Cycle: 1:4.2

Medium: Head 2450, Medium: Head 835; Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.891$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21), ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8, Phantom: SAM 4; Type: SAM Twin Phantom, Type: Twin Phantom; Serial: TP-1408, Serial: TP-1410
- ; SEMCAD X Version 14.0 Build 61

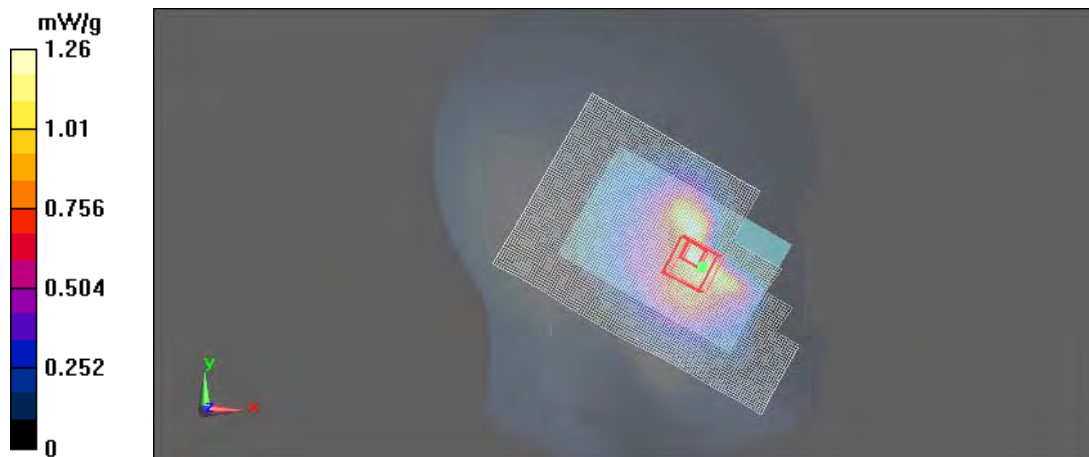
**Configuration/Cheek - Middle – Slide Open/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

**Configuration/Cheek - Middle – Slide Open/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.01 mW/g**

**SAR(10 g) = 0.654 mW/g**

Maximum value of SAR (measured) = 1.26 mW/g



Date/Time: 2010-06-24 16:20:35, Date/Time: 2010-06-30 13:17:07

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: GSM 1900, Communication System: WLAN2450**

Frequency: 1880.0 MHz, Frequency: 2442.0 MHz; Duty Cycle: 1:8.3, Duty Cycle: 1:1

Medium: Head 1900, Medium: Head 2450; Medium Notes: Medium Temperature: 20.8 C, Medium Notes:

Medium Temperature: 22.4 C

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:

$f = 2442$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117, Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.9, 4.9, 4.9), ConvF(4.21, 4.21, 4.21); Calibrated: 2009-07-21, Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682, Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4.5, Phantom: SAM 8; Type: Twin Phantom, Type: SAM Twin Phantom; Serial: TP-1215, Serial: TP-1408
- ; SEMCAD X Version 14.0 Build 61

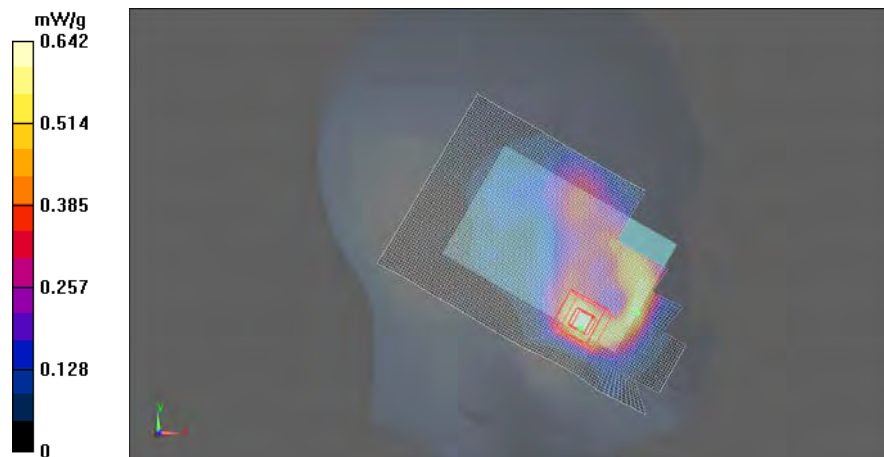
**Configuration/Cheek - Middle – Slide Open/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

**Configuration/Cheek- Middle – Slide Open/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.564 mW/g**

**SAR(10 g) = 0.310 mW/g**

Maximum value of SAR (measured) = 0.642 mW/g



Date/Time: 2010-06-30 13:17:07, Date/Time: 2010-06-23 23:21:25

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450, Communication System: WCDMA1900**

Frequency: 2442.0 MHz, Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Head 2450, Medium: Head 1900; Medium Notes: Medium Temperature: 22.4 C, Medium Notes: Medium Temperature: 22.5 C

Medium parameters used:  $f = 2442 \text{ MHz}$ ;  $\sigma = 1.88 \text{ mho/m}$ ;  $\epsilon_r = 39$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.48 \text{ mho/m}$ ;  $\epsilon_r = 38.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21), ConvF(4.74, 4.74, 4.74); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8, Phantom: SAM 3; Type: SAM Twin Phantom, Type: Twin Phantom; Serial: TP-1408, Serial: TP-1302
- ; SEMCAD X Version 14.0 Build 61

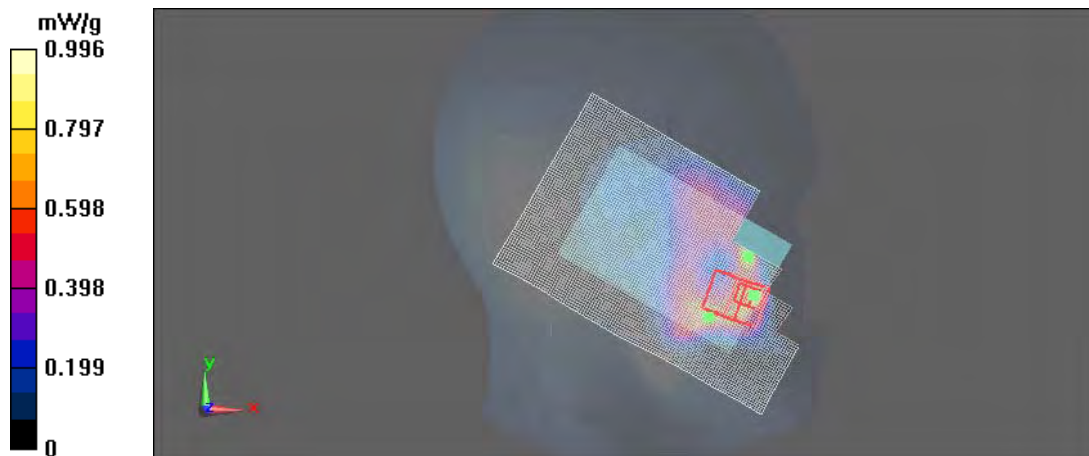
**Configuration/Cheek - Middle – Slide Open/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm**

**Configuration/Cheek - High – Slide Open/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm**

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.767 mW/g**

**SAR(10 g) = 0.398 mW/g**

Maximum value of SAR (measured) = 0.996 mW/g



Date/Time: 2010-07-02 00:36:57, Date/Time: 2010-06-22 22:27:14

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450, Communication System: 2-slot GPRS850**

Frequency: 2412.0 MHz, Frequency: 848.8 MHz; Duty Cycle: 1:1, Duty Cycle: 1:4.2

Medium: Body 2450, Medium: Body 835; Medium Notes: Medium Temperature: 22.8 C, Medium Notes: Medium Temperature: 22.4 C

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.985$  mho/m;  $\epsilon_r = 53.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116, Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.12, 4.12, 4.12), ConvF(5.65, 5.65, 5.65); Calibrated: 2010-02-24, Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn710, Electronics: DAE3 Sn573; Calibrated: 2009-09-18, Calibrated: 2009-07-21
- Phantom: SAM 4.5, Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1215, Serial: TP-1302
- ; SEMCAD X Version 14.0 Build 61

**Configuration/Body - Low - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

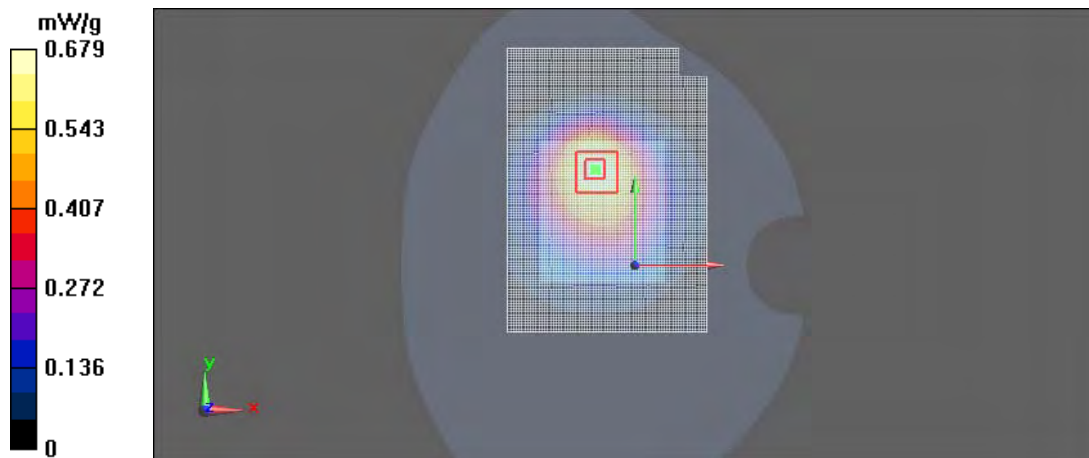
**Configuration/Body - High - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.631 mW/g**

**SAR(10 g) = 0.429 mW/g**

Maximum value of SAR (measured) = 0.679 mW/g



Date/Time: 2010-07-02 00:36:57, Date/Time: 2010-06-24 22:22:39

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450, Communication System: GSM 1900**

Frequency: 2412.0 MHz, Frequency: 1850.2 MHz; Duty Cycle: 1:1, Duty Cycle: 1:8.3

Medium: Body 2450, Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116, Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12), ConvF(4.41, 4.41, 4.41); Calibrated: 2010-02-24, Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn710, Electronics: DAE4 Sn682; Calibrated: 2009-09-18, Calibrated: 2009-07-21
- Phantom: SAM 4.5, Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1215, Serial: TP-1037
- ; SEMCAD X Version 14.0 Build 61

**Configuration/Body - Low - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

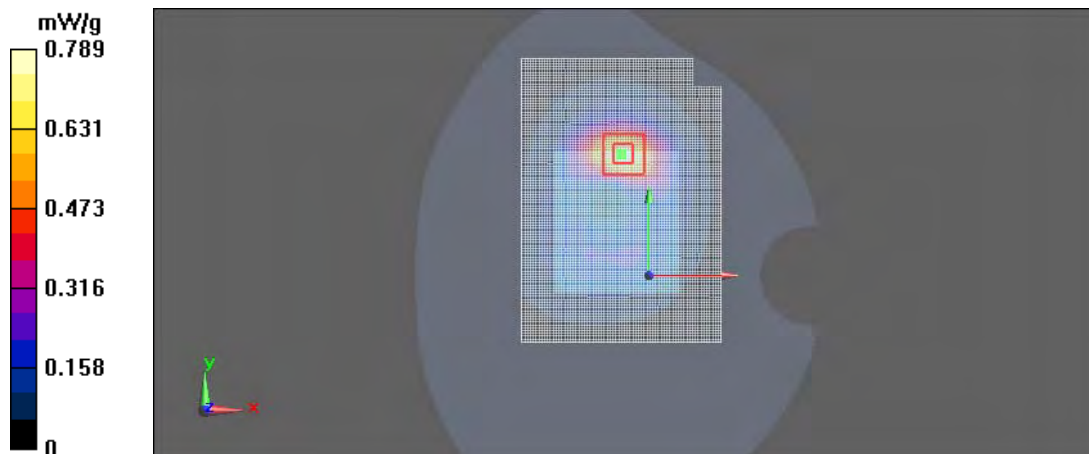
**Configuration/Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.673 mW/g**

**SAR(10 g) = 0.372 mW/g**

Maximum value of SAR (measured) = 0.789 mW/g



Date/Time: 2010-07-02 00:36:57, Date/Time: 2010-06-24 23:44:46

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 352713/04/000957/5

**Communication System: WLAN2450, Communication System: WCDMA1900**

Frequency: 2412.0 MHz, Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: Body 2450, Medium: Body 1900; Medium Notes: Medium Temperature: 22.8 C

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.88$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 52.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116, Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12), ConvF(4.41, 4.41, 4.41); Calibrated: 2010-02-24, Calibrated: 2009-07-21
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn710, Electronics: DAE4 Sn682; Calibrated: 2009-09-18, Calibrated: 2009-07-21
- Phantom: SAM 4.5, Phantom: SAM 2; Type: Twin Phantom; Serial: TP-1215, Serial: TP-1037
- ; SEMCAD X Version 14.0 Build 61

**Configuration/Body - Low - No Accessory - Slide Closed - Display Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

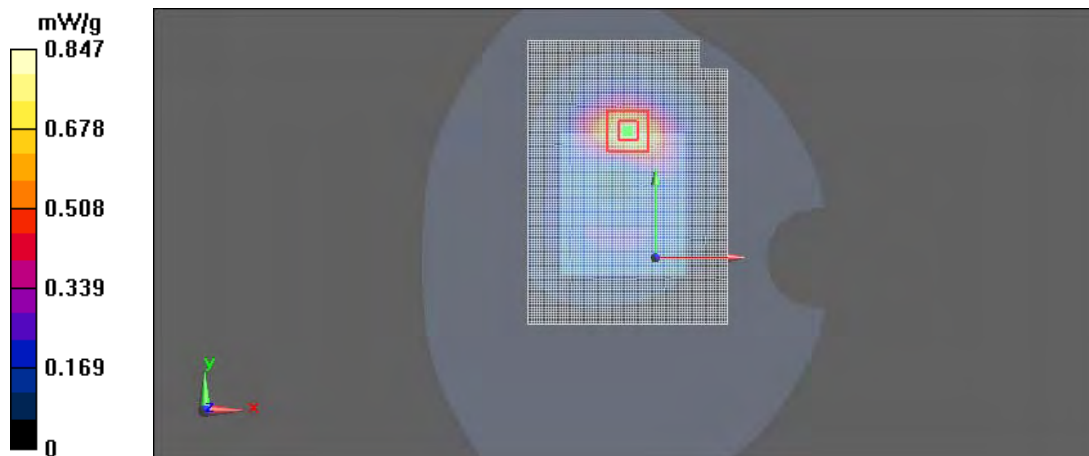
**Configuration/Body - Low - No Accessory - Slide Closed - Back Facing Phantom/Area Scan (8x11x1):**

Measurement grid: dx=15mm, dy=15mm

**Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.734 mW/g**

**SAR(10 g) = 0.405 mW/g**

Maximum value of SAR (measured) = 0.847 mW/g



## APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia

Type: RM-627; Serial: 766988/72/344762/2, HW: 0200, SW: 041.005

### C.1. WCDMA1900 Test results

#### Average power

| Ch / f (MHz)  | P [dBm] |
|---------------|---------|
| 9263 / 1852.6 | 21.56   |
| 9400 / 1880.0 | 21.62   |
| 9537 / 1907.4 | 21.60   |

### C.2. HSUPA1900 Test results

#### Average power

| Ch / f (MHz)  | P [dBm]        |                |                |                |                |
|---------------|----------------|----------------|----------------|----------------|----------------|
|               | Subtest mode 1 | Subtest mode 2 | Subtest mode 3 | Subtest mode 4 | Subtest mode 5 |
| 9263 / 1852.6 | 18.98          | 19.52          | 20.20          | 18.48          | 19.09          |
| 9400 / 1880.0 | 19.72          | 18.54          | 20.52          | 19.58          | 19.62          |
| 9537 / 1907.4 | 19.80          | 18.84          | 20.57          | 18.82          | 19.69          |

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR and E-TFC MPR. In each Subtest mode, the routine with the higher power reduction dominates. As a result, the MPR for each of the Subtest modes is as follows:

| Maximum Power Reduction (MPR) |                |                |                |                |
|-------------------------------|----------------|----------------|----------------|----------------|
| Subtest mode 1                | Subtest mode 2 | Subtest mode 3 | Subtest mode 4 | Subtest mode 5 |
| 1.5dB                         | 2.0dB          | 1.0dB          | 2.0dB          | 1.5dB          |

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

See the following pages

20177

**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 Accreditation Service (SAS)  
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 Denmark A/S**

Certificate No: **ES3-3117\_Jul09**

## CALIBRATION CERTIFICATE

Object: **ES3DV3x - SN:3117**

Calibration procedure(s): **QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **July 21, 2009**

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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Certificate No.)    | Scheduled Calibration |
|----------------------------|-----------------|-------------------------------|-----------------------|
| Power meter E4119B         | GB11293874      | 1-Apr-09 (No. 217-01039)      | Apr-10                |
| Power sensor E4412A        | MY41495277      | 1-Apr-09 (No. 217-01030)      | Apr-10                |
| Power sensor E4412A        | MY41498087      | 1-Apr-09 (No. 217-01030)      | Apr-10                |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 31-Mar-09 (No. 217-01026)     | Mar-10                |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-09 (No. 217-01028)     | Mar-10                |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 31-Mar-09 (No. 217-01027)     | Mar-10                |
| Reference Probe ES3DV2     | SN: 3013        | 2-Jan-09 (No. ES3-3013_Jan09) | Jan-10                |
| DAE4                       | SN: 660         | 9-Sep-08 (No. DAE4-660_Sep08) | Sep-09                |

| Secondary Standards       | ID #         | Check Date (in house)             | Scheduled Check        |
|---------------------------|--------------|-----------------------------------|------------------------|
| RF generator HP 8648C     | US3642U01700 | 4-Aug-99 (in house check Oct-07)  | in house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585   | 18-Oct-01 (in house check Oct-08) | in house check: Oct-09 |

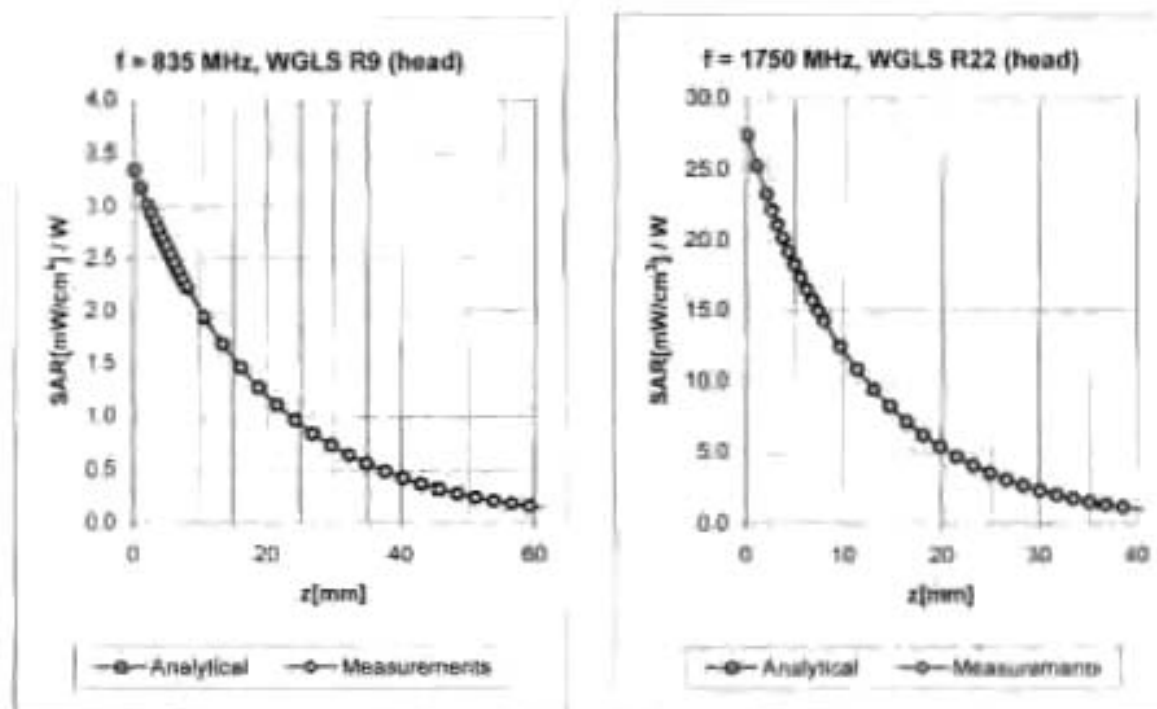
|                |                 |                       |           |
|----------------|-----------------|-----------------------|-----------|
|                | Name            | Function              | Signature |
| Calibrated by: | Claudio Leubler | Laboratory Technician |           |

|              |               |                   |
|--------------|---------------|-------------------|
| Approved by: | Katja Pokovic | Technical Manager |
|--------------|---------------|-------------------|

Issued: July 21, 2009

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

## Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>2</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 5%    | 0.88  | 1.11  | 5.85 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.1 ± 5%    | 1.37 ± 5%    | 0.53  | 1.48  | 5.04 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Head | 40.8 ± 5%    | 1.40 ± 5%    | 0.50  | 1.50  | 4.90 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.41  | 1.79  | 4.38 ± 11.0% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.90  | 1.11  | 5.76 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Body | 53.4 ± 5%    | 1.49 ± 5%    | 0.37  | 2.02  | 4.83 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.31  | 2.84  | 4.41 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.81  | 1.21  | 4.12 ± 11.0% (k=2) |

<sup>2</sup> The validity of ± 100 MHz only applies for DASY v4.4 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.



Accredited by the Swiss Accreditation Service (SAS)  
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 Denmark A/S**

Certificate No: **ES3-3118\_Sep09**

## CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3118**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2  
Calibration procedure for dosimetric E-field probes**

Calibration date: **September 22, 2009**

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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Certificate No.)    | Scheduled Calibration |
|----------------------------|-----------------|-------------------------------|-----------------------|
| Power meter E4119B         | GB41293874      | 1-Apr-09 (No. 217-01030)      | Apr-10                |
| Power sensor E4412A        | MY41495277      | 1-Apr-09 (No. 217-01030)      | Apr-10                |
| Power sensor E4412A        | MY41498087      | 1-Apr-09 (No. 217-01030)      | Apr-10                |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 31-Mar-09 (No. 217-01026)     | Mar-10                |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-09 (No. 217-01028)     | Mar-10                |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 31-Mar-09 (No. 217-01027)     | Mar-10                |
| Reference Probe ES3DV2     | SN: 3013        | 2-Jan-09 (No. ES3-3013_Jan09) | Jan-10                |
| DAE4                       | SN: 660         | 9-Sep-08 (No. DAE4-660_Sep08) | Sep-09                |

| Secondary Standards       | ID #         | Check Date (in house)             | Scheduled Check        |
|---------------------------|--------------|-----------------------------------|------------------------|
| RF generator HP 8648C     | US3642U01700 | 4-Aug-99 (in house check Oct-07)  | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585   | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

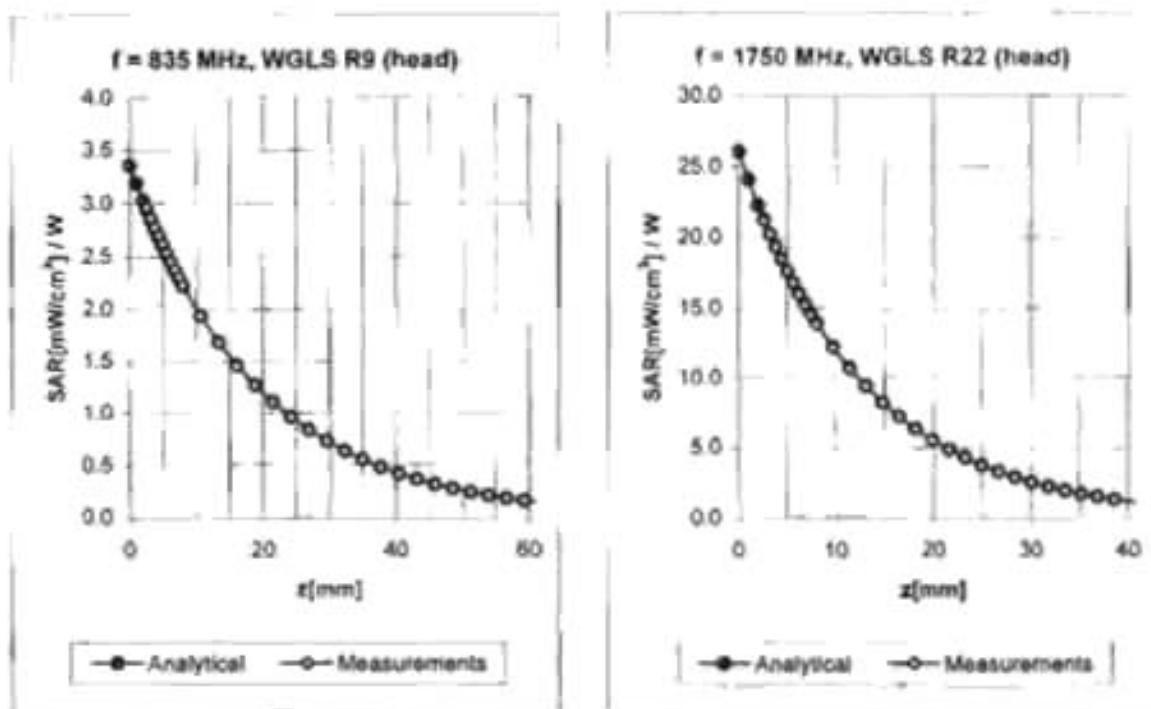
Calibrated by: **Marcel Fehr** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Issued: September 22, 2009

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%    | 0.97  | 1.07  | 5.85 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.1 ± 5%    | 1.37 ± 5%    | 0.61  | 1.40  | 4.97 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.50  | 1.53  | 4.74 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.46  | 1.69  | 4.21 ± 11.0% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.95  | 1.13  | 5.65 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Body | 53.4 ± 5%    | 1.49 ± 5%    | 0.41  | 1.92  | 4.80 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.41  | 2.14  | 4.37 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.99  | 1.05  | 4.05 ± 11.0% (k=2) |

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 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.

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**APPENDIX E: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)**

See the following pages



Accredited by the Swiss Accreditation Service (SAS)  
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 Denmark A/S**

Certificate No.: **D835V2-4d042\_Sep08**

## CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d042**

Calibration procedure(s): **QA CAL-05.v7  
Calibration procedure for dipole validation kits**

Calibration date: **September 22, 2008**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (N&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)     | Scheduled Calibration |
|-----------------------------|--------------------|--------------------------------|-----------------------|
| Power meter EPM-442A        | GB37480704         | 04-Oct-07 (No. 217-00736)      | Oct-08                |
| Power sensor HP 8481A       | US37282763         | 04-Oct-07 (No. 217-00736)      | Oct-08                |
| Reference 20 dB Attenuator  | SN: 6066 (20g)     | 01-Jul-08 (No. 217-00864)      | Jul-09                |
| Type-N mismatch combination | SN: 9047.2 / 06327 | 01-Jul-08 (No. 217-00867)      | Jul-09                |
| Reference Probe ES30V2      | SN: 3025           | 28-Apr-06 (No. ES3-3025_Apr06) | Apr-09                |
| DAE4                        | SN: 601            | 14-Mar-06 (No. DAE4-601_Mar06) | Mar-09                |

| Secondary Standards       | ID #             | Check Date (in house)             | Scheduled Check        |
|---------------------------|------------------|-----------------------------------|------------------------|
| Power sensor HP 8481A     | NY41092317       | 18-Oct-02 (in house check Oct-07) | In house check: Oct-08 |
| RF generator R&S SMT-06   | 100005           | 4-Aug-99 (in house check Oct-07)  | In house check: Oct-08 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

|                |                      |                              |                  |
|----------------|----------------------|------------------------------|------------------|
|                | <b>Name</b>          | <b>Function</b>              | <b>Signature</b> |
| Calibrated by: | <b>Jean Kestret</b>  | <b>Laboratory Technician</b> |                  |
| Approved by:   | <b>Katja Pokorec</b> | <b>Technical Manager</b>     |                  |

Issued: September 22, 2008

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## DASY5 Validation Report for Head TSL

Date/Time: 22.09.2008 10:40:16

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d042**

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.901 \text{ mho/m}$ ;  $\epsilon_r = 41.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

### DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

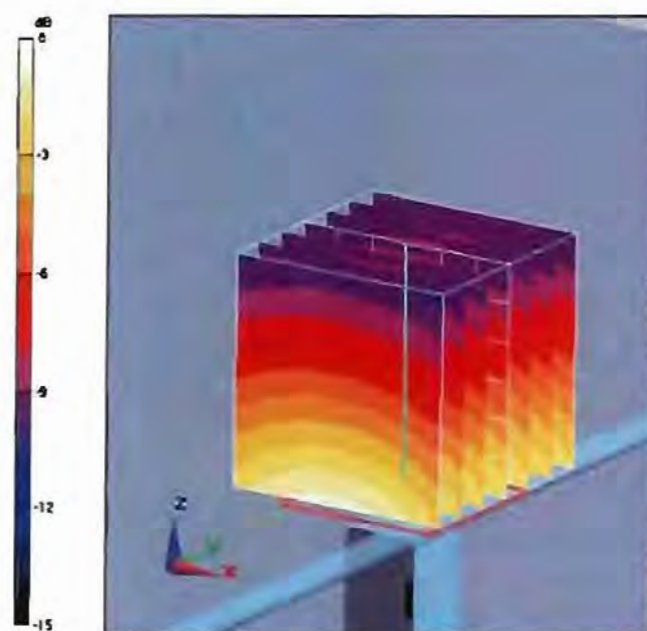
**Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.9 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.48 W/kg

**SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.57 mW/g**

Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69mW/g

## DASY5 Validation Report for Body TSL

Date/Time: 16.09.2008 10:46:36

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d042**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL900

Medium parameters used:  $f = 835$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 53.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEBE/IEC)

### DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.9, 5.9, 5.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

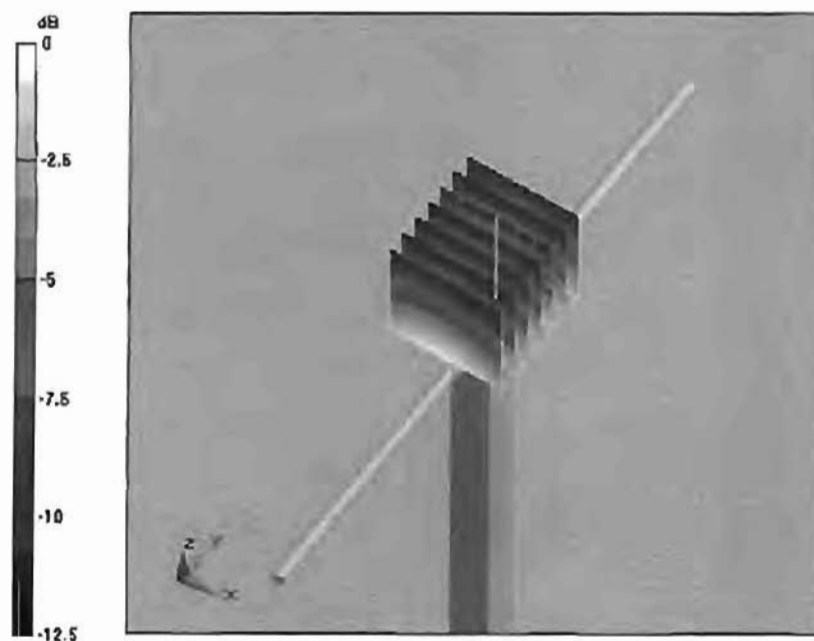
**Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 3.63 W/kg

**SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.65 mW/g**

Maximum value of SAR (measured) = 2.81 mW/g



0 dB = 2.81 mW/g



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Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D1900V2-5d063\_Feb10**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d063**

Calibration procedure(s) **QA CAL-05.v7**  
**Calibration procedure for dipole validation kits**

Calibration date: **February 23, 2010**

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 (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-09 (No. 217-01086)         | Oct-10                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)     | 31-Mar-09 (No. 217-01025)         | Mar-10                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 31-Mar-09 (No. 217-01029)         | Mar-10                 |
| Reference Probe ES3DV3      | SN: 3205           | 26-Jun-09 (No. ES3-3205_Jun09)    | Jun-10                 |
| DAE4                        | SN: 601            | 07-Mar-09 (No. DAE4-601_Mar09)    | Mar-10                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-09) | In house check: Oct-10 |

Calibrated by: **Jeton Kastrati**

Function  
 Laboratory Technician

Signature

Approved by: **Katja Pokovic**

Technical Manager

Issued: February 25, 2010

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## DASY5 Validation Report for Head TSL

Date/Time: 23.02.2010 13:21:31

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d063**

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

Medium: HSL U11 BB

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.42$  mho/m;  $\epsilon_r = 39.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

### DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

**Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement**

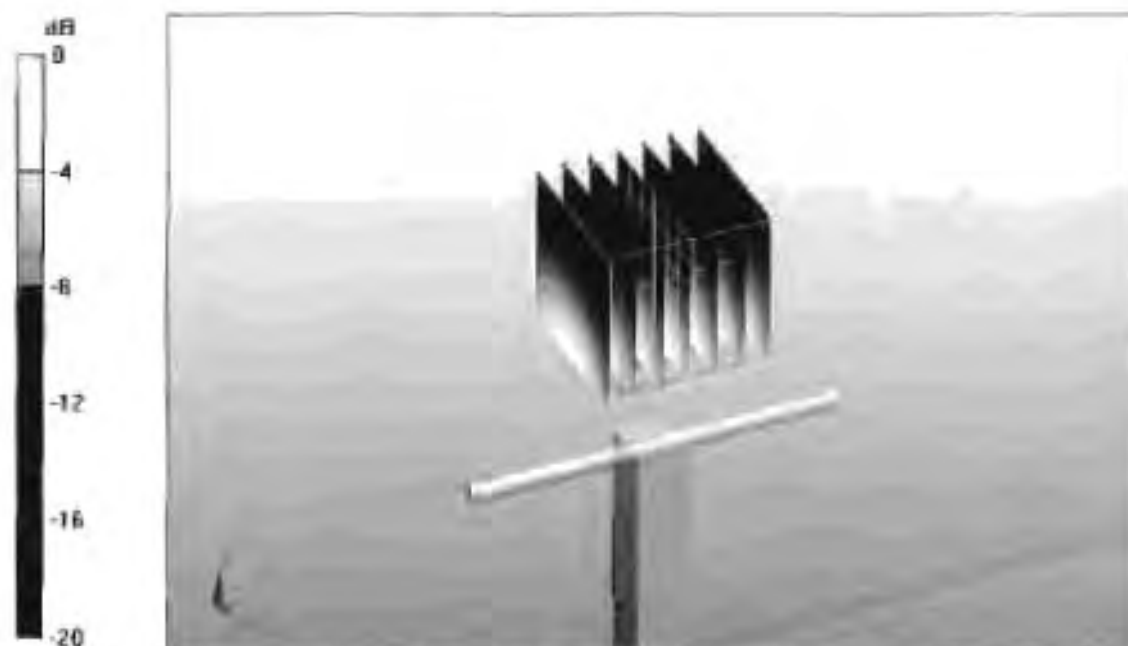
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.1 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 9.98 mW/g; SAR(10 g) = 5.2 mW/g

Maximum value of SAR (measured) = 12.4 mW/g



0 dB = 12.4mW/g

## DASY5 Validation Report for Body

Date/Time: 16.02.2010 13:00:42

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d063**

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

Medium: MSL U10 BB

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.56$  mho/m;  $\epsilon_r = 52.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

### DASY5 Configuration:

- Probe: ES1DV3 - SN1205; ConvF: 4.59, 4.59, 4.59; Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: OD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

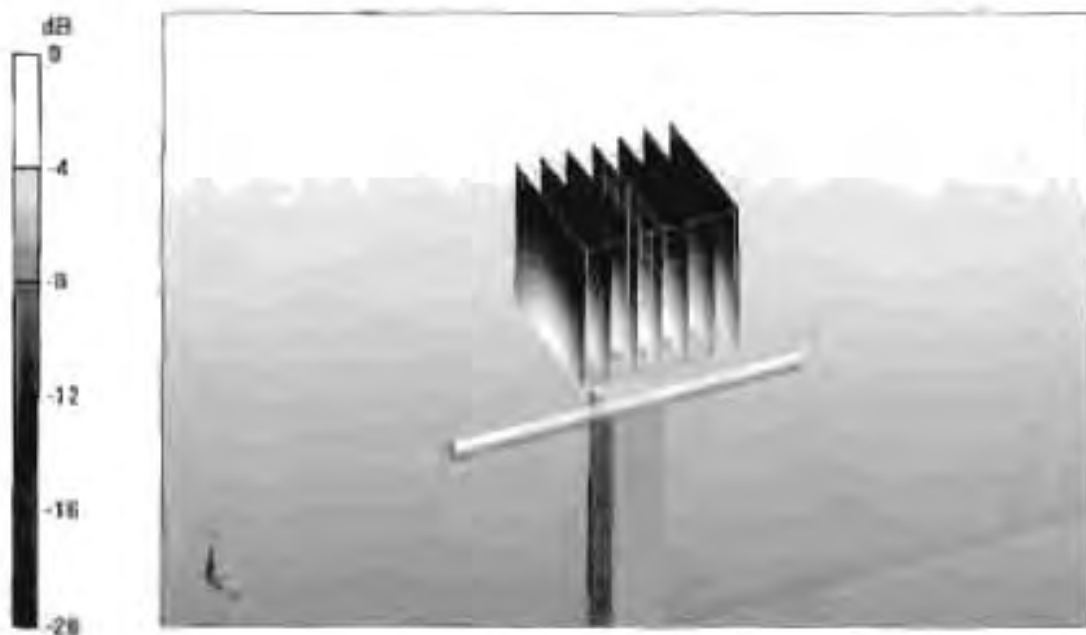
**Pin 250 mW / d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 96.1 V/m, Power Drift = 0.078 dB

Peak SAR (extrapolated) = 16.7 W/kg

**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.31 mW/g**

Maximum value of SAR (measured) = 12.8 mW/g



0 dB = 12.8 mW/g



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Accreditation No.: SCS 108

Client **Nokia Denmark A/S**

Certificate No: **D2450V2-790\_Sep08**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 790**

Calibration procedure(s) **QA CAL-05.v7  
Calibration procedure for dipole validation kits**

Calibration date: **September 24, 2008**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (MATE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)     | Scheduled Calibration |
|-----------------------------|--------------------|--------------------------------|-----------------------|
| Power meter EPM-442A        | G837460704         | 04-Oct-07 (No. 217-00736)      | Oct-08                |
| Power sensor HP 8461A       | US37292763         | 04-Oct-07 (No. 217-00736)      | Oct-08                |
| Reference 20 dB Attenuator  | SN: 55086 (20g)    | 01-Jul-08 (No. 217-00864)      | Jul-09                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Jul-08 (No. 217-00867)      | Jul-09                |
| Reference Probe ES3DV2      | SN: 3025           | 28-Apr-08 (No. ES3-3025_Apr08) | Apr-09                |
| DAE4                        | SN: 601            | 14-Mar-08 (No. DAE4-601_Mar08) | Mar-09                |

| Secondary Standards       | ID #             | Check Date (in house)             | Scheduled Check        |
|---------------------------|------------------|-----------------------------------|------------------------|
| Power sensor HP 8461A     | MY41092317       | 18-Oct-02 (in house check Oct-07) | In house check: Oct-09 |
| RF generator R&S SM1-06   | 100005           | 4-Aug-99 (in house check Oct-07)  | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 54206 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

|                | Name           | Function              | Signature |
|----------------|----------------|-----------------------|-----------|
| Calibrated by: | Jeton Kastrati | Laboratory Technician |           |
| Approved by:   | Katja Pokovic  | Technical Manager     |           |

Issued: September 25, 2008

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## DASY5 Validation Report for Head TSL

Date/Time: 24.09.2008 12:50:11

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN790**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.8$  mho/m;  $\epsilon_r = 39.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

### DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

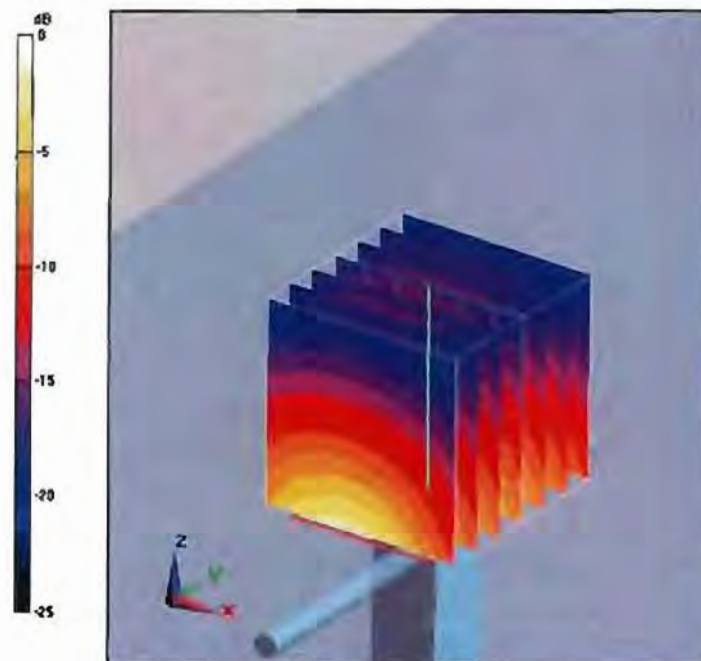
**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.9 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 27.6 W/kg

**SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.15 mW/g**

Maximum value of SAR (measured) = 15.8 mW/g



0 dB = 15.8mW/g

## DASY5 Validation Report for Body TSL

Date/Time: 18.09.2008 13:52:58

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:790**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.97$  mho/m;  $\epsilon_r = 50.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

### DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.07, 4.07, 4.07); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

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

Reference Value = 91.9 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 26 W/kg

**SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.81 mW/g**

Maximum value of SAR (measured) = 15.7 mW/g



0 dB = 15.7 mW/g