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

See the next six pages.



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Nokia Salo TCC**

Certificate No: **ET3-1396\_Feb07**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1396**

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

Calibration date: **February 12, 2007**

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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|----------------------------|-----------------|-------------------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Power sensor E4412A        | MY41495277      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Power sensor E4412A        | MY41498087      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 10-Aug-06 (METAS, No. 217-00592)          | Aug-07                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 4-Apr-06 (METAS, No. 251-00558)           | Apr-07                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 10-Aug-06 (METAS, No. 217-00593)          | Aug-07                 |
| Reference Probe ES3DV2     | SN: 3013        | 4-Jan-07 (SPEAG, No. ES3-3013_Jan07)      | Jan-08                 |
| DAE4                       | SN: 654         | 21-Jun-06 (SPEAG, No. DAE4-654_Jun06)     | Jun-07                 |
| Secondary Standards        | ID #            | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (SPEAG, in house check Nov-05)   | In house check: Nov-07 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (SPEAG, in house check Oct-06)  | In house check: Oct-07 |

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

Issued: February 12, 2007

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

DASY - Parameters of Probe: ET3DV6 SN:1396

| Sensitivity in Free Space <sup>A</sup> |              |                       | Diode Compression <sup>B</sup> |       |
|----------------------------------------|--------------|-----------------------|--------------------------------|-------|
| NormX                                  | 1.80 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP X                          | 91 mV |
| NormY                                  | 1.79 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Y                          | 91 mV |
| NormZ                                  | 1.99 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Z                          | 91 mV |

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

|                                           |                              |                                   |        |  |
|-------------------------------------------|------------------------------|-----------------------------------|--------|--|
| TSL                                       | 900 MHz                      | Typical SAR gradient: 5 % per mm  |        |  |
| Sensor Center to Phantom Surface Distance |                              | 3.7 mm                            | 4.7 mm |  |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 7.7                               | 4.2    |  |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.1                               | 0.2    |  |
| TSL                                       | 1810 MHz                     | Typical SAR gradient: 10 % per mm |        |  |
| Sensor Center to Phantom Surface Distance |                              | 3.7 mm                            | 4.7 mm |  |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 12.0                              | 8.5    |  |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.2                               | 0.3    |  |

Sensor Offset

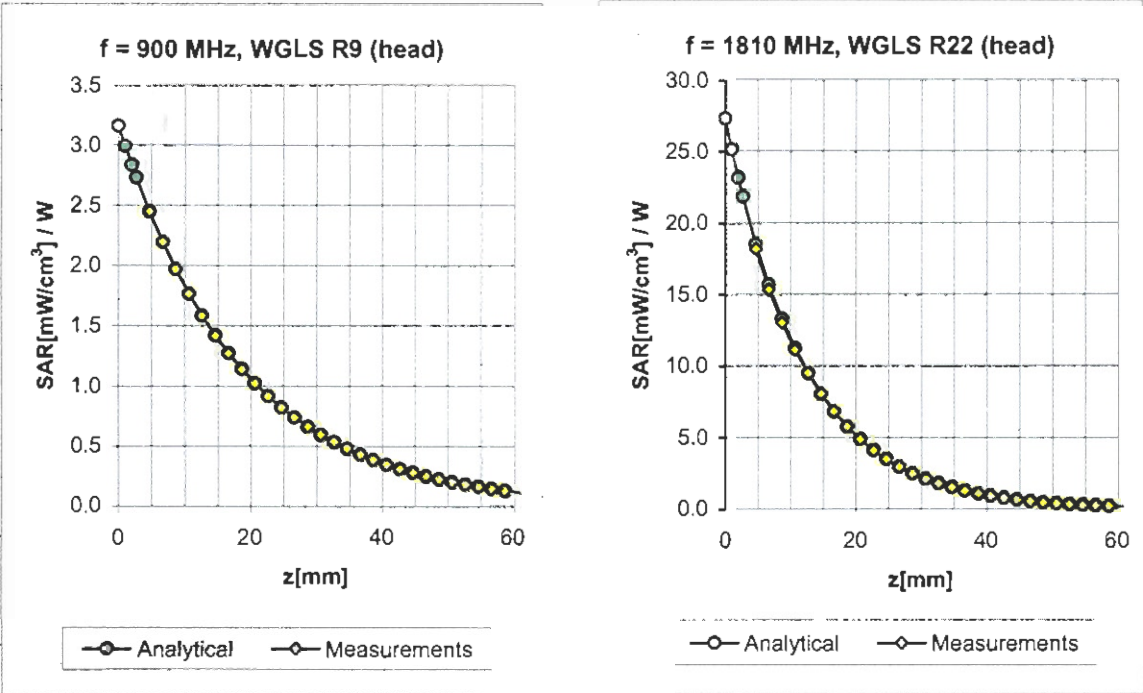
|                            |        |
|----------------------------|--------|
| Probe Tip to Sensor Center | 2.7 mm |
|----------------------------|--------|

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.30  | 2.57  | 6.86 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.47  | 2.64  | 5.28 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.48  | 2.78  | 4.95 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.60  | 2.12  | 4.51 ± 11.8% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.31  | 2.60  | 6.62 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.58  | 2.62  | 4.70 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.70  | 2.31  | 4.45 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.56  | 2.47  | 4.00 ± 11.8% (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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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Nokia Salo TCC**

Certificate No: **ES3-3131\_Feb07**

## CALIBRATION CERTIFICATE

|                                  |                                                                     |
|----------------------------------|---------------------------------------------------------------------|
| Object                           | ES3DV3 - SN:3131                                                    |
| Calibration procedure(s)         | QA CAL-01.v5<br>Calibration procedure for dosimetric E-field probes |
| Calibration date:                | February 23, 2007                                                   |
| Condition of the calibrated item | In Tolerance                                                        |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|----------------------------|-----------------|-------------------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Power sensor E4412A        | MY41495277      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Power sensor E4412A        | MY41498087      | 5-Apr-06 (METAS, No. 251-00557)           | Apr-07                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 10-Aug-06 (METAS, No. 217-00592)          | Aug-07                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 4-Apr-06 (METAS, No. 251-00558)           | Apr-07                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 10-Aug-06 (METAS, No. 217-00593)          | Aug-07                 |
| Reference Probe ES3DV2     | SN: 3013        | 4-Jan-07 (SPEAG, No. ES3-3013_Jan07)      | Jan-08                 |
| DAE4                       | SN: 654         | 21-Jun-06 (SPEAG, No. DAE4-654_Jun06)     | Jun-07                 |
| Secondary Standards        | ID #            | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (SPEAG, in house check Nov-05)   | In house check: Nov-07 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (SPEAG, in house check Oct-06)  | In house check: Oct-07 |

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

Issued: February 26, 2007

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DASY - Parameters of Probe: ES3DV3 SN:3131

| Sensitivity in Free Space <sup>A</sup> |              |                       | Diode Compression <sup>B</sup> |       |
|----------------------------------------|--------------|-----------------------|--------------------------------|-------|
| NormX                                  | 1.33 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP X                          | 94 mV |
| NormY                                  | 1.30 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Y                          | 93 mV |
| NormZ                                  | 1.24 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Z                          | 95 mV |

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

|                                           |                              |                                   |        |  |
|-------------------------------------------|------------------------------|-----------------------------------|--------|--|
| TSL                                       | 900 MHz                      | Typical SAR gradient: 5 % per mm  |        |  |
| Sensor Center to Phantom Surface Distance |                              | 3.0 mm                            | 4.0 mm |  |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 5.5                               | 2.5    |  |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.0                               | 0.2    |  |
| TSL                                       | 1810 MHz                     | Typical SAR gradient: 10 % per mm |        |  |
| Sensor Center to Phantom Surface Distance |                              | 3.0 mm                            | 4.0 mm |  |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 3.9                               | 1.7    |  |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.1                               | 0.1    |  |

Sensor Offset

|                            |        |
|----------------------------|--------|
| Probe Tip to Sensor Center | 2.0 mm |
|----------------------------|--------|

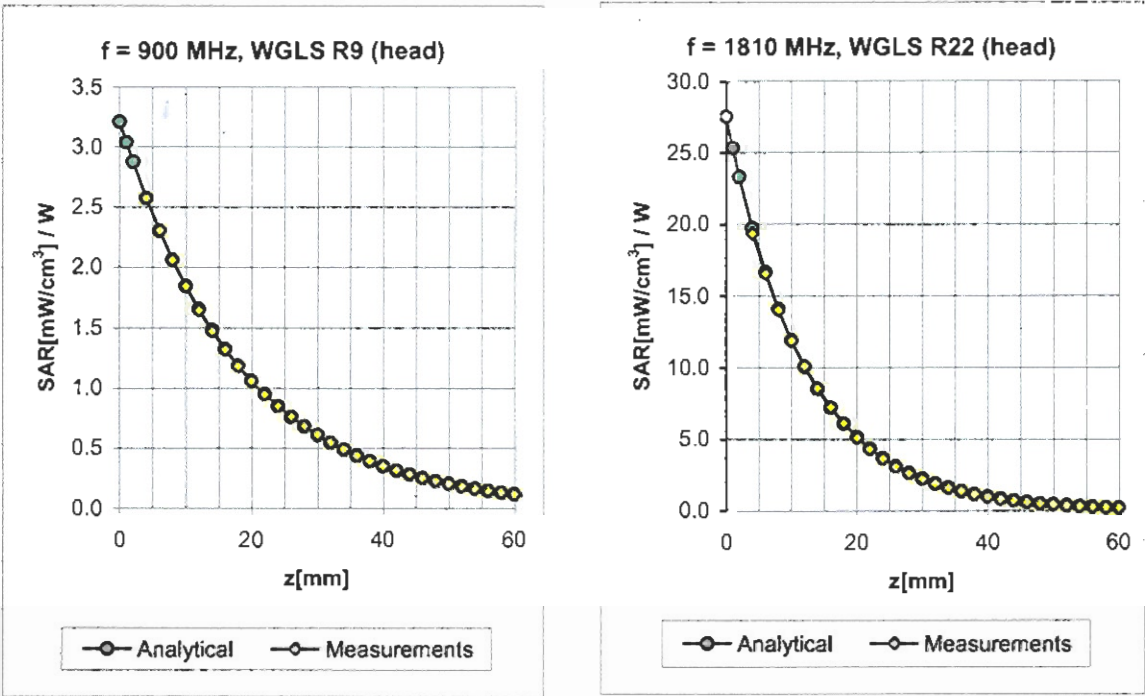
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.



Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.97  | 1.15  | 6.05 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.70  | 1.30  | 5.08 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.76  | 1.24  | 4.71 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.63  | 1.42  | 4.45 ± 11.8% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.87  | 1.18  | 6.03 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.84  | 1.30  | 4.76 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.81  | 1.28  | 4.51 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.65  | 1.35  | 4.10 ± 11.8% (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 D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)**

See the next nine pages.





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Accreditation No.: **SCS 108**

Client **Nokia Salo TCC**

Certificate No: **D835V2-480\_May07**

## CALIBRATION CERTIFICATE

Object **D835V2 - SN: 480**

Calibration procedure(s) **QA CAL-05.v6  
Calibration procedure for dipole validation kits**

Calibration date: **May 21, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #             | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|------------------|-------------------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Power sensor HP 8481A       | US37292783       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)   | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference 10 dB Attenuator  | SN: 5047.2 (10r) | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference Probe ET3DV6 (HF) | SN 1507          | 19-Oct-06 (SPEAG, No. ET3-1507_Oct06)     | Oct-07                 |
| DAE4                        | SN 601           | 30-Jan-07 (SPEAG, No. DAE4-601_Jan07)     | Jan-08                 |
| Secondary Standards         | ID #             | Check Date (in house)                     | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317       | 18-Oct-02 (SPEAG, in house check Oct-05)  | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675       | 11-May-05 (SPEAG, in house check Nov-05)  | In house check: Nov-07 |
| Network Analyzer HP 8753E   | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Oct-06)  | In house check: Oct-07 |

|                |               |                       |           |
|----------------|---------------|-----------------------|-----------|
|                | Name          | Function              | Signature |
| Calibrated by: | Marcel Fehr   | Laboratory Technician |           |
| Approved by:   | Katja Pokovic | Technical Manager     |           |

Issued: May 30, 2007

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

## DASY4 Validation Report for Head TSL

Date/Time: 21.05.2007 15:29:18

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:480**

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

Medium: HSL 900 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.9 \text{ mho/m}$ ;  $\epsilon_r = 41.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:**

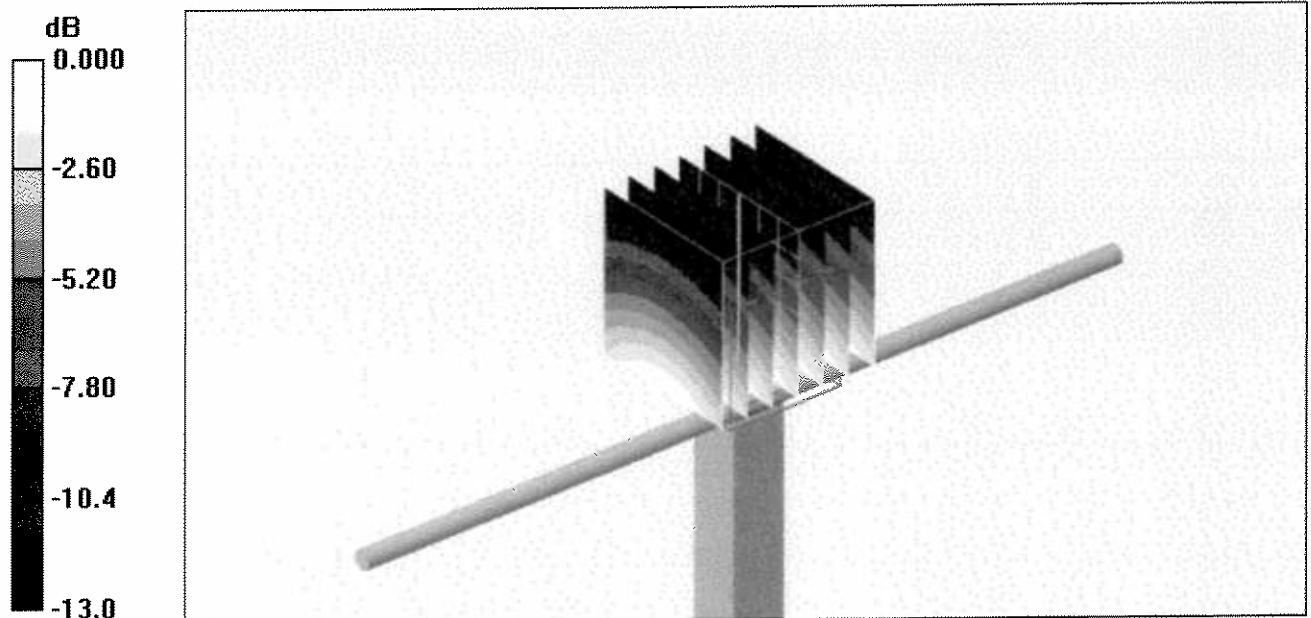
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.7 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 3.29 W/kg

**SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.5 mW/g**

Maximum value of SAR (measured) = 2.47 mW/g



0 dB = 2.47mW/g

## DASY4 Validation Report for Body TSL

Date/Time: 21.05.2007 12:35:17

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:480**

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

Medium: MSL900;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.98 \text{ mho/m}$ ;  $\epsilon_r = 53$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.75, 5.75, 5.75); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

### **Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0:**

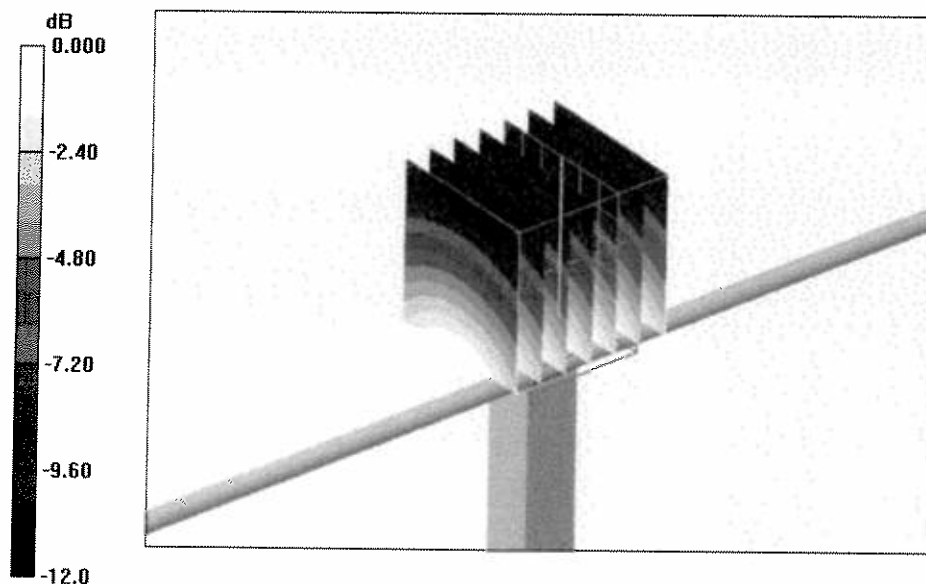
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.8 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.45 W/kg

**SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.65 mW/g**

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



0 dB = 2.69mW/g



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Salo TCC**

Certificate No: **D1900V2-5d013\_Jul06**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d013**

Calibration procedure(s) **QA CAL-05.v6**  
**Calibration procedure for dipole validation kits**

Calibration date: **July 07, 2006**

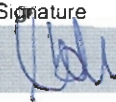
Condition of the calibrated item **In Tolerance**

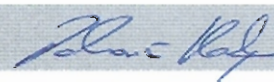
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #             | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|------------------|-------------------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704       | 04-Oct-05 (METAS, No. 251-00516)          | Oct-06                 |
| Power sensor HP 8481A       | US37292783       | 04-Oct-05 (METAS, No. 251-00516)          | Oct-06                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)   | 11-Aug-05 (METAS, No 251-00498)           | Aug-06                 |
| Reference 10 dB Attenuator  | SN: 5047.2 (10r) | 11-Aug-05 (METAS, No 251-00498)           | Aug-06                 |
| Reference Probe ET3DV6      | SN: 1507         | 28-Oct-05 (SPEAG, No. ET3-1507_Oct05)     | Oct-06                 |
| DAE4                        | SN: 601          | 15-Dec-05 (SPEAG, No. DAE4-601_Dec05)     | Dec-06                 |
| Secondary Standards         | ID #             | Check Date (in house)                     | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317       | 18-Oct-02 (SPEAG, in house check Oct-05)  | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675       | 11-May-05 (SPEAG, in house check Nov-05)  | In house check: Nov-07 |
| Network Analyzer HP 8753E   | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Nov-05)  | In house check: Nov-06 |

Calibrated by: **Claudio Leubler** **Laboratory Technician** 

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

Issued: July 10, 2006

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

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013**

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

Medium: HSL U10 BB;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 39.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.74, 4.74, 4.74); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 171

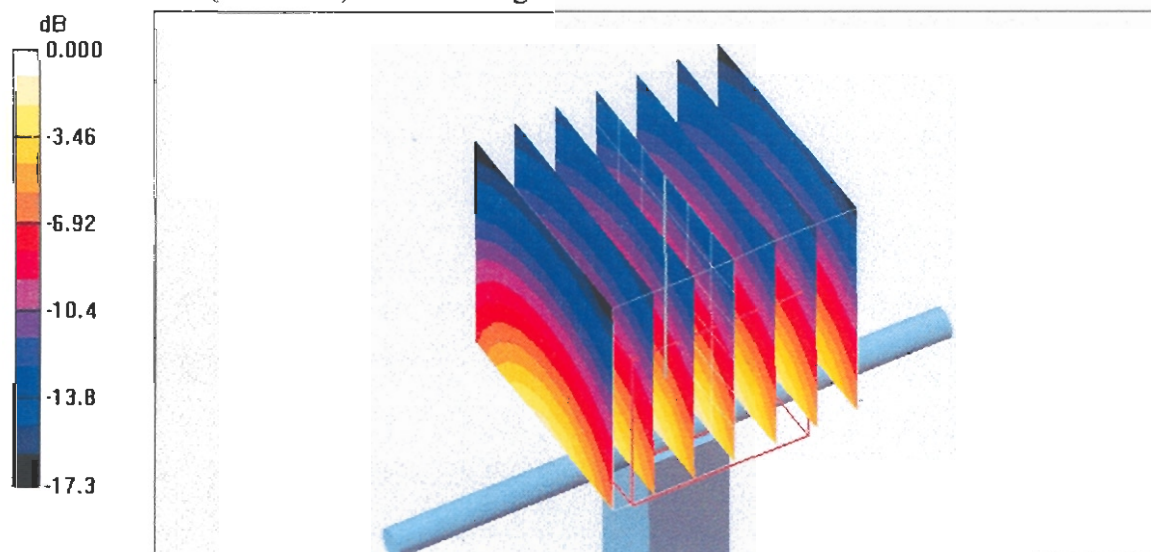
**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.5 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 16.7 W/kg

**SAR(1 g) = 9.69 mW/g; SAR(10 g) = 5.11 mW/g**

Maximum value of SAR (measured) = 11.0 mW/g



0 dB = 11.0mW/g



Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013**

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

Medium: MSL U10;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

#### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.3, 4.3, 4.3); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 171

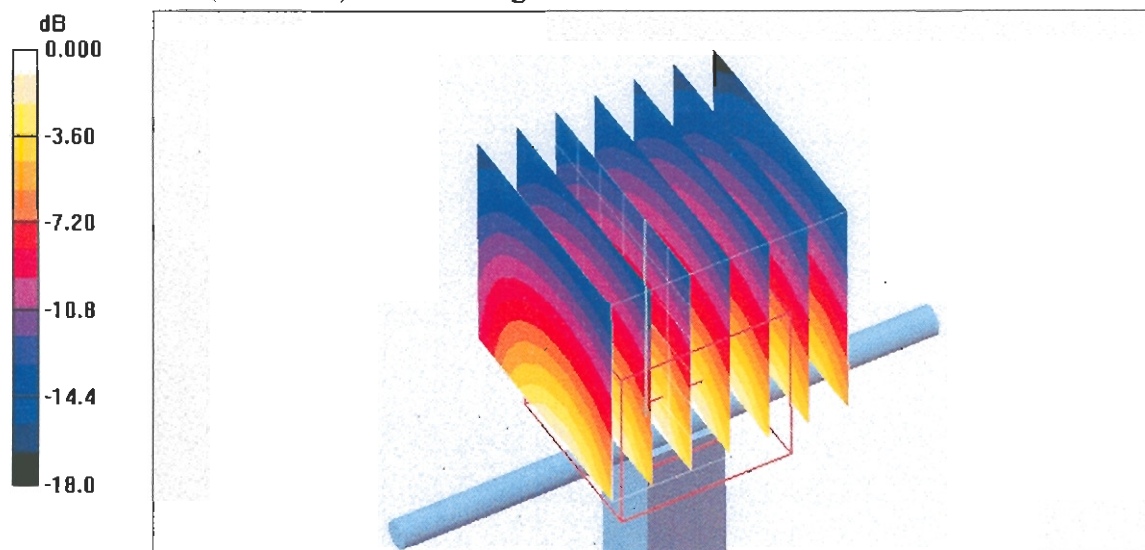
**Pin = 250 mW; d = 10 mm big batch/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.1 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 17.4 W/kg

**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.36 mW/g**

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



0 dB = 11.3mW/g





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

Accreditation No.: **SCS 108**

Client **Nokia Salo TCC**

Certificate No: **D2450V2-749\_Apr06**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 749**

Calibration procedure(s) **QA CAL-05.v6**  
**Calibration procedure for dipole validation kits**

Calibration date: **April 27, 2006**

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 (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|------------------|-------------------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704       | 04-Oct-05 (METAS, No. 251-00516)          | Oct-06                 |
| Power sensor HP 8481A       | US37292783       | 04-Oct-05 (METAS, No. 251-00516)          | Oct-06                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)   | 11-Aug-05 (METAS, No 251-00498)           | Aug-06                 |
| Reference 10 dB Attenuator  | SN: 5047.2 (10r) | 11-Aug-05 (METAS, No 251-00498)           | Aug-06                 |
| Reference Probe ES3DV2      | SN 3025          | 28-Oct-05 (SPEAG, No. ES3-3025_Oct05)     | Oct-06                 |
| DAE4                        | SN 601           | 15-Dec-05 (SPEAG, No. DAE4-601_Dec05)     | Dec-06                 |
| Secondary Standards         | ID #             | Check Date (in house)                     | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317       | 18-Oct-02 (SPEAG, in house check Oct-05)  | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675       | 11-May-05 (SPEAG, in house check Nov-05)  | In house check: Nov-07 |
| Network Analyzer HP 8753E   | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Nov-05)  | In house check: Nov-06 |

Calibrated by: **Name** Mike Meili **Function** Laboratory Technician

**Signature**

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

Issued: April 28, 2006

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

## DASY4 Validation Report for Head TSL

Date/Time: 27.04.2006 14:08:29

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN749**

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

Medium: HSL U10 BB\_060425;

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.76$  mho/m;  $\epsilon_r = 38.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025 (HF); ConvF(4.4, 4.4, 4.4); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 21; Postprocessing SW: SEMCAD, V1.8 Build 165

**Pin = 250 mW; d = 10 mm/Area Scan (71x71x1):**

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

Maximum value of SAR (interpolated) = 16.5 mW/g

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

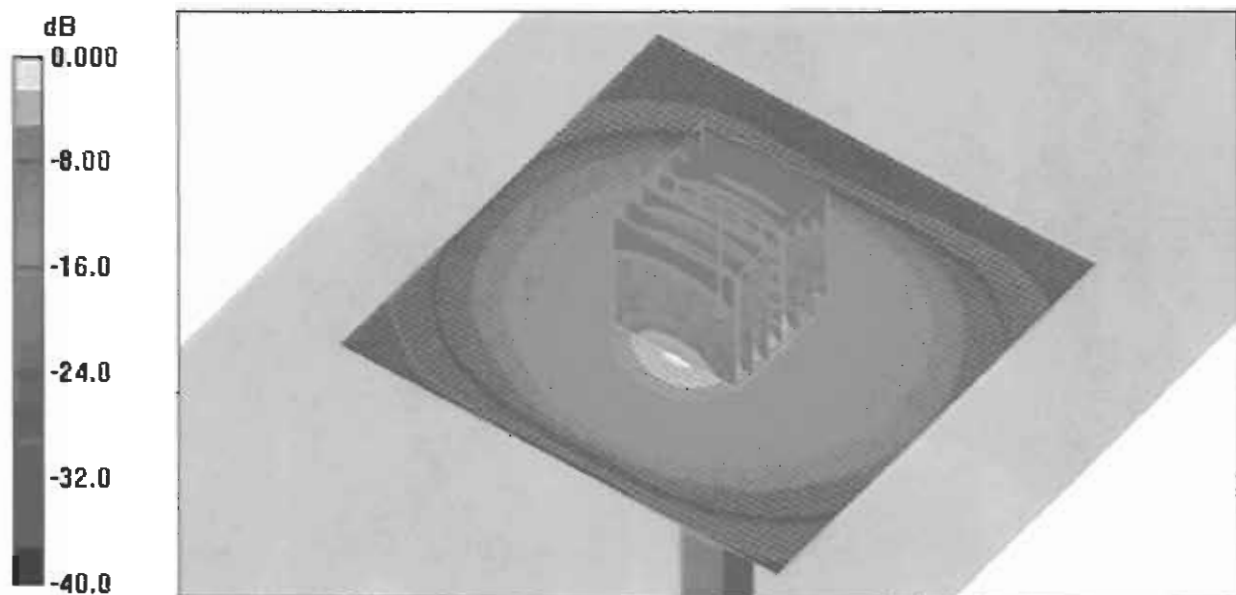
Measurement grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 94.0 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 28.1 W/kg

**SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.26 mW/g**

Maximum value of SAR (measured) = 15.4 mW/g



0 dB = 15.4mW/g

## DASY4 Validation Report for Body TSL

Date/Time: 25.04.2006 14:23:08

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN749**

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

Medium: MSL U10;

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.97$  mho/m;  $\epsilon_r = 53.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025 (HF); ConvF(4.06, 4.06, 4.06); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn60I; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 21; Postprocessing SW: SEMCAD, V1.8 Build 165

**Pin = 250 mW; d = 10 mm/Area Scan (61x61x1):**

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

Maximum value of SAR (interpolated) = 17.1 mW/g

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

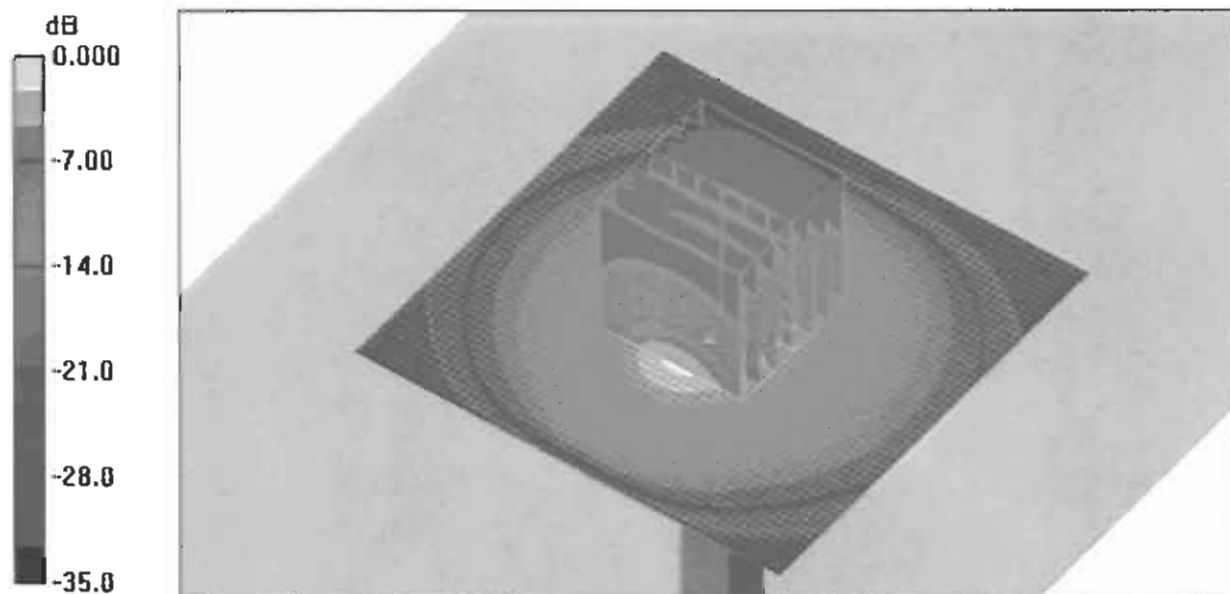
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.0 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 30.0 W/kg

**SAR(1 g) = 14.1 mW/g; SAR(10 g) = 6.5 mW/g**

Maximum value of SAR (measured) = 15.6 mW/g



0 dB = 15.6mW/g