

## DASY4 Validation Report for Head TSL

Date/Time: 21.11.2006 12:57:12

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 487**

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

Medium: HSL 900 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.901 \text{ mho/m}$ ;  $\epsilon_r = 42.3$ ;  $\rho = 1000 \text{ kg/m}^3$

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: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

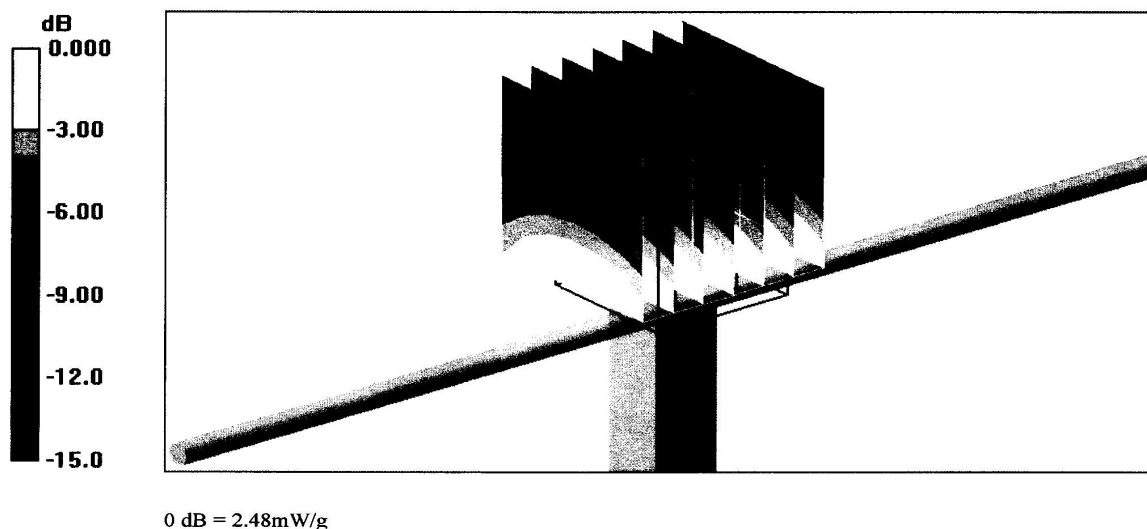
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.8 V/m; Power Drift = -0.040 dB

Peak SAR (extrapolated) = 3.32 W/kg

**SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.51 mW/g**

Maximum value of SAR (measured) = 2.48 mW/g



## DASY4 Validation Report for Body TSL

Date/Time: 14.11.2006 13:02:09

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:487**

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

Medium: MSL900;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.99 \text{ mho/m}$ ;  $\epsilon_r = 53.7$ ;  $\rho = 1000 \text{ kg/m}^3$

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: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

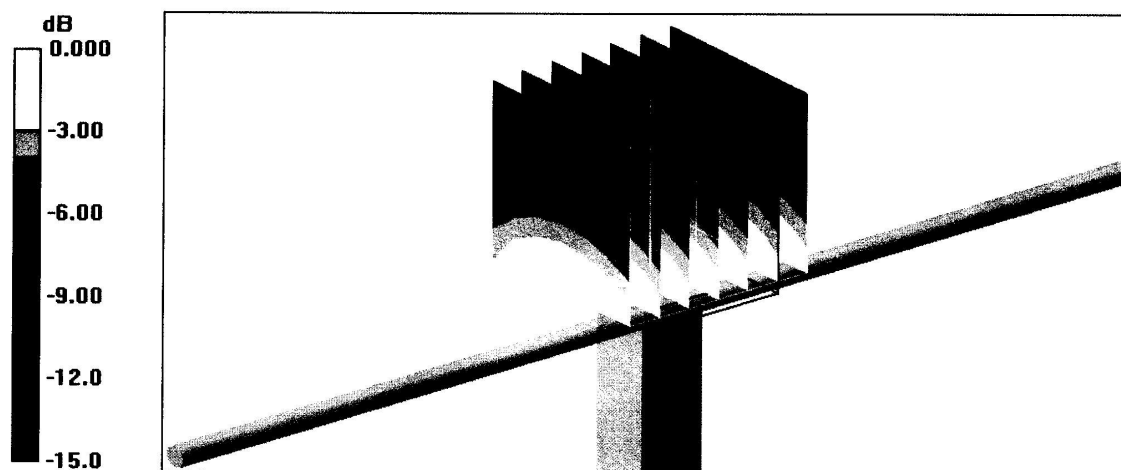
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.1 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 3.41 W/kg

**SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.62 mW/g**

Maximum value of SAR (measured) = 2.64 mW/g



**Calibration Laboratory of  
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Zeughausstrasse 43, 8004 Zurich, Switzerland



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

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

Accreditation No.: **SCS 108**

Client **Nokia SD TCC**

Certificate No: **D1900V2-534\_Sep06**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 534**

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

Calibration date: **September 20, 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)   | 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      | SN: 1507         | 28-Oct-05 (SPEAG, No. ET3-1507_Oct05)     | Oct-06                 |
| Reference Probe ES3DV3      | 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<br>Marcel Fehr | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Katja Pokovic       | Technical Manager                 |               |

Issued: September 20, 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: 13.09.2006 15:19:52

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:534**

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

Medium: HSL U10 BB;

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.41 \text{ mho/m}$ ;  $\epsilon_r = 38.6$ ;  $\rho = 1000 \text{ kg/m}^3$

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 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

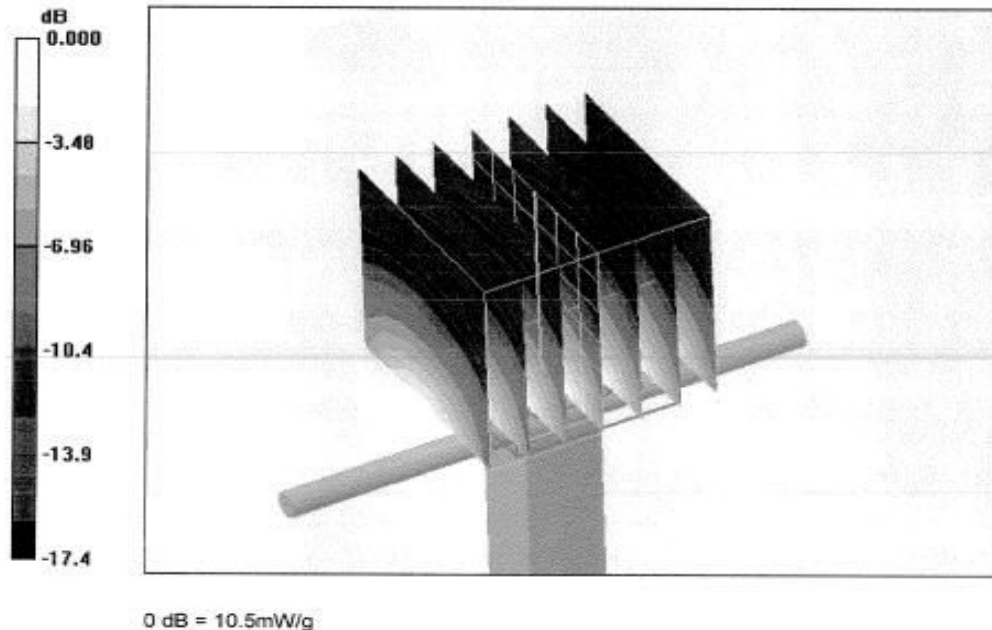
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 92.2 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 15.9 W/kg

**SAR(1 g) = 9.38 mW/g; SAR(10 g) = 4.97 mW/g**

Maximum value of SAR (measured) = 10.5 mW/g



## DASY4 Validation Report for Body TSL

Date/Time: 20.09.2006 10:57:32

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:534**

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

Medium: MSL U10;

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.56 \text{ mho/m}$ ;  $\epsilon_r = 52.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ES3DV2 - SN3025 (HF); ConvF(4.38, 4.38, 4.38); 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 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**$P_{in} = 250 \text{ mW}$ ;  $d = 10 \text{ mm}$ /Zoom Scan (7x7x7)/Cube 0:**

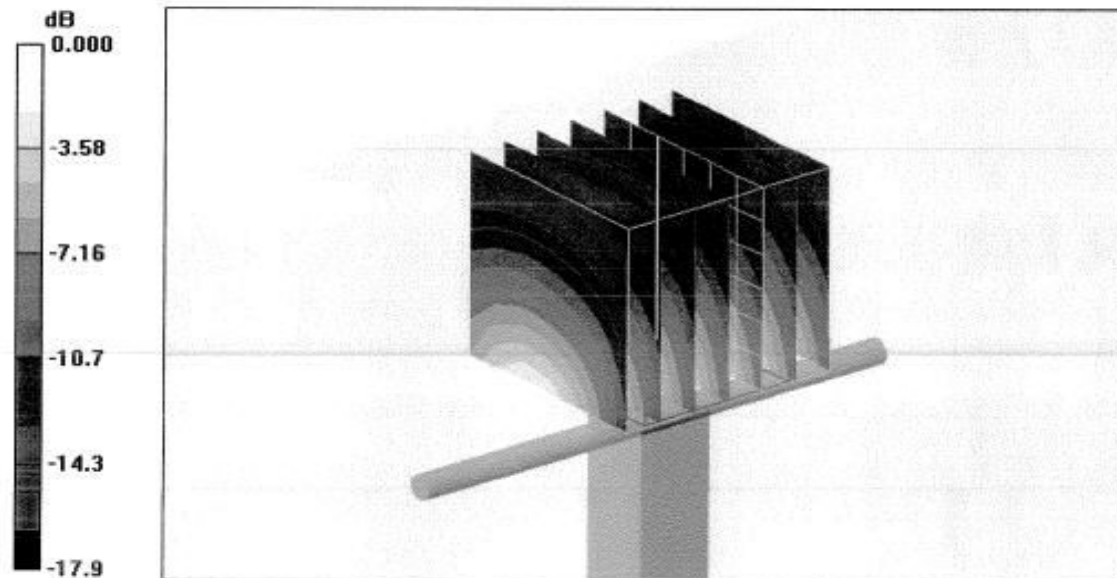
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $85.6 \text{ V/m}$ ; Power Drift =  $0.060 \text{ dB}$

Peak SAR (extrapolated) =  $16.5 \text{ W/kg}$

**SAR(1 g) =  $10.1 \text{ mW/g}$ ; SAR(10 g) =  $5.37 \text{ mW/g}$**

Maximum value of SAR (measured) =  $11.2 \text{ mW/g}$



0 dB =  $11.2 \text{ mW/g}$

## APPENDIX E: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED TRANSMISSION MODES

Test Laboratory: TCC Nokia

Type: RH-108; Serial: A00000011E6E56

### CDMA800

| Radio Configuration | Service Options and Channel Configurations | Supported  | Ch 1013<br>824.70 MHz | Ch 384<br>836.52 MHz | Ch 777<br>848.31 MHz |
|---------------------|--------------------------------------------|------------|-----------------------|----------------------|----------------------|
|                     |                                            |            | Pavg (dBm)            | Pavg (dBm)           | Pavg (dBm)           |
| RC1                 | S01                                        | no         |                       |                      |                      |
| RC1                 | S02                                        | yes        | 24.31                 | 24.03                | 24.01                |
| RC1                 | S03                                        | no         |                       |                      |                      |
| RC1                 | S055                                       | yes        | 24.42                 | 24.02                | 24.00                |
| RC2                 | S09                                        | yes        | 24.36                 | 24.10                | 23.90                |
| RC2                 | S055                                       | yes        | 24.39                 | 24.14                | 23.95                |
| RC3                 | S01                                        | no         |                       |                      |                      |
| RC3                 | S02                                        | yes        | 24.40                 | 24.06                | 23.89                |
| RC3                 | S03                                        | no         |                       |                      |                      |
| RC3                 | S032 (no SCH1)                             | no         |                       |                      |                      |
| RC3                 | S032 (SCH1 9.6 kpbs)                       | no         |                       |                      |                      |
| RC3                 | S032 (SCH1 19.2 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S032 (SCH1 38.4 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S032 (SCH1 76.8 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S032 (SCH1 153.6 kpbs)                     | no         |                       |                      |                      |
| RC3                 | S033 (SCH1 9.6 kpbs)                       | no         |                       |                      |                      |
| RC3                 | S033 (SCH1 19.2 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S033 (SCH1 38.4 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S033 (SCH1 76.8 kpbs)                      | no         |                       |                      |                      |
| RC3                 | S033 (SCH1 153.6 kpbs)                     | no         |                       |                      |                      |
| <b>RC3</b>          | <b>S055</b>                                | <b>yes</b> | <b>24.61</b>          | <b>24.35</b>         | <b>24.05</b>         |
| RC4                 | S01                                        | no         |                       |                      |                      |
| RC4                 | S02                                        | yes        | 24.42                 | 24.05                | 23.90                |
| RC4                 | S03                                        | no         |                       |                      |                      |
| RC4                 | S032 (no SCH1)                             | no         |                       |                      |                      |
| RC4                 | S032 (SCH1 9.6 kpbs)                       | no         |                       |                      |                      |
| RC4                 | S032 (SCH1 19.2 kpbs)                      | no         |                       |                      |                      |
| RC4                 | S032 (SCH1 38.4 kpbs)                      | no         |                       |                      |                      |
| RC4                 | S032 (SCH1 76.8 kpbs)                      | no         |                       |                      |                      |
| RC4                 | S032 (SCH1 153.6 kpbs)                     | no         |                       |                      |                      |
| RC4                 | S033 (SCH1 9.6 kpbs)                       | no         |                       |                      |                      |
| RC4                 | S033 (SCH1 19.2 kpbs)                      | no         |                       |                      |                      |
| RC4                 | S033 (SCH1 38.4 kpbs)                      | no         |                       |                      |                      |
| RC4                 | S033 (SCH1 76.8 kpbs)                      | no         |                       |                      |                      |

|     |                        |     |       |       |       |
|-----|------------------------|-----|-------|-------|-------|
| RC4 | S033 (SCH1 153.6 kpbs) | no  |       |       |       |
| RC4 | S055                   | yes | 24.46 | 24.08 | 23.94 |
| RC5 | S09                    | yes | 24.49 | 24.10 | 23.93 |
| RC5 | S033 (SCH1 9.6 kpbs)   | no  |       |       |       |
| RC5 | S033 (SCH1 19.2 kpbs)  | no  |       |       |       |
| RC5 | S033 (SCH1 38.4 kpbs)  | no  |       |       |       |
| RC5 | S033 (SCH1 76.8 kpbs)  | no  |       |       |       |
| RC5 | S033 (SCH1 153.6 kpbs) | no  |       |       |       |
| RC5 | S055                   | yes | 24.46 | 24.05 | 23.85 |

**CDMA1900**

| Radio Configuration | Service Options and Channel Configurations | Supported  | Ch25<br>1851.25MHz | Ch600<br>1880.00MHz | Ch1175<br>1908.75MHz |
|---------------------|--------------------------------------------|------------|--------------------|---------------------|----------------------|
|                     |                                            |            | Pavg (dBm)         | Pavg (dBm)          | Pavg (dBm)           |
| RC1                 | S01                                        | no         |                    |                     |                      |
| RC1                 | S02                                        | yes        | 23.21              | 23.20               | 23.21                |
| RC1                 | S03                                        | no         |                    |                     |                      |
| RC1                 | S055                                       | yes        | 23.30              | 23.17               | 23.20                |
| RC2                 | S09                                        | yes        | 23.31              | 23.31               | 23.22                |
| RC2                 | S055                                       | yes        | 23.21              | 23.36               | 23.08                |
| RC3                 | S01                                        | no         |                    |                     |                      |
| RC3                 | S02                                        | no         | 23.24              | 23.34               | 23.21                |
| RC3                 | S03                                        | no         |                    |                     |                      |
| RC3                 | S032 (no SCH1)                             | no         |                    |                     |                      |
| RC3                 | S032 (SCH1 9.6 kpbs)                       | no         |                    |                     |                      |
| RC3                 | S032 (SCH1 19.2 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S032 (SCH1 38.4 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S032 (SCH1 76.8 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S032 (SCH1 153.6 kpbs)                     | no         |                    |                     |                      |
| RC3                 | S033 (SCH1 9.6 kpbs)                       | no         |                    |                     |                      |
| RC3                 | S033 (SCH1 19.2 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S033 (SCH1 38.4 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S033 (SCH1 76.8 kpbs)                      | no         |                    |                     |                      |
| RC3                 | S033 (SCH1 153.6 kpbs)                     | no         |                    |                     |                      |
| <b>RC3</b>          | <b>S055</b>                                | <b>yes</b> | <b>23.47</b>       | <b>23.57</b>        | <b>23.42</b>         |
| RC4                 | S01                                        | no         |                    |                     |                      |
| RC4                 | S02                                        | yes        | 23.47              | 23.47               | 23.20                |
| RC4                 | S03                                        | no         |                    |                     |                      |
| RC4                 | S032 (no SCH1)                             | no         |                    |                     |                      |
| RC4                 | S032 (SCH1 9.6 kpbs)                       | no         |                    |                     |                      |
| RC4                 | S032 (SCH1 19.2 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S032 (SCH1 38.4 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S032 (SCH1 76.8 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S032 (SCH1 153.6 kpbs)                     | no         |                    |                     |                      |
| RC4                 | S033 (SCH1 9.6 kpbs)                       | no         |                    |                     |                      |
| RC4                 | S033 (SCH1 19.2 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S033 (SCH1 38.4 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S033 (SCH1 76.8 kpbs)                      | no         |                    |                     |                      |
| RC4                 | S033 (SCH1 153.6 kpbs)                     | no         |                    |                     |                      |
| RC4                 | S055                                       | yes        | 23.33              | 23.33               | 23.21                |
| RC5                 | S09                                        | yes        | 23.25              | 23.45               | 23.26                |
| RC5                 | S033 (SCH1 9.6 kpbs)                       | no         |                    |                     |                      |
| RC5                 | S033 (SCH1 19.2 kpbs)                      | no         |                    |                     |                      |

SAR Report

WR1192.002\_2

Applicant: Nokia Corporation

Type: RH-108

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|     |                        |     |       |       |       |
|-----|------------------------|-----|-------|-------|-------|
| RC5 | S033 (SCH1 38.4 kpbs)  | no  |       |       |       |
| RC5 | S033 (SCH1 76.8 kpbs)  | no  |       |       |       |
| RC5 | S033 (SCH1 153.6 kpbs) | no  |       |       |       |
| RC5 | S055                   | yes | 23.44 | 23.45 | 23.24 |