

# SAR TEST REPORT

The following samples were submitted and identified on behalf of the client as:

|                             |                                                                        |
|-----------------------------|------------------------------------------------------------------------|
| <b>Equipment Under Test</b> | PDA Phone                                                              |
| <b>Model Name</b>           | PM-0120-BV                                                             |
| <b>Brand Name</b>           | SONY                                                                   |
| <b>Marketing Name</b>       | ST21a                                                                  |
| <b>Company Name</b>         | Sony Mobile Communications AB                                          |
| <b>Company Address</b>      | Nya Vattentornet 22188 Lund/SWEDEN                                     |
| <b>Standards</b>            | FCC- OET 65 supplement C, IEEE /ANSI C95.1 , C95.3, IEEE 1528, RSS-102 |
| <b>FCC ID</b>               | PY7PM-0120                                                             |
| <b>IC ID</b>                | 4170B-PM0120                                                           |
| <b>Date of Receipt</b>      | January 16, 2012                                                       |
| <b>Date of Test(s)</b>      | January 20 ~ Jun. 05, 2012                                             |
| <b>Date of Issue</b>        | Jul. 13, 2012                                                          |

In the configuration tested, the EUT complied with the standards specified above.

## Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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## Signed for on the behalf of SGS

Supervisor

*Ricky Huang*

**Ricky Huang**

**Date:** Jul. 13, 2012

Supervisor

*Nick Hsu*

**Nick Hsu**

**Date:** Jul. 13, 2012

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## Version

| Report Number    | Revision | Date       | Memo                             |
|------------------|----------|------------|----------------------------------|
| ES/2012/20001-01 | 00       | 2012/05/28 | Initial creation of test report. |
| ES/2012/20001-01 | 01       | 2012/06/07 | 1 <sup>st</sup> modification     |
| ES/2012/20001-01 | 02       | 2012/06/20 | 2 <sup>nd</sup> modification     |
| ES/2012/20001-01 | 03       | 2012/06/28 | 3 <sup>rd</sup> modification     |
| ES/2012/20001-01 | 04       | 2012/07/04 | 4 <sup>th</sup> modification     |
| ES/2012/20001-01 | 05       | 2012/07/05 | 5 <sup>th</sup> modification     |
| ES/2012/20001-01 | 06       | 2012/07/06 | 6 <sup>th</sup> modification     |
| ES/2012/20001-01 | 07       | 2012/07/12 | 7 <sup>th</sup> modification     |
| ES/2012/20001-01 | 08       | 2012/07/12 | 8 <sup>th</sup> modification     |
| ES/2012/20001-01 | 09       | 2012/07/13 | 9 <sup>th</sup> modification     |

**This test report contains a reference to the previous version test report that it replaces.**

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# 1. General Information

## 1.1 Testing Laboratory

|                                                        |                        |
|--------------------------------------------------------|------------------------|
| SGS Taiwan Ltd. Electronics & Communication Laboratory |                        |
| 134, Wu Kung Road, Wuku industrial zone                |                        |
| Taipei county, Taiwan, R.O.C.                          |                        |
| Tel                                                    | +886-2-2299-3279       |
| Fax                                                    | +886-2-2298-0488       |
| Internet                                               | http://www.tw.sgs.com/ |

## 1.2 Details of Applicant

|                 |                                            |
|-----------------|--------------------------------------------|
| Company Name    | Sony Mobile Communications AB              |
| Company Address | Nya Vattentornet 22188 Lund/SWEDEN         |
| Contact Person  | Mats Hansson/Head of Regulatory Compliance |
| Tel             | +46 10 8023357                             |
| Fax             | +46 10 8002441                             |
| E-mail          | Mats.Hansson@sonymobile.com                |

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### 1.3 Description of EUT

|                          |                                                                                                                                                                                                                                                                                                                     |                                                               |        |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------|
| EUT Name                 | PDA Phone                                                                                                                                                                                                                                                                                                           |                                                               |        |
| Model Name               | PM-0120-BV                                                                                                                                                                                                                                                                                                          |                                                               |        |
| Marketing Name           | ST21a                                                                                                                                                                                                                                                                                                               |                                                               |        |
| HW Version               | A                                                                                                                                                                                                                                                                                                                   |                                                               |        |
| SW Version               | EMC_1.*.J.0.5_userdebug                                                                                                                                                                                                                                                                                             |                                                               |        |
| IMEI Code                | 004402144458621                                                                                                                                                                                                                                                                                                     |                                                               |        |
| FCC ID                   | PY7PM-0120                                                                                                                                                                                                                                                                                                          |                                                               |        |
| IC ID                    | 4170B-PM0120                                                                                                                                                                                                                                                                                                        |                                                               |        |
| Mode of Operation        | <input checked="" type="checkbox"/> GSM <input checked="" type="checkbox"/> GPRS <input checked="" type="checkbox"/> EDGE <input checked="" type="checkbox"/> WCDMA <input checked="" type="checkbox"/> HSDPA<br><input checked="" type="checkbox"/> WLAN802.11 b/g/n <input checked="" type="checkbox"/> Bluetooth |                                                               |        |
| Definition               | Production unit                                                                                                                                                                                                                                                                                                     |                                                               |        |
| Duty Cycle               | GSM                                                                                                                                                                                                                                                                                                                 | 1/8.3                                                         |        |
|                          | GPRS (multi class 12)                                                                                                                                                                                                                                                                                               | 1/2 (1Dn4UP)<br>1/3 (1Dn3UP)<br>1/4 (1Dn2UP)<br>1/8.3(1Dn1UP) |        |
|                          | EDGE (multi class 12)                                                                                                                                                                                                                                                                                               | 1/2 (1Dn4UP)<br>1/3 (1Dn3UP)<br>1/4 (1Dn2UP)<br>1/8.3(1Dn1UP) |        |
|                          | WCDMA                                                                                                                                                                                                                                                                                                               | 1                                                             |        |
|                          | WLAN 802.11 b/g/n(H20)                                                                                                                                                                                                                                                                                              | 1                                                             |        |
|                          | Bluetooth                                                                                                                                                                                                                                                                                                           | 1                                                             |        |
|                          |                                                                                                                                                                                                                                                                                                                     |                                                               |        |
| TX Frequency Range (MHz) | GSM850                                                                                                                                                                                                                                                                                                              | 824.2                                                         | 848.8  |
|                          | GSM1900                                                                                                                                                                                                                                                                                                             | 1850.2                                                        | 1909.8 |
|                          | WCDMA Band II                                                                                                                                                                                                                                                                                                       | 1852.4                                                        | 1907.6 |
|                          | WCDMA Band V                                                                                                                                                                                                                                                                                                        | 826.4                                                         | 846.6  |
|                          | WLAN 802.11 b/g/n(H20)                                                                                                                                                                                                                                                                                              | 2412                                                          | 2462   |
|                          | Bluetooth                                                                                                                                                                                                                                                                                                           | 2402                                                          | 2480   |

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|                                           |                                                                     |               |         |                                                                                       |                                                                                                    |
|-------------------------------------------|---------------------------------------------------------------------|---------------|---------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Channel Number<br>(ARFCN)                 | GSM850                                                              |               | 128     | —                                                                                     | 251                                                                                                |
|                                           | GSM1900                                                             |               | 512     | —                                                                                     | 810                                                                                                |
|                                           | WCDMA Band II                                                       |               | 9262    | —                                                                                     | 9538                                                                                               |
|                                           | WCDMA Band V                                                        |               | 4132    | —                                                                                     | 4233                                                                                               |
|                                           | WLAN 802.11 b                                                       |               | 1       | —                                                                                     | 11                                                                                                 |
|                                           | Bluetooth                                                           |               | 0       | —                                                                                     | 78                                                                                                 |
| VOIP Function                             | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |               |         |                                                                                       |                                                                                                    |
| Max. SAR<br>Measured(1 g)<br>(Unit: mW/g) | Head                                                                | GSM850        | 1.28    | <input checked="" type="checkbox"/> Left<br><input checked="" type="checkbox"/> Cheek | <input type="checkbox"/> Right<br><input type="checkbox"/> Tilt<br>251 Channel                     |
|                                           |                                                                     | GSM1900       | 0.76    | <input type="checkbox"/> Left<br><input checked="" type="checkbox"/> Cheek            | <input checked="" type="checkbox"/> Right<br><input type="checkbox"/> Tilt<br>512 Channel          |
|                                           |                                                                     | WCDMA Band II | 1.2     | <input type="checkbox"/> Left<br><input checked="" type="checkbox"/> Cheek            | <input checked="" type="checkbox"/> Right<br><input type="checkbox"/> Tilt<br>9262 Channel         |
|                                           |                                                                     | WCDMA Band V  | 1.14    | <input checked="" type="checkbox"/> Left<br><input checked="" type="checkbox"/> Cheek | <input type="checkbox"/> Right<br><input type="checkbox"/> Tilt<br>4183 Channel                    |
|                                           |                                                                     | WLAN802.11 b  | 0.00922 | <input type="checkbox"/> Left<br><input type="checkbox"/> Cheek                       | <input checked="" type="checkbox"/> Right<br><input checked="" type="checkbox"/> Tilt<br>1 Channel |
|                                           | Body worn<br>(speech mode)                                          | GSM 850       | 0.548   | <input type="checkbox"/> Front                                                        | <input checked="" type="checkbox"/> Back<br>251 Channel<br>- with headset                          |
|                                           |                                                                     | GSM 1900      | 0.53    | <input type="checkbox"/> Front                                                        | <input checked="" type="checkbox"/> Back<br>512 Channel<br>- with headset                          |
|                                           |                                                                     | WCDMA Band II | 0.576   | <input type="checkbox"/> Front                                                        | <input checked="" type="checkbox"/> Back<br>9262 Channel<br>- with headset                         |
|                                           |                                                                     | WCDMA Band V  | 0.742   | <input type="checkbox"/> Front                                                        | <input checked="" type="checkbox"/> Back<br>4233 Channel<br>- with headset                         |

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|                                           |                 |               |       |                                                                                                                                                                                                      |
|-------------------------------------------|-----------------|---------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max. SAR<br>Measured(1 g)<br>(Unit: mW/g) | Hotspot<br>mode | GSM850        | 1.27  | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back<br><input type="checkbox"/> Bottom <input type="checkbox"/> Right<br><input type="checkbox"/> Left<br>251 Channel            |
|                                           |                 | GSM1900       | 1.11  | <input type="checkbox"/> Front <input type="checkbox"/> Back<br><input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Right<br><input type="checkbox"/> Left<br>512 Channel            |
|                                           |                 | WCDMA Band II | 1.37  | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back<br><input type="checkbox"/> Bottom <input type="checkbox"/> Right<br><input type="checkbox"/> Left<br>9262 Channel           |
|                                           |                 | WCDMA Band V  | 1.36  | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back<br><input type="checkbox"/> Bottom <input type="checkbox"/> Right<br><input type="checkbox"/> Left<br>4183 Channel           |
|                                           |                 | WLAN802.11 b  | 0.013 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back<br><input type="checkbox"/> Top <input type="checkbox"/> Right<br><input type="checkbox"/> Left<br>1 Channel<br>With headset |

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# # Scaling SAR table:

| Mode |                         | Band            | Channel | Power (dBm) | Target Power (dBm) | Scaling | Max. SAR Measured (1 g)(W/Kg) | Calculated SAR (1 g)(W/Kg) |
|------|-------------------------|-----------------|---------|-------------|--------------------|---------|-------------------------------|----------------------------|
| Head |                         | GSM 850         | 251     | 33.1        | 33.5               | 9.65%   | 1.28                          | <b>1.40</b>                |
|      |                         | GSM 1900        | 512     | 29.9        | 30.5               | 14.82%  | 0.76                          | 0.87                       |
|      |                         | WCDMA Band II   | 9262    | 22.6        | 22.5               | 0%      | 1.20                          | 1.20                       |
|      |                         | WCDMA Band V    | 4183    | 23.91       | 24                 | 2.09%   | 1.14                          | 1.16                       |
| Body | Body worn (speech mode) | GSM 850         | 251     | 33.1        | 33.5               | 9.65%   | 0.55                          | 0.60                       |
|      |                         | GSM 1900        | 512     | 29.9        | 30.5               | 14.82%  | 0.53                          | 0.61                       |
|      |                         | WCDMA Band II   | 9262    | 22.6        | 22.5               | 0%      | 0.58                          | 0.58                       |
|      |                         | WCDMA Band V    | 4233    | 23.63       | 24                 | 8.89%   | 0.74                          | 0.81                       |
|      | Hotspot mode            | GPRS 850 1Dn2UP | 251     | 30.2        | 30.5               | 7.15%   | 1.27                          | 1.36                       |
|      |                         | GPRS1900 1Dn4UP | 512     | 25          | 25                 | 0%      | 1.11                          | 1.11                       |
|      |                         | WCDMA Band II   | 9262    | 22.6        | 22.5               | 0%      | 1.37                          | 1.37                       |
|      |                         | WCDMA Band V    | 4183    | 23.91       | 24                 | 2.09%   | 1.36                          | <b>1.39</b>                |

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# # . GSM/GPRS/EDGE conducted power table:

| EUT mode                                                   | Frequency (MHz) | CH  | Burst average power | Source-based time average power |
|------------------------------------------------------------|-----------------|-----|---------------------|---------------------------------|
|                                                            |                 |     | Avg.(dBm)           | Avg.(dBm)                       |
| GSM 850 (GMSK)                                             | 824.2           | 128 | 33.00               | 23.97                           |
|                                                            | 836.6           | 190 | 33.10               | 24.07                           |
|                                                            | 848.8           | 251 | 33.10               | 24.07                           |
| The division factor compared to the number of TX time slot |                 |     |                     |                                 |
| Division factor                                            |                 |     | 1 TX time slot      |                                 |
|                                                            |                 |     | -9.03               |                                 |

| Burst average power                                        |                 |     |                |                |                |                |
|------------------------------------------------------------|-----------------|-----|----------------|----------------|----------------|----------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP         | 1Dn2UP         | 1Dn3UP         | 1Dn4UP         |
|                                                            |                 |     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     |
| GPRS 850 (GMSK)                                            | 824.2           | 128 | 32.80          | 30.00          | 28.00          | 26.60          |
|                                                            | 836.6           | 190 | 32.80          | 30.10          | 28.00          | 26.60          |
|                                                            | 848.8           | 251 | 32.80          | 30.20          | 28.00          | 26.60          |
| Source-based time average power                            |                 |     |                |                |                |                |
| GPRS 850 (GMSK)                                            | 824.2           | 128 | 23.77          | 23.98          | 23.74          | 23.59          |
|                                                            | 836.6           | 190 | 23.77          | 24.08          | 23.74          | 23.59          |
|                                                            | 848.8           | 251 | 23.77          | 24.18          | 23.74          | 23.59          |
| The division factor compared to the number of TX time slot |                 |     |                |                |                |                |
| Division factor                                            |                 |     | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
|                                                            |                 |     | -9.03          | -6.02          | -4.26          | -3.01          |

| Burst average power                                        |                 |     |                |                |                |                |
|------------------------------------------------------------|-----------------|-----|----------------|----------------|----------------|----------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP         | 1Dn2UP         | 1Dn3UP         | 1Dn4UP         |
|                                                            |                 |     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     |
| EDGE 850 (MCS 5)                                           | 824.2           | 128 | 27.20          | 27.10          | 27.00          | 26.00          |
|                                                            | 836.6           | 190 | 27.20          | 27.10          | 27.00          | 26.00          |
|                                                            | 848.8           | 251 | 27.20          | 27.10          | 27.10          | 26.00          |
| Source-based time average power                            |                 |     |                |                |                |                |
| EDGE 850 (MCS 5)                                           | 824.2           | 128 | 18.17          | 21.08          | 22.74          | 22.99          |
|                                                            | 836.6           | 190 | 18.17          | 21.08          | 22.74          | 22.99          |
|                                                            | 848.8           | 251 | 18.17          | 21.08          | 22.84          | 22.99          |
| The division factor compared to the number of TX time slot |                 |     |                |                |                |                |
| Division factor                                            |                 |     | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
|                                                            |                 |     | -9.03          | -6.02          | -4.26          | -3.01          |

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| Burst average power                                        |                 |     |                      |                      |                      |                      |
|------------------------------------------------------------|-----------------|-----|----------------------|----------------------|----------------------|----------------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP<br>Avg. (dBm) | 1Dn2UP<br>Avg. (dBm) | 1Dn3UP<br>Avg. (dBm) | 1Dn4UP<br>Avg. (dBm) |
| EDGE 850 (MCS 4)                                           | 824.2           | 128 | 26.90                | 26.80                | 26.80                | 26.70                |
|                                                            | 836.6           | 190 | 27.10                | 27.00                | 26.90                | 26.90                |
|                                                            | 848.8           | 251 | 27.20                | 27.10                | 27.00                | 27.00                |
| Source-based time average power                            |                 |     |                      |                      |                      |                      |
| EDGE 850 (MCS 4)                                           | 824.2           | 128 | 17.87                | 20.78                | 22.54                | 23.69                |
|                                                            | 836.6           | 190 | 18.07                | 20.98                | 22.64                | 23.89                |
|                                                            | 848.8           | 251 | 18.17                | 21.08                | 22.74                | 23.99                |
| The division factor compared to the number of TX time slot |                 |     |                      |                      |                      |                      |
| Division factor                                            |                 |     | 1 TX time slot       | 2 TX time slot       | 3 TX time slot       | 4 TX time slot       |
|                                                            |                 |     | -9.03                | -6.02                | -4.26                | -3.01                |

| Burst average power                                        |                 |     |                      |                      |                      |                      |
|------------------------------------------------------------|-----------------|-----|----------------------|----------------------|----------------------|----------------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP<br>Avg. (dBm) | 1Dn2UP<br>Avg. (dBm) | 1Dn3UP<br>Avg. (dBm) | 1Dn4UP<br>Avg. (dBm) |
| EDGE 850 (MCS 9)                                           | 824.2           | 128 | 27.10                | 27.00                | 27.00                | 25.90                |
|                                                            | 836.6           | 190 | 27.30                | 27.20                | 27.10                | 26.10                |
|                                                            | 848.8           | 251 | 27.40                | 27.30                | 27.30                | 26.20                |
| Source-based time average power                            |                 |     |                      |                      |                      |                      |
| EDGE 850 (MCS 9)                                           | 824.2           | 128 | 18.07                | 20.98                | 22.74                | 22.89                |
|                                                            | 836.6           | 190 | 18.27                | 21.18                | 22.84                | 23.09                |
|                                                            | 848.8           | 251 | 18.37                | 21.28                | 23.04                | 23.19                |
| The division factor compared to the number of TX time slot |                 |     |                      |                      |                      |                      |
| Division factor                                            |                 |     | 1 TX time slot       | 2 TX time slot       | 3 TX time slot       | 4 TX time slot       |
|                                                            |                 |     | -9.03                | -6.02                | -4.26                | -3.01                |

| EUT mode                                                   | Frequency (MHz) | CH  | Burst average power | Source-based time average power |
|------------------------------------------------------------|-----------------|-----|---------------------|---------------------------------|
|                                                            |                 |     | Avg.(dBm)           | Avg.(dBm)                       |
| GSM 1900 (GMSK)                                            | 1850.2          | 512 | 29.90               | 20.87                           |
|                                                            | 1880            | 661 | 29.90               | 20.87                           |
|                                                            | 1909.8          | 810 | 30.10               | 21.07                           |
| The division factor compared to the number of TX time slot |                 |     |                     |                                 |
| Division factor                                            |                 |     | 1 TX time slot      |                                 |
|                                                            |                 |     | -9.03               |                                 |

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| Burst average power                                        |                 |     |                |                |                |                |
|------------------------------------------------------------|-----------------|-----|----------------|----------------|----------------|----------------|
|                                                            |                 |     | 1Dn1UP         | 1Dn2UP         | 1Dn3UP         | 1Dn4UP         |
| EUT mode                                                   | Frequency (MHz) | CH  | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     |
| GPRS 1900 (GMSK)                                           | 1850.2          | 512 | 29.90          | 27.80          | 25.70          | 25.00          |
|                                                            | 1880            | 661 | 30.00          | 27.70          | 25.70          | 25.00          |
|                                                            | 1909.8          | 810 | 30.10          | 27.70          | 25.70          | 25.00          |
| Source-based time average power                            |                 |     |                |                |                |                |
| GPRS 1900 (GMSK)                                           | 1850.2          | 512 | 20.87          | 21.78          | 21.44          | 21.99          |
|                                                            | 1880            | 661 | 20.97          | 21.68          | 21.44          | 21.99          |
|                                                            | 1909.8          | 810 | 21.07          | 21.68          | 21.44          | 21.99          |
| The division factor compared to the number of TX time slot |                 |     |                |                |                |                |
| Division factor                                            |                 |     | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
|                                                            |                 |     | -9.03          | -6.02          | -4.26          | -3.01          |

| Burst average power                                        |                 |     |                |                |                |                |
|------------------------------------------------------------|-----------------|-----|----------------|----------------|----------------|----------------|
|                                                            |                 |     | 1Dn1UP         | 1Dn2UP         | 1Dn3UP         | 1Dn4UP         |
| EUT mode                                                   | Frequency (MHz) | CH  | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     | Avg. (dBm)     |
| EDGE 1900 (MCS 5)                                          | 1850.2          | 512 | 26.50          | 26.30          | 25.50          | 24.50          |
|                                                            | 1880            | 661 | 26.50          | 26.40          | 25.40          | 24.50          |
|                                                            | 1909.8          | 810 | 26.50          | 26.40          | 25.40          | 24.50          |
| Source-based time average power                            |                 |     |                |                |                |                |
| EDGE 1900 (MCS 5)                                          | 1850.2          | 512 | 17.47          | 20.28          | 21.24          | 21.49          |
|                                                            | 1880            | 661 | 17.47          | 20.38          | 21.14          | 21.49          |
|                                                            | 1909.8          | 810 | 17.47          | 20.38          | 21.14          | 21.49          |
| The division factor compared to the number of TX time slot |                 |     |                |                |                |                |
| Division factor                                            |                 |     | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
|                                                            |                 |     | -9.03          | -6.02          | -4.26          | -3.01          |

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| Burst average power                                        |                 |     |                         |                         |                         |                         |
|------------------------------------------------------------|-----------------|-----|-------------------------|-------------------------|-------------------------|-------------------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP<br>Avg. (dBm)    | 1Dn2UP<br>Avg. (dBm)    | 1Dn3UP<br>Avg. (dBm)    | 1Dn4UP<br>Avg. (dBm)    |
| EDGE 1900 (MCS 4)                                          | 1850.2          | 512 | 26.30                   | 26.20                   | 25.20                   | 24.70                   |
|                                                            | 1880            | 661 | 26.60                   | 26.50                   | 25.60                   | 24.80                   |
|                                                            | 1909.8          | 810 | 26.60                   | 26.50                   | 25.60                   | 24.80                   |
| Source-based time average power                            |                 |     |                         |                         |                         |                         |
| EDGE 1900 (MCS 4)                                          | 1850.2          | 512 | 17.27                   | 20.18                   | 20.94                   | 21.69                   |
|                                                            | 1880            | 661 | 17.57                   | 20.48                   | 21.34                   | 21.79                   |
|                                                            | 1909.8          | 810 | 17.57                   | 20.48                   | 21.34                   | 21.79                   |
| The division factor compared to the number of TX time slot |                 |     |                         |                         |                         |                         |
| Division factor                                            |                 |     | 1 TX time slot<br>-9.03 | 2 TX time slot<br>-6.02 | 3 TX time slot<br>-4.26 | 4 TX time slot<br>-3.01 |

| Burst average power                                        |                 |     |                         |                         |                         |                         |
|------------------------------------------------------------|-----------------|-----|-------------------------|-------------------------|-------------------------|-------------------------|
| EUT mode                                                   | Frequency (MHz) | CH  | 1Dn1UP<br>Avg. (dBm)    | 1Dn2UP<br>Avg. (dBm)    | 1Dn3UP<br>Avg. (dBm)    | 1Dn4UP<br>Avg. (dBm)    |
| EDGE 1900 (MCS 9)                                          | 1850.2          | 512 | 26.40                   | 25.30                   | 24.70                   | 23.60                   |
|                                                            | 1880            | 661 | 26.70                   | 25.60                   | 25.00                   | 24.00                   |
|                                                            | 1909.8          | 810 | 26.60                   | 25.60                   | 25.00                   | 24.00                   |
| Source-based time average power                            |                 |     |                         |                         |                         |                         |
| EDGE 1900 (MCS 9)                                          | 1850.2          | 512 | 17.37                   | 19.28                   | 20.44                   | 20.59                   |
|                                                            | 1880            | 661 | 17.67                   | 19.58                   | 20.74                   | 20.99                   |
|                                                            | 1909.8          | 810 | 17.57                   | 19.58                   | 20.74                   | 20.99                   |
| The division factor compared to the number of TX time slot |                 |     |                         |                         |                         |                         |
| Division factor                                            |                 |     | 1 TX time slot<br>-9.03 | 2 TX time slot<br>-6.02 | 3 TX time slot<br>-4.26 | 4 TX time slot<br>-3.01 |

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# # . WCDMA Band II & V HSDPA conducted power table:

| Band             | Channel | Rel99<br>AV(dBm) | HSDPA mode AV(dBm)_rel 5 |            |            |            |
|------------------|---------|------------------|--------------------------|------------|------------|------------|
|                  |         |                  | sub-test 1               | sub-test 2 | sub-test 3 | sub-test 4 |
| WCDMA<br>Band II | 9262    | 22.60            | 22.77                    | 22.48      | 22.29      | 22.36      |
|                  | 9400    | 22.67            | 22.56                    | 22.53      | 22.11      | 22.12      |
|                  | 9538    | 22.40            | 22.26                    | 22.25      | 21.73      | 21.85      |
| WCDMA<br>Band V  | 4132    | 23.93            | 23.72                    | 23.86      | 23.26      | 23.31      |
|                  | 4183    | 23.91            | 23.77                    | 23.8       | 23.29      | 23.33      |
|                  | 4233    | 23.63            | 23.75                    | 23.5       | 23.26      | 23.32      |

| Sub-te<br>st | $\beta_c$ | $\beta_d$ | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ | CM (dB) | MPR<br>(dB) |
|--------------|-----------|-----------|-------------------|-------------------|--------------|---------|-------------|
| 1            | 2/15      | 15/15     | 64                | 2/15              | 4/15         | 0.0     | 0.0         |
| 2            | 12/15     | 15/15     | 64                | 12/15             | 24/15        | 1.0     | 0.0         |
| 3            | 15/15     | 8/15      | 64                | 15/8              | 30/15        | 1.5     | 0.5         |
| 4            | 15/15     | 4/15      | 64                | 15/4              | 30/15        | 1.5     | 0.5         |

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### #. WLAN802.11 b/g/n (20M) conducted power table:

| 802.11b |                 | Average Power Output (dBm) |       |       |       |
|---------|-----------------|----------------------------|-------|-------|-------|
| CH      | Frequency (MHz) | Data Rate (Mbps)           |       |       |       |
|         |                 | 1                          | 2     | 5.5   | 11    |
| 1       | 2412            | 12.51                      | 12.44 | 12.50 | 12.36 |
| 6       | 2437            | 12.47                      | 12.41 | 12.42 | 12.39 |
| 11      | 2462            | 12.39                      | 12.36 | 12.35 | 12.31 |

| 802.11g |                 | Average Power Output(dBm) |       |       |       |       |       |       |       |
|---------|-----------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|
| CH      | Frequency (MHz) | Data Rate (Mbps)          |       |       |       |       |       |       |       |
|         |                 | 6                         | 9     | 12    | 18    | 24    | 36    | 48    | 54    |
| 1       | 2412            | 12.43                     | 12.35 | 12.22 | 12.1  | 11.88 | 11.62 | 11.49 | 11.31 |
| 6       | 2437            | 12.52                     | 12.46 | 12.43 | 12.28 | 12.03 | 11.93 | 11.88 | 11.84 |
| 11      | 2462            | 12.49                     | 12.43 | 12.42 | 12.22 | 12.05 | 11.95 | 11.82 | 11.77 |

| 802.11n (20M) |                 | Average Power Output(dBm) |       |       |      |      |      |      |      |       |
|---------------|-----------------|---------------------------|-------|-------|------|------|------|------|------|-------|
| CH            | Frequency (MHz) | Data Rate (Mbps)          |       |       |      |      |      |      |      |       |
|               |                 | 6.5                       | 13    | 19.5  | 26   | 39   | 52   | 58.5 | 65   | 72.2  |
| 1             | 2412            | 10.44                     | 10.11 | 9.82  | 9.67 | 9.25 | 9.07 | 8.91 | 8.87 | 10.44 |
| 6             | 2437            | 10.32                     | 10.05 | 9.91  | 9.82 | 9.55 | 9.36 | 9.01 | 8.92 | 10.32 |
| 11            | 2462            | 10.37                     | 10.15 | 10.01 | 9.81 | 9.44 | 9.28 | 9.02 | 8.88 | 10.37 |

### #. Bluetooth conducted power table:

| Channel | Peak Power (dBm) |       | Average Power (dBm) |      |
|---------|------------------|-------|---------------------|------|
|         | BDR              | EDR   | BDR                 | EDR  |
| 2402    | 8.96             | 9.61  | 7.85                | 5.98 |
| 2441    | 9.71             | 10.11 | 8.57                | 6.76 |
| 2480    | 9.3              | 9.5   | 7.83                | 5.92 |

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## 1.4 Test Environment

Ambient Temperature :  $22 \pm 2^{\circ} \text{C}$

Tissue Simulating Liquid:  $22 \pm 2^{\circ} \text{C}$

## 1.5 Operation Description

### General:

1. The EUT is controlled by using a Radio Communication Tester (R&S CMU200), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. Testing Head SAR at lowest, middle and highest channel for all bands with LET/LEC/RET/REC conditions.
5. Testing body-worn speech mode SAR by separating **15mm** for GSM850, GSM1900, WCDMA Band II and WCDMA Band V. (Front side & back side)

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6. Testing hotspot mode SAR by separating **10mm**.

#. The SAR testing for portable devices with wireless router capability is referred as test guidance of **KDB 941225 D06** (SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities).

#. The following procedures are applicable when the overall device length and width are  $\geq 9 \text{ cm} \times 5 \text{ cm}$  respectively. A test separation of 10 mm is required. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode.

# For GPRS body-worn (15mm separation): the testing device support mobile hotspot function, the separation distance is **10mm (No need to perform SAR testing with Body worn accessory (15mm separation distance) due to the hotspot mode(10mm separation distance) is more conservative than Body worn accessory mode.)**

Test configurations:

- (1) Front side
  - (2) Back side
  - (3) Top side.(WWAN antenna to edge distance  $> 25\text{mm}$ \_No SAR)
  - (4) Bottom side. (WLAN antenna to edge distance  $> 25\text{mm}$ \_No SAR)
  - (5) Right side.
  - (6) Left side.
7. When the maximum transmitter and antenna output power are  $\leq 60/f(\text{GHz})$  (mW) SAR evaluation is typically not required for FCC or TCB approval **(Bluetooth average power= 8.57dBm)**
8. According to **KDB248227**-SAR is not required for 802.11 g/HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.
9. Using **KDB941225 D01** to exclude SAR test requirements for HSDPA modes due to the maximum average output power of HSDPA active is less than 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC

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10. For Head, The highest 1-g SAR for WLAN is 0.00922 W/kg and the highest 1-g SAR for WWAN is 1.28W/kg. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is  $0.00922 + 1.28 = 1.28922$  W/kg.
11. For Body, The highest 1-g SAR for WLAN is 0.013 W/kg and the highest 1-g SAR for WWAN is 1.37W/kg. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is  $0.013 + 1.37 = 1.383$  W/kg.
12. For both head & body, summing 1-g SAR for WLAN and WWAN **were lower than the limit 1.6W/kg**. According to **KDB648474/KDB447498** Simultaneous SAR evaluation is not required.
13. WLAN / WWAN – Antenna separation is 79.65mm > 5cm, Sum of SAR is less than 1.6W/kg, hence no simultaneous SAR is needed.

**Additional configuration(Head):**

14. For highest SAR configuration in this band repeated with external Memory card inside.
15. For highest SAR configuration in this band repeated with 2<sup>nd</sup> Battery(Supplier: Samsung).

**Additional configuration(Body):**

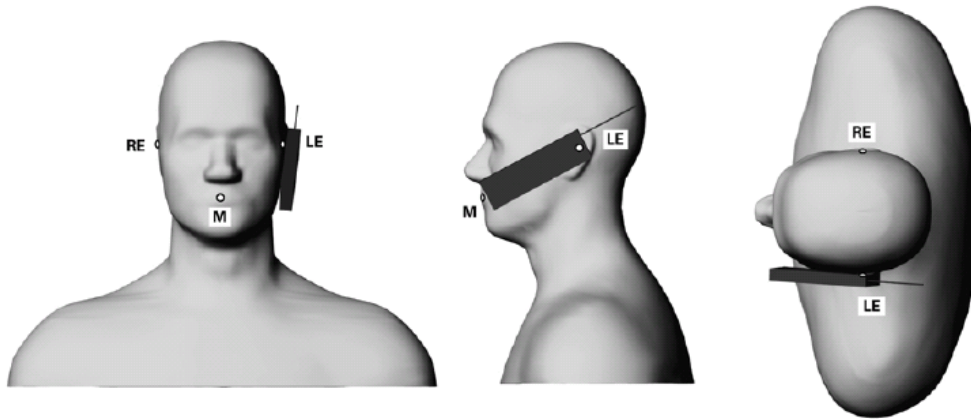
16. For highest SAR configuration in this band repeated with external Memory card inside.
17. For highest SAR configuration in this band repeated with Headset.
18. For highest SAR configuration in this band repeated with 2<sup>nd</sup> Battery(Supplier: Samsung).

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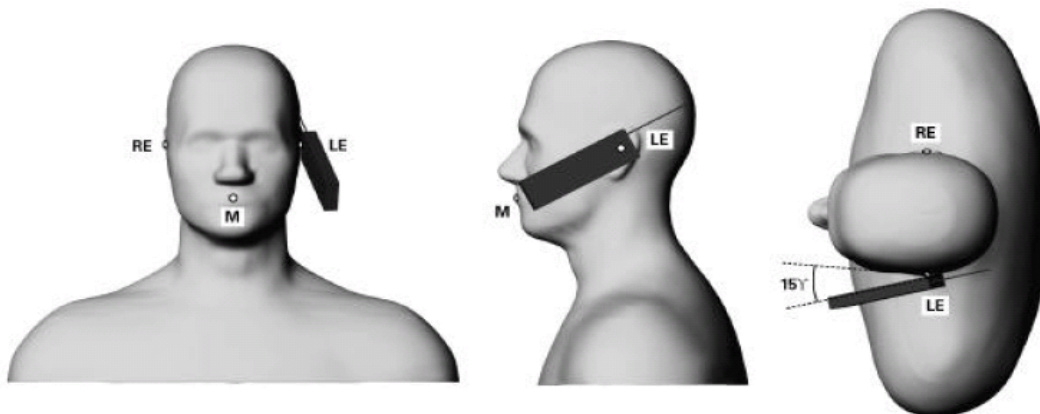
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## 1.6 Positioning Procedure



Phone position 1, “cheek” or “touch” position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, “tilted position.” The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

### Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

### Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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## 1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. The generation of a high-resolution mesh within the measured volume.
4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It

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is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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## 1.8 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system ). Model ES3DV3/ EX3DV4 field probe are used to determine the internal electric fields. The SAR can be obtained from the equation  $SAR = \sigma (|E_i|^2) / \rho$  where  $\sigma$  and  $\rho$  are the conductivity and mass density of the tissue-simulant.

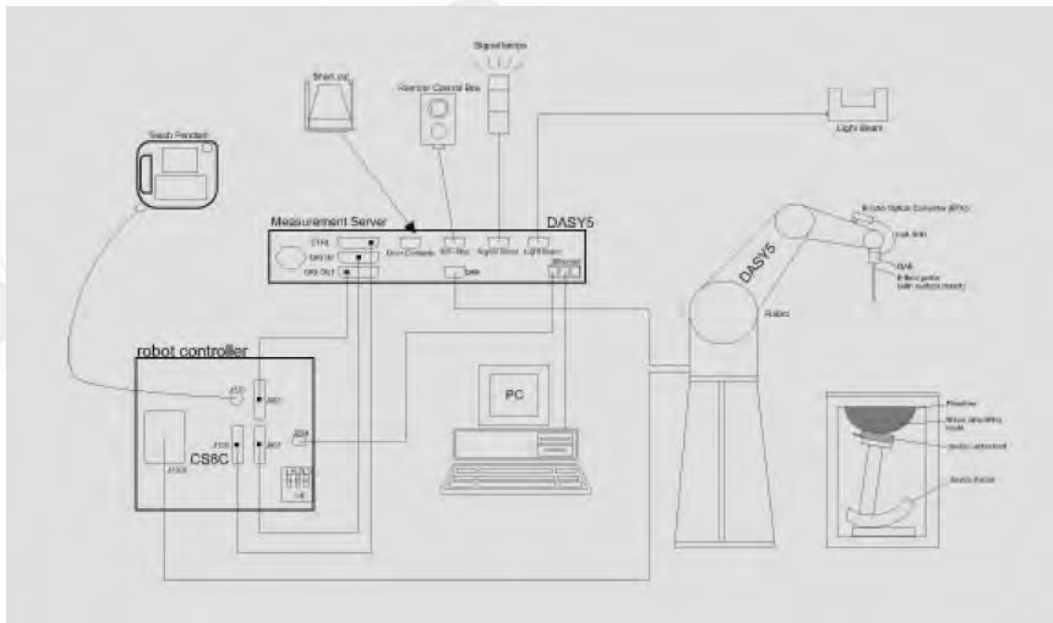


Fig.a The block diagram of SAR system

The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal

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multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

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## 1.9 System Components

### ES3DV3/EX3DV4 E-Field Probe

|               |                                                                                                                                                                                                            |                                                                                     |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE)                                                |  |
| Calibration   | Basic Broad Band Calibration in air<br>Conversion Factors (CF) for<br>HSL835/1900/2450MHz Additional CF for other liquids and frequencies upon request                                                     |                                                                                     |
| Frequency     | 10 MHz to > 6 GHz; Linearity: $\pm 0.6$ dB (30 MHz to 4 GHz)                                                                                                                                               |                                                                                     |
| Directivity   | $\pm 0.3$ dB in HSL (rotation around probe axis)<br>$\pm 0.5$ dB in tissue material (rotation normal to probe axis)                                                                                        |                                                                                     |
| Dynamic Range | 10 $\mu$ W/g to > 100 mW/g;<br>Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)                                                                                                                    |                                                                                     |
| Dimensions    | Tip diameter: 2.5 mm (EX3DV4)<br>Tip diameter: 4 mm (ES3DV3)                                                                                                                                               |                                                                                     |
| Application   | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. |                                                                                     |

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## SAM PHANTOM V4.0C

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                     |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Construction:    | <p>The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209.</p> <p>It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.</p> |                                                                                     |
| Shell Thickness: | 2 ± 0.2 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| Filling Volume:  | Approx. 25 liters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                     |
| Dimensions:      | Height: 810 mm;<br>Length: 1000 mm;<br>Width: 500 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |

## DEVICE HOLDER

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Construction | <p>In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).</p> |  <p>Device Holder</p> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|

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## 1.10 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within  $\pm 5\%$  from the target SAR values.

These tests were done at 835/1900/2450 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was 21.7°C, the relative humidity was 62% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

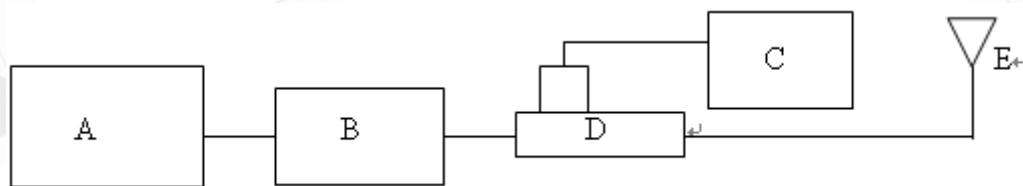
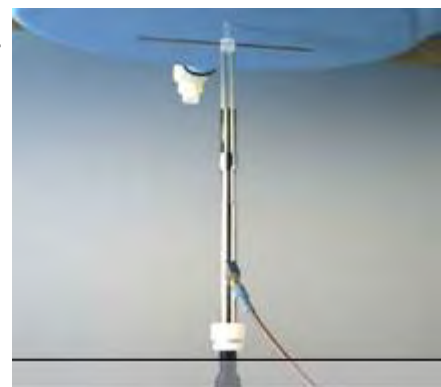


Fig.b The block diagram of system verification

- A. Agilent Model 8648D/N5181A Signal Generator
- B. Mini circuits Model ZHL-42 Amplifier
- C. Agilent Model U2001B/E4417A Power Sensor
- D. Agilent Model 778D/777D Dual directional coupling
- E. Reference dipole antenna



Photograph of the dipole Antenna

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| Validation Kit | S/N   | Frequency (MHz) | Target SAR (1g)<br>(Pin=250mW) (mW/g) | Measured SAR<br>(1g)(mW/g) | Measured Date |
|----------------|-------|-----------------|---------------------------------------|----------------------------|---------------|
| D835V2         | 4d063 | 835             | Head                                  | 2.31                       | Jan. 21, 2012 |
|                |       |                 | Body                                  | 2.43                       | Jan. 21, 2012 |
| D1900V2        | 5d027 | 1900            | Head                                  | 10.1                       | Jan. 20, 2012 |
|                |       |                 | Body                                  | 9.93                       | Jan. 20, 2012 |
| D2450V2        | 727   | 2450            | Head                                  | 13.7                       | Jan. 25, 2012 |
|                |       |                 | Body                                  | 12.7                       | Jan. 25, 2012 |
| D1900V2        | 5d027 | 1900            | Body                                  | 10                         | May 25, 2012  |
| D835V2         | 4d120 | 835             | Body                                  | 2.43                       | Jun. 05, 2012 |
| D1900V2        | 5d027 | 1900            | Body                                  | 10                         | Jun. 05, 2012 |

Table 1. System validation (follow manufacture target value)

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### 1.11 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the HP Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with HP 8753D Network Analyzer (30 KHz-6000MHz).

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant iin the flat section of the phantom was 15cm±5mm during all tests. (Appendix Fig .2)

| Frequency<br>(MHz) | Tissue<br>type | Dielectric Parameters      |                | Recommended<br>Limits | Measured | Measurement<br>date |
|--------------------|----------------|----------------------------|----------------|-----------------------|----------|---------------------|
| 835                | Head           | Verification               | $\rho$         | 38.38-42.42           | 42.174   | Jan. 21, 2012       |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.898    |                     |
|                    |                | Test CH<br>(L)_GSM         | P              | 38.38-42.42           | 42.327   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.888    |                     |
|                    |                | Test CH<br>(M)_GSM         | P              | 38.38-42.42           | 42.142   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.901    |                     |
|                    |                | Test CH<br>(H)_GSM         | P              | 38.38-42.42           | 41.984   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.912    |                     |
|                    |                | Test CH<br>(L)_WCDMA       | P              | 38.38-42.42           | 42.284   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.89     |                     |
|                    |                | Test CH (M)_<br>WCDMA      | P              | 38.38-42.42           | 42.142   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.901    |                     |
|                    |                | Test CH (H)_<br>WCDMA      | P              | 38.38-42.42           | 42.021   |                     |
|                    |                |                            | $\sigma$ (S/m) | 0.84-0.92             | 0.911    |                     |
|                    |                | Simulated Tissue Temp.(°C) |                | 20-24                 | 21.7     |                     |

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|                            |           |                   |                |             |        |               |
|----------------------------|-----------|-------------------|----------------|-------------|--------|---------------|
| 835                        | Body      | Verification      | P              | 51.21-56.60 | 55.605 | Jan. 21, 2012 |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.965  |               |
|                            |           | Test CH (L)_GSM   | P              | 51.21-56.60 | 55.716 |               |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.954  |               |
|                            |           | Test CH (M)_GSM   | P              | 51.21-56.60 | 55.56  |               |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.966  |               |
|                            |           | Test CH (H)_GSM   | P              | 51.21-56.60 | 55.49  |               |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.976  |               |
|                            |           | Test CH (L)_WCDMA | P              | 51.21-56.60 | 55.67  |               |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.957  |               |
|                            |           | Test CH (M)_WCDMA | P              | 51.21-56.60 | 55.56  |               |
|                            |           |                   | $\sigma$ (S/m) | 0.95-1.05   | 0.966  |               |
|                            |           | Test CH (H)_WCDMA | P              | 51.21-56.60 | 55.509 |               |
| $\sigma$ (S/m)             | 0.95-1.05 |                   | 0.974          |             |        |               |
| Simulated Tissue Temp.(°C) |           |                   | 20-24          | 21.7        |        |               |

|                            |           |                   |                |             |        |               |
|----------------------------|-----------|-------------------|----------------|-------------|--------|---------------|
| 1900                       | Head      | Verification      | P              | 36.96-40.85 | 40.157 | Jan. 20, 2012 |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.459  |               |
|                            |           | Test CH (L)_GSM   | P              | 36.96-40.85 | 40.291 |               |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.412  |               |
|                            |           | Test CH (M)_GSM   | P              | 36.96-40.85 | 40.235 |               |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.442  |               |
|                            |           | Test CH (H)_GSM   | P              | 36.96-40.85 | 40.124 |               |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.468  |               |
|                            |           | Test CH (L)_WCDMA | P              | 36.96-40.85 | 40.296 |               |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.414  |               |
|                            |           | Test CH (M)_WCDMA | P              | 36.96-40.85 | 40.235 |               |
|                            |           |                   | $\sigma$ (S/m) | 1.34-1.48   | 1.442  |               |
|                            |           | Test CH (H)_WCDMA | P              | 36.96-40.85 | 40.133 |               |
| $\sigma$ (S/m)             | 1.34-1.48 |                   | 1.467          |             |        |               |
| Simulated Tissue Temp.(°C) |           |                   | 20-24          | 21.7        |        |               |

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|      |      |                            |                |             |        |               |
|------|------|----------------------------|----------------|-------------|--------|---------------|
| 1900 | Body | Verification               | P              | 50.64-55.97 | 51.657 | May 25, 2012  |
|      |      |                            | $\sigma$ (S/m) | 1.43-1.59   | 1.512  |               |
|      |      | Test CH (L)_GSM            | P              | 50.64-55.97 | 51.77  |               |
|      |      |                            | $\sigma$ (S/m) | 1.43-1.59   | 1.46   |               |
|      |      | Test CH (M)_GSM            | P              | 50.64-55.97 | 51.638 |               |
|      |      |                            | $\sigma$ (S/m) | 1.43-1.59   | 1.49   |               |
|      |      | Test CH (H)_GSM            | P              | 50.64-55.97 | 51.622 | Jan. 20, 2012 |
|      |      |                            | $\sigma$ (S/m) | 1.43-1.59   | 1.522  |               |
|      |      | Test CH (H)_WCDMA          | P              | 48.55-53.66 | 51.881 |               |
|      |      |                            | $\sigma$ (S/m) | 1.44-1.60   | 1.572  |               |
|      |      | Test CH (H)_WCDMA          | P              | 48.55-53.66 | 51.812 |               |
|      |      |                            | $\sigma$ (S/m) | 1.44-1.60   | 1.598  |               |
| 2450 | Head | Verification               | P              | 48.55-53.66 | 51.732 |               |
|      |      |                            | $\sigma$ (S/m) | 1.44-1.60   | 1.55   |               |
|      |      | Simulated Tissue Temp.(°C) |                |             | 20-24  | 21.7          |
|      |      | Verification               | P              | 36.77-40.64 | 40.189 | Jan. 25, 2012 |
|      |      |                            | $\sigma$ (S/m) | 1.63-1.81   | 1.778  |               |
|      |      | Test CH (L)_WLAN           | P              | 36.77-40.64 | 40.329 |               |
|      |      |                            | $\sigma$ (S/m) | 1.63-1.81   | 1.741  |               |
|      |      | Test CH (M)_WLAN           | P              | 36.77-40.64 | 40.232 |               |
|      |      |                            | $\sigma$ (S/m) | 1.63-1.81   | 1.763  |               |
|      |      | Test CH (H)_WLAN           | P              | 36.77-40.64 | 40.145 |               |
|      |      |                            | $\sigma$ (S/m) | 1.63-1.81   | 1.798  |               |
|      |      | Simulated Tissue Temp.(°C) |                |             | 20-24  | 21.7          |

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|                            |      |                       |                |             |        |               |
|----------------------------|------|-----------------------|----------------|-------------|--------|---------------|
| 2450                       | Body | Verification          | P              | 48.07-53.13 | 52.991 | Jan. 25, 2012 |
|                            |      |                       | $\sigma$ (S/m) | 1.81-2.01   | 1.995  |               |
|                            |      | Test CH<br>(L)_WLAN   | P              | 48.07-53.13 | 53.078 |               |
|                            |      |                       | $\sigma$ (S/m) | 1.81-2.01   | 1.946  |               |
|                            |      | Test CH<br>(M)_WLAN   | P              | 48.07-53.13 | 53.024 |               |
|                            |      |                       | $\sigma$ (S/m) | 1.81-2.01   | 1.98   |               |
|                            |      | Test CH<br>(H)_WLAN   | P              | 48.07-53.13 | 52.977 |               |
|                            |      |                       | $\sigma$ (S/m) | 1.81-2.01   | 2.006  |               |
| Simulated Tissue Temp.(°C) |      |                       | 20-24          | 21.7        |        |               |
| 835                        | Body | Verification          | P              | 51.11-56.49 | 53.762 | Jun. 05, 2012 |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.987  |               |
|                            |      | Test CH<br>(L)_GSM    | P              | 51.11-56.49 | 53.917 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.983  |               |
|                            |      | Test CH<br>(M)_GSM    | P              | 51.11-56.49 | 53.658 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.996  |               |
|                            |      | Test CH<br>(H)_GSM    | P              | 51.11-56.49 | 53.688 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 1.008  |               |
|                            |      | Test CH<br>(L)_WCDMA  | P              | 51.11-56.49 | 53.849 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.99   |               |
|                            |      | Test CH (M)_<br>WCDMA | P              | 51.11-56.49 | 53.658 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.996  |               |
|                            |      | Test CH (H)_<br>WCDMA | P              | 51.11-56.49 | 53.664 |               |
|                            |      |                       | $\sigma$ (S/m) | 0.93-1.03   | 0.997  |               |
| Simulated Tissue Temp.(°C) |      |                       | 20-24          | 21.7        |        |               |

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|                            |      |                      |                |             |        |               |
|----------------------------|------|----------------------|----------------|-------------|--------|---------------|
| 1900                       | Body | Verification         | P              | 50.64-55.97 | 51.215 | Jun. 05, 2012 |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.544  |               |
|                            |      | Test CH<br>(L)_GSM   | P              | 50.64-55.97 | 51.32  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.478  |               |
|                            |      | Test CH<br>(M)_GSM   | P              | 50.64-55.97 | 51.19  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.52   |               |
|                            |      | Test CH<br>(H)_GSM   | P              | 50.64-55.97 | 51.12  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.551  |               |
|                            |      | Test CH<br>(H)_WCDMA | P              | 50.64-55.97 | 51.21  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.506  |               |
|                            |      | Test CH<br>(H)_WCDMA | P              | 50.64-55.97 | 51.19  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.52   |               |
|                            |      | Test CH<br>(H)_WCDMA | P              | 50.64-55.97 | 51.16  |               |
|                            |      |                      | $\sigma$ (S/m) | 1.43-1.59   | 1.546  |               |
| Simulated Tissue Temp.(°C) |      |                      | 20-24          | 21.7        |        |               |

Table 2. Dielectric Parameters of Tissue Simulant Fluid

The composition of the brain tissue simulating liquid:

| Frequency (MHz) | Mode | Ingredient |        |       |               |           |        | Total amount |
|-----------------|------|------------|--------|-------|---------------|-----------|--------|--------------|
|                 |      | DGMBE      | Water  | Salt  | Preventol D-7 | Cellulose | Sugar  |              |
| 850             | Head | —          | 532.63 | 18.29 | 2.40          | 3.20      | 765.49 | 1.0L(Kg)     |
|                 | Body | —          | 633.91 | 11.76 | 1.20          | —         | 602.12 | 1.0L(Kg)     |
| 1900            | Head | 445.08     | 554.12 | 0.80  | —             | —         | —      | 1.0L(Kg)     |
|                 | Body | 300.03     | 697.94 | 2.03  | —             | —         | —      | 1.0L(Kg)     |
| 2450            | Head | 450.00     | 550.00 | —     | —             | —         | —      | 1.0L(Kg)     |
|                 | Body | 313.65     | 686.35 | —     | —             | —         | —      | 1.0L(Kg)     |

Table 3. Recipes for tissue simulating liquid (Unit: g)

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## 1.12 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1-1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

- (1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels

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or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

| Human Exposure                               | Uncontrolled Environment<br>General Population | Controlled Environment<br>Occupational |
|----------------------------------------------|------------------------------------------------|----------------------------------------|
| Spatial Peak SAR<br>(Brain)                  | 1.60 m W/g                                     | 8.00 m W/g                             |
| Spatial Average SAR<br>(Whole Body)          | 0.08 m W/g                                     | 0.40 m W/g                             |
| Spatial Peak SAR<br>(Hands/Feet/Ankle/Wrist) | 4.00 m W/g                                     | 20.00 m W/g                            |

Table 4. RF exposure limits

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

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## 2. Summary of Results

### GSM 850 MHz

| Band                                  | Mode           | EUT<br>Position               | Test<br>Configuration             | Averaged SAR over 1g (W/kg)           |        |        | SAR<br>Limit 1g<br>(W/kg) |
|---------------------------------------|----------------|-------------------------------|-----------------------------------|---------------------------------------|--------|--------|---------------------------|
|                                       |                |                               |                                   | CH 128                                | CH 190 | CH 251 |                           |
|                                       |                |                               |                                   | 824.20                                | 836.60 | 848.80 |                           |
|                                       |                |                               |                                   | MHz                                   | MHz    | MHz    |                           |
|                                       |                |                               |                                   | Source-based time average power (dBm) |        |        |                           |
|                                       |                |                               |                                   | GSM                                   |        |        |                           |
|                                       |                |                               |                                   | 23.97                                 | 24.07  | 24.07  |                           |
| Source-based time average power (dBm) |                |                               |                                   |                                       |        |        |                           |
| GPRS                                  |                |                               |                                   |                                       |        |        |                           |
| 23.98                                 | 24.08          | 24.18                         |                                   |                                       |        |        |                           |
| GSM850                                | GSM            | Right                         | Cheek                             | 0.721                                 | 0.922  | 1.17   | 1.6                       |
|                                       |                |                               | Tilt                              | —                                     | 0.516  | —      | 1.6                       |
|                                       |                | Left                          | Cheek                             | 0.702                                 | 0.995  | 1.28   | 1.6                       |
|                                       |                |                               | - With<br>Memory card             | —                                     | —      | 1.23   | 1.6                       |
|                                       |                |                               | - With<br>2 <sup>nd</sup> Battery | —                                     | —      | 1.27   | 1.6                       |
|                                       |                |                               | Tilt                              | —                                     | 0.493  | —      | 1.6                       |
|                                       |                | Body worn<br>(speech<br>mode) | Front                             | —                                     | 0.293  | —      | 1.6                       |
|                                       |                |                               | Back                              | 0.319                                 | 0.413  | 0.548  | 1.6                       |
|                                       | GPRS<br>1Dn2UP | Hotspot<br>mode               | Front                             | —                                     | 0.787  | —      | 1.6                       |
|                                       |                |                               | Back                              | 0.857                                 | 1.17   | 1.27   | 1.6                       |
|                                       |                |                               | Bottom                            | —                                     | 0.080  | —      | 1.6                       |
|                                       |                |                               | Right                             | —                                     | 0.491  | —      | 1.6                       |
|                                       |                |                               | Left                              | —                                     | 0.506  | —      | 1.6                       |

# Using KDB941225 D03 and KDB941225 D04 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower

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than that in the GPRS mode.

- # According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

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# GSM 1900 MHz

| Band        | Mode           | EUT<br>Position               | Test<br>Configuration | Averaged SAR over 1g (W/kg)           |                |                | SAR<br>Limit 1g<br>(W/kg) |
|-------------|----------------|-------------------------------|-----------------------|---------------------------------------|----------------|----------------|---------------------------|
|             |                |                               |                       | CH 512                                | CH 661         | CH 810         |                           |
|             |                |                               |                       | 1850.20<br>MHz                        | 1800.00<br>MHz | 1909.80<br>MHz |                           |
|             |                |                               |                       | Source-based time average power (dBm) |                |                |                           |
|             |                |                               |                       | GSM                                   |                |                |                           |
|             |                |                               |                       | 20.87                                 | 20.87          | 21.07          |                           |
|             |                |                               |                       | Source-based time average power (dBm) |                |                |                           |
|             |                |                               |                       | GPRS                                  |                |                |                           |
| 21.99       | 21.99          | 21.99                         |                       |                                       |                |                |                           |
| GSM<br>1900 | GSM            | Right                         | Cheek                 | 0.760                                 | 0.586          | 0.350          | 1.6                       |
|             |                |                               | Tilt                  | —                                     | 0.247          | —              | 1.6                       |
|             |                | Left                          | Cheek                 | —                                     | 0.500          | —              | 1.6                       |
|             |                |                               | Tilt                  | —                                     | 0.247          | —              | 1.6                       |
|             |                | Body worn<br>(speech<br>mode) | Front                 | —                                     | 0.305          | —              | 1.6                       |
|             |                |                               | Back                  | 0.53                                  | 0.449          | 0.352          | 1.6                       |
|             | GPRS<br>1Dn4UP | Hotspot<br>mode               | Front                 | —                                     | 0.605          | —              | 1.6                       |
|             |                |                               | Back                  | 0.984                                 | 0.849          | 0.64           | 1.6                       |
|             |                |                               | Bottom                | 1.11                                  | 1.04           | 0.833          | 1.6                       |
|             |                |                               | Right                 | —                                     | 0.182          | —              | 1.6                       |
|             |                |                               | Left                  | —                                     | 0.315          | —              | 1.6                       |

- # Using KDB941225 D03 and KDB941225 D04 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.
- # According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

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# WCDMA Band II

| Band             | Mode         | EUT<br>Position                   | Test<br>Configuration | Averaged SAR over 1g (W/kg) |                |                | SAR<br>Limit 1g<br>(W/kg) |
|------------------|--------------|-----------------------------------|-----------------------|-----------------------------|----------------|----------------|---------------------------|
|                  |              |                                   |                       | CH 9262                     | CH 9400        | CH 9538        |                           |
|                  |              |                                   |                       | 1852.40<br>MHz              | 1880.00<br>MHz | 1907.60<br>MHz |                           |
|                  |              |                                   |                       | R99 Average power (dBm)     |                |                |                           |
|                  |              |                                   |                       | 22.6                        | 22.67          | 22.4           |                           |
| WCDMA<br>Band II | R99          | Right                             | Cheek                 | 1.2                         | 0.894          | 0.787          | 1.6                       |
|                  |              |                                   | Tilt                  | —                           | 0.420          | —              | 1.6                       |
|                  |              | Left                              | Cheek                 | 1.06                        | 0.816          | 0.776          | 1.6                       |
|                  |              |                                   | Tilt                  | —                           | 0.440          | —              | 1.6                       |
|                  |              | Body worn<br>(speech<br>mode)     | Front                 | —                           | 0.313          | —              | 1.6                       |
|                  |              |                                   | Back                  | 0.576                       | 0.49           | 0.509          | 1.6                       |
|                  | Hotspot mode | Front                             | —                     | 0.687                       | —              | 1.6            |                           |
|                  |              | Back                              | 1.37                  | 1.09                        | 0.928          | 1.6            |                           |
|                  |              | - With Headset                    | 1.27                  | —                           | —              | 1.6            |                           |
|                  |              | - With Memory<br>card             | 1.3                   | —                           | —              | 1.6            |                           |
|                  |              | - With 2 <sup>nd</sup><br>Battery | 1.2                   | —                           | —              | 1.6            |                           |
|                  |              | Bottom                            | 1.32                  | 1.03                        | 0.952          | 1.6            |                           |
|                  |              | Right                             | —                     | 0.221                       | —              | 1.6            |                           |
|                  |              | Left                              | —                     | 0.395                       | —              | 1.6            |                           |

- # Using KDB941225 D01 to exclude SAR test requirements for HSDPA modes due to the maximum average output power of HSDPA active is less than 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC
- # According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

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# WCDMA Band V

| Band            | Mode         | EUT<br>Position               | Test<br>Configuration | Averaged SAR over 1g (W/kg) |               |               | SAR<br>Limit 1g<br>(W/kg) |
|-----------------|--------------|-------------------------------|-----------------------|-----------------------------|---------------|---------------|---------------------------|
|                 |              |                               |                       | CH 4132                     | CH 4183       | CH 4233       |                           |
|                 |              |                               |                       | 826.40<br>MHz               | 836.60<br>MHz | 846.60<br>MHz |                           |
|                 |              |                               |                       | R99 Average power (dBm)     |               |               |                           |
|                 |              |                               |                       | 23.93                       | 23.91         | 23.63         |                           |
| WCDMA<br>Band V | R99          | Right                         | Cheek                 | 1.02                        | 1.08          | 1.05          | 1.6                       |
|                 |              |                               | Tilt                  | —                           | 0.593         | —             | 1.6                       |
|                 |              | Left                          | Cheek                 | 1.08                        | 1.14          | 1.11          | 1.6                       |
|                 |              |                               | Tilt                  | —                           | 0.537         | —             | 1.6                       |
|                 |              | Body worn<br>(speech<br>mode) | Front                 | —                           | 0.485         | —             | 1.6                       |
|                 |              |                               | Back                  | 0.601                       | 0.701         | 0.742         | 1.6                       |
|                 | Hotspot mode | Front                         | 0.839                 | 0.910                       | 0.844         | 1.6           |                           |
|                 |              | Back                          | 1.26                  | 1.36                        | 1.21          | 1.6           |                           |
|                 |              | Bottom                        | —                     | 0.095                       | —             | 1.6           |                           |
|                 |              | Right                         | —                     | 0.530                       | —             | 1.6           |                           |
|                 |              | Left                          | —                     | 0.549                       | —             | 1.6           |                           |

- # Using KDB941225 D01 to exclude SAR test requirements for HSDPA modes due to the maximum average output power of HSDPA active is less than 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC
- # According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

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# WLAN802.11 b

| Band             | EUT<br>Position | Test<br>Configuration             | Averaged SAR over 1g (W/kg) |          |          | SAR<br><br>Limit 1g<br>(W/kg) |
|------------------|-----------------|-----------------------------------|-----------------------------|----------|----------|-------------------------------|
|                  |                 |                                   | CH 1                        | CH 6     | CH 11    |                               |
|                  |                 |                                   | 2412 MHz                    | 2437 MHz | 2462 MHz |                               |
|                  |                 |                                   | Average Power Output (dBm)  |          |          |                               |
|                  |                 |                                   | 12.51                       | 12.47    | 12.39    |                               |
| WLAN<br>802.11 b | Right           | Cheek                             | —                           | 0.00587  | —        | 1.6                           |
|                  |                 | Tilt                              | 0.00922                     | 0.00807  | 0.00772  | 1.6                           |
|                  |                 | - With Memory<br>card             | 0.00902                     | —        | —        | 1.6                           |
|                  |                 | - With 2 <sup>nd</sup><br>Battery | 0.00813                     | —        | —        | 1.6                           |
|                  | Left            | Cheek                             | —                           | 0.00348  | —        | 1.6                           |
|                  |                 | Tilt                              | —                           | 0.0058   | —        | 1.6                           |
|                  | Hotspot mode    | Front                             | —                           | 0.0025   | —        | 1.6                           |
|                  |                 | Back                              | 0.012                       | 0.00995  | 0.011    | 1.6                           |
|                  |                 | - With Headset                    | 0.013                       | —        | —        | 1.6                           |
|                  |                 | - With Memory<br>card             | 0.011                       | —        | —        | 1.6                           |
|                  |                 | - With 2 <sup>nd</sup><br>Battery | 0.00901                     | —        | —        | 1.6                           |
|                  |                 | Top                               | —                           | 0.00872  | —        | 1.6                           |
|                  |                 | Bottom                            | —                           | —        | —        | 1.6                           |
|                  |                 | Right                             | —                           | 0.00105  | —        | 1.6                           |
|                  |                 | Left                              | —                           | 0.0044   | —        | 1.6                           |

# Using KDB248227-SAR is not required for 802.11 g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

# According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

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### 3. Instruments List

| Device                                     | Manufacturer                    | Type             | Serial number  | Date of last calibration   | Date of next calibration   |
|--------------------------------------------|---------------------------------|------------------|----------------|----------------------------|----------------------------|
| Dosimetric E-Field Probe                   | Schmid & Partner Engineering AG | ES3DV3<br>EX3DV4 | 3172<br>3831   | Aug.23,2011<br>Jan.04,2012 | Aug.22,2012<br>Jan.03,2013 |
| 835/1900/2450 MHz System Validation Dipole | Schmid & Partner Engineering AG | D835V2           | 4d063<br>4d120 | May25.2011<br>Jul.19.2011  | May24.2012<br>Jul.18.2012  |
|                                            |                                 | D1900V2          | 5d027          | Apr.19,2011<br>Apr.26,2012 | Apr.18,2012<br>Apr.25,2013 |
|                                            |                                 | D2450V2          | 727            | Apr.19,2011                | Apr.18,2012                |
| Data acquisition Electronics               | Schmid & Partner Engineering AG | DAE4             | 1260<br>914    | Aug.22,2011<br>Dec.08,2011 | Aug.21,2012<br>Dec.07,2012 |
| Software                                   | Schmid & Partner Engineering AG | DASY 5 V52.8     | N/A            | Calibration not required   | Calibration not required   |
| Phantom                                    | Schmid & Partner Engineering AG | SAM              | N/A            | Calibration not required   | Calibration not required   |
| Network Analyzer                           | HP                              | 8753D            | 3410A05547     | Mar.16,2011<br>Mar.15,2012 | Mar.15,2012<br>Mar.14,2013 |
| Dielectric Probe Kit                       | HP                              | 85070D           | US01440168     | Calibration not required   | Calibration not required   |
| Dual-directional coupler                   | Agilent                         | 778D             | 50313          | Aug.19,2011                | Aug.18,2012                |
|                                            |                                 | 777D             | 50114          | Aug.18,2011                | Aug.17,2012                |
| RF Signal Generator                        | Agilent                         | 8648D            | 3847M00432     | Jun.01,2011                | May 31,2012                |
|                                            |                                 | N5181A           | MY50141235     | Jan.06,2012                | Jan.05,2013                |
| Power Sensor                               | Agilent                         | U2001B           | MY48100169     | Apr.28,2011                | Apr.27,2012                |
|                                            |                                 | E4417A           | MY51410006     | Oct.24,2011                | Oct.23,2012                |

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| Device                   | Manufacturer        | Type     | Serial number | Date of last calibration   | Date of next calibration   |
|--------------------------|---------------------|----------|---------------|----------------------------|----------------------------|
| Radio Communication Test | R&S                 | CMU200   | 113505        | May 31,2011<br>May 11,2012 | May 30,2012<br>May 10,2013 |
| TECPEL                   | Digital thermometer | DTM-303A | TP102615      | Mar.08.2012                | Mar.07.2013                |
| Power Sensor             | Anritsu             | ML2495A  | 1005007       | Feb.17.2010                | Feb.16.2012                |
| Power Meter              | Anritsu             | MA2411B  | 917032        | Jan.16.2012                | Jan.15.2014                |
| Spectrum Analyzer        | Agilent             | E4446A   | MY43360126    | Apr.19.2010                | Apr.18.2012                |
| Spectrum Analyzer        | Agilent             | E4440A   | MY45304525    | Jan.25.2011                | Jan.24.2013                |

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## 4. Measurements

Date: 2012/1/21

### Re Cheek\_CH128

Communication System: GSM; Communication System Band: GSM850; Frequency: 824.2 MHz;

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.888$  mho/m;  $\epsilon_r = 42.327$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 4.215 mW/g m

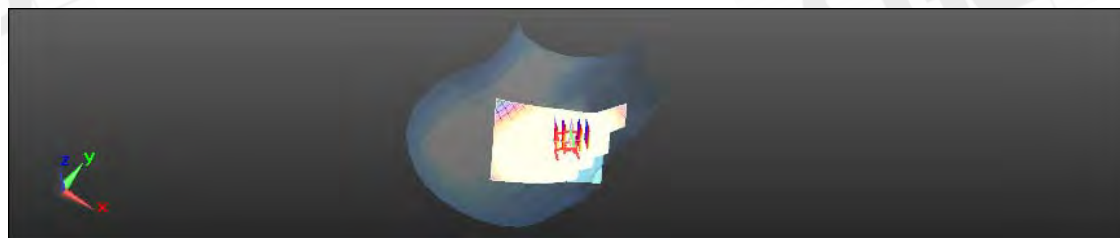
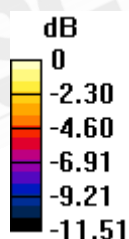
**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 11.939 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.9550

**SAR(1 g) = 0.721 mW/g; SAR(10 g) = 0.527 mW/g**

Maximum value of SAR (measured) = 0.775 mW/g



0 dB = 0.770mW/g m = -2.27 dB mW/g m

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Date: 2012/1/21

## Re Cheek\_CH190

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz; Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 5.441 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

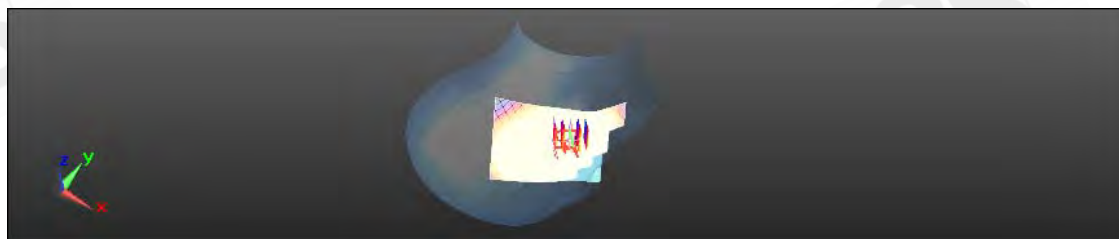
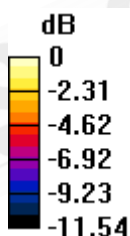
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.494 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.2280

**SAR(1 g) = 0.922 mW/g; SAR(10 g) = 0.677 mW/g**

Maximum value of SAR (measured) = 1.001 mW/g



0 dB = 1.000mW/g m = 0 dB mW/g m

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Date: 2012/1/21

## Re Cheek\_CH251

Communication System: GSM; Communication System Band: GSM850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.912$  mho/m;  $\epsilon_r = 41.984$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 6.847 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

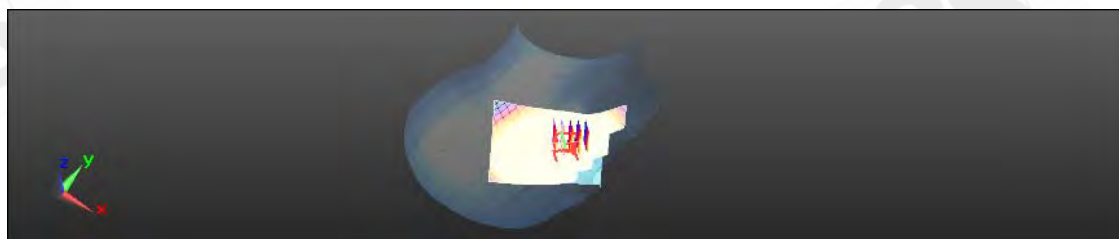
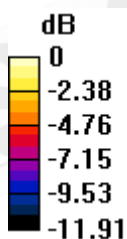
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 14.819 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.5560

**SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.852 mW/g**

Maximum value of SAR (measured) = 1.261 mW/g



0 dB = 1.260mW/g m = 2.01 dB mW/g m

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Date: 2012/1/21

## Re Tilt\_CH190

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 3.096 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

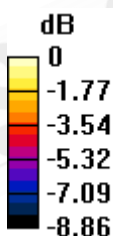
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 18.503 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.6710

**SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.381 mW/g**

Maximum value of SAR (measured) = 0.563 mW/g



0 dB = 0.560mW/g m = -5.04 dB mW/g m

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Date: 2012/1/21

## Le Cheek\_CH128

Communication System: GSM; Communication System Band: GSM850; Frequency: 824.2 MHz;

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.888$  mho/m;  $\epsilon_r = 42.327$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 3.945 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

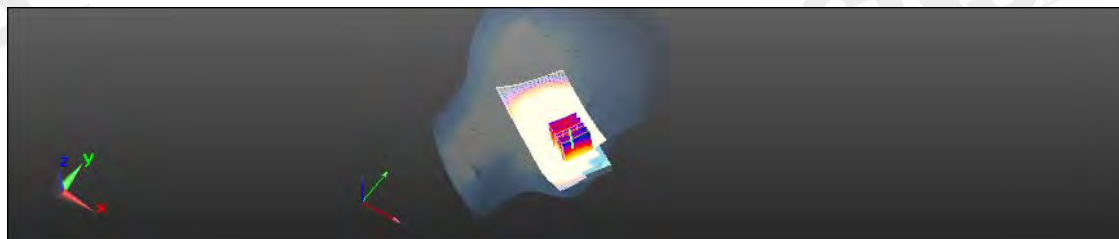
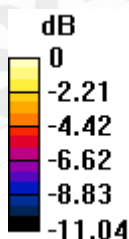
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 11.138 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.8920

**SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.522 mW/g**

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



0 dB = 0.770mW/g m = -2.27 dB mW/g m

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Date: 2012/1/21

## Le Cheek\_CH190

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 5.572 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

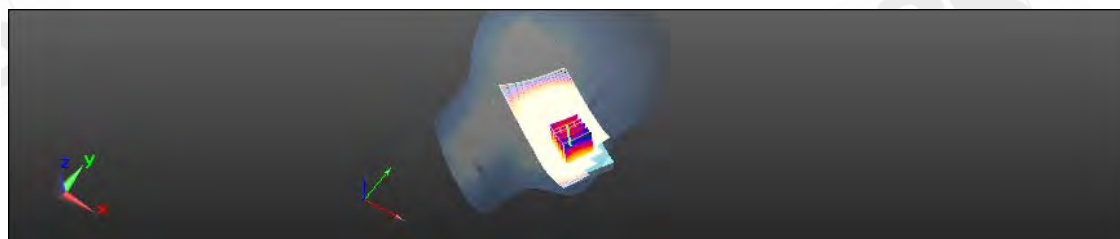
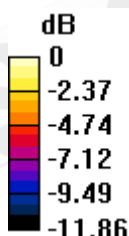
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 12.529 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.2650

**SAR(1 g) = 0.995 mW/g; SAR(10 g) = 0.733 mW/g**

Maximum value of SAR (measured) = 1.076 mW/g



0 dB = 1.080mW/g m = 0.67 dB mW/g m

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Date: 2012/1/21

## Le Cheek\_CH251

Communication System: GSM; Communication System Band: GSM850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.912$  mho/m;  $\epsilon_r = 41.984$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 7.064 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

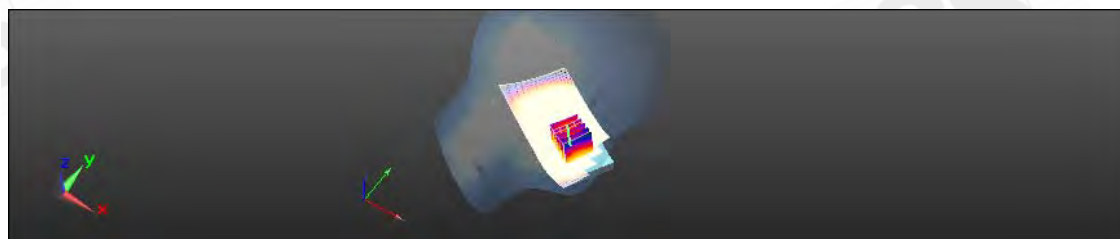
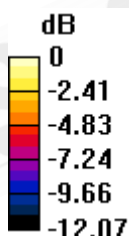
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 14.166 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.6400

**SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.939 mW/g**

Maximum value of SAR (measured) = 1.389 mW/g

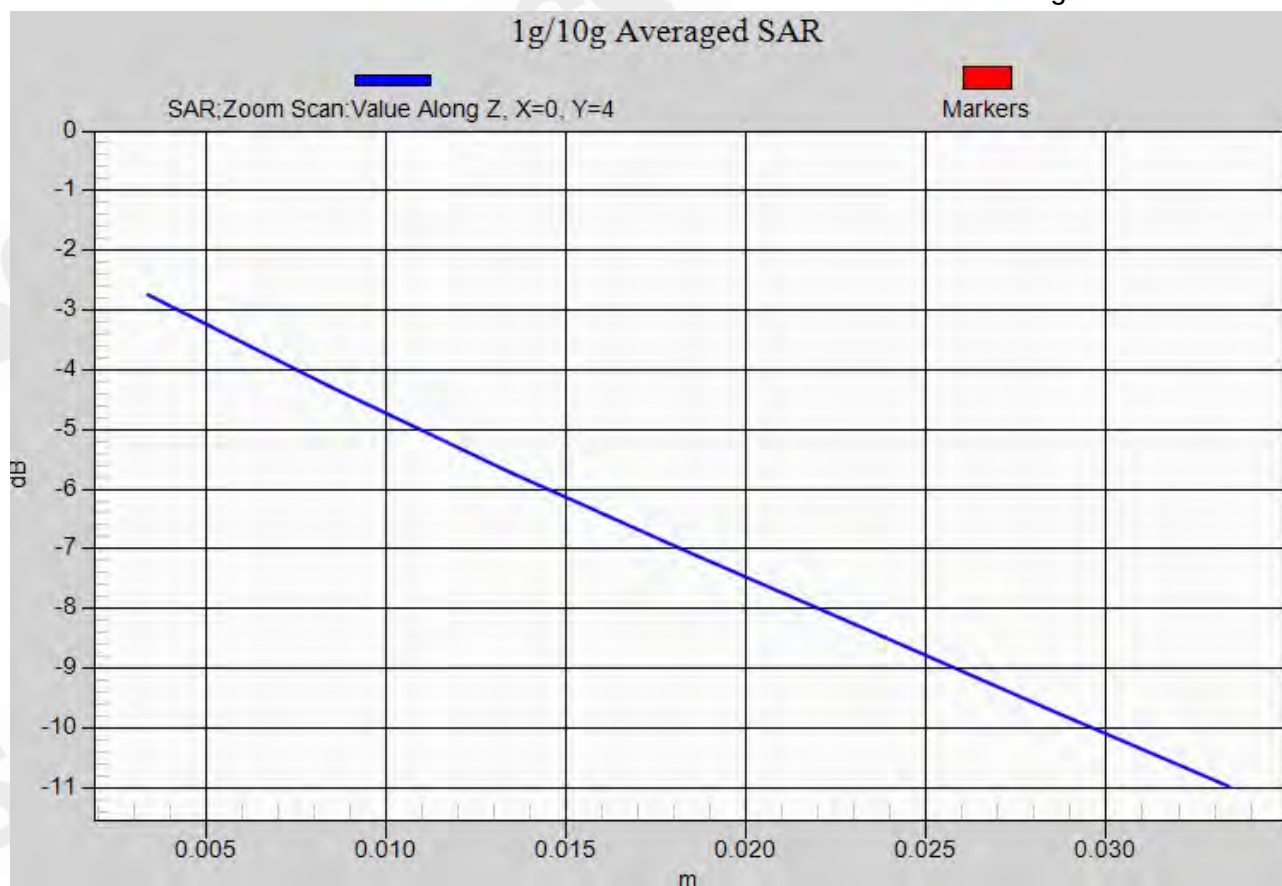


0 dB = 1.390mW/g m = 2.86 dB mW/g m

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Date: 2012/1/21

## Le Cheek\_CH251\_repeated with memory card

Communication System: GSM; Communication System Band: GSM850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.912$  mho/m;  $\epsilon_r = 41.984$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 7.008 mW/g m

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

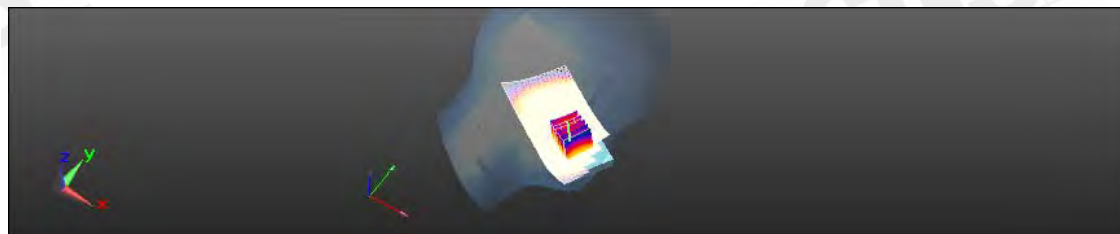
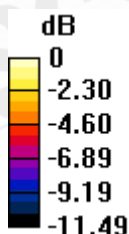
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.858 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.5490

**SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.905 mW/g**

Maximum value of SAR (measured) = 1.321 mW/g



0 dB = 1.320mW/g m = 2.41 dB mW/g m

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## Le Cheek\_GSM 850\_CH251\_repeated with 2<sup>nd</sup> Battery

Communication System: GSM; Communication System Band: GSM850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.912 \text{ mho/m}$ ;  $\epsilon_r = 41.984$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.433 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

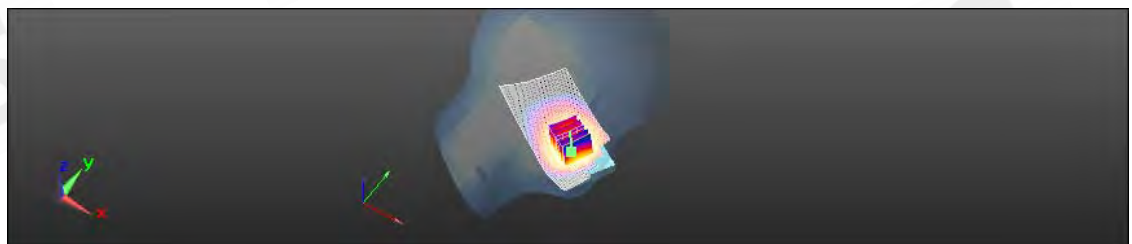
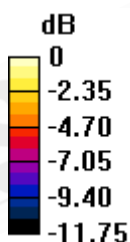
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 14.863 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.6690

**SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.935 mW/g**

Maximum value of SAR (measured) = 1.405 mW/g



0 dB = 1.400mW/g = 2.92 dB mW/g

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## Le Tilt\_CH190

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 3.690 mW/g m

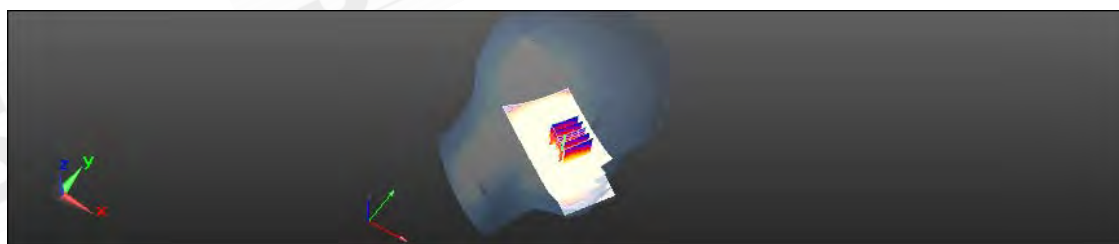
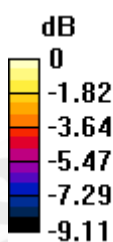
**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 17.676 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.6470

**SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.364 mW/g**

Maximum value of SAR (measured) = 0.535 mW/g



0 dB = 0.530mW/g m = -5.51 dB mW/g m

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Date: 2012/6/5

## Speech mode\_Front side\_CH190\_repeated with headset

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.996$  mho/m;  $\epsilon_r = 53.658$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.344 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

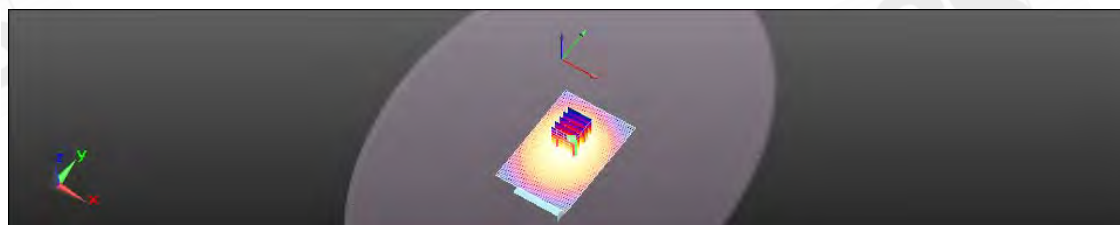
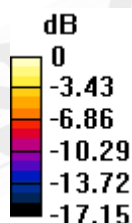
dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.562 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.380 mW/g

**SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.215 mW/g**

Maximum value of SAR (measured) = 0.341 mW/g



0 dB = 0.344 mW/g = -9.28 dB mW/g

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## Speech mode\_Back side\_CH128\_CH190\_repeated with headset

Communication System: GSM; Communication System Band: GSM850; Frequency: 824.2 MHz;

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.983$  mho/m;  $\epsilon_r = 53.917$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.380 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

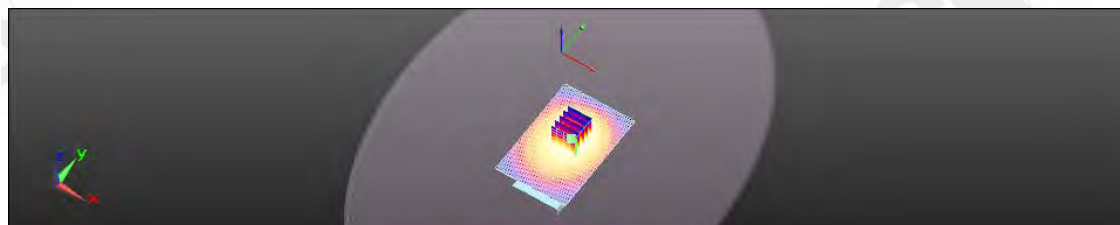
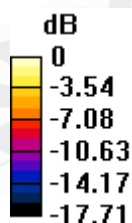
dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.049 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.435 mW/g

**SAR(1 g) = 0.319 mW/g; SAR(10 g) = 0.228 mW/g**

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



0 dB = 0.380 mW/g = -8.41 dB mW/g

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## Speech mode\_Back side\_CH190\_repeated with headset

Communication System: GSM; Communication System Band: GSM850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.996$  mho/m;  $\epsilon_r = 53.658$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.494 mW/g

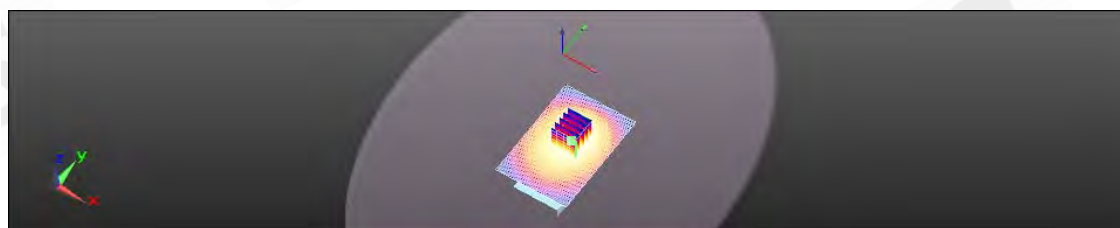
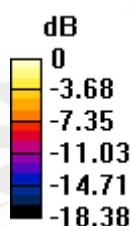
**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.637 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.557 mW/g

**SAR(1 g) = 0.413 mW/g; SAR(10 g) = 0.295 mW/g**

Maximum value of SAR (measured) = 0.493 mW/g



0 dB = 0.494 mW/g = -6.12 dB mW/g

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## Speech mode\_Back side\_CH251\_repeated with headset

Communication System: GSM; Communication System Band: GSM850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.008$  mho/m;  $\epsilon_r = 53.688$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.653 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.867 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.739 mW/g

**SAR(1 g) = 0.548 mW/g; SAR(10 g) = 0.391 mW/g**

Maximum value of SAR (measured) = 0.653 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

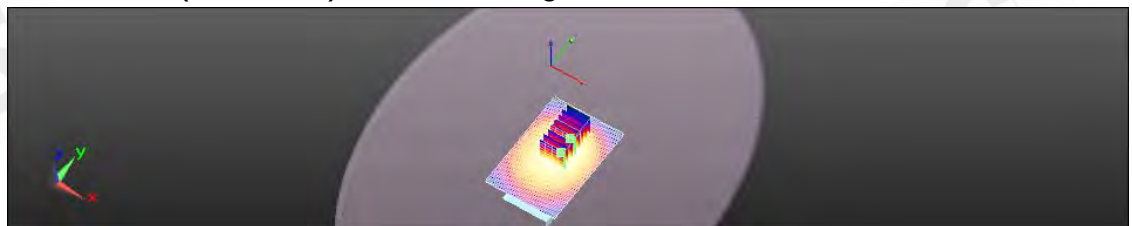
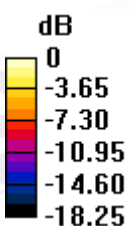
dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.867 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.731 mW/g

**SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.335 mW/g**

Maximum value of SAR (measured) = 0.630 mW/g



0 dB = 0.653 mW/g = -3.70 dB mW/g

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## Front side\_CH190

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 3.998 mW/g m

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

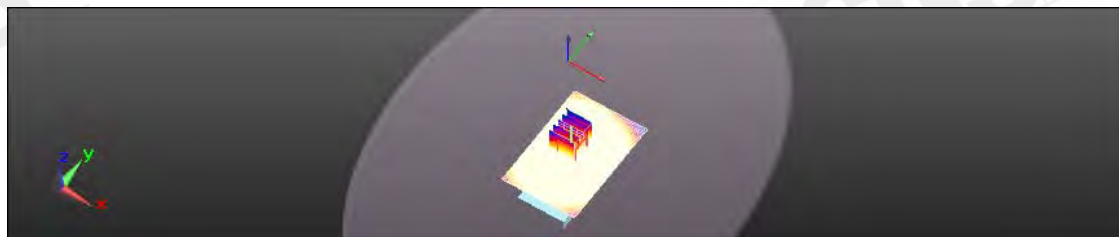
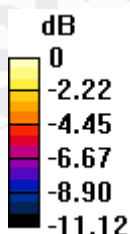
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 26.336 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.0220

**SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.579 mW/g**

Maximum value of SAR (measured) = 0.851 mW/g



0 dB = 0.850mW/g m = -1.41 dB mW/g m

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Date: 2012/1/21

## Back side\_CH128

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 824.2 MHz;

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.954$  mho/m;  $\epsilon_r = 55.716$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 7.715 mW/g m

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

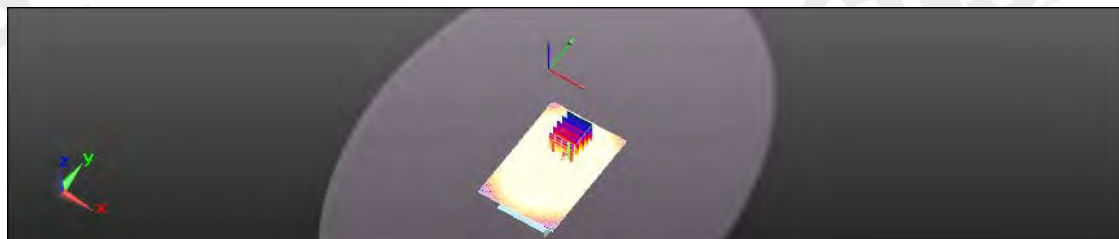
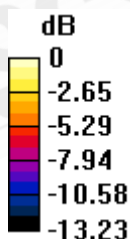
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 28.365 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.2510

**SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.584 mW/g**

Maximum value of SAR (measured) = 0.984 mW/g



0 dB = 0.980mW/g m = -0.18 dB mW/g m

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Date: 2012/1/21

## Back side\_CH190

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of Total (interpolated) = 9.531 mW/g m

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 32.599 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.5740

**SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.725 mW/g**

Maximum value of SAR (measured) = 1.202 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

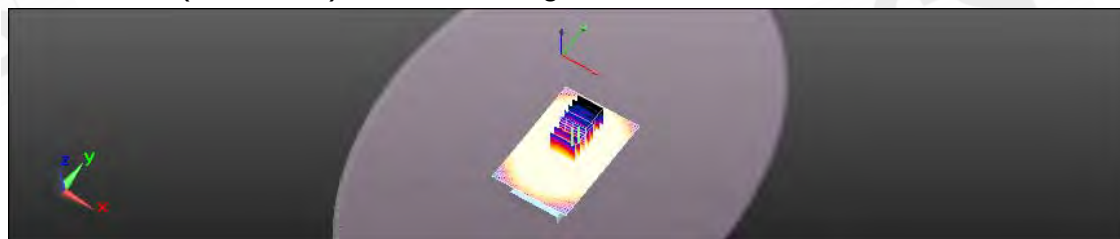
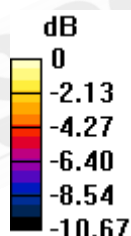
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 32.599 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.6380

**SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.812 mW/g**

Maximum value of SAR (measured) = 1.284 mW/g



0 dB = 1.280mW/g m = 2.14 dB mW/g m

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Date: 2012/1/21

## Back side\_CH251

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 848.8 MHz;

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.976 \text{ mho/m}$ ;  $\epsilon_r = 55.49$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.499 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

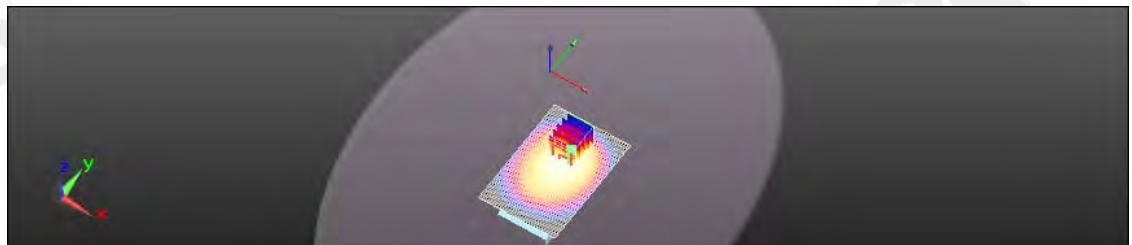
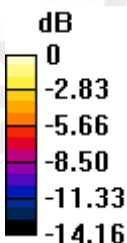
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 34.271 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.8370

**SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.860 mW/g**

Maximum value of SAR (measured) = 1.427 mW/g



0 dB = 1.430mW/g = 3.11 dB mW/g

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Date: 2012/1/21

## Bottom side\_CH190

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.094 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

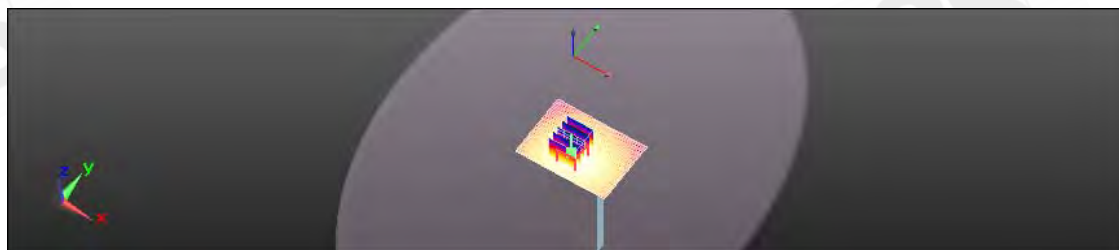
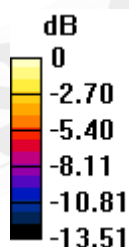
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.304 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.1570

**SAR(1 g) = 0.080 mW/g; SAR(10 g) = 0.050 mW/g**

Maximum value of SAR (measured) = 0.094 mW/g



0 dB = 0.090mW/g = -20.92 dB mW/g

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Date: 2012/1/21

## Right side\_CH190

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.505 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

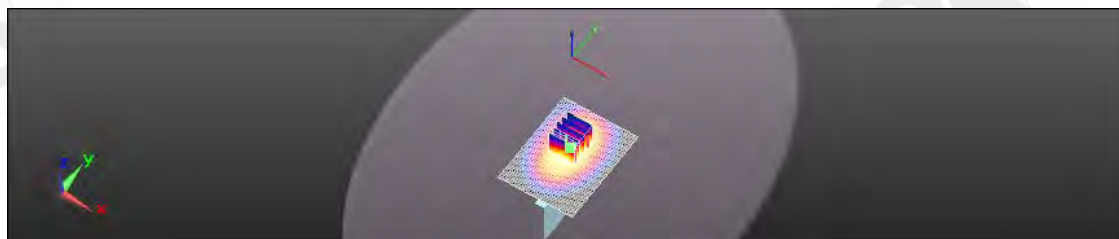
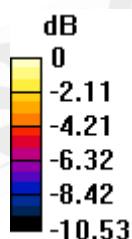
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 21.988 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.7210

**SAR(1 g) = 0.491 mW/g; SAR(10 g) = 0.328 mW/g**

Maximum value of SAR (measured) = 0.537 mW/g



0 dB = 0.540mW/g = -5.35 dB mW/g

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Date: 2012/1/21

## Left side\_CH190

Communication System: GPRS-10; Communication System Band: GPRS850; Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.531 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

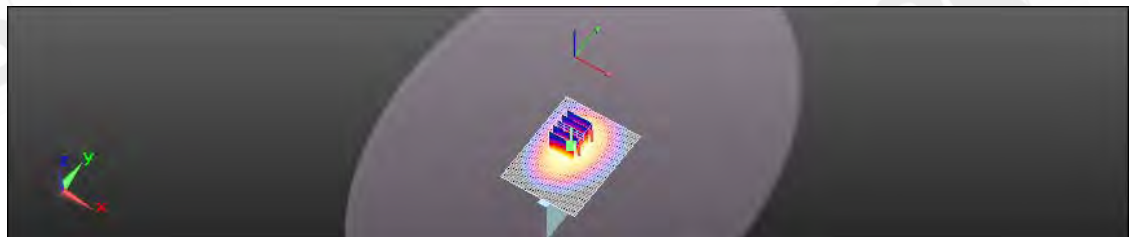
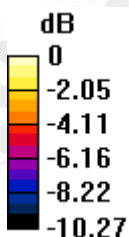
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 20.819 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.7200

**SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.346 mW/g**

Maximum value of SAR (measured) = 0.558 mW/g



0 dB = 0.560mW/g = -5.04 dB mW/g

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Date: 2012/1/20

## Re Cheek\_CH512

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1850.2 MHz;

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.412$  mho/m;  $\epsilon_r = 40.291$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.950 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

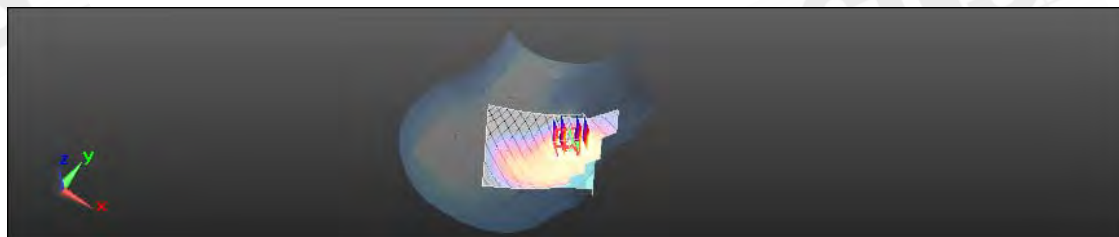
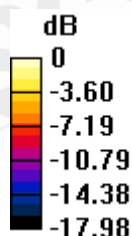
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.330 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.3220

**SAR(1 g) = 0.760 mW/g; SAR(10 g) = 0.414 mW/g**

Maximum value of SAR (measured) = 0.884 mW/g



0 dB = 0.880mW/g = -1.11 dB mW/g

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Date: 2012/1/20

## Re Cheek\_CH661

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.720 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

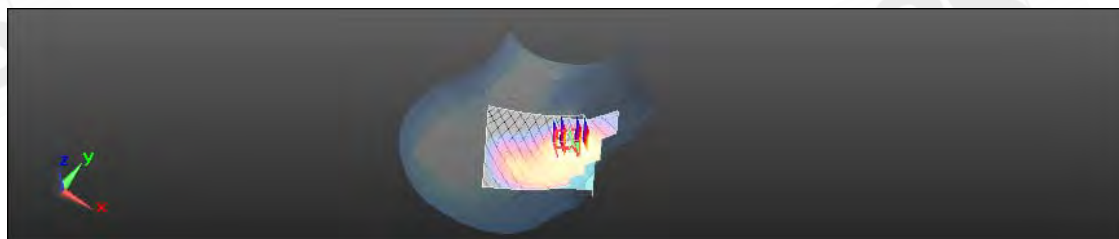
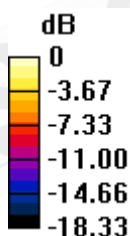
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 8.264 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.0320

**SAR(1 g) = 0.586 mW/g; SAR(10 g) = 0.316 mW/g**

Maximum value of SAR (measured) = 0.684 mW/g



0 dB = 0.680mW/g = -3.35 dB mW/g

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## Re Cheek\_CH810

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1909.8 MHz;

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.468$  mho/m;  $\epsilon_r = 40.124$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.435 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

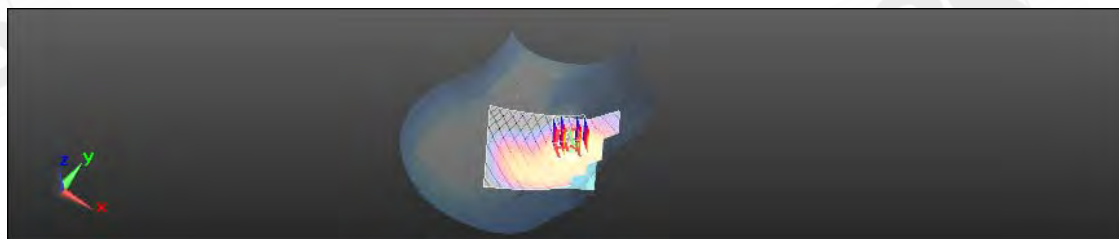
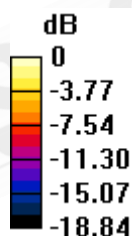
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 7.008 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.6010

**SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.191 mW/g**

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



0 dB = 0.420mW/g = -7.54 dB mW/g

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Date: 2012/1/20

## Re Tilt\_CH661

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.299 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

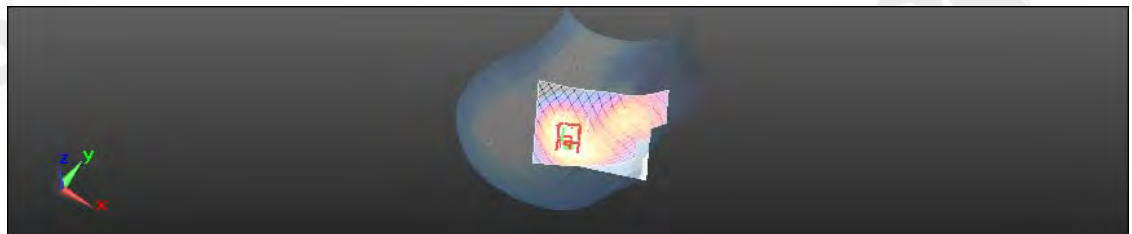
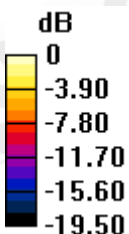
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 12.870 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.3940

**SAR(1 g) = 0.247 mW/g; SAR(10 g) = 0.147 mW/g**

Maximum value of SAR (measured) = 0.274 mW/g



0 dB = 0.270mW/g = -11.37 dB mW/g

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Date: 2012/1/20

## Le Cheek\_CH661

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.569 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.160 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.7880

**SAR(1 g) = 0.497 mW/g; SAR(10 g) = 0.300 mW/g**

Maximum value of SAR (measured) = 0.566 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.160 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.7790

**SAR(1 g) = 0.446 mW/g; SAR(10 g) = 0.253 mW/g**

Maximum value of SAR (measured) = 0.540 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 2:** Measurement grid:

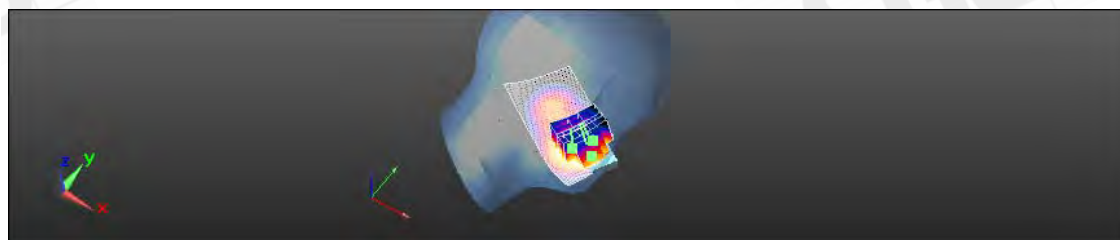
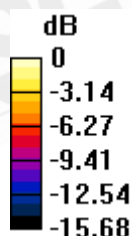
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.160 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.7860

**SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.298 mW/g**

Maximum value of SAR (measured) = 0.567 mW/g



0 dB = 0.570mW/g = -4.88 dB mW/g

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Maxima

Find secondary maxima  dB,

and with a peak SAR value greater than  W/kg,

and at least  mm away from the global

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## Le Tilt\_CH661

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.306 mW/g

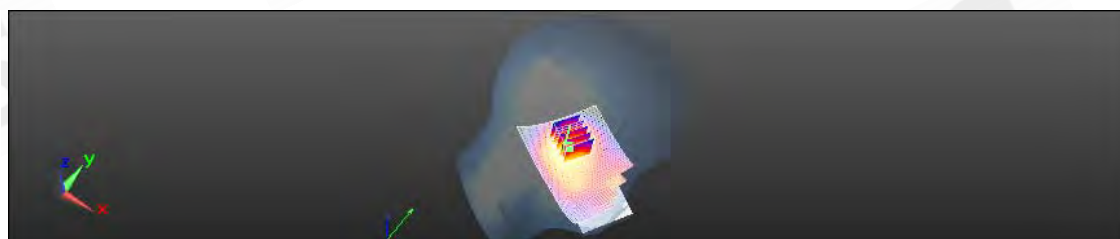
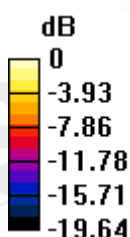
**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.593 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.4090

**SAR(1 g) = 0.247 mW/g; SAR(10 g) = 0.140 mW/g**

Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.280mW/g = -11.06 dB mW/g

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Date: 2012/6/5

## Speech mode\_Front side\_CH661\_repeated with headset

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.52$  mho/m;  $\epsilon_r = 51.188$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.386 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

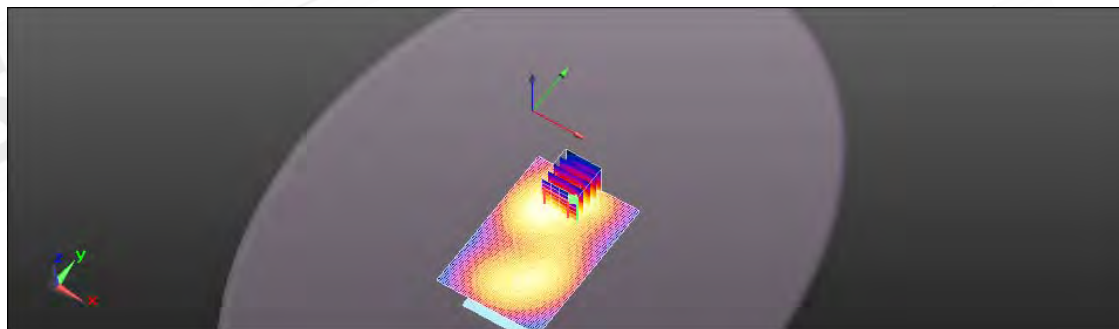
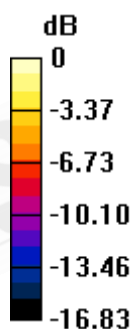
dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.673 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.475 mW/g

**SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.184 mW/g**

Maximum value of SAR (measured) = 0.387 mW/g



0 dB = 0.386 mW/g = -8.27 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH512\_repeated with headset

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1850.2 MHz;

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.478$  mho/m;  $\epsilon_r = 51.319$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.723 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

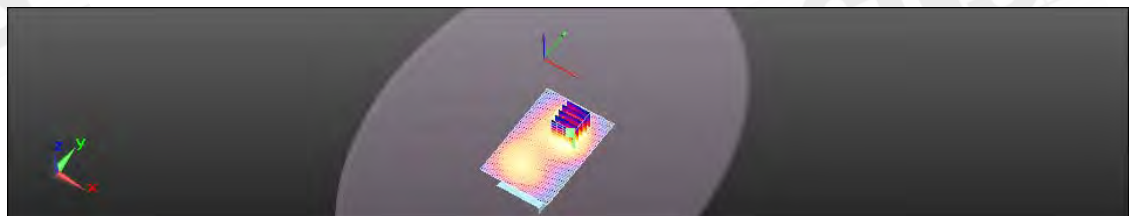
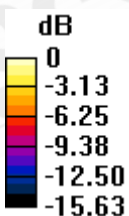
dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.042 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.852 mW/g

**SAR(1 g) = 0.530 mW/g; SAR(10 g) = 0.322 mW/g**

Maximum value of SAR (measured) = 0.695 mW/g



0 dB = 0.723 mW/g = -2.81 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH661\_repeated with headset

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.52 \text{ mho/m}$ ;  $\epsilon_r = 51.188$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.619 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

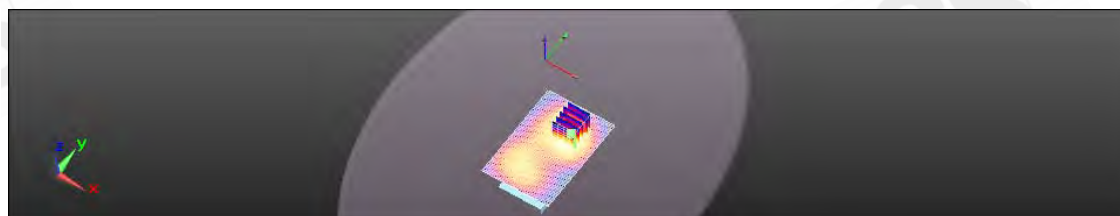
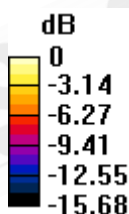
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.493 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.734 mW/g

**SAR(1 g) = 0.449 mW/g; SAR(10 g) = 0.273 mW/g**

Maximum value of SAR (measured) = 0.595 mW/g



0 dB = 0.619 mW/g = -4.17 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH810\_repeated with headset

Communication System: GSM; Communication System Band: GSM1900; Frequency: 1909.8 MHz;

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.551$  mho/m;  $\epsilon_r = 51.119$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.481 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

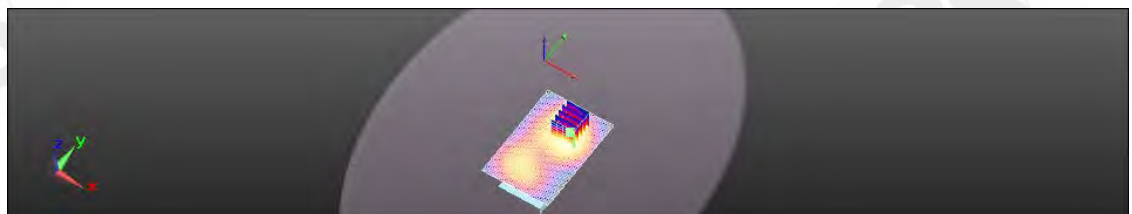
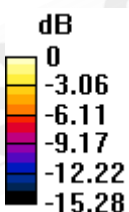
dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.805 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.575 mW/g

**SAR(1 g) = 0.352 mW/g; SAR(10 g) = 0.211 mW/g**

Maximum value of SAR (measured) = 0.468 mW/g



0 dB = 0.481 mW/g = -6.36 dB mW/g

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## Front side\_CH661

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 51.638$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.738 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 12.143 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.984 mW/g

**SAR(1 g) = 0.605 mW/g; SAR(10 g) = 0.341 mW/g**

Maximum value of SAR (measured) = 0.760 mW/g

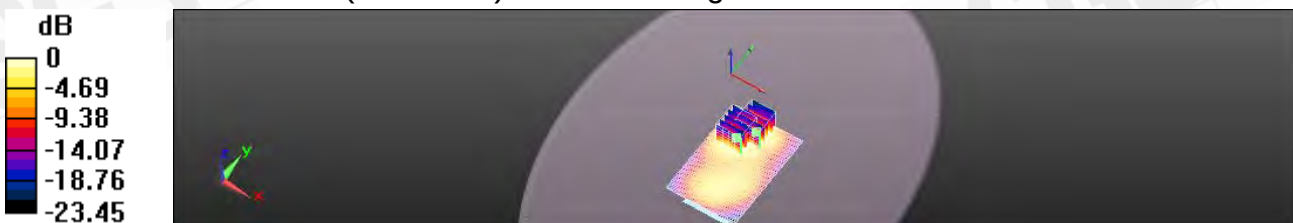
**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 12.143 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.962 mW/g

**SAR(1 g) = 0.573 mW/g; SAR(10 g) = 0.323 mW/g**

Maximum value of SAR (measured) = 0.800 mW/g



0 dB = 0.738 mW/g = -2.64 dB mW/g

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Date: 2012/5/25

## Back side\_CH512

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1850.2 MHz;

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 51.77$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.42 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

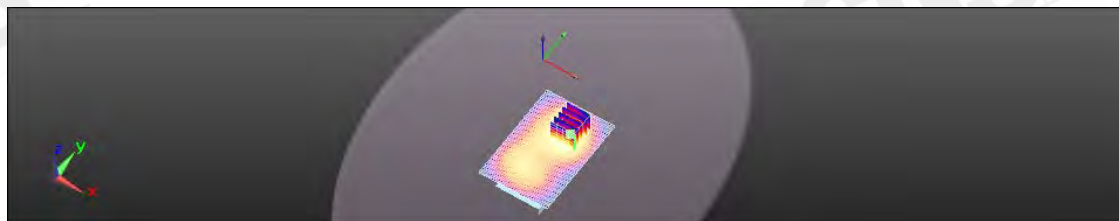
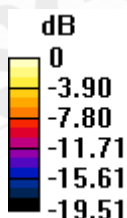
dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.174 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.646 mW/g

**SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.588 mW/g**

Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.42 mW/g = 3.07 dB mW/g

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Date: 2012/5/25

## Back side\_CH661

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 51.638$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.24 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

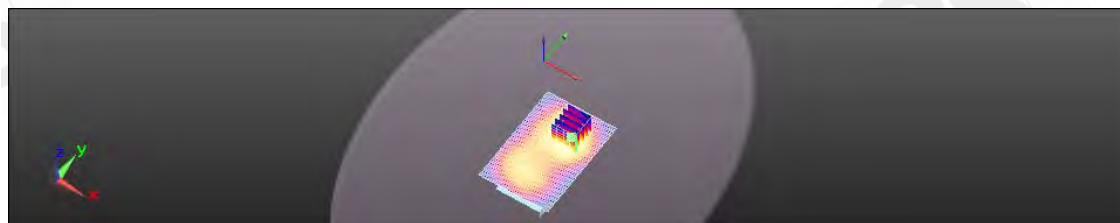
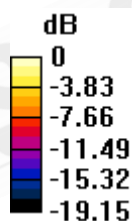
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 15.022 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.430 mW/g

**SAR(1 g) = 0.849 mW/g; SAR(10 g) = 0.502 mW/g**

Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.24 mW/g = 1.87 dB mW/g

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Date: 2012/5/25

## Back side\_CH810

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1909.8 MHz;

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.522$  mho/m;  $\epsilon_r = 51.622$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.915 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

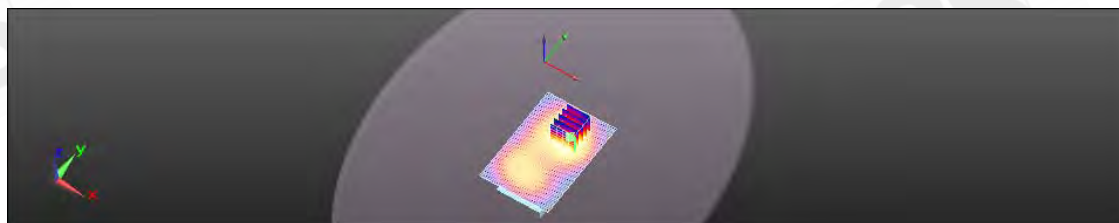
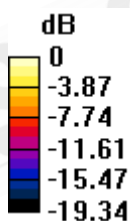
dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.817 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.088 mW/g

**SAR(1 g) = 0.640 mW/g; SAR(10 g) = 0.373 mW/g**

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



0 dB = 0.915 mW/g = -0.77 dB mW/g

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Date: 2012/5/25

## Bottom side\_CH512

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1850.2 MHz;

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 51.77$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.55 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

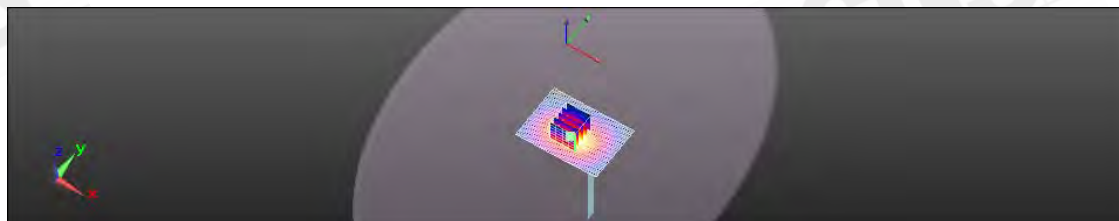
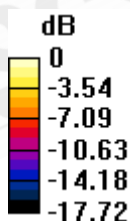
dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.354 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.874 mW/g

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.589 mW/g**

Maximum value of SAR (measured) = 1.54 mW/g



0 dB = 1.55 mW/g = 3.81 dB mW/g

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Date: 2012/5/25

## Bottom side\_CH661

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 51.638$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.42 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

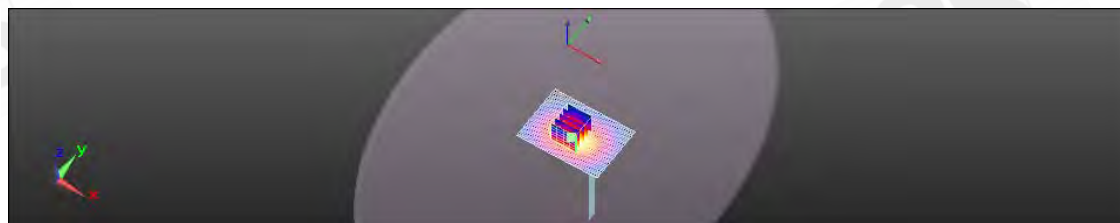
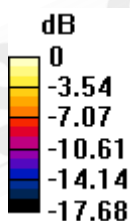
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 25.997 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.778 mW/g

**SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.544 mW/g**

Maximum value of SAR (measured) = 1.46 mW/g



0 dB = 1.42 mW/g = 3.02 dB mW/g

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Date: 2012/5/25

## Bottom side\_CH810

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1909.8 MHz;

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.522$  mho/m;  $\epsilon_r = 51.622$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.15 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

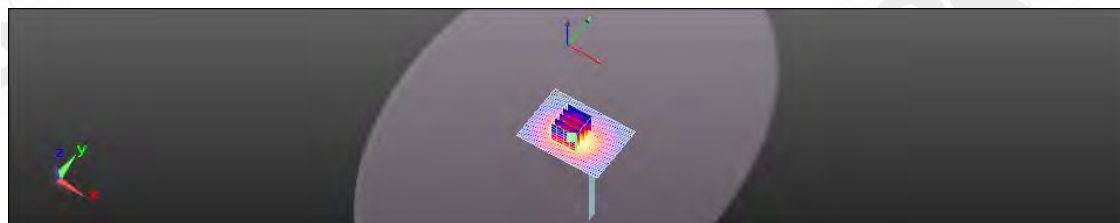
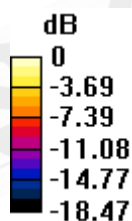
dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.626 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.420 mW/g

**SAR(1 g) = 0.833 mW/g; SAR(10 g) = 0.434 mW/g**

Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.15 mW/g = 1.20 dB mW/g

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Date: 2012/5/25

## Right side\_CH661

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 51.638$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.257 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

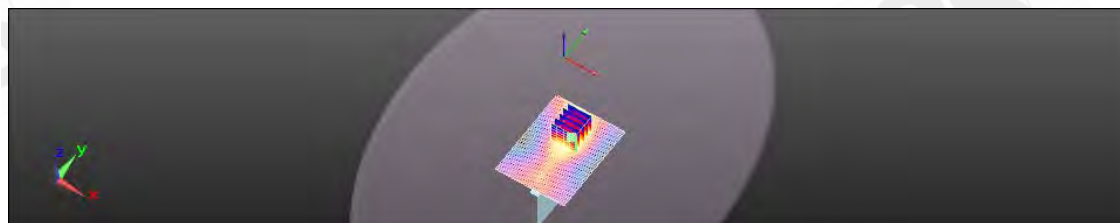
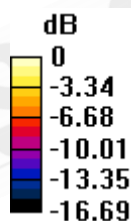
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.206 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.304 mW/g

**SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.103 mW/g**

Maximum value of SAR (measured) = 0.245 mW/g



0 dB = 0.257 mW/g = -11.81 dB mW/g

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Date: 2012/5/25

## Left side\_CH661

Communication System: GPRS-12; Communication System Band: GPRS1900; Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 51.638$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.422 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

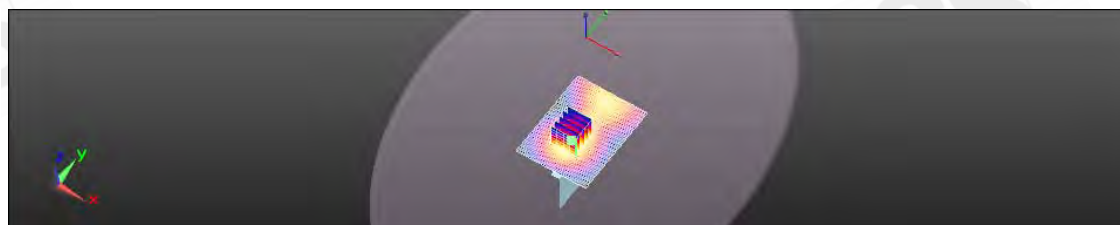
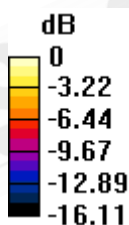
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 13.381 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.510 mW/g

**SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.186 mW/g**

Maximum value of SAR (measured) = 0.416 mW/g



0 dB = 0.422 mW/g = -7.50 dB mW/g

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## Re Cheek\_CH9262

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.414$  mho/m;  $\epsilon_r = 40.296$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.454 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

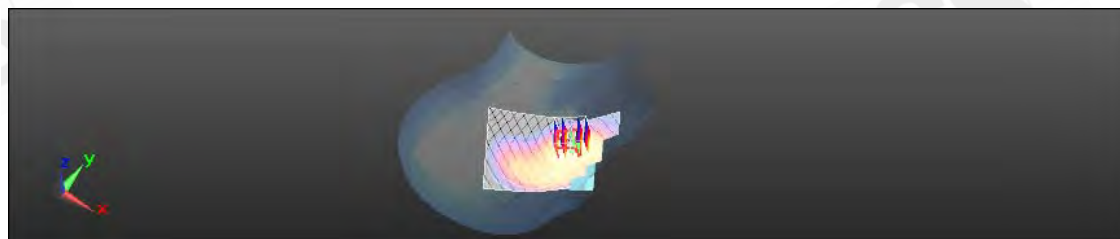
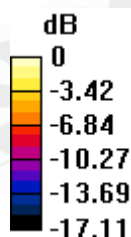
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 11.581 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.0610

**SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.655 mW/g**

Maximum value of SAR (measured) = 1.394 mW/g



0 dB = 1.390mW/g = 2.86 dB mW/g

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Date: 2012/1/20

## Re Cheek\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.084 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

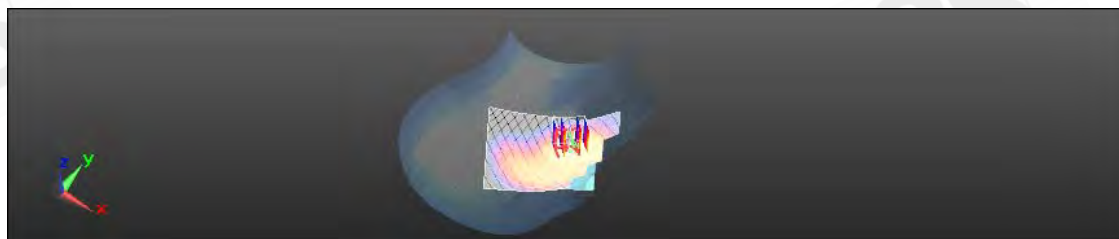
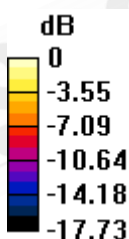
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 10.402 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.5220

**SAR(1 g) = 0.894 mW/g; SAR(10 g) = 0.488 mW/g**

Maximum value of SAR (measured) = 1.054 mW/g



0 dB = 1.050mW/g = 0.42 dB mW/g

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Date: 2012/1/20

## Re Cheek\_CH9538

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1907.6 MHz;

Medium parameters used:  $f = 1908$  MHz;  $\sigma = 1.467$  mho/m;  $\epsilon_r = 40.133$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.965 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

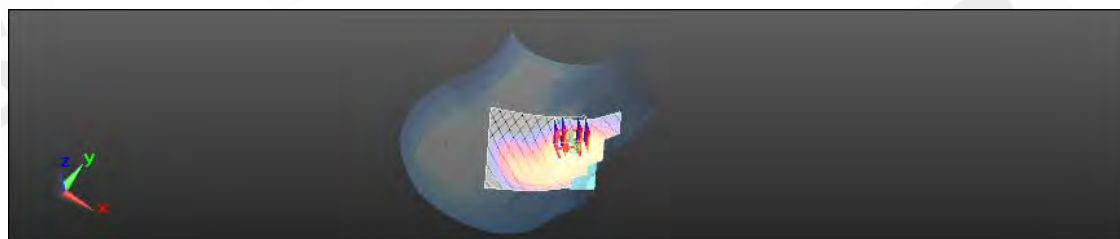
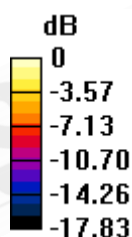
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.720 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.3320

**SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.430 mW/g**

Maximum value of SAR (measured) = 0.917 mW/g



0 dB = 0.920mW/g = -0.72 dB mW/g

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Date: 2012/1/20

## Re Tilt\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.512 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

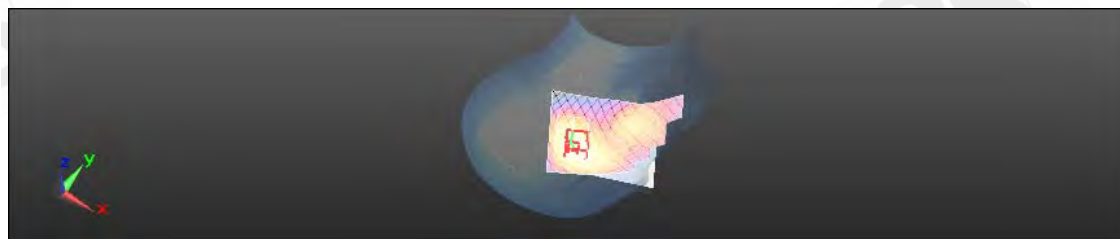
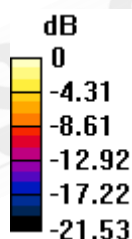
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 16.734 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.6600

**SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.254 mW/g**

Maximum value of SAR (measured) = 0.470 mW/g



0 dB = 0.470mW/g = -6.56 dB mW/g

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Date: 2012/1/20

## Le Cheek\_CH9262

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4 \text{ MHz}$ ;  $\sigma = 1.414 \text{ mho/m}$ ;  $\epsilon_r = 40.296$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.241 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 14.252 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.6710

**SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.642 mW/g**

Maximum value of SAR (measured) = 1.211 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 14.252 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.6490

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.629 mW/g**

Maximum value of SAR (measured) = 1.192 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 2:** Measurement grid:

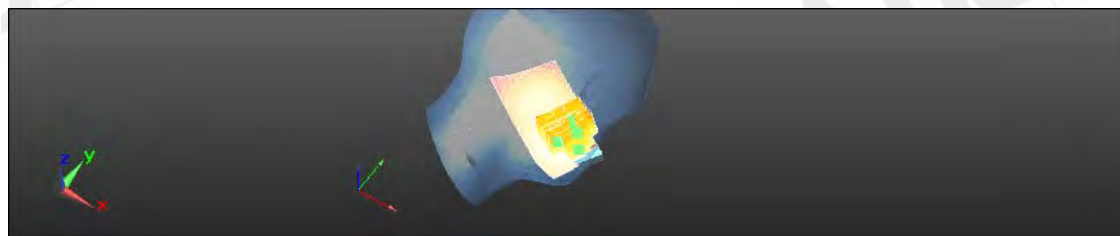
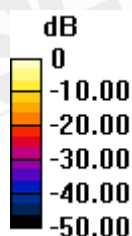
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 14.252 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.6020

**SAR(1 g) = 0.917 mW/g; SAR(10 g) = 0.531 mW/g**

Maximum value of SAR (measured) = 1.118 mW/g



0 dB = 1.120mW/g = 0.98 dB mW/g

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## Le Cheek\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.442$  mho/m;  $\epsilon_r = 40.235$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.944 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 12.606 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.2900

**SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.493 mW/g**

Maximum value of SAR (measured) = 0.935 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 12.606 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.2300

**SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.410 mW/g**

Maximum value of SAR (measured) = 0.856 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 2:** Measurement grid:

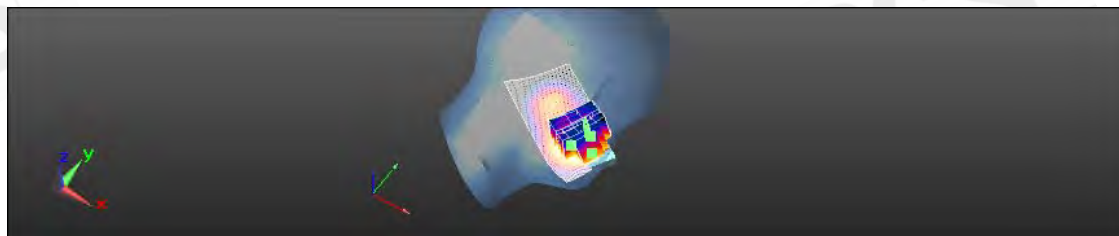
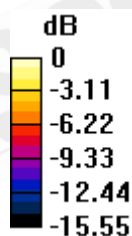
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 12.606 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.2520

**SAR(1 g) = 0.798 mW/g; SAR(10 g) = 0.476 mW/g**

Maximum value of SAR (measured) = 0.908 mW/g



0 dB = 0.910mW/g = -0.82 dB mW/g

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Date: 2012/1/20

## Le Cheek\_CH9538

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1907.6 MHz;

Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.467 \text{ mho/m}$ ;  $\epsilon_r = 40.133$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.902 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.662 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.2340

**SAR(1 g) = 0.776 mW/g; SAR(10 g) = 0.465 mW/g**

Maximum value of SAR (measured) = 0.893 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.662 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.2060

**SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.391 mW/g**

Maximum value of SAR (measured) = 0.836 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 2:** Measurement grid:

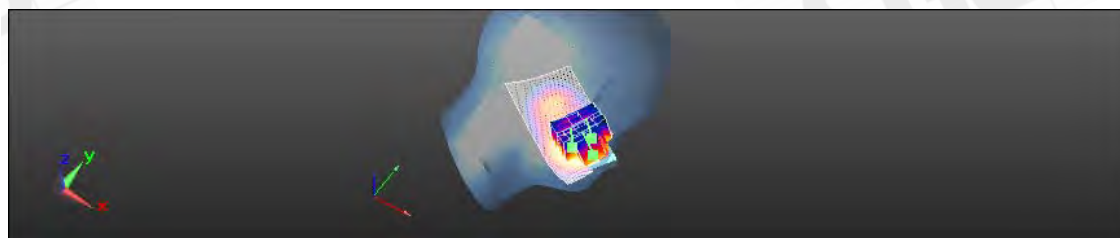
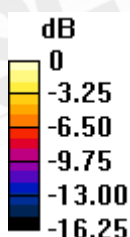
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.662 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.2130

**SAR(1 g) = 0.763 mW/g; SAR(10 g) = 0.451 mW/g**

Maximum value of SAR (measured) = 0.873 mW/g



0 dB = 0.870mW/g = -1.21 dB mW/g

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Date: 2012/1/20

## Le Tilt\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.442 \text{ mho/m}$ ;  $\epsilon_r = 40.235$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.559 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

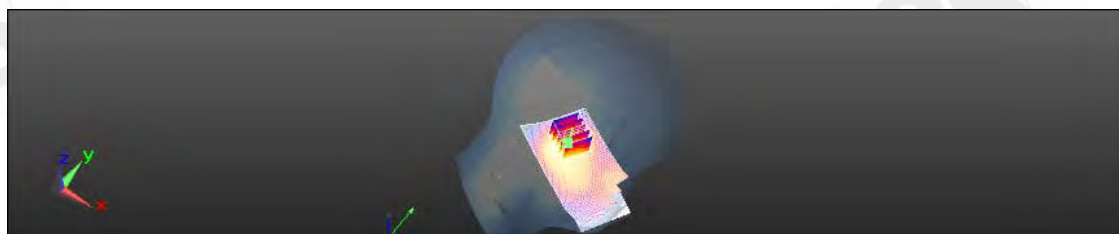
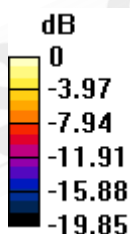
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 18.246 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.7250

**SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.253 mW/g**

Maximum value of SAR (measured) = 0.500 mW/g



0 dB = 0.500mW/g = -6.02 dB mW/g

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Date: 2012/6/5

## Speech mode\_Front side\_CH9400\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.52 \text{ mho/m}$ ;  $\epsilon_r = 51.188$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.394 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

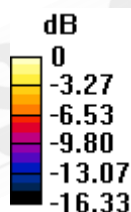
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.470 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.486 mW/g

**SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.189 mW/g**

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



0 dB = 0.394 mW/g = -8.09 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH9262\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.506$  mho/m;  $\epsilon_r = 51.208$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.781 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

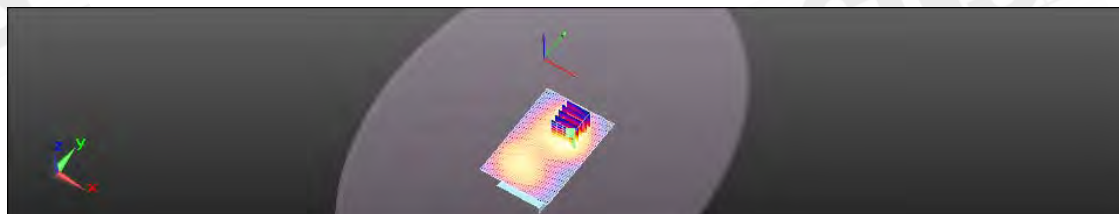
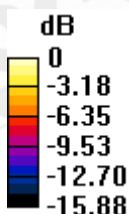
dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.334 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.931 mW/g

**SAR(1 g) = 0.576 mW/g; SAR(10 g) = 0.350 mW/g**

Maximum value of SAR (measured) = 0.755 mW/g



0 dB = 0.781 mW/g = -2.15 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH9400\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.52 \text{ mho/m}$ ;  $\epsilon_r = 51.188$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.665 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

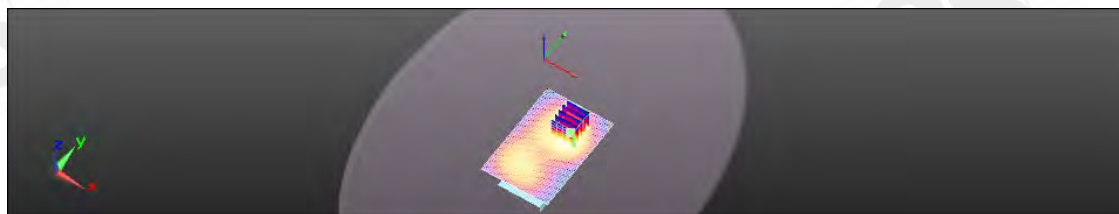
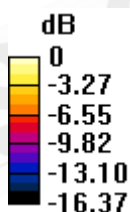
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.857 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.797 mW/g

**SAR(1 g) = 0.490 mW/g; SAR(10 g) = 0.299 mW/g**

Maximum value of SAR (measured) = 0.647 mW/g



0 dB = 0.665 mW/g = -3.54 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH9538\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1907.6 MHz;

Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.546 \text{ mho/m}$ ;  $\epsilon_r = 51.156$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.688 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

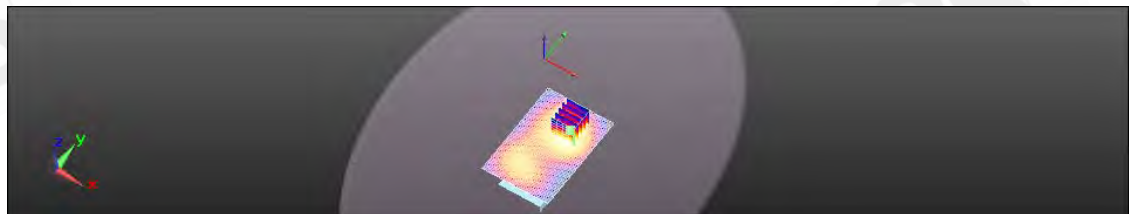
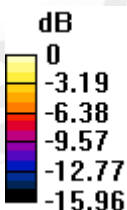
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.677 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.827 mW/g

**SAR(1 g) = 0.509 mW/g; SAR(10 g) = 0.307 mW/g**

Maximum value of SAR (measured) = 0.675 mW/g



0 dB = 0.688 mW/g = -3.25 dB mW/g

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## Front side\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.598 \text{ mho/m}$ ;  $\epsilon_r = 51.812$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.777 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

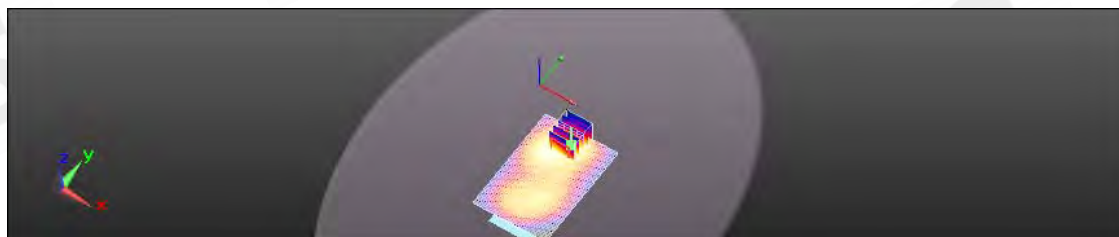
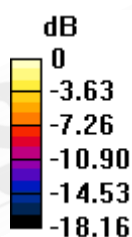
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 12.825 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.1500

**SAR(1 g) = 0.687 mW/g; SAR(10 g) = 0.381 mW/g**

Maximum value of SAR (measured) = 0.779 mW/g



0 dB = 0.780mW/g = -2.16 dB mW/g

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Date: 2012/1/20

## Back side\_CH9262

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.572$  mho/m;  $\epsilon_r = 51.881$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.695 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

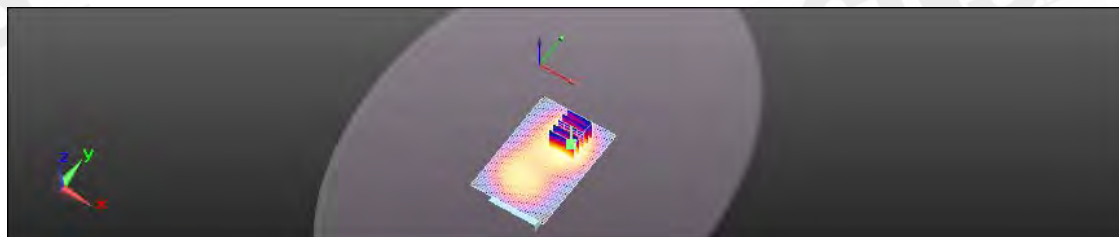
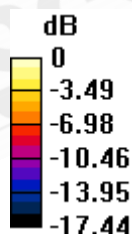
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 16.773 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 2.3700

**SAR(1 g) = 1.37 mW/g; SAR(10 g) = 0.782 mW/g**

Maximum value of SAR (measured) = 1.604 mW/g

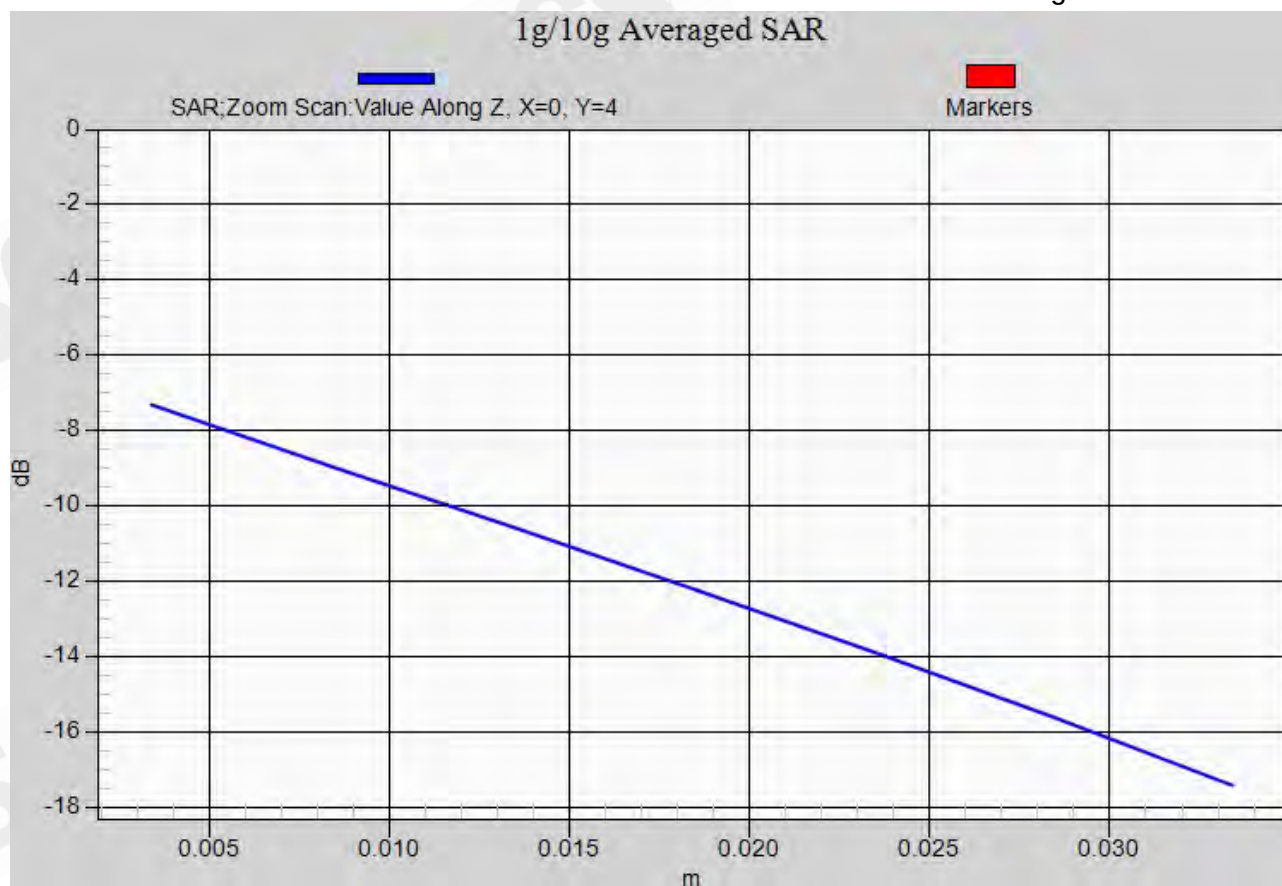


0 dB = 1.600mW/g = 4.08 dB mW/g

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Date: 2012/1/20

## Back side\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.598$  mho/m;  $\epsilon_r = 51.812$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.344 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

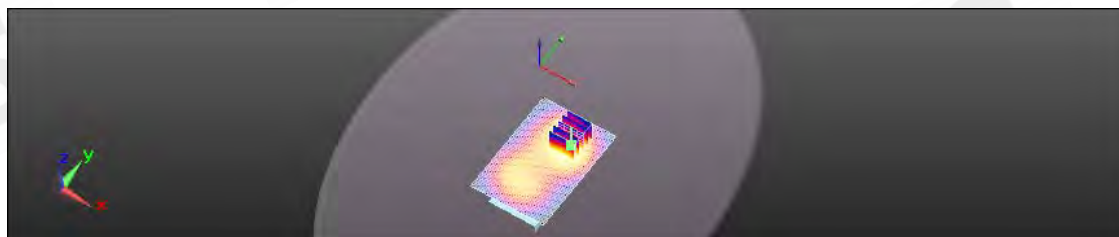
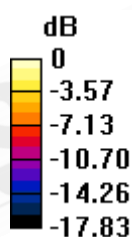
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.691 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.8980

**SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.618 mW/g**

Maximum value of SAR (measured) = 1.278 mW/g



0 dB = 1.280mW/g = 2.14 dB mW/g

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Date: 2012/1/20

## Back side\_CH9538

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1907.6 MHz;

Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.55 \text{ mho/m}$ ;  $\epsilon_r = 51.732$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.142 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

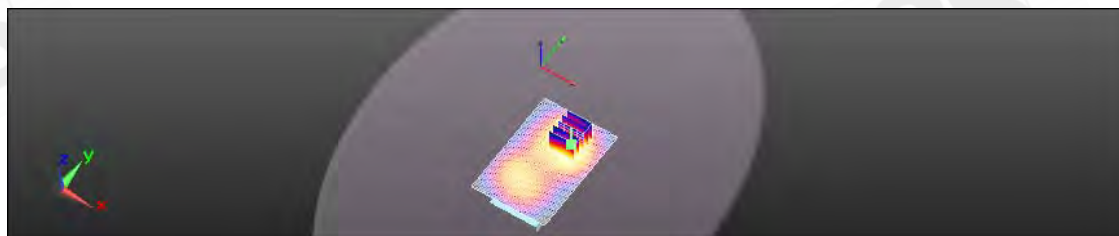
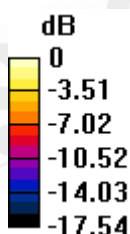
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.735 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.6310

**SAR(1 g) = 0.928 mW/g; SAR(10 g) = 0.520 mW/g**

Maximum value of SAR (measured) = 1.071 mW/g



0 dB = 1.070mW/g = 0.59 dB mW/g

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Date: 2012/1/20

## Back side\_CH9262\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.572$  mho/m;  $\epsilon_r = 51.881$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.542 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

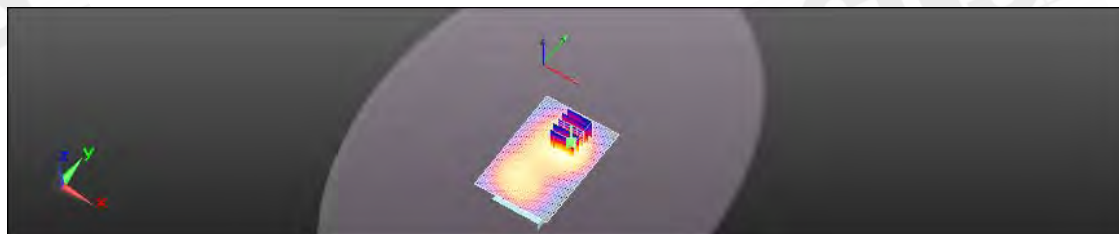
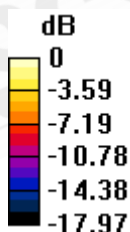
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 16.931 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 2.2000

**SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.724 mW/g**

Maximum value of SAR (measured) = 1.505 mW/g



0 dB = 1.500mW/g = 3.52 dB mW/g

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Date: 2012/1/20

## Back side\_CH9262\_repeated with memory card

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.572$  mho/m;  $\epsilon_r = 51.881$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.618 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

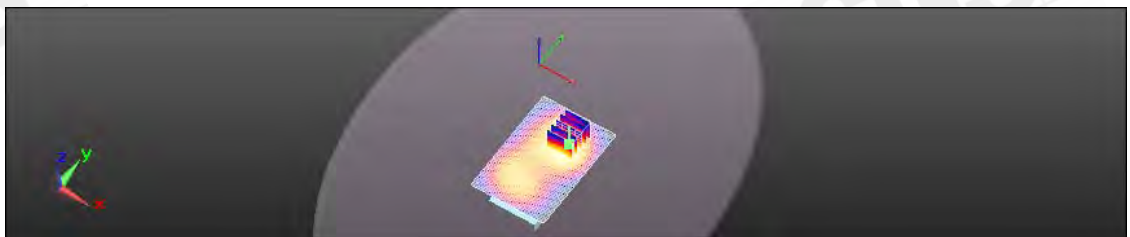
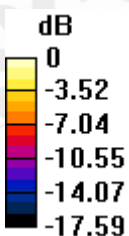
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 15.442 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 2.2500

**SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.744 mW/g**

Maximum value of SAR (measured) = 1.540 mW/g



0 dB = 1.540mW/g = 3.75 dB mW/g

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Date: 2012/1/20

## Back side\_CH9262\_repeated with 2<sup>nd</sup> Battery

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.572$  mho/m;  $\epsilon_r = 51.881$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.469 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

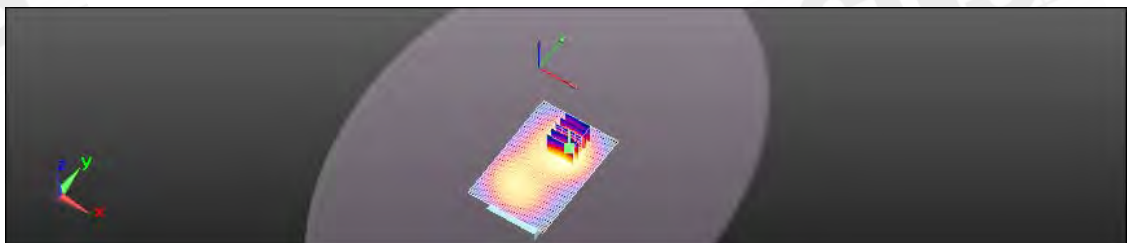
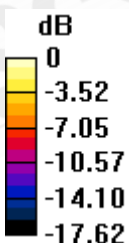
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 16.243 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.0520

**SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.688 mW/g**

Maximum value of SAR (measured) = 1.413 mW/g



0 dB = 1.410mW/g = 2.98 dB mW/g

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## Bottom side\_CH9262

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1852.4 MHz;

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.572$  mho/m;  $\epsilon_r = 51.881$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.582 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

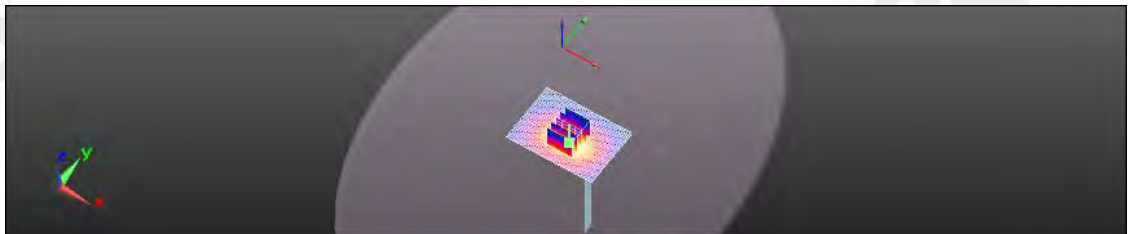
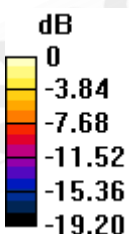
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 20.590 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 2.3030

**SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.670 mW/g**

Maximum value of SAR (measured) = 1.619 mW/g



0 dB = 1.620mW/g = 4.19 dB mW/g

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Date: 2012/1/20

## Bottom side\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.598 \text{ mho/m}$ ;  $\epsilon_r = 51.812$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.245 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

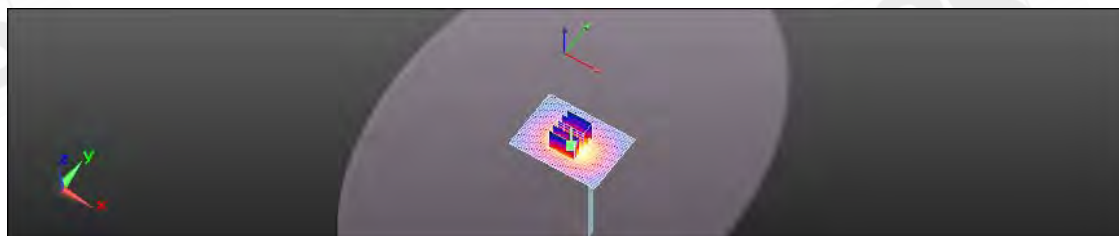
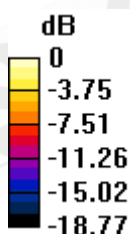
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 15.501 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.7750

**SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.533 mW/g**

Maximum value of SAR (measured) = 1.234 mW/g



0 dB = 1.230mW/g = 1.80 dB mW/g

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Date: 2012/1/20

## Bottom side\_CH9538

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1907.6 MHz;

Medium parameters used:  $f = 1908 \text{ MHz}$ ;  $\sigma = 1.55 \text{ mho/m}$ ;  $\epsilon_r = 51.732$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.166 mW/g

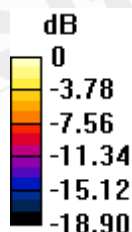
**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 15.231 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.6630

**SAR(1 g) = 0.952 mW/g; SAR(10 g) = 0.491 mW/g**

Maximum value of SAR (measured) = 1.146 mW/g



0 dB = 1.150mW/g = 1.21 dB mW/g

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## Right side\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.598$  mho/m;  $\epsilon_r = 51.812$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.267 mW/g

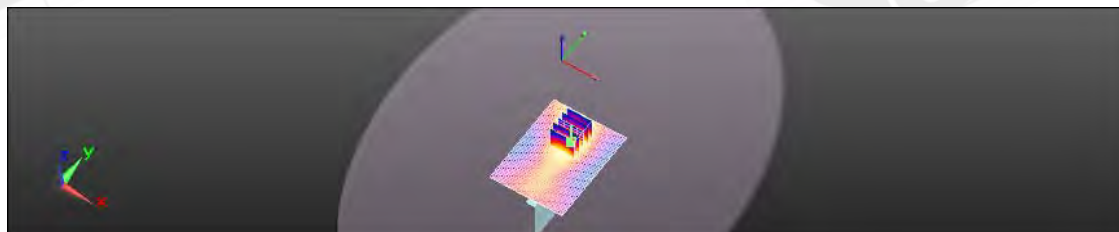
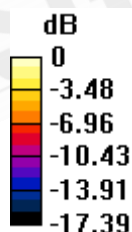
**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 8.223 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.3740

**SAR(1 g) = 0.221 mW/g; SAR(10 g) = 0.124 mW/g**

Maximum value of SAR (measured) = 0.258 mW/g



0 dB = 0.260mW/g = -11.70 dB mW/g

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Date: 2012/1/20

## Left side\_CH9400

Communication System: WCDMA; Communication System Band: WCDMA Band 2;

Frequency: 1880 MHz;

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.598$  mho/m;  $\epsilon_r = 51.812$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.469 mW/g

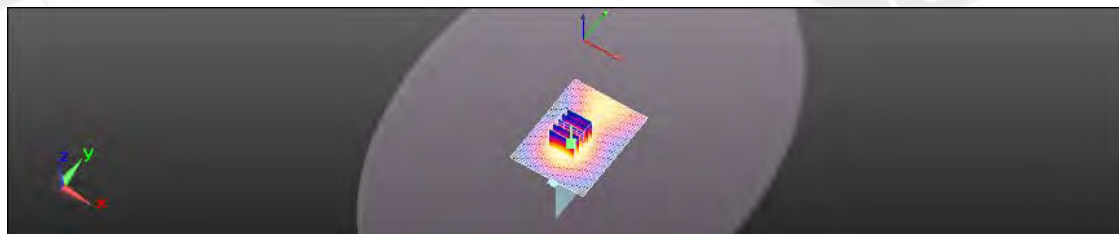
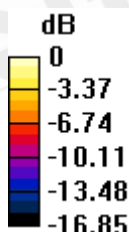
**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.632 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.6540

**SAR(1 g) = 0.395 mW/g; SAR(10 g) = 0.227 mW/g**

Maximum value of SAR (measured) = 0.458 mW/g



0 dB = 0.460mW/g = -6.74 dB mW/g

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Date: 2012/1/21

## Re Cheek\_CH4132

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 826.4 MHz;

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.89$  mho/m;  $\epsilon_r = 42.284$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.113 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

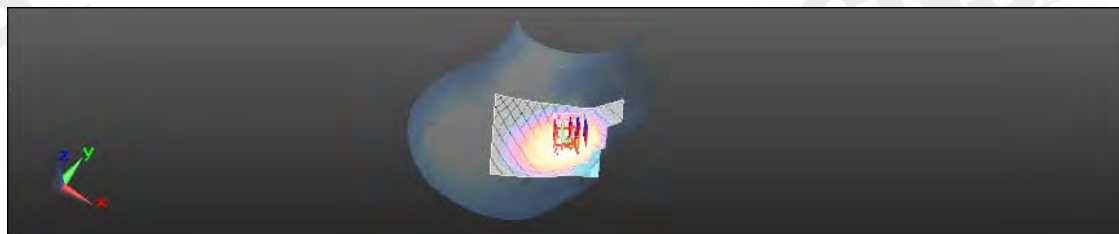
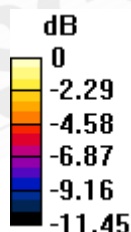
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 14.029 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.3490

**SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.752 mW/g**

Maximum value of SAR (measured) = 1.099 mW/g



0 dB = 1.100mW/g = 0.83 dB mW/g

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Date: 2012/1/21

## Re Cheek\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.172 mW/g

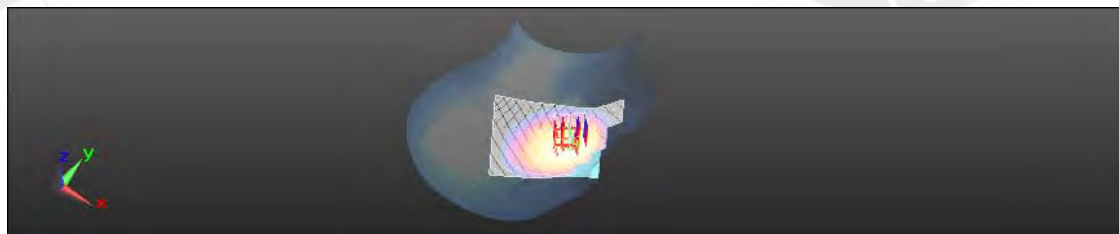
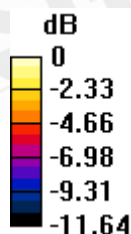
**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.862 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.4330

**SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.792 mW/g**

Maximum value of SAR (measured) = 1.162 mW/g



0 dB = 1.160mW/g = 1.29 dB mW/g

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Date: 2012/1/21

## Re Cheek\_CH4233

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 846.6 MHz; Communication System PAR: 0 dB; PMF: 1.12202

Medium parameters used:  $f = 847$  MHz;  $\sigma = 0.911$  mho/m;  $\epsilon_r = 42.021$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.132 mW/g

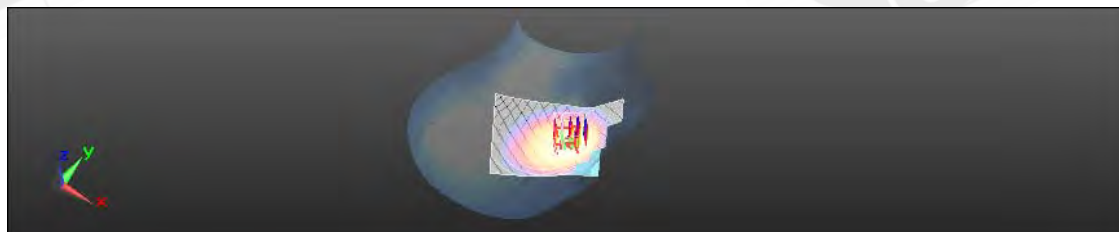
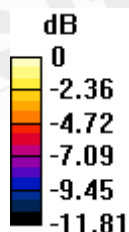
**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 14.000 V/m; Power Drift = 0.0075 dB

Peak SAR (extrapolated) = 1.3820

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.769 mW/g**

Maximum value of SAR (measured) = 1.139 mW/g



0 dB = 1.140mW/g = 1.14 dB mW/g

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Date: 2012/1/21

## Re Tilt\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.632 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 19.560 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.7750

**SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.439 mW/g**

Maximum value of SAR (measured) = 0.647 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

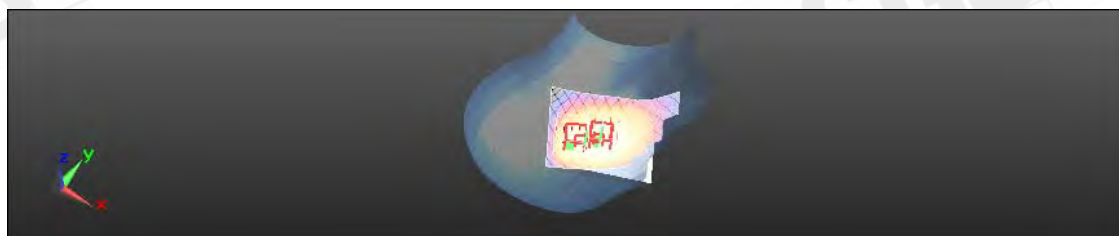
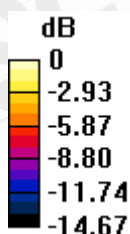
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 19.560 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.6470

**SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.313 mW/g**

Maximum value of SAR (measured) = 0.555 mW/g



0 dB = 0.550mW/g = -5.19 dB mW/g

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## Le Cheek\_CH4132

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 826.4 MHz;

Medium parameters used (interpolated):  $f = 826.4 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 42.284$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.181 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

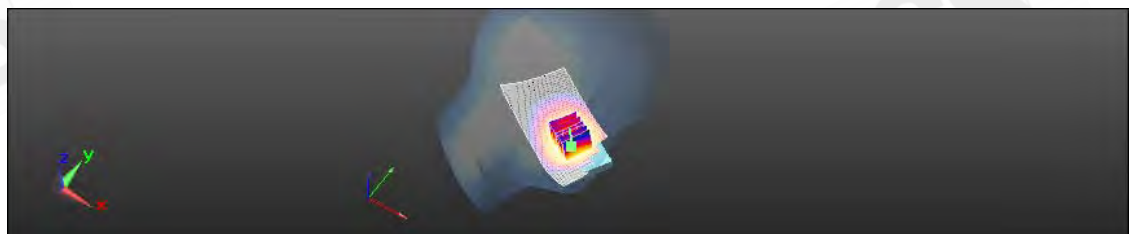
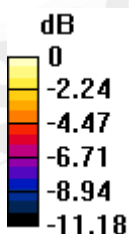
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 13.122 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.3740

**SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.802 mW/g**

Maximum value of SAR (measured) = 1.168 mW/g



0 dB = 1.170mW/g = 1.36 dB mW/g

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Date: 2012/1/21

## Le Cheek\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.232 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

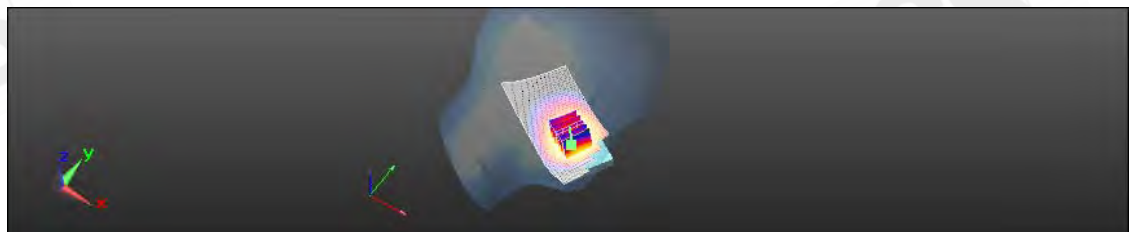
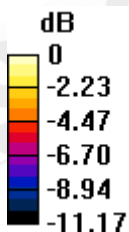
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.313 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.4380

**SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.848 mW/g**

Maximum value of SAR (measured) = 1.236 mW/g



0 dB = 1.240mW/g = 1.87 dB mW/g

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Date: 2012/1/21

## Le Cheek\_CH4233

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 846.6 MHz;

Medium parameters used:  $f = 847$  MHz;  $\sigma = 0.911$  mho/m;  $\epsilon_r = 42.021$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.213 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

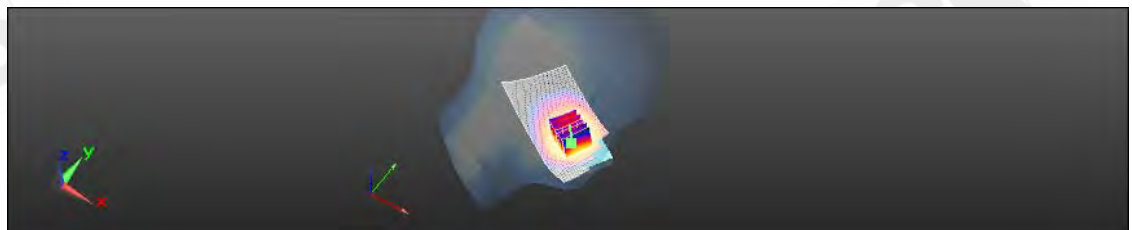
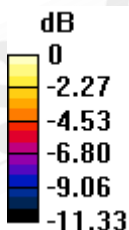
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 13.009 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.4050

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.819 mW/g**

Maximum value of SAR (measured) = 1.201 mW/g



0 dB = 1.200mW/g = 1.58 dB mW/g

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Date: 2012/1/21

## Le Tilt\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.901$  mho/m;  $\epsilon_r = 42.142$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.580 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

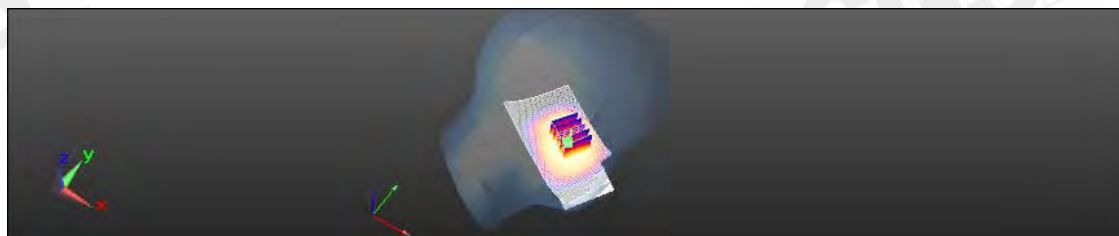
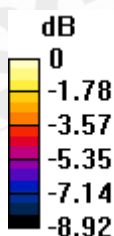
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 18.290 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.6940

**SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.400 mW/g**

Maximum value of SAR (measured) = 0.584 mW/g



0 dB = 0.580mW/g = -4.73 dB mW/g

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Date: 2012/6/5

## Speech mode\_Front side\_CH4183\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837 \text{ MHz}$ ;  $\sigma = 0.996 \text{ mho/m}$ ;  $\epsilon_r = 53.658$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.565 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

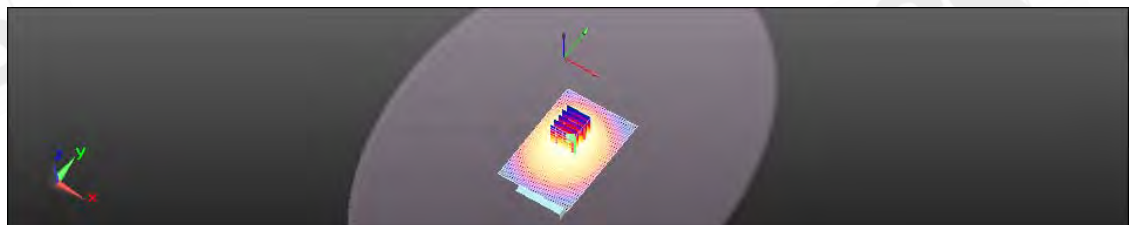
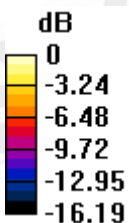
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 21.982 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.631 mW/g

**SAR(1 g) = 0.485 mW/g; SAR(10 g) = 0.357 mW/g**

Maximum value of SAR (measured) = 0.565 mW/g



0 dB = 0.565 mW/g = -4.96 dB mW/g

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## Speech mode\_Back side\_CH4132\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 826.4 MHz;

Medium parameters used (interpolated):  $f = 826.4 \text{ MHz}$ ;  $\sigma = 0.99 \text{ mho/m}$ ;  $\epsilon_r = 53.849$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.725 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 25.087 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.807 mW/g

**SAR(1 g) = 0.601 mW/g; SAR(10 g) = 0.431 mW/g**

Maximum value of SAR (measured) = 0.715 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

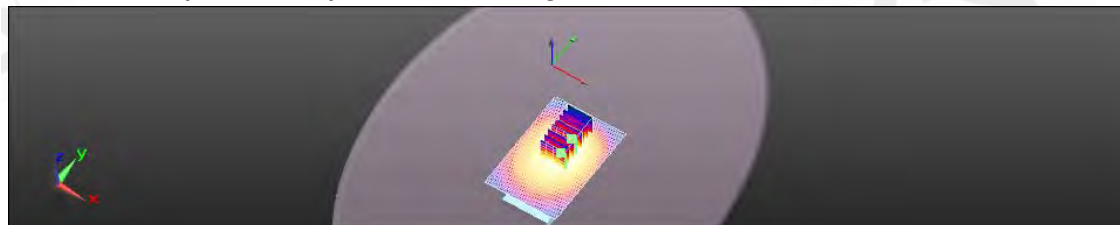
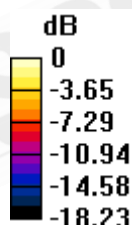
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 25.087 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.792 mW/g

**SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.372 mW/g**

Maximum value of SAR (measured) = 0.691 mW/g



0 dB = 0.725 mW/g = -2.80 dB mW/g

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Date: 2012/6/5

## Speech mode\_Back side\_CH4183\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.996$  mho/m;  $\epsilon_r = 53.658$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.843 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.173 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.947 mW/g

**SAR(1 g) = 0.701 mW/g; SAR(10 g) = 0.502 mW/g**

Maximum value of SAR (measured) = 0.835 mW/g

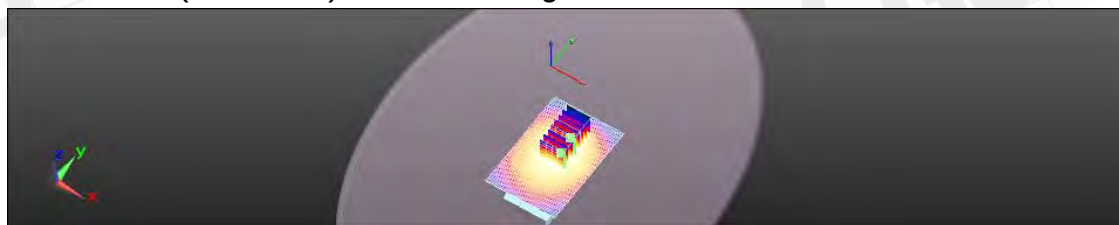
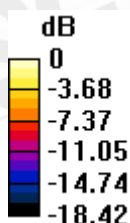
**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.173 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.956 mW/g

**SAR(1 g) = 0.660 mW/g; SAR(10 g) = 0.440 mW/g**

Maximum value of SAR (measured) = 0.825 mW/g



0 dB = 0.843 mW/g = -1.48 dB mW/g

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## Speech mode\_Back side\_CH4233\_repeated with headset

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 846.6 MHz;

Medium parameters used:  $f = 847 \text{ MHz}$ ;  $\sigma = 0.997 \text{ mho/m}$ ;  $\epsilon_r = 53.664$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.882 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 28.350 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.003 mW/g

**SAR(1 g) = 0.742 mW/g; SAR(10 g) = 0.530 mW/g**

Maximum value of SAR (measured) = 0.886 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

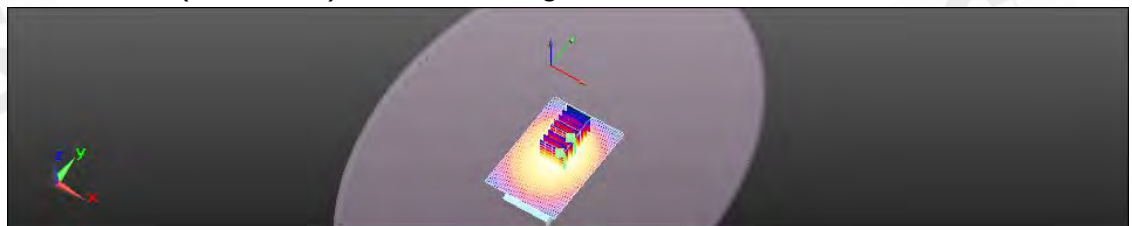
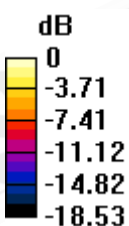
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 28.350 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.974 mW/g

**SAR(1 g) = 0.675 mW/g; SAR(10 g) = 0.446 mW/g**

Maximum value of SAR (measured) = 0.845 mW/g



0 dB = 0.882 mW/g = -1.09 dB mW/g

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## Front side\_CH4132

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 826.4 MHz;

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.957$  mho/m;  $\epsilon_r = 55.67$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.912 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

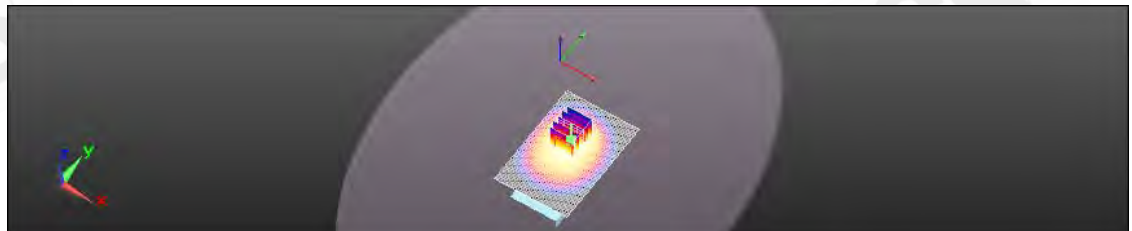
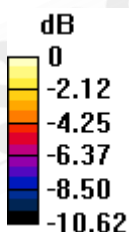
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 26.775 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.1000

**SAR(1 g) = 0.839 mW/g; SAR(10 g) = 0.615 mW/g**

Maximum value of SAR (measured) = 0.909 mW/g



0 dB = 0.910mW/g = -0.82 dB mW/g

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Date: 2012/1/21

## Front side\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.972 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

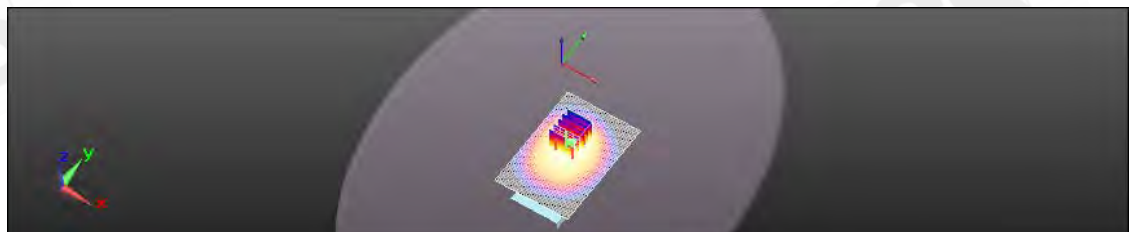
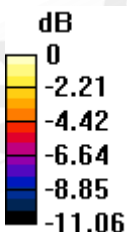
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 28.610 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.1920

**SAR(1 g) = 0.910 mW/g; SAR(10 g) = 0.667 mW/g**

Maximum value of SAR (measured) = 0.984 mW/g



0 dB = 0.980mW/g = -0.18 dB mW/g

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Date: 2012/1/21

## Front side\_CH4233

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 846.6 MHz;

Medium parameters used:  $f = 847$  MHz;  $\sigma = 0.974$  mho/m;  $\epsilon_r = 55.509$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.913 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

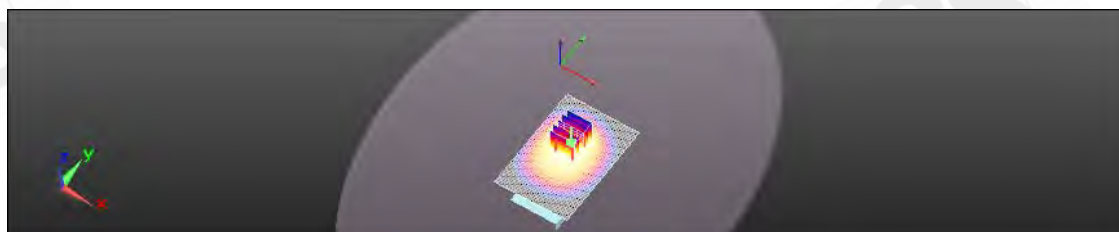
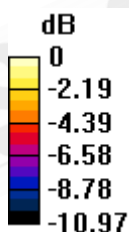
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 26.855 V/m; Power Drift = 0.0097 dB

Peak SAR (extrapolated) = 1.1160

**SAR(1 g) = 0.844 mW/g; SAR(10 g) = 0.617 mW/g**

Maximum value of SAR (measured) = 0.914 mW/g



0 dB = 0.910mW/g = -0.82 dB mW/g

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Date: 2012/1/21

## Back side\_CH4132

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 826.4 MHz;

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.957$  mho/m;  $\epsilon_r = 55.67$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.543 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 34.980 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.8780

**SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.854 mW/g**

Maximum value of SAR (measured) = 1.433 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

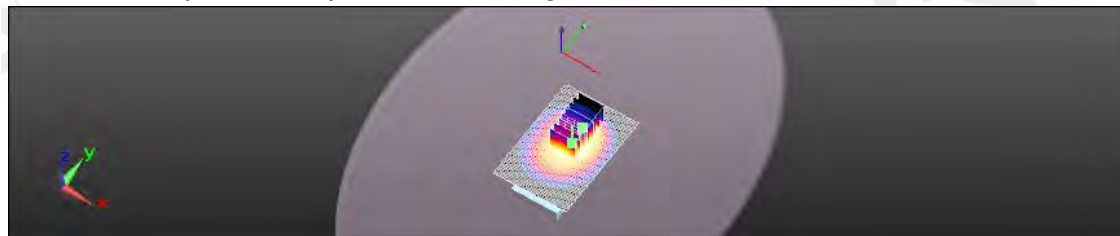
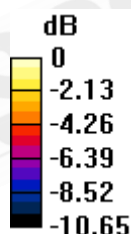
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 34.980 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.8640

**SAR(1 g) = 1.20 mW/g; SAR(10 g) = 0.83 mW/g**

Maximum value of SAR (measured) = 1.459 mW/g



0 dB = 1.460mW/g = 3.29 dB mW/g

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## Back side\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837 \text{ MHz}$ ;  $\sigma = 0.966 \text{ mho/m}$ ;  $\epsilon_r = 55.56$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.664 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 36.326 V/m; Power Drift = -0.0089 dB

Peak SAR (extrapolated) = 2.0390

**SAR(1 g) = 1.36 mW/g; SAR(10 g) = 0.918 mW/g**

Maximum value of SAR (measured) = 1.535 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

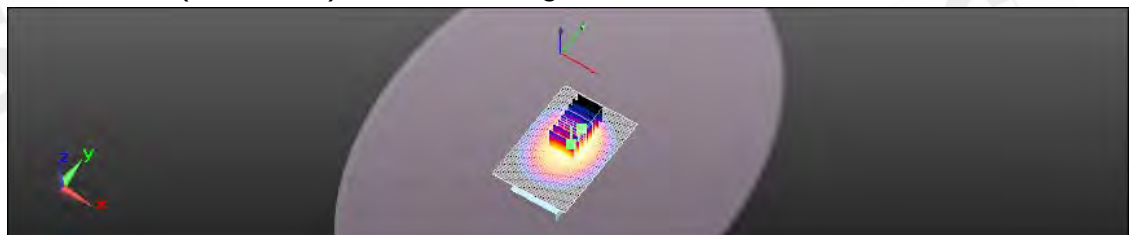
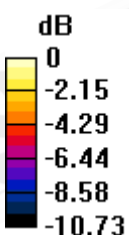
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 36.326 V/m; Power Drift = -0.0089 dB

Peak SAR (extrapolated) = 1.9980

**SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.9 mW/g**

Maximum value of SAR (measured) = 1.565 mW/g



0 dB = 1.570mW/g = 3.92 dB mW/g

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Date: 2012/1/21

## Back side\_CH4233

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 846.6 MHz;

Medium parameters used:  $f = 847$  MHz;  $\sigma = 0.974$  mho/m;  $\epsilon_r = 55.509$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 1.495 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 34.188 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.8270

**SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.815 mW/g**

Maximum value of SAR (measured) = 1.364 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 1:** Measurement grid:

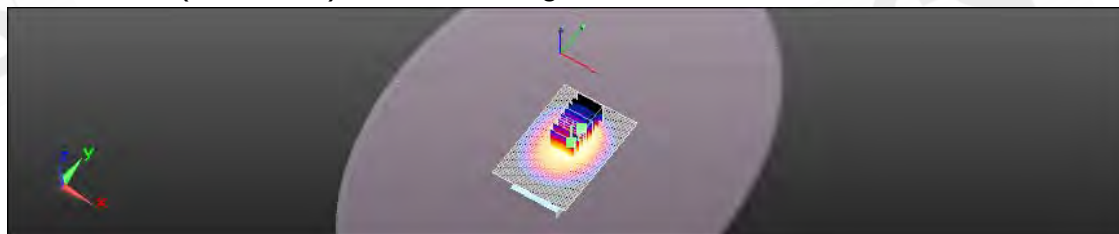
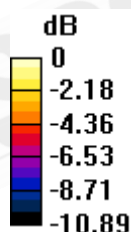
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 34.188 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.8040

**SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.8 mW/g**

Maximum value of SAR (measured) = 1.406 mW/g



0 dB = 1.410mW/g = 2.98 dB mW/g

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## Bottom side\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

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

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

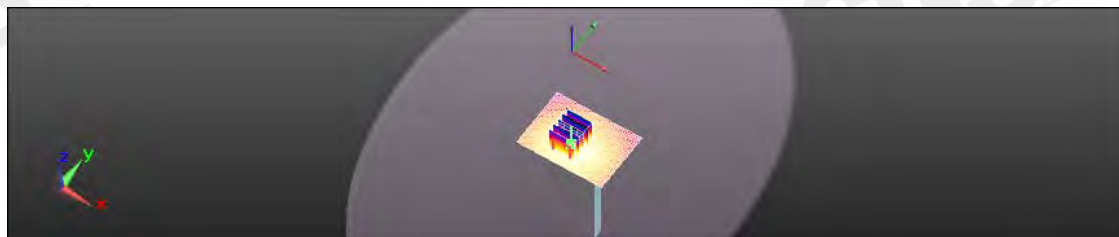
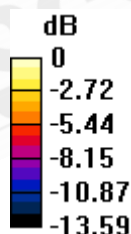
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 9.831 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.1850

**SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.058 mW/g**

Maximum value of SAR (measured) = 0.111 mW/g



0 dB = 0.110mW/g = -19.17 dB mW/g

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Date: 2012/1/21

## Right side\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837 \text{ MHz}$ ;  $\sigma = 0.966 \text{ mho/m}$ ;  $\epsilon_r = 55.56$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

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

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

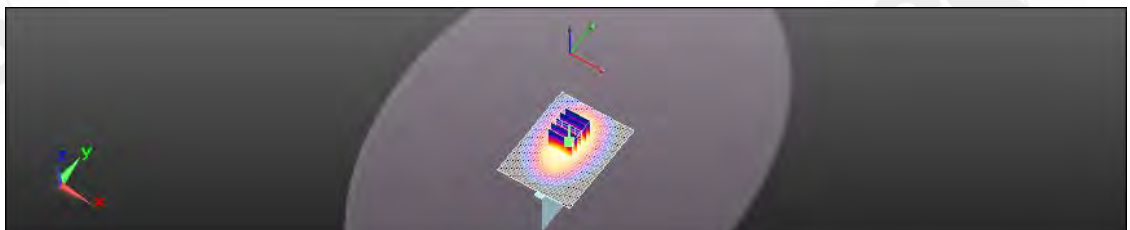
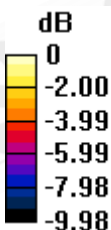
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 22.746 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.7650

**SAR(1 g) = 0.530 mW/g; SAR(10 g) = 0.361 mW/g**

Maximum value of SAR (measured) = 0.592 mW/g



0 dB = 0.590mW/g = -4.58 dB mW/g

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Date: 2012/1/21

## Left side\_CH4183

Communication System: WCDMA; Communication System Band: WCDMA Band 5;

Frequency: 836.6 MHz;

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.966$  mho/m;  $\epsilon_r = 55.56$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x81x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.611 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

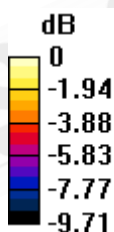
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 22.814 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.7860

**SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.378 mW/g**

Maximum value of SAR (measured) = 0.609 mW/g



0 dB = 0.610mW/g = -4.29 dB mW/g

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Date: 2012/1/25

## Re Cheek\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.763$  mho/m;  $\epsilon_r = 40.232$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.00707 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

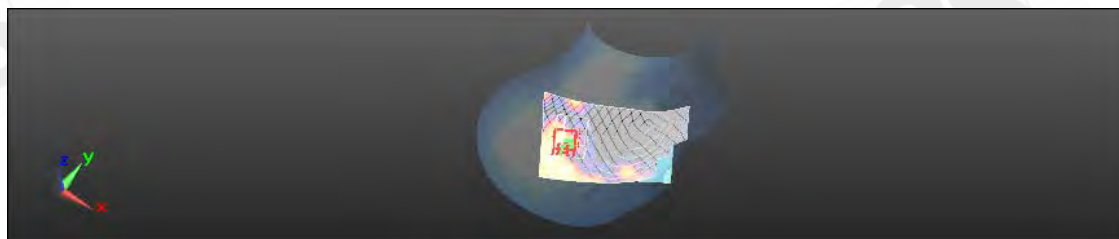
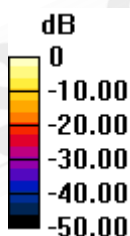
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 0.900 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.0120

**SAR(1 g) = 0.00587 mW/g; SAR(10 g) = 0.00232 mW/g**

Maximum value of SAR (measured) = 0.00724 mW/g



0 dB = 0.0072mW/g = -42.85 dB mW/g

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Date: 2012/1/25

## Re Tilt\_CH1

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.741$  mho/m;  $\epsilon_r = 40.329$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.017 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

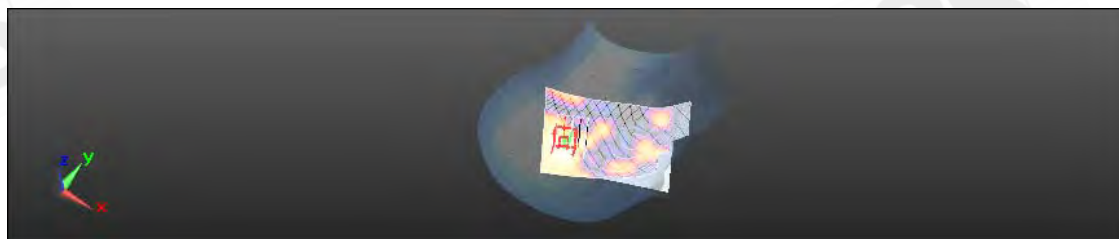
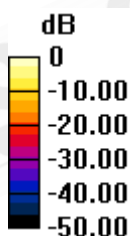
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.404 V/m; Power Drift = 0.20 dB

Peak SAR (extrapolated) = 0.0250

**SAR(1 g) = 0.00922 mW/g; SAR(10 g) = 0.00393 mW/g**

Maximum value of SAR (measured) = 0.011 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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Date: 2012/1/25

## Re Tilt\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.763$  mho/m;  $\epsilon_r = 40.232$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.024 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

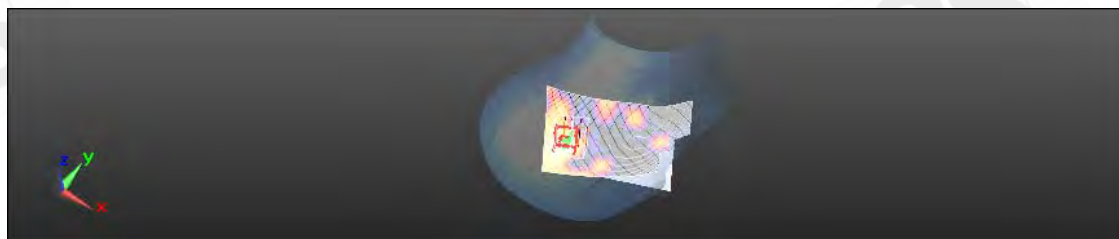
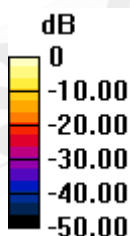
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.183 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.0170

**SAR(1 g) = 0.00807 mW/g; SAR(10 g) = 0.0035 mW/g**

Maximum value of SAR (measured) = 0.00987 mW/g



0 dB = 0.0099mW/g = -40.09 dB mW/g

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Date: 2012/1/25

## Re Tilt\_CH11

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2462 MHz;

Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.798$  mho/m;  $\epsilon_r = 40.145$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.021 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

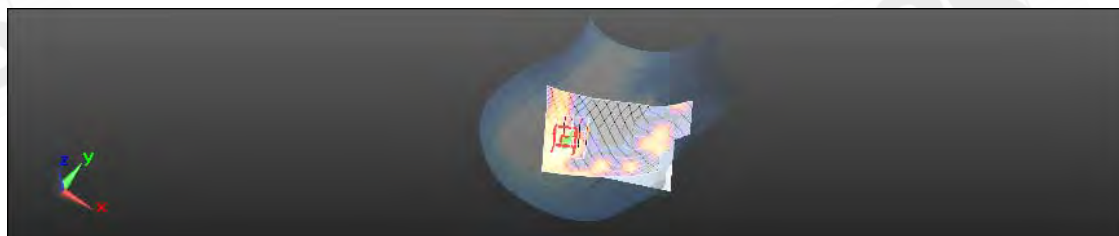
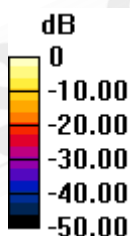
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.222 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.0170

**SAR(1 g) = 0.00772 mW/g; SAR(10 g) = 0.00325 mW/g**

Maximum value of SAR (measured) = 0.00968 mW/g



0 dB = 0.0097mW/g = -40.26 dB mW/g

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Date: 2012/1/25

## Re Tilt\_CH1\_repeated with memory card

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.741$  mho/m;  $\epsilon_r = 40.329$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.015 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

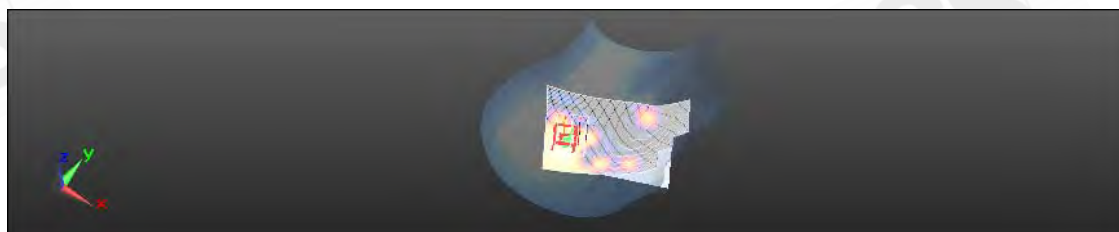
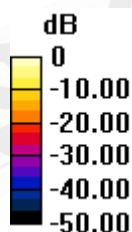
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.442 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.0200

**SAR(1 g) = 0.00902 mW/g; SAR(10 g) = 0.00396 mW/g**

Maximum value of SAR (measured) = 0.011 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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Date: 2012/1/25

## Re Tilt\_CH1\_repeated with 2<sup>nd</sup> Battery

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;  
Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.741$  mho/m;  $\epsilon_r = 40.329$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (61x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.017 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

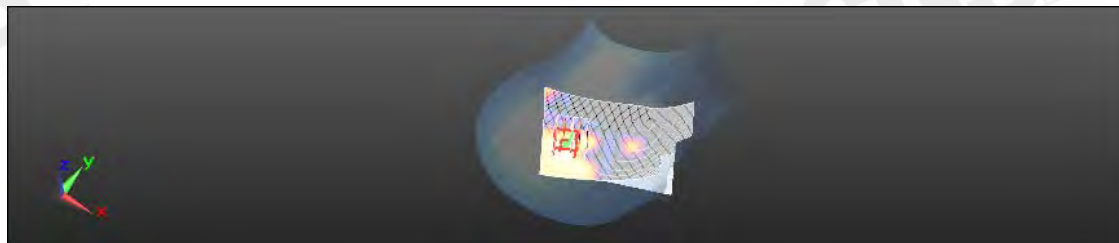
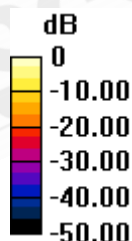
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.897 V/m; Power Drift = -0.117 dB

Peak SAR (extrapolated) = 0.0170

**SAR(1 g) = 0.00813 mW/g; SAR(10 g) = 0.00361 mW/g**

Maximum value of SAR (measured) = 0.011 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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## Le Cheek\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.763 \text{ mho/m}$ ;  $\epsilon_r = 40.232$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.0053 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

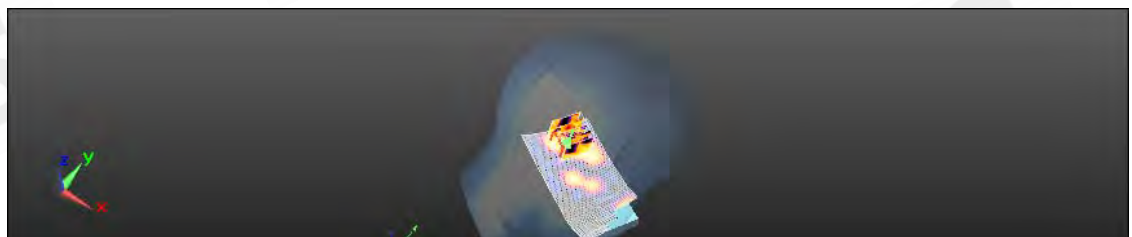
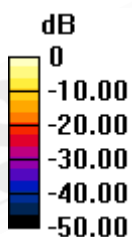
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.935 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.0130

**SAR(1 g) = 0.00348 mW/g; SAR(10 g) = 0.0013 mW/g**

Maximum value of SAR (measured) = 0.00421 mW/g



0 dB = 0.0042mW/g = -47.54 dB mW/g

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Date: 2012/1/25

## Le Tilt\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.763$  mho/m;  $\epsilon_r = 40.232$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Head/Area Scan (51x101x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.00684 mW/g

**Configuration/Head/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

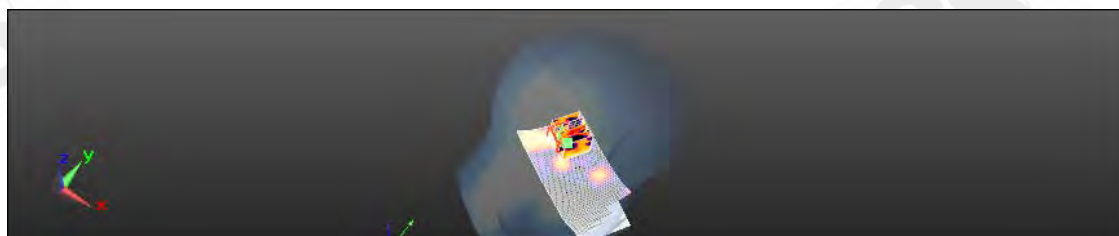
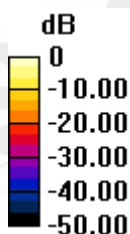
$dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.140 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.0160

**SAR(1 g) = 0.0058 mW/g; SAR(10 g) = 0.00197 mW/g**

Maximum value of SAR (measured) = 0.00731 mW/g



0 dB = 0.0073mW/g = -42.73 dB mW/g

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Date: 2012/1/25

## Front side\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.98 \text{ mho/m}$ ;  $\epsilon_r = 53.024$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.00607 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

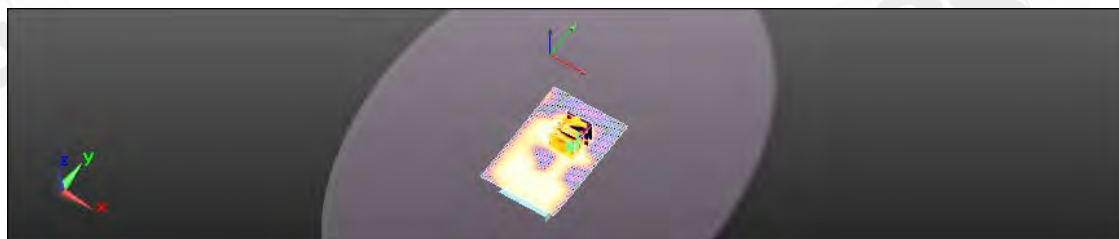
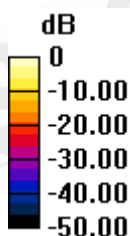
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.531 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.008450

**SAR(1 g) = 0.0025 mW/g; SAR(10 g) = 0.00103 mW/g**

Maximum value of SAR (measured) = 0.003 mW/g



0 dB = 0.003mW/g = -50.46 dB mW/g

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## Back side\_CH1

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.946 \text{ mho/m}$ ;  $\epsilon_r = 53.078$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.017 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

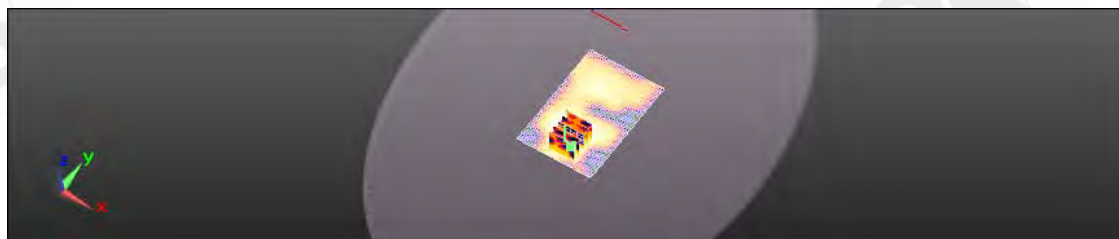
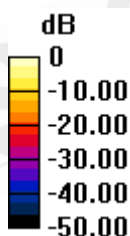
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.616 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.0290

**SAR(1 g) = 0.012 mW/g; SAR(10 g) = 0.00511 mW/g**

Maximum value of SAR (measured) = 0.018 mW/g



0 dB = 0.020mW/g = -33.98 dB mW/g

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## Back side\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.98 \text{ mho/m}$ ;  $\epsilon_r = 53.024$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.012 \text{ mW/g}$

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

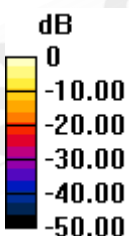
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $0.720 \text{ V/m}$ ; Power Drift =  $-0.03 \text{ dB}$

Peak SAR (extrapolated) =  $0.0240$

**SAR(1 g) =  $0.00995 \text{ mW/g}$ ; SAR(10 g) =  $0.00412 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.013 \text{ mW/g}$



$0 \text{ dB} = 0.010\text{mW/g} = -40.00 \text{ dB mW/g}$

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Date: 2012/1/25

## Back side\_CH11

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2462 MHz;

Medium parameters used:  $f = 2462 \text{ MHz}$ ;  $\sigma = 2.006 \text{ mho/m}$ ;  $\epsilon_r = 52.977$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.013 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

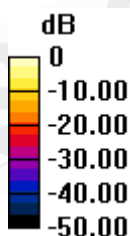
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.554 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.0220

**SAR(1 g) = 0.011 mW/g; SAR(10 g) = 0.00487 mW/g**

Maximum value of SAR (measured) = 0.016 mW/g



0 dB = 0.020mW/g = -33.98 dB mW/g

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Date: 2012/1/25

## Back side\_CH1\_repeated with headset

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.946 \text{ mho/m}$ ;  $\epsilon_r = 53.078$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.012 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

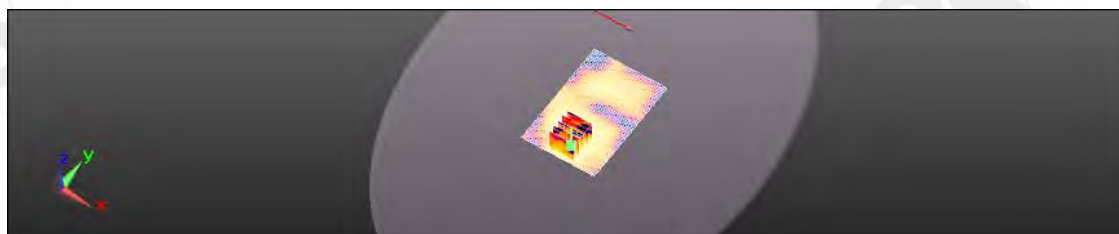
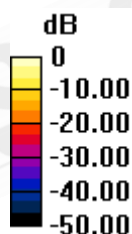
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.540 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.0240

**SAR(1 g) = 0.013 mW/g; SAR(10 g) = 0.00494 mW/g**

Maximum value of SAR (measured) = 0.016 mW/g



0 dB = 0.020mW/g = -33.98 dB mW/g

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Date: 2012/1/25

## Back side\_CH1\_repeated with memory card

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.946 \text{ mho/m}$ ;  $\epsilon_r = 53.078$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.016 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

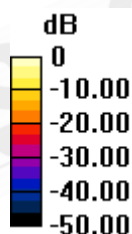
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.824 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.0250

**SAR(1 g) = 0.011 mW/g; SAR(10 g) = 0.00496 mW/g**

Maximum value of SAR (measured) = 0.013 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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## Back side\_CH1\_repeated with 2<sup>nd</sup> Battery

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2412 MHz;

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.946 \text{ mho/m}$ ;  $\epsilon_r = 53.078$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.012 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

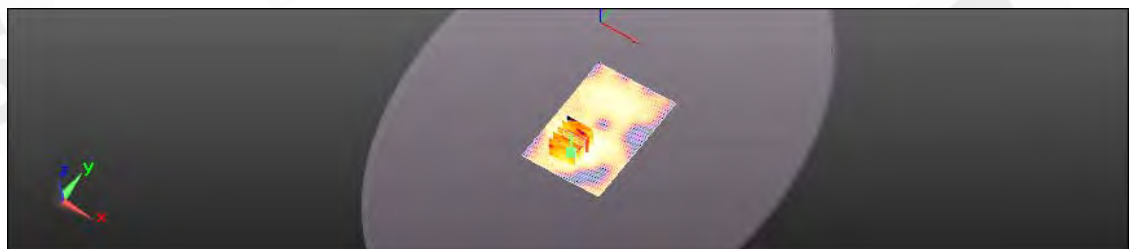
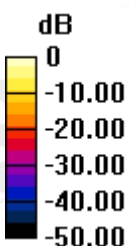
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 1.224 V/m; Power Drift = -0.174 dB

Peak SAR (extrapolated) = 0.0160

**SAR(1 g) = 0.00901 mW/g; SAR(10 g) = 0.00374 mW/g**

Maximum value of SAR (measured) = 0.011 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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## Top side\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.98$  mho/m;  $\epsilon_r = 53.024$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (71x51x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (interpolated) = 0.013 mW/g

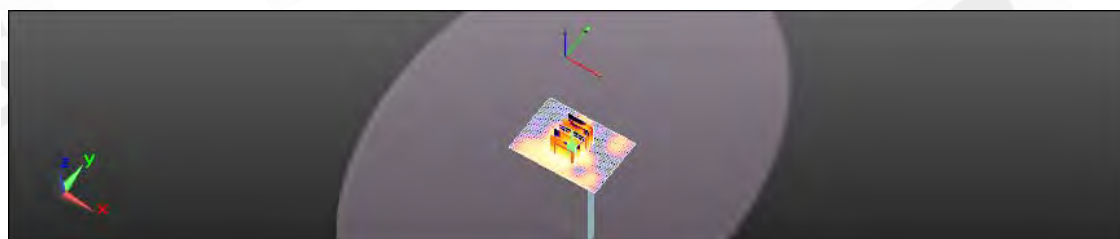
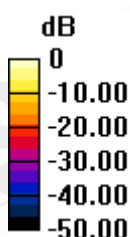
**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  
 $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.692 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.0170

**SAR(1 g) = 0.00872 mW/g; SAR(10 g) = 0.00382 mW/g**

Maximum value of SAR (measured) = 0.011 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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Date: 2012/1/25

## Right side\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.98 \text{ mho/m}$ ;  $\epsilon_r = 53.024$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.00168 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

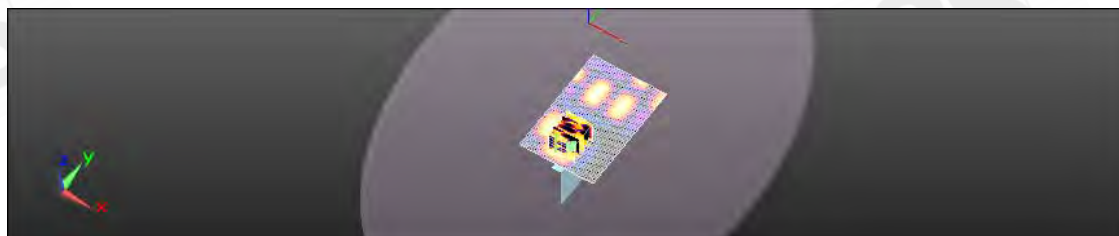
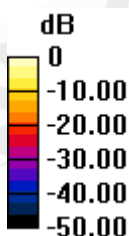
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.261 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.005230

**SAR(1 g) = 0.00105 mW/g; SAR(10 g) = 0.000437 mW/g**

Maximum value of SAR (measured) = 0.00147 mW/g



0 dB = 0.0015mW/g = -56.48 dB mW/g

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Date: 2012/1/25

## Left side\_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b\_FCC;  
Frequency: 2437 MHz;

Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.98 \text{ mho/m}$ ;  $\epsilon_r = 53.024$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Configuration/Body/Area Scan (61x91x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.00899 mW/g

**Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:

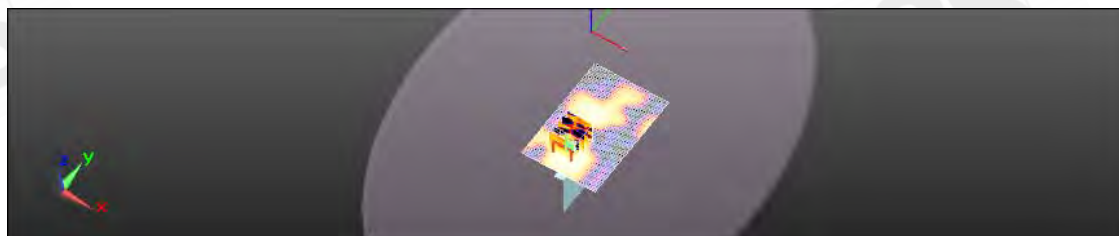
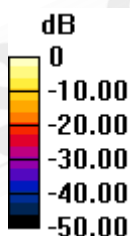
$dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.453 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.0100

**SAR(1 g) = 0.0044 mW/g; SAR(10 g) = 0.00179 mW/g**

Maximum value of SAR (measured) = 0.00551 mW/g



0 dB = 0.0055mW/g = -45.19 dB mW/g

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## 5. System Verification

Date: 2012/1/21

### DUT: Dipole 835 MHz; (Head)

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.898 \text{ mho/m}$ ;  $\epsilon_r = 42.174$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x101x1): Measurement grid:

$dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.672 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

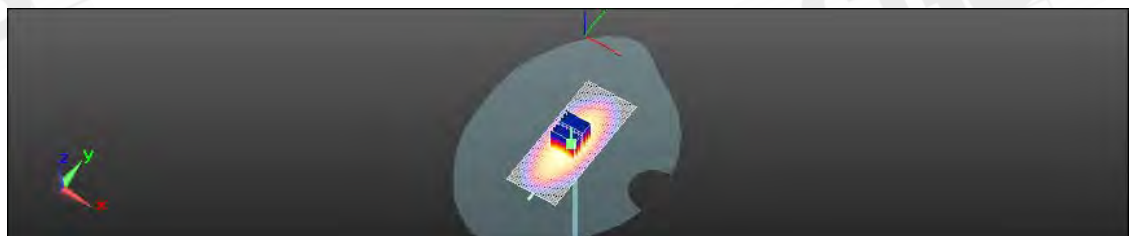
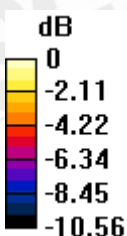
grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.203 V/m; Power Drift = -0.00047 dB

Peak SAR (extrapolated) = 3.7590

**SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.51 mW/g**

Maximum value of SAR (measured) = 2.672 mW/g



0 dB = 2.670mW/g = 8.53 dB mW/g

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Date: 2012/1/21

## DUT: Dipole 835 MHz; (Body)

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.965 \text{ mho/m}$ ;  $\epsilon_r = 55.605$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x101x1): Measurement grid:

$dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.646 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

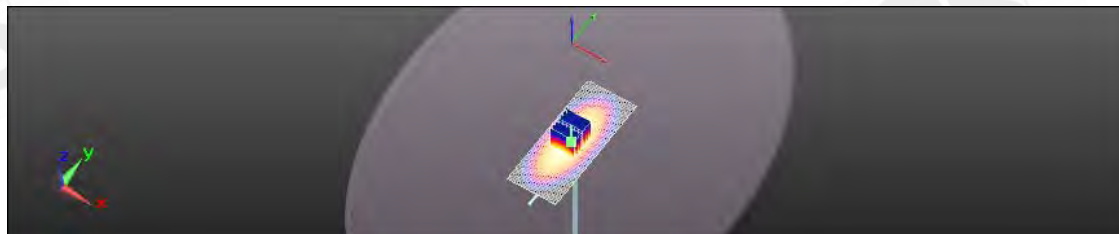
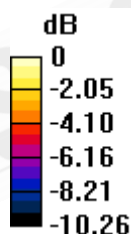
grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 53.113 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.6480

**SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.62 mW/g**

Maximum value of SAR (measured) = 2.625 mW/g



0 dB = 2.620mW/g = 8.37 dB mW/g

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Date: 2012/1/20

## DUT: Dipole 1900 MHz; (Head)

Communication System: CW; Communication System Band: D1900 (1900.0 MHz);

Frequency: 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.459$  mho/m;  $\epsilon_r = 40.157$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x71x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 12.084 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

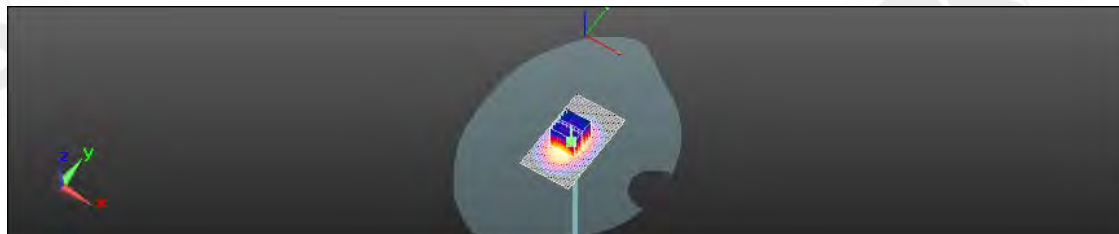
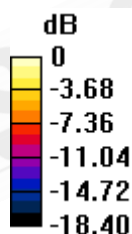
grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 88.876 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 19.5600

**SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.22 mW/g**

Maximum value of SAR (measured) = 11.485 mW/g



0 dB = 11.480mW/g = 21.20 dB mW/g

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Date: 2012/1/20

## DUT: Dipole 1900 MHz; (Body)

Communication System: CW; Communication System Band: D1900 (1900.0 MHz);

Frequency: 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.568$  mho/m;  $\epsilon_r = 51.76$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 11.207 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

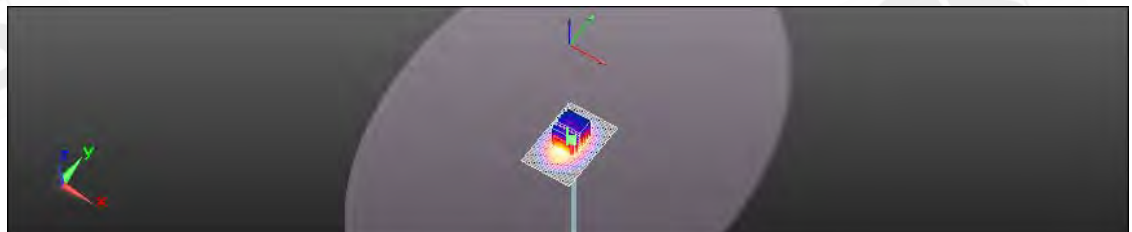
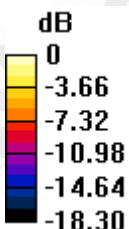
grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 82.613 V/m; Power Drift = 0.0056 dB

Peak SAR (extrapolated) = 18.1260

**SAR(1 g) = 9.75 mW/g; SAR(10 g) = 5 mW/g**

Maximum value of SAR (measured) = 11.027 mW/g



0 dB = 11.030mW/g = 20.85 dB mW/g

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Date: 2012/1/25

## DUT: Dipole 2450 MHz; (Head)

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);

Frequency: 2450 MHz;

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.778$  mho/m;  $\epsilon_r = 40.189$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.17, 4.17, 4.17); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 17.914 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

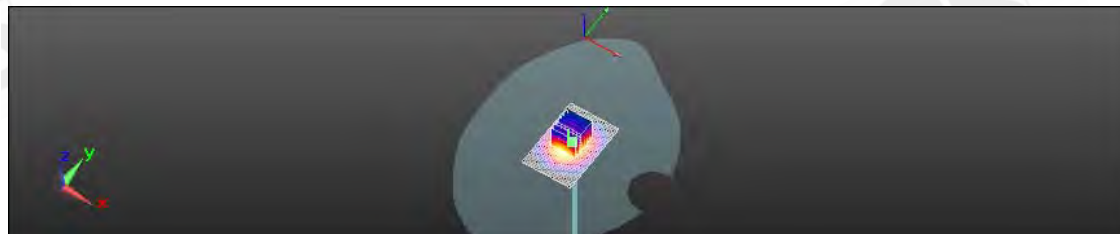
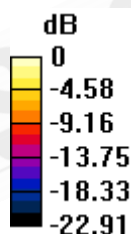
grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 93.201 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 29.3370

**SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.36 mW/g**

Maximum value of SAR (measured) = 17.077 mW/g



0 dB = 17.080mW/g = 24.65 dB mW/g

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Date: 2012/1/25

## DUT: Dipole 2450 MHz; (Body)

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);

Frequency: 2450 MHz;

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.995$  mho/m;  $\epsilon_r = 52.991$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY Configuration:

- Probe: ES3DV3 - SN3172; ConvF(3.99, 3.99, 3.99); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection),  $z = 2.0, 32.0$
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

### Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 15.373 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

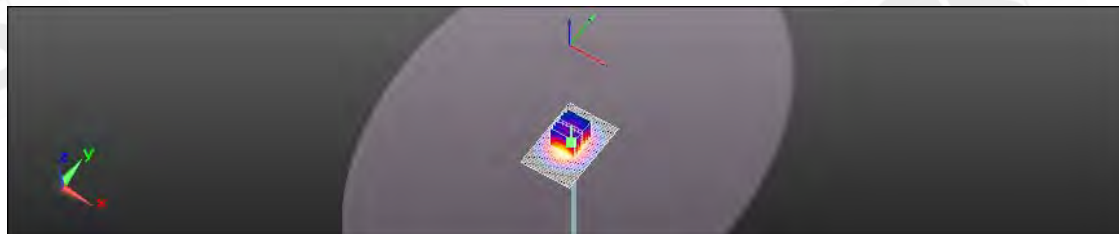
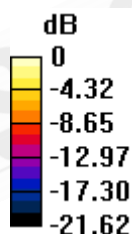
grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 85.754 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 26.4700

**SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.93 mW/g**

Maximum value of SAR (measured) = 14.523 mW/g



0 dB = 14.520mW/g = 23.24 dB mW/g

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Date: 2012/5/25

## DUT: Dipole 1900 MHz; (Body)

Communication System: CW; Communication System Band: D1900 (1900.0 MHz);

Frequency: 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.512$  mho/m;  $\epsilon_r = 51.657$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

### Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

dx=15mm, dy=15mm

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

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

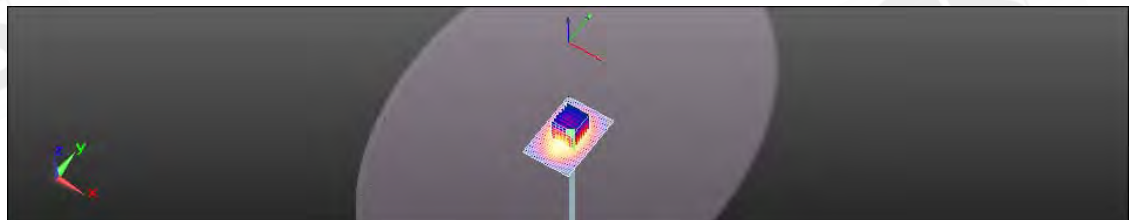
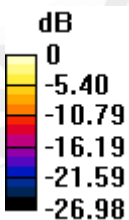
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.538 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 18.024 mW/g

**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.21 mW/g**

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



0 dB = 12.3 mW/g = 21.81 dB mW/g

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## DUT: Dipole 835 MHz; (Body)

Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.987 \text{ mho/m}$ ;  $\epsilon_r = 53.762$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.02, 9.02, 9.02); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

### Configuration/Pin=250mW/Area Scan (51x121x1): Measurement grid:

$dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.73 mW/g

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

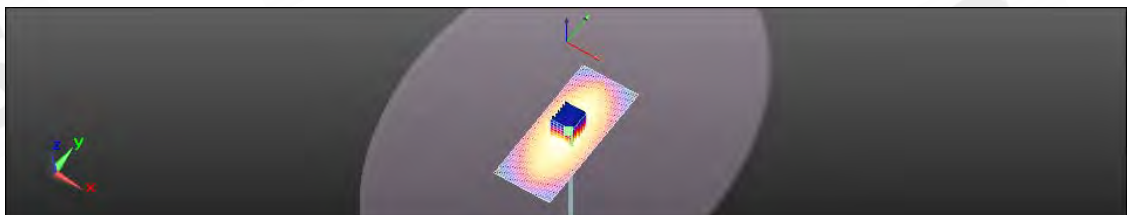
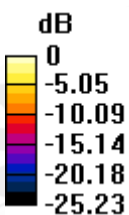
grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 53.939 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.673 mW/g

**SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.59 mW/g**

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



0 dB = 2.73 mW/g = 8.72 dB mW/g

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Date: 2012/6/5

## DUT: Dipole 1900 MHz; (Body)

Communication System: CW; Communication System Band: D1900 (1900.0 MHz);

Frequency: 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.544$  mho/m;  $\epsilon_r = 51.215$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

### DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.25, 7.25, 7.25); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn914; Calibrated: 2011/12/8
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

### Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

dx=15mm, dy=15mm

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

### Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

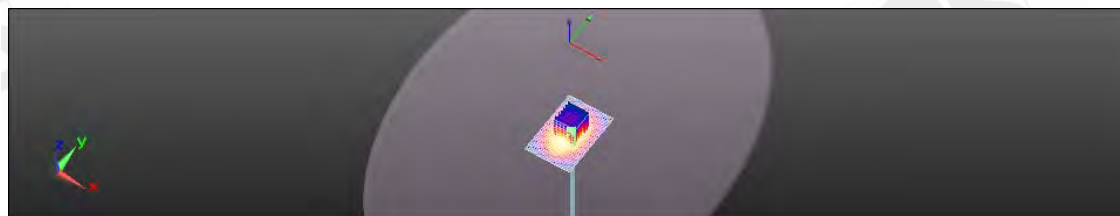
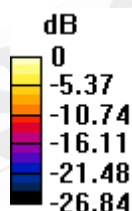
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.339 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 17.985 mW/g

**SAR(1 g) = 9.9 mW/g; SAR(10 g) = 5.2 mW/g**

Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.3 mW/g = 21.78 dB mW/g

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## 6. DAE & Probe Calibration Certificate

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



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

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS (Auden)**

Certificate No: **DAE4-1260\_Aug11**

### CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BJ - SN: 1260**

Calibration procedure(s) **QA CAL-06 v23  
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **August 22, 2011**

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  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 28-Sep-10 (No:10376)       | Sep-11                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Calibrator Box V1.1           | SE UMS 006 AB 1004 | 08-Jun-11 (in house check) | In house check: Jun-12 |

|                |                              |                                     |               |
|----------------|------------------------------|-------------------------------------|---------------|
| Calibrated by: | Name<br><b>Eric Hainfeld</b> | Function<br><b>Technician</b>       | Signature<br> |
| Approved by:   | Name<br><b>Fin Bornholt</b>  | Function<br><b>R&amp;D Director</b> | Signature<br> |

Issued: August 22, 2011

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

Certificate No: DAE4-1260\_Aug11

Page 1 of 5

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

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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

## Glossary

**DAE** data acquisition electronics  
**Connector angle** information used in DASY system to align probe sensor X to the robot coordinate system.

## Methods Applied and Interpretation of Parameters

- **DC Voltage Measurement:** Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- **Connector angle:** The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - **DC Voltage Measurement Linearity:** Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - **Common mode sensitivity:** Influence of a positive or negative common mode voltage on the differential measurement.
  - **Channel separation:** Influence of a voltage on the neighbor channels not subject to an input voltage.
  - **AD Converter Values with inputs shorted:** Values on the internal AD converter corresponding to zero input voltage
  - **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
  - **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - **Input resistance:** Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
  - **Power consumption:** Typical value for information. Supply currents in various operating modes.

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**DC Voltage Measurement**

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                        | Y                        | Z                        |
|---------------------|--------------------------|--------------------------|--------------------------|
| High Range          | 406.004 $\pm$ 0.1% (k=2) | 404.956 $\pm$ 0.1% (k=2) | 405.556 $\pm$ 0.1% (k=2) |
| Low Range           | 3.95601 $\pm$ 0.7% (k=2) | 4.01927 $\pm$ 0.7% (k=2) | 4.00399 $\pm$ 0.7% (k=2) |

**Connector Angle**

|                                           |                                     |
|-------------------------------------------|-------------------------------------|
| Connector Angle to be used in DASY system | 179.0 $^{\circ}$ $\pm$ 1 $^{\circ}$ |
|-------------------------------------------|-------------------------------------|

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## Appendix

### 1. DC Voltage Linearity

| High Range        | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 199997.7                  | 5.90                         | 0.00      |
| Channel X + Input | 20002.71                  | 3.31                         | 0.02      |
| Channel X - Input | -19996.91                 | 2.89                         | -0.01     |
| Channel Y + Input | 199990.1                  | -0.85                        | -0.00     |
| Channel Y + Input | 19999.25                  | -0.35                        | -0.00     |
| Channel Y - Input | -19999.22                 | 0.58                         | -0.00     |
| Channel Z + Input | 199999.4                  | -3.57                        | -0.00     |
| Channel Z + Input | 19998.93                  | -0.47                        | -0.00     |
| Channel Z - Input | -20000.48                 | -0.68                        | 0.00      |

| Low Range         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 2000.2                    | 0.06                         | 0.00      |
| Channel X + Input | 200.93                    | 1.13                         | 0.57      |
| Channel X - Input | -199.54                   | 0.66                         | -0.33     |
| Channel Y + Input | 1999.6                    | -0.56                        | -0.03     |
| Channel Y + Input | 200.02                    | 0.12                         | 0.06      |
| Channel Y - Input | -200.40                   | -0.40                        | 0.20      |
| Channel Z + Input | 1999.9                    | -0.28                        | -0.01     |
| Channel Z + Input | 199.09                    | -0.91                        | -0.46     |
| Channel Z - Input | -200.84                   | -0.94                        | 0.47      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | -0.15                                        | -2.12                                       |
|           | -200                           | 4.13                                         | 1.79                                        |
| Channel Y | 200                            | 12.24                                        | 11.93                                       |
|           | -200                           | -13.72                                       | -13.81                                      |
| Channel Z | 200                            | -2.45                                        | -1.93                                       |
|           | -200                           | -0.71                                        | -0.36                                       |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 5.11                        | -1.01                       |
| Channel Y | 200                | 2.60                        | -                           | 5.42                        |
| Channel Z | 200                | 1.73                        | 0.39                        | -                           |

Certificate No: DAE4-1260\_Aug11

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#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 15925            | 16002           |
| Channel Y | 15815            | 15768           |
| Channel Z | 16047            | 16670           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$ 

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | -0.44              | -2.66                  | 0.28                   | 0.41                      |
| Channel Y | -0.80              | -2.28                  | 0.37                   | 0.41                      |
| Channel Z | -1.59              | -2.59                  | -0.14                  | 0.44                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: &lt;25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (k $\Omega$ m) | Measuring (M $\Omega$ m) |
|-----------|------------------------|--------------------------|
| Channel X | 200                    | 200                      |
| Channel Y | 200                    | 200                      |
| Channel Z | 200                    | 200                      |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |

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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **DAE4-914\_Dec11**

## CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BK - SN: 914**

Calibration procedure(s) **QA CAL-06.v23**  
 Calibration procedure for the data acquisition electronics (DAE)

Calibration date: **December 8, 2011**

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  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 28-Sep-11 (No:11450)       | Sep-12                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Calibrator Box V1.1           | SE UMS 006 AB 1004 | 08-Jun-11 (in house check) | In house check: Jun-12 |

|                | Name              | Function     | Signature |
|----------------|-------------------|--------------|-----------|
| Calibrated by: | Dominique Steffen | Technician   |           |
| Approved by:   | Fin Bornholt      | R&D Director |           |

Issued: December 8, 2011

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

Certificate No: DAE4-914\_Dec11

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Accreditation No.: SCS 108

## Glossary

DAE data acquisition electronics  
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

## Methods Applied and Interpretation of Parameters

- **DC Voltage Measurement:** Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
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  - **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
  - **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - **Input resistance:** Typical value for information; DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
  - **Power consumption:** Typical value for information. Supply currents in various operating modes.

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## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                    | Y                    | Z                    |
|---------------------|----------------------|----------------------|----------------------|
| High Range          | 404.430 ± 0.1% (k=2) | 404.471 ± 0.1% (k=2) | 403.724 ± 0.1% (k=2) |
| Low Range           | 3.99253 ± 0.7% (k=2) | 3.95785 ± 0.7% (k=2) | 3.98845 ± 0.7% (k=2) |

## Connector Angle

|                                           |              |
|-------------------------------------------|--------------|
| Connector Angle to be used in DASY system | 65.0 ° ± 1 ° |
|-------------------------------------------|--------------|

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## Appendix

### 1. DC Voltage Linearity

| High Range        | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 200001.0                  | -0.18                        | -0.00     |
| Channel X + Input | 19998.80                  | -1.00                        | -0.00     |
| Channel X - Input | -19997.26                 | 2.34                         | -0.01     |
| Channel Y + Input | 200007.4                  | -1.88                        | -0.00     |
| Channel Y + Input | 19994.57                  | -5.03                        | -0.03     |
| Channel Y - Input | -20001.70                 | -2.50                        | 0.01      |
| Channel Z + Input | 200005.3                  | -3.10                        | -0.00     |
| Channel Z + Input | 19996.23                  | -3.17                        | -0.02     |
| Channel Z - Input | -20002.05                 | -2.85                        | 0.01      |

| Low Range         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 1998.8                    | -1.15                        | -0.06     |
| Channel X + Input | 199.72                    | -0.18                        | -0.09     |
| Channel X - Input | -199.83                   | 0.17                         | -0.08     |
| Channel Y + Input | 1999.3                    | -0.71                        | -0.04     |
| Channel Y + Input | 199.51                    | -0.49                        | -0.25     |
| Channel Y - Input | -201.93                   | -2.03                        | 1.01      |
| Channel Z + Input | 2000.1                    | -0.03                        | -0.00     |
| Channel Z + Input | 198.84                    | -0.96                        | -0.48     |
| Channel Z - Input | -201.32                   | -1.32                        | 0.66      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | -0.86                                        | -2.25                                       |
|           | - 200                          | 3.38                                         | 1.61                                        |
| Channel Y | 200                            | -5.83                                        | -6.16                                       |
|           | - 200                          | 4.37                                         | 4.28                                        |
| Channel Z | 200                            | -15.57                                       | -15.83                                      |
|           | - 200                          | 14.89                                        | 14.76                                       |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 4.16                        | 0.70                        |
| Channel Y | 200                | 2.79                        | -                           | 5.86                        |
| Channel Z | 200                | 2.87                        | -2.21                       | -                           |

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#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16315            | 13913           |
| Channel Y | 15862            | 15284           |
| Channel Z | 16146            | 16142           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | -1.48              | -2.38                  | -0.31                  | 0.40                      |
| Channel Y | -0.09              | -1.61                  | 0.82                   | 0.47                      |
| Channel Z | -0.45              | -1.69                  | 0.81                   | 0.40                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |

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Zeughausstrasse 43, 8004 Zurich, Switzerland



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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **ES3-3172\_Aug11**

## CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3172**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **August 23, 2011**

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      | 31-Mar-11 (No. 217-01372)         | Apr-12                 |
| Power sensor E4412A        | MY41498087      | 31-Mar-11 (No. 217-01372)         | Apr-12                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 29-Mar-11 (No. 217-01369)         | Apr-12                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 29-Mar-11 (No. 217-01367)         | Apr-12                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 29-Mar-11 (No. 217-01370)         | Apr-12                 |
| Reference Probe ES3DV2     | SN: 3013        | 29-Dec-10 (No. ES3-3013_Dec10)    | Dec-11                 |
| DAE4                       | SN: 654         | 3-May-11 (No. DAE4-654_May11)     | May-12                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

|                                                                                                                 | Name          | Function          | Signature |
|-----------------------------------------------------------------------------------------------------------------|---------------|-------------------|-----------|
| Calibrated by:                                                                                                  | Katja Pokovic | Technical Manager |           |
| Approved by:                                                                                                    | Niels Kuster  | Quality Manager   |           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |               |                   |           |

Issued: August 23, 2011

Certificate No: ES3-3172\_Aug11

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### Glossary:

|                        |                                                                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                    | tissue simulating liquid                                                                                                                          |
| NORM <sub>x,y,z</sub>  | sensitivity in free space                                                                                                                         |
| ConvF                  | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                        |
| DCP                    | diode compression point                                                                                                                           |
| CF                     | crest factor (1/duty_cycle) of the RF signal                                                                                                      |
| A, B, C                | modulation dependent linearization parameters                                                                                                     |
| Polarization $\varphi$ | $\varphi$ rotation around probe axis                                                                                                              |
| Polarization $\theta$  | $\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\theta = 0$ is normal to probe axis |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* frequency\_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>, B<sub>x,y,z</sub>, C<sub>x,y,z</sub>, VR<sub>x,y,z</sub>**: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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ES3DV3 - SN:3172

August 23, 2011

## Probe ES3DV3

SN:3172

Manufactured: January 23, 2008  
Calibrated: August 23, 2011

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)

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ES3DV3- SN:3172

August 23, 2011

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

### Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2)     |
|-----------------------------------------------------------|----------|----------|----------|---------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 1.38     | 1.15     | 0.97     | $\pm 10.1 \%$ |
| DCP (mV) <sup>B</sup>                                     | 100.5    | 105.1    | 95.2     |               |

### Modulation Calibration Parameters

| UID   | Communication System Name | PAR  |   | A<br>dB | B<br>dB | C<br>dB | VR<br>mV | Unc <sup>E</sup><br>(k=2) |
|-------|---------------------------|------|---|---------|---------|---------|----------|---------------------------|
| 10000 | CW                        | 0.00 | X | 0.00    | 0.00    | 1.00    | 117.7    | $\pm 2.7 \%$              |
|       |                           |      | Y | 0.00    | 0.00    | 1.00    | 110.5    |                           |
|       |                           |      | Z | 0.00    | 0.00    | 1.00    | 93.7     |                           |

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

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the  $E^2$ -field uncertainty inside TSL (see Pages 5 and 6).

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

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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ES3DV3- SN:3172

August 23, 2011

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

### 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 | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 41.9                               | 0.89                            | 6.06    | 6.06    | 6.06    | 1.00  | 1.00       | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 5.83    | 5.83    | 5.83    | 1.00  | 1.00       | ± 12.0 %    |
| 900                  | 41.5                               | 0.97                            | 5.77    | 5.77    | 5.77    | 1.00  | 1.00       | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 4.94    | 4.94    | 4.94    | 0.95  | 1.09       | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 4.78    | 4.78    | 4.78    | 0.95  | 1.12       | ± 12.0 %    |
| 2000                 | 40.0                               | 1.40                            | 4.77    | 4.77    | 4.77    | 0.97  | 1.08       | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 4.50    | 4.50    | 4.50    | 0.76  | 1.24       | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 4.17    | 4.17    | 4.17    | 0.80  | 1.19       | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 4.11    | 4.11    | 4.11    | 0.64  | 1.46       | ± 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.

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ES3DV3- SN:3172

August 23, 2011

## DASY/EASY - Parameters of Probe: ES3DV3- SN:3172

### 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 | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 55.5                               | 0.96                            | 5.89    | 5.89    | 5.89    | 1.00  | 1.00       | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 5.83    | 5.83    | 5.83    | 1.00  | 1.00       | ± 12.0 %    |
| 900                  | 55.0                               | 1.05                            | 5.72    | 5.72    | 5.72    | 1.00  | 1.00       | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 4.60    | 4.60    | 4.60    | 0.88  | 1.25       | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 4.38    | 4.38    | 4.38    | 0.78  | 1.34       | ± 12.0 %    |
| 2000                 | 53.3                               | 1.52                            | 4.46    | 4.46    | 4.46    | 0.77  | 1.32       | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 4.18    | 4.18    | 4.18    | 1.00  | 1.05       | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 3.99    | 3.99    | 3.99    | 1.00  | 1.00       | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 3.90    | 3.90    | 3.90    | 1.00  | 1.00       | ± 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.

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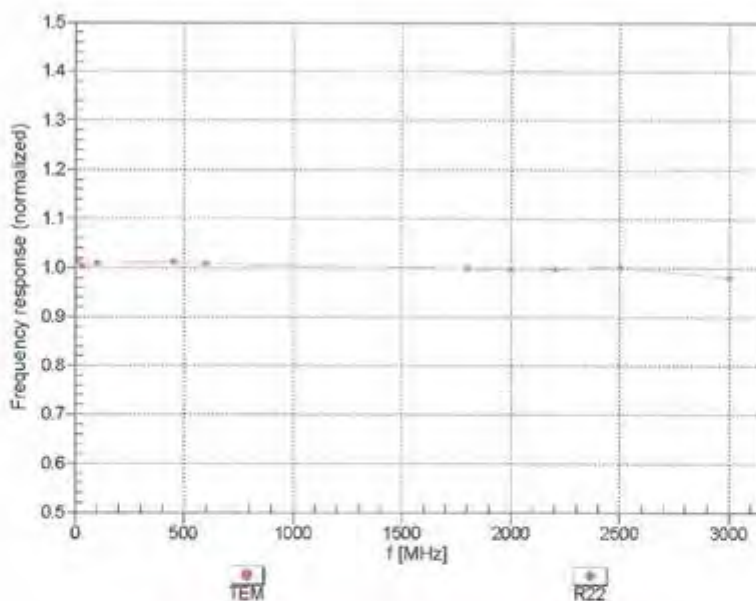
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ES3DV3- SN.3172

August 23, 2011

## Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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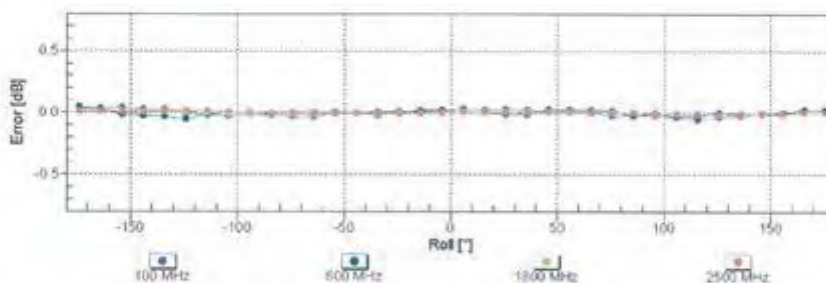
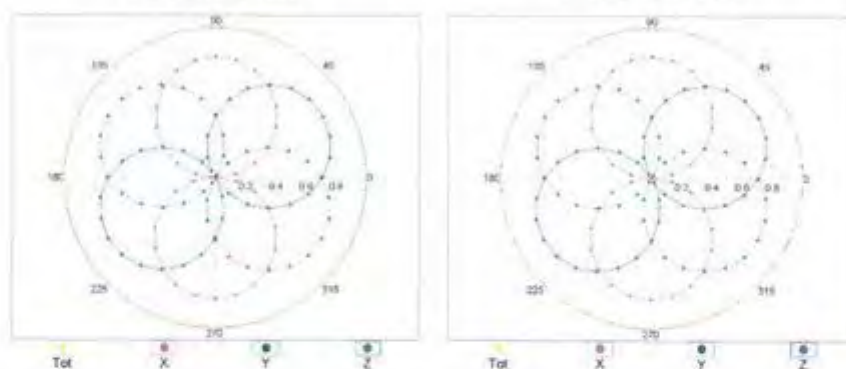
ES3DV3-SN:3172

August 23, 2011

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz, TEM

f=1800 MHz, R22



Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

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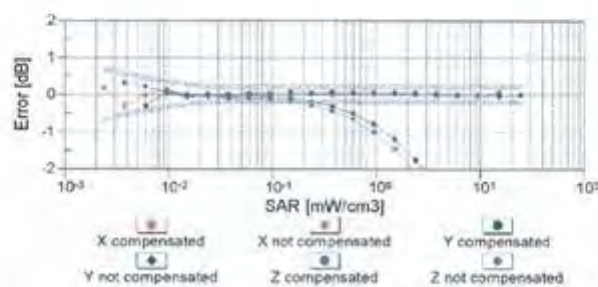
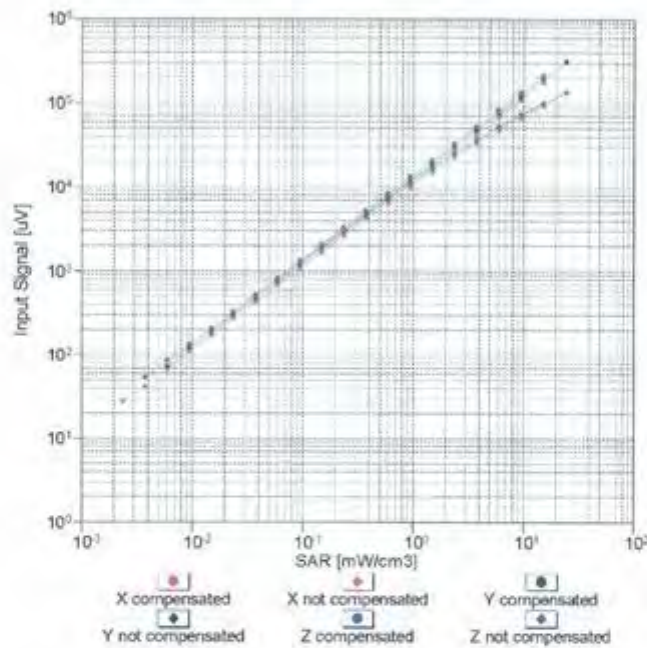
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## Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f = 900 MHz)



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  (k=2)

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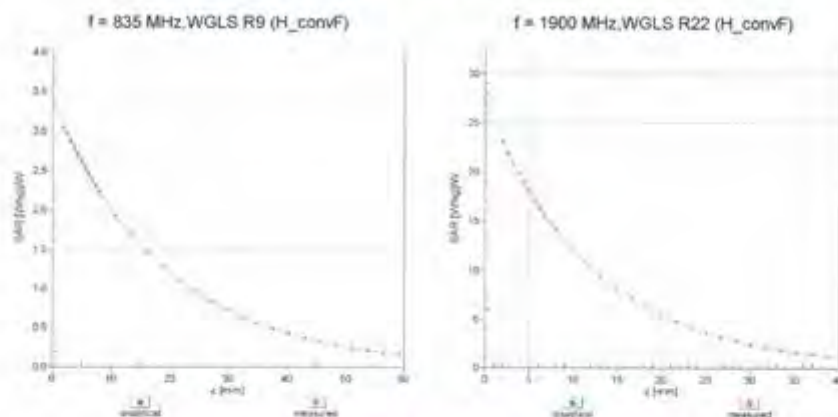
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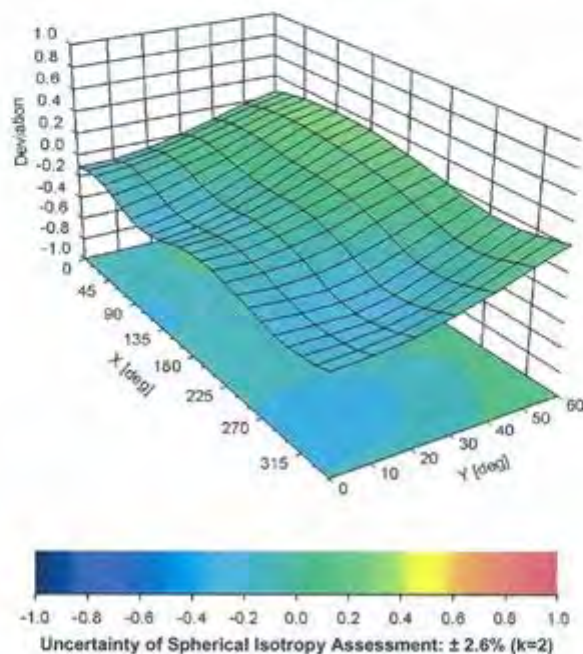
ES3DV3-SN:3172

August 23, 2011

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi$ , $\theta$ ), $f = 900$ MHz



Certificate No: ES-3172\_Aug11

Page 10 of 11

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ES3DV3- SN:3172

August 23, 2011

## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

### Other Probe Parameters

|                                               |                |
|-----------------------------------------------|----------------|
| Sensor Arrangement                            | Triangular     |
| Connector Angle (°)                           | Not applicable |
| Mechanical Surface Detection Mode             | enabled        |
| Optical Surface Detection Mode                | disabled       |
| Probe Overall Length                          | 337 mm         |
| Probe Body Diameter                           | 10 mm          |
| Tip Length                                    | 10 mm          |
| Tip Diameter                                  | 4 mm           |
| Probe Tip to Sensor X Calibration Point       | 2 mm           |
| Probe Tip to Sensor Y Calibration Point       | 2 mm           |
| Probe Tip to Sensor Z Calibration Point       | 2 mm           |
| Recommended Measurement Distance from Surface | 3 mm           |

Certificate No: ES3-3172\_Aug11

Page 11 of 11

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



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 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 **SGS-TW (Auden)**

Certificate No: **EX3-3831\_Jan12**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3831**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4**  
 Calibration procedure for dosimetric E-field probes

Calibration date: **January 4, 2012**

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      | 31-Mar-11 (No. 217-01372)         | Apr-12                 |
| Power sensor E4412A        | MY41498087      | 31-Mar-11 (No. 217-01372)         | Apr-12                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 29-Mar-11 (No. 217-01369)         | Apr-12                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 29-Mar-11 (No. 217-01367)         | Apr-12                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 29-Mar-11 (No. 217-01370)         | Apr-12                 |
| Reference Probe ES3DV2     | SN: 3013        | 29-Dec-11 (No. ES3-3013_Dec11)    | Dec-12                 |
| DAE4                       | SN: 654         | 3-May-11 (No. DAE4-654_May11)     | May-12                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-11)  | In house check: Apr-13 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |

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

Issued: January 5, 2012

Certificate No: EX3-3831\_Jan12

Page 1 of 11

張正昌

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Accreditation No.: **SCS 108**

## Glossary:

|                        |                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                    | tissue simulating liquid                                                                                                                      |
| NORM <sub>x,y,z</sub>  | sensitivity in free space                                                                                                                     |
| ConvF                  | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                    |
| DCP                    | diode compression point                                                                                                                       |
| CF                     | crest factor (1/duty_cycle) of the RF signal                                                                                                  |
| A, B, C                | modulation dependent linearization parameters                                                                                                 |
| Polarization $\varphi$ | $\varphi$ rotation around probe axis                                                                                                          |
| Polarization $\psi$    | $\psi$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\psi = 0$ is normal to probe axis |

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\psi = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the  $E^2$ -field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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EX3DV4 – SN:3831

January 4, 2012

# Probe EX3DV4

SN:3831

Manufactured: September 6, 2011  
Calibrated: January 4, 2012

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)

Certificate No: EX3-3831\_Jan12

Page 3 of 11

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EX3DV4-SN:3831

January 4, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

### Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|-----------------------------------------------------------|----------|----------|----------|-----------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.44     | 0.41     | 0.43     | ± 10.1 %  |
| DCP (mV) <sup>B</sup>                                     | 101.7    | 101.4    | 99.5     |           |

### Modulation Calibration Parameters

| UID   | Communication System Name | PAR  |   | A<br>dB | B<br>dB | C<br>dB | VR<br>mV | Unc <sup>E</sup><br>(k=2) |
|-------|---------------------------|------|---|---------|---------|---------|----------|---------------------------|
| 10000 | CW                        | 0.00 | X | 0.00    | 0.00    | 1.00    | 111.7    | ±3.0 %                    |
|       |                           |      | Y | 0.00    | 0.00    | 1.00    | 96.2     |                           |
|       |                           |      | Z | 0.00    | 0.00    | 1.00    | 106.7    |                           |

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

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

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

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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EX3DV4- SN:3831

January 4, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

### 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 | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 41.9                               | 0.89                            | 9.32    | 9.32    | 9.32    | 0.44  | 0.84       | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 8.82    | 8.82    | 8.82    | 0.19  | 1.48       | ± 12.0 %    |
| 900                  | 41.5                               | 0.97                            | 8.71    | 8.71    | 8.71    | 0.22  | 1.38       | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 8.03    | 8.03    | 8.03    | 0.39  | 0.81       | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 7.76    | 7.76    | 7.76    | 0.44  | 0.77       | ± 12.0 %    |
| 2000                 | 40.0                               | 1.40                            | 7.65    | 7.65    | 7.65    | 0.61  | 0.63       | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 7.44    | 7.44    | 7.44    | 0.41  | 0.83       | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 6.84    | 6.84    | 6.84    | 0.49  | 0.73       | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 6.67    | 6.67    | 6.67    | 0.33  | 0.96       | ± 12.0 %    |
| 5200                 | 36.0                               | 4.66                            | 4.64    | 4.64    | 4.64    | 0.42  | 1.80       | ± 13.1 %    |
| 5300                 | 35.9                               | 4.76                            | 4.37    | 4.37    | 4.37    | 0.44  | 1.80       | ± 13.1 %    |
| 5600                 | 35.5                               | 5.07                            | 4.10    | 4.10    | 4.10    | 0.48  | 1.80       | ± 13.1 %    |
| 5800                 | 35.3                               | 5.27                            | 4.12    | 4.12    | 4.12    | 0.45  | 1.80       | ± 13.1 %    |

<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.

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EX3DV4- SN:3831

January 4, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

### 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 | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 750                  | 55.5                               | 0.96                            | 9.24    | 9.24    | 9.24    | 0.23  | 1.25       | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 9.02    | 9.02    | 9.02    | 0.28  | 1.13       | ± 12.0 %    |
| 900                  | 55.0                               | 1.05                            | 8.93    | 8.93    | 8.93    | 0.25  | 1.28       | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 7.67    | 7.67    | 7.67    | 0.38  | 0.87       | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 7.25    | 7.25    | 7.25    | 0.57  | 0.70       | ± 12.0 %    |
| 2000                 | 53.3                               | 1.52                            | 7.31    | 7.31    | 7.31    | 0.27  | 1.09       | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 7.26    | 7.26    | 7.26    | 0.71  | 0.66       | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 6.82    | 6.82    | 6.82    | 0.74  | 0.62       | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 6.63    | 6.63    | 6.63    | 0.80  | 0.50       | ± 12.0 %    |
| 5200                 | 49.0                               | 5.30                            | 4.12    | 4.12    | 4.12    | 0.50  | 1.90       | ± 13.1 %    |
| 5300                 | 48.9                               | 5.42                            | 3.92    | 3.92    | 3.92    | 0.50  | 1.90       | ± 13.1 %    |
| 5600                 | 48.5                               | 5.77                            | 3.30    | 3.30    | 3.30    | 0.65  | 1.90       | ± 13.1 %    |
| 5800                 | 48.2                               | 6.00                            | 3.77    | 3.77    | 3.77    | 0.60  | 1.90       | ± 13.1 %    |

<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.

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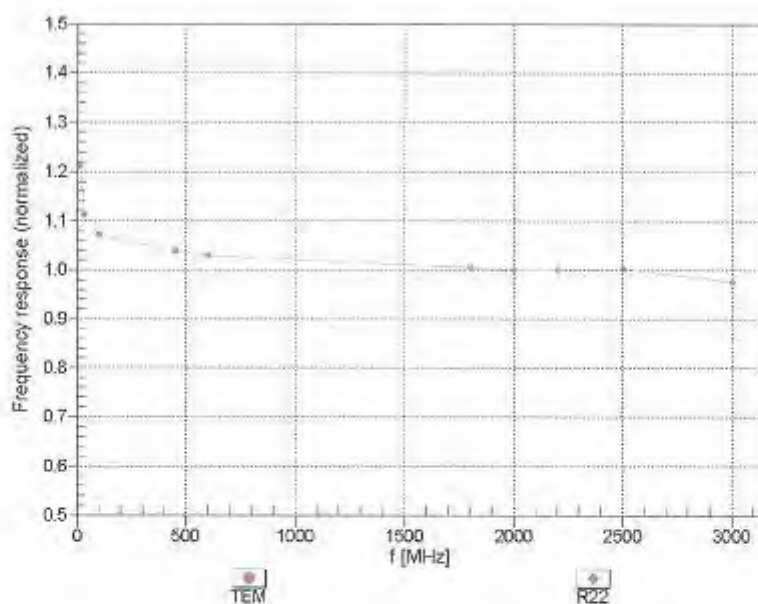
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EX3DV4-SN:3831

January 4, 2012

## Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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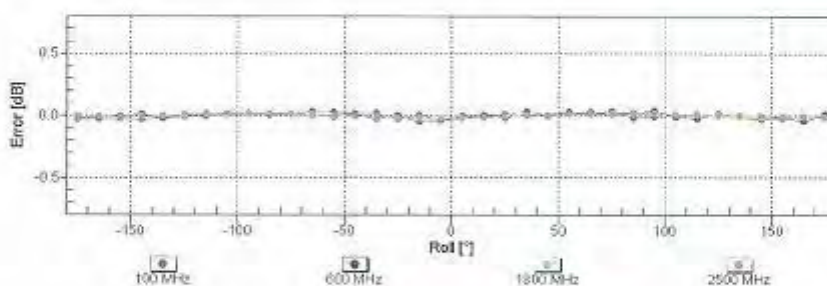
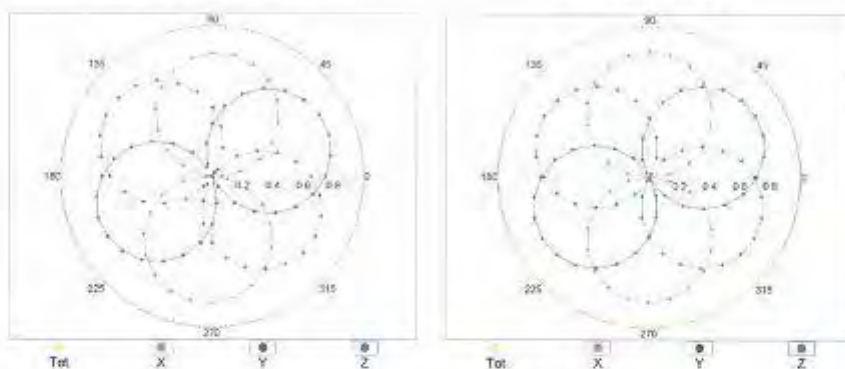
EX3DV4- SN:3831

January 4, 2012

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz, TEM

f=1800 MHz, R22



Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

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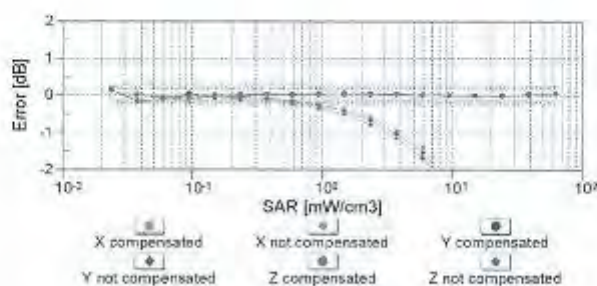
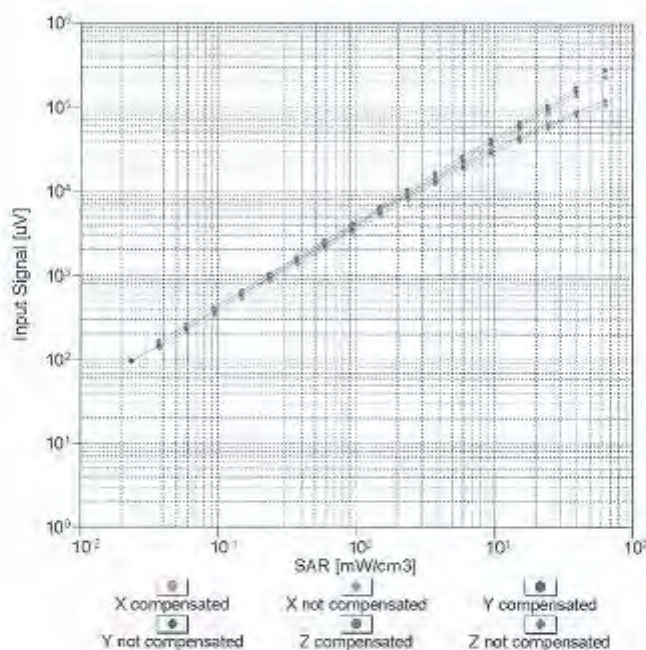
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EX3DV4- SN-3831

January 4, 2012

## Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f = 900 MHz)



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  (k=2)

Certificate No: EX3-3831\_Jan12

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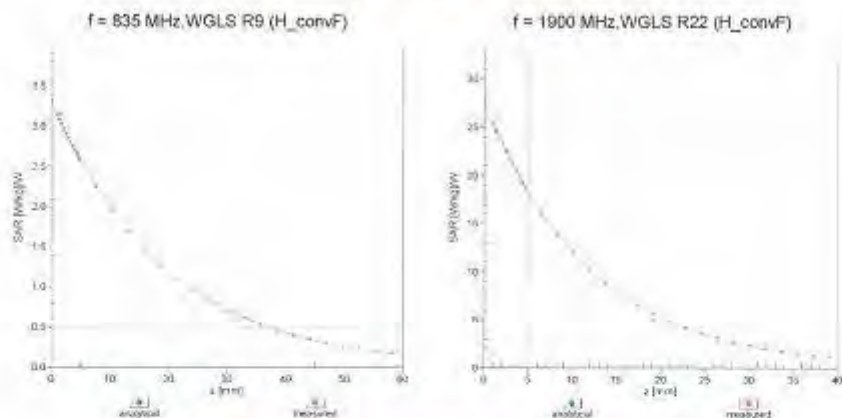
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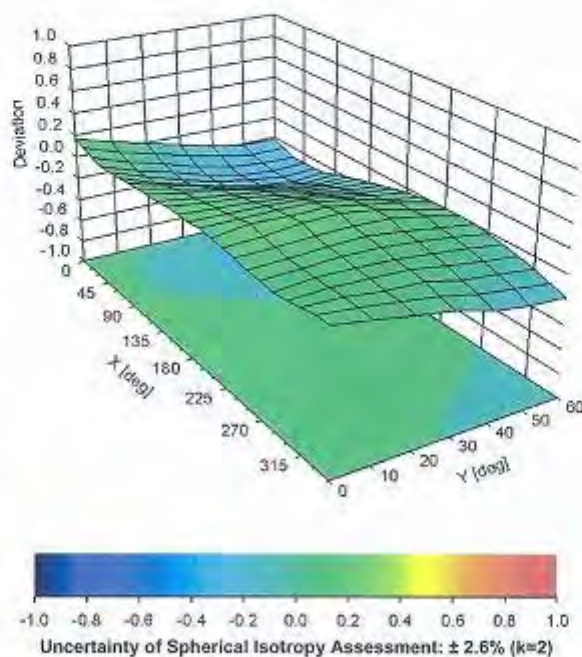
EX3DV4-SN.3831

January 4, 2012

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi$ , $\theta$ ), $f = 900$ MHz



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EX3DV4- SN:3831

January 4, 2012

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

### Other Probe Parameters

|                                               |                |
|-----------------------------------------------|----------------|
| Sensor Arrangement                            | Triangular     |
| Connector Angle (°)                           | Not applicable |
| Mechanical Surface Detection Mode             | enabled        |
| Optical Surface Detection Mode                | disabled       |
| Probe Overall Length                          | 337 mm         |
| Probe Body Diameter                           | 10 mm          |
| Tip Length                                    | 9 mm           |
| Tip Diameter                                  | 2.5 mm         |
| Probe Tip to Sensor X Calibration Point       | 1 mm           |
| Probe Tip to Sensor Y Calibration Point       | 1 mm           |
| Probe Tip to Sensor Z Calibration Point       | 1 mm           |
| Recommended Measurement Distance from Surface | 2 mm           |

Certificate No: EX3-3831\_Jan12

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## 7. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test  
IEEE 1528

| A                                                | c                              | D                           | e          | f       | g        | h=c * f / e             | i=c * g / e             | k              |
|--------------------------------------------------|--------------------------------|-----------------------------|------------|---------|----------|-------------------------|-------------------------|----------------|
| Source of Uncertainty                            | Tolerance/<br>Uncertainty<br>% | Probability<br>Distribution | Div        | ci (1g) | ci (10g) | Standard<br>uncertainty | Standard<br>uncertainty | vi, or<br>Veff |
| <b>Measurement system</b>                        |                                |                             |            |         |          |                         |                         |                |
| Probe calibration (under 2.6Ghz)                 | 6.00%                          | N                           | 1          | 1       | 1        | 6.00%                   | 6.00%                   | ∞              |
| <b>Isotropy, Axial</b>                           | 3.50%                          | R                           | $\sqrt{3}$ | 1       | 1        | 2.02%                   | 2.02%                   | ∞              |
| <b>Isotropy, Hemispherical</b>                   | 9.60%                          | R                           | $\sqrt{3}$ | 1       | 1        | 5.54%                   | 5.54%                   | ∞              |
| Boundary Effect                                  | 1.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.58%                   | 0.58%                   | ∞              |
| Linearity                                        | 4.70%                          | R                           | $\sqrt{3}$ | 1       | 1        | 2.71%                   | 2.71%                   | ∞              |
| Detection Limits                                 | 1.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.58%                   | 0.58%                   | ∞              |
| Readout Electronics                              | 0.30%                          | N                           | 1          | 1       | 1        | 0.30%                   | 0.30%                   | ∞              |
| Response time                                    | 0.80%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.46%                   | 0.46%                   | ∞              |
| Integration Time                                 | 2.60%                          | R                           | $\sqrt{3}$ | 1       | 1        | 1.50%                   | 1.50%                   | ∞              |
| <b>Measurement drift (class A evaluation)</b>    | 1.75%                          | R                           | $\sqrt{3}$ | 1       | 1        | 1.01%                   | 1.01%                   | ∞              |
| RF ambient condition - noise                     | 3.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 1.73%                   | 1.73%                   | ∞              |
| RF ambient conditions - reflections              | 3.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 1.73%                   | 1.73%                   | ∞              |
| Probe positioner Mechanical restrictions         | 0.40%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.23%                   | 0.23%                   | ∞              |
| Probe Positioning with respect to phantom shell  | 2.90%                          | R                           | $\sqrt{3}$ | 1       | 1        | 1.67%                   | 1.67%                   | ∞              |
| Post-processing                                  | 1.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.58%                   | 0.58%                   | ∞              |
| Max SAR Eval                                     | 1.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 0.58%                   | 0.58%                   | ∞              |
| <b>Test Sample related</b>                       |                                |                             |            |         |          |                         |                         |                |
| Test sample positioning                          | 2.90%                          | N                           | 1          | 1       | 1        | 2.90%                   | 2.90%                   | M-1            |
| Device Holder Uncertainty                        | 3.60%                          | N                           | 1          | 1       | 1        | 3.60%                   | 3.60%                   | M-1            |
| Drift of output power                            | 5.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 2.89%                   | 2.89%                   | ∞              |
| <b>Phantom and Setup</b>                         |                                |                             |            |         |          |                         |                         |                |
| Phantom Uncertainty                              | 4.00%                          | R                           | $\sqrt{3}$ | 1       | 1        | 2.31%                   | 2.31%                   | ∞              |
| Liquid conductivity(meas.) Max at 1900 band      | 4.60%                          | N                           | 1          | 0.64    | 0.43     | 2.94%                   | 1.98%                   | M              |
| Liquid permittivity(meas.) Max at 835 band       | 2.17%                          | N                           | 1          | 0.6     | 0.49     | 1.30%                   | 1.06%                   | M              |
| Combined standard uncertainty                    |                                | RSS                         |            |         |          | 11.72%                  | 11.49%                  |                |
| Expan uncertainty (95% confidence interval), K=2 |                                |                             |            |         |          | 23.44%                  | 22.98%                  |                |

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## 8. Phantom Description

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zürich, Switzerland  
Phone +41 1 245 9700, Fax +41 1 245 9779  
info@speag.com, http://www.speag.com

**s p e a g**

**Certificate of Conformity / First Article Inspection**

|              |                                                              |
|--------------|--------------------------------------------------------------|
| Item         | SAM Twin Phantom V4.0                                        |
| Type No      | QD 000 P40 C                                                 |
| Series No    | TP-1150 and higher                                           |
| Manufacturer | SPEAG<br>Zeughausstrasse 43<br>CH-8004 Zürich<br>Switzerland |

**Tests**  
The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

| Test                        | Requirement                                                                                                                                                                                      | Details                                                                  | Units tested                                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------|
| Dimensions                  | Compliant with the geometry according to the CAD model.                                                                                                                                          | IT'IS CAD File (*)                                                       | First article, Samples                      |
| Material thickness of shell | Compliant with the requirements according to the standards                                                                                                                                       | 2mm +/- 0.2mm in flat and specific areas of head section                 | First article, Samples, TP-1314 ff.         |
| Material thickness at ERP   | Compliant with the requirements according to the standards                                                                                                                                       | 6mm +/- 0.2mm at ERP                                                     | First article, All items                    |
| Material parameters         | Dielectric parameters for required frequencies                                                                                                                                                   | 300 MHz – 6 GHz:<br>Relative permittivity < 5,<br>Loss tangent < 0.05    | Material samples                            |
| Material resistivity        | The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility. | DEGMSE based simulating liquids                                          | Pre-series, First article, Material samples |
| Sagging                     | Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.                                                               | < 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below | Prototypes, Sample testing                  |

**Standards**  
[1] CENELEC EN 50361  
[2] IEEE Std 1528-2003  
[3] IEC 62209 Part I  
[4] FCC OET Bulletin 65, Supplement C, Edition 01-01  
(\*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

**Conformity**  
Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date: 07.07.2005

Signature / Stamp

**S p e a g**  
Schmid & Partner Engineering AG  
Zeughausstrasse 43, 8004 Zürich, Switzerland  
Phone +41 1 245 9700, Fax +41 1 245 9779  
info@speag.com, http://www.speag.com

Doc No : 881 – QD 000 P40 C – F Page : 1 (1)

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## 9. System Validation from Original Equipment Supplier

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



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

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **D835V2-4d063\_May11**

### CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d063**

Calibration procedure(s) **QA CAL-05.v8  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 25, 2011**

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 EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Reference 20 dB Attenuator  | SN: S5086 (20b)    | 29-Mar-11 (No. 217-01367)         | Apr-12                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371)         | Apr-12                 |
| Reference Probe ES3DV3      | SN: 3205           | 29-Apr-11 (No. ES3-3205_Apr11)    | Apr-12                 |
| DAE4                        | SN: 601            | 10-Jun-10 (No. DAE4-601_Jun10)    | Jun-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

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

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

Issued: May 25, 2011

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

Certificate No: D835V2-4d063\_May11

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Accreditation No.: SCS 108

## Glossary:

TSL tissue simulating liquid  
ConvF sensitivity in TSL / NORM x,y,z  
N/A not applicable or not measured

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

- DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D835V2-4d063\_May11

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## Measurement Conditions

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.6.2     |
| 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 | 40.4 $\pm$ 6 % | 0.88 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 | 2.31 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 9.34 mW / g $\pm$ 17.0 % (k=2) |

|                                                         |                    |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
| SAR measured                                            | 250 mW input power | 1.52 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.13 mW / g $\pm$ 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 | 53.9 $\pm$ 6 % | 1.00 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 mW / g                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 9.45 mW / g $\pm$ 17.0 % (k=2) |

|                                                         |                    |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                |
| SAR measured                                            | 250 mW input power | 1.60 mW / g                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.27 mW / g $\pm$ 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 53.4 $\Omega$ - 1.5 j $\Omega$ |
| Return Loss                          | - 28.9 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 48.7 $\Omega$ - 4.1 j $\Omega$ |
| Return Loss                          | - 27.3 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.426 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.

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 | November 27, 2006 |

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## DASY5 Validation Report for Head TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063**

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

Medium: HSL900

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 40.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

### DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Cube 0:

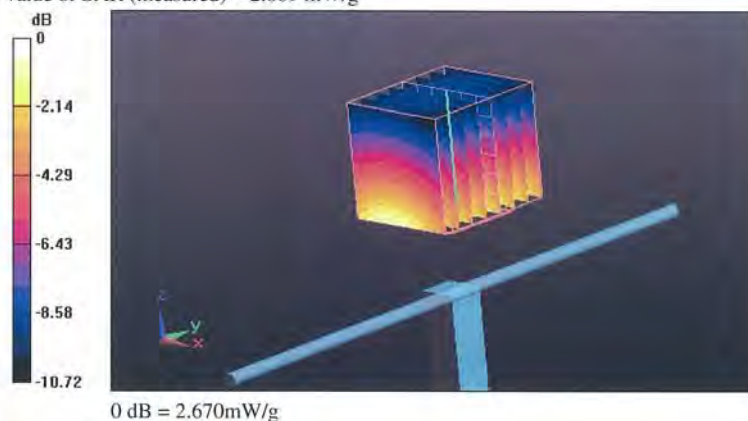
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.554 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.427 W/kg

**SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.52 mW/g**

Maximum value of SAR (measured) = 2.669 mW/g

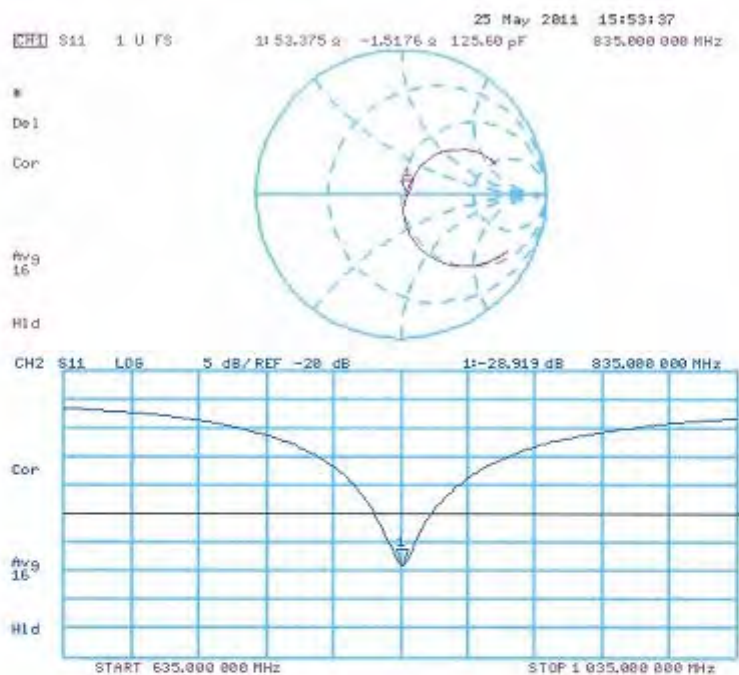


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## Impedance Measurement Plot for Head TSL



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## DASY5 Validation Report for Body TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063**

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

Medium: MSL900

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 53.9$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Cube 0:

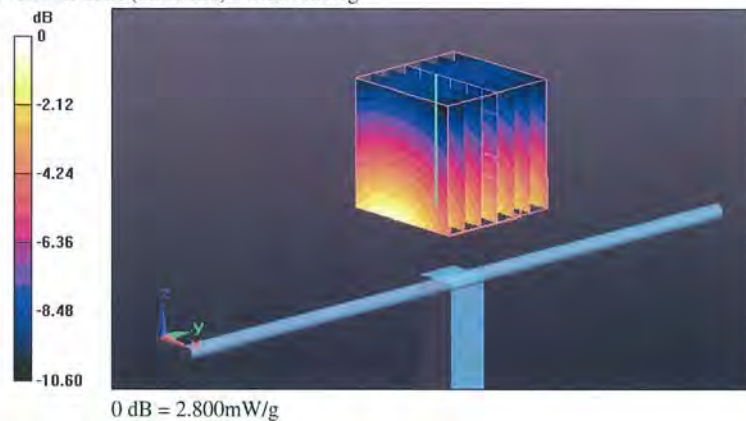
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.297 V/m; Power Drift = 0.06 dB

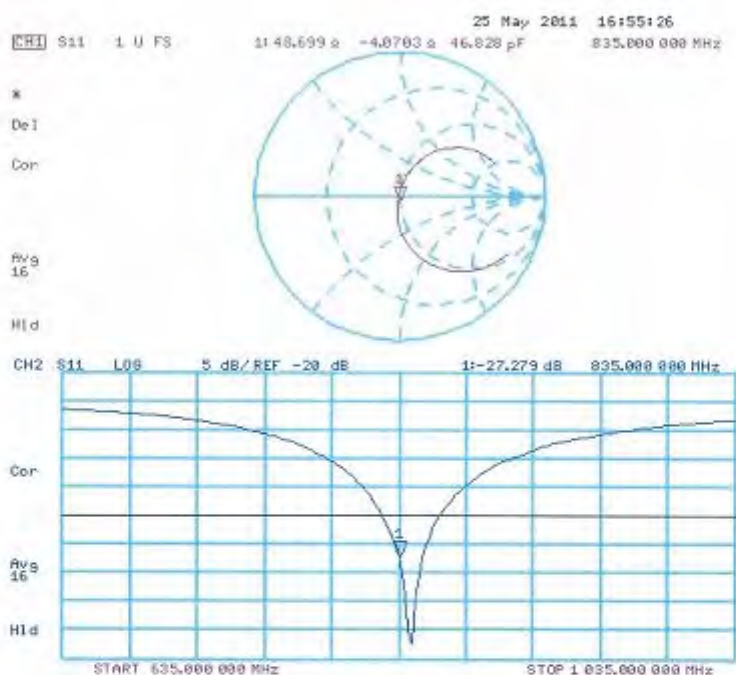
Peak SAR (extrapolated) = 3.530 W/kg

**SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.804 mW/g



## Impedance Measurement Plot for Body TSL



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client: **Auden**

Certificate No: **D835V2-4d120\_Jul11**

## CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d120**

Calibration procedure(s): **QA CAL-05.v8  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **July 19, 2011**

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 EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Reference 20 dB Attenuator  | SN: S5086 (20b)    | 29-Mar-11 (No. 217-01367)         | Apr-12                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371)         | Apr-12                 |
| Reference Probe ES3DV3      | SN: 3205           | 29-Apr-11 (No. ES3-3205_Apr11)    | Apr-12                 |
| DAE4                        | SN: 601            | 04-Jul-11 (No. DAE4-601_Jul11)    | Jul-12                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-09) | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

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

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

Signature

Issued: July 19, 2011

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

Certificate No: D835V2-4d120\_Jul11

Page 1 of 8

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Accreditation No.: **SCS 108**

## Glossary:

TSL tissue simulating liquid  
ConvF sensitivity in TSL / NORM x,y,z  
N/A not applicable or not measured

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

- DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

### Measurement Conditions

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.6.2     |
| 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 | 41.0 $\pm$ 6 % | 0.88 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 | 2.30 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 9.33 mW / g $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 1.51 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.11 mW / g $\pm$ 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 | 53.8 $\pm$ 6 % | 0.98 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 mW / g                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 9.59 mW / g $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 1.60 mW / g                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.34 mW / g $\pm$ 16.5 % (k=2) |

**Appendix****Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 52.0 $\Omega$ - 3.4 j $\Omega$ |
| Return Loss                          | - 28.3 dB                      |

**Antenna Parameters with Body TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 47.7 $\Omega$ - 5.2 j $\Omega$ |
| Return Loss                          | - 24.7 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.397 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.

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 | June 29, 2010 |

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## DASY5 Validation Report for Head TSL

Date: 18.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d120**

Communication System: CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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

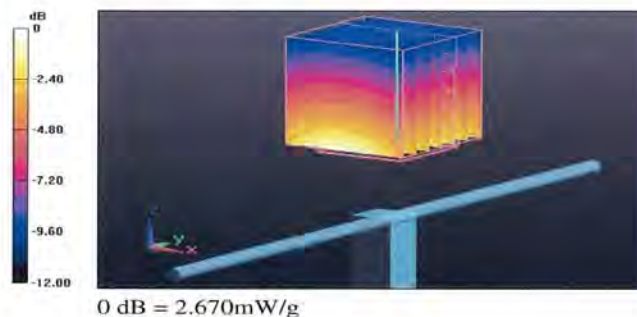
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 56.919 V/m; Power Drift = 0.04 dB

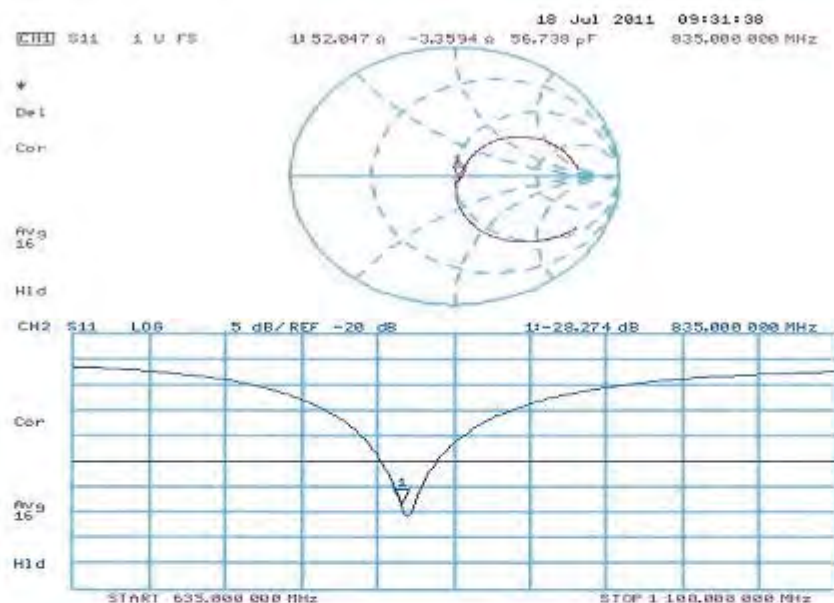
Peak SAR (extrapolated) = 3.366 W/kg

**SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.51 mW/g**

Maximum value of SAR (measured) = 2.672 mW/g



## Impedance Measurement Plot for Head TSL



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## DASY5 Validation Report for Body TSL

Date: 19.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d120**

Communication System: CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.98 \text{ mho/m}$ ;  $\epsilon_r = 53.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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

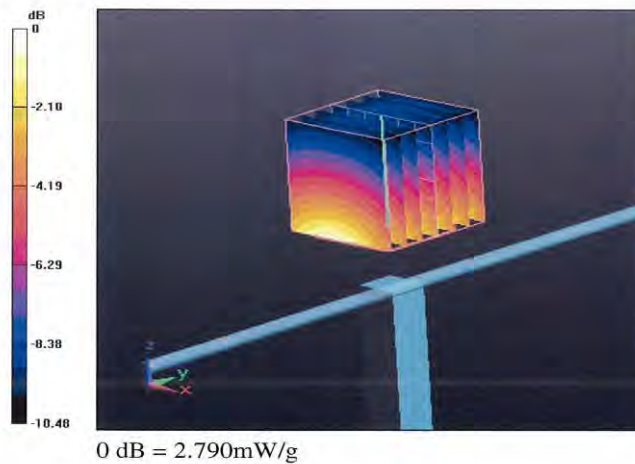
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 55.302 V/m; Power Drift = 0.01 dB

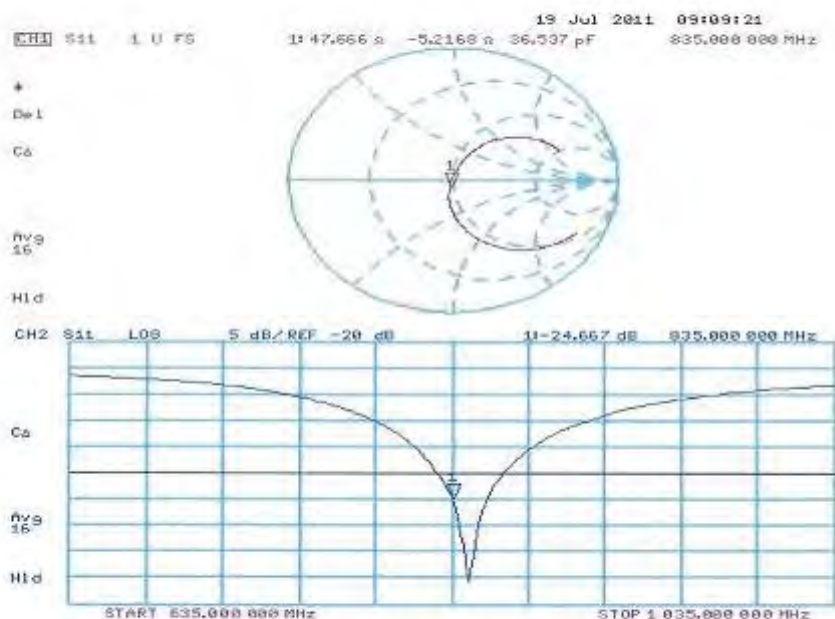
Peak SAR (extrapolated) = 3.528 W/kg

**SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g**

Maximum value of SAR (measured) = 2.787 mW/g



## Impedance Measurement Plot for Body TSL



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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS TW (Auden)**

Certificate No: D1900V2-5d027\_Apr11

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d027**

Calibration procedure(s) **QA CAL-05.v8  
Calibration procedure for dipole validation kits**

Calibration date: **April 19, 2011**

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 EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)         | Oct-11                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)     | 29-Mar-11 (No. 217-01368)         | Apr-12                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371)         | Apr-12                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Apr-10 (No. ES3-3205_Apr10)    | Apr-11                 |
| DAE4                        | SN: 601            | 10-Jun-10 (No. DAE4-601_Jun10)    | Jun-11                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06     | 100005             | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

Calibrated by: **Claudio Leubler** (Name) **Laboratory Technician** (Function)  (Signature)

Approved by: **Katja Pokovic** (Name) **Technical Manager** (Function)  (Signature)

Issued: April 19, 2011

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

Certificate No: D1900V2-5d027\_Apr11

Page 1 of 9

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Accreditation No.: **SCS 108**

## Glossary:

TSL tissue simulating liquid  
ConvF sensitivity in TSL / NORM x,y,z  
N/A not applicable or not measured

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

- DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D1900V2-5d027\_Apr11

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## Measurement Conditions

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

|                              |                           |             |
|------------------------------|---------------------------|-------------|
| DASY Version                 | DASY5                     | V52.6.2     |
| Extrapolation                | Advanced Extrapolation    |             |
| Phantom                      | Modular Flat Phantom V5.0 |             |
| 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 | 38.9 $\pm$ 6 % | 1.41 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (21.0 $\pm$ 0.2) °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 | 10.1 mW / g                    |
| SAR normalized                                        | normalized to 1W   | 40.4 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 40.1 mW / g $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 5.26 mW / g                    |
| SAR normalized                                          | normalized to 1W   | 21.0 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 20.9 mW / g $\pm$ 16.5 % (k=2) |

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### 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 ± 0.2) °C | 51.1 ± 6 %   | 1.52 mho/m ± 6 % |
| Body TSL temperature during test | (21.8 ± 0.2) °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 | 9.93 mW / g                       |
| SAR normalized                                        | normalized to 1W   | 39.7 mW / g                       |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | <b>39.4 mW / g ± 17.0 % (k=2)</b> |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                   |
|---------------------------------------------------------|--------------------|-----------------------------------|
| SAR measured                                            | 250 mW input power | 5.18 mW / g                       |
| SAR normalized                                          | normalized to 1W   | 20.7 mW / g                       |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | <b>20.6 mW / g ± 16.5 % (k=2)</b> |

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## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 51.8 $\Omega$ + 6.4 j $\Omega$ |
| Return Loss                          | - 23.7 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 48.1 $\Omega$ + 6.6 j $\Omega$ |
| Return Loss                          | - 23.1 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.194 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.

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/Time: 18.04.2011 15:27:22

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027**

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

Medium: HSL U12 BB

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.41$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

**Pin=250 mW, Cube 0:**

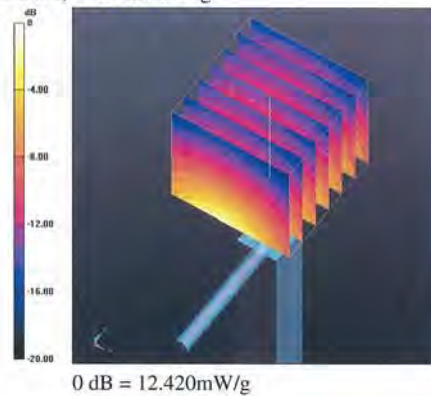
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.235 V/m; Power Drift = 0.05 dB

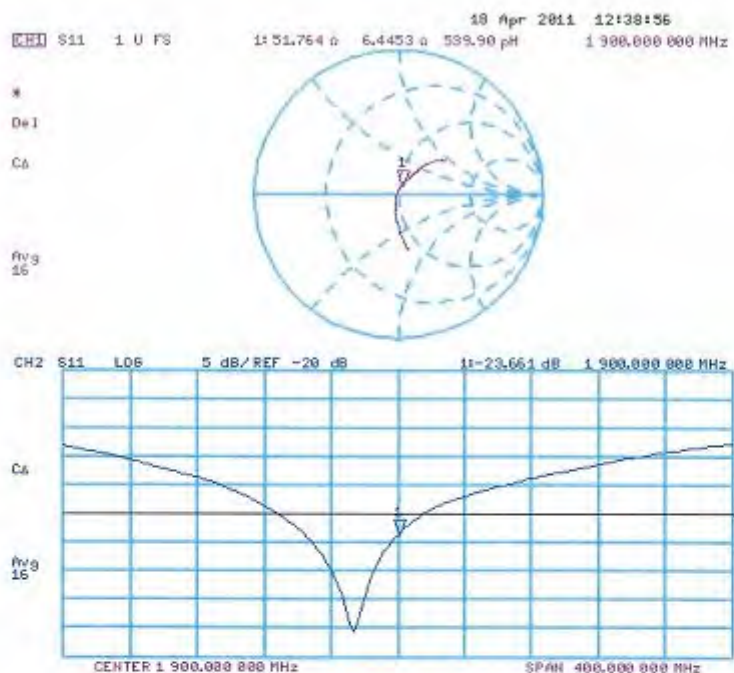
Peak SAR (extrapolated) = 18.650 W/kg

**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.26 mW/g**

Maximum value of SAR (measured) = 12.424 mW/g



## Impedance Measurement Plot for Head TSL



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## DASY5 Validation Report for Body TSL

Date/Time: 19.04.2011 12:53:51

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027**

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

Medium: MSL U12 BB

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.52 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

### DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

### Pin=250 mW, Cube 0:

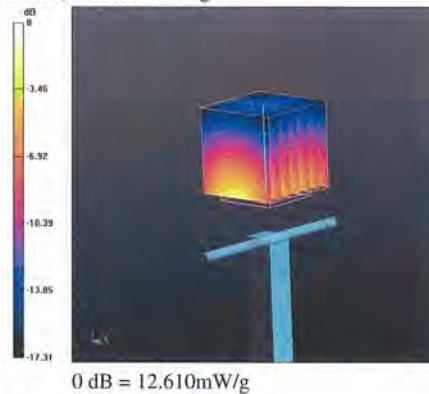
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.170 V/m; Power Drift = 0.01 dB

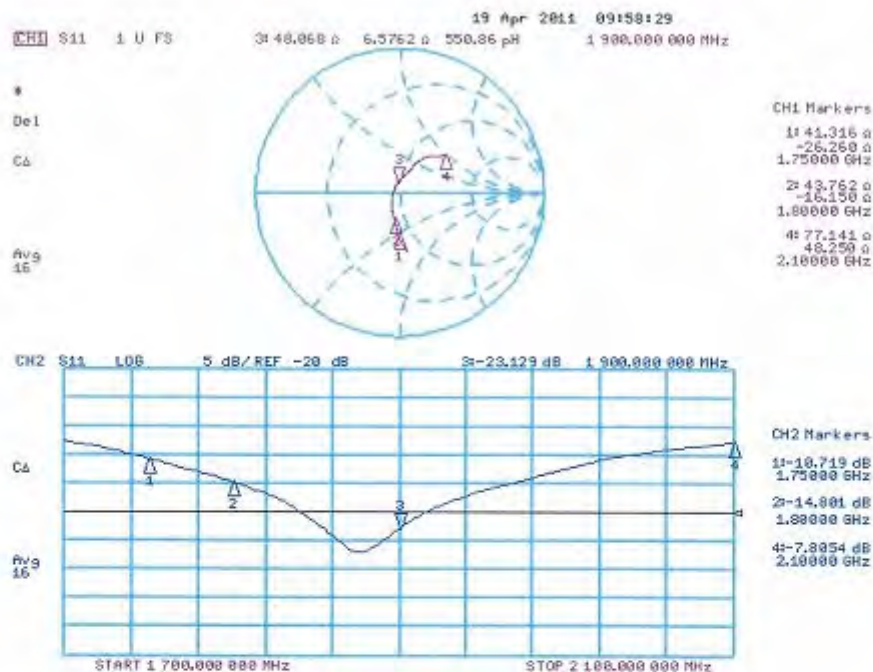
Peak SAR (extrapolated) = 17.156 W/kg

**SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.18 mW/g**

Maximum value of SAR (measured) = 12.615 mW/g



## Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **D1900V2-5d027\_Apr12**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d027**

Calibration procedure(s) **QA CAL-05.v8**  
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **April 26, 2012**

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         | 05-Oct-11 (No. 217-01451)         | Oct-12                 |
| Power sensor HP 8481A       | US37292783         | 05-Oct-11 (No. 217-01451)         | Oct-12                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 27-Mar-12 (No. 217-01530)         | Apr-13                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 27-Mar-12 (No. 217-01533)         | Apr-13                 |
| Reference Probe ES3DV3      | SN: 3205           | 30-Dec-11 (No. ES3-3205_Dec11)    | Dec-12                 |
| DAE4                        | SN: 601            | 04-Jul-11 (No. DAE4-601_Jul11)    | Jul-12                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |

|                | Name           | Function              | Signature |
|----------------|----------------|-----------------------|-----------|
| Calibrated by: | Israe El-Naouq | Laboratory Technician |           |
| Approved by:   | Katja Pokovic  | Technical Manager     |           |

Issued: April 26, 2012

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Certificate No: D1900V2-5d027\_Apr12

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**S** Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

## Glossary:

TSL tissue simulating liquid  
ConvF sensitivity in TSL / NORM x,y,z  
N/A not applicable or not measured

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

- DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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

## Measurement Conditions

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.1     |
| 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 | 40.8 $\pm$ 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 | 9.43 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 38.4 mW / g $\pm$ 17.0 % (k=2) |

|                                                         |                    |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
| SAR measured                                            | 250 mW input power | 4.96 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 20.1 mW / g $\pm$ 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 | 53.3 $\pm$ 6 % | 1.51 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 | 10.0 mW / g                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 40.2 mW / g $\pm$ 17.0 % (k=2) |

|                                                         |                    |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                |
| SAR measured                                            | 250 mW input power | 5.30 mW / g                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 21.3 mW / g $\pm$ 16.5 % (k=2) |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $49.5 \Omega + 4.5 j\Omega$ |
| Return Loss                          | - 26.9 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $46.2 \Omega + 4.5 j\Omega$ |
| Return Loss                          | - 24.3 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.197 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 |

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## DASY5 Validation Report for Head TSL

Date: 26.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027**

Communication System: CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.37 \text{ mho/m}$ ;  $\epsilon_r = 40.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

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

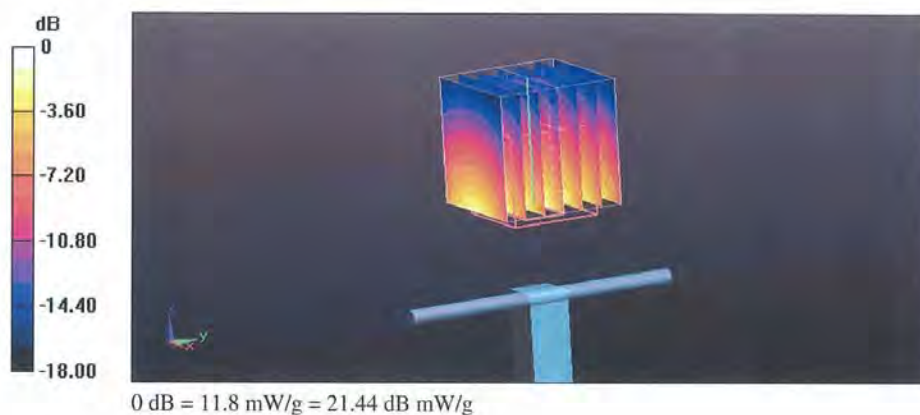
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.127 V/m; Power Drift = 0.03 dB

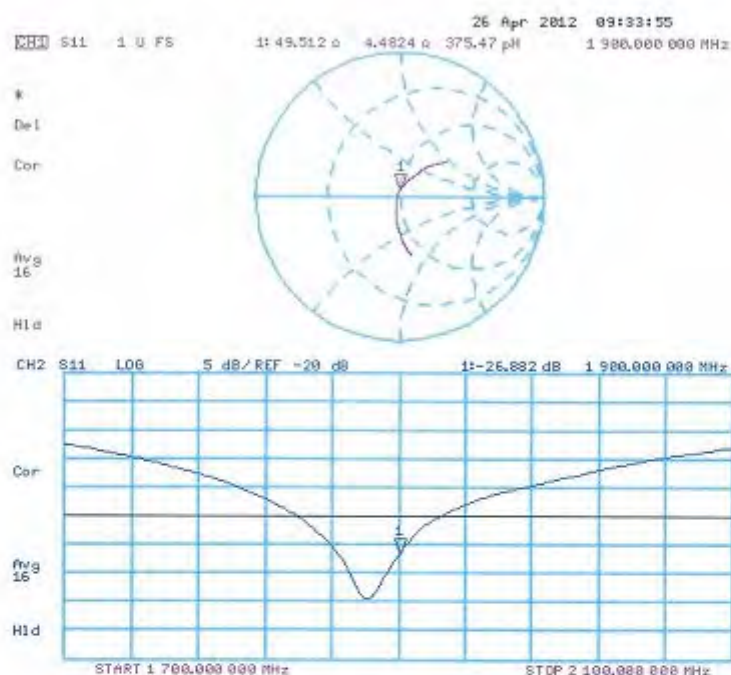
Peak SAR (extrapolated) = 16.890 mW/g

**SAR(1 g) = 9.43 mW/g; SAR(10 g) = 4.96 mW/g**

Maximum value of SAR (measured) = 11.8 mW/g



## Impedance Measurement Plot for Head TSL



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## DASY5 Validation Report for Body TSL

Date: 26.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027**

Communication System: CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 53.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

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

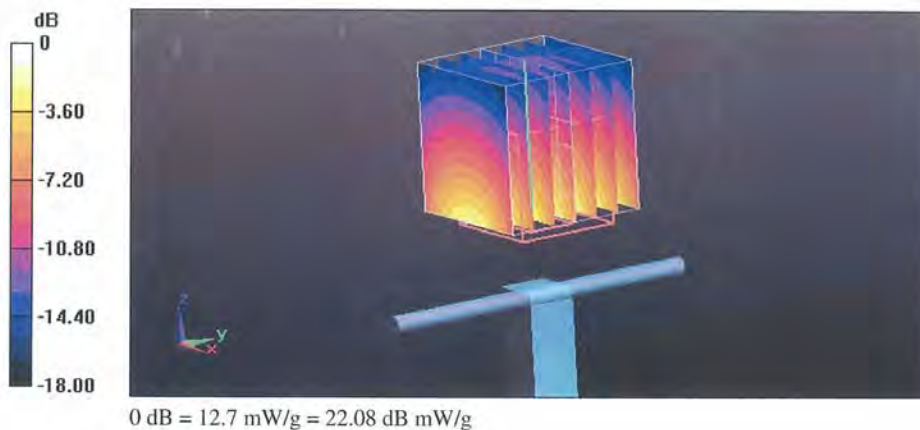
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.355 V/m; Power Drift = -0.00 dB

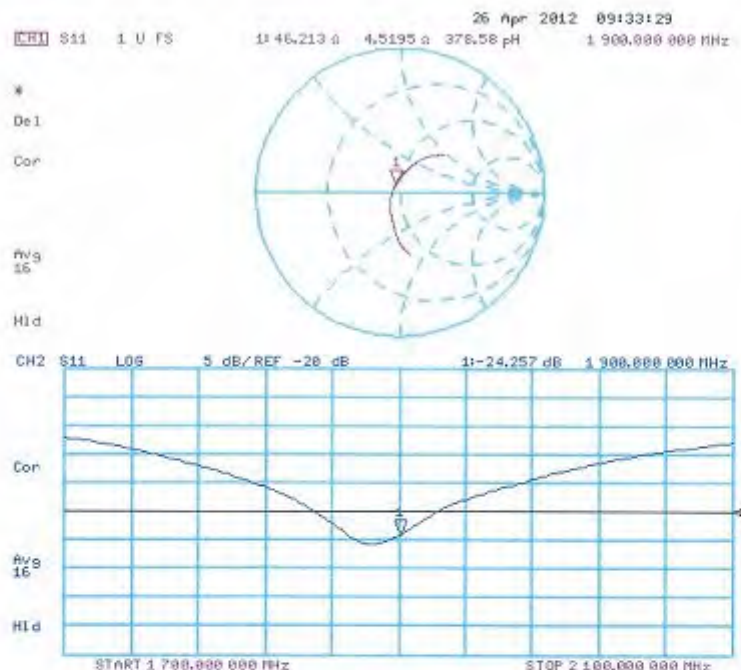
Peak SAR (extrapolated) = 17.593 mW/g

**SAR(1 g) = 10 mW/g; SAR(10 g) = 5.3 mW/g**

Maximum value of SAR (measured) = 12.7 mW/g



## Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **SGS TW (Auden)**

Certificate No: **D2450V2- 727\_Apr11**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 727**

Calibration procedure(s) **QA CAL-05.v8  
Calibration procedure for dipole validation kits**

Calibration date: **April 19, 2011**

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 EPM-442A        | GB37480704         | 06-Oct-10 (No. 217-01266)      | Oct-11                |
| Power sensor HP 8481A       | US37292783         | 06-Oct-10 (No. 217-01266)      | Oct-11                |
| Reference 20 dB Attenuator  | SN: 5086 (20g)     | 29-Mar-11 (No. 217-01368)      | Apr-12                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371)      | Apr-12                |
| Reference Probe ES3DV3      | SN: 3205           | 30-Apr-10 (No. ES3-3205_Apr10) | Apr-11                |
| DAE4                        | SN: 601            | 10-Jun-10 (No. DAE4-601_Jun10) | Jun-11                |

| Secondary Standards       | ID #             | Check Date (in house)             | Scheduled Check        |
|---------------------------|------------------|-----------------------------------|------------------------|
| Power sensor HP 8481A     | MY41092317       | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| RF generator R&S SMT-06   | 100005           | 4-Aug-99 (in house check Oct-09)  | In house check: Oct-11 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |

|                | Name            | Function              | Signature |
|----------------|-----------------|-----------------------|-----------|
| Calibrated by: | Claudio Leubler | Laboratory Technician |           |
| Approved by:   | Katja Pokovic   | Technical Manager     |           |

Issued: April 19, 2011

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Certificate No: D2450V2-727\_Apr11

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Accreditation No.: SCS 108

## Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

- DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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## Measurement Conditions

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

|                              |                           |             |
|------------------------------|---------------------------|-------------|
| DASY Version                 | DASY5                     | V52.6.2     |
| Extrapolation                | Advanced Extrapolation    |             |
| Phantom                      | Modular Flat Phantom V5.0 |             |
| 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 | 38.7 $\pm$ 6 % | 1.72 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (21.0 $\pm$ 0.2) °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 | 13.7 mW / g                    |
| SAR normalized                                        | normalized to 1W   | 54.8 mW / g                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 55.8 mW / g $\pm$ 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 6.39 mW / g                    |
| SAR normalized                                          | normalized to 1W   | 25.6 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 25.7 mW / g $\pm$ 16.5 % (k=2) |

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### 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 ± 0.2) °C | 50.6 ± 6 %   | 1.91 mho/m ± 6 % |
| Body TSL temperature during test | (21.5 ± 0.2) °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 | 12.7 mW / g                |
| SAR normalized                                        | normalized to 1W   | 50.8 mW / g                |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 50.8 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                            |
|---------------------------------------------------------|--------------------|----------------------------|
| SAR measured                                            | 250 mW input power | 5.84 mW / g                |
| SAR normalized                                          | normalized to 1W   | 23.4 mW / g                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 23.3 mW / g ± 16.5 % (k=2) |

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## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 54.3 $\Omega$ + 2.0 j $\Omega$ |
| Return Loss                          | - 26.9 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.9 $\Omega$ + 3.7 j $\Omega$ |
| Return Loss                          | - 28.6 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1,149 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.

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 9, 2003 |

## DASY5 Validation Report for Head TSL

Date/Time: 18.04.2011 16:55:19

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727**

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

Medium: HSL U12 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.74$  mho/m;  $\epsilon_r = 38.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

### DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

### Pin=250 mW, Cube 0:

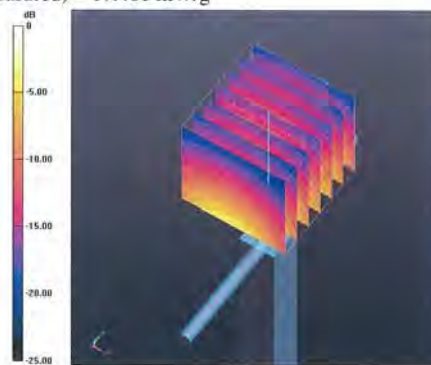
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.6 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 27.919 W/kg

**SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.39 mW/g**

Maximum value of SAR (measured) = 17.401 mW/g



0 dB = 17.400mW/g

Certificate No: D2450V2-727\_Apr11

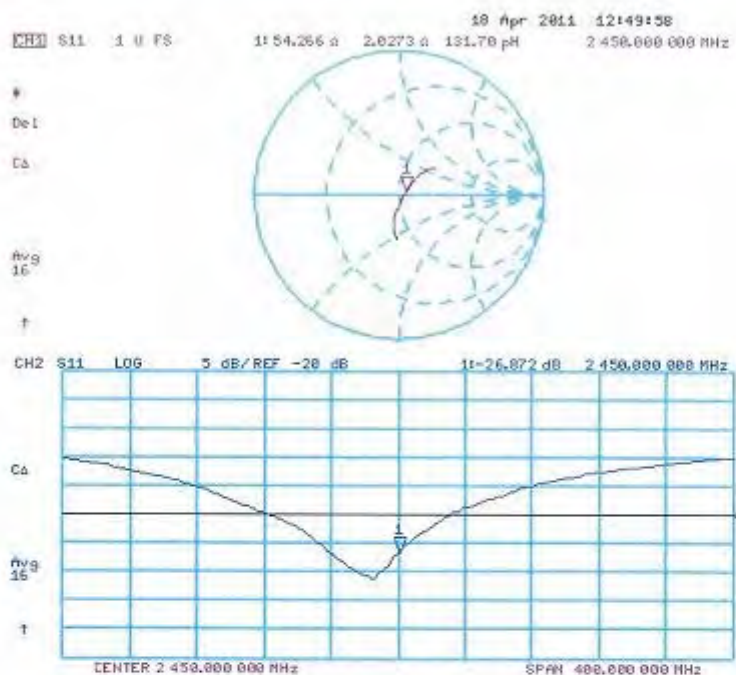
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## Impedance Measurement Plot for Head TSL



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## DASY5 Validation Report for Body TSL

Date/Time: 19.04.2011 14:37:11

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727**

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

Medium: MSL U12 BB

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.91 \text{ mho/m}$ ;  $\epsilon_r = 50.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

**Pin=250 mW, Cube 0:**

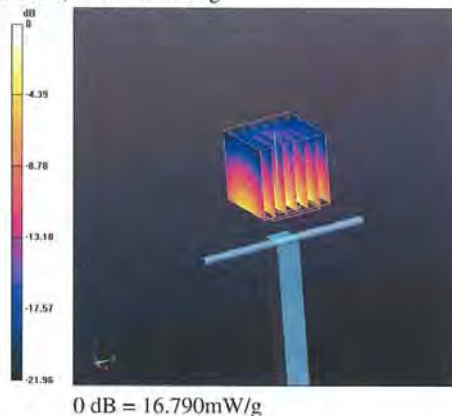
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.949 V/m; Power Drift = -0.04 dB

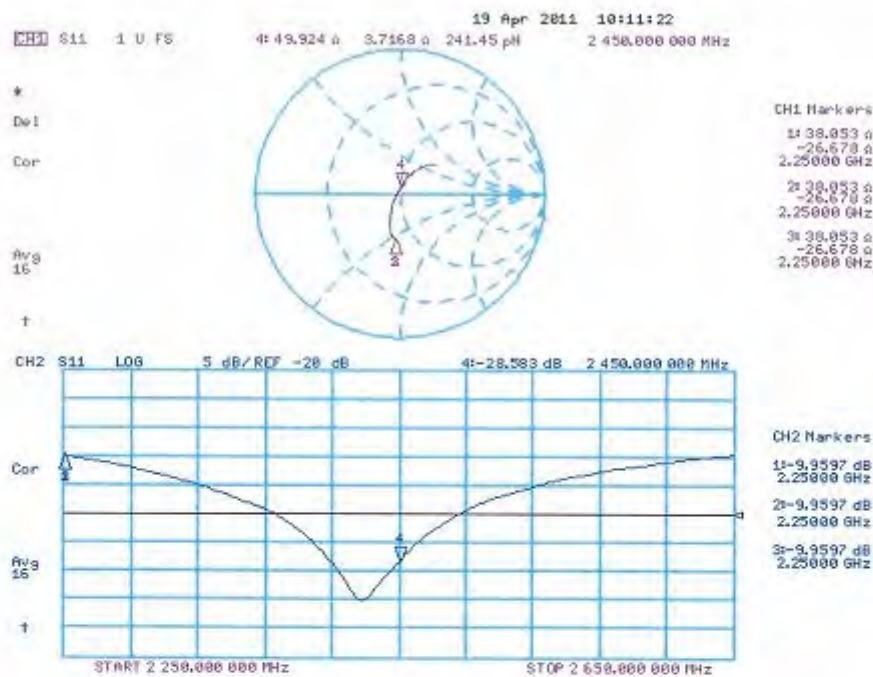
Peak SAR (extrapolated) = 26.888 W/kg

**SAR(1 g) = 12.7 mW/g; SAR(10 g) = 5.84 mW/g**

Maximum value of SAR (measured) = 16.794 mW/g



## Impedance Measurement Plot for Body TSL



**End of 1<sup>st</sup> part of report**

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