

## SAR Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |                                                                                                                         |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Test report no.:</b>                                 | FCC_RM-1062_01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Date of report:</b>         | 2014-12-16                                                                                                              |
| <b>Template version:</b>                                | 19.82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Number of pages:</b>        | 65                                                                                                                      |
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| <b>Tested device:</b>                                   | RM-1062                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                |                                                                                                                         |
| <b>FCC ID:</b>                                          | PYARM-1062                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>IC:</b>                     | -                                                                                                                       |
| <b>Supplement reports:</b>                              | SAR_Photo_RM- 1062_02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                |                                                                                                                         |
| <b>Testing has been carried out in accordance with:</b> | <b>47CFR §2.1093</b><br>Radiofrequency Radiation Exposure Evaluation: Portable Devices<br><b>FCC published RF exposure KDB procedures</b><br><b>RSS-102, Issue 4</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 - 2013</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 |                                |                                                                                                                         |
| <b>Documentation:</b>                                   | The documentation of the testing performed on the tested devices is archived for 15 years at TCC Microsoft.                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                                                                                                                         |
| <b>Test results:</b>                                    | <b>The tested device complies with the requirements in respect of all parameters subject to the test.</b> 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.                                                                                                                                                                                                                                                                       |                                |                                                                                                                         |
| <b>Date and signatures:</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |                                                                                                                         |
| For the contents:                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |                                                                                                                         |

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## 1. SUMMARY OF SAR TEST REPORT

### 1.1 Test Details

|                                    |                                                     |
|------------------------------------|-----------------------------------------------------|
| Period of test                     | 2014-11-12 to 2014-11-27                            |
| HW and SW numbers of tested device | RM-1062, HW: 3202, SW: 02148.00000.14431.29000      |
| Batteries used in testing          | BV-T4B                                              |
| Headsets used in testing           | WH-108                                              |
| Other accessories used in testing  | Cover CC-3090 Optional Wireless Charging back cover |
| State of sample                    | Prototype unit                                      |
| Notes                              | -                                                   |

### 1.2 Maximum Results

The maximum reported SAR values for Head, Body-Worn, Wireless Router and 10g Extremity SAR configurations are given in section 1.2.1, 1.2.2, 1.2.3 and 1.2.4 respectively. The device conforms to the requirements of the standards when the maximum measured SAR value is less than or equal to the limit.

#### 1.2.1 Head Configuration

| Mode                                                  | Reported*<br>SAR value<br>(1g avg) | SAR limit<br>(1g avg) | Result        | Plot #    |
|-------------------------------------------------------|------------------------------------|-----------------------|---------------|-----------|
| 2-slot GPRS850                                        | <b>0.34 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H1</b> |
| WCDMA850 (Band 5)                                     | <b>0.30 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H2</b> |
| 2-slot GPRS1900                                       | <b>0.45 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H3</b> |
| LTE2500 (Band 7)                                      | <b>0.66 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H4</b> |
| WLAN2450                                              | <b>1.26 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H5</b> |
| Maximum of SPEAG combined multiband algorithm results |                                    |                       |               |           |
| 2-slot GPRS1900 + WLAN2450                            | <b>1.39 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>H6</b> |

## 1.2.2 Body Worn Configuration

Summary of Maximum Results for Body-worn mode at 15.0mm

| Mode                                                  | Reported*<br>SAR value<br>(1g avg) | SAR limit<br>(1g avg) | Result        | Plot #    |
|-------------------------------------------------------|------------------------------------|-----------------------|---------------|-----------|
| 2-slot GPRS850                                        | <b>0.38 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>B1</b> |
| WCDMA850 (Band 5)                                     | <b>0.32 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>B2</b> |
| 2-slot GPRS1900                                       | <b>0.36 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>B3</b> |
| LTE2500 (Band 7)                                      | <b>0.58 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>B4</b> |
| WLAN2450                                              | <b>0.11 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>B5</b> |
| Maximum of SPEAG combined multiband algorithm results |                                    |                       |               |           |
| LTE2500 (Band 7) + WLAN2450                           | <b>0.58 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | -         |

## 1.2.3 Wireless Router Configuration

Summary of Maximum Results for Wireless Router mode at 10.0mm

| Mode                                                  | Reported*<br>SAR value<br>(1g avg) | SAR limit<br>(1g avg) | Result        | Plot #    |
|-------------------------------------------------------|------------------------------------|-----------------------|---------------|-----------|
| 2-slot GPRS850                                        | <b>0.58 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>W1</b> |
| WCDMA850 (Band 5)                                     | <b>0.51 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>W2</b> |
| 2-slot GPRS1900                                       | <b>0.73 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>W3</b> |
| LTE2500 (Band 7)                                      | <b>1.44 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>W4</b> |
| WLAN2450                                              | <b>0.25 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | <b>W5</b> |
| Maximum of SPEAG combined multiband algorithm results |                                    |                       |               |           |
| LTE2500 (Band 7) + WLAN2450                           | <b>1.44 W/kg</b>                   | 1.6 W/kg              | <b>PASSED</b> | -         |

## 1.2.4 10-g Extremity SAR Configuration

| Mode                                                  | Reported*<br>SAR value<br>(10g avg) | SAR limit<br>(10g avg) | Result        | Plot #    |
|-------------------------------------------------------|-------------------------------------|------------------------|---------------|-----------|
| LTE2500 (Band 7)                                      | <b>3.14 W/kg</b>                    | 4.0 W/kg               | <b>PASSED</b> | <b>E1</b> |
| WLAN2450                                              | <b>0.04 W/kg</b>                    | 4.0 W/kg               | <b>PASSED</b> | <b>E2</b> |
| Maximum of SPEAG combined multiband algorithm results |                                     |                        |               |           |
| LTE2500 (Band 7) + WLAN2450                           | <b>3.21 W/kg</b>                    | 4.0 W/kg               | <b>PASSED</b> | <b>E3</b> |

\* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

All other bands/communication systems and all other surfaces and edges have Wireless Router Reported SAR less than 1.2W/kg (when scaled to maximum power if WR power reduction applied), therefore there is no need to test Phablet 10-g extremity SAR according to KDB 648474 D04 Handset SAR v01r01.

### 1.2.5 Summary SAR data

| Description                                                                                  | FCC-defined SAR values for the Grants of Equipment Authorization |      |     |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------|------|-----|
|                                                                                              | PCE                                                              | DTS  | NII |
| <b>Maximum Head SAR values</b>                                                               | 0.66                                                             | 1.26 | -   |
| {Max + Max} Simultaneous Head SAR value                                                      | 1.56                                                             |      |     |
| <b>Maximum Body SAR values</b>                                                               | 0.58                                                             | 0.11 | -   |
| {Max + Max} Simultaneous Body SAR value                                                      | 0.69                                                             |      |     |
| <b>Maximum Product Specific (Wireless Router) SAR values</b>                                 | 1.44                                                             | 0.25 | -   |
| {Max + Max} Simultaneous Product Specific (Wireless Router) SAR value                        | 1.45                                                             |      |     |
| <b>Maximum Product Specific (10g Extremity SAR) SAR values</b>                               | 3.14                                                             | 0.04 | -   |
| {Max + Max} Simultaneous Product Specific (10g Extremity SAR) SAR value                      | 3.18                                                             |      |     |
| <b>Maximum Simultaneous SAR value<br/>10g Extremity SAR:<br/>LTE2500 (Band 7) + WLAN2450</b> | 3.18                                                             |      |     |

Note:

PCE contains the highest results between all cellular modes (cellular, AWS and PCS bands)

DTS contains the highest results between WLAN 2.4 GHz + WLAN 5725-5850 MHz

NII contains the highest results between WLAN 5150-5250, 5250-5350 and 5470-5725 MHz

### 1.2.6 Maximum Drift

|                                   |          |
|-----------------------------------|----------|
| Maximum drift during measurements | ≤ 0.2 dB |
|-----------------------------------|----------|

### 1.2.7 Measurement Uncertainty

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

## 2. DESCRIPTION OF THE DEVICE UNDER TEST

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

### 2.1 Bands and Modes of the DUT

| Bands         | Modes of Operation | Modulation Mode | Duty Cycle | Channel Bandwidth (MHz) | Transmitter Frequency Range (MHz) | Power Reduction in Wireless Router (Hotspot) Mode (dB) |        |        |        |
|---------------|--------------------|-----------------|------------|-------------------------|-----------------------------------|--------------------------------------------------------|--------|--------|--------|
|               |                    |                 |            |                         |                                   | 1-slot                                                 | 2-slot | 3-slot | 4-slot |
| 850           | GSM/GPRS           | GMSK            | 1/8 to 4/8 |                         | 824 – 849                         | 0                                                      | 0      | 0      | 0      |
| 850           | EGPRS              | GMSK / 8PSK     | 1/8 to 4/8 |                         | 824 – 849                         | 0                                                      | 0      | 0      | 0      |
| 850 (Band 5)  | WCDMA              |                 | 1          |                         | 826 – 847                         | 0                                                      |        |        |        |
| 850 (Band 5)  | HSUPA              |                 | 1          |                         | 826 – 847                         | 0                                                      |        |        |        |
| 850 (Band 5)  | DC-HSDPA           |                 | 1          |                         | 826 – 847                         | 0                                                      |        |        |        |
| 1900          | GSM/GPRS           | GMSK            | 1/8 to 4/8 |                         | 1850 – 1910                       | 0                                                      | 0      | 0      | 0      |
| 1900          | EGPRS              | GMSK / 8PSK     | 1/8 to 4/8 |                         | 1850 – 1910                       | 0                                                      | 0      | 0      | 0      |
| 2500 (Band 7) | LTE                | QPSK / 16QAM    | 1          | 5, 10, 15, 20           | 2500 - 2570                       | 0                                                      |        |        |        |
| 2450          | BT                 | GFSK            | 1          |                         | 2402 – 2480                       | 0                                                      |        |        |        |
| 2450          | WLAN b-mode        | DSSS            | 1          | 20                      | 2412 – 2462                       | 0                                                      |        |        |        |
| 2450          | WLAN g-mode        | OFDM            | 1          | 20                      | 2412 – 2462                       | 0                                                      |        |        |        |
| 2450          | WLAN n-mode        | OFDM            | 1          | 20                      | 2412 – 2462                       | 0                                                      |        |        |        |

## 2.2 DUT Features and Test Requirements

| Common features             | Testing / Specification / KDB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|--|-----------|-----------|-------------------|---|---|-------------------|---|---|--------------------|---|---|------------------|---|---|
| Bands operating outside USA | These bands are not part of this filing:<br>LTE850 (Band 20)<br>GSM/GPRS/EGPRS900<br>WCDMA/HSUPA/DC-HSDPA900 (Band 8)<br>LTE900 (Band 8)<br>GSM/GPRS/EGPRS1800<br>LTE1800 (Band 3)<br>WCDMA/HSUPA/DC-HSDPA2100 (Band 1)<br>LTE2100 (Band 1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Number of SIM cards:        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Ambient temperature:        | 20.5 – 22.5 °C / Controlled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Ambient humidity (RH %):    | 35 – 55 %RH / Controlled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Output power and batteries  | The device output power was set to maximum power level for all tests.<br>A fully charged battery was used for every test sequence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Test channels               | In all operating bands the measurements were performed on lowest, middle and highest channels, and/or on all required test channels as defined in Published FCC KDB Procedures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| VOIP                        | This device has Voice-over-IP capability for use at the ear. Therefore SAR for data modes was evaluated against the head profile of the phantom for all communication systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Antennas                    | <p>Two antennas for cellular bands and another antenna for WLAN band and BT.<br/>See the antenna drawing in the report SAR_Photo_RM-1062_02, Section 3.</p> <p>Two antennas are used for transmission of some of the cellular bands in diversity-Tx mode. In this mode the antennas can not transmit at the same time. See table below for applicable antennas in each transmission band and mode. A separate single antenna is used for WLAN. All antennas are fully and separately SAR tested for individual transmission. Simultaneous transmissions with WLAN2450/WLAN5000 are assessed separately for both cellular antennas.</p> <p>Same RF PA circuitry is used for both antennas and therefore same output power targets and conducted power results apply to both antennas. Control software was used to route the TX power to the chosen antenna during the SAR test sequence.</p> <table><tr><th rowspan="2">Band</th><th colspan="2">Tx Antennas</th></tr><tr><th>Antenna 1</th><th>Antenna 2</th></tr><tr><td>GSM/GPRS/EGPRS850</td><td>✓</td><td>✓</td></tr><tr><td>WCDMA850 (Band 5)</td><td>✓</td><td>✓</td></tr><tr><td>GSM/GPRS/EGPRS1900</td><td>✓</td><td>✓</td></tr><tr><td>LTE2500 (Band 7)</td><td>✓</td><td>✓</td></tr></table> | Band      | Tx Antennas |  | Antenna 1 | Antenna 2 | GSM/GPRS/EGPRS850 | ✓ | ✓ | WCDMA850 (Band 5) | ✓ | ✓ | GSM/GPRS/EGPRS1900 | ✓ | ✓ | LTE2500 (Band 7) | ✓ | ✓ |
| Band                        | Tx Antennas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
|                             | Antenna 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Antenna 2 |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| GSM/GPRS/EGPRS850           | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ✓         |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| WCDMA850 (Band 5)           | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ✓         |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| GSM/GPRS/EGPRS1900          | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ✓         |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| LTE2500 (Band 7)            | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ✓         |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| GSM/GPRS/EGPRS              | KDB 941225 D03 SAR Test Reduction Procedures for GSM/GPRS/EDGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| Device Class                | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| GSM multi slot class        | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |
| DTM class                   | <p>DTM class 11.</p> <p>Dual Transfer Mode was not specifically tested as the average power in multi-slot GMSK GPRS mode is always greater than, or equal to, the average power in Dual Transfer Mode in Microsoft devices.</p> <p>The hotspot mode (Wireless Router mode) may operate concurrently in DTM mode with voice calls. The reported SAR test results are conservative regarding that use case, since output power in hotspot mode is equal to or lower than in normal voice and data modes. See Table 2.1 for hotspot mode power reductions. Also simultaneous transmissions with WLANs are already conservatively</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |             |  |           |           |                   |   |   |                   |   |   |                    |   |   |                  |   |   |

|                                 | assessed for head and body-worn exposure conditions due to VoIP capability.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------|--------|--------|--------|----------|--|----------|---------|---------|-------|--------|--------|--------|------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|
| EGPRS                           | 8PSK EGPRS mode was not measured, because maximum averaged output power is lower in 8PSK EGPRS mode than in GPRS mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Call tester settings            | CMU200 / Anritsu: MS signal was always set to maximum power: Pmax 5 for GSM850 and 0 for GSM1900.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Number of slots used in testing | The number of Tx slots in all GSM/GPRS mode tests was based on tuning target/conducted power data, see Section 3. The number of slots with highest or equal highest time-average power was tested.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| WCDMA                           | KDB 941225 D01 SAR Measurement Procedures for 3G Devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| WCDMA / HSUPA / DC-HSDPA        | Rel 8.<br>Conducted power measurements for WCDMA modes have been carried out in accordance with 3GPP TS34.1083 and GPP TS 34.121-1. See conducted power results in section 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Call test settings for WCDMA    | CMU200 / Anritsu: UE uplink signal was configured to 12.2kbps RMC with all TPC bit set to 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| HSUPA                           | SAR tests for HSUPA mode have not been performed as no HSUPA Sub-test mode has an average power > 0.25 dB above the basic WCDMA 12.2 kbps RMC mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| DC-HSDPA                        | SAR tests for DC-HSDPA mode have not been performed as no DC-HSDPA Sub-test mode has an average power > 0.25 dB above the basic WCDMA 12.2 kbps RMC mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| LTE                             | KDB 941225 D05 SAR for LTE Devices v02r02 DR07-41372                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| LTE Category                    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Call tester settings            | CMW500:<br>Uplink Power Control was set to 'Max Power'.<br>Additional Spectrum Emission was set to 'NS_01' to disable A-MPR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| LTE MPR                         | <p>MPR values as stipulated in Table 6.2.3_1 of 3GPP TS 36.101 (presented below) have been incorporated into the device; these MPR values are dependent on the modulation, Channel Bandwidth and Resource Block allocations as shown:</p> <table><caption>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</caption><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 2</td></tr></table> <p>No additional MPR settings have been incorporated into the design of the device and therefore no A-MPR settings have been active during its testing.</p> <p>Conducted Power Tables in Section 3: "Nominal" column lists measured powers with MPR active. The "A-MPR active" column lists measured powers with MPR and A-MPR active (as defined by 3GPP TS 36.101).</p> | Modulation | Channel bandwidth / Transmission bandwidth (RB) |        |        |        |          |  | MPR (dB) | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 | 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 | 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 |
| Modulation                      | Channel bandwidth / Transmission bandwidth (RB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                 |        |        |        | MPR (dB) |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
|                                 | 1.4 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.0 MHz    | 5 MHz                                           | 10 MHz | 15 MHz | 20 MHz |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| QPSK                            | > 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | > 4        | > 8                                             | > 12   | > 16   | > 18   | ≤ 1      |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| 16 QAM                          | ≤ 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ≤ 4        | ≤ 8                                             | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| 16 QAM                          | > 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | > 4        | > 8                                             | > 12   | > 16   | > 18   | ≤ 2      |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| WLAN                            | KDB 248227 SAR Measurement Procedures for 802.11 a/b/g Transmitters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| WLAN modes tested               | <p>The standard transmission mode of the device in all WLAN b-mode tests was BPSK 1 Mbps.</p> <p>The standard transmission modes used have maximum time-averaged output powers within 0.25 dB of the highest time-averaged output power of all the WLAN a, b, g and n modulation modes in this device as illustrated by the tables in Section 3.</p> <p>In the tables in Section 3 it is shown if other transmission modes are used for check measurements.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| WLAN test settings              | The device was put into operation by using control software.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| BT                              | KDB 447498 D01 General RF Exposure Guidance v05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| BT Class                        | I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                 |        |        |        |          |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BT testing                               | <p>BT power tuning target upper limit is 11.5 dBm.</p> <p>WLAN2450 power tuning target upper limit is 17.0 dBm.</p> <p>Since WLAN2450 and BT use same frequency and antenna, WLAN2450 power is 5.5 dB higher, and they cannot transmit simultaneously, the WLAN2450 standalone SAR is conservative estimation of BT SAR.</p> <p>As WLAN2450 SAR result is below limit, also BT SAR can be deemed to comply without further analysis or standalone measurements.</p> <p>Also WLAN2450+cellular bands combined SAR results can be regarded as conservative estimation of BT+cellular combined SARs. As WLAN2450+cellular combined SAR results are below limit, also BT+cellular combined SAR can be deemed to comply without further analysis.</p>                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Simultaneous transmission</b>         | <b>KDB 447498 D01 General RF Exposure Guidance v05</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| In Head and Body-worn use                | Simultaneous transmission of any singular cellular, PCS or AWS with WLAN2450 is possible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Wireless Router "Hotspot" mode           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| In Wireless Router use                   | <p>Simultaneous transmission of any singular cellular, AWS or PCS band with WLAN2450 is possible.</p> <p>The hotspot mode (Wireless Router mode) may operate concurrently in DTM mode with voice calls. The reported SAR test results are conservative regarding that use case, since output power in hotspot mode is equal to or lower than in normal voice and data modes. See following chapter for hotspot mode power reductions. Also simultaneous transmissions with WLANs are already conservatively assessed for head and body-worn exposure conditions due to VoIP capability.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Power reduction for Wireless Router mode | See the table in Section 2.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>10-g Extremity SAR for phablets</b>   | <b>KDB 648474 D04 SAR Handsets SAR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test concentration                       | <p>For smart phones with a display diagonal dimension &gt; 15.0 cm or an overall diagonal dimension &gt; 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, unless it is confirmed otherwise through KDB inquiries, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance.</p> <p>Phablet procedures applied to test the SAR of all surfaces and edges with an antenna located at <math>\leq 25</math> mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR &gt; 1.2 W/kg.</p> |
| <b>KDBs used in testing</b>              | <p><b>KDB 248227 SAR Measurement Procedures for 802.11 a/b/g Transmitters</b></p> <p><b>KDB 447498 D01 General RF Exposure Guidance v05</b></p> <p><b>KDB 648474 D04 Handset SAR v01r01</b></p> <p><b>KDB 690783 D01 SAR Listings on Grants</b></p> <p><b>KDB 865664 D01 SAR Measurements 100 MHz to 6 GHz v01</b></p> <p><b>KDB 865664 D02 SAR Reporting v01</b></p> <p><b>KDB 941225 D01 SAR Measurement Procedures for 3G Devices</b></p> <p><b>KDB 941225 D03 SAR Test Reduction Procedures for GSM/GPRS/EDGE</b></p> <p><b>KDB 941225 D05 SAR for LTE Devices v02r02 DR07-41372</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### 3. CONDUCTED POWERS

The conducted output power of the device was measured by a separate test laboratory on the same units as used for SAR testing.

Shaded lines in the tables below show which mode/configuration is used in testing.

#### 3.1 GSM/GPRS/EGPRS

##### 3.1.1 GSM850 Antenna 1 Head, Body-worn and Wireless Router

| GSM 850             |                     |                   |                       |                     |                     |                           |                     |                     |
|---------------------|---------------------|-------------------|-----------------------|---------------------|---------------------|---------------------------|---------------------|---------------------|
| SN: 004402740524404 |                     |                   | Conducted power (dBm) |                     |                     | Time-averaged power (dBm) |                     |                     |
| Slot configuration  | Tuning target (dBm) | Upper limit (dBm) | CH 128<br>824.2 MHz   | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz | CH 128<br>824.2 MHz       | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz |
| GSM 1-slot          | 32.5                | 32.9              | 32.2                  | 32.2                | 32.2                | 23.2                      | 23.2                | 23.2                |
| GPRS 2-slot         | 30.0                | 30.4              | 29.7                  | 29.7                | 29.8                | 23.7                      | 23.7                | 23.8                |
| GPRS 3-slot         | 28.0                | 28.4              | 27.7                  | 27.7                | 27.8                | 23.4                      | 23.4                | 23.5                |
| GPRS 4-slot         | 26.5                | 26.9              | 26.3                  | 26.3                | 26.4                | 23.3                      | 23.3                | 23.4                |
| EGPRS 1-slot        | 26.0                | 26.4              | 26.2                  | 26.1                | 26.2                | 17.2                      | 17.1                | 17.2                |
| EGPRS 2-slot        | 25.0                | 25.4              | 25.1                  | 25.1                | 25.1                | 19.1                      | 19.1                | 19.1                |
| EGPRS 3-slot        | 23.0                | 23.4              | 22.9                  | 22.9                | 23.0                | 18.6                      | 18.6                | 18.7                |
| EGPRS 4-slot        | 21.5                | 21.9              | 21.8                  | 21.7                | 21.8                | 18.8                      | 18.7                | 18.8                |

##### 3.1.2 GSM850 Antenna 2 Head, Body-worn and Wireless Router

| GSM 850             |                     |                   |                       |                     |                     |                           |                     |                     |
|---------------------|---------------------|-------------------|-----------------------|---------------------|---------------------|---------------------------|---------------------|---------------------|
| SN: 004402740524404 |                     |                   | Conducted power (dBm) |                     |                     | Time-averaged power (dBm) |                     |                     |
| Slot configuration  | Tuning target (dBm) | Upper limit (dBm) | CH 128<br>824.2 MHz   | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz | CH 128<br>824.2 MHz       | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz |
| GSM 1-slot          | 32.5                | 32.9              | 32.0                  | 32.0                | 32.0                | 23.0                      | 23.0                | 23.0                |
| GPRS 2-slot         | 30.0                | 30.4              | 29.5                  | 29.5                | 29.6                | 23.5                      | 23.5                | 23.6                |
| GPRS 3-slot         | 28.0                | 28.4              | 27.5                  | 27.5                | 27.6                | 23.2                      | 23.2                | 23.3                |
| GPRS 4-slot         | 26.5                | 26.9              | 26.1                  | 26.1                | 26.2                | 23.1                      | 23.1                | 23.2                |
| EGPRS 1-slot        | 26.0                | 26.4              | 26.0                  | 25.9                | 26.0                | 17.0                      | 16.9                | 17.0                |
| EGPRS 2-slot        | 25.0                | 25.4              | 24.9                  | 24.9                | 24.9                | 18.9                      | 18.9                | 18.9                |
| EGPRS 3-slot        | 23.0                | 23.4              | 22.7                  | 22.7                | 22.8                | 18.4                      | 18.4                | 18.5                |
| EGPRS 4-slot        | 21.5                | 21.9              | 21.6                  | 21.5                | 21.6                | 18.6                      | 18.5                | 18.6                |

### 3.1.3 GSM1900 Antenna 1 Head, Body-worn and Wireless Router

| GSM 1900            |                     |                   |                       |                      |                      |                           |                      |                      |
|---------------------|---------------------|-------------------|-----------------------|----------------------|----------------------|---------------------------|----------------------|----------------------|
| SN: 004402740524511 |                     |                   | Conducted power (dBm) |                      |                      | Time-averaged power (dBm) |                      |                      |
| Slot configuration  | Tuning target (dBm) | Upper limit (dBm) | CH 512<br>1850.2 MHz  | CH 661<br>1880.0 MHz | CH 810<br>1909.8 MHz | CH 512<br>1850.2 MHz      | CH 661<br>1880.0 MHz | CH 810<br>1909.8 MHz |
| GSM 1-slot          | 29.5                | 29.9              | 29.4                  | 29.5                 | 29.4                 | 20.4                      | 20.5                 | 20.4                 |
| GPRS 2-slot         | 28.5                | 28.9              | 28.6                  | 28.6                 | 28.6                 | 22.6                      | 22.6                 | 22.6                 |
| GPRS 3-slot         | 26.5                | 26.9              | 26.5                  | 26.5                 | 26.5                 | 22.2                      | 22.2                 | 22.2                 |
| GPRS 4-slot         | 25.0                | 25.4              | 25.1                  | 25.0                 | 25.0                 | 22.1                      | 22.0                 | 22.0                 |
| EGRPS 1-slot        | 25.5                | 25.9              | 25.5                  | 25.3                 | 25.3                 | 16.5                      | 16.3                 | 16.3                 |
| EGPRS 2-slot        | 25.5                | 25.9              | 25.4                  | 25.1                 | 25.1                 | 19.4                      | 19.1                 | 19.1                 |
| EGPRS 3-slot        | 23.0                | 23.4              | 23.3                  | 23.1                 | 23.1                 | 19.0                      | 18.8                 | 18.8                 |
| EGPRS 4-slot        | 22.0                | 22.4              | 21.8                  | 21.7                 | 21.7                 | 18.8                      | 18.7                 | 18.7                 |

### 3.1.4 GSM1900 Antenna 2 Head, Body-worn and Wireless Router

| GSM 1900            |                     |                   |                       |                      |                      |                           |                      |                      |
|---------------------|---------------------|-------------------|-----------------------|----------------------|----------------------|---------------------------|----------------------|----------------------|
| SN: 004402740524511 |                     |                   | Conducted power (dBm) |                      |                      | Time-averaged power (dBm) |                      |                      |
| Slot configuration  | Tuning target (dBm) | Upper limit (dBm) | CH 512<br>1850.2 MHz  | CH 661<br>1880.0 MHz | CH 810<br>1909.8 MHz | CH 512<br>1850.2 MHz      | CH 661<br>1880.0 MHz | CH 810<br>1909.8 MHz |
| GSM 1-slot          | 29.5                | 29.9              | 29.0                  | 29.1                 | 29.0                 | 20.0                      | 20.1                 | 20.0                 |
| GPRS 2-slot         | 28.5                | 28.9              | 28.2                  | 28.2                 | 28.2                 | 22.2                      | 22.2                 | 22.2                 |
| GPRS 3-slot         | 26.5                | 26.9              | 26.1                  | 26.1                 | 26.1                 | 21.8                      | 21.8                 | 21.8                 |
| GPRS 4-slot         | 25.0                | 25.4              | 24.7                  | 24.6                 | 24.6                 | 21.7                      | 21.6                 | 21.6                 |
| EGRPS 1-slot        | 25.5                | 25.9              | 25.1                  | 24.9                 | 24.9                 | 16.1                      | 15.9                 | 15.9                 |
| EGPRS 2-slot        | 25.5                | 25.9              | 25.0                  | 24.7                 | 24.7                 | 19.0                      | 18.7                 | 18.7                 |
| EGPRS 3-slot        | 23.0                | 23.4              | 22.9                  | 22.7                 | 22.7                 | 18.6                      | 18.4                 | 18.4                 |
| EGPRS 4-slot        | 22.0                | 22.4              | 21.4                  | 21.3                 | 21.3                 | 18.4                      | 18.3                 | 18.3                 |

## 3.2 WCDMA

### 3.2.1 WCDMA850 (Band 5) Antenna 1 Head, Body-worn and Wireless Router

| SN: 004402740524404 |                     | WCDMA 5           |                   |                   |                   |
|---------------------|---------------------|-------------------|-------------------|-------------------|-------------------|
| Mode                | Tuning target (dBm) | Upper limit (dBm) | CH 4132 826.4 MHz | CH 4175 835.0 MHz | CH 4233 846.6 MHz |
| WCDMA               | 23.5                | 23.9              | 23.2              | 23.3              | 23.2              |
| HSUPA Sub-mode 1    | 22.5                | 22.9              | 22.1              | 22.2              | 22.4              |
| HSUPA Sub-mode 2    | 20.5                | 20.9              | 21.2              | 20.9              | 21.2              |
| HSUPA Sub-mode 3    | 21.5                | 21.9              | 20.8              | 20.9              | 20.7              |
| HSUPA Sub-mode 4    | 20.5                | 20.9              | 21.7              | 21.9              | 21.8              |
| HSUPA Sub-mode 5    | 22.5                | 22.9              | 22.3              | 22.3              | 22.3              |
| DC-HSDPA Sub-mode 1 | 22.5                | 22.9              | 22.0              | 22.1              | 22.1              |
| DC-HSDPA Sub-mode 2 | 22.5                | 22.9              | 22.0              | 22.1              | 22.1              |
| DC-HSDPA Sub-mode 3 | 22                  | 22.4              | 22.0              | 22.1              | 22.1              |
| DC-HSDPA Sub-mode 4 | 22                  | 22.4              | 22.0              | 22.1              | 22.1              |

### 3.2.2 WCDMA850 (Band 5) Antenna 2 Head, Body-worn and Wireless Router

| SN: 004402740524404 |                     | WCDMA 5           |                   |                   |                   |
|---------------------|---------------------|-------------------|-------------------|-------------------|-------------------|
| Mode                | Tuning target (dBm) | Upper limit (dBm) | CH 4132 826.4 MHz | CH 4175 835.0 MHz | CH 4233 846.6 MHz |
| WCDMA               | 23.5                | 23.9              | 23.0              | 23.1              | 23.0              |
| HSUPA Sub-mode 1    | 22.5                | 22.9              | 21.9              | 22.0              | 22.2              |
| HSUPA Sub-mode 2    | 20.5                | 20.9              | 21.0              | 20.7              | 21.0              |
| HSUPA Sub-mode 3    | 21.5                | 21.9              | 20.6              | 20.7              | 20.5              |
| HSUPA Sub-mode 4    | 20.5                | 20.9              | 21.5              | 21.7              | 21.6              |
| HSUPA Sub-mode 5    | 22.5                | 22.9              | 22.1              | 22.1              | 22.1              |
| DC-HSDPA Sub-mode 1 | 22.5                | 22.9              | 21.8              | 21.9              | 21.9              |
| DC-HSDPA Sub-mode 2 | 22.5                | 22.9              | 21.8              | 21.9              | 21.9              |
| DC-HSDPA Sub-mode 3 | 22                  | 22.4              | 21.8              | 21.9              | 21.9              |
| DC-HSDPA Sub-mode 4 | 22                  | 22.4              | 21.8              | 21.9              | 21.9              |

### 3.3 LTE

#### 3.3.1 LTE2500 (Band 7) Antenna 1 Head, Body-worn and Wireless Router

| SN: 004402740524552 |            |               |           |                     |                   | Nominal              |                    |                      |
|---------------------|------------|---------------|-----------|---------------------|-------------------|----------------------|--------------------|----------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20775 / 2502.5 MHz | Ch21100 / 2535 MHz | Ch21425 / 2567.5 MHz |
| LTE7<br>5 MHz       | QPSK       | 1             | 0         | 22.5                | 22.9              | 22.3                 | 22.3               | 22.1                 |
|                     |            | 1             | 12        | 22.5                | 22.9              | 22.3                 | 22.3               | 22.1                 |
|                     |            | 1             | 24        | 22.5                | 22.9              | 22.2                 | 22.3               | 22.1                 |
|                     |            | 12            | 0         | 21.5                | 21.9              | 21.1                 | 21.4               | 21.3                 |
|                     |            | 12            | 6         | 21.5                | 21.9              | 21.1                 | 21.4               | 21.2                 |
|                     |            | 12            | 13        | 21.5                | 21.9              | 21.2                 | 21.4               | 21.2                 |
|                     |            | 25            | 0         | 21.5                | 21.9              | 21.2                 | 21.4               | 21.2                 |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.9                 | 21.2               | 21.0                 |
|                     |            | 1             | 12        | 21.5                | 21.9              | 20.9                 | 21.2               | 20.9                 |
|                     |            | 1             | 24        | 21.5                | 21.9              | 20.9                 | 21.2               | 20.9                 |
|                     |            | 12            | 0         | 20.5                | 20.9              | 20.2                 | 20.4               | 20.2                 |
|                     |            | 12            | 6         | 20.5                | 20.9              | 20.2                 | 20.5               | 20.2                 |
|                     |            | 12            | 13        | 20.5                | 20.9              | 20.3                 | 20.5               | 20.2                 |
|                     |            | 25            | 0         | 20.5                | 20.9              | 20.2                 | 20.4               | 20.2                 |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal            |                    |                    |
|---------------------|------------|---------------|-----------|---------------------|-------------------|--------------------|--------------------|--------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20800 / 2505 MHz | Ch21100 / 2535 MHz | Ch21400 / 2565 MHz |
| LTE7<br>10 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 22.2               | 22.4               | 22.2               |
|                     |            | 1             | 24        | 22.5                | 22.9              | 22.2               | 22.3               | 22.1               |
|                     |            | 1             | 49        | 22.5                | 22.9              | 22.2               | 22.3               | 22.1               |
|                     |            | 25            | 0         | 21.5                | 21.9              | 21.2               | 21.4               | 21.2               |
|                     |            | 25            | 12        | 21.5                | 21.9              | 21.2               | 21.4               | 21.1               |
|                     |            | 25            | 25        | 21.5                | 21.9              | 21.2               | 21.4               | 21.2               |
|                     |            | 50            | 0         | 21.5                | 21.9              | 21.2               | 21.3               | 21.2               |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 21.3               | 21.6               | 21.4               |
|                     |            | 1             | 24        | 21.5                | 21.9              | 21.3               | 21.5               | 21.3               |
|                     |            | 1             | 49        | 21.5                | 21.9              | 21.4               | 21.5               | 21.3               |
|                     |            | 25            | 0         | 20.5                | 20.9              | 20.3               | 20.4               | 20.3               |
|                     |            | 25            | 12        | 20.5                | 20.9              | 20.2               | 20.4               | 20.2               |
|                     |            | 25            | 25        | 20.5                | 20.9              | 20.2               | 20.5               | 20.2               |
|                     |            | 50            | 0         | 20.5                | 20.9              | 20.2               | 20.4               | 20.1               |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal              |                    |                      |
|---------------------|------------|---------------|-----------|---------------------|-------------------|----------------------|--------------------|----------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20825 / 2507.5 MHz | Ch21100 / 2535 MHz | Ch21375 / 2562.5 MHz |
| LTE7<br>15 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 22.2                 | 22.3               | 22.3                 |
|                     |            | 1             | 36        | 22.5                | 22.9              | 22.1                 | 22.4               | 22.2                 |
|                     |            | 1             | 74        | 22.5                | 22.9              | 22.3                 | 22.3               | 22.1                 |
|                     |            | 36            | 0         | 21.5                | 21.9              | 21.2                 | 21.3               | 21.3                 |
|                     |            | 36            | 18        | 21.5                | 21.9              | 21.3                 | 21.4               | 21.2                 |
|                     |            | 36            | 38        | 21.5                | 21.9              | 21.3                 | 21.4               | 21.2                 |
|                     |            | 75            | 0         | 21.5                | 21.9              | 21.3                 | 21.4               | 21.2                 |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 21.0                 | 21.2               | 21.2                 |
|                     |            | 1             | 36        | 21.5                | 21.9              | 20.9                 | 21.2               | 21.1                 |
|                     |            | 1             | 74        | 21.5                | 21.9              | 21.2                 | 21.2               | 21.1                 |
|                     |            | 36            | 0         | 20.5                | 20.9              | 20.2                 | 20.3               | 20.3                 |
|                     |            | 36            | 18        | 20.5                | 20.9              | 20.3                 | 20.3               | 20.2                 |
|                     |            | 36            | 38        | 20.5                | 20.9              | 20.2                 | 20.4               | 20.2                 |
|                     |            | 75            | 0         | 20.5                | 20.9              | 20.3                 | 20.4               | 20.2                 |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal            |                    |                    |
|---------------------|------------|---------------|-----------|---------------------|-------------------|--------------------|--------------------|--------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20850 / 2510 MHz | Ch21100 / 2535 MHz | Ch21350 / 2560 MHz |
| LTE7<br>20 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 22.1               | 22.3               | 22.3               |
|                     |            | 1             | 49        | 22.5                | 22.9              | 22.2               | 22.3               | 22.2               |
|                     |            | 1             | 99        | 22.5                | 22.9              | 22.4               | 22.3               | 22.2               |
|                     |            | 50            | 0         | 21.5                | 21.9              | 21.3               | 21.5               | 21.3               |
|                     |            | 50            | 24        | 21.5                | 21.9              | 21.3               | 21.4               | 21.3               |
|                     |            | 50            | 50        | 21.5                | 21.9              | 21.3               | 21.4               | 21.2               |
|                     |            | 100           | 0         | 21.5                | 21.9              | 21.3               | 21.4               | 21.3               |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.9               | 21.2               | 21.5               |
|                     |            | 1             | 49        | 21.5                | 21.9              | 21.1               | 21.2               | 21.5               |
|                     |            | 1             | 99        | 21.5                | 21.9              | 21.2               | 21.3               | 21.3               |
|                     |            | 50            | 0         | 20.5                | 20.9              | 20.3               | 20.4               | 20.2               |
|                     |            | 50            | 24        | 20.5                | 20.9              | 20.2               | 20.4               | 20.2               |
|                     |            | 50            | 50        | 20.5                | 20.9              | 20.3               | 20.4               | 20.2               |
|                     |            | 100           | 0         | 20.5                | 20.9              | 20.3               | 20.4               | 20.2               |

### 3.3.2 LTE2500 (Band 7) Antenna 2 Head, Body-worn and Wireless Router

| SN: 004402740524552 |            |               |           |                     |                   | Nominal              |                    |                      |
|---------------------|------------|---------------|-----------|---------------------|-------------------|----------------------|--------------------|----------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20775 / 2502.5 MHz | Ch21100 / 2535 MHz | Ch21425 / 2567.5 MHz |
| LTE7<br>5 MHz       | QPSK       | 1             | 0         | 22.5                | 22.9              | 21.8                 | 21.8               | 21.6                 |
|                     |            | 1             | 12        | 22.5                | 22.9              | 21.8                 | 21.8               | 21.6                 |
|                     |            | 1             | 24        | 22.5                | 22.9              | 21.7                 | 21.8               | 21.6                 |
|                     |            | 12            | 0         | 21.5                | 21.9              | 20.6                 | 20.9               | 20.8                 |
|                     |            | 12            | 6         | 21.5                | 21.9              | 20.6                 | 20.9               | 20.7                 |
|                     |            | 12            | 13        | 21.5                | 21.9              | 20.7                 | 20.9               | 20.7                 |
|                     |            | 25            | 0         | 21.5                | 21.9              | 20.7                 | 20.9               | 20.7                 |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.4                 | 20.7               | 20.5                 |
|                     |            | 1             | 12        | 21.5                | 21.9              | 20.4                 | 20.7               | 20.4                 |
|                     |            | 1             | 24        | 21.5                | 21.9              | 20.4                 | 20.7               | 20.4                 |
|                     |            | 12            | 0         | 20.5                | 20.9              | 19.7                 | 19.9               | 19.7                 |
|                     |            | 12            | 6         | 20.5                | 20.9              | 19.7                 | 20.0               | 19.7                 |
|                     |            | 12            | 13        | 20.5                | 20.9              | 19.8                 | 20.0               | 19.7                 |
|                     |            | 25            | 0         | 20.5                | 20.9              | 19.7                 | 19.9               | 19.7                 |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal            |                    |                    |
|---------------------|------------|---------------|-----------|---------------------|-------------------|--------------------|--------------------|--------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20800 / 2505 MHz | Ch21100 / 2535 MHz | Ch21400 / 2565 MHz |
| LTE7<br>10 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 21.7               | 21.9               | 21.7               |
|                     |            | 1             | 24        | 22.5                | 22.9              | 21.7               | 21.8               | 21.6               |
|                     |            | 1             | 49        | 22.5                | 22.9              | 21.7               | 21.8               | 21.6               |
|                     |            | 25            | 0         | 21.5                | 21.9              | 20.7               | 20.9               | 20.7               |
|                     |            | 25            | 12        | 21.5                | 21.9              | 20.7               | 20.9               | 20.6               |
|                     |            | 25            | 25        | 21.5                | 21.9              | 20.7               | 20.9               | 20.7               |
|                     |            | 50            | 0         | 21.5                | 21.9              | 20.7               | 20.8               | 20.7               |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.8               | 21.1               | 20.9               |
|                     |            | 1             | 24        | 21.5                | 21.9              | 20.8               | 21.0               | 20.8               |
|                     |            | 1             | 49        | 21.5                | 21.9              | 20.9               | 21.0               | 20.8               |
|                     |            | 25            | 0         | 20.5                | 20.9              | 19.8               | 19.9               | 19.8               |
|                     |            | 25            | 12        | 20.5                | 20.9              | 19.7               | 19.9               | 19.7               |
|                     |            | 25            | 25        | 20.5                | 20.9              | 19.7               | 20.0               | 19.7               |
|                     |            | 50            | 0         | 20.5                | 20.9              | 19.7               | 19.9               | 19.6               |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal              |                    |                      |
|---------------------|------------|---------------|-----------|---------------------|-------------------|----------------------|--------------------|----------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20825 / 2507.5 MHz | Ch21100 / 2535 MHz | Ch21375 / 2562.5 MHz |
| LTE7<br>15 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 21.7                 | 21.8               | 21.8                 |
|                     |            | 1             | 36        | 22.5                | 22.9              | 21.6                 | 21.9               | 21.7                 |
|                     |            | 1             | 74        | 22.5                | 22.9              | 21.8                 | 21.8               | 21.6                 |
|                     |            | 36            | 0         | 21.5                | 21.9              | 20.7                 | 20.8               | 20.8                 |
|                     |            | 36            | 18        | 21.5                | 21.9              | 20.8                 | 20.9               | 20.7                 |
|                     |            | 36            | 38        | 21.5                | 21.9              | 20.8                 | 20.9               | 20.7                 |
|                     |            | 75            | 0         | 21.5                | 21.9              | 20.8                 | 20.9               | 20.7                 |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.5                 | 20.7               | 20.7                 |
|                     |            | 1             | 36        | 21.5                | 21.9              | 20.4                 | 20.7               | 20.6                 |
|                     |            | 1             | 74        | 21.5                | 21.9              | 20.7                 | 20.7               | 20.6                 |
|                     |            | 36            | 0         | 20.5                | 20.9              | 19.7                 | 19.8               | 19.8                 |
|                     |            | 36            | 18        | 20.5                | 20.9              | 19.8                 | 19.8               | 19.7                 |
|                     |            | 36            | 38        | 20.5                | 20.9              | 19.7                 | 19.9               | 19.7                 |
|                     |            | 75            | 0         | 20.5                | 20.9              | 19.8                 | 19.9               | 19.7                 |

| SN: 004402740524552 |            |               |           |                     |                   | Nominal            |                    |                    |
|---------------------|------------|---------------|-----------|---------------------|-------------------|--------------------|--------------------|--------------------|
| Band / BW           | Modulation | RB Allocation | RB Offset | Tuning target (dBm) | Upper limit (dBm) | Ch20850 / 2510 MHz | Ch21100 / 2535 MHz | Ch21350 / 2560 MHz |
| LTE7<br>20 MHz      | QPSK       | 1             | 0         | 22.5                | 22.9              | 21.6               | 21.8               | 21.8               |
|                     |            | 1             | 49        | 22.5                | 22.9              | 21.7               | 21.8               | 21.7               |
|                     |            | 1             | 99        | 22.5                | 22.9              | 21.9               | 21.8               | 21.7               |
|                     |            | 50            | 0         | 21.5                | 21.9              | 20.8               | 21.0               | 20.8               |
|                     |            | 50            | 24        | 21.5                | 21.9              | 20.8               | 20.9               | 20.8               |
|                     |            | 50            | 50        | 21.5                | 21.9              | 20.8               | 20.9               | 20.7               |
|                     |            | 100           | 0         | 21.5                | 21.9              | 20.8               | 20.9               | 20.8               |
|                     | 16QAM      | 1             | 0         | 21.5                | 21.9              | 20.4               | 20.7               | 21.0               |
|                     |            | 1             | 49        | 21.5                | 21.9              | 20.6               | 20.7               | 21.0               |
|                     |            | 1             | 99        | 21.5                | 21.9              | 20.7               | 20.8               | 20.8               |
|                     |            | 50            | 0         | 20.5                | 20.9              | 19.8               | 19.9               | 19.7               |
|                     |            | 50            | 24        | 20.5                | 20.9              | 19.7               | 19.9               | 19.7               |
|                     |            | 50            | 50        | 20.5                | 20.9              | 19.8               | 19.9               | 19.7               |
|                     |            | 100           | 0         | 20.5                | 20.9              | 19.8               | 19.9               | 19.7               |

### 3.4 BT

| BT2450              |                   |
|---------------------|-------------------|
| Tuning target (dBm) | Upper limit (dBm) |
| 10.0                | 11.5              |

### 3.5 WLAN2450 Head, Body-worn and Wireless Router

| WLAN 2.4 GHz: 20 MHz channel bandwidth |           |                 |            |                   |                     |      |      |      |       |       |
|----------------------------------------|-----------|-----------------|------------|-------------------|---------------------|------|------|------|-------|-------|
| Standard                               | MCX index | Spatial streams | Modulation | Data speed [Mbps] | Tuning target (dBm) |      |      |      |       |       |
|                                        |           |                 |            |                   | CH 1                | CH 2 | CH 6 | CH 7 | CH 10 | CH 11 |
| 802.11b                                |           |                 | BPSK       | 1                 | 15.5                | 15.5 | 15.5 | 15.5 | 15.5  | 15.5  |
| 802.11b                                |           |                 | QPSK       | 2                 | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11b                                |           |                 | QPSK       | 5.5               | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11b                                |           |                 | QPSK       | 11                | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11g                                |           |                 | BPSK       | 6                 | 15.5                | 15.5 | 15.5 | 15.5 | 15.5  | 15.5  |
| 802.11g                                |           |                 | BPSK       | 9                 | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11g                                |           |                 | QPSK       | 12                | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11g                                |           |                 | QPSK       | 18                | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11g                                |           |                 | 16QAM      | 24                | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11g                                |           |                 | 16QAM      | 36                | 14.5                | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11g                                |           |                 | 64QAM      | 48                | 14.0                | 14.0 | 14.0 | 14.0 | 14.0  | 14.0  |
| 802.11g                                |           |                 | 64QAM      | 54                | 13.0                | 13.0 | 13.0 | 13.0 | 13.0  | 13.0  |
| 802.11n                                | 0         | 1               | BPSK       | 6.5 / 7.25        | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11n                                | 1         | 1               | QPSK       | 13.0 / 14.4       | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11n                                | 2         | 1               | QPSK       | 19.5 / 21.7       | 15.0                | 15.0 | 15.0 | 15.0 | 15.0  | 15.0  |
| 802.11n                                | 3         | 1               | 16QAM      | 26.0 / 28.9       | 14.5                | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11n                                | 4         | 1               | 16QAM      | 39.0 / 43.3       | 14.5                | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11n                                | 5         | 1               | 64QAM      | 52.0 / 57.8       | 14.5                | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11n                                | 6         | 1               | 64QAM      | 58.5 / 65.0       | 13.0                | 13.0 | 13.0 | 13.0 | 13.0  | 13.0  |
| 802.11n                                | 7         | 1               | 64QAM      | 65.0 / 72.2       | 11.0                | 11.0 | 11.0 | 11.0 | 11.0  | 11.0  |

| WLAN 2.4 GHz: 20 MHz channel bandwidth |           |                 |            |                   |                                    |      |      |      |       |       |
|----------------------------------------|-----------|-----------------|------------|-------------------|------------------------------------|------|------|------|-------|-------|
| Standard                               | MCX index | Spatial streams | Modulation | Data speed [Mbps] | Upper limit of tuning target (dBm) |      |      |      |       |       |
|                                        |           |                 |            |                   | CH 1                               | CH 2 | CH 6 | CH 7 | CH 10 | CH 11 |
| 802.11b                                |           |                 | BPSK       | 1                 | 17.0                               | 17.0 | 17.0 | 17.0 | 17.0  | 17.0  |
| 802.11b                                |           |                 | QPSK       | 2                 | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11b                                |           |                 | QPSK       | 5.5               | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11b                                |           |                 | QPSK       | 11                | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11g                                |           |                 | BPSK       | 6                 | 17.0                               | 17.0 | 17.0 | 17.0 | 17.0  | 17.0  |
| 802.11g                                |           |                 | BPSK       | 9                 | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11g                                |           |                 | QPSK       | 12                | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11g                                |           |                 | QPSK       | 18                | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11g                                |           |                 | 16QAM      | 24                | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11g                                |           |                 | 16QAM      | 36                | 16.0                               | 16.0 | 16.0 | 16.0 | 16.0  | 16.0  |
| 802.11g                                |           |                 | 64QAM      | 48                | 15.5                               | 15.5 | 15.5 | 15.5 | 15.5  | 15.5  |
| 802.11g                                |           |                 | 64QAM      | 54                | 14.5                               | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11n                                | 0         | 1               | BPSK       | 6.5 / 7.25        | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11n                                | 1         | 1               | QPSK       | 13.0 / 14.4       | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11n                                | 2         | 1               | QPSK       | 19.5 / 21.7       | 16.5                               | 16.5 | 16.5 | 16.5 | 16.5  | 16.5  |
| 802.11n                                | 3         | 1               | 16QAM      | 26.0 / 28.9       | 16.0                               | 16.0 | 16.0 | 16.0 | 16.0  | 16.0  |
| 802.11n                                | 4         | 1               | 16QAM      | 39.0 / 43.3       | 16.0                               | 16.0 | 16.0 | 16.0 | 16.0  | 16.0  |
| 802.11n                                | 5         | 1               | 64QAM      | 52.0 / 57.8       | 16.0                               | 16.0 | 16.0 | 16.0 | 16.0  | 16.0  |
| 802.11n                                | 6         | 1               | 64QAM      | 58.5 / 65.0       | 14.5                               | 14.5 | 14.5 | 14.5 | 14.5  | 14.5  |
| 802.11n                                | 7         | 1               | 64QAM      | 65.0 / 72.2       | 12.5                               | 12.5 | 12.5 | 12.5 | 12.5  | 12.5  |

| WLAN 2.4 GHz: 20 MHz channel bandwidth |           |                 |            |                   |                      |      |             |      |       |             |
|----------------------------------------|-----------|-----------------|------------|-------------------|----------------------|------|-------------|------|-------|-------------|
| SN: 004402740524370                    |           |                 |            |                   | Measured value (dBm) |      |             |      |       |             |
| Standard                               | MCX index | Spatial streams | Modulation | Data speed [Mbps] | CH 1                 | CH 2 | CH 6        | CH 7 | CH 10 | CH 11       |
| 802.11b                                |           |                 | BPSK       | 1                 | <b>16.1</b>          | 15.9 | <b>16.0</b> | 16.1 | 16.0  | <b>16.1</b> |
| 802.11b                                |           |                 | QPSK       | 2                 | 15.3                 | 15.6 | 15.2        | 15.3 | 15.4  | 15.6        |
| 802.11b                                |           |                 | QPSK       | 5.5               | 15.7                 | 15.6 | 15.4        | 15.7 | 15.7  | 15.9        |
| 802.11b                                |           |                 | QPSK       | 11                | 15.4                 | 15.7 | 15.4        | 15.4 | 15.8  | 15.7        |
| 802.11g                                |           |                 | BPSK       | 6                 | 15.9                 | 15.9 | 15.7        | 15.9 | 15.8  | 15.9        |
| 802.11g                                |           |                 | BPSK       | 9                 | 15.2                 | 15.4 | 15.3        | 15.3 | 15.5  | 15.5        |
| 802.11g                                |           |                 | QPSK       | 12                | 15.1                 | 15.4 | 15.2        | 15.2 | 15.2  | 15.3        |
| 802.11g                                |           |                 | QPSK       | 18                | 14.7                 | 14.9 | 14.9        | 14.9 | 14.8  | 14.9        |
| 802.11g                                |           |                 | 16QAM      | 24                | 14.6                 | 14.8 | 14.7        | 14.7 | 14.8  | 14.8        |
| 802.11g                                |           |                 | 16QAM      | 36                | 14.3                 | 14.2 | 14.0        | 14.3 | 14.4  | 14.4        |
| 802.11g                                |           |                 | 64QAM      | 48                | 13.5                 | 13.9 | 13.6        | 13.8 | 13.6  | 13.7        |
| 802.11g                                |           |                 | 64QAM      | 54                | 12.8                 | 12.8 | 12.5        | 12.8 | 12.6  | 12.7        |
| 802.11n                                | 0         | 1               | BPSK       | 6.5 / 7.25        | 14.7                 | 14.9 | 14.7        | 14.7 | 14.8  | 14.9        |
| 802.11n                                | 1         | 1               | QPSK       | 13.0 / 14.4       | 14.7                 | 14.9 | 14.7        | 14.9 | 14.8  | 15.0        |
| 802.11n                                | 2         | 1               | QPSK       | 19.5 / 21.7       | 14.7                 | 14.7 | 14.7        | 14.7 | 14.8  | 15.0        |
| 802.11n                                | 3         | 1               | 16QAM      | 26.0 / 28.9       | 14.2                 | 14.7 | 14.3        | 14.5 | 14.1  | 14.1        |
| 802.11n                                | 4         | 1               | 16QAM      | 39.0 / 43.3       | 14.3                 | 14.4 | 14.1        | 14.3 | 14.2  | 14.4        |
| 802.11n                                | 5         | 1               | 64QAM      | 52.0 / 57.8       | 14.1                 | 14.4 | 14.2        | 14.4 | 14.1  | 14.3        |
| 802.11n                                | 6         | 1               | 64QAM      | 58.5 / 65.0       | 12.8                 | 12.8 | 12.2        | 13.0 | 12.6  | 13.0        |
| 802.11n                                | 7         | 1               | 64QAM      | 65.0 / 72.2       | 10.9                 | 10.6 | 10.1        | 10.7 | 10.2  | 11.3        |

#### 4. DESCRIPTION OF THE TEST EQUIPMENT

##### 4.1 Measurement System and Components

The measurements were performed using an automated DASY near-field scanning system 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 date | Calibration expiry |
|--------------------------------|---------------|------------------|--------------------|
| DAE4                           | 1316          | 2014-10          | 2015-10            |
| DAE4                           | 793           | 2014-10          | 2015-10            |
| DAE4                           | 1213          | 2014-10          | 2015-10            |
| DAE4                           | 555           | 2014-11          | 2015-11            |
| E-field Probe ES3DV3           | 3118          | 2014-10          | 2015-10            |
| E-field Probe ES3DV3           | 3131          | 2014-10          | 2015-10            |
| E-field Probe EX3DV4           | 3835          | 2014-10          | 2015-10            |
| E-field Probe ES3DV3           | 3165          | 2014-05          | 2015-05            |
| Dipole Validation Kit, D835V2  | 462           | 2014-05          | 2016-05            |
| Dipole Validation Kit, D1900V2 | 5d030         | 2014-05          | 2016-05            |
| Dipole Validation Kit, D2450V2 | 729           | 2014-05          | 2016-05            |
| Dipole Validation Kit, D2600V2 | 1009          | 2014-05          | 2016-05            |
| DASY5 software                 | Version 52.8  | -                | -                  |

Additional test equipment used in testing:

| Test Equipment       | Model      | Serial Number | Calibration date | Calibration expiry |
|----------------------|------------|---------------|------------------|--------------------|
| Signal Generator     | E4438C     | MY42080610    | 2014-09          | 2015-09            |
| Signal Generator     | SML03      | 101264        | 2014-09          | 2015-09            |
| Signal Generator     | E4436B     | US39260114    | 2014-09          | 2015-09            |
| Signal Generator     | SME06      | 836407/007    | 2014-09          | 2015-09            |
| Amplifier            | 5S1G4M3    | 302338        | -                | -                  |
| Amplifier            | ZHL-42-SMA | NO72095-5     | -                | -                  |
| Amplifier            | 5S1G4      | 25583         | -                | -                  |
| Amplifier            | ZHL-42     | 854105        | -                | -                  |
| Power Meter          | NRVS       | 838624/032    | 2014-09          | 2015-09            |
| Power Meter          | NRVD       | 840023/028    | 2014-09          | 2015-09            |
| Power Meter          | NRVZ       | 849305/029    | 2014-09          | 2015-09            |
| Power Meter          | NRVD       | 840297/032    | 2014-09          | 2015-09            |
| Power Sensor         | NRV-Z32    | 100067        | 2014-09          | 2015-09            |
| Power Sensor         | NRV-Z32    | 849745/018    | 2014-09          | 2015-09            |
| Power Sensor         | NRV-Z32    | 825600/002    | 2014-09          | 2015-09            |
| Power Sensor         | NRV-Z53    | 848532/001    | 2014-09          | 2015-09            |
| Call Tester          | CMU 200    | 103293        | -                | -                  |
| Call Tester          | CMU 200    | 104983        | -                | -                  |
| Call Tester          | CMU 200    | 101111        | -                | -                  |
| Call Tester          | CMW 500    | 145474        | -                | -                  |
| Call Tester          | CMW 500    | 110565        | -                | -                  |
| Call Tester          | MT8820C    | 6200883095    | -                | -                  |
| Call Tester          | MT8820C    | 6201060952    | -                | -                  |
| Network Analyzer     | ENA E5071C | MY46213166    | 2014-09          | 2015-09            |
| Dielectric Probe Kit | DAK-3.5    | 1042          | -                | -                  |
| Signal Generator     | E4438C     | MY42080610    | 2014-09          | 2015-09            |

#### 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 $\mu\text{W/g}$ 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                                                                          |

#### 4.1.2 Isotropic E-field Probe Type EX3DV4

|                      |                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction</b>  | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| <b>Calibration</b>   | Calibration certificate in Appendix D                                                                                                                       |
| <b>Frequency</b>     | 10 MHz to >6 GHz (dosimetry); Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)                                                                                     |
| <b>Directivity</b>   | $\pm 0.3$ dB in HSL (rotation around probe axis)<br>$\pm 0.5$ dB in tissue material (rotation normal to probe axis)                                         |
| <b>Dynamic Range</b> | 10 $\mu\text{W/g}$ to > 100 mW/g; Linearity: $\pm 0.2$ dB                                                                                                   |
| <b>Dimensions</b>    | Overall length: 330 mm<br>Tip length: 10 mm<br>Body diameter: 12 mm<br>Tip diameter: 2.5 mm<br>Distance from probe tip to dipole centers: 1.0 mm            |
| <b>Application</b>   | General dosimetry up to 6 GHz<br>Compliance tests of mobile phones<br>Fast automatic scanning in arbitrary phantoms                                         |

## 4.2 Phantoms

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

The phantom used for all Body SAR tests i.e. for both system checks and device testing, was a flat phantom also manufactured by SPEAG this phantom conform to the requirements of FCC published RF Exposure KDB Procedures.

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 and FCC published RF Exposure KDB Procedures. 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 for all system check and device tests, measured from the ear reference point in the case of the SAM phantom and from the inner surface of the flat phantom.

### 4.3.1 Tissue Simulant Recipes

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

| 800 MHz band    |                       |                       |
|-----------------|-----------------------|-----------------------|
| Ingredient      | Head<br>(% by weight) | Body<br>(% by weight) |
| Deionised Water | 51.50                 | 69.25                 |
| Tween 20        | 47.35                 | 30.00                 |
| Salt            | 1.15                  | 0.75                  |

| 1900 MHz band   |                       |                       |
|-----------------|-----------------------|-----------------------|
| Ingredient      | Head<br>(% by weight) | Body<br>(% by weight) |
| Deionised Water | 54.50                 | 70.25                 |
| Tween 20        | 45.23                 | 29.41                 |
| Salt            | 0.27                  | 0.34                  |

| 2450-2600 MHz 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                  |

#### 4.4 System validation and System checking

##### 4.4.1 System validation status

| Probe Calibration Point f / MHz | Test System      | DASY SW | Dipole Type / SN | Probe Type / SN | Calibrated signal type(s) | DAE unit Type / SN | Validation done      |                      |
|---------------------------------|------------------|---------|------------------|-----------------|---------------------------|--------------------|----------------------|----------------------|
|                                 |                  |         |                  |                 |                           |                    | Head tissue simulant | Body tissue simulant |
| 835                             | TCC Salo / SAR-2 | V52.8   | D835V2 / 462     | ES3DV4 / 3131   | CW                        | DAE4 / 793         | 2014-10              | 2013-12              |
| 1900                            | TCC Salo / SAR-1 | V52.8   | D1900V2 / 5d030  | EX3DV4 / 3118   | CW                        | DAE4 / 1316        | 2014-10              | 2014-10              |
| 1900                            | TCC Salo / SAR-5 | V52.8   | D1900V2 / 5d030  | EX3DV4 / 3165   | CW                        | DAE4 / 555         | 2014-06              | 2014-06              |
| 2450                            | TCC Salo / SAR-4 | V52.8   | D2450V2 / 729    | EX3DV4 / 3835   | CW                        | DAE4 / 1213        | 2014 -10             | 2014-10              |
| 2600                            | TCC Salo / SAR-4 | V52.8   | D2600V2 / 1009   | EX3DV4 / 3835   | CW                        | DAE4 / 1213        | 2014-10              | 2014-10              |

##### 4.4.2 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. The dipole was placed under the flat section of the twin SAM phantom for head system checking, and under the flat phantom for body system checking. The system checking results (dielectric parameters and SAR values) are given in the table below.

### System checking, head tissue simulant

| Dipole freq.<br>[MHz] | Description               | SAR 1g<br>[W/kg] | Estimated SAR 1g<br>[W/kg] | Estimated SAR 1g<br>Dev. dSAR [%] | Scaled 1W<br>SAR 1g<br>[W/kg] | Dielectric Parameters |           | SAR 1g<br>Deviation<br>from target                 | Dielectric Parameters<br>Deviation from target |                   | Temp<br>[°C] | Plot<br># |
|-----------------------|---------------------------|------------------|----------------------------|-----------------------------------|-------------------------------|-----------------------|-----------|----------------------------------------------------|------------------------------------------------|-------------------|--------------|-----------|
|                       |                           |                  |                            |                                   |                               | $\epsilon_r$          | $s$ [S/m] |                                                    | $dSAR$ [%]                                     | $d\epsilon_r$ [%] | $ds$ [%]     |           |
| 835                   | Tolerances                |                  |                            | ±3%                               |                               |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br>SN:462   | -                | -                          | -                                 | 9.19                          | 41.5                  | 0.90      | TCC Salo / SAR-2<br>ES3DV3 - SN:3131 Head 835 MHz  |                                                |                   |              |           |
|                       | 2014-11-12                | 2.31             | 2.36                       | 2.16                              | 9.24                          | 41.5                  | 0.92      | 0.54                                               | 0.00                                           | 2.22              | 22.1         | -         |
|                       | 2014-11-13                | 2.27             | 2.33                       | 2.64                              | 9.08                          | 40.8                  | 0.91      | -1.20                                              | -1.69                                          | 1.11              | 22.2         | 1         |
|                       | 2014-11-14                | 2.31             | 2.35                       | 1.73                              | 9.24                          | 41.0                  | 0.91      | 0.54                                               | -1.20                                          | 1.11              | 22.0         | -         |
|                       | 2014-11-16                | 2.28             | 2.34                       | 2.63                              | 9.12                          | 40.6                  | 0.91      | -0.76                                              | -2.17                                          | 1.11              | 22.1         | -         |
| 1900                  | Tolerances                |                  |                            | ±3%                               |                               |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br>SN:5d030 | -                | -                          | -                                 | 39.70                         | 40.0                  | 1.40      | TCC Salo / SAR-1<br>ES3DV3 - SN:3118 Head 1900 MHz |                                                |                   |              |           |
|                       | 2014-11-15                | 9.96             | 10.10                      | 1.41                              | 39.84                         | 39.1                  | 1.41      | 0.35                                               | -2.25                                          | 0.71              | 21.1         | 2         |
| 1900                  | Tolerances                |                  |                            | ±3%                               |                               |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br>SN:5d030 | -                | -                          | -                                 | 39.70                         | 40.0                  | 1.40      | TCC Salo / SAR-5<br>ES3DV3 - SN:3165 Head 1900 MHz |                                                |                   |              |           |
|                       | 2014-11-15                | 9.58             | 9.78                       | 2.09                              | 38.32                         | 39.0                  | 1.42      | -3.48                                              | -2.50                                          | 1.43              | 22.0         | 3         |
|                       | 2014-11-16                | 9.86             | 10.10                      | 2.43                              | 39.44                         | 38.5                  | 1.40      | -0.65                                              | -3.75                                          | 0.00              | 22.1         | -         |
| 2450                  | Tolerances                |                  |                            | ±3%                               |                               |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br>SN:729   | -                | -                          | -                                 | 52.60                         | 39.2                  | 1.80      | TCC Salo / SAR-4<br>EX3DV4 - SN:3835 Head 2450 MHz |                                                |                   |              |           |
|                       | 2014-11-12                | 12.70            | 12.70                      | 0.00                              | 50.80                         | 38.0                  | 1.78      | -3.42                                              | -3.06                                          | -1.11             | 22.4         | -         |
|                       | 2014-11-13                | 12.70            | 12.70                      | 0.00                              | 50.80                         | 37.6                  | 1.79      | -3.42                                              | -4.08                                          | -0.56             | 21.8         | -         |
|                       | 2014-11-16                | 12.30            | 12.20                      | -0.81                             | 49.20                         | 38.1                  | 1.75      | -6.46                                              | -2.81                                          | -2.78             | 22.1         | 4         |
|                       | 2014-11-25                | 12.80            | 12.80                      | 0.00                              | 51.20                         | 37.8                  | 1.76      | -2.66                                              | -3.57                                          | -2.22             | 22.2         | -         |
| 2600                  | Tolerances                |                  |                            | ±3%                               |                               |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br>SN:1009  | -                | -                          | -                                 | 57.30                         | 39.0                  | 1.96      | TCC Salo / SAR-4<br>EX3DV4 - SN:3835 Head 2600 MHz |                                                |                   |              |           |
|                       | 2014-11-20                | 13.90            | 14.10                      | 1.44                              | 55.60                         | 37.8                  | 1.92      | -2.97                                              | -3.08                                          | -2.04             | 22.5         | -         |
|                       | 2014-11-21                | 13.70            | 14.00                      | 2.19                              | 54.80                         | 37.4                  | 1.93      | -4.36                                              | -4.10                                          | -1.53             | 22.5         | 5         |

\* Dielectric parameter reference data taken from IEEE1528/IEC62209

### System checking, body tissue simulant

| Dipole freq.<br>[MHz] | Description                      | SAR 1g<br>[W/kg] | Estimated SAR 1g<br>[W/kg] | Estimated SAR 1g<br>Dev. dSAR [%] | Scaled 1W SAR 1g<br>[W/kg] | Dielectric Parameters |           | SAR 1g<br>Deviation<br>from target                 | Dielectric Parameters<br>Deviation from target |                   | Temp<br>[°C] | Plot<br># |
|-----------------------|----------------------------------|------------------|----------------------------|-----------------------------------|----------------------------|-----------------------|-----------|----------------------------------------------------|------------------------------------------------|-------------------|--------------|-----------|
|                       |                                  |                  |                            |                                   |                            | $\epsilon_r$          | $s$ [S/m] |                                                    | $dSAR$ [%]                                     | $d\epsilon_r$ [%] | $ds$ [%]     |           |
| 835                   | Tolerances                       |                  |                            | ±3%                               |                            |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br><b>SN:462</b>   | -                | -                          | -                                 | 9.41                       | 55.2                  | 0.97      | TCC Salo / SAR-2<br>ES3DV3 - SN:3131 Body 835 MHz  |                                                |                   |              |           |
|                       | 2014-11-17                       | 2.35             | 2.39                       | 1.70                              | 9.40                       | 54.2                  | 0.97      | -0.11                                              | -1.81                                          | 0.00              | 21.8         | 6         |
| 1900                  | Tolerances                       |                  |                            | ±3%                               |                            |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br><b>SN:5d030</b> | -                | -                          | -                                 | 40.30                      | 53.3                  | 1.52      | TCC Salo / SAR-1<br>ES3DV3 - SN:3118 Body 1900 MHz |                                                |                   |              |           |
|                       | 2014-11-14                       | 9.83             | 9.87                       | 0.41                              | 39.32                      | 53.0                  | 1.52      | -2.43                                              | -0.56                                          | 0.00              | 21.1         | 7         |
| 2450                  | Tolerances                       |                  |                            | ±3%                               |                            |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br><b>SN:729</b>   | -                | -                          | -                                 | 51.40                      | 52.7                  | 1.95      | TCC Salo / SAR-4<br>EX3DV4 - SN:3835 Body 2450 MHz |                                                |                   |              |           |
|                       | 2014-11-16                       | 12.30            | 12.10                      | -1.63                             | 49.20                      | 51.4                  | 1.90      | -4.28                                              | -2.47                                          | -2.56             | 22.1         | 8         |
|                       | 2014-11-17                       | 12.40            | 12.30                      | -0.81                             | 49.60                      | 51.2                  | 1.90      | -3.50                                              | -2.85                                          | -2.56             | 22.1         | -         |
| 2600                  | Tolerances                       |                  |                            | ±3%                               |                            |                       |           | ±10 %                                              | ±5 %                                           | ±5 %              |              |           |
|                       | Target result<br><b>SN:1009</b>  | -                | -                          | -                                 | 56.90                      | 52.5                  | 2.16      | TCC Salo / SAR-4<br>EX3DV4 - SN:3835 Body 2600 MHz |                                                |                   |              |           |
|                       | 2014-11-14                       | 14.00            | 14.20                      | 1.43                              | 56.00                      | 51.2                  | 2.12      | -1.58                                              | -2.48                                          | -1.85             | 22.1         | -         |
|                       | 2014-11-18                       | 13.90            | 14.10                      | 1.44                              | 55.60                      | 50.7                  | 2.07      | -2.28                                              | -3.43                                          | -4.17             | 22.4         | -         |
| 2600                  | 2014-11-19                       | 13.60            | 13.70                      | 0.74                              | 54.40                      | 50.7                  | 2.09      | -4.39                                              | -3.43                                          | -3.24             | 22.1         | 9         |

\* Dielectric parameter reference data taken from FCC Published RF Exposure KDB Procedures

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

#### 4.5 Tissue Simulants used in the Measurements

Head tissue simulant measurements

| f<br>[MHz] | Description       | Dielectric Parameters |         | Dielectric Parameters Deviation from recommended value |          | Temp<br>[°C] |
|------------|-------------------|-----------------------|---------|--------------------------------------------------------|----------|--------------|
|            |                   | $\epsilon_r$          | s [S/m] | $d\epsilon_r$ [%]                                      | $ds$ [%] |              |
| 835        | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %    |              |
|            | Recommended value | 41.5                  | 0.90    |                                                        |          |              |
|            | 2014-11-12        | 41.5                  | 0.92    | 0.00                                                   | 2.22     | 22.1         |
|            | 2014-11-13        | 40.8                  | 0.91    | -1.69                                                  | 1.11     | 22.2         |
|            | 2014-11-14        | 41.0                  | 0.91    | -1.20                                                  | 1.11     | 22.0         |
|            | 2014-11-16        | 40.6                  | 0.91    | -2.17                                                  | 1.11     | 22.1         |
| 836        | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %    |              |
|            | Recommended value | 41.5                  | 0.90    |                                                        |          |              |
|            | 2014-11-12        | 41.5                  | 0.92    | 0.00                                                   | 2.22     | 22.1         |
|            | 2014-11-13        | 40.8                  | 0.91    | -1.69                                                  | 1.11     | 22.2         |
|            | 2014-11-14        | 41.0                  | 0.91    | -1.20                                                  | 1.11     | 22.0         |
|            | 2014-11-16        | 40.6                  | 0.91    | -2.17                                                  | 1.11     | 22.1         |
| 1880       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %    |              |
|            | Recommended value | 40.0                  | 1.40    |                                                        |          |              |
|            | 2014-11-15        | 39.1                  | 1.39    | -2.25                                                  | -0.71    | 21.1         |
|            | 2014-11-15        | 39.1                  | 1.40    | -2.25                                                  | 0.00     | 22.0         |
|            | 2014-11-16        | 38.6                  | 1.38    | -3.50                                                  | -1.43    | 22.1         |
| 2437       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %    |              |
|            | Recommended value | 39.2                  | 1.79    |                                                        |          |              |
|            | 2014-11-12        | 38.1                  | 1.77    | -2.81                                                  | -1.12    | 22.4         |
|            | 2014-11-13        | 37.7                  | 1.78    | -3.83                                                  | -0.56    | 21.8         |
|            | 2014-11-16        | 38.1                  | 1.74    | -2.81                                                  | -2.79    | 22.1         |
|            | 2014-11-25        | 37.9                  | 1.75    | -3.32                                                  | -2.23    | 22.2         |
| 2535       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %    |              |
|            | Recommended value | 39.1                  | 1.89    |                                                        |          |              |
|            | 2014-11-20        | 38.1                  | 1.85    | -2.56                                                  | -2.12    | 22.5         |
|            | 2014-11-21        | 37.7                  | 1.86    | -3.58                                                  | -1.59    | 22.5         |

**Body tissue simulant measurements**

| f<br>[MHz] | Description       | Dielectric Parameters |         | Dielectric Parameters Deviation from recommended value |                | Temp<br>[°C] |
|------------|-------------------|-----------------------|---------|--------------------------------------------------------|----------------|--------------|
|            |                   | $\epsilon_r$          | s [S/m] | $\Delta\epsilon_r$ [%]                                 | $\Delta s$ [%] |              |
| 835        | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %          |              |
|            | Recommended value | 55.2                  | 0.97    |                                                        |                |              |
|            | 2014-11-17        | 54.2                  | 0.97    | -1.81                                                  | 0.00           | 21.8         |
| 836        | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %          |              |
|            | Recommended value | 55.2                  | 0.97    |                                                        |                |              |
|            | 2014-11-17        | 54.2                  | 0.97    | -1.81                                                  | 0.00           | 21.8         |
| 1880       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %          |              |
|            | Recommended value | 53.3                  | 1.52    |                                                        |                |              |
|            | 2014-11-14        | 53.0                  | 1.51    | -0.56                                                  | -0.66          | 21.1         |
| 2437       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %          |              |
|            | Recommended value | 52.7                  | 1.94    |                                                        |                |              |
|            | 2014-11-16        | 51.5                  | 1.88    | -2.28                                                  | -3.09          | 22.1         |
|            | 2014-11-17        | 51.2                  | 1.89    | -2.85                                                  | -2.58          | 22.1         |
|            | 2014-11-21        | 51.0                  | 1.90    | -3.23                                                  | -2.06          | 22.2         |
| 2535       | Tolerances        |                       |         | ± 5 %                                                  | ± 5 %          |              |
|            | Recommended value | 52.6                  | 2.07    |                                                        |                |              |
|            | 2014-11-14        | 51.5                  | 2.05    | -2.09                                                  | -0.97          | 22.1         |
|            | 2014-11-18        | 50.9                  | 1.99    | -3.23                                                  | -3.86          | 22.4         |
|            | 2014-11-19        | 50.9                  | 2.01    | -3.23                                                  | -2.90          | 22.1         |

Dielectric parameter data for the band edges is given in Appendix C.

## 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 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.



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 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

### 5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the spacer and placed below the flat phantom. The distance between the device and the phantom was kept at the separation distance indicated in Section 1.2 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.

Microsoft body-worn accessories are commonly available for the separation distance used in this testing.

### 5.2.3 Wireless Router Configuration

The device was placed in the SPEAG holder and, in sequence, the back, display and each of the 4 edges was positioned 10.0mm away from the flat phantom. The spacer was removed before the start of the measurements.

### 5.2.4 10-g Extremity SAR

The device was placed in the SPEAG holder and the bottom edge was positioned 0.0mm away from the flat phantom.

## 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. Fast SAR is measured according to the KDB 447498 D01 General RF Exposure Guidance v05r01.

## 5.4 SAR Averaging Methods

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

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The interpolation, extrapolation and maximum search routines within Dasy52 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 for 1g Full SAR in 0.3-6G Hz range

| 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                 | ±6.6     | N         | 1   | 1               | ±6.6                | ∞     |
| 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                 | ±2.0     | R         | √3  | 1               | ±1.2                | ∞     |
| Linearity                                                                       | E2.4                 | ±4.7     | R         | √3  | 1               | ±2.7                | ∞     |
| System Detection Limits                                                         | E2.5                 | ±1.0     | R         | √3  | 1               | ±0.6                | ∞     |
| Modulation response                                                             | E2.5                 | ±2.4     | R         | √3  | 1               | ±1.4                |       |
| Readout Electronics                                                             | E2.6                 | ±0.3     | N         | 1   | 1               | ±0.3                | ∞     |
| 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                 | ±0.8     | R         | √3  | 1               | ±0.5                | ∞     |
| Probe Positioning with respect to Phantom Shell                                 | E6.3                 | ±6.7     | R         | √3  | 1               | ±3.9                | ∞     |
| Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | E5                   | ±4.0     | 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                 | ±3.6     | N         | 1   | 1               | ±3.6                | 5     |
| Output Power Variation - SAR drift measurement                                  | E2.9                 | ±5.0     | R         | √3  | 1               | ±2.9                | ∞     |
| <b>Phantom and Tissue Parameters</b>                                            |                      |          |           |     |                 |                     |       |
| Phantom Uncertainty (shape and thickness tolerances)                            | E3.1                 | ±6.6     | R         | √3  | 1               | ±3.8                | ∞     |
| SAR correction                                                                  | E3.2                 | ±1.9     | R         | √3  | 1               | ±1.1                | ∞     |
| Conductivity Target - tolerance                                                 | E3.4                 | ±5.0     | R         | √3  | 0.6             | ±1.8                | ∞     |
| Conductivity - measurement uncertainty                                          | E3.3                 | ±5.5     | N         | 1   | 0.6             | ±3.5                | 5     |
| Permittivity Target - tolerance                                                 | E3.4                 | ±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       |     |                 | ±14.0               | 198   |
| <b>Coverage Factor for 95%</b>                                                  |                      |          | k=2       |     |                 |                     |       |
| <b>Expanded Uncertainty</b>                                                     |                      |          |           |     |                 | ±28.2               |       |

Table 6.2 – Measurement uncertainty evaluation for 1g Fast SAR in 0.3-6G Hz range

| <b>Relative DASY5 Uncertainty Budget for Fast SAR Tests</b><br><b>According to IEEE 1528/2011 and IEC 62209-1/2011</b><br><b>(0.3-6 GHz range)</b> |          |            |      |                 |                     |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|------|-----------------|---------------------|-------|
| Uncertainty Component                                                                                                                              | Tol. (%) | Prob Dist. | Div. | $c_i$           | $c_i \cdot u_i$ (%) | $v_i$ |
| <b>Measurement System</b>                                                                                                                          |          |            |      |                 |                     |       |
| Probe Calibration                                                                                                                                  | ±6.6     | N          | 1    | 0               |                     |       |
| Axial Isotropy                                                                                                                                     | ±4.7     | R          | √3   | $(1-c_p)^{1/2}$ | ±1.9                | ∞     |
| Hemispherical Isotropy                                                                                                                             | ±9.6     | R          | √3   | $(c_p)^{1/2}$   | ±3.9                | ∞     |
| Boundary Effect                                                                                                                                    | ±2.0     | R          | √3   | 1               | ±1.2                | ∞     |
| Linearity                                                                                                                                          | ±4.7     | R          | √3   | 1               | ±2.7                | ∞     |
| System Detection Limits                                                                                                                            | ±1.0     | R          | √3   | 1               | ±0.6                | ∞     |
| Modulation Response                                                                                                                                | ±2.4     | R          | √3   | 1               | ±1.4                | ∞     |
| Readout Electronics                                                                                                                                | ±0.3     | N          | 1    | 0               |                     |       |
| Response Time                                                                                                                                      | ±0.8     | R          | √3   | 0               |                     |       |
| Integration Time                                                                                                                                   | ±2.6     | R          | √3   | 1               | ±1.5                | ∞     |
| RF Ambient Conditions - Noise                                                                                                                      | ±3.0     | R          | √3   | 1               | ±1.7                | ∞     |
| RF Ambient Conditions - Reflections                                                                                                                | ±3.0     | R          | √3   | 0               |                     |       |
| Probe Positioner Mechanical Tolerance                                                                                                              | ±0.8     | R          | √3   | 1               | ±0.5                | ∞     |
| Probe Positioning with respect to Phantom Shell                                                                                                    | ±6.7     | R          | √3   | 1               | ±3.9                | ∞     |
| Spatial x-y Resolution                                                                                                                             | ±10.0    | R          | √3   | 1               | ±5.8                | ∞     |
| Fast SAR z Approximation                                                                                                                           | ±14.0    | R          | √3   | 1               | ±8.1                | ∞     |
| <b>Test sample Related</b>                                                                                                                         |          |            |      |                 |                     |       |
| Test Sample Positioning                                                                                                                            | ±6.0     | N          | 1    | 1               | ±6.0                | 12    |
| Device Holder Uncertainty                                                                                                                          | ±3.6     | N          | 1    | 1               | ±3.6                | 5     |
| Output Power Variation - SAR drift measurement                                                                                                     | ±5.0     | R          | √3   | 1               | ±2.9                | ∞     |
| Power Scaling                                                                                                                                      | ±0       | R          | √3   | 0               |                     |       |
| <b>Phantom and Setup</b>                                                                                                                           |          |            |      |                 |                     |       |
| Phantom Uncertainty (shape and thickness tolerances)                                                                                               | ±6.6     | R          | √3   | 1               | ±3.8                | ∞     |
| SAR correction                                                                                                                                     | ±1.9     | R          | √3   | 0               |                     |       |
| Conductivity Target - tolerance                                                                                                                    | ±1.9     | R          | √3   | 0               |                     |       |
| Conductivity - measurement uncertainty                                                                                                             | ±5.0     | R          | √3   | 0               |                     |       |
| Permittivity Target - tolerance                                                                                                                    | ±5.5     | N          | 1    | 0               |                     |       |
| Permittivity - measurement uncertainty                                                                                                             | ±5.0     | R          | √3   | 0               |                     |       |
| <b>Combined Standard Uncertainty</b>                                                                                                               |          |            |      |                 |                     |       |
|                                                                                                                                                    |          | RSS        |      |                 | ±14.9               | 748   |
| <b>Coverage Factor for 95%</b>                                                                                                                     |          |            |      |                 |                     |       |
|                                                                                                                                                    |          | k=2        |      |                 |                     |       |
| <b>Expanded Uncertainty</b>                                                                                                                        |          |            |      |                 |                     |       |
|                                                                                                                                                    |          |            |      |                 | ±29.8               |       |

## 7. RESULTS

### 7.1 The measured Head SAR values for the test device

2-slot GPRS850 Head SAR results – Antenna 1

| 2-slot GPRS850      |                 |                        |           |           |                         |           |           |                       |        |
|---------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 128                 | CH 190    | CH 251    | CH 128                  | CH 190    | CH 251    |                       |        |
|                     |                 | 824.2 MHz              | 836.6 MHz | 848.8 MHz | 824.2 MHz               | 836.6 MHz | 848.8 MHz |                       |        |
| Upper limit         |                 | 30.4                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power     |                 | 29.7                   | 29.7      | 29.8      | 0.7                     | 0.7       | 0.6       | dB                    |        |
| Time-averaged Power |                 | 23.7                   | 23.7      | 23.8      | 1.17                    | 1.17      | 1.15      | Lin                   |        |
| Left Cheek          | Estimated SAR   | -                      | 0.191     | -         | -                       | 0.224     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Left Tilt           | Estimated SAR   | -                      | 0.100     | -         | -                       | 0.117     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Right Cheek         | Estimated SAR   | 0.237                  | 0.215     | 0.198     | 0.278                   | 0.253     | 0.227     | 0.01                  | -      |
|                     | Full SAR        | 0.246                  | -         | -         | 0.289                   | -         | -         | -                     | -      |
| Right Tilt          | Estimated SAR   | -                      | 0.115     | -         | -                       | 0.135     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |

| 2-slot 8PSK EGPRS850 |                 |                        |           |           |                         |           |           |                       |        |
|----------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation   | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                      |                 | CH 128                 | CH 190    | CH 251    | CH 128                  | CH 190    | CH 251    |                       |        |
|                      |                 | 824.2 MHz              | 836.6 MHz | 848.8 MHz | 824.2 MHz               | 836.6 MHz | 848.8 MHz |                       |        |
| Upper limit          |                 | 25.4                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power      |                 | 25.1                   | 25.1      | 25.1      | 0.3                     | 0.3       | 0.3       | dB                    |        |
| Time-averaged Power  |                 | 19.1                   | 19.1      | 19.1      | 1.07                    | 1.07      | 1.07      | Lin                   |        |
| Right Cheek          | Estimated SAR   | 0.095                  | -         | -         | 0.102                   | -         | -         | 0.00                  | -      |
|                      | Full SAR        | 0.096                  | -         | -         | 0.103                   | -         | -         | -                     | -      |

### 2-slot GPRS850 Head SAR results – Antenna 2

| 2-slot GPRS850       |                 |                        |           |           |                         |           |           |                       |        |
|----------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation   | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                      |                 | CH 128                 | CH 190    | CH 251    | CH 128                  | CH 190    | CH 251    |                       |        |
|                      |                 | 824.2 MHz              | 836.6 MHz | 848.8 MHz | 824.2 MHz               | 836.6 MHz | 848.8 MHz |                       |        |
| Upper limit          |                 | 30.4                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power      |                 | 29.5                   | 29.5      | 29.6      | 0.9                     | 0.9       | 0.8       | dB                    |        |
| Time-averaged Power  |                 | 23.5                   | 23.5      | 23.6      | 1.23                    | 1.23      | 1.20      | Lin                   |        |
| Left Cheek           | Estimated SAR   | -                      | 0.237     | -         | -                       | 0.292     | -         | -                     | -      |
|                      | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Left Tilt            | Estimated SAR   | -                      | 0.151     | -         | -                       | 0.186     | -         | -                     | -      |
|                      | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Right Cheek          | Estimated SAR   | 0.272                  | 0.242     | 0.231     | 0.335                   | 0.298     | 0.278     | 0.01                  | H1     |
|                      | Full SAR        | 0.278                  | -         | -         | 0.342                   | -         | -         | -                     | -      |
| Right Tilt           | Estimated SAR   | -                      | 0.139     | -         | -                       | 0.171     | -         | -                     | -      |
|                      | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Right Cheek CC-3090  | Estimated SAR   | 0.267                  | 0.257     | 0.228     | 0.328                   | 0.316     | 0.274     | 0.01                  | -      |
|                      | Full SAR        | 0.276                  | -         | -         | 0.340                   | -         | -         | -                     | -      |
| 2-slot 8PSK EGPRS850 |                 |                        |           |           |                         |           |           |                       |        |
| Device orientation   | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                      |                 | CH 128                 | CH 190    | CH 251    | CH 128                  | CH 190    | CH 251    |                       |        |
|                      |                 | 824.2 MHz              | 836.6 MHz | 848.8 MHz | 824.2 MHz               | 836.6 MHz | 848.8 MHz |                       |        |
| Upper limit          |                 | 25.4                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power      |                 | 24.9                   | 24.9      | 24.9      | 0.5                     | 0.5       | 0.5       | dB                    |        |
| Time-averaged Power  |                 | 18.9                   | 18.9      | 18.9      | 1.12                    | 1.12      | 1.12      | Lin                   |        |
| Right Cheek          | Estimated SAR   | 0.090                  | -         | -         | 0.101                   | -         | -         | 0.00                  | -      |
|                      | Full SAR        | 0.094                  | -         | -         | 0.105                   | -         | -         | -                     | -      |

### WCDMA850 (Band 5) Head SAR results – Antenna 1

| WCDMA850 (Band 5)   |                 |                        |           |           |                         |           |           |                       |        |
|---------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 4132                | CH 4175   | CH 4233   | CH 4132                 | CH 4175   | CH 4233   |                       |        |
|                     |                 | 826.4 MHz              | 835.0 MHz | 846.6 MHz | 826.4 MHz               | 835.0 MHz | 846.6 MHz |                       |        |
| Upper limit         |                 | 23.9                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power     |                 | 23.2                   | 23.3      | 23.2      | 0.7                     | 0.6       | 0.7       | dB                    |        |
| Time-averaged Power |                 | 23.2                   | 23.3      | 23.2      | 1.17                    | 1.15      | 1.17      | Lin                   |        |
| Left Cheek          | Estimated SAR   | -                      | 0.171     | -         | -                       | 0.196     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Left Tilt           | Estimated SAR   | -                      | 0.087     | -         | -                       | 0.100     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Right Cheek         | Estimated SAR   | 0.182                  | 0.183     | 0.195     | 0.214                   | 0.210     | 0.229     | 0.00                  | -      |
|                     | Full SAR        | -                      | -         | 0.197     | -                       | -         | 0.231     | -                     | -      |
| Right Tilt          | Estimated SAR   | -                      | 0.094     | -         | -                       | 0.108     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |

### WCDMA850 (Band 5) Head SAR results – Antenna 2

| WCDMA850 (Band 5)   |                 |                        |                   |                   |                         |                   |                   |                       |        |
|---------------------|-----------------|------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 4132 826.4 MHz      | CH 4175 835.0 MHz | CH 4233 846.6 MHz | CH 4132 826.4 MHz       | CH 4175 835.0 MHz | CH 4233 846.6 MHz |                       |        |
| Upper limit         |                 | 23.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power     |                 | 23.0                   | 23.1              | 23.0              | 0.9                     | 0.8               | 0.9               | dB                    |        |
| Time-averaged Power |                 | 23.0                   | 23.1              | 23.0              | 1.23                    | 1.20              | 1.23              | Lin                   |        |
| Left Cheek          | Estimated SAR   | 0.217                  | 0.253             | 0.245             | 0.267                   | 0.304             | 0.301             | 0.01                  | -      |
|                     | Full SAR        | -                      | 0.248             | -                 | -                       | 0.298             | -                 |                       |        |
| Left Tilt           | Estimated SAR   | -                      | 0.135             | -                 | -                       | 0.162             | -                 | -                     | -      |
|                     | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Right Cheek         | Estimated SAR   | -                      | 0.224             | -                 | -                       | 0.269             | -                 | -                     | -      |
|                     | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Right Tilt          | Estimated SAR   | -                      | 0.116             | -                 | -                       | 0.139             | -                 | -                     | -      |
|                     | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Left Cheek CC-3090  | Estimated SAR   | 0.212                  | 0.232             | 0.236             | 0.261                   | 0.279             | 0.290             | 0.01                  | H2     |
|                     | Full SAR        | -                      | -                 | 0.245             | -                       | -                 | 0.301             |                       |        |

### 2-slot GPRS1900 Head SAR results – Antenna 1

| 2-slot GPRS1900     |                 |                        |            |            |                         |            |            |                       |        |
|---------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 512                 | CH 661     | CH 810     | CH 512                  | CH 661     | CH 810     |                       |        |
|                     |                 | 1850.2 MHz             | 1880.0 MHz | 1909.8 MHz | 1850.2 MHz              | 1880.0 MHz | 1909.8 MHz |                       |        |
| Upper limit         |                 | 28.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power     |                 | 28.6                   | 28.6       | 28.6       | 0.3                     | 0.3        | 0.3        | dB                    |        |
| Time-averaged Power |                 | 22.6                   | 22.6       | 22.6       | 1.07                    | 1.07       | 1.07       | Lin                   |        |
| Left Cheek          | Estimated SAR   | 0.092                  | 0.083      | 0.074      | 0.099                   | 0.089      | 0.079      | 0.00                  | -      |
|                     | Full SAR        | 0.096                  | -          | -          | 0.103                   | -          | -          |                       |        |
| Left Tilt           | Estimated SAR   | -                      | 0.073      | -          | -                       | 0.078      | -          | -                     | -      |
|                     | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Right Cheek         | Estimated SAR   | -                      | 0.060      | -          | -                       | 0.064      | -          | -                     | -      |
|                     | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Right Tilt          | Estimated SAR   | -                      | 0.036      | -          | -                       | 0.038      | -          | -                     | -      |
|                     | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |

| 2-slot 8PSK EGPRS1900 |                 |                        |            |            |                         |            |            |                       |        |
|-----------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation    | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                       |                 | CH 512                 | CH 661     | CH 810     | CH 512                  | CH 661     | CH 810     |                       |        |
|                       |                 | 1850.2 MHz             | 1880.0 MHz | 1909.8 MHz | 1850.2 MHz              | 1880.0 MHz | 1909.8 MHz |                       |        |
| Upper limit           |                 | 25.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power       |                 | 25.4                   | 25.1       | 25.1       | 0.5                     | 0.8        | 0.8        | dB                    |        |
| Time-averaged Power   |                 | 19.4                   | 19.1       | 19.1       | 1.12                    | 1.20       | 1.20       | Lin                   |        |
| Left Cheek            | Estimated SAR   | 0.045                  | -          | -          | 0.051                   | -          | -          | 0.00                  | -      |
|                       | Full SAR        | 0.046                  | -          | -          | 0.051                   | -          | -          |                       |        |

### 2-slot GPRS1900 Head SAR results – Antenna 2

| 2-slot GPRS1900       |                 |                        |                   |                   |                         |                   |                   |                       |        |
|-----------------------|-----------------|------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-----------------------|--------|
| Device orientation    | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                       |                 | CH 512 1850.2 MHz      | CH 661 1880.0 MHz | CH 810 1909.8 MHz | CH 512 1850.2 MHz       | CH 661 1880.0 MHz | CH 810 1909.8 MHz |                       |        |
|                       |                 |                        |                   |                   |                         |                   |                   |                       |        |
| Upper limit           |                 | 28.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power       |                 | 28.2                   | 28.2              | 28.2              | 0.7                     | 0.7               | 0.7               | dB                    |        |
| Time-averaged Power   |                 | 22.2                   | 22.2              | 22.2              | 1.17                    | 1.17              | 1.17              | Lin                   |        |
| Left Cheek            | Estimated SAR   | 0.371                  | 0.389             | 0.384             | 0.436                   | 0.457             | 0.451             | 0.01                  | H3     |
|                       | Full SAR        | -                      | 0.382             | -                 | -                       | 0.449             | -                 |                       |        |
| Left Tilt             | Estimated SAR   | -                      | 0.278             | -                 | -                       | 0.327             | -                 | -                     | -      |
|                       | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Right Cheek           | Estimated SAR   | -                      | 0.257             | -                 | -                       | 0.302             | -                 | -                     | -      |
|                       | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Right Tilt            | Estimated SAR   | -                      | 0.173             | -                 | -                       | 0.203             | -                 | -                     | -      |
|                       | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Left Cheek CC-3090    | Estimated SAR   | 0.356                  | 0.370             | 0.361             | 0.418                   | 0.435             | 0.424             | 0.01                  | -      |
|                       | Full SAR        | -                      | 0.375             | -                 | -                       | 0.441             | -                 |                       |        |
| 2-slot 8PSK EGPRS1900 |                 |                        |                   |                   |                         |                   |                   |                       |        |
| Device orientation    | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                       |                 | CH 512 1850.2 MHz      | CH 661 1880.0 MHz | CH 810 1909.8 MHz | CH 512 1850.2 MHz       | CH 661 1880.0 MHz | CH 810 1909.8 MHz |                       |        |
|                       |                 |                        |                   |                   |                         |                   |                   |                       |        |
| Upper limit           |                 | 25.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power       |                 | 25.0                   | 24.7              | 24.7              | 0.9                     | 1.2               | 1.2               | dB                    |        |
| Time-averaged Power   |                 | 19.0                   | 18.7              | 18.7              | 1.23                    | 1.32              | 1.32              | Lin                   |        |
| Left Cheek            | Estimated SAR   | -                      | 0.176             | -                 | -                       | 0.232             | -                 | -                     | -      |
|                       | Full SAR        | -                      | 0.176             | -                 | -                       | 0.232             | -                 |                       |        |

### LTE2500 (Band 7) Head SAR results – Antenna 1

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |            |            |                         |            |            |                       |        |
|----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 22.4                   | 22.3       | 22.2       | 0.5                     | 0.6        | 0.7        | dB                    |        |
| Time-averaged Power                                      |                 | 22.4                   | 22.3       | 22.2       | 1.12                    | 1.15       | 1.17       | Lin                   |        |
| Left Cheek                                               | Estimated SAR   | 0.259                  | -          | -          | 0.291                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Left Tilt                                                | Estimated SAR   | 0.246                  | -          | -          | 0.276                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right Cheek                                              | Estimated SAR   | 0.575                  | -          | -          | 0.645                   | -          | -          | 0.02                  | H4     |
|                                                          | Full SAR        | 0.592                  | -          | -          | 0.664                   | -          | -          | -                     | -      |
| Right Tilt                                               | Estimated SAR   | 0.165                  | -          | -          | 0.185                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right Cheek CC-3090                                      | Estimated SAR   | 0.515                  | -          | -          | 0.578                   | -          | -          | 0.01                  | -      |
|                                                          | Full SAR        | 0.520                  | -          | -          | 0.583                   | -          | -          | -                     | -      |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 21.3                   | 21.5       | 21.3       | 0.6                     | 0.4        | 0.6        | dB                    |        |
| Time-averaged Power                                      |                 | 21.3                   | 21.5       | 21.3       | 1.15                    | 1.10       | 1.15       | Lin                   |        |
| Left Cheek                                               | Estimated SAR   | -                      | 0.234      | -          | -                       | 0.257      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Left Tilt                                                | Estimated SAR   | -                      | 0.190      | -          | -                       | 0.208      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right Cheek                                              | Estimated SAR   | -                      | 0.500      | -          | -                       | 0.548      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right Tilt                                               | Estimated SAR   | -                      | 0.131      | -          | -                       | 0.144      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |

### LTE2500 (Band 7) Head SAR results – Antenna 2

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |                     |                     |                         |                     |                     |                       |        |
|----------------------------------------------------------|-----------------|------------------------|---------------------|---------------------|-------------------------|---------------------|---------------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850 2510.0 MHz    | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz | CH 20850 2510.0 MHz     | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power                                          |                 | 21.9                   | 21.8                | 21.7                | 1.0                     | 1.1                 | 1.2                 | dB                    |        |
| Time-averaged Power                                      |                 | 21.9                   | 21.8                | 21.7                | 1.26                    | 1.29                | 1.32                | Lin                   |        |
| Left Cheek                                               | Estimated SAR   | 0.135                  | -                   | -                   | 0.170                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Left Tilt                                                | Estimated SAR   | 0.058                  | -                   | -                   | 0.073                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Right Cheek                                              | Estimated SAR   | 0.128                  | -                   | -                   | 0.161                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Right Tilt                                               | Estimated SAR   | 0.147                  | -                   | -                   | 0.185                   | -                   | -                   | 0.00                  | -      |
|                                                          | Full SAR        | 0.143                  | -                   | -                   | 0.180                   | -                   | -                   | -                     | -      |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0 |                 |                        |                     |                     |                         |                     |                     |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850 2510.0 MHz    | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz | CH 20850 2510.0 MHz     | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 21.9                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power                                          |                 | 20.8                   | 21.0                | 20.8                | 1.1                     | 0.9                 | 1.1                 | dB                    |        |
| Time-averaged Power                                      |                 | 20.8                   | 21.0                | 20.8                | 1.29                    | 1.23                | 1.29                | Lin                   |        |
| Left Cheek                                               | Estimated SAR   | -                      | 0.126               | -                   | -                       | 0.155               | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Left Tilt                                                | Estimated SAR   | -                      | 0.064               | -                   | -                       | 0.078               | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Right Cheek                                              | Estimated SAR   | -                      | 0.112               | -                   | -                       | 0.138               | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Right Tilt                                               | Estimated SAR   | -                      | 0.130               | -                   | -                       | 0.160               | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |

### WLAN2450 Head SAR results

| WLAN2450 b-mode BPSK 1 Mbps       |                 |                        |                    |                     |                         |                    |                     |                       |        |
|-----------------------------------|-----------------|------------------------|--------------------|---------------------|-------------------------|--------------------|---------------------|-----------------------|--------|
| Device orientation                | SAR measurement | Measured 1g SAR [W/kg] |                    |                     | Reported* 1g SAR [W/kg] |                    |                     | Max Deviation* [W/kg] | Plot # |
|                                   |                 | CH 1<br>2412.0 MHz     | CH 6<br>2437.0 MHz | CH 11<br>2462.0 MHz | CH 1<br>2412.0 MHz      | CH 6<br>2437.0 MHz | CH 11<br>2462.0 MHz |                       |        |
| Upper limit                       |                 | 17.0                   | 17.0               | 17.0                | Scaling factor*         |                    |                     |                       |        |
| Conducted Power                   |                 | 16.1                   | 16.0               | 16.1                | 0.9                     | 1.0                | 0.9                 | dB                    |        |
| Time-averaged Power               |                 | 16.1                   | 16.0               | 16.1                | 1.23                    | 1.26               | 1.23                | Lin                   |        |
| Left Cheek                        | Estimated SAR   | 0.812                  | 0.980              | 0.943               | 0.999                   | 1.234              | 1.160               | 0.09                  | -      |
|                                   | Full SAR        | -                      | 0.887              | -                   | -                       | 1.117              | -                   |                       |        |
| Left Tilt                         | Estimated SAR   | 0.613                  | 0.673              | 0.739               | 0.754                   | 0.847              | 0.909               | 0.02                  | -      |
|                                   | Full SAR        | -                      | -                  | 0.754               | -                       | -                  | 0.928               |                       |        |
| Right Cheek                       | Estimated SAR   | -                      | 0.367              | -                   | -                       | 0.462              | -                   | 0.02                  | -      |
|                                   | Full SAR        | -                      | 0.389              | -                   | -                       | 0.490              | -                   |                       |        |
| Right Tilt                        | Estimated SAR   | -                      | 0.320              | -                   | -                       | 0.403              | -                   | -                     | -      |
|                                   | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Left Cheek<br>CC-3090             | Estimated SAR   | 0.915                  | 0.973              | 1.020               | 1.126                   | 1.225              | 1.255               | -                     | -      |
|                                   | Full SAR        | -                      | -                  | 1.020               | -                       | -                  | 1.255               |                       |        |
| Left Cheek<br>CC-3090<br>Repeated | Estimated SAR   | -                      | -                  | 1.020               | -                       | -                  | 1.255               | -                     | H5     |
|                                   | Full SAR        | -                      | -                  | 1.020               | -                       | -                  | 1.255               |                       |        |

Individual Head SAR plots are given in Appendix B.

**Simultaneous transmissions: Combined Head 1g SAR results –  
WLAN and Individual band Max results - Antenna 1**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Left Cheek         | 1.255     | 0.224          | 0.196              | 0.103           | 0.291             | - | - | - |
| Left Tilt          | 0.928     | 0.227          | 0.100              | 0.078           | 0.276             | - | - | - |
| Right Cheek        | 0.490     | 0.289          | 0.231              | 0.064           | 0.664             | - | - | - |
| Right Tilt         | 0.403     | 0.135          | 0.108              | 0.038           | 0.185             | - | - | - |

**Simultaneous transmissions: Combined Head 1g SAR results –  
WLAN Max + Max combined results - Antenna 1**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Left Cheek         | <b>1.479</b>               | <b>1.451</b>                   | <b>1.358</b>                | <b>1.546</b>                  | - | - | - | - |
| Left Tilt          | 1.155                      | 1.028                          | 1.006                       | 1.204                         | - | - | - | - |
| Right Cheek        | 0.779                      | 0.721                          | 0.554                       | 1.154                         | - | - | - | - |
| Right Tilt         | 0.538                      | 0.511                          | 0.441                       | 0.588                         | - | - | - | - |

**Simultaneous transmissions: Combined Head 1g SAR results –  
WLAN and Individual band Max results - Antenna 2**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Left Cheek         | 1.255     | 0.292          | 0.301              | 0.449           | 0.170             | - | - | - |
| Left Tilt          | 0.928     | 0.186          | 0.162              | 0.327           | 0.078             | - | - | - |
| Right Cheek        | 0.490     | 0.342          | 0.269              | 0.302           | 0.161             | - | - | - |
| Right Tilt         | 0.403     | 0.171          | 0.139              | 0.203           | 0.180             | - | - | - |

**Simultaneous transmissions: Combined Head 1g SAR results –  
WLAN Max + Max combined results - Antenna 2**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Left Cheek         | <b>1.547</b>               | <b>1.556</b>                   | <b>1.704</b>                | <b>1.425</b>                  | - | - | - | - |
| Left Tilt          | 1.114                      | 1.090                          | 1.255                       | 1.006                         | - | - | - | - |
| Right Cheek        | 0.832                      | 0.759                          | 0.792                       | 0.651                         | - | - | - | - |
| Right Tilt         | 0.574                      | 0.542                          | 0.606                       | 0.583                         | - | - | - | - |

### 7.1.1 Simultaneous Transmission SAR Test Exclusion Considerations for Head Measurements

Simultaneous transmission SAR tests exclusion procedures as described in KDB 447498 D01 v05 is needed for some Head measurements. Following table gives antenna pair SAR to peak location separation ratios for the transmitter combinations for which the sum of simultaneously transmitting 1g SAR was above limit (See "Max+Max Combined results" table in previous section).

| Antenna Pair SAR to Peak Location Separation Ratio |                    |              |
|----------------------------------------------------|--------------------|--------------|
|                                                    | 2-slot<br>GPRS1900 | WLAN<br>2450 |
| X [mm]                                             | 59.0               | 29.8         |
| Y [mm]                                             | 254.1              | 330.4        |
| Z [mm]                                             | -174.2             | -173.3       |
| DISTANCE [mm]                                      | 81.70              |              |
| MAX + MAX (Reported SAR)                           | 1.70               |              |
| SAR to peak location separation ratio              | 0.03               |              |

All simultaneous transmitter configurations where the Antenna Pair SPLSR  $\leq 0.04$ , are excluded from expanded zoom scan testing. For this product no expanded zoom scan testing is required.

### 7.1.2 Combined 1g Head SAR data

**The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.**

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.

The combinations are done for the maximum Head configuration of the each band. Maximum configurations are given in the Max+Max tables in the Section 7.1 of the report.

**Simultaneous transmissions: Reported\* Combined 1g SAR Head results –  
SPEAG Combined Multiband algorithm results for antenna 1**

| Test configuration | 2-slot<br>GPRS850<br>+<br>WLAN<br>2450 | WCDMA<br>850<br>(Band 5)<br>+<br>WLAN<br>2450 | 2-slot<br>GPRS1900<br>+<br>WLAN<br>2450 | LTE<br>2500<br>(Band 7)<br>+<br>WLAN<br>2450 | - | - | - | - |
|--------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------|----------------------------------------------|---|---|---|---|
| Left Cheek         | -                                      | -                                             | -                                       | 1.380                                        | - | - | - | - |
| Left Tilt          | -                                      | -                                             | -                                       | -                                            | - | - | - | - |
| Right Cheek        | -                                      | -                                             | -                                       | -                                            | - | - | - | - |
| Right Tilt         | -                                      | -                                             | -                                       | -                                            | - | - | - | - |

**Simultaneous transmissions: Reported\* Combined 1g SAR Head results –  
SPEAG Combined Multiband algorithm results for antenna 2**

| Test configuration | 2-slot<br>GPRS850<br>+<br>WLAN<br>2450 | WCDMA<br>850<br>(Band 5)<br>+<br>WLAN<br>2450 | 2-slot<br>GPRS1900<br>+<br>WLAN<br>2450 | LTE<br>2500<br>(Band 7)<br>+<br>WLAN<br>2450 | - | - | - | - |
|--------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------|----------------------------------------------|---|---|---|---|
| Left Cheek         | -                                      | 1.340                                         | 1.390                                   | -                                            | - | - | - | - |
| Left Tilt          | -                                      | -                                             | -                                       | -                                            | - | - | - | - |
| Right Cheek        | -                                      | -                                             | -                                       | -                                            | - | - | - | - |
| Right Tilt         | -                                      | -                                             | -                                       | -                                            | - | - | - | - |

WCDMA850 (Band 5) + WLAN2450 has the highest Max + Max result of the 850MHz grouped bands 2-slot GPRS850 and WCDMA850 (Band 5).

Note:

\* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan result is given in Section for the maximum simultaneous transmitter combination.

Speag Combined Multiband Head SAR plots are given in Appendix B.

## 7.2 The measured Body 1.5 cm SAR values for the test device

### 2-slot GPRS850 Body SAR results – Antenna 1

| 2-slot GPRS850      |                 |                        |                     |                     |                         |                     |                     |                       |        |
|---------------------|-----------------|------------------------|---------------------|---------------------|-------------------------|---------------------|---------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 128<br>824.2 MHz    | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz | CH 128<br>824.2 MHz     | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz |                       |        |
|                     |                 |                        |                     |                     |                         |                     |                     |                       |        |
| Upper limit         |                 | 30.4                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power     |                 | 29.7                   | 29.7                | 29.8                | 0.7                     | 0.7                 | 0.6                 | dB                    |        |
| Time-averaged Power |                 | 23.7                   | 23.7                | 23.8                | 1.17                    | 1.17                | 1.15                | Lin                   |        |
| Back                | Estimated SAR   | -                      | 0.215               | -                   | -                       | 0.253               | -                   | -                     | -      |
|                     | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   | -                     | -      |
| Display             | Estimated SAR   | 0.254                  | 0.219               | 0.187               | 0.298                   | 0.257               | 0.215               | 0.00                  | -      |
|                     | Full SAR        | 0.253                  | -                   | -                   | 0.297                   | -                   | -                   |                       |        |

### 2-slot GPRS850 Body SAR results – Antenna 2

| 2-slot GPRS850      |                 |                        |                     |                     |                         |                     |                     |                       |        |
|---------------------|-----------------|------------------------|---------------------|---------------------|-------------------------|---------------------|---------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 128<br>824.2 MHz    | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz | CH 128<br>824.2 MHz     | CH 190<br>836.6 MHz | CH 251<br>848.8 MHz |                       |        |
| Upper limit         |                 | 30.4                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power     |                 | 29.5                   | 29.5                | 29.6                | 0.9                     | 0.9                 | 0.8                 | dB                    |        |
| Time-averaged Power |                 | 23.5                   | 23.5                | 23.6                | 1.23                    | 1.23                | 1.20                | Lin                   |        |
| Back                | Estimated SAR   | 0.301                  | 0.255               | 0.242               | 0.370                   | 0.314               | 0.291               | 0.01                  | B1     |
|                     | Full SAR        | 0.311                  | -                   | -                   | 0.383                   | -                   | -                   |                       |        |
| Display             | Estimated SAR   | -                      | 0.244               | -                   | -                       | 0.300               | -                   | -                     | -      |
|                     | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Back<br>CC-3090     | Estimated SAR   | 0.279                  | 0.247               | 0.218               | 0.343                   | 0.304               | 0.262               | 0.01                  | -      |
|                     | Full SAR        | 0.286                  | -                   | -                   | 0.352                   | -                   | -                   |                       |        |

### WCDMA850 (Band 5) Body SAR results – Antenna 1

| WCDMA850 (Band 5)   |                 |                        |           |           |                         |           |           |                       |        |
|---------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 4132                | CH 4175   | CH 4233   | CH 4132                 | CH 4175   | CH 4233   |                       |        |
|                     |                 | 826.4 MHz              | 835.0 MHz | 846.6 MHz | 826.4 MHz               | 835.0 MHz | 846.6 MHz |                       |        |
| Upper limit         |                 | 23.9                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power     |                 | 23.2                   | 23.3      | 23.2      | 0.7                     | 0.6       | 0.7       | dB                    |        |
| Time-averaged Power |                 | 23.2                   | 23.3      | 23.2      | 1.17                    | 1.15      | 1.17      | Lin                   |        |
| Back                | Estimated SAR   | -                      | 0.189     | -         | -                       | 0.217     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         | -                     | -      |
| Display             | Estimated SAR   | 0.195                  | 0.194     | 0.194     | 0.229                   | 0.223     | 0.228     | 0.00                  | -      |
|                     | Full SAR        | 0.191                  | -         | -         | 0.224                   | -         | -         |                       |        |

### WCDMA850 (Band 5) Body SAR results – Antenna 2

| WCDMA850 (Band 5)   |                 |                        |                   |                   |                         |                   |                   |                       |        |
|---------------------|-----------------|------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 4132 826.4 MHz      | CH 4175 835.0 MHz | CH 4233 846.6 MHz | CH 4132 826.4 MHz       | CH 4175 835.0 MHz | CH 4233 846.6 MHz |                       |        |
|                     |                 |                        |                   |                   |                         |                   |                   |                       |        |
| Upper limit         |                 | 23.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power     |                 | 23.0                   | 23.1              | 23.0              | 0.9                     | 0.8               | 0.9               | dB                    |        |
| Time-averaged Power |                 | 23.0                   | 23.1              | 23.0              | 1.23                    | 1.20              | 1.23              | Lin                   |        |
| Back                | Estimated SAR   | 0.240                  | 0.248             | 0.257             | 0.295                   | 0.298             | 0.316             | 0.00                  | B2     |
|                     | Full SAR        | -                      | -                 | 0.260             | -                       | -                 | 0.320             |                       |        |
| Display             | Estimated SAR   | -                      | 0.221             | -                 | -                       | 0.266             | -                 | -                     | -      |
|                     | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Back CC-3090        | Estimated SAR   | 0.222                  | 0.226             | 0.233             | 0.273                   | 0.272             | 0.287             | 0.00                  | -      |
|                     | Full SAR        | -                      | -                 | 0.237             | -                       | -                 | 0.292             |                       |        |

### 2-slot GPRS1900 Body SAR results – Antenna 1

| 2-slot GPRS1900     |                 |                        |            |            |                         |            |            |                       |        |
|---------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 512                 | CH 661     | CH 810     | CH 512                  | CH 661     | CH 810     |                       |        |
|                     |                 | 1850.2 MHz             | 1880.0 MHz | 1909.8 MHz | 1850.2 MHz              | 1880.0 MHz | 1909.8 MHz |                       |        |
| Upper limit         |                 | 28.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power     |                 | 28.6                   | 28.6       | 28.6       | 0.3                     | 0.3        | 0.3        | dB                    |        |
| Time-averaged Power |                 | 22.6                   | 22.6       | 22.6       | 1.07                    | 1.07       | 1.07       | Lin                   |        |
| Back                | Estimated SAR   | 0.229                  | 0.185      | 0.175      | 0.245                   | 0.198      | 0.188      | 0.02                  | -      |
|                     | Full SAR        | 0.244                  | -          | -          | 0.261                   | -          | -          |                       |        |
| Display             | Estimated SAR   | -                      | 0.153      | -          | -                       | 0.164      | -          | -                     | -      |
|                     | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |

### 2-slot GPRS1900 Body SAR results – Antenna 2

| 2-slot GPRS1900     |                 |                        |                   |                   |                         |                   |                   |                       |        |
|---------------------|-----------------|------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 512 1850.2 MHz      | CH 661 1880.0 MHz | CH 810 1909.8 MHz | CH 512 1850.2 MHz       | CH 661 1880.0 MHz | CH 810 1909.8 MHz |                       |        |
|                     |                 |                        |                   |                   |                         |                   |                   |                       |        |
| Upper limit         |                 | 28.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power     |                 | 28.2                   | 28.2              | 28.2              | 0.7                     | 0.7               | 0.7               | dB                    |        |
| Time-averaged Power |                 | 22.2                   | 22.2              | 22.2              | 1.17                    | 1.17              | 1.17              | Lin                   |        |
| Back                | Estimated SAR   | -                      | 0.296             | -                 | -                       | 0.348             | -                 | -                     | -      |
|                     | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Display             | Estimated SAR   | 0.300                  | 0.299             | 0.290             | 0.352                   | 0.351             | 0.341             | 0.01                  | B3     |
|                     | Full SAR        | 0.306                  | -                 | -                 | 0.360                   | -                 | -                 |                       |        |
| Display CC-3090     | Estimated SAR   | 0.163                  | 0.135             | 0.142             | 0.192                   | 0.159             | 0.167             | 0.01                  | -      |
|                     | Full SAR        | 0.175                  | -                 | -                 | 0.206                   | -                 | -                 |                       |        |

### LTE2500 (Band 7) Body SAR results – Antenna 1

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |            |            |                         |            |            |                       |        |
|----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 22.4                   | 22.3       | 22.2       | 0.5                     | 0.6        | 0.7        | dB                    |        |
| Time-averaged Power                                      |                 | 22.4                   | 22.3       | 22.2       | 1.12                    | 1.15       | 1.17       | Lin                   |        |
| Back                                                     | Estimated SAR   | 0.267                  | -          | -          | 0.300                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                  | Estimated SAR   | 0.344                  | -          | -          | 0.386                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | 0.344                  | -          | -          | 0.386                   | -          | -          | -                     | -      |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 21.3                   | 21.5       | 21.3       | 0.6                     | 0.4        | 0.6        | dB                    |        |
| Time-averaged Power                                      |                 | 21.3                   | 21.5       | 21.3       | 1.15                    | 1.10       | 1.15       | Lin                   |        |
| Back                                                     | Estimated SAR   | -                      | 0.230      | -          | -                       | 0.252      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                  | Estimated SAR   | -                      | 0.290      | -          | -                       | 0.318      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |

### LTE2500 (Band 7) Body SAR results – Antenna 2

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |            |            |                         |            |            |                       |        |
|----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 21.9                   | 21.8       | 21.7       | 1.0                     | 1.1        | 1.2        | dB                    |        |
| Time-averaged Power                                      |                 | 21.9                   | 21.8       | 21.7       | 1.26                    | 1.29       | 1.32       | Lin                   |        |
| Back                                                     | Estimated SAR   | 0.348                  | -          | -          | 0.438                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                  | Estimated SAR   | 0.450                  | -          | -          | 0.567                   | -          | -          | 0.01                  | B4     |
|                                                          | Full SAR        | 0.460                  | -          | -          | 0.579                   | -          | -          |                       |        |
| Display CC-3090                                          | Estimated SAR   | 0.411                  | -          | -          | 0.517                   | -          | -          | 0.01                  | -      |
|                                                          | Full SAR        | 0.424                  | -          | -          | 0.534                   | -          | -          |                       |        |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 20.8                   | 21.0       | 20.8       | 1.1                     | 0.9        | 1.1        | dB                    |        |
| Time-averaged Power                                      |                 | 20.8                   | 21.0       | 20.8       | 1.29                    | 1.23       | 1.29       | Lin                   |        |
| Back                                                     | Estimated SAR   | -                      | 0.295      | -          | -                       | 0.363      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                  | Estimated SAR   | -                      | 0.351      | -          | -                       | 0.432      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |

### WLAN2450 Body SAR results

| WLAN2450 b-mode BPSK 1 Mbps |                 |                        |            |            |                         |            |            |                       |        |
|-----------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation          | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                             |                 | CH 1                   | CH 6       | CH 11      | CH 1                    | CH 6       | CH 11      |                       |        |
|                             |                 | 2412.0 MHz             | 2437.0 MHz | 2462.0 MHz | 2412.0 MHz              | 2437.0 MHz | 2462.0 MHz |                       |        |
| Upper limit                 |                 | 17.0                   | 17.0       | 17.0       | Scaling factor*         |            |            |                       |        |
| Conducted Power             |                 | 16.1                   | 16.0       | 16.1       | 0.9                     | 1.0        | 0.9        | dB                    |        |
| Time-averaged Power         |                 | 16.1                   | 16.0       | 16.1       | 1.23                    | 1.26       | 1.23       | Lin                   |        |
| Back                        | Estimated SAR   | -                      | 0.070      | -          | -                       | 0.088      | -          | -                     | -      |
|                             | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Display                     | Estimated SAR   | 0.072                  | 0.081      | 0.094      | 0.089                   | 0.102      | 0.116      | 0.00                  | B5     |
|                             | Full SAR        | -                      | -          | 0.092      | -                       | -          | 0.113      |                       |        |
| Display CC-3090             | Estimated SAR   | 0.067                  | 0.077      | 0.085      | 0.082                   | 0.097      | 0.104      | 0.00                  | -      |
|                             | Full SAR        | -                      | -          | 0.080      | -                       | -          | 0.098      |                       |        |

Individual Body SAR plots are given Appendix B.

**Simultaneous transmissions: Combined Body 1g SAR results –  
WLAN and Individual band Max results - Antenna 1**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Back               | 0.088     | 0.253          | 0.217              | 0.261           | 0.300             | - | - | - |
| Display            | 0.113     | 0.297          | 0.224              | 0.164           | 0.386             | - | - | - |

**Simultaneous transmissions: Combined Body 1g SAR results –  
WLAN Max + Max combined results - Antenna 1**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Back               | 0.341                      | 0.305                          | <b>0.349</b>                | 0.388                         | - | - | - | - |
| Display            | <b>0.410</b>               | <b>0.337</b>                   | 0.277                       | <b>0.499</b>                  | - | - | - | - |

**Simultaneous transmissions: Combined Body 1g SAR results –  
WLAN and Individual band Max results - Antenna 2**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Back               | 0.088     | 0.383          | 0.320              | 0.348           | 0.438             | - | - | - |
| Display            | 0.113     | 0.300          | 0.266              | 0.360           | 0.579             | - | - | - |

**Simultaneous transmissions: Combined Body 1g SAR results –  
WLAN Max + Max combined results - Antenna 2**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Back               | <b>0.471</b>               | <b>0.408</b>                   | 0.436                       | 0.526                         | - | - | - | - |
| Display            | 0.413                      | 0.379                          | <b>0.473</b>                | <b>0.692</b>                  | - | - | - | - |

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

## 7.2.1 Combined 1g Body SAR data

**The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.**

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.

The combinations are done for the maximum Body configuration of the each band. Maximum configurations are given in the Max+Max tables in the Section 7.2 of the report.

**Simultaneous transmissions: Reported\* Combined 1g SAR Body results –  
SPEAG Combined Multiband algorithm results for Antenna 2**

| Test configuration | 2-slot GPRS850<br>+<br>WLAN 2450 | WCDMA 850 (Band 5)<br>+<br>WLAN 2450 | 2-slot GPRS1900<br>+<br>WLAN 2450 | LTE 2500 (Band 7)<br>+<br>WLAN 2450 | - | - | - | - |
|--------------------|----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|---|---|---|---|
| Back               | 0.379                            | -                                    | -                                 | -                                   | - | - | - | - |
| Display            | -                                | -                                    | 0.372                             | 0.579                               | - | - | - | - |

WCDMA850 (Band 5) + WLAN2450 has the highest Max + Max result of the 850MHz grouped bands 2-slot GPRS850 and WCDMA850 (Band 5).

Note:

\* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan result is given in Section for the maximum simultaneous transmitter combination.

### 7.3 The measured Body 1.0 cm SAR values of Wireless Router mode for the test device

2-slot GPRS850 Wireless Router SAR results – Antenna 1

| 2-slot GPRS850      |                 |                        |                  |                  |                         |                  |                  |                       |        |
|---------------------|-----------------|------------------------|------------------|------------------|-------------------------|------------------|------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                  |                  | Reported* 1g SAR [W/kg] |                  |                  | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 128 824.2 MHz       | CH 190 836.6 MHz | CH 251 848.8 MHz | CH 128 824.2 MHz        | CH 190 836.6 MHz | CH 251 848.8 MHz |                       |        |
|                     |                 |                        |                  |                  |                         |                  |                  |                       |        |
| Upper limit         |                 | 30.4                   |                  |                  | Scaling factor*         |                  |                  |                       |        |
| Conducted Power     |                 | 29.7                   | 29.7             | 29.8             | 0.7                     | 0.7              | 0.6              | dB                    |        |
| Time-averaged Power |                 | 23.7                   | 23.7             | 23.8             | 1.17                    | 1.17             | 1.15             | Lin                   |        |
| Back                | Estimated SAR   | -                      | 0.365            | -                | -                       | 0.429            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Display             | Estimated SAR   | 0.433                  | 0.377            | 0.328            | 0.509                   | 0.443            | 0.377            | 0.02                  | -      |
|                     | Full SAR        | 0.415                  | -                | -                | 0.488                   | -                | -                |                       |        |
| Top                 | Estimated SAR   | -                      | 0.014            | -                | -                       | 0.017            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Bottom              | Estimated SAR   | -                      | 0.253            | -                | -                       | 0.297            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Left                | Estimated SAR   | -                      | 0.145            | -                | -                       | 0.170            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Right               | Estimated SAR   | -                      | 0.227            | -                | -                       | 0.267            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |

2-slot GPRS850 Wireless Router SAR results – Antenna 2

| 2-slot GPRS850      |                 |                        |                  |                  |                         |                  |                  |                       |        |
|---------------------|-----------------|------------------------|------------------|------------------|-------------------------|------------------|------------------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                  |                  | Reported* 1g SAR [W/kg] |                  |                  | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 128 824.2 MHz       | CH 190 836.6 MHz | CH 251 848.8 MHz | CH 128 824.2 MHz        | CH 190 836.6 MHz | CH 251 848.8 MHz |                       |        |
| Upper limit         |                 | 30.4                   |                  |                  | Scaling factor*         |                  |                  |                       |        |
| Conducted Power     |                 | 29.5                   | 29.5             | 29.6             | 0.9                     | 0.9              | 0.8              | dB                    |        |
| Time-averaged Power |                 | 23.5                   | 23.5             | 23.6             | 1.23                    | 1.23             | 1.20             | Lin                   |        |
| Back                | Estimated SAR   | 0.482                  | 0.408            | 0.371            | 0.593                   | 0.502            | 0.446            | 0.02                  | W1     |
|                     | Full SAR        | 0.467                  | -                | -                | 0.575                   | -                | -                |                       |        |
| Display             | Estimated SAR   | -                      | 0.401            | -                | -                       | 0.493            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Top                 | Estimated SAR   | -                      | 0.018            | -                | -                       | 0.022            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Bottom              | Estimated SAR   | -                      | 0.236            | -                | -                       | 0.290            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Left                | Estimated SAR   | -                      | 0.259            | -                | -                       | 0.319            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Right               | Estimated SAR   | -                      | 0.196            | -                | -                       | 0.241            | -                | -                     | -      |
|                     | Full SAR        | -                      | -                | -                | -                       | -                | -                |                       |        |
| Back CC-3090        | Estimated SAR   | 0.451                  | 0.396            | 0.344            | 0.555                   | 0.487            | 0.414            | 0.01                  | -      |
|                     | Full SAR        | 0.439                  | -                | -                | 0.540                   | -                | -                |                       |        |

### WCDMA850 (Band 5) Wireless Router SAR results – Antenna 1

| WCDMA850 (Band 5)   |                 |                        |                      |                      |                         |                      |                      |                          |        |
|---------------------|-----------------|------------------------|----------------------|----------------------|-------------------------|----------------------|----------------------|--------------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |                      |                      | Reported* 1g SAR [W/kg] |                      |                      | Max Deviation*<br>[W/kg] | Plot # |
|                     |                 | CH 4132<br>826.4 MHz   | CH 4175<br>835.0 MHz | CH 4233<br>846.6 MHz | CH 4132<br>826.4 MHz    | CH 4175<br>835.0 MHz | CH 4233<br>846.6 MHz |                          |        |
| Upper limit         |                 | 23.9                   |                      |                      | Scaling factor*         |                      |                      |                          |        |
| Conducted Power     |                 | 23.2                   | 23.3                 | 23.2                 | 0.7                     | 0.6                  | 0.7                  | dB                       |        |
| Time-averaged Power |                 | 23.2                   | 23.3                 | 23.2                 | 1.17                    | 1.15                 | 1.17                 | Lin                      |        |
| Back                | Estimated SAR   | -                      | 0.338                | -                    | -                       | 0.388                | -                    | -                        | -      |
|                     | Full SAR        | -                      | -                    | -                    | -                       | -                    | -                    |                          |        |
| Display             | Estimated SAR   | 0.331                  | 0.340                | 0.347                | 0.389                   | 0.390                | 0.408                | 0.02                     | -      |
|                     | Full SAR        | -                      | -                    | 0.328                | -                       | -                    | 0.385                |                          |        |
| Top                 | Estimated SAR   | -                      | 0.015                | -                    | -                       | 0.017                | -                    | -                        | -      |
|                     | Full SAR        | -                      | -                    | -                    | -                       | -                    | -                    |                          |        |
| Bottom              | Estimated SAR   | -                      | 0.228                | -                    | -                       | 0.262                | -                    | -                        | -      |
|                     | Full SAR        | -                      | -                    | -                    | -                       | -                    | -                    |                          |        |
| Left                | Estimated SAR   | -                      | 0.121                | -                    | -                       | 0.139                | -                    | -                        | -      |
|                     | Full SAR        | -                      | -                    | -                    | -                       | -                    | -                    |                          |        |
| Right               | Estimated SAR   | -                      | 0.192                | -                    | -                       | 0.220                | -                    | -                        | -      |
|                     | Full SAR        | -                      | -                    | -                    | -                       | -                    | -                    |                          |        |

### WCDMA850 (Band 5) Wireless Router SAR results – Antenna 2

| WCDMA850 (Band 5)   |                 |                        |           |           |                         |           |           |                       |        |
|---------------------|-----------------|------------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg] |           |           | Reported* 1g SAR [W/kg] |           |           | Max Deviation* [W/kg] | Plot # |
|                     |                 | CH 4132                | CH 4175   | CH 4233   | CH 4132                 | CH 4175   | CH 4233   |                       |        |
|                     |                 | 826.4 MHz              | 835.0 MHz | 846.6 MHz | 826.4 MHz               | 835.0 MHz | 846.6 MHz |                       |        |
| Upper limit         |                 | 23.9                   |           |           | Scaling factor*         |           |           |                       |        |
| Conducted Power     |                 | 23.0                   | 23.1      | 23.0      | 0.9                     | 0.8       | 0.9       | dB                    |        |
| Time-averaged Power |                 | 23.0                   | 23.1      | 23.0      | 1.23                    | 1.20      | 1.23      | Lin                   |        |
| Back                | Estimated SAR   | 0.416                  | 0.414     | 0.428     | 0.512                   | 0.498     | 0.527     | 0.02                  | W2     |
|                     | Full SAR        | -                      | -         | 0.413     | -                       | -         | 0.508     |                       |        |
| Display             | Estimated SAR   | -                      | 0.392     | -         | -                       | 0.471     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         |                       |        |
| Top                 | Estimated SAR   | -                      | 0.021     | -         | -                       | 0.025     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         |                       |        |
| Bottom              | Estimated SAR   | -                      | 0.217     | -         | -                       | 0.261     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         |                       |        |
| Left                | Estimated SAR   | -                      | 0.228     | -         | -                       | 0.274     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         |                       |        |
| Right               | Estimated SAR   | -                      | 0.170     | -         | -                       | 0.204     | -         | -                     | -      |
|                     | Full SAR        | -                      | -         | -         | -                       | -         | -         |                       |        |
| Back CC-3090        | Estimated SAR   | 0.384                  | 0.388     | 0.398     | 0.472                   | 0.466     | 0.490     | 0.01                  | -      |
|                     | Full SAR        | -                      | -         | 0.389     | -                       | -         | 0.479     |                       |        |

### 2-slot GPRS1900 Wireless Router SAR results – Antenna 1

| 2-slot GPRS1900     |                 |                         |                         |                         |                         |                         |                         |                          |        |
|---------------------|-----------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------|
| Device orientation  | SAR measurement | Measured 1g SAR [W/kg]  |                         |                         | Reported* 1g SAR [W/kg] |                         |                         | Max Deviation*<br>[W/kg] | Plot # |
|                     |                 | CH 512<br>1850.2<br>MHz | CH 661<br>1880.0<br>MHz | CH 810<br>1909.8<br>MHz | CH 512<br>1850.2<br>MHz | CH 661<br>1880.0<br>MHz | CH 810<br>1909.8<br>MHz |                          |        |
| Upper limit         |                 | 28.9                    |                         |                         | Scaling factor*         |                         |                         |                          |        |
| Conducted Power     |                 | 28.6                    | 28.6                    | 28.6                    | 0.3                     | 0.3                     | 0.3                     | dB                       |        |
| Time-averaged Power |                 | 22.6                    | 22.6                    | 22.6                    | 1.07                    | 1.07                    | 1.07                    | Lin                      |        |
| Back                | Estimated SAR   | -                       | 0.359                   | -                       | -                       | 0.385                   | -                       | -                        | -      |
|                     | Full SAR        | -                       | -                       | -                       | -                       | -                       | -                       |                          |        |
| Display             | Estimated SAR   | -                       | 0.398                   | -                       | -                       | 0.426                   | -                       | -                        | -      |
|                     | Full SAR        | -                       | -                       | -                       | -                       | -                       | -                       |                          |        |
| Top                 | Estimated SAR   | -                       | 0.011                   | -                       | -                       | 0.011                   | -                       | -                        | -      |
|                     | Full SAR        | -                       | -                       | -                       | -                       | -                       | -                       |                          |        |
| Bottom              | Estimated SAR   | 0.469                   | 0.411                   | 0.430                   | 0.503                   | 0.440                   | 0.461                   | 0.01                     | -      |
|                     | Full SAR        | 0.479                   | -                       | -                       | 0.513                   | -                       | -                       |                          |        |
| Left                | Estimated SAR   | -                       | 0.054                   | -                       | -                       | 0.058                   | -                       | -                        | -      |
|                     | Full SAR        | -                       | -                       | -                       | -                       | -                       | -                       |                          |        |
| Right               | Estimated SAR   | -                       | 0.109                   | -                       | -                       | 0.117                   | -                       | -                        | -      |
|                     | Full SAR        | -                       | -                       | -                       | -                       | -                       | -                       |                          |        |

### 2-slot GPRS1900 Wireless Router SAR results – Antenna 2

| 2-slot GPRS1900 Wireless Router SAR Results - Part 2 |                 |                        |                   |                   |                         |                   |                   |                       |        |
|------------------------------------------------------|-----------------|------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-----------------------|--------|
| Device orientation                                   | SAR measurement | Measured 1g SAR [W/kg] |                   |                   | Reported* 1g SAR [W/kg] |                   |                   | Max Deviation* [W/kg] | Plot # |
|                                                      |                 | CH 512 1850.2 MHz      | CH 661 1880.0 MHz | CH 810 1909.8 MHz | CH 512 1850.2 MHz       | CH 661 1880.0 MHz | CH 810 1909.8 MHz |                       |        |
| Upper limit                                          |                 | 28.9                   |                   |                   | Scaling factor*         |                   |                   |                       |        |
| Conducted Power                                      |                 | 28.2                   | 28.2              | 28.2              | 0.7                     | 0.7               | 0.7               | dB                    |        |
| Time-averaged Power                                  |                 | 22.2                   | 22.2              | 22.2              | 1.17                    | 1.17              | 1.17              | Lin                   |        |
| Back                                                 | Estimated SAR   | 0.571                  | 0.681             | 0.554             | 0.671                   | 0.800             | 0.651             | 0.06                  | W3     |
|                                                      | Full SAR        | -                      | 0.618             | -                 | -                       | 0.726             | -                 |                       |        |
| Display                                              | Estimated SAR   | 0.567                  | 0.709             | 0.544             | 0.666                   | 0.833             | 0.639             | 0.13                  | -      |
|                                                      | Full SAR        | 0.577                  | 0.577             | 0.550             | 0.678                   | 0.678             | 0.646             |                       |        |
| Top                                                  | Estimated SAR   | -                      | 0.042             | -                 | -                       | 0.049             | -                 | -                     | -      |
|                                                      | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Bottom                                               | Estimated SAR   | -                      | 0.420             | -                 | -                       | 0.493             | -                 | 0.02                  | -      |
|                                                      | Full SAR        | -                      | 0.405             | -                 | -                       | 0.476             | -                 |                       |        |
| Left                                                 | Estimated SAR   | -                      | 0.341             | -                 | -                       | 0.401             | -                 | -                     | -      |
|                                                      | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Right                                                | Estimated SAR   | -                      | 0.112             | -                 | -                       | 0.132             | -                 | -                     | -      |
|                                                      | Full SAR        | -                      | -                 | -                 | -                       | -                 | -                 |                       |        |
| Back CC-3090                                         | Estimated SAR   | 0.579                  | 0.578             | 0.554             | 0.680                   | 0.679             | 0.651             | 0.03                  | -      |
|                                                      | Full SAR        | 0.610                  | -                 | -                 | 0.717                   | -                 | -                 |                       |        |

### LTE2500 (Band 7) Wireless Router SAR results – Antenna 1

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 0  |                 |                        |            |            |                         |            |            |                       |        |
|----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 22.1                   | 22.3       | 22.3       | 0.8                     | 0.6        | 0.6        | dB                    |        |
| Time-averaged Power                                      |                 | 22.1                   | 22.3       | 22.3       | 1.20                    | 1.15       | 1.15       | Lin                   |        |
| Bottom                                                   | Estimated SAR   | -                      | -          | 0.893      | -                       | -          | 1.025      | 0.01                  | -      |
|                                                          | Full SAR        | -                      | -          | 0.900      | -                       | -          | 1.033      |                       |        |
| Repeated                                                 | Estimated SAR   | -                      | -          | 0.891      | -                       | -          | 1.023      | 0.01                  | -      |
|                                                          | Full SAR        | -                      | -          | 0.902      | -                       | -          | 1.036      |                       |        |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                          |                 | 22.4                   | 22.3       | 22.2       | 0.5                     | 0.6        | 0.7        | dB                    |        |
| Time-averaged Power                                      |                 | 22.4                   | 22.3       | 22.2       | 1.12                    | 1.15       | 1.17       | Lin                   |        |
| Back                                                     | Estimated SAR   | 0.483                  | -          | -          | 0.542                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Display                                                  | Estimated SAR   | 0.528                  | -          | -          | 0.592                   | -          | -          | 0.01                  | -      |
|                                                          | Full SAR        | 0.535                  | -          | -          | 0.600                   | -          | -          |                       |        |
| Top                                                      | Estimated SAR   | 0.012                  | -          | -          | 0.014                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Bottom                                                   | Estimated SAR   | 0.698                  | 0.827      | -          | 0.783                   | 0.950      | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Left                                                     | Estimated SAR   | 0.027                  | -          | -          | 0.030                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |
| Right                                                    | Estimated SAR   | 0.382                  | -          | -          | 0.429                   | -          | -          | -                     | -      |
|                                                          | Full SAR        | -                      | -          | -          | -                       | -          | -          |                       |        |

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0  |                 |                        |            |            |                         |            |            |                       |        |
|-----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                        | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                           |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                           |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                               |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                           |                 | 21.3                   | 21.5       | 21.3       | 0.6                     | 0.4        | 0.6        | dB                    |        |
| Time-averaged Power                                       |                 | 21.3                   | 21.5       | 21.3       | 1.15                    | 1.10       | 1.15       | Lin                   |        |
| Back                                                      | Estimated SAR   | -                      | 0.395      | -          | -                       | 0.433      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                   | Estimated SAR   | -                      | 0.454      | -          | -                       | 0.498      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Top                                                       | Estimated SAR   | -                      | 0.047      | -          | -                       | 0.052      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Bottom                                                    | Estimated SAR   | -                      | 0.643      | -          | -                       | 0.705      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Left                                                      | Estimated SAR   | -                      | 0.026      | -          | -                       | 0.028      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right                                                     | Estimated SAR   | -                      | 0.360      | -          | -                       | 0.395      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 100 RB - Offset 0 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                        | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                           |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                           |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                               |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                           |                 | 21.3                   | 21.4       | 21.3       | 0.6                     | 0.5        | 0.6        | dB                    |        |
| Time-averaged Power                                       |                 | 21.3                   | 21.4       | 21.3       | 1.15                    | 1.12       | 1.15       | Lin                   |        |
| Bottom                                                    | Estimated SAR   | -                      | 0.650      | -          | -                       | 0.729      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |

### LTE2500 (Band 7) Wireless Router SAR results – Antenna 2

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 0  |                 |                        |                     |                     |                         |                     |                     |                       |        |
|----------------------------------------------------------|-----------------|------------------------|---------------------|---------------------|-------------------------|---------------------|---------------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850 2510.0 MHz    | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz | CH 20850 2510.0 MHz     | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power                                          |                 | 21.6                   | 21.8                | 21.8                | 1.3                     | 1.1                 | 1.1                 | dB                    |        |
| Time-averaged Power                                      |                 | 21.6                   | 21.8                | 21.8                | 1.35                    | 1.29                | 1.29                | Lin                   |        |
| Display                                                  | Estimated SAR   | -                      | -                   | 0.878               | -                       | -                   | 1.131               | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Bottom                                                   | Estimated SAR   | -                      | -                   | 1.020               | -                       | -                   | 1.314               | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Bottom CC-3090                                           | Estimated SAR   | -                      | -                   | 1.080               | -                       | -                   | 1.391               | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                        |                     |                     |                         |                     |                     |                       |        |
| Device orientation                                       | SAR measurement | Measured 1g SAR [W/kg] |                     |                     | Reported* 1g SAR [W/kg] |                     |                     | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850 2510.0 MHz    | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz | CH 20850 2510.0 MHz     | CH 21100 2535.0 MHz | CH 21350 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                   |                     |                     | Scaling factor*         |                     |                     |                       |        |
| Conducted Power                                          |                 | 21.9                   | 21.8                | 21.7                | 1.0                     | 1.1                 | 1.2                 | dB                    |        |
| Time-averaged Power                                      |                 | 21.9                   | 21.8                | 21.7                | 1.26                    | 1.29                | 1.32                | Lin                   |        |
| Back                                                     | Estimated SAR   | 0.536                  | -                   | -                   | 0.675                   | -                   | -                   | 0.07                  | -      |
|                                                          | Full SAR        | 0.603                  | -                   | -                   | 0.759                   | -                   | -                   |                       |        |
| Display                                                  | Estimated SAR   | 0.956                  | 0.885               | -                   | 1.204                   | 1.140               | -                   | 0.01                  | -      |
|                                                          | Full SAR        | 0.946                  | -                   | -                   | 1.191                   | -                   | -                   |                       |        |
| Top                                                      | Estimated SAR   | 0.017                  | -                   | -                   | 0.022                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Bottom                                                   | Estimated SAR   | 1.110                  | 1.010               | -                   | 1.397                   | 1.301               | -                   | 0.01                  | -      |
|                                                          | Full SAR        | 1.100                  | -                   | -                   | 1.385                   | -                   | -                   |                       |        |
| Left                                                     | Estimated SAR   | 0.239                  | -                   | -                   | 0.301                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Right                                                    | Estimated SAR   | 0.164                  | -                   | -                   | 0.206                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | -                      | -                   | -                   | -                       | -                   | -                   |                       |        |
| Bottom CC-3090                                           | Estimated SAR   | 1.130                  | 1.090               | -                   | 1.423                   | 1.404               | -                   | 0.01                  | W4     |
|                                                          | Full SAR        | 1.140                  | -                   | -                   | 1.435                   | -                   | -                   |                       |        |
| Bottom Repeated                                          | Estimated SAR   | 1.100                  | -                   | -                   | 1.385                   | -                   | -                   | 0.01                  | -      |
|                                                          | Full SAR        | 1.110                  | -                   | -                   | 1.397                   | -                   | -                   |                       |        |
| Bottom CC-3090 Repeated                                  | Estimated SAR   | 1.040                  | -                   | -                   | 1.309                   | -                   | -                   | -                     | -      |
|                                                          | Full SAR        | 1.040                  | -                   | -                   | 1.309                   | -                   | -                   |                       |        |

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 50 RB - Offset 0  |                 |                        |            |            |                         |            |            |                       |        |
|-----------------------------------------------------------|-----------------|------------------------|------------|------------|-------------------------|------------|------------|-----------------------|--------|
| Device orientation                                        | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                           |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                           |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                               |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                           |                 | 20.8                   | 21.0       | 20.8       | 1.1                     | 0.9        | 1.1        | dB                    |        |
| Time-averaged Power                                       |                 | 20.8                   | 21.0       | 20.8       | 1.29                    | 1.23       | 1.29       | Lin                   |        |
| Back                                                      | Estimated SAR   | -                      | 0.479      | -          | -                       | 0.589      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Display                                                   | Estimated SAR   | 0.667                  | 0.724      | 0.704      | 0.859                   | 0.891      | 0.907      | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Top                                                       | Estimated SAR   | -                      | 0.013      | -          | -                       | 0.016      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Bottom                                                    | Estimated SAR   | 0.716                  | 0.810      | 0.741      | 0.922                   | 0.997      | 0.955      | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Left                                                      | Estimated SAR   | -                      | 0.203      | -          | -                       | 0.250      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Right                                                     | Estimated SAR   | -                      | 0.094      | -          | -                       | 0.116      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 100 RB - Offset 0 |                 |                        |            |            |                         |            |            |                       |        |
| Device orientation                                        | SAR measurement | Measured 1g SAR [W/kg] |            |            | Reported* 1g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                           |                 | CH 20850               | CH 21100   | CH 21350   | CH 20850                | CH 21100   | CH 21350   |                       |        |
|                                                           |                 | 2510.0 MHz             | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                               |                 | 21.9                   |            |            | Scaling factor*         |            |            |                       |        |
| Conducted Power                                           |                 | 20.8                   | 20.9       | 20.8       | 1.1                     | 1.0        | 1.1        | dB                    |        |
| Time-averaged Power                                       |                 | 20.8                   | 20.9       | 20.8       | 1.29                    | 1.26       | 1.29       | Lin                   |        |
| Display                                                   | Estimated SAR   | -                      | 0.725      | -          | -                       | 0.913      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |
| Bottom                                                    | Estimated SAR   | -                      | 0.790      | -          | -                       | 0.995      | -          | -                     | -      |
|                                                           | Full SAR        | -                      | -          | -          | -                       | -          | -          | -                     | -      |

# WLAN2450 Wireless Router SAR results

| WLAN2450 b-mode BPSK 1 Mbps |                 |                        |                    |                     |                         |                    |                     |                       |        |
|-----------------------------|-----------------|------------------------|--------------------|---------------------|-------------------------|--------------------|---------------------|-----------------------|--------|
| Device orientation          | SAR measurement | Measured 1g SAR [W/kg] |                    |                     | Reported* 1g SAR [W/kg] |                    |                     | Max Deviation* [W/kg] | Plot # |
|                             |                 | CH 1<br>2412.0 MHz     | CH 6<br>2437.0 MHz | CH 11<br>2462.0 MHz | CH 1<br>2412.0 MHz      | CH 6<br>2437.0 MHz | CH 11<br>2462.0 MHz |                       |        |
| Upper limit                 |                 | 17.0                   | 17.0               | 17.0                | Scaling factor*         |                    |                     |                       |        |
| Conducted Power             |                 | 16.1                   | 16.0               | 16.1                | 0.9                     | 1.0                | 0.9                 | dB                    |        |
| Time-averaged Power         |                 | 16.1                   | 16.0               | 16.1                | 1.23                    | 1.26               | 1.23                | Lin                   |        |
| Back                        | Estimated SAR   | 0.157                  | 0.176              | 0.193               | 0.193                   | 0.222              | 0.237               | 0.00                  | -      |
|                             | Full SAR        | -                      | -                  | 0.191               | -                       | -                  | 0.235               |                       |        |
| Display                     | Estimated SAR   | -                      | 0.162              | -                   | -                       | 0.204              | -                   | -                     | -      |
|                             | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Top                         | Estimated SAR   | -                      | 0.079              | -                   | -                       | 0.099              | -                   | -                     | -      |
|                             | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Bottom                      | Estimated SAR   | -                      | 0.012              | -                   | -                       | 0.015              | -                   | -                     | -      |
|                             | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Left                        | Estimated SAR   | -                      | 0.026              | -                   | -                       | 0.033              | -                   | -                     | -      |
|                             | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Right                       | Estimated SAR   | -                      | 0.093              | -                   | -                       | 0.118              | -                   | -                     | -      |
|                             | Full SAR        | -                      | -                  | -                   | -                       | -                  | -                   |                       |        |
| Back<br>CC-3090             | Estimated SAR   | 0.167                  | 0.183              | 0.207               | 0.205                   | 0.230              | 0.255               | 0.01                  | W5     |
|                             | Full SAR        | -                      | -                  | 0.201               | -                       | -                  | 0.247               |                       |        |

Individual Wireless Router SAR plots are given in Appendix B.

**Simultaneous transmissions: Combined Wireless Router 1g SAR results –  
WLAN and Individual band Max results - Antenna 1**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Back               | 0.247     | 0.429          | 0.388              | 0.385           | 0.542             | - | - | - |
| Display            | 0.204     | 0.488          | 0.385              | 0.426           | 0.600             | - | - | - |
| Top                | 0.099     | 0.017          | 0.017              | 0.011           | 0.052             | - | - | - |
| Bottom             | 0.015     | 0.297          | 0.262              | 0.513           | 1.036             | - | - | - |
| Left               | 0.033     | 0.170          | 0.139              | 0.058           | 0.030             | - | - | - |
| Right              | 0.118     | 0.267          | 0.220              | 0.117           | 0.429             | - | - | - |

**Simultaneous transmissions: Combined Wireless Router 1g SAR results –  
WLAN Max + Max combined results - Antenna 1**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Back               | 0.676                      | <b>0.635</b>                   | <b>0.632</b>                | 0.789                         | - | - | - | - |
| Display            | <b>0.692</b>               | 0.589                          | 0.630                       | 0.804                         | - | - | - | - |
| Top                | 0.116                      | 0.116                          | 0.110                       | 0.151                         | - | - | - | - |
| Bottom             | 0.312                      | 0.277                          | 0.528                       | <b>1.051</b>                  | - | - | - | - |
| Left               | 0.203                      | 0.172                          | 0.091                       | 0.063                         | - | - | - | - |
| Right              | 0.385                      | 0.338                          | 0.235                       | 0.547                         | - | - | - | - |

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

**Simultaneous transmissions: Combined Wireless Router 1g SAR results –  
WLAN and Individual band Max results - Antenna 2**

| Test configuration | WLAN 2450 | 2-slot GPRS850 | WCDMA 850 (Band 5) | 2-slot GPRS1900 | LTE 2500 (Band 7) | - | - | - |
|--------------------|-----------|----------------|--------------------|-----------------|-------------------|---|---|---|
| Back               | 0.247     | 0.575          | 0.508              | 0.726           | 0.759             | - | - | - |
| Display            | 0.204     | 0.493          | 0.471              | 0.678           | 1.191             | - | - | - |
| Top                | 0.099     | 0.022          | 0.025              | 0.049           | 0.022             | - | - | - |
| Bottom             | 0.015     | 0.290          | 0.261              | 0.476           | 1.435             | - | - | - |
| Left               | 0.033     | 0.319          | 0.274              | 0.401           | 0.301             | - | - | - |
| Right              | 0.118     | 0.241          | 0.204              | 0.132           | 0.206             | - | - | - |

**Simultaneous transmissions: Combined Wireless Router 1g SAR results –  
WLAN Max + Max combined results - Antenna 2**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Back               | <b>0.822</b>               | <b>0.755</b>                   | <b>0.973</b>                | 1.006                         | - | - | - | - |
| Display            | 0.697                      | 0.675                          | 0.882                       | 1.395                         | - | - | - | - |
| Top                | 0.121                      | 0.124                          | 0.148                       | 0.121                         | - | - | - | - |
| Bottom             | 0.305                      | 0.276                          | 0.491                       | <b>1.450</b>                  | - | - | - | - |
| Left               | 0.352                      | 0.307                          | 0.434                       | 0.334                         | - | - | - | - |
| Right              | 0.359                      | 0.322                          | 0.250                       | 0.324                         | - | - | - | - |

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product.

### 7.3.1 Combined 1g Wireless Router SAR data

**The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.**

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.

The combinations are done for the maximum Wireless Router configuration of the each band. Maximum configurations are given in the Max+Max tables in the Section 7.3 of the report.

**Simultaneous transmissions: Reported\* Combined 1g SAR Wireless Router results –  
SPEAG Combined Multiband algorithm results for Antenna 2**

| Test configuration | 2-slot GPRS850 + WLAN 2450 | WCDMA 850 (Band 5) + WLAN 2450 | 2-slot GPRS1900 + WLAN 2450 | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - |
|--------------------|----------------------------|--------------------------------|-----------------------------|-------------------------------|---|---|---|---|
| Back               | 0.621                      | -                              | 0.834                       | -                             | - | - | - | - |
| Display            | -                          | -                              | -                           | -                             | - | - | - | - |
| Top                | -                          | -                              | -                           | -                             | - | - | - | - |
| Bottom             | -                          | -                              | -                           | 1.430                         | - | - | - | - |
| Left               | -                          | -                              | -                           | -                             | - | - | - | - |
| Right              | -                          | -                              | -                           | -                             | - | - | - | - |

2-slot GPRS850 + WLAN2450 has the highest Max + Max result of the 850MHz grouped bands 2-slot GPRS850 and WCDMA850 (Band 5).

Maximum of the Combined SAR values, namely 2-slot GPRS850 + WLAN2450, in the above table is less than the maximum SAR value 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 this case, the maximum SAR values given for the combined Mode in the Summary table in Section 1.2.1 is that for the individual cellular band 2-slot GPRS850/individual WLAN2450.

Note:

\* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan result is given in Section for the maximum simultaneous transmitter combination.

7.4 The measured 10-g Extremity 0 cm SAR values for the test device are tabulated below

LTE2500 (Band 7) Extremity SAR results – Antenna 2

| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 0  |                 |                         |            |            |                          |            |            |                       |        |
|----------------------------------------------------------|-----------------|-------------------------|------------|------------|--------------------------|------------|------------|-----------------------|--------|
| Device orientation                                       | SAR measurement | Measured 10g SAR [W/kg] |            |            | Reported* 10g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850                | CH 21100   | CH 21350   | CH 20850                 | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz               | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                    |            |            | Scaling factor*          |            |            |                       |        |
| Conducted Power                                          |                 | 21.6                    | 21.8       | 21.8       | 1.3                      | 1.1        | 1.1        | dB                    |        |
| Time-averaged Power                                      |                 | 21.6                    | 21.8       | 21.8       | 1.35                     | 1.29       | 1.29       | Lin                   |        |
| Bottom                                                   | Estimated SAR   | -                       | -          | 2.240      | -                        | -          | 2.886      | 0.01                  | -      |
|                                                          | Full SAR        | -                       | -          | 2.250      | -                        | -          | 2.899      |                       |        |
| Bottom CC-3090                                           | Estimated SAR   | -                       | -          | 2.350      | -                        | -          | 3.027      | 0.01                  | -      |
|                                                          | Full SAR        | -                       | -          | 2.340      | -                        | -          | 3.015      |                       |        |
| LTE2500 (Band 7) - 20MHz Ch BW - QPSK - 1 RB - Offset 99 |                 |                         |            |            |                          |            |            |                       |        |
| Device orientation                                       | SAR measurement | Measured 10g SAR [W/kg] |            |            | Reported* 10g SAR [W/kg] |            |            | Max Deviation* [W/kg] | Plot # |
|                                                          |                 | CH 20850                | CH 21100   | CH 21350   | CH 20850                 | CH 21100   | CH 21350   |                       |        |
|                                                          |                 | 2510.0 MHz              | 2535.0 MHz | 2560.0 MHz | 2510.0 MHz               | 2535.0 MHz | 2560.0 MHz |                       |        |
| Upper limit                                              |                 | 22.9                    |            |            | Scaling factor*          |            |            |                       |        |
| Conducted Power                                          |                 | 21.9                    | 21.8       | 21.7       | 1.0                      | 1.1        | 1.2        | dB                    |        |
| Time-averaged Power                                      |                 | 21.9                    | 21.8       | 21.7       | 1.26                     | 1.29       | 1.32       | Lin                   |        |
| Bottom                                                   | Estimated SAR   | 2.340                   | 2.180      | -          | 2.946                    | 2.808      | -          | 0.05                  | -      |
|                                                          | Full SAR        | 2.290                   | 2.180      | -          | 2.883                    | 2.808      | -          |                       |        |
| Bottom CC-3090                                           | Estimated SAR   | 2.420                   | 2.320      | -          | 3.047                    | 2.989      | -          | 0.05                  | -      |
|                                                          | Full SAR        | 2.370                   | 2.300      | -          | 2.984                    | 2.963      | -          |                       |        |
| Bottom CC-3090 Repeated                                  | Estimated SAR   | 2.540                   | -          | -          | 3.198                    | -          | -          | 0.05                  | E1     |
|                                                          | Full SAR        | 2.490                   | -          | -          | 3.135                    | -          | -          |                       |        |

### WLAN2450 Extremity SAR results

| WLAN2450 b-mode BPSK 1 Mbps |                 |                         |                       |                        |                          |                       |                        |                       |        |
|-----------------------------|-----------------|-------------------------|-----------------------|------------------------|--------------------------|-----------------------|------------------------|-----------------------|--------|
| Device orientation          | SAR measurement | Measured 10g SAR [W/kg] |                       |                        | Reported* 10g SAR [W/kg] |                       |                        | Max Deviation* [W/kg] | Plot # |
|                             |                 | CH 1<br>2412.0<br>MHz   | CH 6<br>2437.0<br>MHz | CH 11<br>2462.0<br>MHz | CH 1<br>2412.0<br>MHz    | CH 6<br>2437.0<br>MHz | CH 11<br>2462.0<br>MHz |                       |        |
| Upper limit                 |                 | 17.0                    | 17.0                  | 17.0                   | Scaling factor*          |                       |                        |                       |        |
| Conducted Power             |                 | 16.1                    | 16.0                  | 16.1                   | 0.9                      | 1.0                   | 0.9                    | dB                    |        |
| Time-averaged Power         |                 | 16.1                    | 16.0                  | 16.1                   | 1.23                     | 1.26                  | 1.23                   | Lin                   |        |
| Back                        | Estimated SAR   | -                       | -                     | -                      | -                        | -                     | -                      | -                     | -      |
|                             | Full SAR        | -                       | -                     | -                      | -                        | -                     | -                      |                       |        |
| Display                     | Estimated SAR   | -                       | -                     | -                      | -                        | -                     | -                      | -                     | -      |
|                             | Full SAR        | -                       | -                     | -                      | -                        | -                     | -                      |                       |        |
| Top                         | Estimated SAR   | -                       | -                     | -                      | -                        | -                     | -                      | -                     | -      |
|                             | Full SAR        | -                       | -                     | -                      | -                        | -                     | -                      |                       |        |
| Bottom                      | Estimated SAR   | 0.034                   | 0.035                 | 0.034                  | 0.041                    | 0.044                 | 0.042                  | 0.00                  | E2     |
|                             | Full SAR        | -                       | 0.035                 | -                      | -                        | 0.044                 | -                      |                       |        |
| Left                        | Estimated SAR   | -                       | -                     | -                      | -                        | -                     | -                      | -                     | -      |
|                             | Full SAR        | -                       | -                     | -                      | -                        | -                     | -                      |                       |        |
| Right                       | Estimated SAR   | -                       | -                     | -                      | -                        | -                     | -                      | -                     | -      |
|                             | Full SAR        | -                       | -                     | -                      | -                        | -                     | -                      |                       |        |
| Bottom<br>CC-3090           | Estimated SAR   | 0.016                   | 0.015                 | 0.017                  | 0.020                    | 0.019                 | 0.021                  | 0.00                  | -      |
|                             | Full SAR        | -                       | -                     | 0.014                  | -                        | -                     | 0.017                  |                       |        |

**Simultaneous transmissions: Combined 10g Extremity SAR results –  
WLAN and Individual band Max results - Antenna 2**

| Test configuration | WLAN 2450 | LTE 2500 (Band 7) | - | - | - | - | - | - |
|--------------------|-----------|-------------------|---|---|---|---|---|---|
| Back               | -         | -                 | - | - | - | - | - | - |
| Display            | -         | -                 | - | - | - | - | - | - |
| Top                | -         | -                 | - | - | - | - | - | - |
| Bottom             | 3.135     | 0.044             | - | - | - | - | - | - |
| Left               | -         | -                 | - | - | - | - | - | - |
| Right              | -         | -                 | - | - | - | - | - | - |

**Simultaneous transmissions: Combined 10g Extremity SAR results –  
WLAN Max + Max combined results - Antenna 2**

| Test configuration | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - | - | - | - |
|--------------------|-------------------------------|---|---|---|---|---|---|---|
| Back               | -                             | - | - | - | - | - | - | - |
| Display            | -                             | - | - | - | - | - | - | - |
| Top                | -                             | - | - | - | - | - | - | - |
| Bottom             | 3.179                         | - | - | - | - | - | - | - |
| Left               | -                             | - | - | - | - | - | - | - |
| Right              | -                             | - | - | - | - | - | - | - |

All other bands/communication systems and all other surfaces and edges have Wireless Router Reported SAR less than 1.2W/kg (when scaled to maximum power if WR power reduction applied), therefore there is no need to test Phablet 10-g extremity SAR according to KDB 648474 D04 Handset SAR v01r01.

#### 7.4.1 Combined 10g Extremity SAR data

**The Combined SAR data given in the tables below has been voluntarily calculated and should be ignored for FCC certification.**

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: Reported\* Combined 1g SAR Wireless Router results –  
SPEAG Combined Multiband algorithm results for Antenna 2**

| Test configuration | LTE 2500 (Band 7) + WLAN 2450 | - | - | - | - | - | - | - |
|--------------------|-------------------------------|---|---|---|---|---|---|---|
| Back               | -                             | - | - | - | - | - | - | - |
| Display            | -                             | - | - | - | - | - | - | - |
| Top                | -                             | - | - | - | - | - | - | - |
| Bottom             | 3.210                         | - | - | - | - | - | - | - |
| Left               | -                             | - | - | - | - | - | - | - |
| Right              | -                             | - | - | - | - | - | - | - |

Note:

\* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan result is given in Section for the maximum simultaneous transmitter combination.

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## APPENDIX A: SYSTEM CHECKING SCANS

# Plot 1

Date/Time: 2014-11-13 07:17:00

Test Laboratory: TCC Microsoft

Type: D835V2; Serial: D835V2 - SN:462

## Communication System: CW

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL800-900; Medium Notes: t= 22.2 C

Medium parameters used: f = 835 MHz;  $\sigma$  = 0.908 S/m;  $\epsilon_r$  = 40.842;  $\rho$  = 1000 kg/m<sup>3</sup>

Phantom section: Flat Section

## DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(6.04, 6.04, 6.04); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1596
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=15mm, Pin=250mW/Area Scan (61x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 53.100 V/m

Fast SAR: SAR(1 g) = 2.33 W/kg

Fast SAR(10 g) = 1.57 W/kg

Maximum value of SAR (interpolated) = 2.67 W/kg

**d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 53.100 V/m

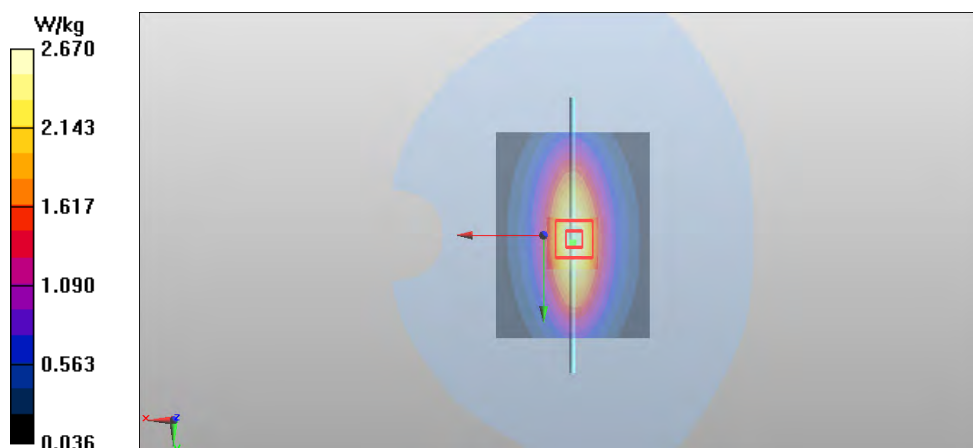
Peak SAR (extrapolated) = 3.37 W/kg

**SAR(1 g) = 2.27 W/kg**

**SAR(10 g) = 1.49 W/kg**

**Power Drift = -0.10 dB**

Maximum value of SAR (measured) = 2.65 W/kg



Test Laboratory: TCC Microsoft

**Type: D1900V2; Serial: D1900V2 - SN:5d030**
**Communication System: CW**

Frequency: **1900 MHz**; Duty Cycle: 1:1

Medium: HSL 1900; Medium Notes: t= 21.0 C

Medium parameters used: f = 1900 MHz;  $\sigma = 1.407$  S/m;  $\epsilon_r = 39.051$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

## DASY Configuration:

- Probe: ES3DV3 - SN3118
- ConvF(4.79, 4.79, 4.79); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1316; Calibrated: 2014-10-14
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 90.878 V/m

Fast SAR: SAR(1 g) = 10.1 W/kg

Fast SAR(10 g) = 5.22 W/kg

Maximum value of SAR (interpolated) = 12.9 W/kg

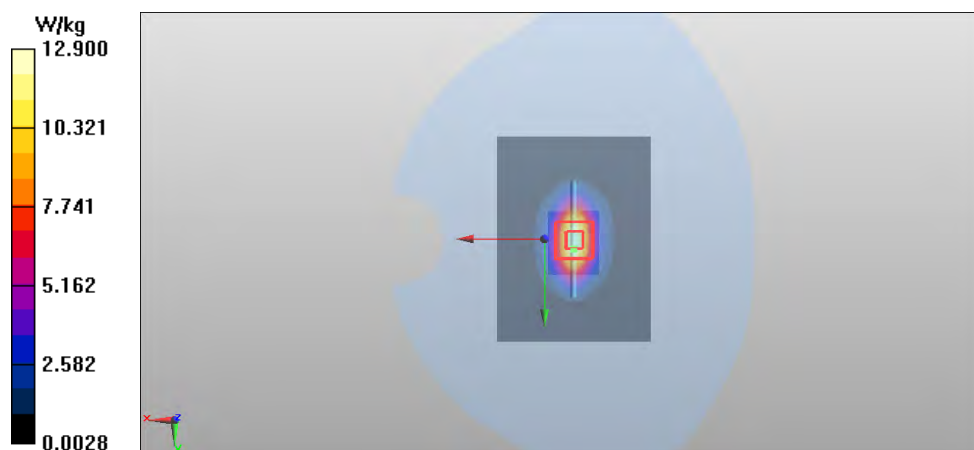
**d=10mm, Pin=250mW/Zoom Scan (5x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.878 V/m

Peak SAR (extrapolated) = 18.0 W/kg

**SAR(1 g) = 9.96 W/kg**
**SAR(10 g) = 5.2 W/kg**
**Power Drift = -0.04 dB**

Maximum value of SAR (measured) = 12.5 W/kg



### Plot 3

Date/Time: 2014-11-15 08:41:27

Test Laboratory: TCC Microsoft

Type: **D1900V2**; Serial: **D1900V2 - SN:5d030**

#### Communication System: CW

Frequency: **1900 MHz**; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: t= 21,5 C

Medium parameters used: f = 1900 MHz;  $\sigma = 1.424$  S/m;  $\epsilon_r = 39.014$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.89, 4.89, 4.89); Calibrated: 2014-05-08;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2014-11-03
- Phantom: SAM 2; Type: SAM; Serial: TP-1175
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 88.505 V/m

Fast SAR: SAR(1 g) = 9.78 W/kg

Fast SAR(10 g) = 5.03 W/kg

Maximum value of SAR (interpolated) = 12.3 W/kg

**d=10mm, Pin=250mW/Zoom Scan (6x6x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 88.505 V/m

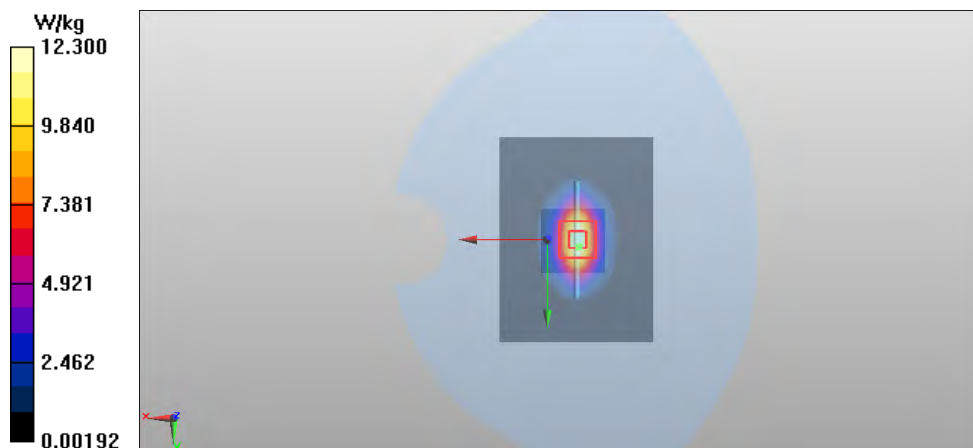
Peak SAR (extrapolated) = 17.5 W/kg

**SAR(1 g) = 9.58 W/kg**

**SAR(10 g) = 4.97 W/kg**

**Power Drift = -0.00 dB**

Maximum value of SAR (measured) = 12.0 W/kg



# Plot 4

Date/Time: 2014-11-16 06:32:15

Test Laboratory: TCC Microsoft

Type: D2450V2; Serial: D2450V2 - SN:729

## Communication System: CW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 22.4 C

Medium parameters used: f = 2450 MHz;  $\sigma$  = 1.756 S/m;  $\epsilon_r$  = 38.062;  $\rho$  = 1000 kg/m<sup>3</sup>

Phantom section: Flat Section

## DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.92, 6.92, 6.92); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #3 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 88.855 V/m

Fast SAR: SAR(1 g) = 12.2 W/kg

Fast SAR(10 g) = 5.41 W/kg

Maximum value of SAR (interpolated) = 16.3 W/kg

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

Reference Value = 88.855 V/m

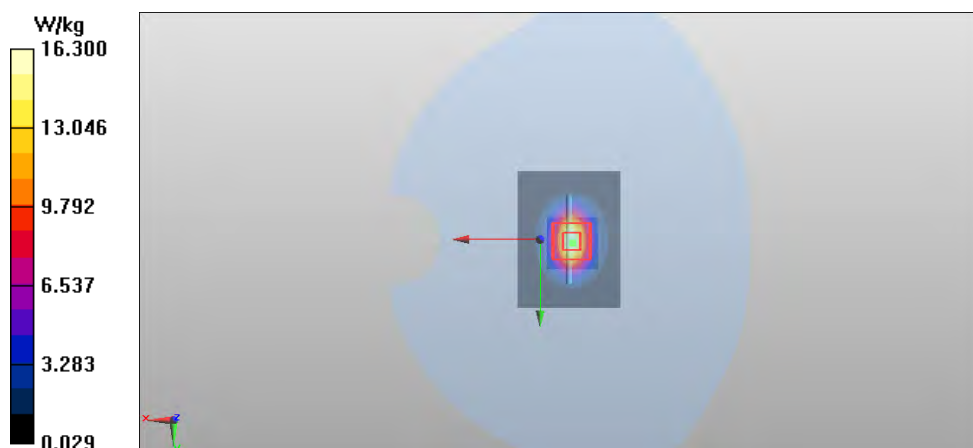
Peak SAR (extrapolated) = 25.3 W/kg

**SAR(1 g) = 12.3 W/kg**

**SAR(10 g) = 5.7 W/kg**

**Power Drift = 0.07 dB**

Maximum value of SAR (measured) = 16.2 W/kg



## Plot 5

Date/Time: 2014-11-21 06:48:13

Test Laboratory: TCC Microsoft

Type: D2600V2; Serial: D2600V2 - SN:1009

### Communication System: CW

Frequency: **2600 MHz**; Duty Cycle: 1:1

Medium: HSL2600; Medium Notes: t= 22,5 C

Medium parameters used: f = 2600 MHz;  $\sigma = 1.935$  S/m;  $\epsilon_r = 37.417$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.79, 6.79, 6.79); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #3 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (61x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 88.863 V/m

Fast SAR: SAR(1 g) = 14 W/kg

Fast SAR(10 g) = 6.3 W/kg

Maximum value of SAR (interpolated) = 18.7 W/kg

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

Reference Value = 88.863 V/m

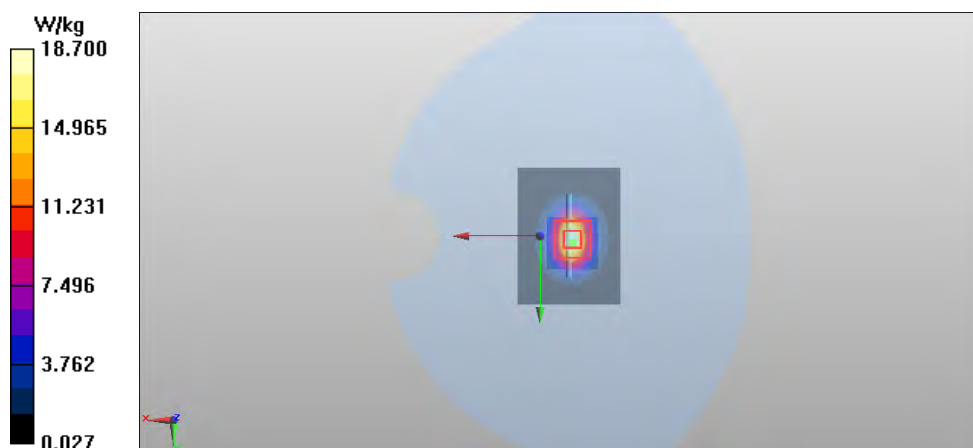
Peak SAR (extrapolated) = 29.9 W/kg

**SAR(1 g) = 13.7 W/kg**

**SAR(10 g) = 6.09 W/kg**

**Power Drift = 0.03 dB**

Maximum value of SAR (measured) = 18.1 W/kg



## Plot 6

Date/Time: 2014-11-17 06:25:42

Test Laboratory: TCC Microsoft

Type: D835V2; Serial: D835V2 - SN:462

### Communication System: CW

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 835 MHz;  $\sigma = 0.967$  S/m;  $\epsilon_r = 54.18$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(5.96, 5.96, 5.96); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=15mm, Pin=250mW/Area Scan (81x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 51.790 V/m

Fast SAR: SAR(1 g) = 2.39 W/kg

Fast SAR(10 g) = 1.6 W/kg

Maximum value of SAR (interpolated) = 2.75 W/kg

**d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 51.790 V/m

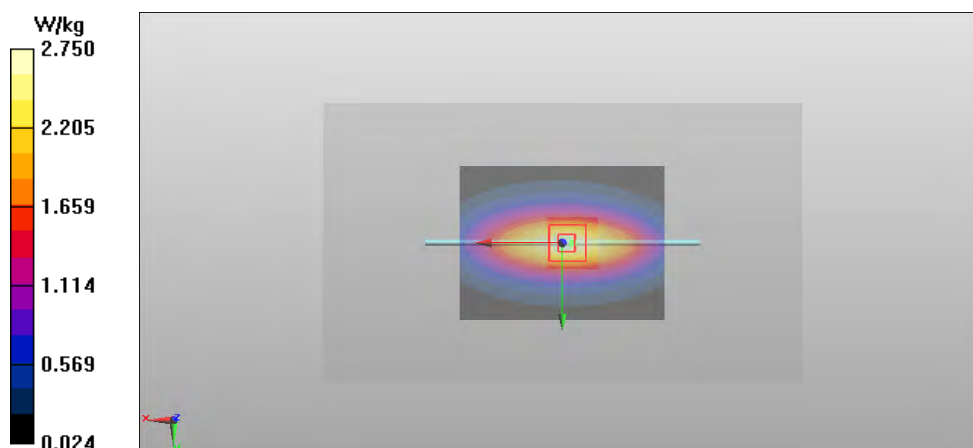
Peak SAR (extrapolated) = 3.42 W/kg

**SAR(1 g) = 2.35 W/kg**

**SAR(10 g) = 1.56 W/kg**

**Power Drift = 0.00 dB**

Maximum value of SAR (measured) = 2.72 W/kg



Test Laboratory: TCC Microsoft

Type: **D1900V2**; Serial: **D1900V2 - SN:5d030****Communication System: CW**Frequency: **1900 MHz**; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: t= 21.1 C

Medium parameters used: f = 1900 MHz;  $\sigma = 1.525$  S/m;  $\epsilon_r = 52.963$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

## DASY Configuration:

- Probe: ES3DV3 - SN3118
- ConvF(4.44, 4.44, 4.44); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1316; Calibrated: 2014-10-14
- Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (81x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 87.091 V/m

Fast SAR: SAR(1 g) = 9.87 W/kg

Fast SAR(10 g) = 4.95 W/kg

Maximum value of SAR (interpolated) = 12.9 W/kg

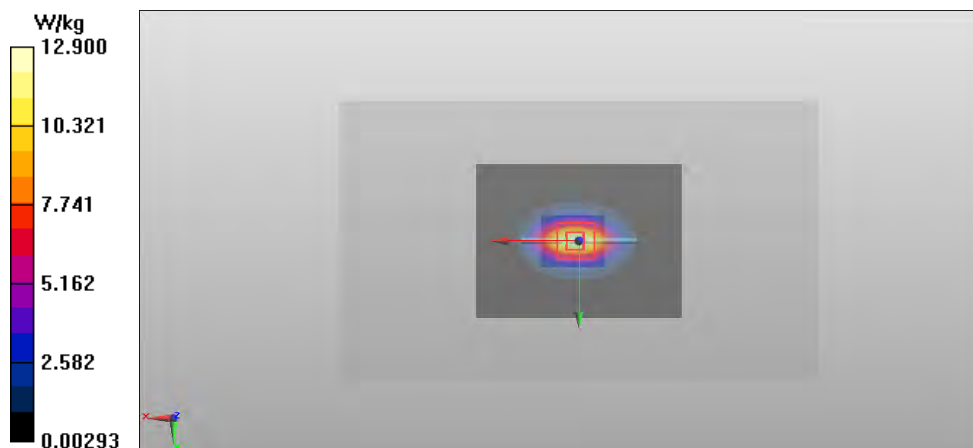
**d=10mm, Pin=250mW/Zoom Scan (6x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 87.091 V/m

Peak SAR (extrapolated) = 17.1 W/kg

**SAR(1 g) = 9.83 W/kg****SAR(10 g) = 5.19 W/kg****Power Drift = -0.01 dB**

Maximum value of SAR (measured) = 12.4 W/kg



## Plot 8

Date/Time: 2014-11-16 07:11:21

Test Laboratory: TCC Microsoft

Type: D2450V2; Serial: D2450V2 - SN:729

### Communication System: CW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: t= 22,2 C

Medium parameters used: f = 2450 MHz;  $\sigma = 1.898$  S/m;  $\epsilon_r = 51.433$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

#### DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.87, 6.87, 6.87); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (81x61x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 85.631 V/m

Fast SAR: SAR(1 g) = 12.1 W/kg

Fast SAR(10 g) = 5.28 W/kg

Maximum value of SAR (interpolated) = 16.2 W/kg

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

Reference Value = 85.631 V/m

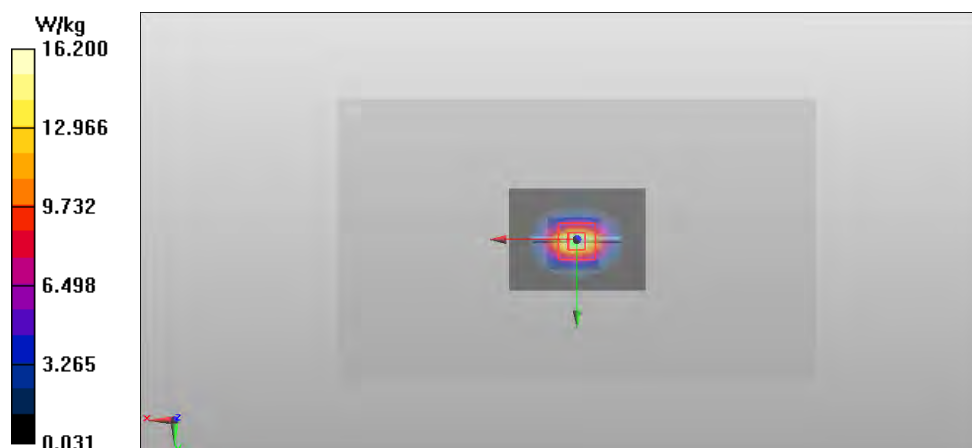
Peak SAR (extrapolated) = 24.8 W/kg

**SAR(1 g) = 12.3 W/kg**

**SAR(10 g) = 5.77 W/kg**

**Power Drift = -0.01 dB**

Maximum value of SAR (measured) = 16.0 W/kg



## Plot 9

Date/Time: 2014-11-19 06:22:09

Test Laboratory: TCC Microsoft

Type: D2600V2; Serial: D2600V2 - SN:1009

### Communication System: CW

Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 22.1 C

Medium parameters used: f = 2600 MHz;  $\sigma$  = 2.09 S/m;  $\epsilon_r$  = 50.728;  $\rho$  = 1000 kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.74, 6.74, 6.74); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**d=10mm, Pin=250mW/Area Scan (81x61x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 85.584 V/m

Fast SAR: SAR(1 g) = 13.7 W/kg

Fast SAR(10 g) = 6.01 W/kg

Maximum value of SAR (interpolated) = 18.4 W/kg

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

Reference Value = 85.584 V/m

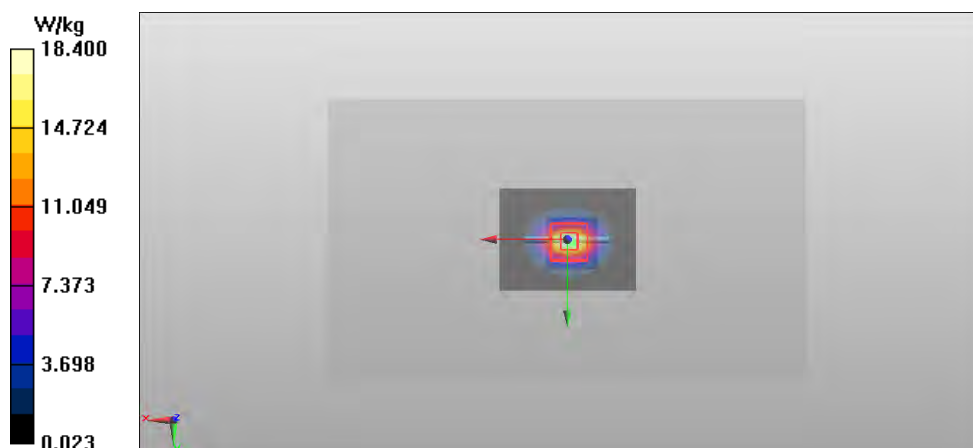
Peak SAR (extrapolated) = 28.8 W/kg

**SAR(1 g) = 13.6 W/kg**

**SAR(10 g) = 6.08 W/kg**

**Power Drift = 0.03 dB**

Maximum value of SAR (measured) = 17.9 W/kg



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**APPENDIX B: MEASUREMENT SCANS**

**Plot H1**

Date/Time: 2014-11-14 09:49:01

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052440/4**

**Communication System: 2-slot GPRS850**

Frequency: **824.2 MHz**; Duty Cycle: 1:4.19952

Medium: HSL800-900; Medium Notes:  $t = 22.0$  C

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.908$  S/m;  $\epsilon_r = 41.08$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(6.04, 6.04, 6.04); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1596
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**2-slot GPRS850 - Right/Cheek - CH 128 - Antenna 2/Area Scan (81x141x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Reference Value = 18.157 V/m

Fast SAR: SAR(1 g) = 0.272 W/kg

Fast SAR(10 g) = 0.192 W/kg

Maximum value of SAR (interpolated) = 0.308 W/kg

**2-slot GPRS850 - Right/Cheek - CH 128 - Antenna 2/Zoom Scan (6x5x7)/Cube 0:** Measurement grid:  $dx=7.5$ mm,  $dy=7.5$ mm,  $dz=5$ mm

Reference Value = 18.261 V/m

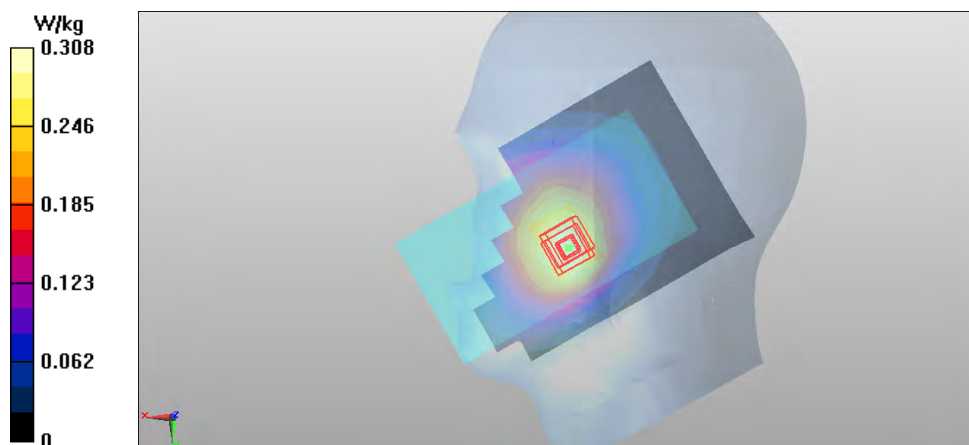
Peak SAR (extrapolated) = 0.351 W/kg

**SAR(1 g) = 0.278 W/kg**

**SAR(10 g) = 0.216 W/kg**

**Power Drift = 0.04 dB**

Maximum value of SAR (measured) = 0.305 W/kg



**Plot H2**

Date/Time: 2014-11-13 15:10:28

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052440/4**

**Communication System: WCDMA850 (Band 5)**

Frequency: **846.6 MHz**; Duty Cycle: 1:1

Medium: HSL800-900; Medium Notes: t= 22.2 C

Medium parameters used: f = 847 MHz;  $\sigma = 0.915$  S/m;  $\epsilon_r = 40.777$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(6.04, 6.04, 6.04); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WCDMA 850 (Band 5) - Left/Cheek - CH 4233 - Antenna 2 - Cover CC-3090/Area Scan (81x141x1): Interpolated**

grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 18.034 V/m

Fast SAR: SAR(1 g) = 0.236 W/kg

Fast SAR(10 g) = 0.166 W/kg

Maximum value of SAR (interpolated) = 0.269 W/kg

**WCDMA 850 (Band 5) - Left/Cheek - CH 4233 - Antenna 2 - Cover CC-3090/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 17.985 V/m

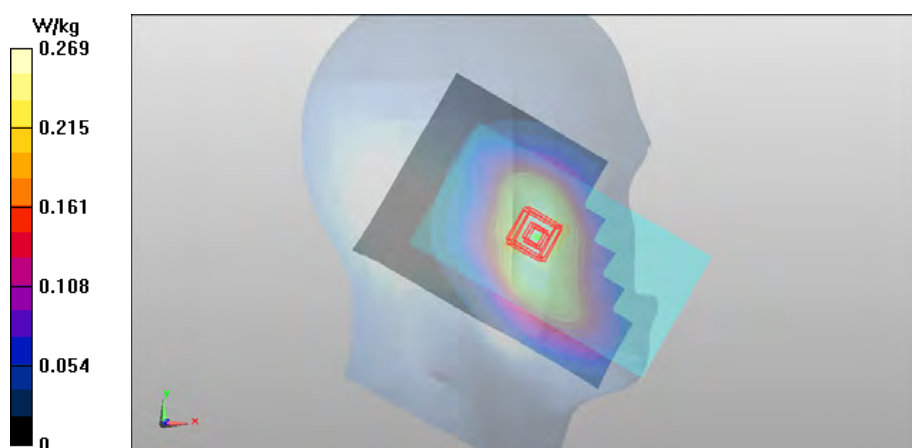
Peak SAR (extrapolated) = 0.304 W/kg

**SAR(1 g) = 0.245 W/kg**

**SAR(10 g) = 0.190 W/kg**

**Power Drift = -0.00 dB**

Maximum value of SAR (measured) = 0.267 W/kg



**Plot H3**

Date/Time: 2014-11-15 13:37:42

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052451/1**

**Communication System: 2-slot GPRS1900**

Frequency: **1880 MHz**; Duty Cycle: 1:4.19952

Medium: HSL 1900; Medium Notes: t= 21.0 C

Medium parameters used: f = 1880 MHz;  $\sigma = 1.387$  S/m;  $\epsilon_r = 39.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY Configuration:

- Probe: ES3DV3 - SN3118
- ConvF(4.79, 4.79, 4.79); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1316; Calibrated: 2014-10-14
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**2-slot GPRS1900 - Left/Cheek - CH 661 - Antenna 2/Area Scan (81x141x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 12.327 V/m

Fast SAR: SAR(1 g) = 0.389 W/kg

Fast SAR(10 g) = 0.230 W/kg

Maximum value of SAR (interpolated) = 0.477 W/kg

**2-slot GPRS1900 - Left/Cheek - CH 661 - Antenna 2/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.969 V/m

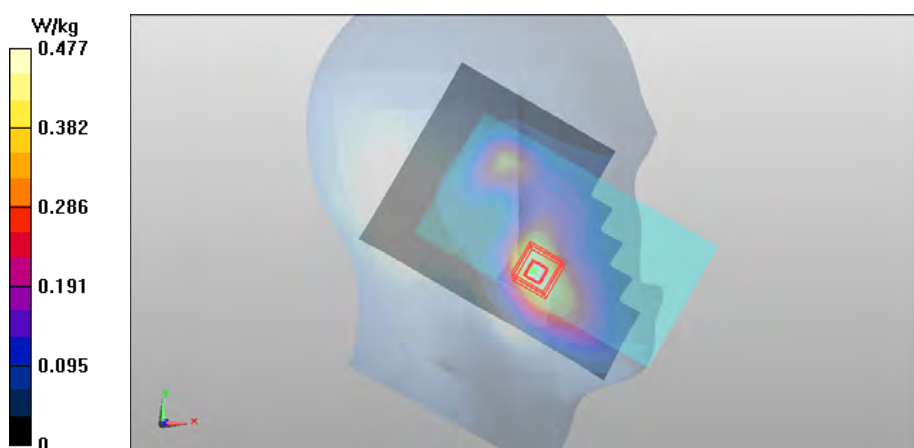
Peak SAR (extrapolated) = 0.569 W/kg

**SAR(1 g) = 0.382 W/kg**

**SAR(10 g) = 0.247 W/kg**

**Power Drift = -0.17 dB**

Maximum value of SAR (measured) = 0.443 W/kg



Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052455/2**

**Communication System: LTE2500 (Band 7)**

Frequency: **2510 MHz**; Duty Cycle: 1:1

Medium: HSL2600; Medium Notes: t= 22,5 C

Medium parameters used: f = 2510 MHz;  $\sigma = 1.824$  S/m;  $\epsilon_r = 38.109$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.79, 6.79, 6.79); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #3 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**LTE2500 (Band 7) - Right/Cheek - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - Antenna 1/Area Scan**

**(121x211x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 3.679 V/m

Fast SAR: SAR(1 g) = 0.575 W/kg

Fast SAR(10 g) = 0.298 W/kg

Maximum value of SAR (interpolated) = 0.742 W/kg

**LTE2500 (Band 7) - Right/Cheek - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - Antenna 1/Zoom Scan**

**(7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.282 V/m

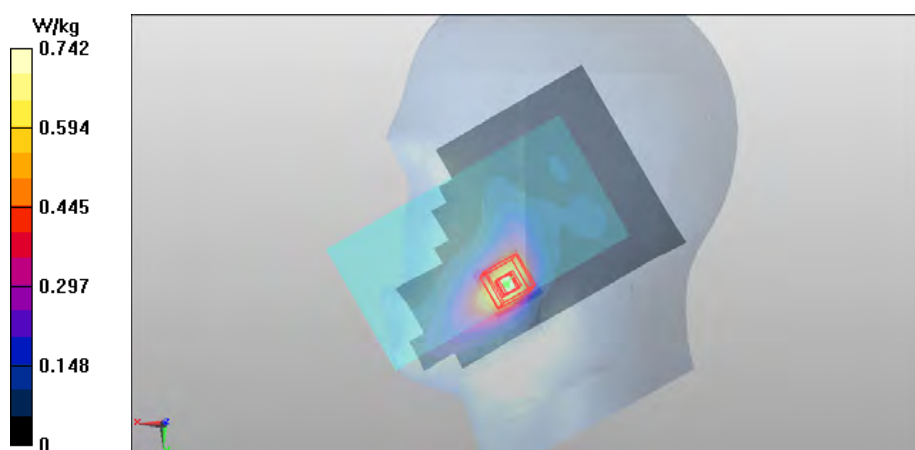
Peak SAR (extrapolated) = 1.05 W/kg

**SAR(1 g) = 0.592 W/kg**

**SAR(10 g) = 0.317 W/kg**

**Power Drift = 0.01 dB**

Maximum value of SAR (measured) = 0.739 W/kg



**Plot H5**

Date/Time: 2014-11-25 22:09:21

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

**Communication System: WLAN2450**

Frequency: **2462 MHz**; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 22.2 C

Medium parameters used: f = 2462 MHz;  $\sigma = 1.774$  S/m;  $\epsilon_r = 37.795$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.92, 6.92, 6.92); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #3 SAM, SAR4 ; Type: QD000P40CD; Serial: TP-1691
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WLAN2450 b-mode - Left/Cheek - CH 11 - BPSK 1 Mbps - Cover CC-3090 - Repeated/Area Scan (121x211x1):**

Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 26.516 V/m

Fast SAR: SAR(1 g) = 1.02 W/kg

Fast SAR(10 g) = 0.490 W/kg

Maximum value of SAR (interpolated) = 1.52 W/kg

**WLAN2450 b-mode - Left/Cheek - CH 11 - BPSK 1 Mbps - Cover CC-3090 - Repeated/Zoom Scan (7x7x7)/Cube**

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

Reference Value = 26.516 V/m

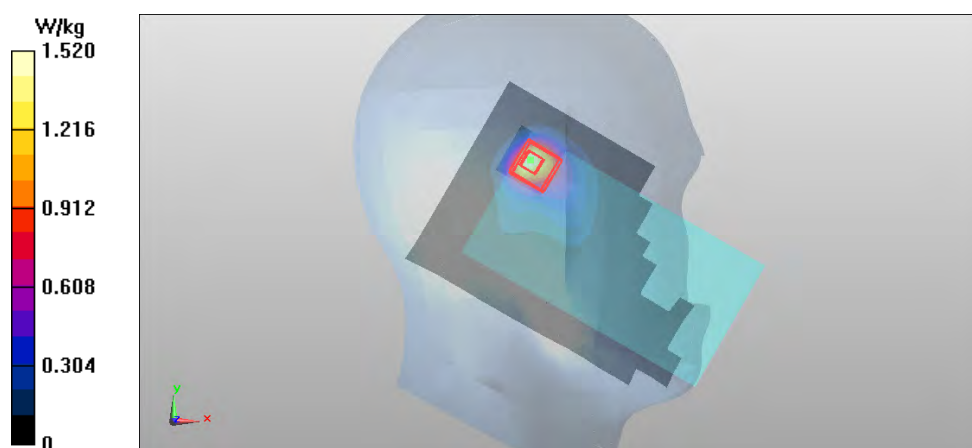
Peak SAR (extrapolated) = 2.25 W/kg

**SAR(1 g) = 1.02 W/kg**

**SAR(10 g) = 0.502 W/kg**

**Power Drift = -0.08 dB**

Maximum value of SAR (measured) = 1.31 W/kg



**Plot H6**

Date/Time: 2014-11-25 22:09:21

**DASY Configuration for WLAN2450 b-mode - Left/Cheek - CH 11 - BPSK 1 Mbps - Cover CC-3090 - Repeated/Area Scan:**

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

Communication System: WLAN2450; Frequency: 2462 MHz; Duty Cycle: 1:1; PMF: 1

Medium: HSL2450 Medium parameters used:  $f = 2462 \text{ MHz}$ ;  $\sigma = 1.774 \text{ S/m}$ ;  $\epsilon_r = 37.795$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Probe: EX3DV4 - SN3835; ConvF(6.92, 6.92, 6.92); Calibrated: 2014-10-20;

Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))

Electronics: DAE4 Sn1213; Calibrated: 2014-10-14

Phantom: #3 SAM, SAR4; Type: QD000P40CD; Serial: TP-1691

Measurement SW: DASY52, Version 52.8 (8)

Date/Time: 2014-11-15 13:37:42

**DASY Configuration for 2-slot GPRS1900 - Left/Cheek - CH 661 - Antenna 2/Area Scan:**

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052451/1**

Communication System: 2-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952; PMF: 2.04927

Medium: HSL 1900 Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.387 \text{ S/m}$ ;  $\epsilon_r = 39.109$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Probe: ES3DV3 - SN3118; ConvF(4.79, 4.79, 4.79); Calibrated: 2014-10-21;

Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))

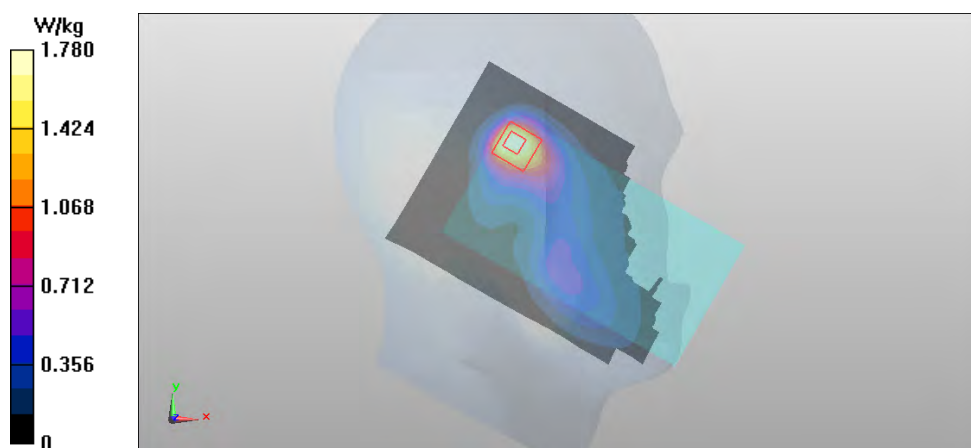
Electronics: DAE4 Sn1316; Calibrated: 2014-10-14

Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449

Measurement SW: DASY52, Version 52.8 (8)

**Fast SAR of Combined Scans: SAR(1 g) = 1.39 W/kg; SAR(10 g) = 0.700 W/kg**

Maximum value of SAR (interpolated) = 1.78 W/kg



WLAN2450 b-mode was scaled with factor 1.23 and 2-slot GPRS1900 with factor 1.17 before combining in SEMCAD SW.

SAR Report

Type: RM-1062

Appendix B for FCC\_RM-1062\_01

Applicant: Microsoft

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# Plot B1

Date/Time: 2014-11-17 09:51:00

Test Laboratory: TCC Microsoft

Type: RM-1062; Serial: 004402/74/052440/4

## Communication System: 2-slot GPRS850

Frequency: 824.2 MHz; Duty Cycle: 1:4.19952

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.96$  S/m;  $\epsilon_r = 54.214$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

### DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(5.96, 5.96, 5.96); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

## 2-slot GPRS850/Body - CH 128 - 15mm - No Headset - Back - Antenna 2/Area Scan (81x141x1): Interpolated

grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 19.543 V/m

Fast SAR: SAR(1 g) = 0.301 W/kg

Fast SAR(10 g) = 0.218 W/kg

Maximum value of SAR (interpolated) = 0.336 W/kg

## 2-slot GPRS850/Body - CH 128 - 15mm - No Headset - Back - Antenna 2/Zoom Scan (5x5x7)/Cube 0:

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

Reference Value = 19.474 V/m

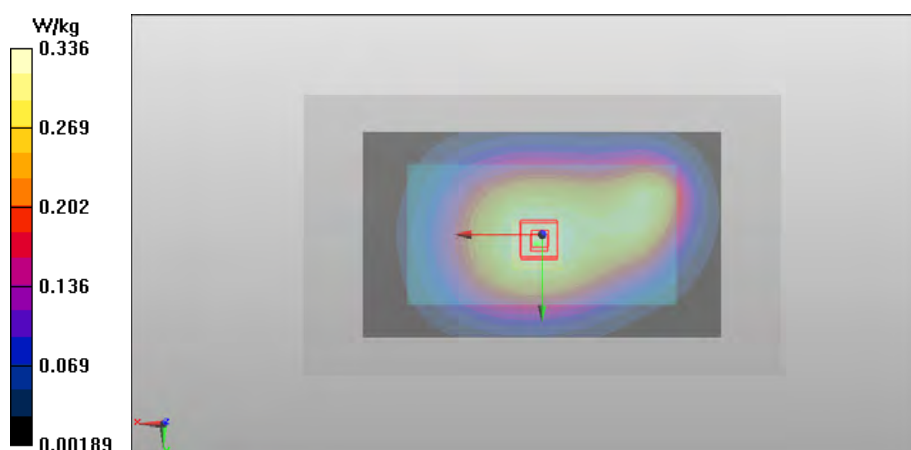
Peak SAR (extrapolated) = 0.388 W/kg

**SAR(1 g) = 0.311 W/kg**

**SAR(10 g) = 0.240 W/kg**

**Power Drift = 0.03 dB**

Maximum value of SAR (measured) = 0.340 W/kg



**Plot B2**

Date/Time: 2014-11-17 10:23:47

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052440/4**

**Communication System: WCDMA850 (Band 5)**

Frequency: **846.6 MHz**; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 847 MHz;  $\sigma = 0.975$  S/m;  $\epsilon_r = 54.145$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(5.96, 5.96, 5.96); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WCDMA850 (Band 5)/Body - CH 4233 - 15mm - No Headset - Back - Antenna 2/Area Scan (81x141x1):**

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 17.432 V/m

Fast SAR: SAR(1 g) = 0.257 W/kg

Fast SAR(10 g) = 0.185 W/kg

Maximum value of SAR (interpolated) = 0.288 W/kg

**WCDMA850 (Band 5)/Body - CH 4233 - 15mm - No Headset - Back - Antenna 2/Zoom Scan (6x5x7)/Cube 0:**

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

Reference Value = 17.659 V/m

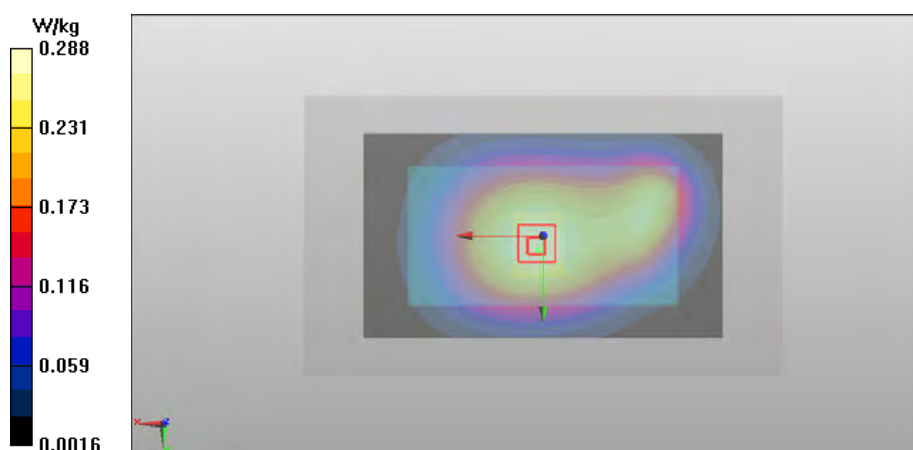
Peak SAR (extrapolated) = 0.324 W/kg

**SAR(1 g) = 0.260 W/kg**

**SAR(10 g) = 0.199 W/kg**

**Power Drift = -0.04 dB**

Maximum value of SAR (measured) = 0.283 W/kg



**Plot B3**

Date/Time: 2014-11-14 17:47:27

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052451/1**

**Communication System: 2-slot GPRS1900**

Frequency: **1850.2 MHz**; Duty Cycle: 1:4.19952

Medium: BSL1900; Medium Notes: t= 21.1 C

Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.492 \text{ S/m}$ ;  $\epsilon_r = 53.066$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3118
- ConvF(4.44, 4.44, 4.44); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1316; Calibrated: 2014-10-14
- Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**2-slot GPRS1900/Body - CH 512 - 15mm - No Headset - Display - Antenna 2/Area Scan (81x141x1): Interpolated**

grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 7.950 V/m

Fast SAR: SAR(1 g) = 0.300 W/kg

Fast SAR(10 g) = 0.172 W/kg

Maximum value of SAR (interpolated) = 0.379 W/kg

**2-slot GPRS1900/Body - CH 512 - 15mm - No Headset - Display - Antenna 2/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 7.938 V/m

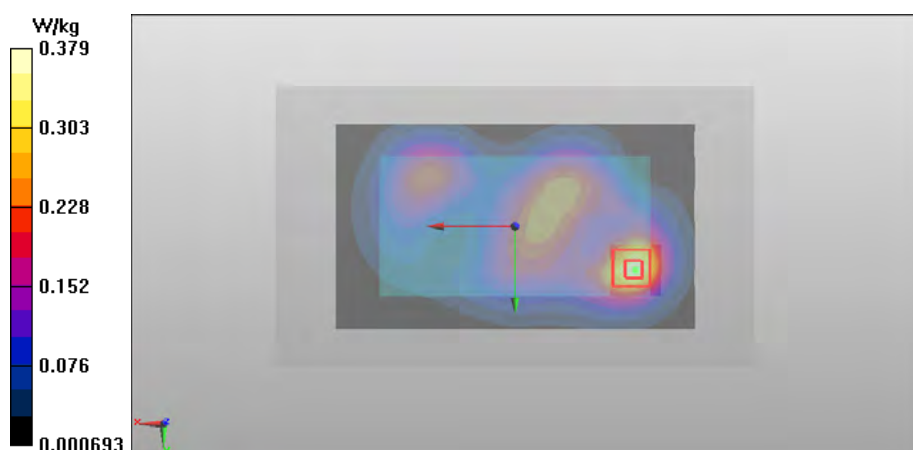
Peak SAR (extrapolated) = 0.494 W/kg

**SAR(1 g) = 0.306 W/kg**

**SAR(10 g) = 0.180 W/kg**

**Power Drift = 0.03 dB**

Maximum value of SAR (measured) = 0.364 W/kg



Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052455/2**

**Communication System: LTE2500 (Band 7)**

Frequency: **2510 MHz**; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 22.1 C

Medium parameters used: f = 2510 MHz;  $\sigma = 1.986$  S/m;  $\epsilon_r = 50.977$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.74, 6.74, 6.74); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 15mm - No Headset - Display -**

**Antenna 2/Area Scan (121x211x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 16.569 V/m

Fast SAR: SAR(1 g) = 0.450 W/kg

Fast SAR(10 g) = 0.230 W/kg

Maximum value of SAR (interpolated) = 0.583 W/kg

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 15mm - No Headset - Display -**

**Antenna 2/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.549 V/m

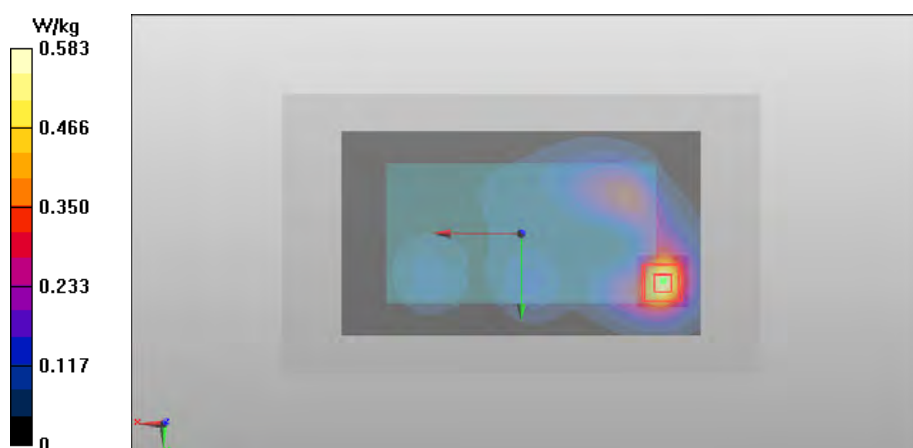
Peak SAR (extrapolated) = 0.866 W/kg

**SAR(1 g) = 0.460 W/kg**

**SAR(10 g) = 0.236 W/kg**

**Power Drift = 0.01 dB**

Maximum value of SAR (measured) = 0.586 W/kg



**Plot B5**

Date/Time: 2014-11-16 12:00:59

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

**Communication System: WLAN2450**

Frequency: **2462 MHz**; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: t= 22,2 C

Medium parameters used: f = 2462 MHz;  $\sigma = 1.912$  S/m;  $\epsilon_r = 51.391$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.87, 6.87, 6.87); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WLAN2450 b-mode/Body - CH 11 - BPSK 1 Mbps - 15mm - No Headset - Display/Area Scan (121x211x1):**

Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 7.697 V/m

Fast SAR: SAR(1 g) = 0.094 W/kg

Fast SAR(10 g) = 0.048 W/kg

Maximum value of SAR (interpolated) = 0.121 W/kg

**WLAN2450 b-mode/Body - CH 11 - BPSK 1 Mbps - 15mm - No Headset - Display/Zoom Scan (7x7x7)/Cube 0:**

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

Reference Value = 7.733 V/m

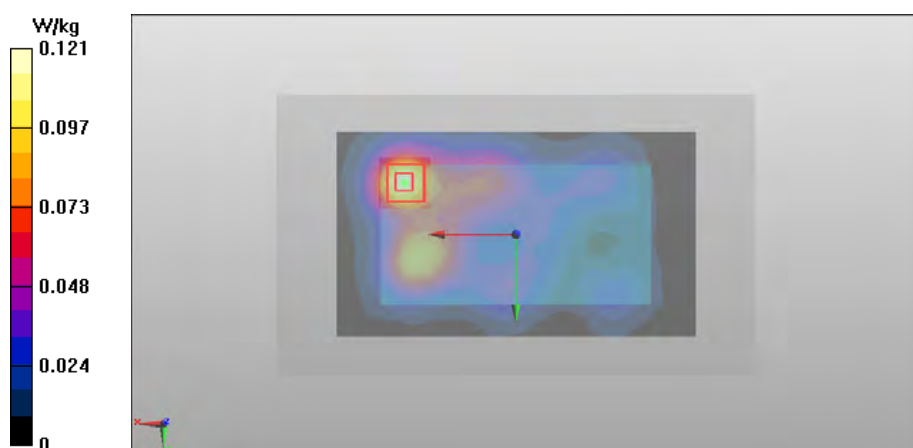
Peak SAR (extrapolated) = 0.171 W/kg

**SAR(1 g) = 0.092 W/kg**

**SAR(10 g) = 0.050 W/kg**

**Power Drift = 0.12 dB**

Maximum value of SAR (measured) = 0.113 W/kg



**Plot W1**

Date/Time: 2014-11-17 19:27:15

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052440/4**

**Communication System: 2-slot GPRS850**

Frequency: **824.2 MHz**; Duty Cycle: 1:4.19952

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used (interpolated): f = 824.2 MHz;  $\sigma = 0.96$  S/m;  $\epsilon_r = 54.214$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(5.96, 5.96, 5.96); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**2-slot GPRS850/Body - CH 128 - 10mm - No Headset - Back - Antenna 2/Area Scan (81x141x1): Interpolated**

grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 15.843 V/m

Fast SAR: SAR(1 g) = 0.482 W/kg

Fast SAR(10 g) = 0.334 W/kg

Maximum value of SAR (interpolated) = 0.557 W/kg

**2-slot GPRS850/Body - CH 128 - 10mm - No Headset - Back - Antenna 2/Zoom Scan (6x6x7)/Cube 0:**

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

Reference Value = 15.885 V/m

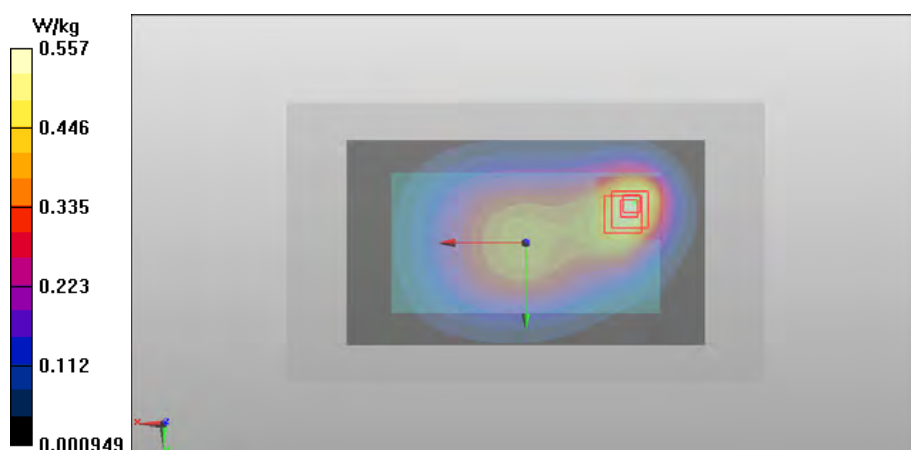
Peak SAR (extrapolated) = 0.707 W/kg

**SAR(1 g) = 0.467 W/kg**

**SAR(10 g) = 0.316 W/kg**

**Power Drift = -0.06 dB**

Maximum value of SAR (measured) = 0.541 W/kg



## Plot W2

Date/Time: 2014-11-17 19:09:48

Test Laboratory: TCC Microsoft

Type: RM-1062; Serial: 004402/74/052440/4

### Communication System: WCDMA850 (Band 5)

Frequency: **846.6 MHz**; Duty Cycle: 1:1

Medium: BSL835; Medium Notes: t= 21.8 C

Medium parameters used: f = 847 MHz;  $\sigma = 0.975$  S/m;  $\epsilon_r = 54.145$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(5.96, 5.96, 5.96); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2014-10-14
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1123/3
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

### WCDMA850 (Band 5)/Body - CH 4233 - 10mm - No Headset - Back - Antenna 2/Area Scan (81x141x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 22.343 V/m

Fast SAR: SAR(1 g) = 0.428 W/kg

Fast SAR(10 g) = 0.293 W/kg

Maximum value of SAR (interpolated) = 0.499 W/kg

### WCDMA850 (Band 5)/Body - CH 4233 - 10mm - No Headset - Back - Antenna 2/Zoom Scan (6x6x7)/Cube 0:

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

Reference Value = 22.305 V/m

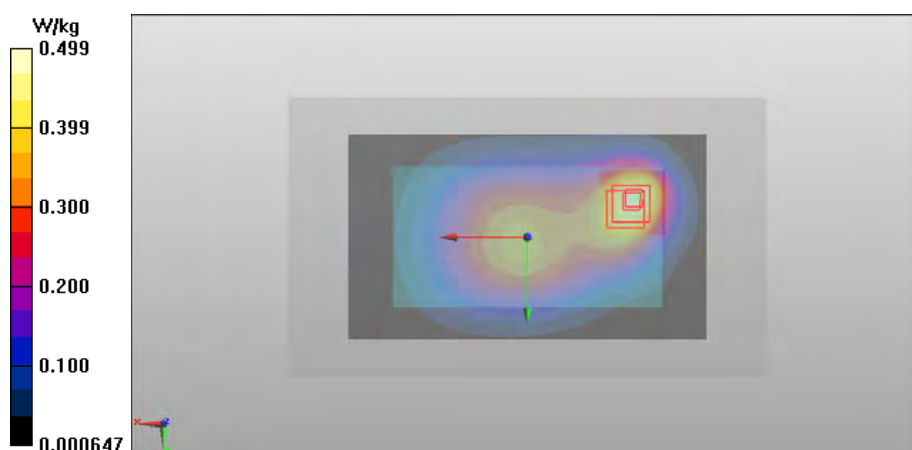
Peak SAR (extrapolated) = 0.627 W/kg

**SAR(1 g) = 0.413 W/kg**

**SAR(10 g) = 0.279 W/kg**

**Power Drift = 0.08 dB**

Maximum value of SAR (measured) = 0.473 W/kg



**Plot W3**

Date/Time: 2014-11-14 13:48:25

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052451/1**

**Communication System: 2-slot GPRS1900**

Frequency: **1880 MHz**; Duty Cycle: 1:4.19952

Medium: BSL1900; Medium Notes: t= 21.1 C

Medium parameters used: f = 1880 MHz;  $\sigma = 1.51$  S/m;  $\epsilon_r = 53.037$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3118
- ConvF(4.44, 4.44, 4.44); Calibrated: 2014-10-21;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1316; Calibrated: 2014-10-14
- Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: TP-1124/2 (1800MHz), TP-1123/2 (1900MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**2-slot GPRS1900/Body - CH 661 - 10mm - No Headset - Back - Antenna 2/Area Scan (81x141x1): Interpolated**

grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 19.810 V/m

Fast SAR: SAR(1 g) = 0.681 W/kg

Fast SAR(10 g) = 0.354 W/kg

Maximum value of SAR (interpolated) = 0.908 W/kg

**2-slot GPRS1900/Body - CH 661 - 10mm - No Headset - Back - Antenna 2/Zoom Scan (6x6x7)/Cube 0:**

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

Reference Value = 18.502 V/m

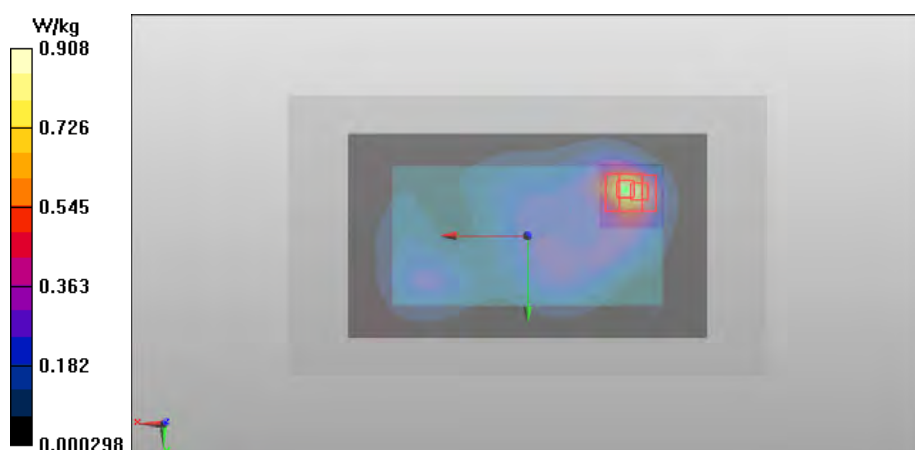
Peak SAR (extrapolated) = 1.09 W/kg

**SAR(1 g) = 0.618 W/kg**

**SAR(10 g) = 0.337 W/kg**

**Power Drift = 0.10 dB**

Maximum value of SAR (measured) = 0.763 W/kg



**Plot W4**

Date/Time: 2014-11-18 18:03:52

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052455/2**

**Communication System: LTE2500 (Band 7)**

Frequency: **2510 MHz**; Duty Cycle: 1:1

Medium: BSL2450-2600; Medium Notes: t= 22,4 C

Medium parameters used: f = 2510 MHz;  $\sigma = 1.963$  S/m;  $\epsilon_r = 50.907$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.74, 6.74, 6.74); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 10mm - No Headset - Bottom -**

**Antenna 2 - Cover CC-3090/Area Scan (61x121x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 28.225 V/m

Fast SAR: SAR(1 g) = 1.13 W/kg

Fast SAR(10 g) = 0.494 W/kg

Maximum value of SAR (interpolated) = 1.54 W/kg

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 10mm - No Headset - Bottom -**

**Antenna 2 - Cover CC-3090/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.225 V/m

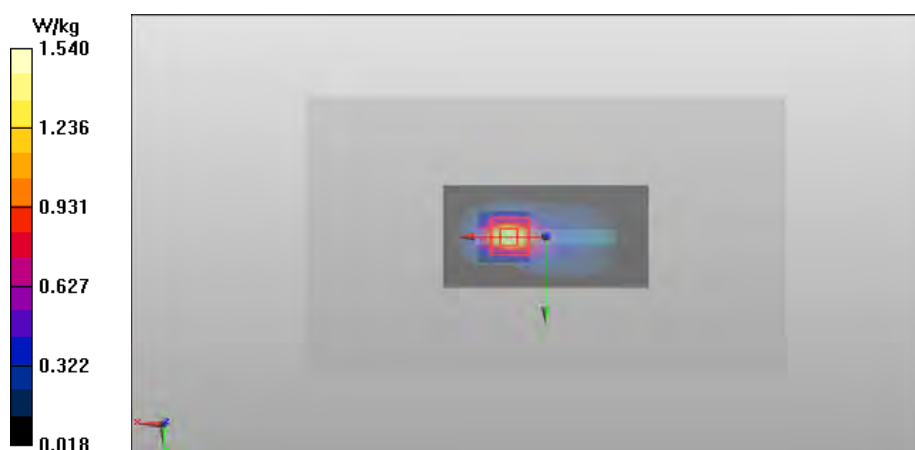
Peak SAR (extrapolated) = 2.35 W/kg

**SAR(1 g) = 1.14 W/kg**

**SAR(10 g) = 0.510 W/kg**

**Power Drift = -0.00 dB**

Maximum value of SAR (measured) = 1.50 W/kg



Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

**Communication System: WLAN2450**

Frequency: **2462 MHz**; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: t= 22.1 C

Medium parameters used: f = 2462 MHz;  $\sigma = 1.917$  S/m;  $\epsilon_r = 51.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.87, 6.87, 6.87); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WLAN2450 b-mode/Body - CH 11 - BPSK 1 Mbps - 10mm - No Headset - Back - Cover CC-3090/Area Scan**

**(121x211x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 11.451 V/m

Fast SAR: SAR(1 g) = 0.207 W/kg

Fast SAR(10 g) = 0.095 W/kg

Maximum value of SAR (interpolated) = 0.275 W/kg

**WLAN2450 b-mode/Body - CH 11 - BPSK 1 Mbps - 10mm - No Headset - Back - Cover CC-3090/Zoom Scan**

**(7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.480 V/m

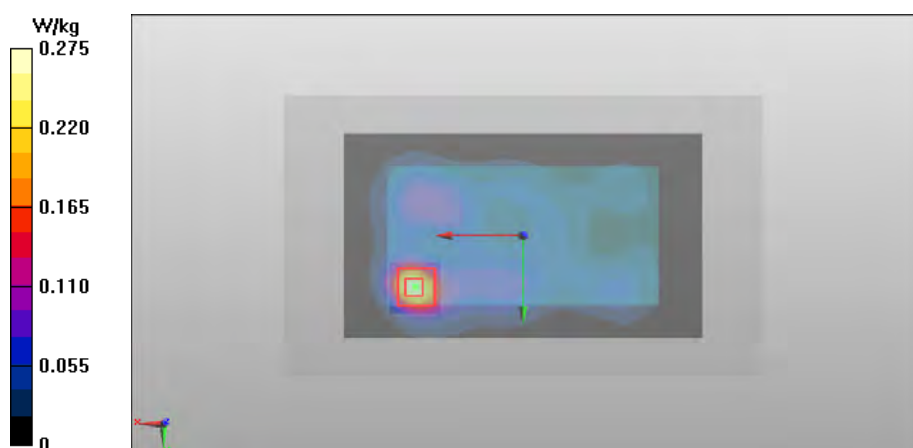
Peak SAR (extrapolated) = 0.402 W/kg

**SAR(1 g) = 0.201 W/kg**

**SAR(10 g) = 0.098 W/kg**

**Power Drift = 0.10 dB**

Maximum value of SAR (measured) = 0.259 W/kg



**Plot E1**

Date/Time: 2014-11-19 16:57:12

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052455/2**

**Communication System: LTE2500 (Band 7)**

Frequency: **2510 MHz**; Duty Cycle: 1:1

Medium: BSL2600; Medium Notes: t= 22.1 C

Medium parameters used: f = 2510 MHz;  $\sigma = 1.986$  S/m;  $\epsilon_r = 50.977$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.74, 6.74, 6.74); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 0mm - No Headset - Bottom - Antenna 2 - Cover CC-3090 - Repeated/Area Scan (61x121x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 65.837 V/m

Fast SAR: SAR(1 g) = 7.76 W/kg

Fast SAR(10 g) = 2.54 W/kg

Maximum value of SAR (interpolated) = 12.9 W/kg

**LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 0mm - No Headset - Bottom - Antenna 2 - Cover CC-3090 - Repeated/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 65.837 V/m

Peak SAR (extrapolated) = 24.2 W/kg

**SAR(1 g) = 7.68 W/kg**

**SAR(10 g) = 2.49 W/kg**

**Power Drift = -0.09 dB**

Maximum value of SAR (measured) = 12.8 W/kg



Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

**Communication System: WLAN2450**

Frequency: **2437 MHz**; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: t= 22.2 C

Medium parameters used: f = 2437 MHz;  $\sigma = 1.904$  S/m;  $\epsilon_r = 50.986$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3835
- ConvF(6.87, 6.87, 6.87); Calibrated: 2014-10-20;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1213; Calibrated: 2014-10-14
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**WLAN2450 b-mode/Body - CH 6 - BPSK 1 Mbps - 0mm - No Headset - Bottom/Area Scan (61x121x1):**

Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 3.776 V/m

Fast SAR: SAR(1 g) = 0.035 W/kg

Fast SAR(10 g) = 0.016 W/kg

Maximum value of SAR (interpolated) = 0.0481 W/kg

**WLAN2450 b-mode/Body - CH 6 - BPSK 1 Mbps - 0mm - No Headset - Bottom/Zoom Scan (7x7x7)/Cube 0:**

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

Reference Value = 3.721 V/m

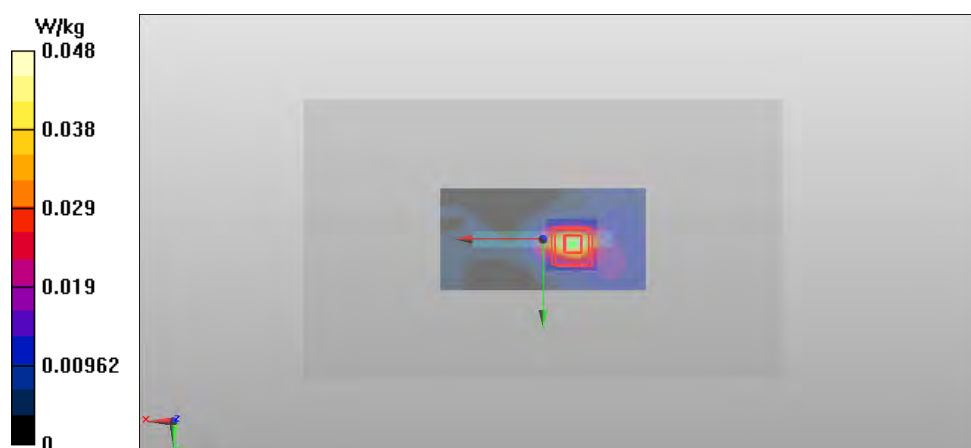
Peak SAR (extrapolated) = 0.0650 W/kg

**SAR(1 g) = 0.035 W/kg**

**SAR(10 g) = 0.018 W/kg**

**Power Drift = -0.12 dB**

Maximum value of SAR (measured) = 0.0463 W/kg



# Plot E3

Date/Time: 2014-11-22 10:17:46

## DASY Configuration for WLAN2450 b-mode/Body - CH 6 - BPSK 1 Mbps - 0mm - No Headset - Bottom/Area Scan:

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052437/0**

Communication System: WLAN2450; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.904$  S/m;  $\epsilon_r = 50.986$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.87, 6.87, 6.87); Calibrated: 2014-10-20;

Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))

Electronics: DAE4 Sn1213; Calibrated: 2014-10-14

Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)

Measurement SW: DASY52, Version 52.8 (8)

Date/Time: 2014-11-19 16:57:12

## DASY Configuration for LTE2500 (Band 7)/Body - CH 20850 - 20MHz - QPSK - 1 RB - Offset 99 - 0mm - No Headset - Bottom - Antenna 2 - Cover CC-3090 - Repeated/Area Scan:

Test Laboratory: TCC Microsoft

**Type: RM-1062; Serial: 004402/74/052455/2**

Communication System: LTE2500 (Band 7); Frequency: 2510 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2600 Medium parameters used:  $f = 2510$  MHz;  $\sigma = 1.986$  S/m;  $\epsilon_r = 50.977$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.74, 6.74, 6.74); Calibrated: 2014-10-20;

Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))

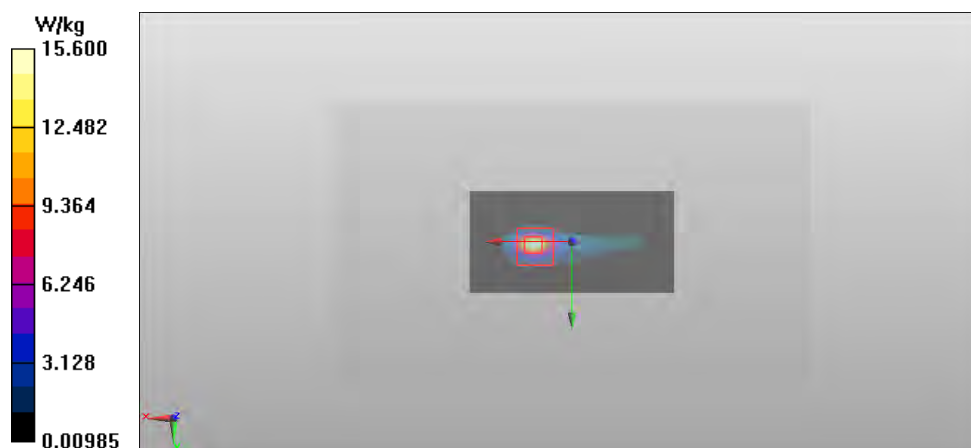
Electronics: DAE4 Sn1213; Calibrated: 2014-10-14

Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA; Serial: TP-1123/1 (750 MHz), TP-1124/1 (2450 MHz)

Measurement SW: DASY52, Version 52.8 (8)

## Fast SAR of Combined Scans: SAR(1 g) = 9.9 W/kg; SAR(10 g) = 3.21 W/kg

Maximum value of SAR (interpolated) = 15.6 W/kg



WLAN2450 b-mode was scaled with factor 1.26 and LTE2500 (Band 7) with factor 1.26 before combining in SEMCAD SW.

SAR Report

Type: RM-1062

Appendix B for FCC\_RM-1062\_01

Applicant: Microsoft

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## APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

### Head tissue simulant dielectric parameters used in the measurements:

| f<br>(MHz) | GSM 850           | Dielectric Parameters  |         |                        |         |                        |         |
|------------|-------------------|------------------------|---------|------------------------|---------|------------------------|---------|
|            | Date              | CH 128<br>824.2 MHz    |         | CH 190<br>836.6 MHz    |         | CH 251<br>848.8 MHz    |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 836        | 2014-11-12        | 41.5                   | 0.91    | 41.5                   | 0.92    | 41.4                   | 0.93    |
|            | 2014-11-13        | 40.9                   | 0.90    | 40.8                   | 0.91    | 40.8                   | 0.92    |
|            | 2014-11-14        | 41.1                   | 0.91    | 41.0                   | 0.91    | 40.9                   | 0.92    |
|            | 2014-11-16        | 40.7                   | 0.90    | 40.6                   | 0.91    | 40.5                   | 0.92    |
| f<br>(MHz) | WCDMA850 (Band 5) | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 4132<br>826.4 MHz   |         | CH 4175<br>835.0 MHz   |         | CH 4233<br>846.6 MHz   |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 835        | 2014-11-12        | 41.5                   | 0.92    | 41.5                   | 0.92    | 41.4                   | 0.93    |
|            | 2014-11-13        | 40.9                   | 0.90    | 40.8                   | 0.91    | 40.8                   | 0.91    |
|            | 2014-11-14        | 41.1                   | 0.91    | 41.0                   | 0.91    | 40.9                   | 0.92    |
|            | 2014-11-16        | 40.6                   | 0.90    | 40.6                   | 0.91    | 40.5                   | 0.92    |
| f<br>(MHz) | GSM 1900          | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 512<br>1850.2 MHz   |         | CH 661<br>1880.0 MHz   |         | CH 810<br>1909.8 MHz   |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 1880       | 2014-11-15        | 39.3                   | 1.35    | 39.1                   | 1.39    | 39.0                   | 1.41    |
|            | 2014-11-15        | 39.2                   | 1.37    | 39.1                   | 1.40    | 39.0                   | 1.43    |
|            | 2014-11-16        | 38.7                   | 1.36    | 38.6                   | 1.38    | 38.5                   | 1.41    |
| f<br>(MHz) | WLAN 2450         | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 1<br>2412.0 MHz     |         | CH 6<br>2437.0 MHz     |         | CH 11<br>2462.0 MHz    |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 2437       | 2014-11-12        | 38.2                   | 1.74    | 38.1                   | 1.77    | 38.0                   | 1.80    |
|            | 2014-11-13        | 37.7                   | 1.76    | 37.7                   | 1.78    | 37.6                   | 1.81    |
|            | 2014-11-16        | 38.2                   | 1.72    | 38.1                   | 1.74    | 38.0                   | 1.77    |
|            | 2014-11-25        | 37.9                   | 1.72    | 37.9                   | 1.75    | 37.8                   | 1.77    |
| f<br>(MHz) | LTE2500 (Band 7)  | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 20850<br>2510.0 MHz |         | CH 21100<br>2535.0 MHz |         | CH 21350<br>2560.0 MHz |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 2535       | 2014-11-20        | 38.1                   | 1.82    | 38.1                   | 1.85    | 38.0                   | 1.88    |
|            | 2014-11-21        | 37.7                   | 1.84    | 37.7                   | 1.86    | 37.6                   | 1.89    |

**Body tissue simulant dielectric parameters used in the measurements:**

| f<br>(MHz) | GSM 850           | Dielectric Parameters  |         |                        |         |                        |         |
|------------|-------------------|------------------------|---------|------------------------|---------|------------------------|---------|
|            | Date              | CH 128<br>824.2 MHz    |         | CH 190<br>836.6 MHz    |         | CH 251<br>848.8 MHz    |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 836        | 2014-11-17        | 54.2                   | 0.96    | 54.2                   | 0.97    | 54.1                   | 0.97    |
| f<br>(MHz) | WCDMA850 (Band 5) | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 4132<br>826.4 MHz   |         | CH 4175<br>835.0 MHz   |         | CH 4233<br>846.6 MHz   |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 835        | 2014-11-17        | 54.2                   | 0.96    | 54.2                   | 0.97    | 54.1                   | 0.97    |
| f<br>(MHz) | GSM 1900          | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 512<br>1850.2 MHz   |         | CH 661<br>1880.0 MHz   |         | CH 810<br>1909.8 MHz   |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 1880       | 2014-11-14        | 53.1                   | 1.49    | 53.0                   | 1.51    | 52.9                   | 1.53    |
|            | 2014-11-27        | 52.5                   | 1.47    | 52.4                   | 1.50    | 52.3                   | 1.53    |
| f<br>(MHz) | WLAN 2450         | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 1<br>2412.0 MHz     |         | CH 6<br>2437.0 MHz     |         | CH 11<br>2462.0 MHz    |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 2437       | 2014-11-16        | 51.5                   | 1.86    | 51.5                   | 1.88    | 51.4                   | 1.91    |
|            | 2014-11-17        | 51.3                   | 1.86    | 51.2                   | 1.89    | 51.1                   | 1.91    |
|            | 2014-11-21        | 51.0                   | 1.88    | 51.0                   | 1.90    | 50.9                   | 1.93    |
| f<br>(MHz) | LTE2500 (Band 7)  | Dielectric Parameters  |         |                        |         |                        |         |
|            | Date              | CH 20850<br>2510.0 MHz |         | CH 21100<br>2535.0 MHz |         | CH 21350<br>2560.0 MHz |         |
|            |                   | er                     | s [S/m] | er                     | s [S/m] | er                     | s [S/m] |
| 2535       | 2014-11-14        | 51.6                   | 2.02    | 51.5                   | 2.05    | 51.4                   | 2.07    |
|            | 2014-11-18        | 50.9                   | 1.96    | 50.9                   | 1.99    | 50.8                   | 2.02    |
|            | 2014-11-19        | 51.0                   | 1.98    | 50.9                   | 2.01    | 50.9                   | 2.04    |

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**APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS**



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Client **TCC Microsoft**

Certificate No: **ES3-3118\_Oct14**

## CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3118**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes**

Calibration date: **October 21, 2014**

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 E4419B         | GB41293874      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Power sensor E4412A        | MY41498087      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 03-Apr-14 (No. 217-01915)         | Apr-15                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 03-Apr-14 (No. 217-01919)         | Apr-15                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 03-Apr-14 (No. 217-01920)         | Apr-15                 |
| Reference Probe ES3DV2     | SN: 3013        | 30-Dec-13 (No. ES3-3013_Dec13)    | Dec-14                 |
| DAE4                       | SN: 660         | 13-Dec-13 (No. DAE4-660_Dec13)    | Dec-14                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-16 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 |

|                                                                                                                 | Name           | Function              | Signature                |
|-----------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------------|
| Calibrated by:                                                                                                  | Israe El-Naouq | Laboratory Technician |                          |
| Approved by:                                                                                                    | Katja Pokovic  | Technical Manager     |                          |
|                                                                                                                 |                |                       | Issued: October 21, 2014 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                |                       |                          |

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3118

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 41.9                               | 0.89                            | 6.04    | 6.04    | 6.04    | 0.24               | 2.17                    | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 5.83    | 5.83    | 5.83    | 0.74               | 1.18                    | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 4.98    | 4.98    | 4.98    | 0.73               | 1.17                    | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 4.79    | 4.79    | 4.79    | 0.80               | 1.16                    | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 4.51    | 4.51    | 4.51    | 0.75               | 1.26                    | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 4.25    | 4.25    | 4.25    | 0.80               | 1.25                    | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 4.18    | 4.18    | 4.18    | 0.80               | 1.27                    | ± 12.0 %    |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3118

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>f</sup> | Conductivity (S/m) <sup>f</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>g</sup> | Depth <sup>g</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 55.5                               | 0.96                            | 5.79    | 5.79    | 5.79    | 0.39               | 1.67                    | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 5.76    | 5.76    | 5.76    | 0.36               | 1.76                    | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 4.64    | 4.64    | 4.64    | 0.60               | 1.40                    | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 4.44    | 4.44    | 4.44    | 0.53               | 1.51                    | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 4.22    | 4.22    | 4.22    | 0.80               | 1.19                    | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 4.03    | 4.03    | 4.03    | 0.80               | 1.16                    | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 3.93    | 3.93    | 3.93    | 0.80               | 1.04                    | ± 12.0 %    |

<sup>c</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>f</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>g</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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Accreditation No.: **SCS 108**

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Multilateral Agreement for the recognition of calibration certificates

Client **TCC Microsoft**

Certificate No: **ES3-3131\_Oct14**

## CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3131**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes**

Calibration date: **October 21, 2014**

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 E4419B         | GB41293874      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Power sensor E4412A        | MY41498087      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 03-Apr-14 (No. 217-01915)         | Apr-15                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 03-Apr-14 (No. 217-01919)         | Apr-15                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 03-Apr-14 (No. 217-01920)         | Apr-15                 |
| Reference Probe ES3DV2     | SN: 3013        | 30-Dec-13 (No. ES3-3013_Dec13)    | Dec-14                 |
| DAE4                       | SN: 660         | 13-Dec-13 (No. DAE4-660_Dec13)    | Dec-14                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-16 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 |

|                |                               |                                   |                                                                                                    |
|----------------|-------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------|
| Calibrated by: | Name<br><b>Israe El-Naouq</b> | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | <b>Katja Pokovic</b>          | Technical Manager                 |               |

Issued: October 21, 2014

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

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3131

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 41.9                               | 0.89                            | 6.29    | 6.29    | 6.29    | 0.58               | 1.27                    | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 6.04    | 6.04    | 6.04    | 0.62               | 1.27                    | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 5.10    | 5.10    | 5.10    | 0.43               | 1.55                    | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 4.92    | 4.92    | 4.92    | 0.58               | 1.32                    | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 4.62    | 4.62    | 4.62    | 0.78               | 1.17                    | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 4.39    | 4.39    | 4.39    | 0.65               | 1.33                    | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 4.25    | 4.25    | 4.25    | 0.79               | 1.22                    | ± 12.0 %    |

<sup>c</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3131

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 55.5                               | 0.96                            | 5.97    | 5.97    | 5.97    | 0.27               | 2.03                    | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 5.96    | 5.96    | 5.96    | 0.54               | 1.37                    | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 4.79    | 4.79    | 4.79    | 0.43               | 1.72                    | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 4.58    | 4.58    | 4.58    | 0.65               | 1.40                    | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 4.33    | 4.33    | 4.33    | 0.76               | 1.21                    | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 4.14    | 4.14    | 4.14    | 0.80               | 1.11                    | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 4.03    | 4.03    | 4.03    | 0.80               | 1.06                    | ± 12.0 %    |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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 Multilateral Agreement for the recognition of calibration certificates

Client **TCC Microsoft**

Certificate No: **EX3-3835\_Oct14**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3835**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **October 20, 2014**

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 E4419B         | GB41293874      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Power sensor E4412A        | MY41498087      | 03-Apr-14 (No. 217-01911)         | Apr-15                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 03-Apr-14 (No. 217-01915)         | Apr-15                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 03-Apr-14 (No. 217-01919)         | Apr-15                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 03-Apr-14 (No. 217-01920)         | Apr-15                 |
| Reference Probe ES3DV2     | SN: 3013        | 30-Dec-13 (No. ES3-3013_Dec13)    | Dec-14                 |
| DAE4                       | SN: 660         | 13-Dec-13 (No. DAE4-660_Dec13)    | Dec-14                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-16 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 |

|                                                                                                                 | Name           | Function              | Signature                |
|-----------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------------|
| Calibrated by:                                                                                                  | Jeton Kastrati | Laboratory Technician |                          |
| Approved by:                                                                                                    | Katja Pokovic  | Technical Manager     |                          |
|                                                                                                                 |                |                       | Issued: October 21, 2014 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                |                       |                          |

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3835

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 41.9                               | 0.89                            | 9.14    | 9.14    | 9.14    | 0.28               | 1.12                    | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 8.87    | 8.87    | 8.87    | 0.29               | 1.03                    | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 7.73    | 7.73    | 7.73    | 0.50               | 0.72                    | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 7.52    | 7.52    | 7.52    | 0.76               | 0.57                    | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 7.23    | 7.23    | 7.23    | 0.50               | 0.70                    | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 6.92    | 6.92    | 6.92    | 0.41               | 0.80                    | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 6.79    | 6.79    | 6.79    | 0.40               | 0.84                    | ± 12.0 %    |
| 5200                 | 36.0                               | 4.66                            | 4.91    | 4.91    | 4.91    | 0.35               | 1.80                    | ± 13.1 %    |
| 5300                 | 35.9                               | 4.76                            | 4.73    | 4.73    | 4.73    | 0.35               | 1.80                    | ± 13.1 %    |
| 5500                 | 35.6                               | 4.96                            | 4.52    | 4.52    | 4.52    | 0.40               | 1.80                    | ± 13.1 %    |
| 5600                 | 35.5                               | 5.07                            | 4.32    | 4.32    | 4.32    | 0.40               | 1.80                    | ± 13.1 %    |
| 5800                 | 35.3                               | 5.27                            | 4.36    | 4.36    | 4.36    | 0.40               | 1.80                    | ± 13.1 %    |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3835

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>f</sup> | Conductivity (S/m) <sup>f</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>g</sup> | Depth <sup>g</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 750                  | 55.5                               | 0.96                            | 8.80    | 8.80    | 8.80    | 0.24               | 1.33                    | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 8.90    | 8.90    | 8.90    | 0.63               | 0.67                    | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 7.46    | 7.46    | 7.46    | 0.78               | 0.63                    | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 7.17    | 7.17    | 7.17    | 0.43               | 0.80                    | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 7.03    | 7.03    | 7.03    | 0.80               | 0.61                    | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 6.87    | 6.87    | 6.87    | 0.80               | 0.58                    | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 6.74    | 6.74    | 6.74    | 0.80               | 0.50                    | ± 12.0 %    |
| 5200                 | 49.0                               | 5.30                            | 4.20    | 4.20    | 4.20    | 0.45               | 1.90                    | ± 13.1 %    |
| 5300                 | 48.9                               | 5.42                            | 4.03    | 4.03    | 4.03    | 0.45               | 1.90                    | ± 13.1 %    |
| 5500                 | 48.6                               | 5.65                            | 3.79    | 3.79    | 3.79    | 0.45               | 1.90                    | ± 13.1 %    |
| 5600                 | 48.5                               | 5.77                            | 3.63    | 3.63    | 3.63    | 0.45               | 1.90                    | ± 13.1 %    |
| 5800                 | 48.2                               | 6.00                            | 3.80    | 3.80    | 3.80    | 0.50               | 1.90                    | ± 13.1 %    |

<sup>c</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>f</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>g</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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Accreditation No.: SCS 108

Client **Nokia Salo TCC**

Certificate No: **ES3-3165\_May14**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3165**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 8, 2014**

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 (Certificate No.)        | Scheduled Calibration  |
|----------------------------|-----------------|-----------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 03-Apr-14 (No. 217-01911)         | Jan-15                 |
| Power sensor E4412A        | MY41498087      | 03-Apr-14 (No. 217-01911)         | Jan-15                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 03-Apr-14 (No. 217-01915)         | Jan-15                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 03-Apr-14 (No. 217-01919)         | Jan-15                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 03-Apr-14 (No. 217-01920)         | Jan-15                 |
| Reference Probe ES3DV2     | SN: 3013        | 30-Dec-13 (No. ES3-3013_Dec13)    | Dec-14                 |
| DAE4                       | SN: 660         | 13-Dec-13 (No. DAE4-660_Dec13)    | Dec-14                 |
|                            |                 |                                   |                        |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-16 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

|                                                                                                                | Name            | Function              | Signature            |
|----------------------------------------------------------------------------------------------------------------|-----------------|-----------------------|----------------------|
| Calibrated by:                                                                                                 | Israa El-Nadoug | Laboratory Technician |                      |
| Approved by:                                                                                                   | Katja Pokovic   | Technical Manager     |                      |
|                                                                                                                |                 |                       | Issued: May 12, 2014 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory |                 |                       |                      |

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3165

Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>f</sup> | Conductivity (S/m) <sup>f</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>g</sup> | Depth <sup>h</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 835                  | 41.5                               | 0.90                            | 6.02    | 6.02    | 6.02    | 0.25               | 2.13                    | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 5.09    | 5.09    | 5.09    | 0.36               | 1.71                    | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 4.89    | 4.89    | 4.89    | 0.60               | 1.30                    | ± 12.0 %    |

<sup>c</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>f</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>g</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3165

Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>e</sup> | Conductivity (S/m) <sup>e</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>d</sup> | Depth <sup>d</sup> (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 835                  | 55.2                               | 0.97                            | 6.01    | 6.01    | 6.01    | 0.70               | 1.23                    | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 4.83    | 4.83    | 4.83    | 0.51               | 1.54                    | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 4.65    | 4.65    | 4.65    | 0.47               | 1.65                    | ± 12.0 %    |

<sup>c</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2); else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>e</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid-compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>d</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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**APPENDIX E: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORTS**



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Client: **Nokia Salo TCC**

Certificate No: **D835V2-462\_May14**

## CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 462**

Calibration procedure(s): **QA CAL-05.v9**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 06, 2014**

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.

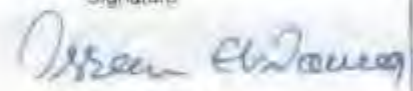
All calibrations have been conducted in the closed laboratory facility, environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | US37292793         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | MY41092317         | 09-Oct-13 (No. 217-01828)         | Oct-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 03-Apr-14 (No. 217-01918)         | Apr-15                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 03-Apr-14 (No. 217-01921)         | Apr-15                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Dec-13 (No. ES3-3205_Dec13)    | Dec-14                 |
| DAE4                        | SN: 601            | 30-Apr-14 (No. DAE4-601_Apr14)    | Apr-15                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-13) | In house check: Oct-16 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

Calibrated by: **Israa El-Naouq** Name: **Israa El-Naouq** Function: **Laboratory Technician**

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

Signature:   


Issued: May 7, 2014

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.6.8     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 15 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 835 MHz $\pm$ 1 MHz    |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 41.5           | 0.90 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 40.2 $\pm$ 6 % | 0.94 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.39 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 9.19 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.54 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 5.98 W/kg $\pm$ 16.5 % (k=2) |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 55.2           | 0.97 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 56.6 $\pm$ 6 % | 1.02 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.43 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 9.41 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.58 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.16 W/kg $\pm$ 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.7 $\Omega$ - 2.8 j $\Omega$ |
| Return Loss                          | -30.8 dB                       |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 45.8 $\Omega$ - 5.4 j $\Omega$ |
| Return Loss                          | -23.0 dB                       |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.390 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                |
|-----------------|----------------|
| Manufactured by | SPEAG          |
| Manufactured on | March 27, 2002 |

## DASY5 Validation Report for Head TSL

Date: 06.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462**

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.94 \text{ S/m}$ ;  $\epsilon_r = 40.2$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

### DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.22, 6.22, 6.22); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### Dipole Calibration for Head Tissue/Pin=250 mW, $d=15\text{mm}$ /Zoom Scan (7x7x7)/Cube 0:

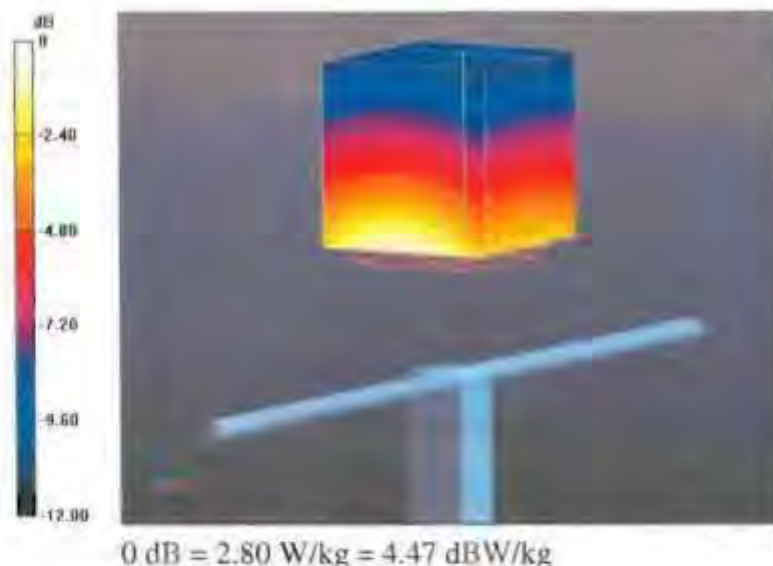
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 56.25 V/m; Power Drift = 0.02 dB

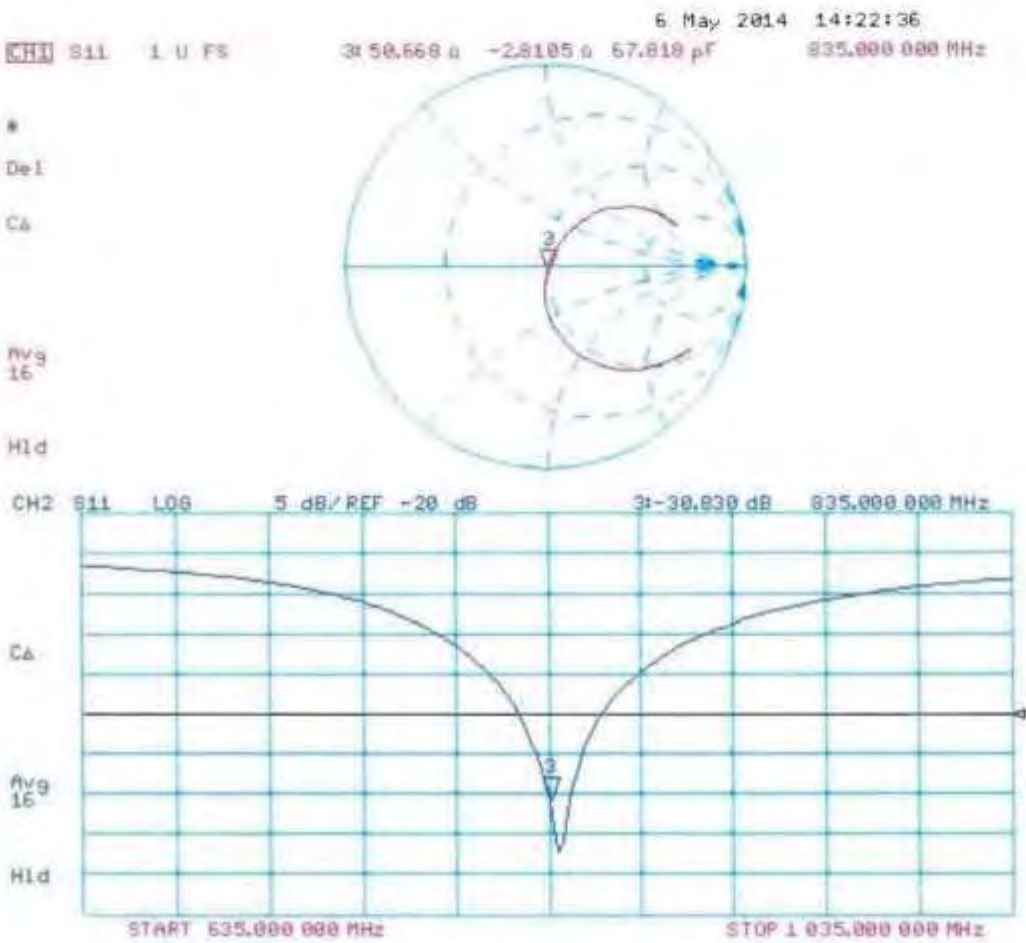
Peak SAR (extrapolated) = 3.62 W/kg

**SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.54 W/kg**

Maximum value of SAR (measured) = 2.80 W/kg



Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 06.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462**

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used:  $f = 835$  MHz;  $\sigma = 1.02$  S/m;  $\epsilon_r = 56.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.09, 6.09, 6.09); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

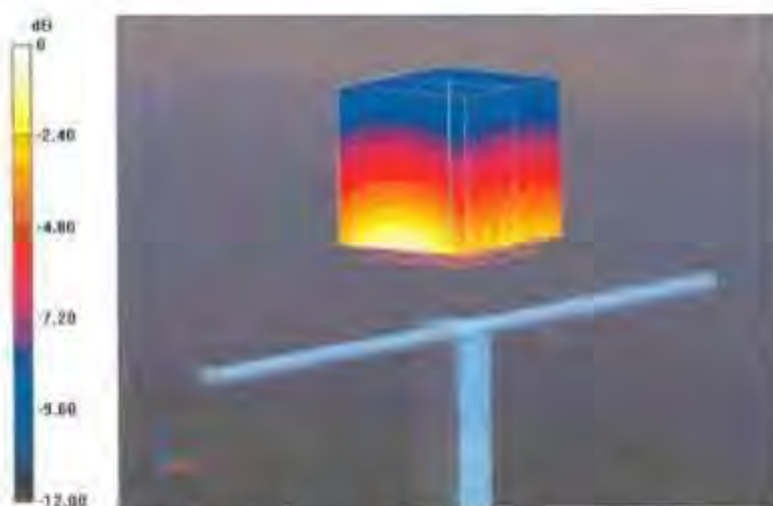
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.63 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.61 W/kg

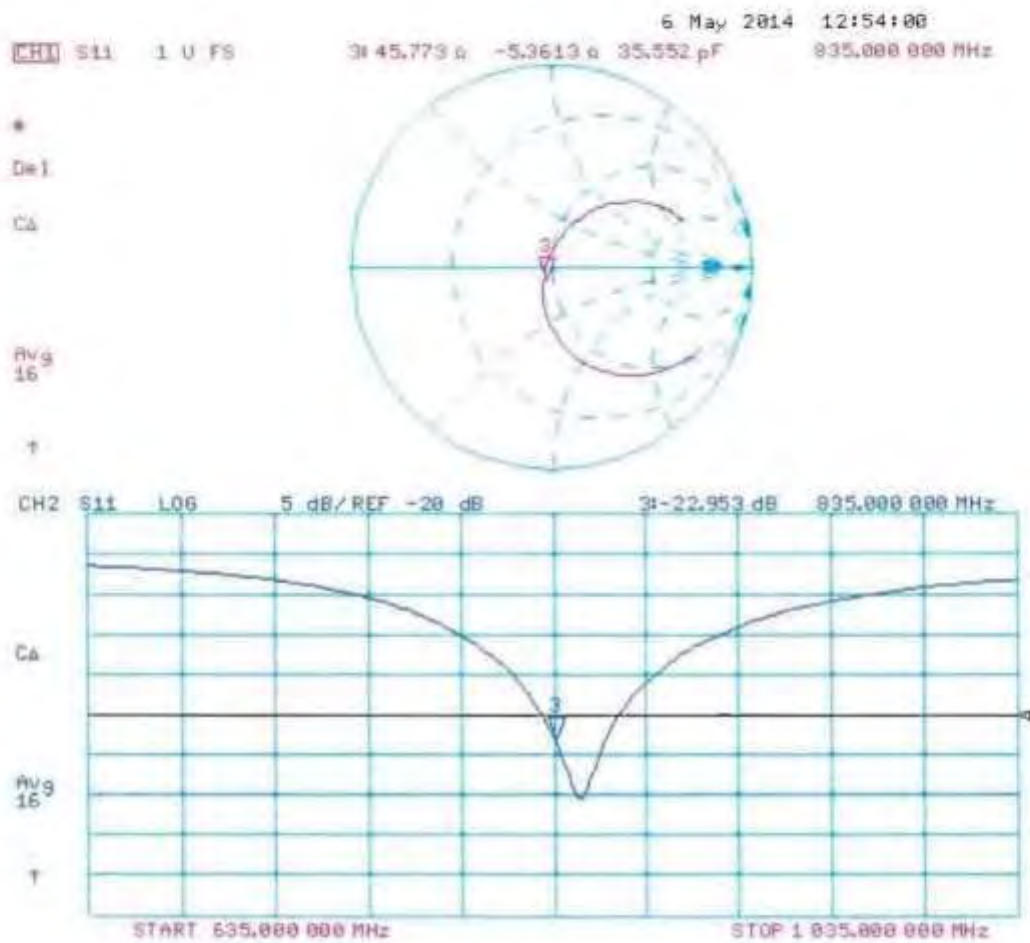
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.58 W/kg

Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Body TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client: **Nokia Salo TCC**

Certificate No: **D1900V2-5d030\_May14**

## CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d030**

Calibration procedure(s): **QA CAL-05.v9**  
**Calibration procedure for dipole validation kits above 700 MHz**

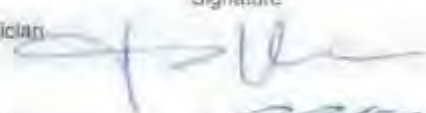
Calibration date: **May 14, 2014**

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         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | US37292783         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | MY41092317         | 09-Oct-13 (No. 217-01828)         | Oct-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 03-Apr-14 (No. 217-01918)         | Apr-15                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 03-Apr-14 (No. 217-01921)         | Apr-15                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Dec-13 (No. ES3-3205 Dec13)    | Dec-14                 |
| DAF4                        | SN: 601            | 30-Apr-14 (No. DAE4-601_Apr14)    | Apr-15                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-13) | In house check: Oct-16 |
| Network Analyzer HP 8753F   | US37390585 S4206   | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

|                |                               |                                          |                                                                                                    |
|----------------|-------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------|
| Calibrated by: | Name<br><b>Jeton Kastrati</b> | Function<br><b>Laboratory Technician</b> | Signature<br> |
| Approved by:   | <b>Katja Pokovic</b>          | <b>Technical Manager</b>                 |               |

Issued: May 15, 2014

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.8     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 1900 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 40.0           | 1.40 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 39.3 $\pm$ 6 % | 1.37 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 9.83 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 39.7 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.15 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 20.7 W/kg $\pm$ 16.5 % (k=2) |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 53.3           | 1.52 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 52.5 $\pm$ 6 % | 1.52 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 10.1 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 40.3 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.34 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 21.3 W/kg $\pm$ 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $50.6 \Omega + 4.3 j\Omega$ |
| Return Loss                          | -27.2 dB                    |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $46.6 \Omega + 4.4 j\Omega$ |
| Return Loss                          | -24.8 dB                    |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.191 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                   |
|-----------------|-------------------|
| Manufactured by | SPEAG             |
| Manufactured on | December 17, 2002 |

## DASY5 Validation Report for Head TSL

Date: 14.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.37$  S/m;  $\epsilon_r = 39.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

### DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

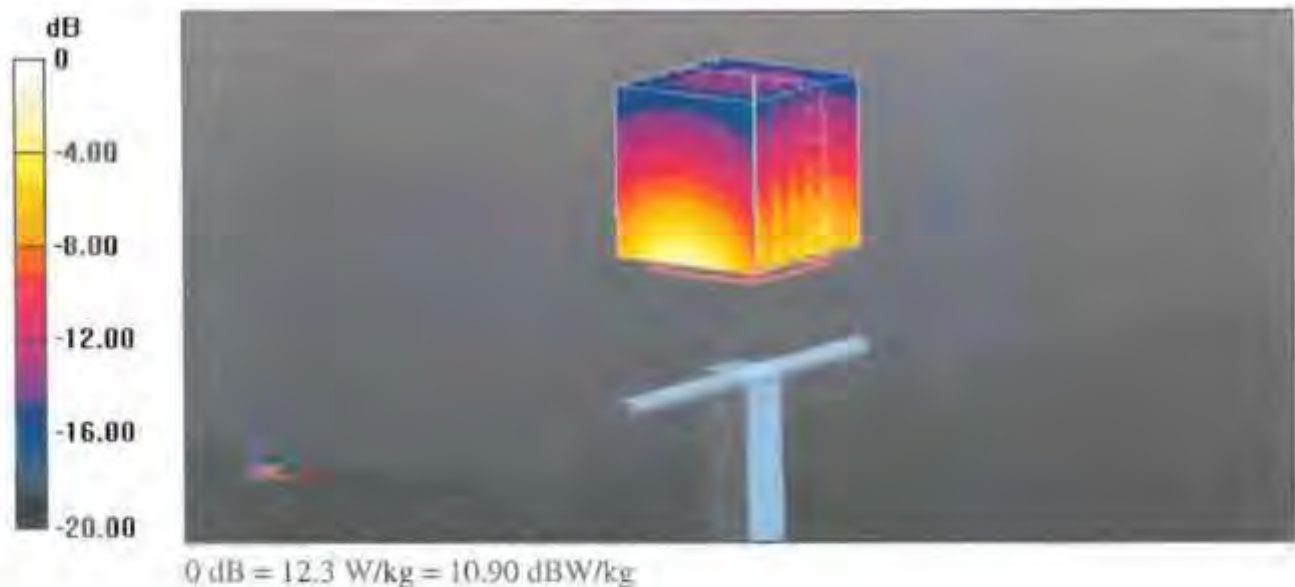
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.75 V/m; Power Drift = 0.01 dB

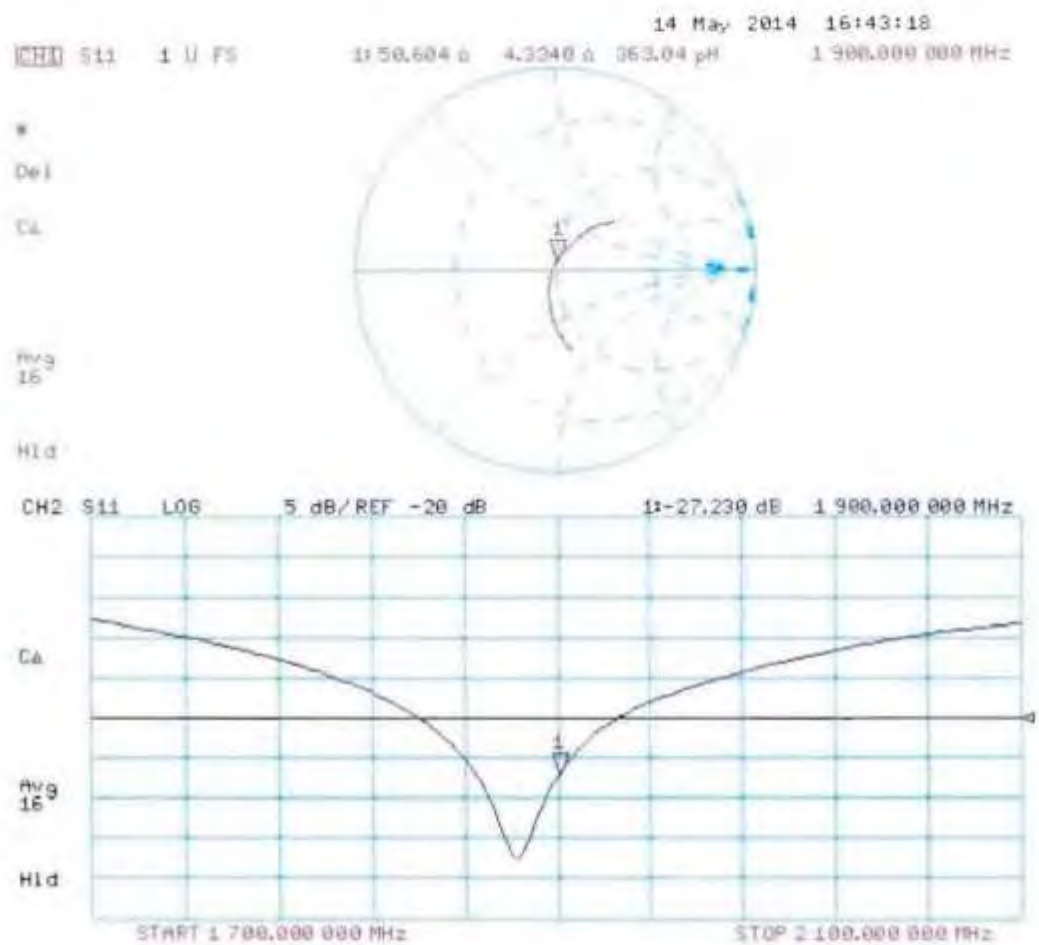
Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.15 W/kg

Maximum value of SAR (measured) = 12.3 W/kg



## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 14.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.52$  S/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 94.65 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 17.6 W/kg

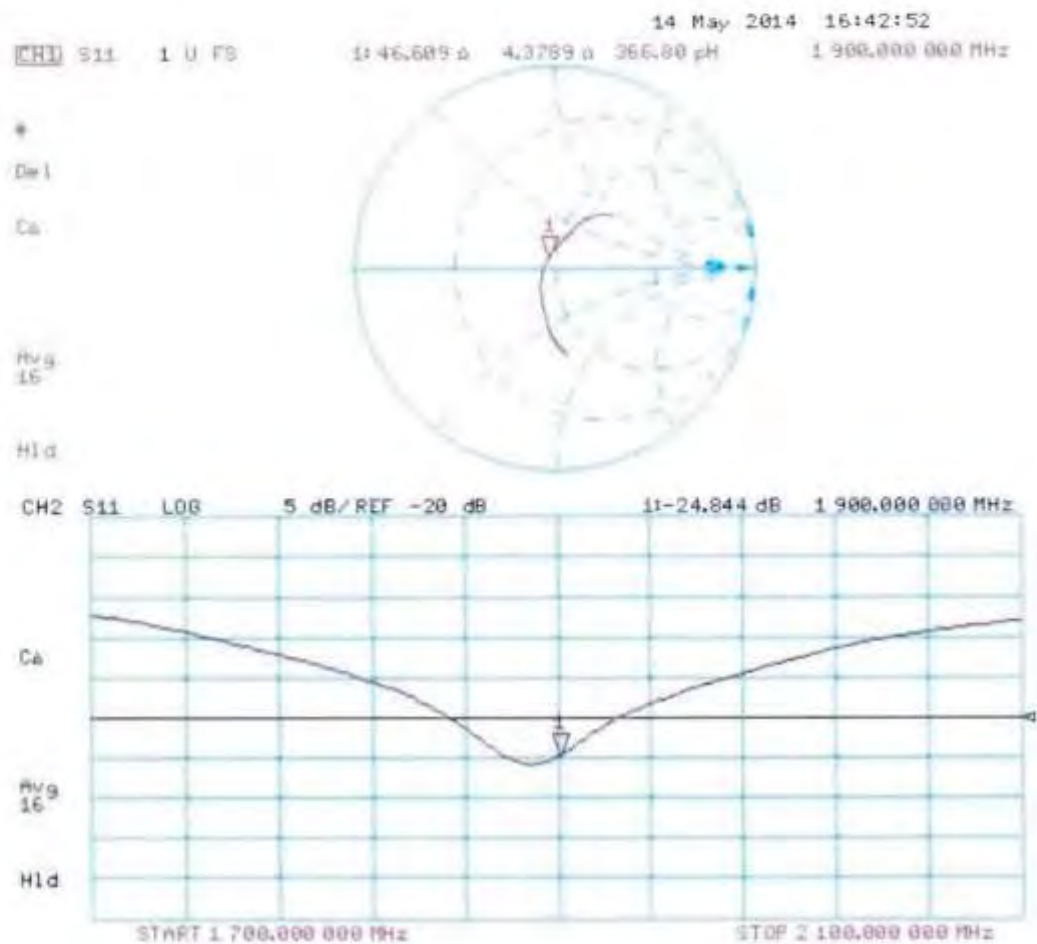
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.34 W/kg

Maximum value of SAR (measured) = 12.6 W/kg



0 dB = 12.6 W/kg = 11.00 dBW/kg

## Impedance Measurement Plot for Body TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Salo TCC**

Certificate No: **D2450V2-729\_May14**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 729**

Calibration procedure(s) **QA CAL-05.v9**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 08, 2014**

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 EPM-442A        | GB37480704         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | US37292783         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | MY41092317         | 09-Oct-13 (No. 217-01828)         | Oct-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20K)     | 03-Apr-14 (No. 217-01918)         | Apr-15                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 03-Apr-14 (No. 217-01921)         | Apr-15                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Dec-13 (No. ES3-3205_Dec13)    | Dec-14                 |
| DAE4                        | SN: 601            | 30-Apr-14 (No. DAE4-601_Apr14)    | Apr-15                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-13) | In house check: Oct-16 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

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

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

Signature

Issued: May 16, 2014

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## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.8     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 2450 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 39.2           | 1.80 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 38.5 $\pm$ 6 % | 1.83 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | —              | —                    |

## SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR measured                                          | 250 mW input power | 13.3 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 52.6 W/kg $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR measured                                            | 250 mW input power | 6.16 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 24.5 W/kg $\pm$ 16.5 % (k=2) |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 52.7           | 1.95 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 50.8 $\pm$ 6 % | 2.03 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | —              | —                    |

## SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR measured                                          | 250 mW input power | 13.2 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 51.4 W/kg $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR measured                                            | 250 mW input power | 6.13 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 24.1 W/kg $\pm$ 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $52.8 \Omega - 0.4 j\Omega$ |
| Return Loss                          | - 31.1 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $49.3 \Omega + 1.2 j\Omega$ |
| Return Loss                          | - 37.4 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.147 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                  |
|-----------------|------------------|
| Manufactured by | SPEAG            |
| Manufactured on | January 09, 2003 |

## DASY5 Validation Report for Head TSL

Date: 08.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.83$  S/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

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

Reference Value = 99.14 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 27.3 W/kg

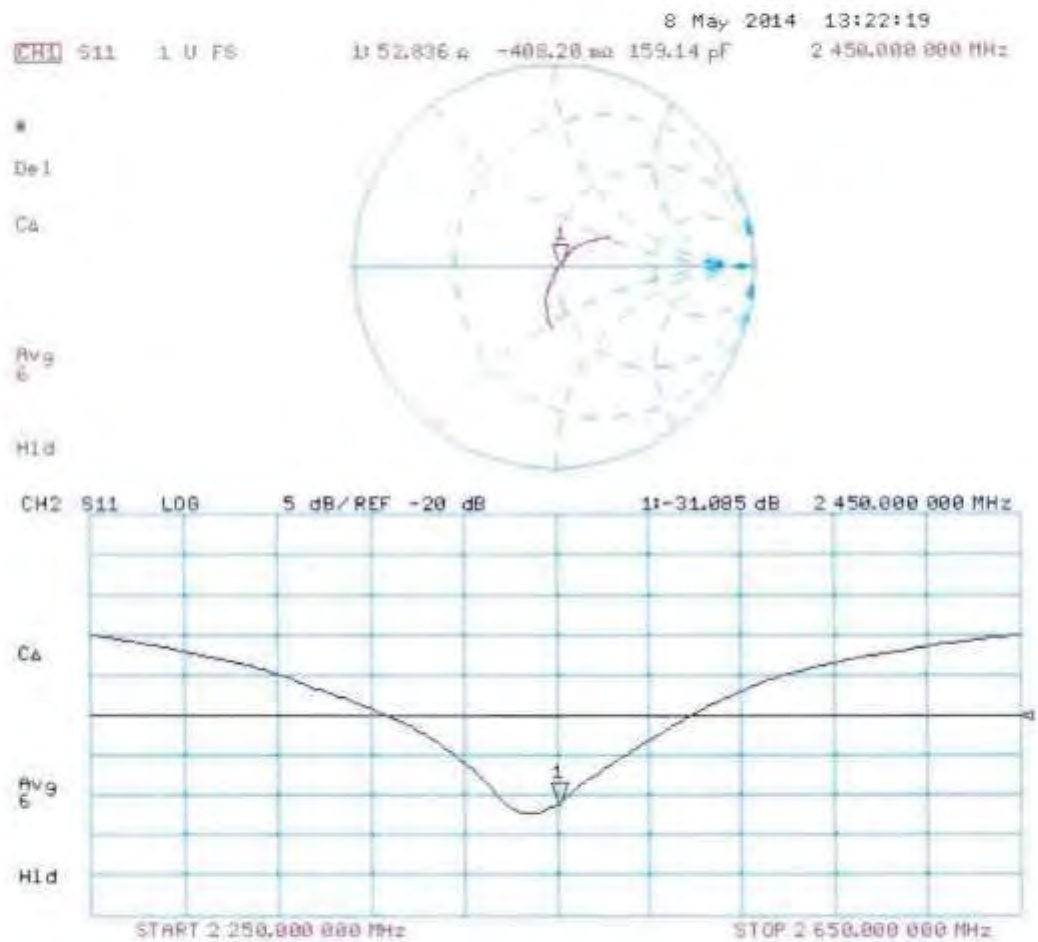
**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg**

Maximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dBW/kg

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 08.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729**

Communication System: UTD 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.03$  S/m;  $\epsilon_r = 50.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

### DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.35, 4.35, 4.35); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

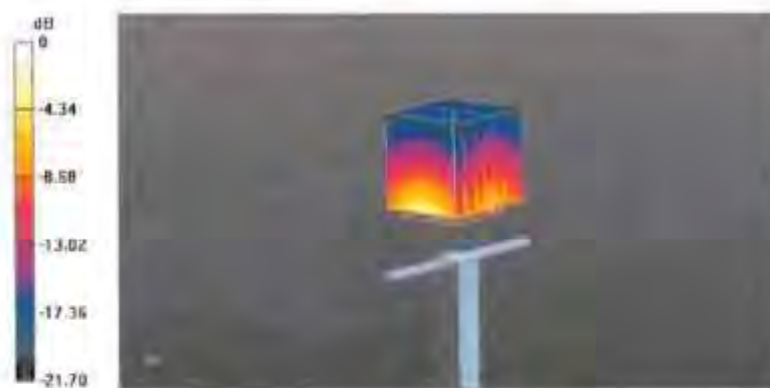
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.61 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 27.6 W/kg

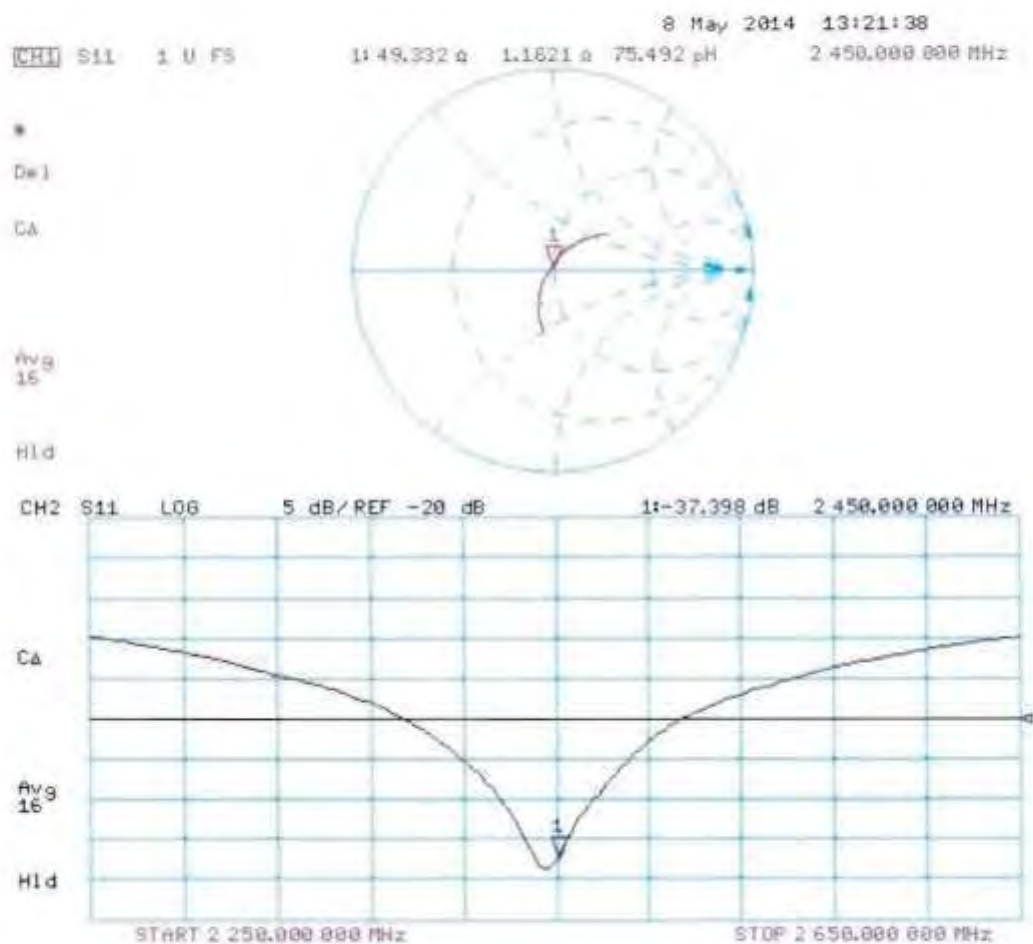
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.13 W/kg

Maximum value of SAR (measured) = 17.4 W/kg



0 dB = 17.4 W/kg = 12.41 dBW/kg

## Impedance Measurement Plot for Body TSL





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 Salo TCC**

Certificate No: **D2600V2-1009\_May14**

## CALIBRATION CERTIFICATE

Object **D2600V2 - SN: 1009**

Calibration procedure(s) **QA CAL-05.v9  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 08, 2014**

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&T critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | US37292783         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | MY41092317         | 09-Oct-13 (No. 217-01828)         | Oct-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 03-Apr-14 (No. 217-01918)         | Apr-15                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 03-Apr-14 (No. 217-01921)         | Apr-15                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Dec-13 (No. ES3-3205_Dec13)    | Dec-14                 |
| DAE4                        | SN: 601            | 30-Apr-14 (No. DAE4-601_Apr14)    | Apr-15                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-13) | In house check: Oct-16 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

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

Signature

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

Issued: May 15, 2014

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

Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.8     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 2600 MHz ± 1 MHz       |             |

Head TSL parameters

The following parameters and calculations were applied.

|                                         |                 |              |                  |
|-----------------------------------------|-----------------|--------------|------------------|
|                                         | Temperature     | Permittivity | Conductivity     |
| Nominal Head TSL parameters             | 22.0 °C         | 39.0         | 1.96 mho/m       |
| Measured Head TSL parameters            | (22.0 ± 0.2) °C | 37.7 ± 6 %   | 1.98 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C        | —            | —                |

SAR result with Head TSL

|                                                       |                    |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                          |
| SAR measured                                          | 250 mW input power | 14.5 W/kg                |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 57.3 W/kg ± 17.0 % (k=2) |

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                          |
| SAR measured                                            | 250 mW input power | 6.44 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 25.6 W/kg ± 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

|                                         |                 |              |                  |
|-----------------------------------------|-----------------|--------------|------------------|
|                                         | Temperature     | Permittivity | Conductivity     |
| Nominal Body TSL parameters             | 22.0 °C         | 52.5         | 2.16 mho/m       |
| Measured Body TSL parameters            | (22.0 ± 0.2) °C | 50.3 ± 6 %   | 2.21 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C        | —            | —                |

SAR result with Body TSL

|                                                       |                    |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                          |
| SAR measured                                          | 250 mW input power | 14.5 W/kg                |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 56.9 W/kg ± 17.0 % (k=2) |

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                          |
| SAR measured                                            | 250 mW input power | 6.39 W/kg                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 25.2 W/kg ± 16.5 % (k=2) |

Appendix

Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.7 $\Omega$ - 4.0 j $\Omega$ |
| Return Loss                          | - 27.8 dB                      |

Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.4 $\Omega$ - 3.1 j $\Omega$ |
| Return Loss                          | - 26.2 dB                      |

General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.150 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

|                 |                |
|-----------------|----------------|
| Manufactured by | SPEAG          |
| Manufactured on | April 12, 2007 |

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1009

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 1.98$  S/m;  $\epsilon_r = 37.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.46, 4.46, 4.46); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

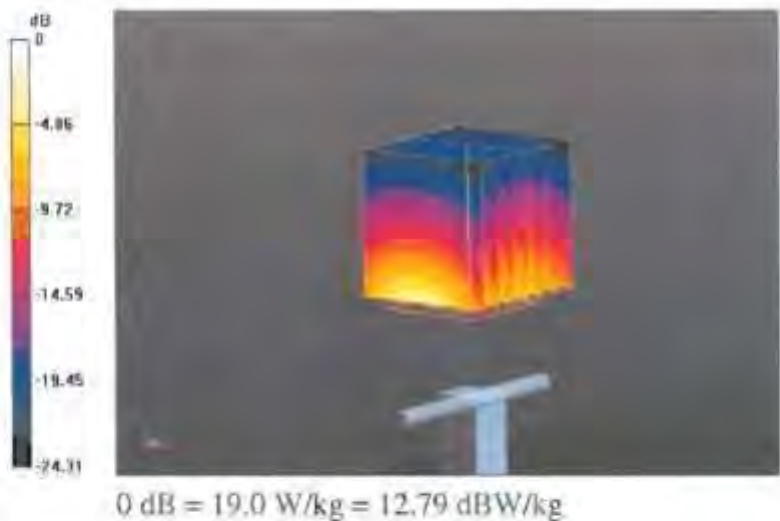
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.6 V/m; Power Drift = 0.05 dB

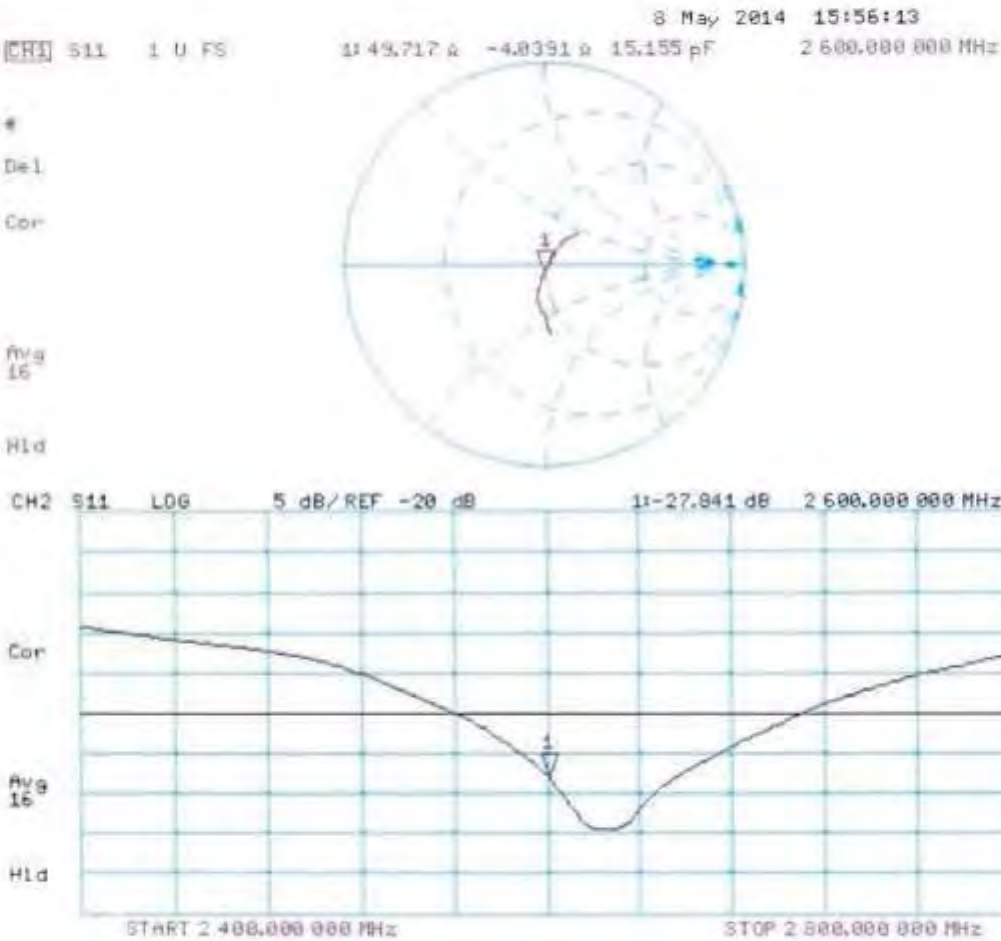
Peak SAR (extrapolated) = 30.9 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.44 W/kg

Maximum value of SAR (measured) = 19.0 W/kg



Impedance Measurement Plot for Head TSL



Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1009**

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 2.21$  S/m;  $\epsilon_r = 50.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.24, 4.24, 4.24); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm 2/Zoom Scan (7x7x7)/Cube 0:**

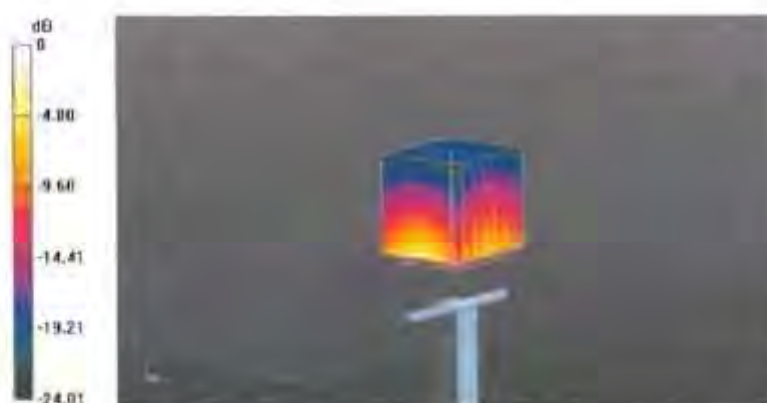
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.96 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 31.4 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.39 W/kg

Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 19.3 W/kg = 12.86 dBW/kg

Impedance Measurement Plot for Body TSL

