

# SAR TEST REPORT

|                      |                                                              |
|----------------------|--------------------------------------------------------------|
| Equipment Under Test | Windows phone                                                |
| Model Name           | PI06100                                                      |
| Company Name         | HTC Corporation                                              |
| Company Address      | No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan |
| Date of Receipt      | 2011.07.19                                                   |
| Date of Test(s)      | 2011.08.20, 2011.08.21, 2011.08.23                           |
| Date of Issue        | 2011.09.09                                                   |

Standards:

## FCC OET Bulletin 65 supplement C, IEEE/ANSI C95.1, C95.3, IEEE 1528

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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Tested by : Chris Tsung  
Engineer



Date : 2011.09.09

Approved by : Kelly Tsai  
Supervisor



Date : 2011.09.09

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

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**Revision Version**

| Report Number | Revision | Date       | Memo                             |
|---------------|----------|------------|----------------------------------|
| EN/2011/70009 | 00       | 2011/09/05 | Initial creation of test report. |
| EN/2011/70009 | 01       | 2011/09/07 | Modify 1 <sup>st</sup> report    |
| EN/2011/70009 | 02       | 2011/09/09 | Modify 2 <sup>nd</sup> report    |

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

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

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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.                          |                                                             |
| Telephone                                              | +886-2-2299-3279                                            |
| Fax                                                    | +886-2-2298-0488                                            |
| Internet                                               | <a href="http://www.tw.sgs.com/">http://www.tw.sgs.com/</a> |

|                  |                                                                                        |
|------------------|----------------------------------------------------------------------------------------|
| Testing Location | 1F,No.8, Alley 15, Lane 120, Sec .1, NeiHu Road NeiHu District Taipei City 114, Taiwan |
|------------------|----------------------------------------------------------------------------------------|

## 1.2 Details of Applicant

|                 |                                                                |
|-----------------|----------------------------------------------------------------|
| Company Name    | HTC Corporation.                                               |
| Company Address | No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan   |
| Contact Person  | Vivian Hsieh                                                   |
| TEL             | +886-3-375-3252                                                |
| Fax             | +886-3-375-5530                                                |
| E-mail          | <a href="mailto:Vivian_hsieh@htc.com">Vivian_hsieh@htc.com</a> |
| Website         | <a href="http://www.htc.com.tw">http://www.htc.com.tw</a>      |

## 1.3 Description of EUT

|            |                   |
|------------|-------------------|
| EUT Name   | Windows phone     |
| Brand Name | HTC               |
| Model Name | PI06100           |
| IMEI Code  | 35808704001450301 |

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|                          |                                                                   |               |                                                                                      |           |
|--------------------------|-------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|-----------|
| FCC ID                   | NM8PI06100                                                        |               |                                                                                      |           |
| Mode of Operation        | GSM/GPRS/EDGE/WLAN802.11 b/g/n(20M) Bluetooth band                |               |                                                                                      |           |
| Definition               | Production unit                                                   |               |                                                                                      |           |
| Duty Cycle               | GSM                                                               | GPRS/EDGE     | WLAN802.11 b/g/n(H20)                                                                | Bluetooth |
|                          | 1/8.3                                                             | 1/2           | 1                                                                                    | 1         |
| TX Frequency Range (MHz) | GSM850                                                            | GSM1900       | WLAN802.11 b/g/n(H20)                                                                | Bluetooth |
|                          | 824.2-848.8                                                       | 1850.2-1909.8 | 2412-2462                                                                            | 2402-2480 |
| Channel Number (ARFCN)   | GSM850                                                            | GSM1900       | WLAN802.11 b/g/n(H20)                                                                | Bluetooth |
|                          | 128-251                                                           | 512- 810      | 1-11                                                                                 | 0-78      |
| VOIP Function            | No                                                                |               |                                                                                      |           |
| Battery Type             | 3.7 V Lithium-Ion                                                 |               |                                                                                      |           |
| Antenna Type             | Internal Antenna                                                  |               |                                                                                      |           |
| Max. SAR Measured (1 g)  | GSM850                                                            |               |                                                                                      |           |
|                          | Head                                                              |               | Hotspot mode                                                                         |           |
|                          | 0.248 mW/g<br>At GSM 850 Right Head (Cheek Position)_251 Channel  |               | 1.36 mW/g<br>Hotspot mode_Back side_ 128 channel(1DN_3UP)_ repeated with WTE Battery |           |
|                          | GSM1900                                                           |               |                                                                                      |           |
|                          | Head                                                              |               | Hotspot mode                                                                         |           |
|                          | 0.356 mW/g<br>At GSM 1900 Right Head (Cheek Position)_512 channel |               | 1.1 mW/g<br>Hotspot mode_Body_Back side_661 channel(1DN_3UP)                         |           |

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| Max. SAR Measured<br>(1 g) | WLAN802.11 b                                                                                                   |                                                                                                   |
|----------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                            | Head                                                                                                           | Hotspot mode                                                                                      |
|                            | <b>0.131 mW/g</b><br>At WLAN802.11b Right Head<br>(Cheek Position)_6<br>channel_repeated with WTE<br>Battery   | <b>0.239 mW/g</b><br>Hotspot mode_Back side_6<br>channel_repeated with Merry<br>headset           |
|                            | DTM Mode (GSM 850)                                                                                             |                                                                                                   |
|                            | Head                                                                                                           | Hotspot mode                                                                                      |
|                            | <b>0.602 mW/g</b><br>At GSM 850 Right Head (Cheek<br>Position)_251 Channel & GPRS<br>850(1DN_2UP)_128 channel  | <b>1.305 mW/g</b><br>Hotspot mode_Back side_128<br>channel (1DN_2UP) &<br>GSM850_251 channel      |
|                            | DTM Mode (GSM 1900)                                                                                            |                                                                                                   |
|                            | Head                                                                                                           | Hotspot mode                                                                                      |
|                            | <b>0.837 mW/g</b><br>At GSM 1900 Right Head (Cheek<br>Position)_512 channel & GPRS<br>1900(1DN_2UP)_661 channe | <b>1.01 mW/g</b><br>Hotspot mode_Body_Back<br>side_661 channel (1DN_2UP) &<br>GSM1900_512 channel |
|                            | Bluetooth                                                                                                      |                                                                                                   |
|                            | Hotspot mode                                                                                                   |                                                                                                   |
|                            | <b>0.00375</b><br>(Hotspot mode_Bottom side_39 channel)                                                        |                                                                                                   |

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

| Burst average power                                        |                 |     |                |              |
|------------------------------------------------------------|-----------------|-----|----------------|--------------|
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 850                                                    | 824.2           | 128 | 34.10          | 33.30        |
|                                                            | 836.6           | 190 | 34.20          | 33.40        |
|                                                            | 848.8           | 251 | 34.20          | 33.50        |
| The division factor compared to the number of TX time slot |                 |     |                |              |
|                                                            |                 |     | 1 TX time slot |              |
| Division factor                                            |                 |     | -9.03          |              |
| Source-based time average power                            |                 |     |                |              |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 850                                                    | 824.2           | 128 | 25.07          | <b>24.27</b> |
|                                                            | 836.6           | 190 | 25.17          | <b>24.37</b> |
|                                                            | 848.8           | 251 | 25.17          | <b>24.47</b> |

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t (886-2) 2299-3939

f (886-2) 2299-9489

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 33.60          | 33.00      | 33.30           | 32.70      | 33.90           | 33.20      | 29.10           | 29.70      |
|                                                            | 836.6           | 190 | 33.70          | 33.10      | 32.70           | 32.60      | 33.60           | 33.00      | 29.30           | 29.00      |
|                                                            | 848.8           | 251 | 33.70          | 33.10      | 32.80           | 32.30      | 33.60           | 32.90      | 29.40           | 29.10      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 24.57          | 23.97      | 27.28           | 26.68      | 29.64           | 28.94      | 26.09           | 26.69      |
|                                                            | 836.6           | 190 | 24.67          | 24.07      | 26.68           | 26.58      | 29.34           | 28.74      | 26.29           | 25.99      |
|                                                            | 848.8           | 251 | 24.67          | 24.07      | 26.78           | 26.28      | 29.34           | 28.64      | 26.39           | 26.09      |

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 850                                                  | 824.2           | 128 | 29.80          | 26.40      | 28.50           | 25.20      | 28.50           | 25.30      | 28.30           | 25.00      |
|                                                            | 836.6           | 190 | 29.80          | 26.50      | 28.60           | 25.30      | 28.60           | 25.40      | 28.60           | 25.40      |
|                                                            | 848.8           | 251 | 29.80          | 26.60      | 28.70           | 25.40      | 28.60           | 25.40      | 28.70           | 25.40      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 20.77          | 17.37      | 22.48           | 19.18      | 24.24           | 21.04      | 25.29           | 21.99      |
|                                                            | 836.6           | 190 | 20.77          | 17.47      | 22.58           | 19.28      | 24.34           | 21.14      | 25.59           | 22.39      |
|                                                            | 848.8           | 251 | 20.77          | 17.57      | 22.68           | 19.38      | 24.34           | 21.14      | 25.69           | 22.39      |

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| Burst average power                                        |                 |     |                |              |
|------------------------------------------------------------|-----------------|-----|----------------|--------------|
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 1900                                                   | 1850.2          | 512 | 31.20          | 30.90        |
|                                                            | 1880            | 661 | 31.00          | 30.60        |
|                                                            | 1909.8          | 810 | 30.60          | 30.30        |
| The division factor compared to the number of TX time slot |                 |     |                |              |
|                                                            |                 |     | 1 TX time slot |              |
| Division factor                                            |                 |     | -9.03          |              |
| Source-based time average power                            |                 |     |                |              |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 1900                                                   | 1850.2          | 512 | 22.17          | <b>21.87</b> |
|                                                            | 1880            | 661 | 21.97          | <b>21.57</b> |
|                                                            | 1909.8          | 810 | 21.57          | <b>21.27</b> |

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 1900                                                  | 1850.2          | 512 | 30.70          | 30.30      | 30.30           | 30.00      | 30.50           | 30.20      | 26.30           | 26.10      |
|                                                            | 1880            | 661 | 30.50          | 30.20      | 30.20           | 29.80      | 30.20           | 29.90      | 26.10           | 25.90      |
|                                                            | 1909.8          | 810 | 30.60          | 30.20      | 29.90           | 29.60      | 30.10           | 29.90      | 26.10           | 25.80      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 1900                                                  | 1850.2          | 512 | 21.67          | 21.27      | 24.28           | 23.98      | 26.24           | 25.94      | 23.29           | 23.09      |
|                                                            | 1880            | 661 | 21.47          | 21.17      | 24.18           | 23.78      | 25.94           | 25.64      | 23.09           | 22.89      |
|                                                            | 1909.8          | 810 | 21.57          | 21.17      | 23.88           | 23.58      | 25.84           | 25.64      | 23.09           | 22.79      |

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 1900                                                 | 1850.2          | 512 | 29.20          | 26.00      | 28.10           | 24.80      | 27.80           | 24.60      | 26.20           | 22.90      |
|                                                            | 1880            | 661 | 29.10          | 25.60      | 27.90           | 24.70      | 27.70           | 24.50      | 26.20           | 22.90      |
|                                                            | 1909.8          | 810 | 28.90          | 25.60      | 27.70           | 24.40      | 27.50           | 24.20      | 25.80           | 22.60      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4TX time slot   |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 1900                                                 | 1850.2          | 512 | 20.17          | 16.97      | 22.08           | 18.78      | 23.54           | 20.34      | 23.19           | 19.89      |
|                                                            | 1880            | 661 | 20.07          | 16.57      | 21.88           | 18.68      | 23.44           | 20.24      | 23.19           | 19.89      |
|                                                            | 1909.8          | 810 | 19.87          | 16.57      | 21.68           | 18.38      | 23.24           | 19.94      | 22.79           | 19.59      |

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**WLAN802.11 b/g/n(H20) conducted power table:**

|                    |       |       |       |
|--------------------|-------|-------|-------|
| WLAN802.11 b(Mhz)  | 2412  | 2437  | 2462  |
| Avg power (dbm)    | 18.58 | 18.74 | 18.79 |
| WLAN802.11 g (Mhz) | 2412  | 2437  | 2462  |
| Avg power (dbm)    | 12.72 | 12.86 | 12.92 |
| WLAN802.11 n(20M)  | 2412  | 2437  | 2462  |
| Avg power (dbm)    | 12.67 | 12.74 | 12.83 |

**DTM Mode :**

DTM device class : B

DTM multislot class level : 11

Total number of time slot for GSM mode : 1 uplink ; 1 downlink

Total number of time slot for GPRS/EGPRS mode : mode on the multislot class 10 : 2 uplink ; 1 downlink

| Burst average power                                        |                 |                |            |            |
|------------------------------------------------------------|-----------------|----------------|------------|------------|
| EUT mode                                                   | Frequency (MHz) | CH             | Peak (dBm) | Avg. (dBm) |
| GSM 850                                                    | 824.2           | 128            | 34.10      | 33.30      |
|                                                            | 836.6           | 190            | 34.20      | 33.40      |
|                                                            | 848.8           | 251            | 34.20      | 33.50      |
| The division factor compared to the number of TX time slot |                 |                |            |            |
|                                                            |                 | 1 TX time slot |            |            |
| Division factor                                            |                 | -9.03          |            |            |
| Source-based time average power                            |                 |                |            |            |
| EUT mode                                                   | Frequency (MHz) | CH             | Peak (dBm) | Avg. (dBm) |
| GSM 850                                                    | 824.2           | 128            | 25.07      | 24.27      |
|                                                            | 836.6           | 190            | 25.17      | 24.37      |
|                                                            | 848.8           | 251            | 25.17      | 24.47      |

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| Burst average power                                        |                 |     |                |            |                 |              |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|--------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |              | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |              | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm)   | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 33.60          | 33.00      | 33.30           | 32.70        | 33.90           | 33.20      | 29.10           | 29.70      |
|                                                            | 836.6           | 190 | 33.70          | 33.10      | 32.70           | 32.60        | 33.60           | 33.00      | 29.30           | 29.00      |
|                                                            | 848.8           | 251 | 33.70          | 33.10      | 32.80           | 32.30        | 33.60           | 32.90      | 29.40           | 29.10      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |              |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |              | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |              | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |              |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |              | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |              | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm)   | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 24.57          | 23.97      | 27.28           | <b>26.68</b> | 29.64           | 28.94      | 26.09           | 26.69      |
|                                                            | 836.6           | 190 | 24.67          | 24.07      | 26.68           | <b>26.58</b> | 29.34           | 28.74      | 26.29           | 25.99      |
|                                                            | 848.8           | 251 | 24.67          | 24.07      | 26.78           | <b>26.28</b> | 29.34           | 28.64      | 26.39           | 26.09      |

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SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 850                                                  | 824.2           | 128 | 29.80          | 26.40      | 28.50           | 25.20      | 28.50           | 25.30      | 28.30           | 25.00      |
|                                                            | 836.6           | 190 | 29.80          | 26.50      | 28.60           | 25.30      | 28.60           | 25.40      | 28.60           | 25.40      |
|                                                            | 848.8           | 251 | 29.80          | 26.60      | 28.70           | 25.40      | 28.60           | 25.40      | 28.70           | 25.40      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 850                                                   | 824.2           | 128 | 20.77          | 17.37      | 22.48           | 19.18      | 24.24           | 21.04      | 25.29           | 21.99      |
|                                                            | 836.6           | 190 | 20.77          | 17.47      | 22.58           | 19.28      | 24.34           | 21.14      | 25.59           | 22.39      |
|                                                            | 848.8           | 251 | 20.77          | 17.57      | 22.68           | 19.38      | 24.34           | 21.14      | 25.69           | 22.39      |

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

| Burst average power                                        |                 |     |                |              |
|------------------------------------------------------------|-----------------|-----|----------------|--------------|
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 1900                                                   | 1850.2          | 512 | 31.20          | 30.90        |
|                                                            | 1880            | 661 | 31.00          | 30.60        |
|                                                            | 1909.8          | 810 | 30.60          | 30.30        |
| The division factor compared to the number of TX time slot |                 |     |                |              |
|                                                            |                 |     | 1 TX time slot |              |
| Division factor                                            |                 |     | -9.03          |              |
| Source-based time average power                            |                 |     |                |              |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm)   |
| GSM 1900                                                   | 1850.2          | 512 | 22.17          | <b>21.87</b> |
|                                                            | 1880            | 661 | 21.97          | <b>21.57</b> |
|                                                            | 1909.8          | 810 | 21.57          | <b>21.27</b> |

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 1900                                                  | 1850.2          | 512 | 30.70          | 30.30      | 30.30           | 30.00      | 30.50           | 30.20      | 26.30           | 26.10      |
|                                                            | 1880            | 661 | 30.50          | 30.20      | 30.20           | 29.80      | 30.20           | 29.90      | 26.10           | 25.90      |
|                                                            | 1909.8          | 810 | 30.60          | 30.20      | 29.90           | 29.60      | 30.10           | 29.90      | 26.10           | 25.80      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| GPRS 1900                                                  | 1850.2          | 512 | 21.67          | 21.27      | 24.28           | 23.98      | 26.24           | 25.94      | 23.29           | 23.09      |
|                                                            | 1880            | 661 | 21.47          | 21.17      | 24.18           | 23.78      | 25.94           | 25.64      | 23.09           | 22.89      |
|                                                            | 1909.8          | 810 | 21.57          | 21.17      | 23.88           | 23.58      | 25.84           | 25.64      | 23.09           | 22.79      |

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| Burst average power                                        |                 |     |                |            |                 |            |                 |            |                 |            |
|------------------------------------------------------------|-----------------|-----|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 1900                                                 | 1850.2          | 512 | 29.20          | 26.00      | 28.10           | 24.80      | 27.80           | 24.60      | 26.20           | 22.90      |
|                                                            | 1880            | 661 | 29.10          | 25.60      | 27.90           | 24.70      | 27.70           | 24.50      | 26.20           | 22.90      |
|                                                            | 1909.8          | 810 | 28.90          | 25.60      | 27.70           | 24.40      | 27.50           | 24.20      | 25.80           | 22.60      |
| The division factor compared to the number of TX time slot |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1 TX time slot |            | 2 TX time slot  |            | 3 TX time slot  |            | 4 TX time slot  |            |
| Division factor                                            |                 |     | -9.03          |            | -6.02           |            | -4.26           |            | -3.01           |            |
| Source-based time average powe                             |                 |     |                |            |                 |            |                 |            |                 |            |
|                                                            |                 |     | 1Dn1UP         |            | 1Dn2UP          |            | 1Dn3UP          |            | 1Dn4UP          |            |
|                                                            |                 |     | Multi- class 8 |            | Multi- class 10 |            | Multi- class 11 |            | Multi- class 12 |            |
| EUT mode                                                   | Frequency (MHz) | CH  | Peak (dBm)     | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) | Peak (dBm)      | Avg. (dBm) |
| EGPRS 1900                                                 | 1850.2          | 512 | 20.17          | 16.97      | 22.08           | 18.78      | 23.54           | 20.34      | 23.19           | 19.89      |
|                                                            | 1880            | 661 | 20.07          | 16.57      | 21.88           | 18.68      | 23.44           | 20.24      | 23.19           | 19.89      |
|                                                            | 1909.8          | 810 | 19.87          | 16.57      | 21.68           | 18.38      | 23.24           | 19.94      | 22.79           | 19.59      |

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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 (Agilent 8960), 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. The testing device support mobile hotspot function, the separation distance is **10mm** due to its dimension of testing device (119 mmx 60 mm) is bigger than 9 x 5 cm referred as test guidance of KDB941225D06. **(No need to perform SAR testing with Body worn accessory (15mm separation distance) due to the hotspot mode(10mm separation distance) is conservative than Body worn accessory mode.)**

Body SAR Test configurations:

- (1) Front side
- (2) Back side
- (3) Top side. (WWAN & WLAN antenna to user distance >25mm\_No need SAR)
- (4) Bottom side.
- (5) Right side.
- (6) Left side.

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f (886-2) 2299-9489

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**SAR evaluation considerations for handsets with multiple transmitters:**

6. 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 (BT power=1.91dBm)
7. 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.
8. According to 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.
9. **Body (Hotsopt mode):**

The highest 1-g SAR for WLAN is 0.239 W/kg (Hotspot mode\_Back side) , the highest 1-g SAR for WWAN is 1.36W/kg(Body worn\_Back side) and the highest 1-g SAR for Bluetooth is 0.00375 W/kg(Body worn\_Bottom side). The sum of 1-g for simultaneous transmitting **WLAN and WWAN antenna pair** is  $0.239+1.36 = 1.599$  W/kg  $< 1.6$  W/kg. The sum of 1-g for simultaneous transmitting **Bluetooth and WWAN antenna pair** is  $0.00375+1.36 = 1.36275$  W/kg  $< 1.6$  W/kg. The sum of 1-g for simultaneous transmitting **WLAN and Bluetooth antenna pair** is  $0.239+0.00375 = 0.24275$  W/kg  $< 1.6$  W/kg. According to KDB648474/ KDB447498 /KDB248227 Simultaneous SAR evaluation is not required.

**Head:**

The highest 1-g SAR for WLAN is 0.131W/kg and the highest 1-g SAR for WWAN is 0.837W/kg (DTM Head REC/GPRS1900). The sum of 1-g for simultaneous transmitting **WLAN and WWAN antenna pair** is  $0.131+0.837= 0.968$  W/kg  $< 1.6$  W/kg. According to KDB648474/ KDB447498 /KDB248227 Simultaneous SAR evaluation is not required.

**Additional configuration(Head):**

11. For highest SAR configuration in this band repeated with WTE Battery.

**Additional configuration(Body):**

12. For highest SAR configuration in this band repeated with Cotron Headset.
13. For highest SAR configuration in this band repeated with Foster Headset.
14. For highest SAR configuration in this band repeated with Merry Headset.
15. For highest SAR configuration in this band repeated with WTE Battery.

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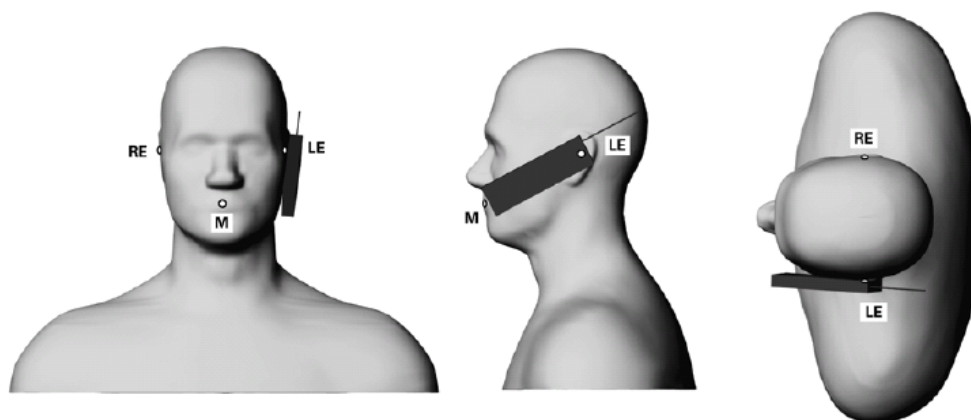
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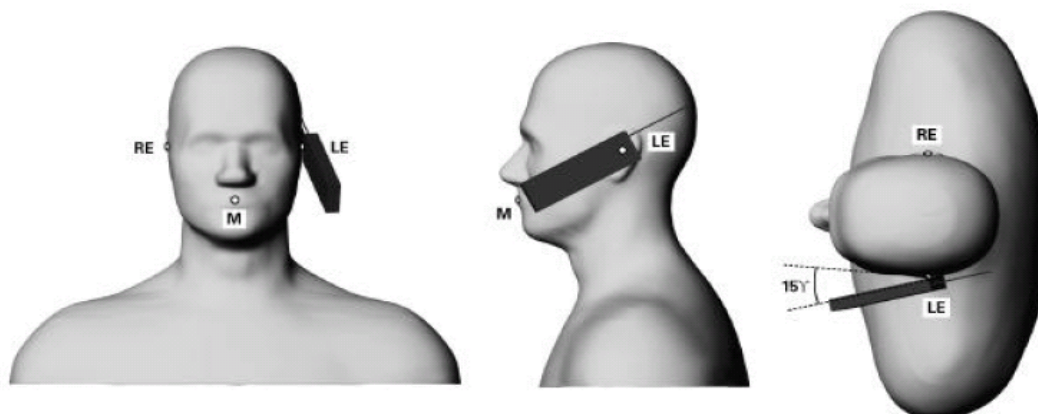
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## 1.6 Positioning Procedure



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.

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

## 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 ). A Model EX3DV4 field probe is 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.

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- 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 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.

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- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- 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.

## 1.9 System Components

### 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)                                                | <br>EX3DV4 E-Field Probe |
| Calibration:   | Basic Broad Band Calibration in air<br>Conversion Factors (CF) for MSL850 /1900/2450 MHZ Additional CF for other liquids and frequencies upon request                                                      |                                                                                                              |
| Frequency:     | 10 MHz to > 6 GHz, Linearity: $\pm 0.2$ dB (30 MHz to 6 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:    | Overall length: 337 mm (Tip: 10 mm)<br>Tip diameter: 2.5 mm (Body: 10 mm)<br>Typical distance from probe tip to dipole centers: 1 mm                                                                       |                                                                                                              |
| 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: 850 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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SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

## 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 850/1900/2450 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 in the range  $22.1^{\circ}\text{C}$ , the relative humidity was in the range 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.

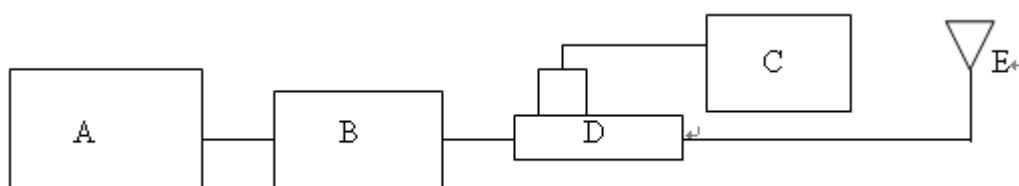


Fig.b The block diagram of system verification

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



Photograph of the dipole Antenna

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| Validation Kit        | Frequency (MHz)    | Target SAR (1g)<br>(Pin=250mW) | Measured SAR (1g) | Measured Date |
|-----------------------|--------------------|--------------------------------|-------------------|---------------|
| D835V2<br>S/N: 4d063  | 835 MHz<br>(Head)  | 2.31 mW/g                      | 2.34 mW/g         | 2011-08-20    |
| D835V2<br>S/N: 4d063  | 835 MHz<br>(Body)  | 2.43 mW/g                      | 2.49 mW/g         | 2011-08-20    |
| D1900V2<br>S/N: 5d027 | 1900 MHz<br>(Head) | 10.1 mW/g                      | 9.7 mW/g          | 2011-08-21    |
| D1900V2<br>S/N: 5d027 | 1900 MHz<br>(Body) | 9.93 mW/g                      | 9.83 mW/g         | 2011-08-21    |
| D2450V2<br>S/N: 727   | 2450 MHz<br>(Head) | 13.7 mW/g                      | 13.6 mW/g         | 2011-08-23    |
| D2450V2<br>S/N: 727   | 2450 MHz<br>(Body) | 12.7 mW/g                      | 12.6 mW/g         | 2011-08-23    |

Table 1. System validation (follow manufacture target value)

### 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) by using a procedure detailed in Section V.

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 (MHz) | Tissue type | Measurement date/<br>Limits | Dielectric Parameters |                |                                  |
|-----------------|-------------|-----------------------------|-----------------------|----------------|----------------------------------|
|                 |             |                             | $\rho$                | $\sigma$ (S/m) | Simulated Tissue Temperature(°C) |
| 850             | Head        | Measured, 2011-08-20        | 41.806                | 0.898          | 21.7                             |
|                 |             | Recommended Limits          | 38.38-42.42           | 0.84-0.92      | 20-24                            |
| 850             | Body        | Measured, 2011-08-20        | 53.842                | 1.01           | 21.7                             |
|                 |             | Recommended Limits          | 51.21-56.60           | 0.95-1.05      | 20-24                            |
| 1900            | Head        | Measured, 2011-08-21        | 39.216                | 1.419          | 21.7                             |
|                 |             | Recommended Limits          | 37.05-40.95           | 1.34-1.48      | 20-24                            |
| 1900            | Body        | Measured, 2011-08-21        | 51.436                | 1.521          | 21.7                             |
|                 |             | Recommended Limits          | 48.55-53.66           | 1.44-1.60      | 20-24                            |
| 2450            | Head        | Measured, 2011-08-23        | 37.268                | 1.788          | 21.7                             |
|                 |             | Recommended Limits          | 36.67-40.53           | 1.65-1.83      | 20-24                            |
| 2450            | Body        | Measured, 2011-08-23        | 51.762                | 1.971          | 21.7                             |
|                 |             | Recommended Limits          | 48.07-53.13           | 1.81-2.01      | 20-24                            |

Table 2. Dielectric Parameters of Tissue Simulant Fluid

The composition of the brain tissue simulating liquid:

| Ingredient    | 850MHz (Head) | 850MHz (Body) | 1900MHz (Head) | 1900MHz (Body) | 2450MHz (Head) | 2450MHz (Body) |
|---------------|---------------|---------------|----------------|----------------|----------------|----------------|
| DGMBE         | X             | X             | 444.52 g       | 300.67g        | 550ml          | 301.7ml        |
| Water         | 532.98 g      | 631.68 g      | 552.42 g       | 716.56 g       | 450ml          | 698.3ml        |
| Salt          | 18.3 g        | 11.72 g       | 3.06 g         | 4.0 g          | X              | X              |
| Preventol D-7 | 2.4 g         | 1.2 g         | X              | X              | X              | X              |
| Cellulose     | 3.2 g         | X             | X              | X              | X              | X              |
| Sugar         | 766.0 g       | 600 g         | X              | X              | X              | X              |
| Total amount  | 1 L (1.0kg)   | 1 L (1.0kg)   | 1 L (1.0kg)    | 1 L (1.0kg)    | 1 L (1.0kg)    | 1 L (1.0kg)    |

Table 3. Recipes for tissue simulating liquid

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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 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).

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SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. /

t (886-2) 2299-3939

f (886-2) 2299-9489

台北縣五股工業區五工路136之1號

[www.sgs.com.tw](http://www.sgs.com.tw)

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

| Right Head (Cheek Position)    |         |       |                                  |                   |                |                  |
|--------------------------------|---------|-------|----------------------------------|-------------------|----------------|------------------|
| Frequency                      | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                        | 128     | 824.2 | 24.27 dBm                        | 0.157             | 22.1           | 21.7             |
|                                | 190     | 836.6 | 24.37 dBm                        | 0.209             | 22.1           | 21.7             |
|                                | 251     | 848.8 | 24.47 dBm                        | 0.248             | 22.1           | 21.7             |
| Left Head (Cheek Position)     |         |       |                                  |                   |                |                  |
| Frequency                      | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                        | 190     | 836.6 | 24.37 dBm                        | 0.188             | 22.1           | 21.7             |
| Right Head (15° Tilt Position) |         |       |                                  |                   |                |                  |
| Frequency                      | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                        | 190     | 836.6 | 24.37 dBm                        | 0.160             | 22.1           | 21.7             |
| Left Head (15° Tilt Position)  |         |       |                                  |                   |                |                  |
| Frequency                      | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                        | 190     | 836.6 | 24.37 dBm                        | 0.150             | 22.1           | 21.7             |

| Hotspot mode_Front side (testing in GPRS mode: class 11_1Dn3UP) |         |       |                                  |                   |                |                  |
|-----------------------------------------------------------------|---------|-------|----------------------------------|-------------------|----------------|------------------|
| Frequency                                                       | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                         | 190     | 836.6 | 28.74 dBm                        | 0.510             | 22.1           | 21.7             |
| Hotspot mode_Back side (testing in GPRS mode: class 11_1Dn3UP)  |         |       |                                  |                   |                |                  |
| Frequency                                                       | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                         | 128     | 824.2 | 28.94 dBm                        | 1.17              | 22.1           | 21.7             |
|                                                                 | 190     | 836.6 | 28.74 dBm                        | 1.14              | 22.1           | 21.7             |
|                                                                 | 251     | 848.8 | 28.64 dBm                        | 1.15              | 22.1           | 21.7             |

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| Hotspot mode_Back side (testing in GPRS mode)_repeated with Cotron headset |         |       |                                  |                      |                |                  |
|----------------------------------------------------------------------------|---------|-------|----------------------------------|----------------------|----------------|------------------|
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 128     | 824.2 | 28.94 dBm                        | 1.04                 | 22.1           | 21.7             |
| Hotspot mode_Back side (testing in GPRS mode)_repeated with Foster headset |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 128     | 824.2 | 28.94 dBm                        | 1.1                  | 22.1           | 21.7             |
| Hotspot mode_Back side (testing in GPRS mode)_repeated with Merry headset  |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 128     | 824.2 | 28.94 dBm                        | 1.08                 | 22.1           | 21.7             |
| Hotspot mode_Back side (testing in GPRS mode)_repeated with WTE Battery    |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 128     | 824.2 | 28.94 dBm                        | 1.36                 | 22.1           | 21.7             |
| Hotspot mode_Bottom side (testing in GPRS mode: class 11_1Dn3UP)           |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 190     | 836.6 | 28.74 dBm                        | 0.234                | 22.1           | 21.7             |
| Hotspot mode_Right side (testing in GPRS mode: class 11_1Dn3UP)            |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 190     | 836.6 | 28.74 dBm                        | 0.471                | 22.1           | 21.7             |
| Hotspot mode_Left side (testing in GPRS mode: class 11_1Dn3UP)             |         |       |                                  |                      |                |                  |
| Frequency                                                                  | Channel | MHz   | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 850 MHz                                                                    | 190     | 836.6 | 28.74 dBm                        | 0.637                | 22.1           | 21.7             |

- #. 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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## PCS 1900 MHZ

### Right Head (Cheek Position)

| Frequency | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
|-----------|---------|--------|----------------------------------|-------------------|----------------|------------------|
| 1900 MHz  | 512     | 1850.2 | 21.87 dBm                        | 0.356             | 22.1           | 21.7             |
|           | 661     | 1880   | 21.57 dBm                        | 0.297             | 22.1           | 21.7             |
|           | 810     | 1909.8 | 21.27 dBm                        | 0.192             | 22.1           | 21.7             |

### Right Head (Cheek Position)\_repeated with WTE Battery

| Frequency | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
|-----------|---------|--------|----------------------------------|-------------------|----------------|------------------|
| 1900 MHz  | 512     | 1850.2 | 21.87 dBm                        | 0.307             | 22.1           | 21.7             |

### Left Head (Cheek Position)

| Frequency | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
|-----------|---------|------|----------------------------------|-------------------|----------------|------------------|
| 1900 MHz  | 661     | 1880 | 21.57 dBm                        | 0.184             | 22.1           | 21.7             |

### Right Head (15° Tilt Position)

| Frequency | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
|-----------|---------|------|----------------------------------|-------------------|----------------|------------------|
| 1900 MHz  | 661     | 1880 | 21.57 dBm                        | 0.063             | 22.1           | 21.7             |

### Left Head (15° Tilt Position)

| Frequency | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
|-----------|---------|------|----------------------------------|-------------------|----------------|------------------|
| 1900 MHz  | 661     | 1880 | 21.57 dBm                        | 0.068             | 22.1           | 21.7             |

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| Hotspot mode_Front side (testing in GPRS mode: class 11_1Dn3UP)  |         |        |                                  |                   |                |                  |
|------------------------------------------------------------------|---------|--------|----------------------------------|-------------------|----------------|------------------|
| Frequency                                                        | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 1900 MHz                                                         | 661     | 1880   | 25.64 dBm                        | 0.384             | 22.1           | 21.7             |
| Hotspot mode_Back side (testing in GPRS mode: class 11_1Dn3UP)   |         |        |                                  |                   |                |                  |
| Frequency                                                        | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 1900 MHz                                                         | 512     | 1850.2 | 25.94 dBm                        | 1                 | 22.1           | 21.7             |
|                                                                  | 661     | 1880   | 25.64 dBm                        | 1.1               | 22.1           | 21.7             |
|                                                                  | 810     | 1909.8 | 25.64 dBm                        | 1.09              | 22.1           | 21.7             |
| Hotspot mode_Bottom side (testing in GPRS mode: class 11_1Dn3UP) |         |        |                                  |                   |                |                  |
| Frequency                                                        | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 1900 MHz                                                         | 661     | 1880   | 25.64 dBm                        | 0.631             | 22.1           | 21.7             |
| Hotspot mode_Right side (testing in GPRS mode: class 11_1Dn3UP)  |         |        |                                  |                   |                |                  |
| Frequency                                                        | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 1900 MHz                                                         | 661     | 1880   | 25.64 dBm                        | 0.144             | 22.1           | 21.7             |
| Hotspot mode_Left side (testing in GPRS mode: class 11_1Dn3UP)   |         |        |                                  |                   |                |                  |
| Frequency                                                        | Channel | MHz    | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 1900 MHz                                                         | 661     | 1880   | 25.64 dBm                        | 0.354             | 22.1           | 21.7             |

- #. 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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## WLAN802.11 b

| Right Head (Cheek Position)                           |         |      |                                  |                   |                |                  |
|-------------------------------------------------------|---------|------|----------------------------------|-------------------|----------------|------------------|
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 1       | 2412 | 18.58 dBm                        | 0.119             | 22.1           | 21.7             |
|                                                       | 6       | 2437 | 18.74 dBm                        | 0.127             | 22.1           | 21.7             |
|                                                       | 11      | 2462 | 18.79 dBm                        | 0.097             | 22.1           | 21.7             |
| Right Head (Cheek Position)_repeated with WTE Battery |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.131             | 22.1           | 21.7             |
| Left Head (Cheek Position)                            |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.102             | 22.1           | 21.7             |
| Right Head (15° Tilt Position)                        |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.054             | 22.1           | 21.7             |
| Left Head (15° Tilt Position)                         |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.037             | 22.1           | 21.7             |
| Hotspot mode_Front side                               |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.069             | 22.1           | 21.7             |
| Hotspot mode_Back side                                |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.208             | 22.1           | 21.7             |

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| Hotspot mode _Back side _repeated with Cotron headset |         |      |                                  |                   |                |                  |
|-------------------------------------------------------|---------|------|----------------------------------|-------------------|----------------|------------------|
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.204             | 22.1           | 21.7             |
| Hotspot mode _Back side _repeated with Foster headset |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.203             | 22.1           | 21.7             |
| Hotspot mode _Back side _repeated with Merry headset  |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.239             | 22.1           | 21.7             |
| Hotspot mode _Back side _repeated with WTE Battery    |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.222             | 22.1           | 21.7             |
| Hotspot mode _Bottom side                             |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.015             | 22.1           | 21.7             |
| Hotspot mode _Right side                              |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.083             | 22.1           | 21.7             |
| Hotspot mode _Left side                               |         |      |                                  |                   |                |                  |
| Frequency                                             | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg) 1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                                              | 6       | 2437 | 18.74 dBm                        | 0.053             | 22.1           | 21.7             |

- #. 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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## Bluetooth

| Hotspot mode_Front side  |         |      |                                  |                      |                |                  |
|--------------------------|---------|------|----------------------------------|----------------------|----------------|------------------|
| Frequency                | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                 | 39      | 2441 | 1.91dBm                          | 0.00245              | 22.1           | 21.7             |
| Hotspot mode_Back side   |         |      |                                  |                      |                |                  |
| Frequency                | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                 | 39      | 2441 | 1.91dBm                          | 0.00211              | 22.1           | 21.7             |
| Hotspot mode_Bottom side |         |      |                                  |                      |                |                  |
| Frequency                | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                 | 39      | 2441 | 1.91dBm                          | 0.00375              | 22.1           | 21.7             |
| Hotspot mode_Right side  |         |      |                                  |                      |                |                  |
| Frequency                | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                 | 39      | 2441 | 1.91dBm                          | 0.00267              | 22.1           | 21.7             |
| Hotspot mode_Left side   |         |      |                                  |                      |                |                  |
| Frequency                | Channel | MHz  | Conducted Output Power (Average) | Measured(W/kg)<br>1g | Amb. Temp[ °C] | Liquid Temp[ °C] |
| 2450 MHz                 | 39      | 2441 | 1.91dBm                          | 0.00245              | 22.1           | 21.7             |

#. 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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# DTM Mode :

DTM device class : B

DTM multislot class level : 11

Total number of time slot for GSM mode : 1 uplink ; 1 downlink

Total number of time slot for GPRS/EGPRS mode : mode on the multislot class 10 : 2 uplink ; 1 downlink

## DTM Head SAR\_GSM\_REC/GPRS850

| Technology        | Frequency | Channel | MHz   | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)           |
|-------------------|-----------|---------|-------|---------------------|--------------------|-------------------------------|
| GSM               | 850       | 251     | 848.8 | 24.47               | 0.248              | <b>0.602</b><br>(0.248+0.354) |
| GPRS(2 up/1 down) | 850       | 128     | 824.2 | 26.68               | 0.354              |                               |

## DTM Head SAR\_GSM\_REC/EGPRS850

| Technology         | Frequency | channel | MHz   | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)            |
|--------------------|-----------|---------|-------|---------------------|--------------------|--------------------------------|
| GSM                | 850       | 251     | 848.8 | 24.47               | 0.248              | <b>0.3463</b><br>(0.248+0.098) |
| EGPRS(2 up/1 down) | 850       | 128     | 824.2 | 19.18               | 0.098              |                                |

## DTM Head SAR\_GSM\_REC/GPRS1900

| Technology        | Frequency | channel | MHz    | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)           |
|-------------------|-----------|---------|--------|---------------------|--------------------|-------------------------------|
| GSM               | 1900      | 512     | 1850.2 | 21.87               | 0.356              | <b>0.837</b><br>(0.356+0.481) |
| GPRS(2 up/1 down) | 1900      | 661     | 1880   | 23.78               | 0.481              |                               |

## DTM Head SAR\_GSM\_REC/EGPRS1900

| Technology         | Frequency | channel | MHz    | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)          |
|--------------------|-----------|---------|--------|---------------------|--------------------|------------------------------|
| GSM                | 1900      | 512     | 1850.2 | 21.87               | 0.356              | <b>0.516</b><br>(0.356+0.16) |
| EGPRS(2 up/1 down) | 1900      | 661     | 1880   | 18.68               | 0.16               |                              |

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### DTM Body SAR\_GSM/GPRS850\_Back(10mm)

| Technology        | Frequency | channel | MHz   | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)           |
|-------------------|-----------|---------|-------|---------------------|--------------------|-------------------------------|
| GSM               | 850       | 251     | 848.8 | 24.47               | 0.488              | <b>1.305</b><br>(0.488+0.817) |
| GPRS(2 up/1 down) | 850       | 128     | 824.2 | 26.68               | 0.817              |                               |

### DTM Body SAR\_GSM/EGPRS850\_Back(10mm)

| Technology         | Frequency | channel | MHz   | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)           |
|--------------------|-----------|---------|-------|---------------------|--------------------|-------------------------------|
| GSM                | 850       | 251     | 848.8 | 24.47               | 0.488              | <b>0.696</b><br>(0.488+0.208) |
| EGPRS(2 up/1 down) | 850       | 128     | 824.2 | 19.18               | 0.208              |                               |

### DTM Body SAR\_GSM/GPRS1900\_Back(10mm)

| Technology        | Frequency | channel | MHz    | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)          |
|-------------------|-----------|---------|--------|---------------------|--------------------|------------------------------|
| GSM               | 1900      | 512     | 1850.2 | 21.87               | 0.362              | <b>1.01</b><br>(0.362+0.648) |
| GPRS(2 up/1 down) | 1900      | 661     | 1880   | 23.78               | 0.648              |                              |

### DTM Body SAR\_GSM/EGPRS1900\_Back(10mm)

| Technology         | Frequency | channel | MHz    | output power (Avg.) | Measured (W/kg) 1g | DTM SAR Value(W/kg)           |
|--------------------|-----------|---------|--------|---------------------|--------------------|-------------------------------|
| GSM                | 1900      | 512     | 1850.2 | 21.87               | 0.362              | <b>0.553</b><br>(0.362+0.191) |
| EGPRS(2 up/1 down) | 1900      | 661     | 1880   | 18.68               | 0.191              |                               |

# The DTM SAR testing is referred as test guidance of KDB 941225 D04(Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode)

# SAR for DTM be evaluated by summing the single timeslot CS(GSM) and multislots PS SAR(GPRS/EGPRS)

### 3. Instruments List

| Manufacturer                    | Device                                       | Type                  | Serial number | Date of last calibration |
|---------------------------------|----------------------------------------------|-----------------------|---------------|--------------------------|
| Schmid & Partner Engineering AG | Dosimetric E-Field Probe                     | EX3DV4                | 3770          | Apr.19.2011              |
| Schmid & Partner Engineering AG | 850 /1900 /2450 MHz System Validation Dipole | D835V2                | 4d063         | May.25.2011              |
|                                 |                                              | D1900V2               | 5d027         | Apr.19.2011              |
|                                 |                                              | D2450V2               | 727           | Apr.19.2011              |
| Schmid & Partner Engineering AG | Data acquisition Electronics                 | DAE4                  | 856           | May.18.2011              |
| Schmid & Partner Engineering AG | Software                                     | DASY 5 V5.0 Build 125 | N/A           | Calibration not required |
| Schmid & Partner Engineering AG | Phantom                                      | SAM                   | N/A           | Calibration not required |
| Agilent                         | Network Analyzer                             | 8753D                 | 3410A05662    | Mar.16.2011              |
| Agilent                         | Dielectric Probe Kit                         | 85070D                | US01440168    | Calibration not required |
| Agilent                         | Dual-directional coupler                     | 777D                  | 50114         | Aug.18.2011              |
|                                 |                                              | 778D                  | 50313         | Jul.19.2011              |
| Agilent                         | RF Signal Generator                          | 8648D                 | 3847M00432    | Jun.01.2011              |
| Agilent                         | Power Sensor                                 | U2001B                | MY48100169    | Apr.28.2011              |
| Agilent                         | Radio Communication Test                     | E5515c                | GB44051912    | JUL.27 .2010             |

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## 4. Measurements

Date: 8/20/2011

### RE Cheek\_CH128

Communication System: Generic GSM; Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.886$  mho/m;  $\epsilon_r = 41.933$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.169 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

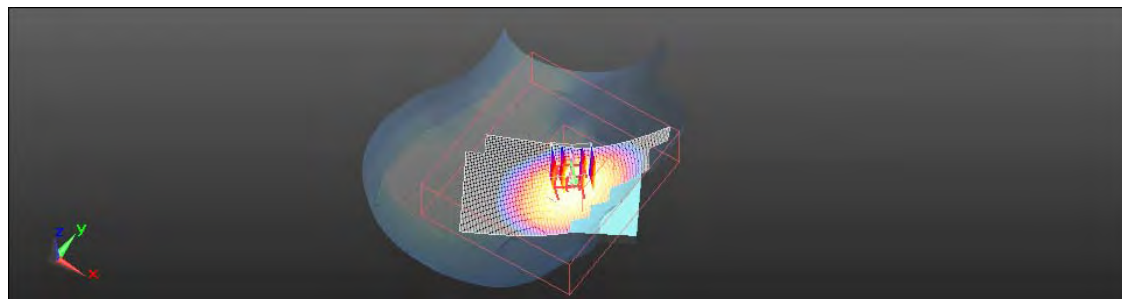
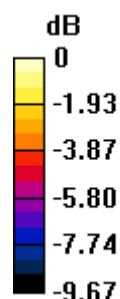
Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 4.217 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.206 W/kg

**SAR(1 g) = 0.157 mW/g; SAR(10 g) = 0.119 mW/g**

Maximum value of SAR (measured) = 0.163 mW/g



0 dB = 0.160mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## RE Cheek\_CH190

Communication System: Generic GSM; Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 41.781$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.229 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

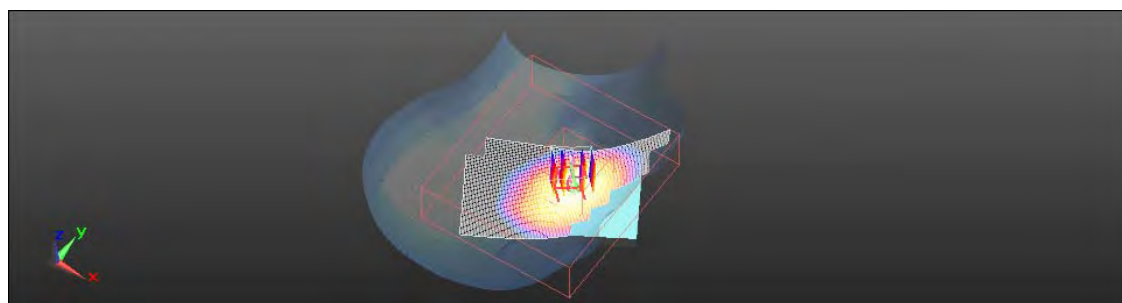
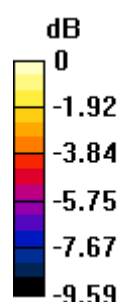
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.601 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.274 W/kg

**SAR(1 g) = 0.209 mW/g; SAR(10 g) = 0.155 mW/g**

Maximum value of SAR (measured) = 0.222 mW/g



0 dB = 0.220mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## RE Cheek\_CH251

Communication System: Generic GSM; Frequency: 848.6 MHz

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.911$  mho/m;  $\epsilon_r = 41.608$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.256 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

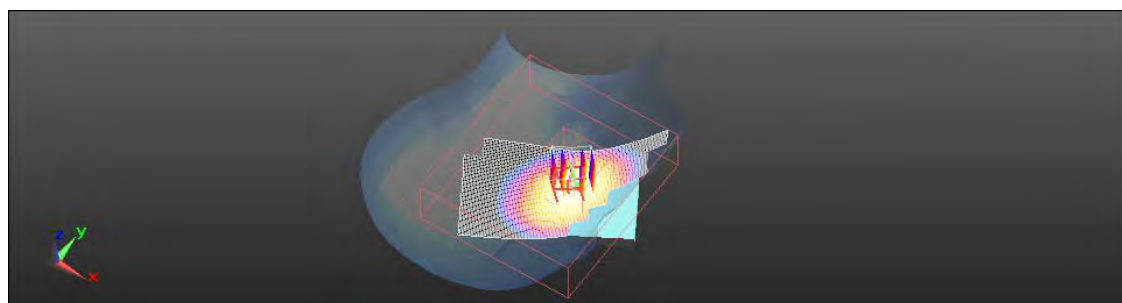
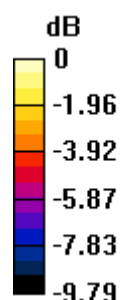
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.230 V/m; Power Drift = -0.0083 dB

Peak SAR (extrapolated) = 0.321 W/kg

**SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.185 mW/g**

Maximum value of SAR (measured) = 0.263 mW/g



0 dB = 0.260mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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## LE Cheek\_CH190

Communication System: Generic GSM; Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 41.781$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/LE Cheek/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.205 mW/g

## Configuration/LE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

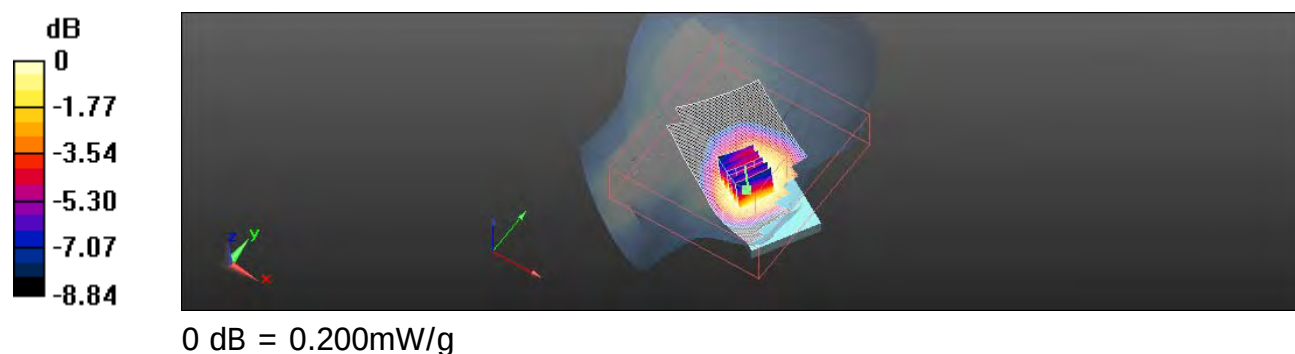
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.066 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.234 W/kg

**SAR(1 g) = 0.188 mW/g; SAR(10 g) = 0.144 mW/g**

Maximum value of SAR (measured) = 0.196 mW/g



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f (886-2) 2299-9489

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Date: 8/20/2011

## RE Tilt\_CH190

Communication System: Generic GSM; Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 41.781$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/RE Tilt/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.174 mW/g

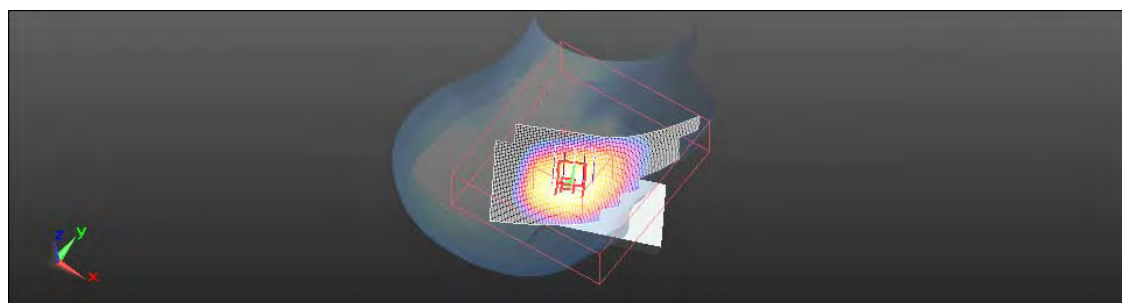
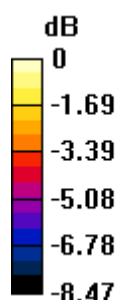
**Configuration/RE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.709 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.200 W/kg

**SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.121 mW/g**

Maximum value of SAR (measured) = 0.166 mW/g



0 dB = 0.170mW/g

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Date: 8/20/2011

## LE Tilt\_CH190

Communication System: Generic GSM; Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 0.9$  mho/m;  $\epsilon_r = 41.781$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/LE Cheek/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.170 mW/g

## Configuration/LE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

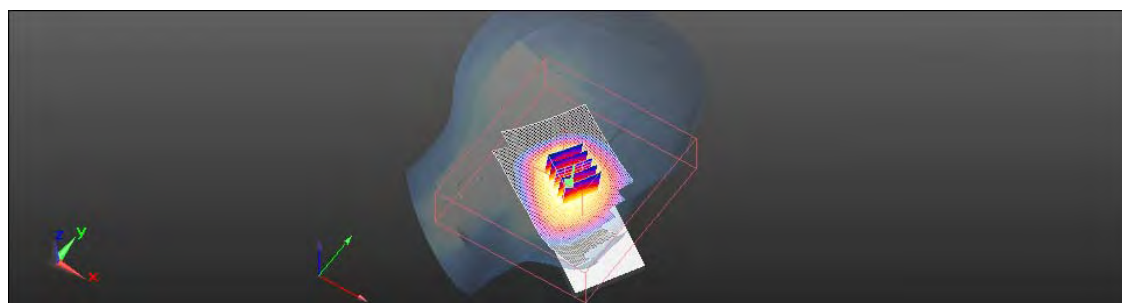
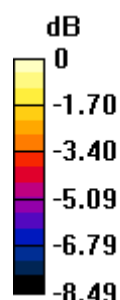
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.143 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.186 W/kg

**SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.114 mW/g**

Maximum value of SAR (measured) = 0.156 mW/g



0 dB = 0.160mW/g

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f (886-2) 2299-9489

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## Body\_CH190\_Front Side

Communication System: GPRS(Class 11); Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1.013$  mho/m;  $\epsilon_r = 53.819$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.557 mW/g

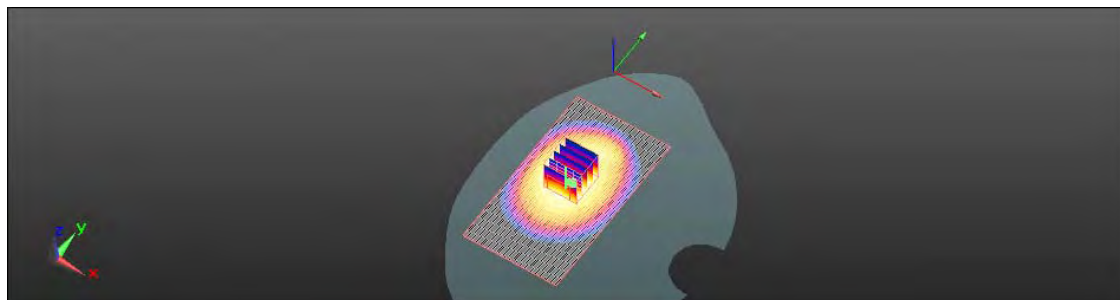
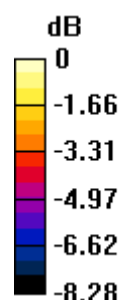
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.023 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.636 W/kg

**SAR(1 g) = 0.510 mW/g; SAR(10 g) = 0.385 mW/g**

Maximum value of SAR (measured) = 0.547 mW/g



0 dB = 0.550mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## Body\_CH128\_Back Side

Communication System: GPRS(Class 11); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.257 mW/g

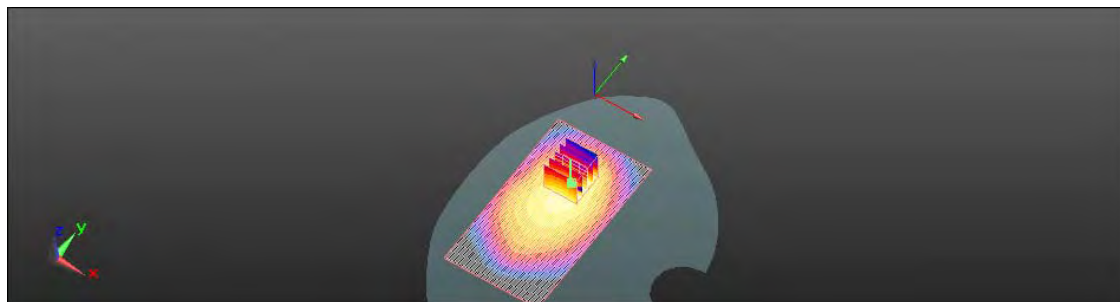
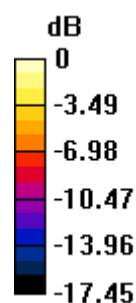
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.012 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.964 W/kg

**SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.704 mW/g**

Maximum value of SAR (measured) = 1.316 mW/g



0 dB = 1.320mW/g

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f (886-2) 2299-9489

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## Body\_CH190\_Back Side

Communication System: GPRS(Class 11); Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1.013$  mho/m;  $\epsilon_r = 53.819$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.245 mW/g

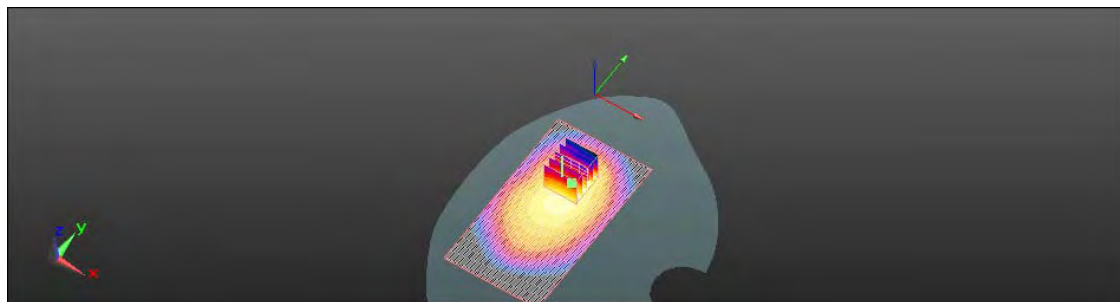
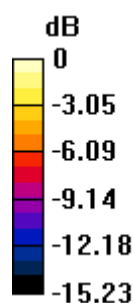
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.711 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.972 W/kg

**SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.706 mW/g**

Maximum value of SAR (measured) = 1.230 mW/g



0 dB = 1.230mW/g

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f (886-2) 2299-9489

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## Body\_CH251\_Back Side

Communication System: GPRS(Class 11); Frequency: 848.8 MHz

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.018$  mho/m;  $\epsilon_r = 53.71$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.226 mW/g

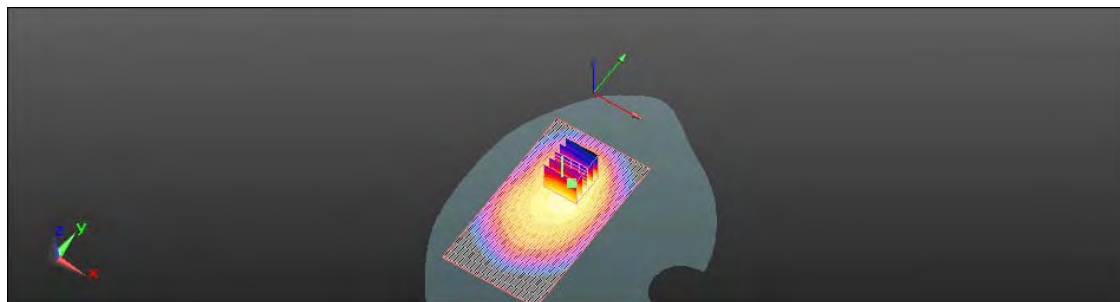
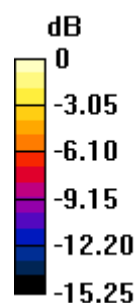
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.828 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.995 W/kg

**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.687 mW/g**

Maximum value of SAR (measured) = 1.275 mW/g



0 dB = 1.280mW/g

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f (886-2) 2299-9489

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## Body\_CH128\_Back Side\_repeated with Cotron headset

Communication System: GPRS(Class 11); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.229 mW/g

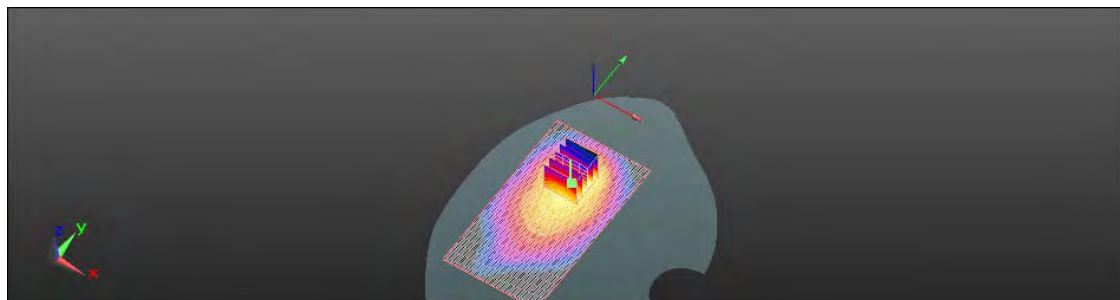
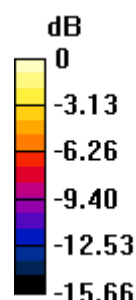
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.909 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.862 W/kg

**SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.597 mW/g**

Maximum value of SAR (measured) = 1.175 mW/g



0 dB = 1.170mW/g

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Date: 8/20/2011

## Body\_CH128\_Back Side\_repeated with Foster headset

Communication System: GPRS(Class 11); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.239 mW/g

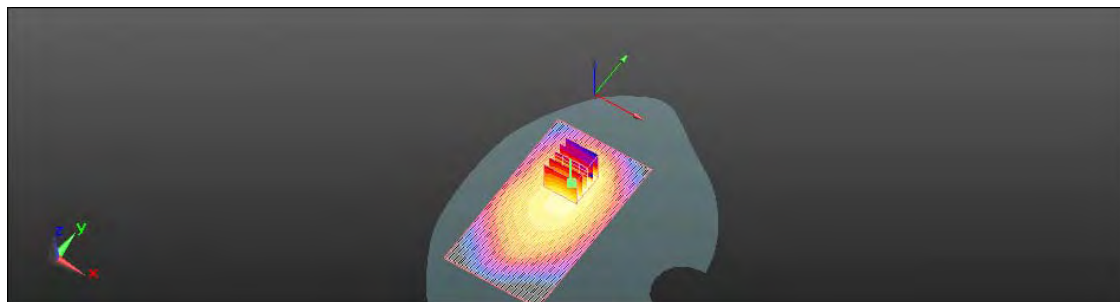
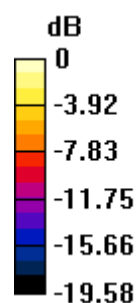
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.603 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.832 W/kg

**SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.648 mW/g**

Maximum value of SAR (measured) = 1.223 mW/g



0 dB = 1.220mW/g

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## Body\_CH128\_Back Side\_repeated with Merry headset

Communication System: GPRS(Class 11); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.200 mW/g

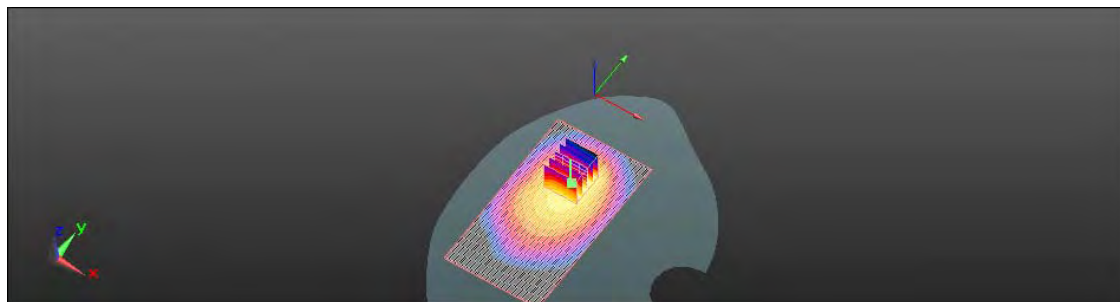
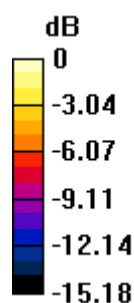
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.530 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 1.866 W/kg

**SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.638 mW/g**

Maximum value of SAR (measured) = 1.189 mW/g



0 dB = 1.190mW/g

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f (886-2) 2299-9489

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## Body\_CH128\_Back Side\_repeated with WTE Battery

Communication System: GPRS(Class 11); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.431 mW/g

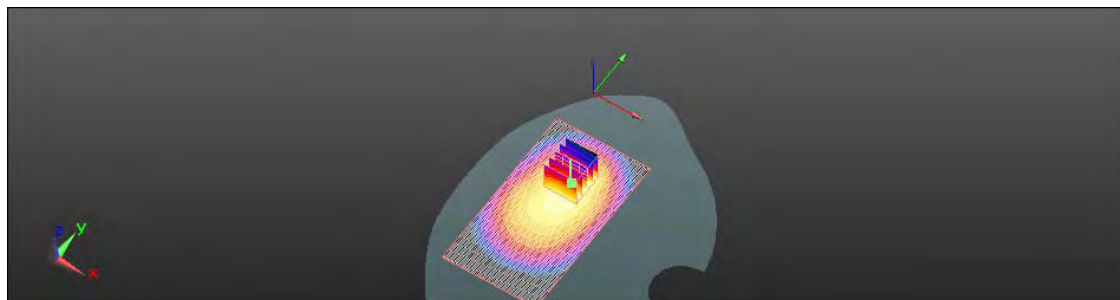
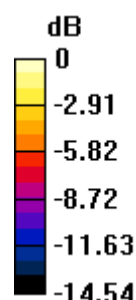
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.767 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 2.349 W/kg

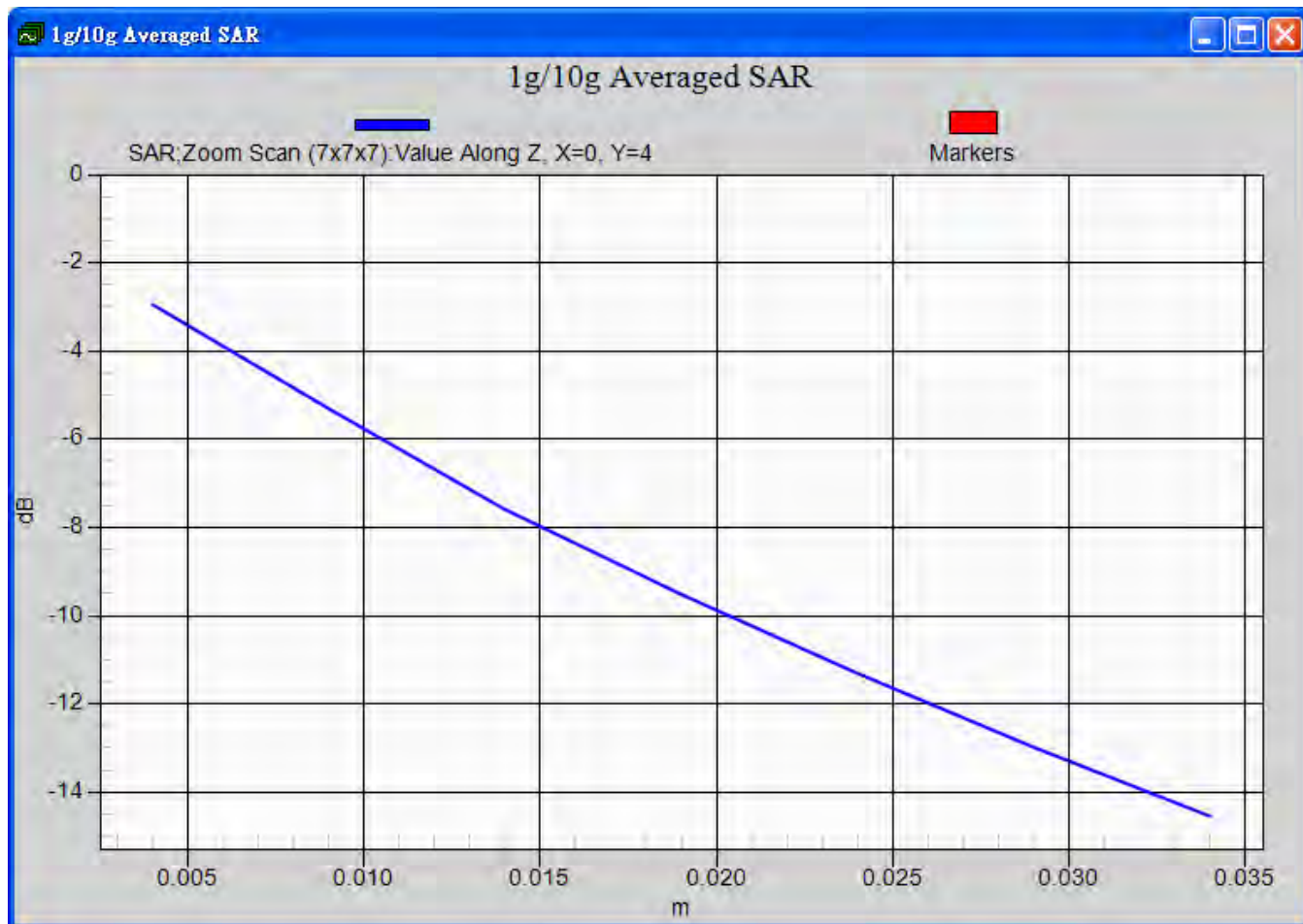
**SAR(1 g) = 1.36 mW/g; SAR(10 g) = 0.814 mW/g**

Maximum value of SAR (measured) = 1.466 mW/g



0 dB = 1.470mW/g

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Date: 8/20/2011

## Body\_CH190\_Bottom Side

Communication System: GPRS(Class 11); Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1.013$  mho/m;  $\epsilon_r = 53.819$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.235 mW/g

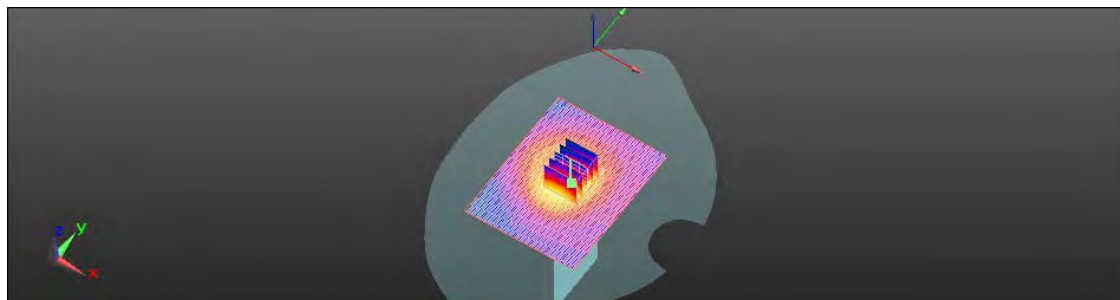
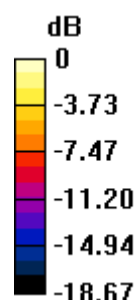
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.826 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.505 W/kg

**SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.115 mW/g**

Maximum value of SAR (measured) = 0.266 mW/g



0 dB = 0.270mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## Body\_CH190\_Right Side

Communication System: GPRS(Class 11); Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1.013$  mho/m;  $\epsilon_r = 53.819$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.524 mW/g

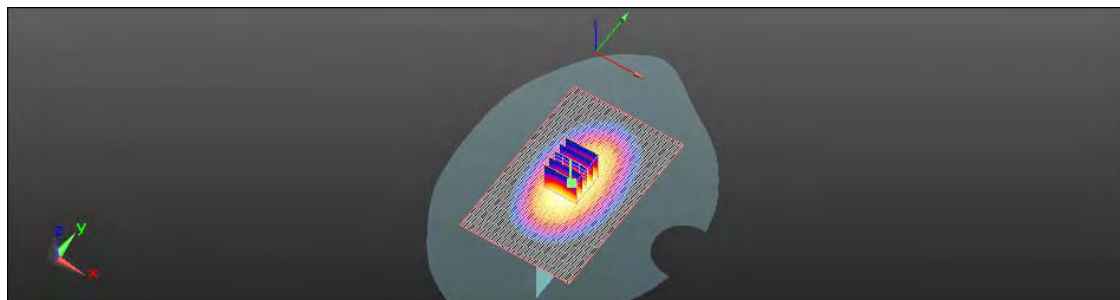
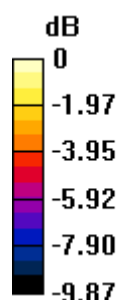
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.994 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.655 W/kg

**SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.325 mW/g**

Maximum value of SAR (measured) = 0.501 mW/g



0 dB = 0.500mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## Body\_CH190\_Left Side

Communication System: GPRS(Class 11); Frequency: 836.6 MHz

Medium parameters used:  $f = 837$  MHz;  $\sigma = 1.013$  mho/m;  $\epsilon_r = 53.819$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.689 mW/g

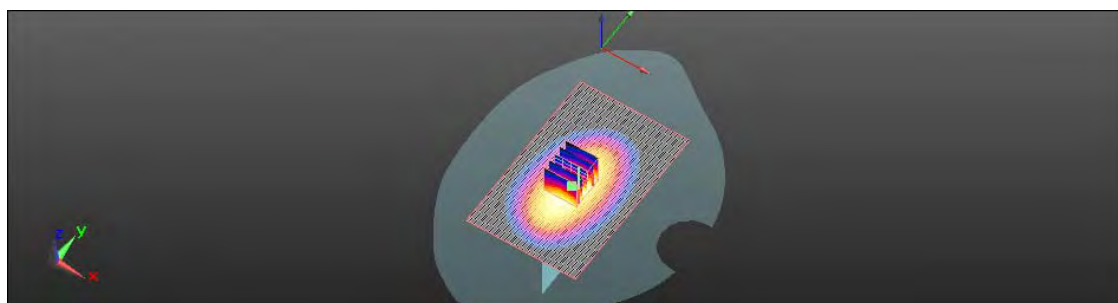
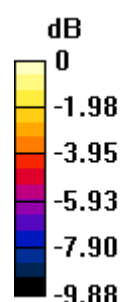
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.830 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.902 W/kg

**SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.430 mW/g**

Maximum value of SAR (measured) = 0.664 mW/g



0 dB = 0.660mW/g

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Date: 8/21/2011

## RE Cheek\_CH512

Communication System: Generic GSM; Frequency: 1850.2 MHz

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.362$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.405 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

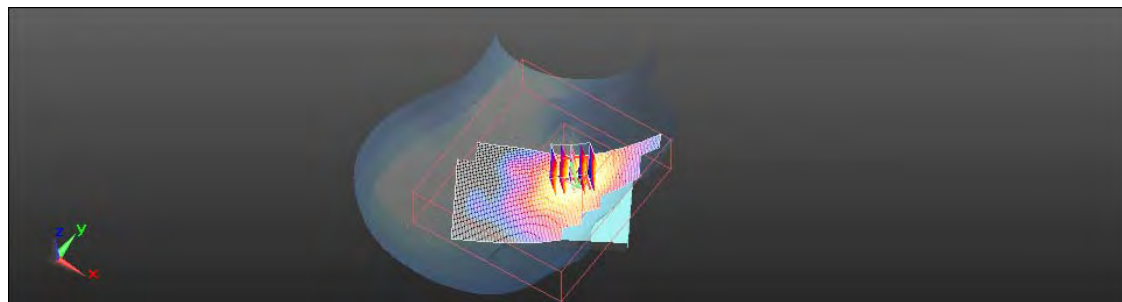
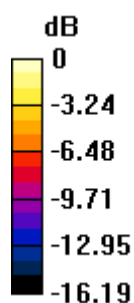
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.658 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.539 W/kg

**SAR(1 g) = 0.356 mW/g; SAR(10 g) = 0.218 mW/g**

Maximum value of SAR (measured) = 0.384 mW/g



0 dB = 0.380mW/g

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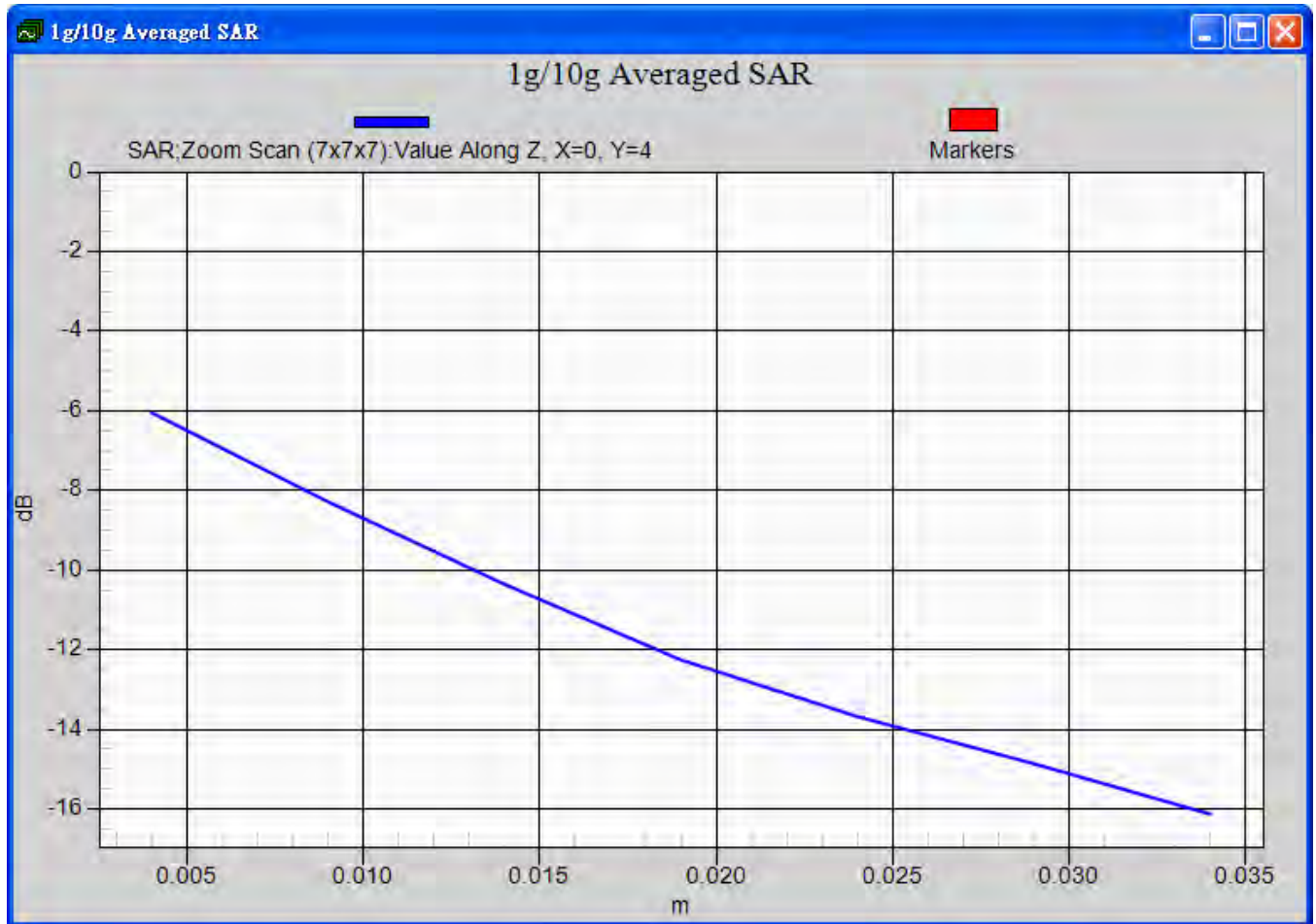
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f (886-2) 2299-9489

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Date: 8/21/2011

## RE Cheek\_CH661

Communication System: Generic GSM; Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.312 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

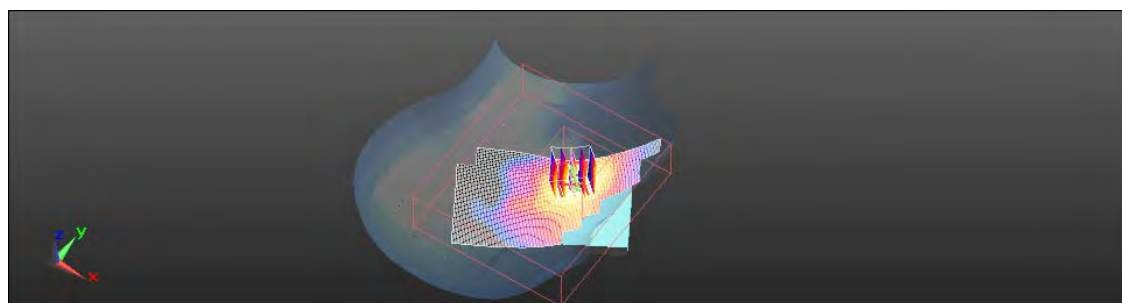
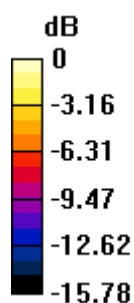
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.194 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.456 W/kg

**SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.181 mW/g**

Maximum value of SAR (measured) = 0.324 mW/g



0 dB = 0.320mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## RE Cheek\_CH810

Communication System: Generic GSM; Frequency: 1909.8 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.428$  mho/m;  $\epsilon_r = 39.203$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.200 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

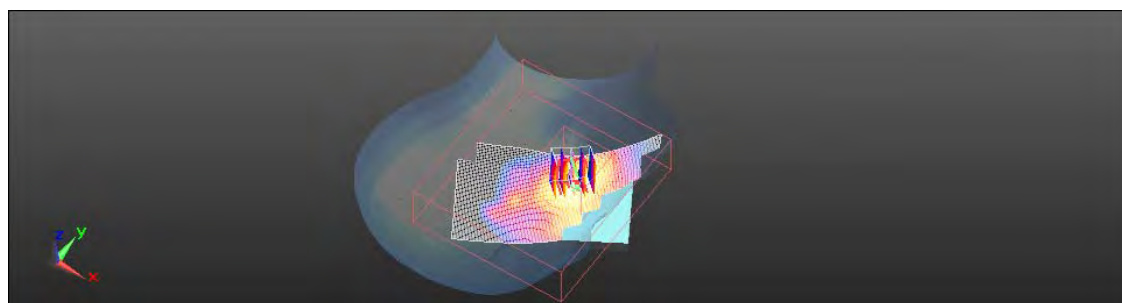
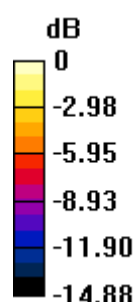
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.761 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.289 W/kg

**SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.116 mW/g**

Maximum value of SAR (measured) = 0.199 mW/g



0 dB = 0.200mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## RE Cheek\_CH512\_repeated with WTE Battery

Communication System: Generic GSM; Frequency: 1850.2 MHz

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.362$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.337 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

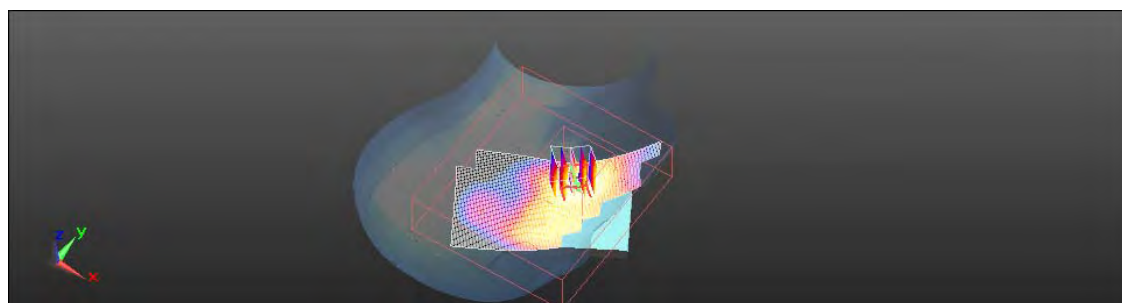
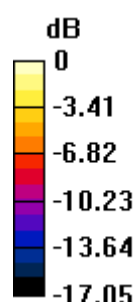
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.625 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.467 W/kg

**SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.189 mW/g**

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



0 dB = 0.330mW/g

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Date: 8/21/2011

## LE Cheek\_CH661

Communication System: Generic GSM; Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/LE Cheek/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.201 mW/g

## Configuration/LE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

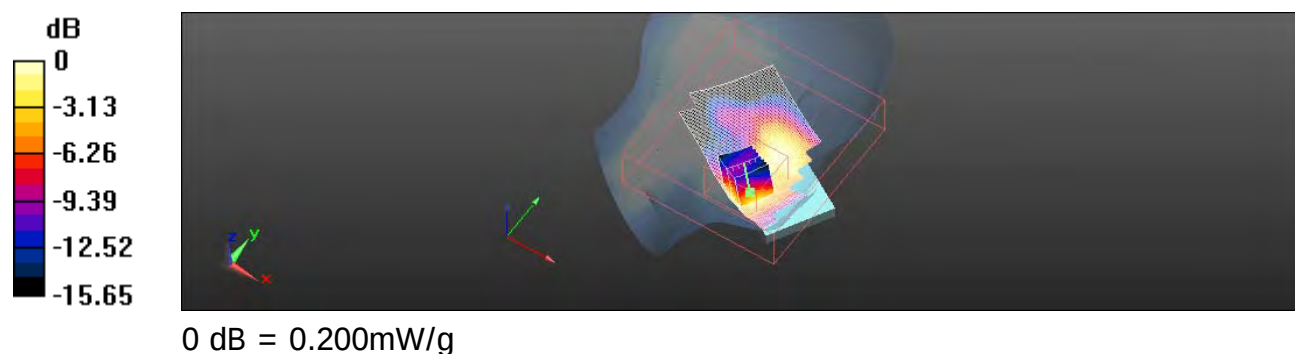
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.943 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.275 W/kg

**SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.116 mW/g**

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



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Date: 8/21/2011

## RE Tilt\_CH661

Communication System: Generic GSM; Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/RE Tilt/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.066 mW/g

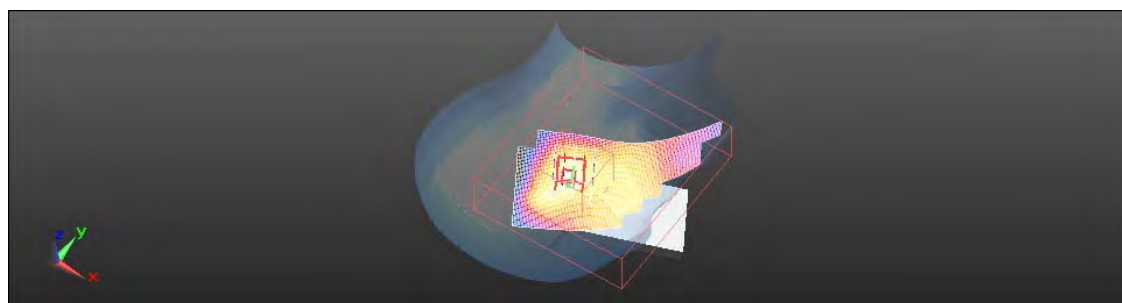
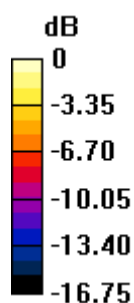
**Configuration/RE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.798 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.106 W/kg

**SAR(1 g) = 0.063 mW/g; SAR(10 g) = 0.037 mW/g**

Maximum value of SAR (measured) = 0.067 mW/g



0 dB = 0.070mW/g

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Date: 8/21/2011

## LE Tilt\_CH661

Communication System: Generic GSM; Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/LE Tilt/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.078 mW/g

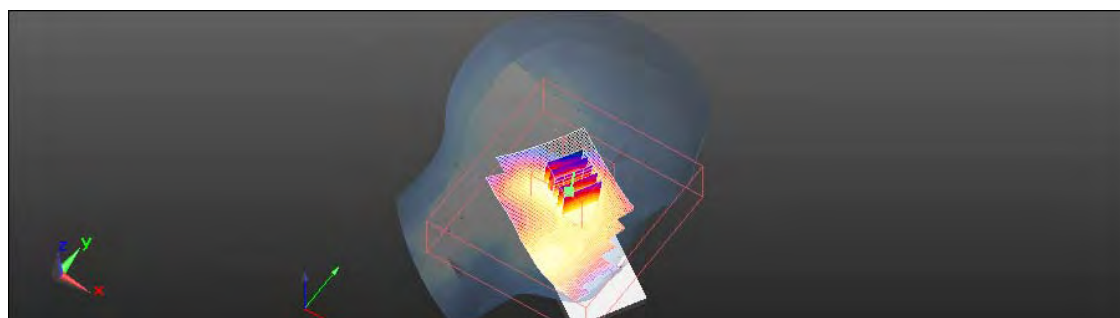
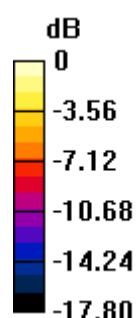
**Configuration/LE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.243 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.112 W/kg

**SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.041 mW/g**

Maximum value of SAR (measured) = 0.073 mW/g



0 dB = 0.070mW/g

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Date: 8/21/2011

## Body\_CH661\_Front Side

Communication System: GPRS(Class 11); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.436 mW/g

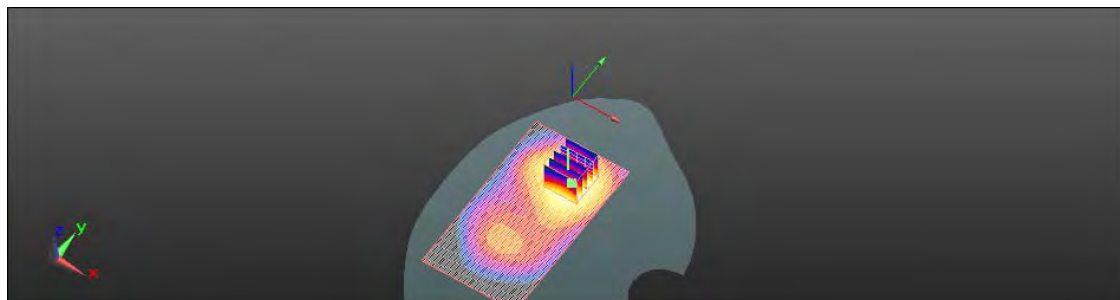
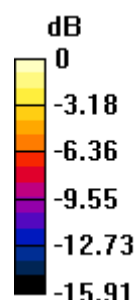
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.751 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.653 W/kg

**SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.228 mW/g**

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



0 dB = 0.410mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH512\_Back Side

Communication System: GPRS(Class 11); Frequency: 1850.2 MHz

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.465$  mho/m;  $\epsilon_r = 51.568$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.130 mW/g

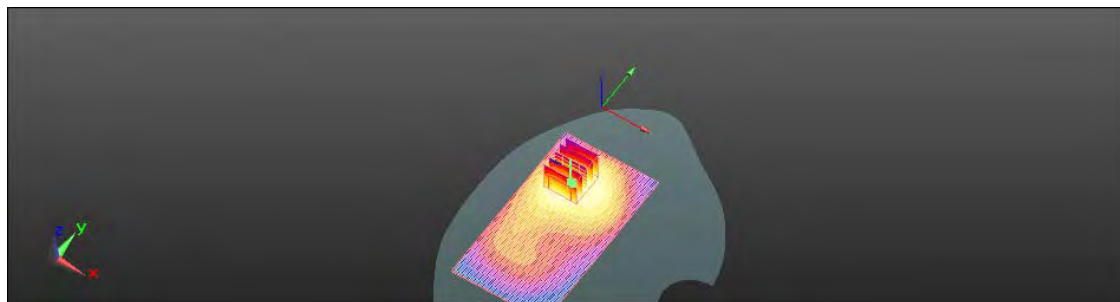
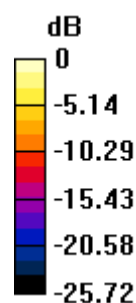
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.359 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 1.795 W/kg

**SAR(1 g) = 1 mW/g; SAR(10 g) = 0.547 mW/g**

Maximum value of SAR (measured) = 1.094 mW/g



0 dB = 1.090mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH661\_Back Side

Communication System: GPRS(Class 11); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.283 mW/g

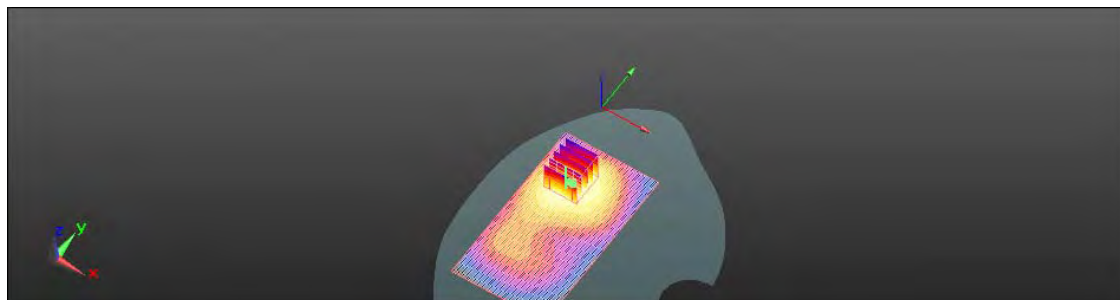
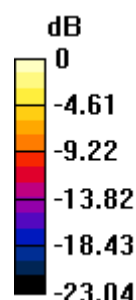
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.141 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.966 W/kg

**SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.620 mW/g**

Maximum value of SAR (measured) = 1.188 mW/g



0 dB = 1.190mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH810\_Back Side

Communication System: GPRS(Class 11); Frequency: 1909.8 MHz

Medium parameters used:  $f = 1910$  MHz;  $\sigma = 1.534$  mho/m;  $\epsilon_r = 51.402$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.236 mW/g

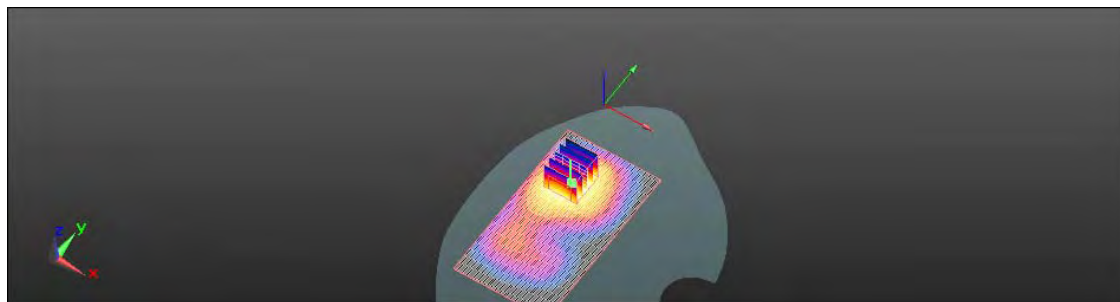
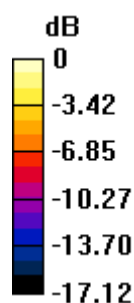
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.396 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.941 W/kg

**SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.630 mW/g**

Maximum value of SAR (measured) = 1.171 mW/g



0 dB = 1.170mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH661\_Bottom Side

Communication System: GPRS(Class 11); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.706 mW/g

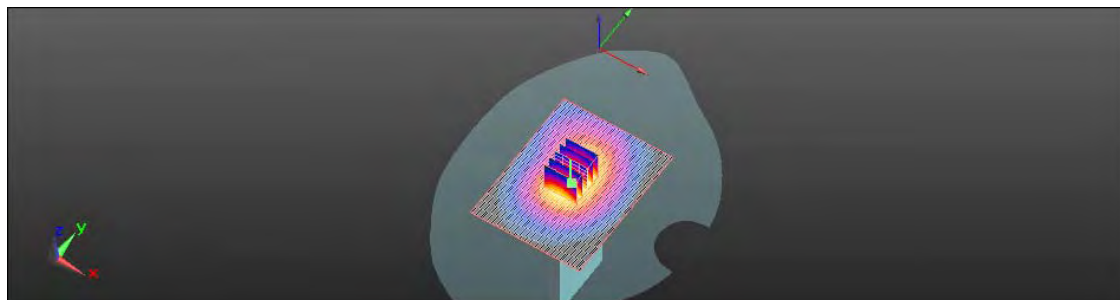
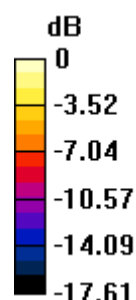
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.699 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.099 W/kg

**SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.339 mW/g**

Maximum value of SAR (measured) = 0.706 mW/g



0 dB = 0.710mW/g

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**SGS Taiwan Ltd.**

台灣檢驗科技股份有限公司

No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/21/2011

## Body\_CH661\_Right Side

Communication System: GPRS(Class 11); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.177 mW/g

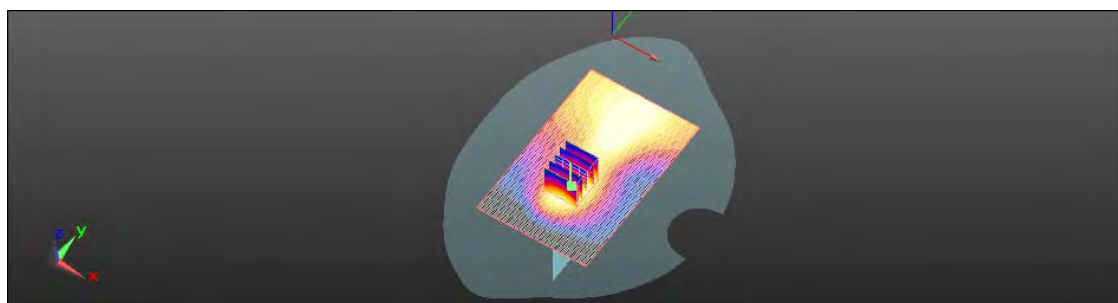
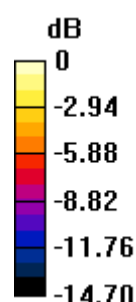
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.796 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.231 W/kg

**SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.085 mW/g**

Maximum value of SAR (measured) = 0.154 mW/g



0 dB = 0.150mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/21/2011

## Body\_CH661\_Left Side

Communication System: GPRS(Class 11); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

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

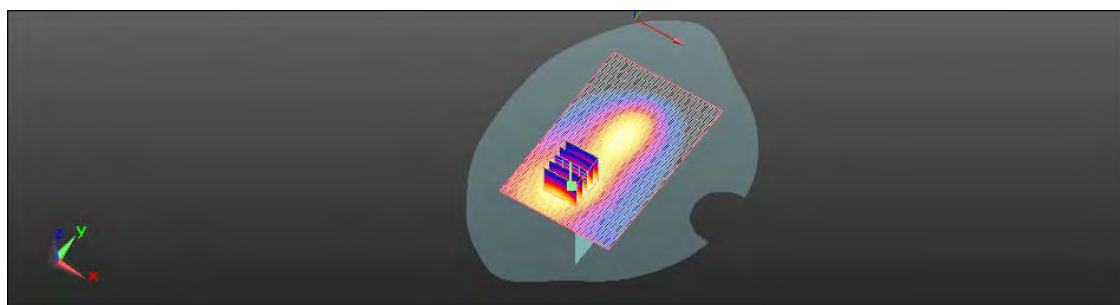
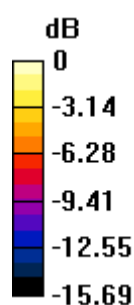
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.647 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.576 W/kg

**SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.208 mW/g**

Maximum value of SAR (measured) = 0.384 mW/g



0 dB = 0.380mW/g

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Date: 8/23/2011

## RE Cheek\_WLAN802.11b\_CH1

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2412 MHz  
Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.736$  mho/m;  $\epsilon_r = 37.373$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.135 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

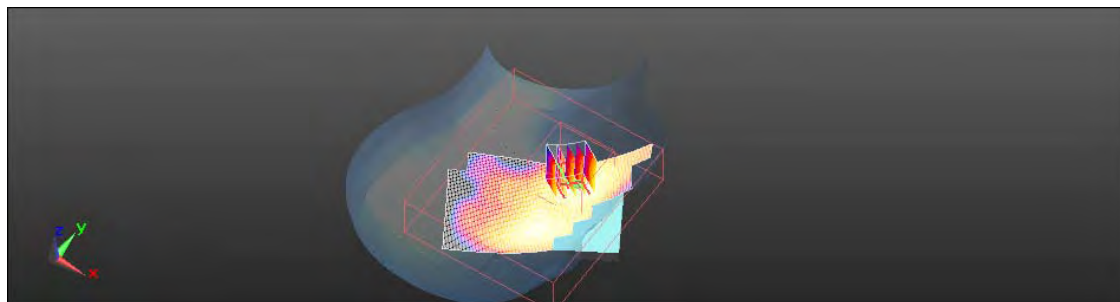
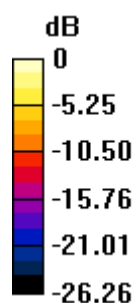
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.034 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 0.235 W/kg

**SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.063 mW/g**

Maximum value of SAR (measured) = 0.134 mW/g



0 dB = 0.130mW/g

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Date: 8/23/2011

## RE Cheek\_WLAN802.11b\_CH6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.772$  mho/m;  $\epsilon_r = 37.316$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.148 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

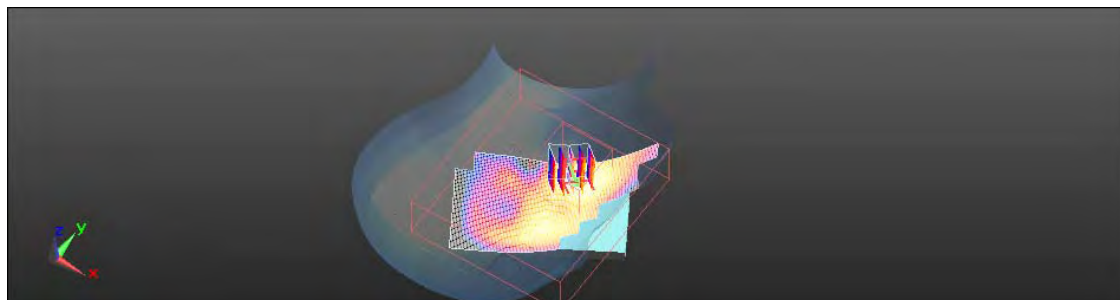
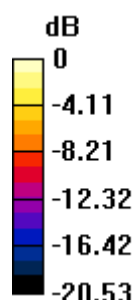
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.151 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.256 W/kg

**SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.067 mW/g**

Maximum value of SAR (measured) = 0.140 mW/g



0 dB = 0.140mW/g

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Date: 8/23/2011

## RE Cheek\_WLAN802.11b\_CH11

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2462 MHz  
Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.802$  mho/m;  $\epsilon_r = 37.209$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.111 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

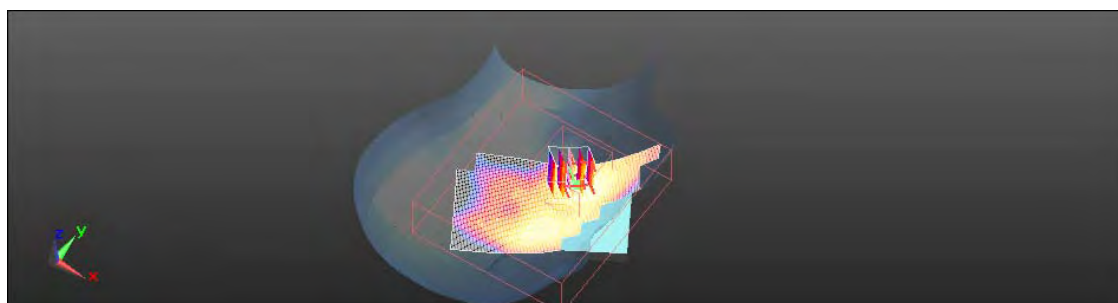
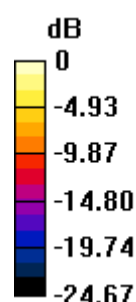
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.832 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.195 W/kg

**SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.050 mW/g**

Maximum value of SAR (measured) = 0.111 mW/g



0 dB = 0.110mW/g

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Date: 8/23/2011

## RE Cheek\_WLAN802.11b\_CH6\_repeated with WTE Battery

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.772 \text{ mho/m}$ ;  $\epsilon_r = 37.316$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Right Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

$dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.147 \text{ mW/g}$

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

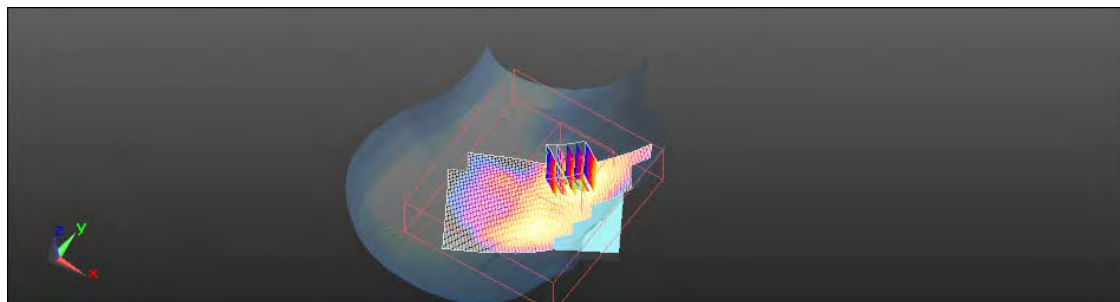
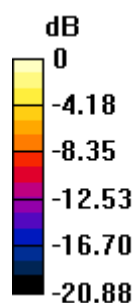
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $2.746 \text{ V/m}$ ; Power Drift =  $-0.13 \text{ dB}$

Peak SAR (extrapolated) =  $0.266 \text{ W/kg}$

**SAR(1 g) =  $0.131 \text{ mW/g}$ ; SAR(10 g) =  $0.066 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.144 \text{ mW/g}$



0 dB =  $0.140\text{mW/g}$

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Date: 8/23/2011

## LE Cheek\_WLAN802.11b\_CH6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.772 \text{ mho/m}$ ;  $\epsilon_r = 37.316$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Left Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/CE Tilt/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.114 \text{ mW/g}$

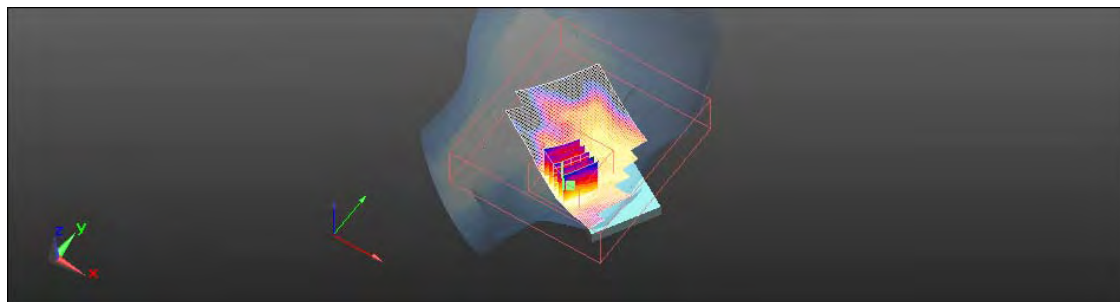
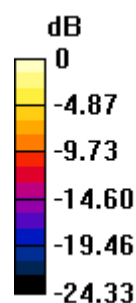
**Configuration/CE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $2.178 \text{ V/m}$ ; Power Drift =  $0.10 \text{ dB}$

Peak SAR (extrapolated) =  $0.197 \text{ W/kg}$

**SAR(1 g) =  $0.102 \text{ mW/g}$ ; SAR(10 g) =  $0.054 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.106 \text{ mW/g}$



0 dB =  $0.110\text{mW/g}$

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Date: 8/23/2011

## RE Tilt\_WLAN802.11b\_CH6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.772$  mho/m;  $\epsilon_r = 37.316$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/RE Tilt/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.062 mW/g

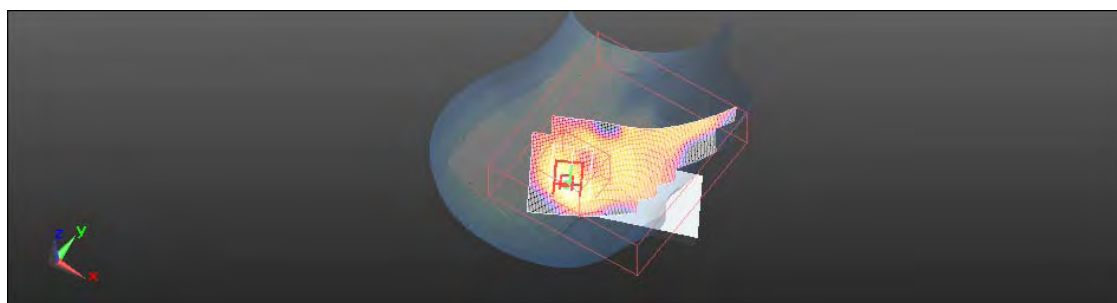
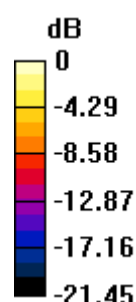
**Configuration/RE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.414 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.109 W/kg

**SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.026 mW/g**

Maximum value of SAR (measured) = 0.057 mW/g



0 dB = 0.060mW/g

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Date: 8/23/2011

## LE Tilt\_WLAN802.11b\_CH6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.772$  mho/m;  $\epsilon_r = 37.316$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/CE Tilt/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.057 mW/g

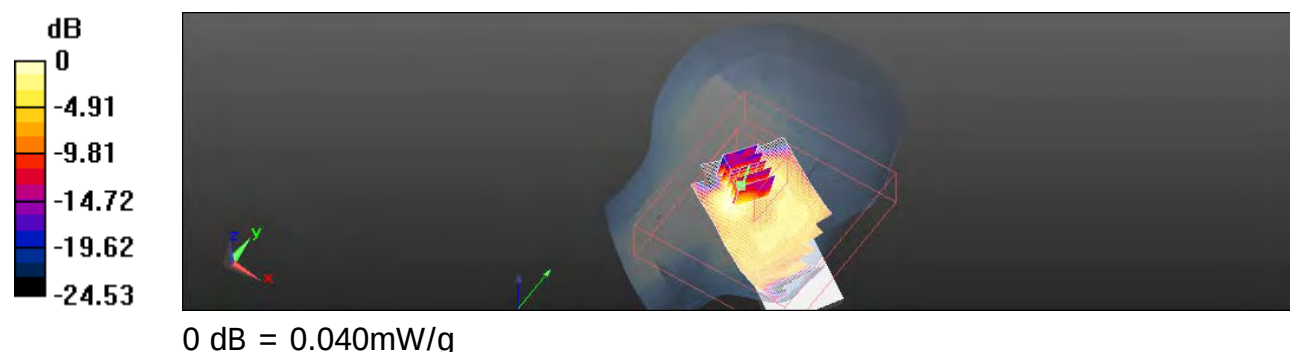
**Configuration/CE Tilt/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.828 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.063 W/kg

**SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.019 mW/g**

Maximum value of SAR (measured) = 0.041 mW/g



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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Front Side

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.952$  mho/m;  $\epsilon_r = 51.824$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

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

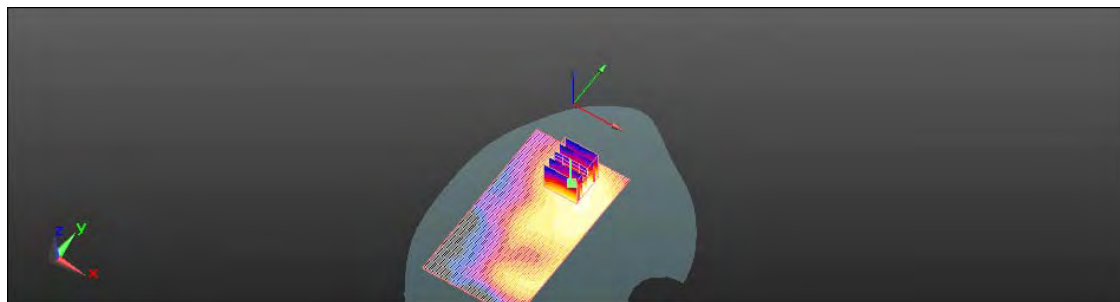
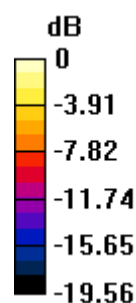
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.874 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.132 W/kg

**SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.038 mW/g**

Maximum value of SAR (measured) = 0.074 mW/g



0 dB = 0.070mW/g

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Back Side

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.177 \text{ mW/g}$

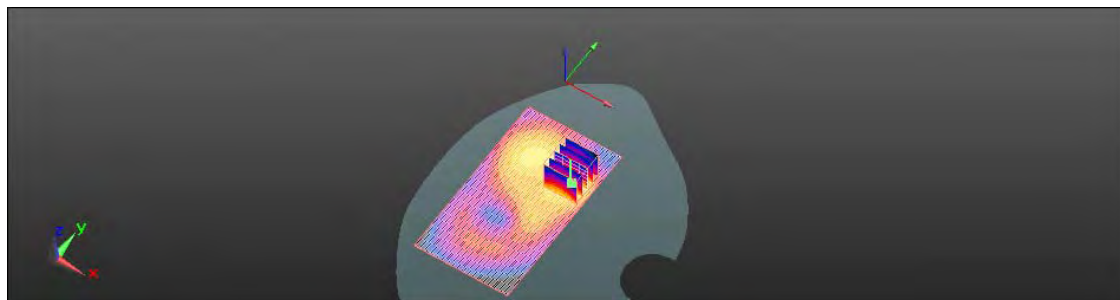
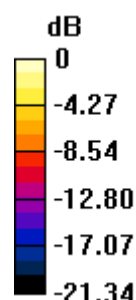
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $4.495 \text{ V/m}$ ; Power Drift =  $0.09 \text{ dB}$

Peak SAR (extrapolated) =  $0.446 \text{ W/kg}$

**SAR(1 g) =  $0.208 \text{ mW/g}$ ; SAR(10 g) =  $0.092 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.228 \text{ mW/g}$



0 dB =  $0.230\text{mW/g}$

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Back Side\_repeated with Cotron headset

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.176 \text{ mW/g}$

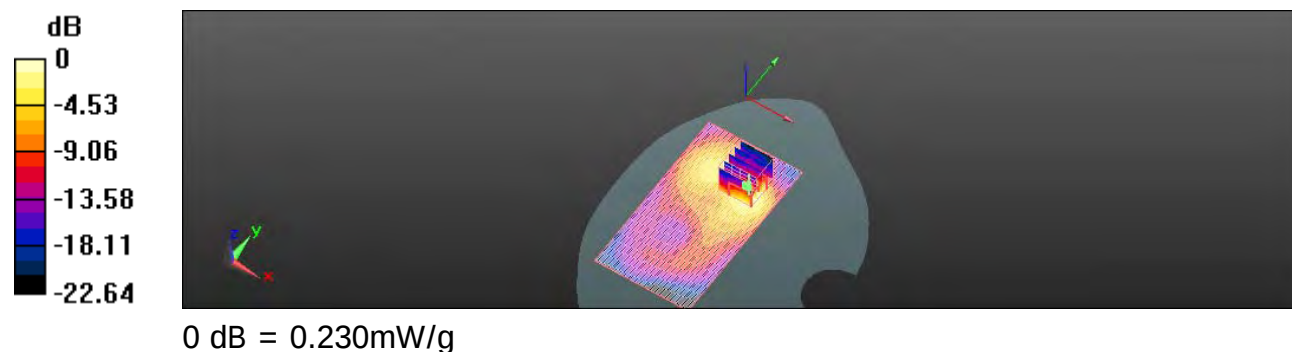
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $4.280 \text{ V/m}$ ; Power Drift =  $-0.08 \text{ dB}$

Peak SAR (extrapolated) =  $0.439 \text{ W/kg}$

**SAR(1 g) =  $0.204 \text{ mW/g}$ ; SAR(10 g) =  $0.091 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.226 \text{ mW/g}$



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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Back Side\_repeated with Foster headset

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.172 \text{ mW/g}$

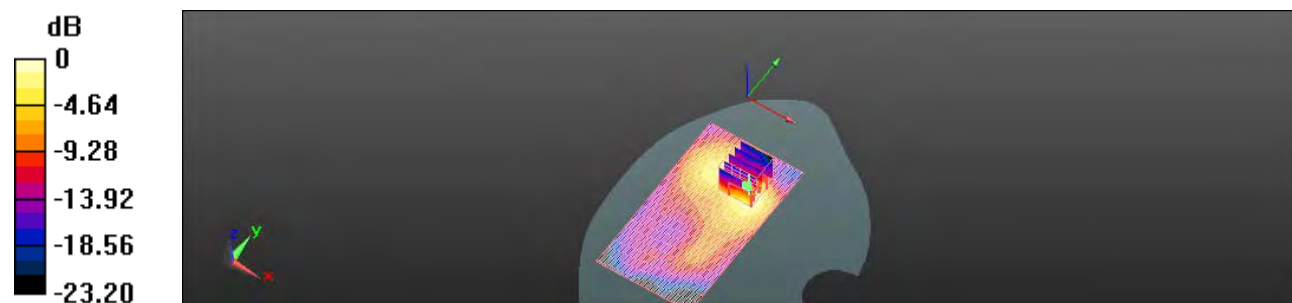
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $3.996 \text{ V/m}$ ; Power Drift =  $0.04 \text{ dB}$

Peak SAR (extrapolated) =  $0.437 \text{ W/kg}$

**SAR(1 g) =  $0.203 \text{ mW/g}$ ; SAR(10 g) =  $0.089 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.228 \text{ mW/g}$



0 dB =  $0.230\text{mW/g}$

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Back Side\_repeated with Merry headset

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.220 \text{ mW/g}$

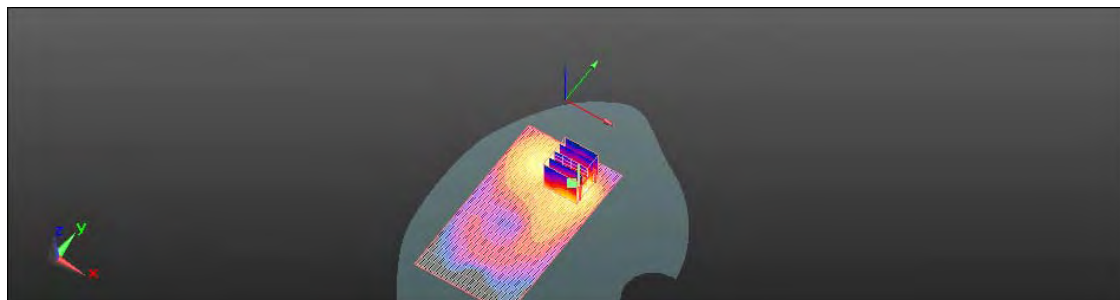
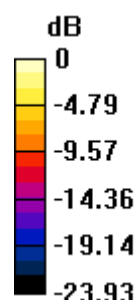
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $3.951 \text{ V/m}$ ; Power Drift =  $0.16 \text{ dB}$

Peak SAR (extrapolated) =  $0.529 \text{ W/kg}$

**SAR(1 g) =  $0.239 \text{ mW/g}$ ; SAR(10 g) =  $0.104 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.281 \text{ mW/g}$



0 dB =  $0.280\text{mW/g}$

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Back Side\_repeated with WTE Battery

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.219 \text{ mW/g}$

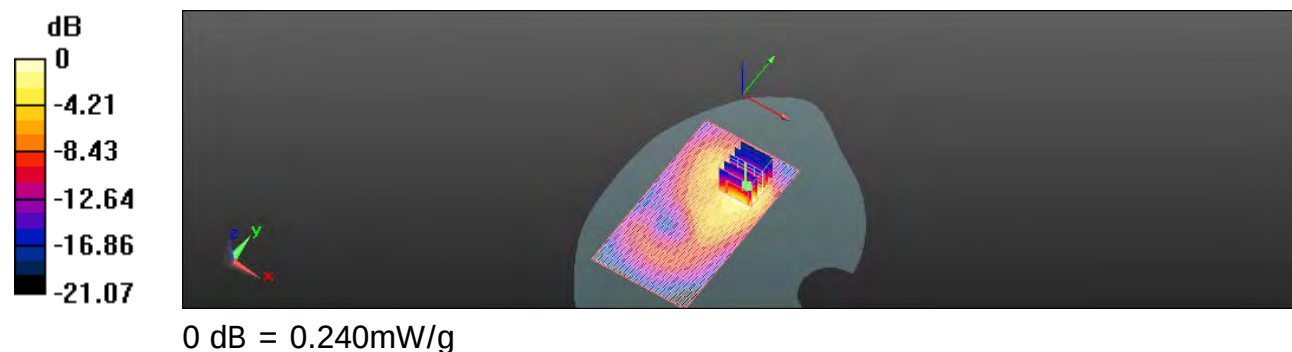
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $4.773 \text{ V/m}$ ; Power Drift =  $0.08 \text{ dB}$

Peak SAR (extrapolated) =  $0.502 \text{ W/kg}$

**SAR(1 g) =  $0.222 \text{ mW/g}$ ; SAR(10 g) =  $0.101 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.239 \text{ mW/g}$



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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Bottom Side

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.952$  mho/m;  $\epsilon_r = 51.824$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x91x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.026 mW/g

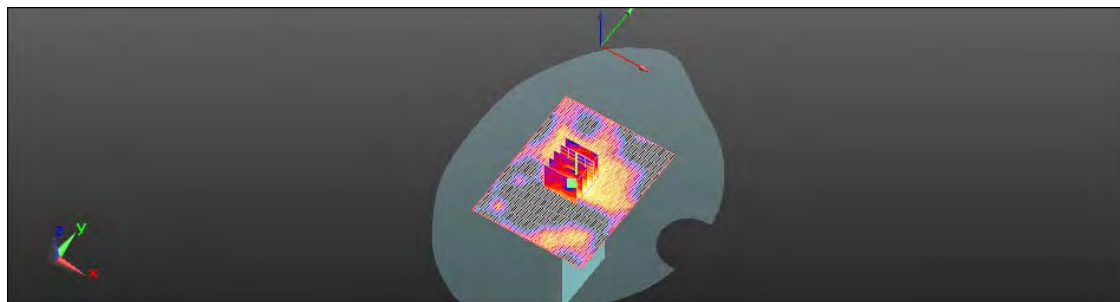
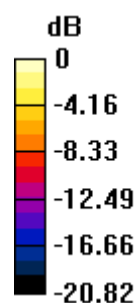
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.643 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.025 W/kg

**SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00832 mW/g**

Maximum value of SAR (measured) = 0.017 mW/g



0 dB = 0.020mW/g

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Right Side

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437 \text{ MHz}$ ;  $\sigma = 1.952 \text{ mho/m}$ ;  $\epsilon_r = 51.824$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) =  $0.091 \text{ mW/g}$

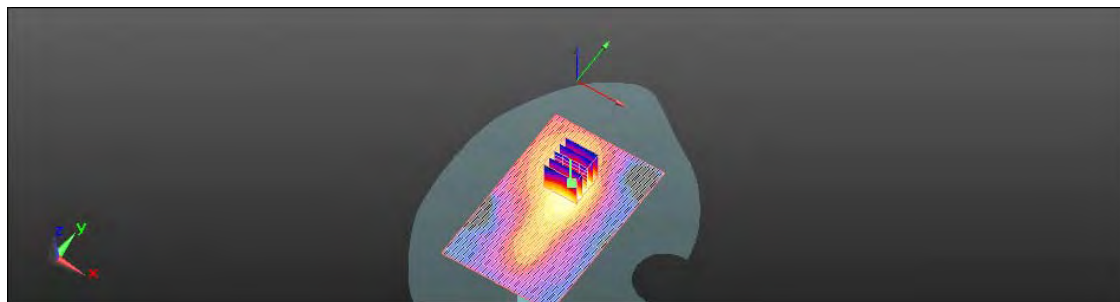
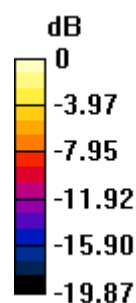
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $4.376 \text{ V/m}$ ; Power Drift =  $0.06 \text{ dB}$

Peak SAR (extrapolated) =  $0.151 \text{ W/kg}$

**SAR(1 g) =  $0.083 \text{ mW/g}$ ; SAR(10 g) =  $0.045 \text{ mW/g}$**

Maximum value of SAR (measured) =  $0.089 \text{ mW/g}$



0 dB =  $0.090\text{mW/g}$

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Date: 8/23/2011

## Body\_WLAN802.11b\_CH6\_Left Side

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.952$  mho/m;  $\epsilon_r = 51.824$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.057 mW/g

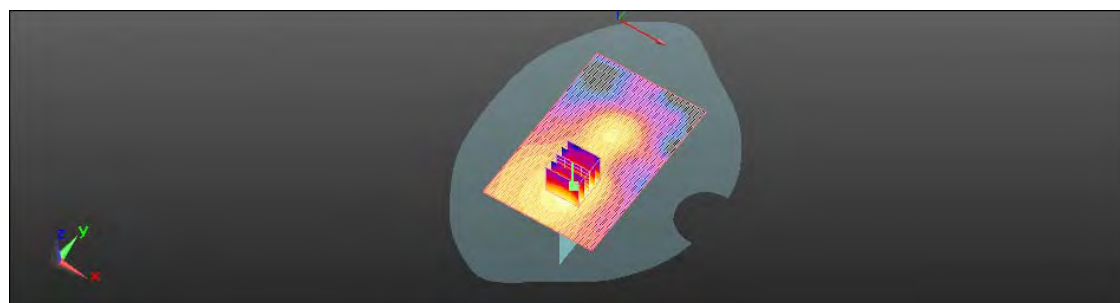
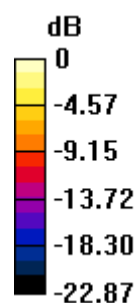
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.670 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.101 W/kg

**SAR(1 g) = 0.053 mW/g; SAR(10 g) = 0.027 mW/g**

Maximum value of SAR (measured) = 0.060 mW/g



0 dB = 0.060mW/g

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Date: 8/23/2011

## Body\_Front side\_Bluetooth\_CH39

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: Muscle 2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.958 \text{ mho/m}$ ;  $\epsilon_r = 51.81$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x131x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.010 mW/g

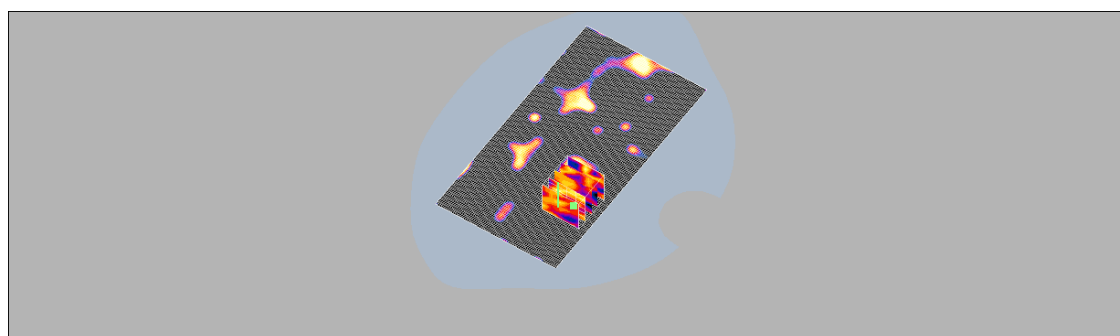
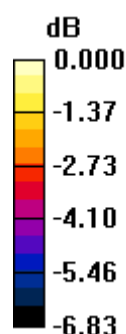
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 1.20 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.007 W/kg

**SAR(1 g) = 0.00245 mW/g; SAR(10 g) = 0.00111 mW/g**

Maximum value of SAR (measured) = 0.004 mW/g



0 dB = 0.004mW/g

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Date: 8/23/2011

## Body\_Back side\_Bluetooth\_CH39

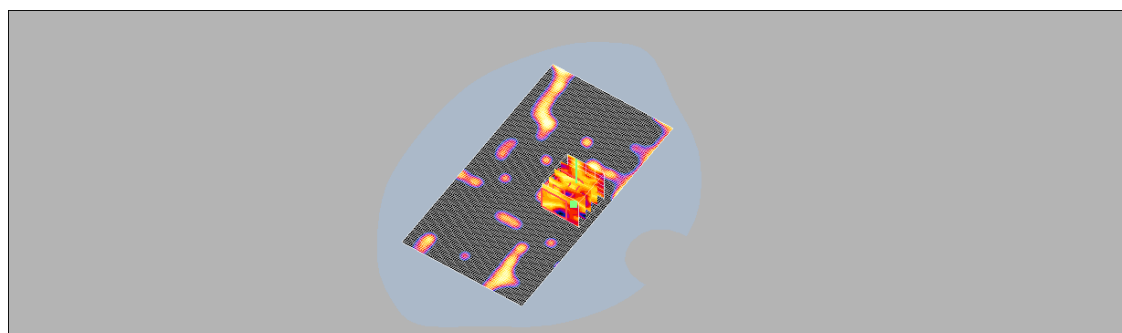
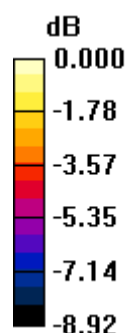
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1  
Medium: Muscle 2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.958 \text{ mho/m}$ ;  $\epsilon_r = 51.81$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (71x131x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
Maximum value of SAR (interpolated) = 0.011 mW/g

**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value = 1.11 V/m; Power Drift = 0.12 dB  
Peak SAR (extrapolated) = 0.005 W/kg

**SAR(1 g) = 0.00211 mW/g; SAR(10 g) = 0.000917 mW/g**  
Maximum value of SAR (measured) = 0.004 mW/g



0 dB = 0.004mW/g

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Date: 8/23/2011

## Body\_Bottom side\_Bluetooth\_CH39

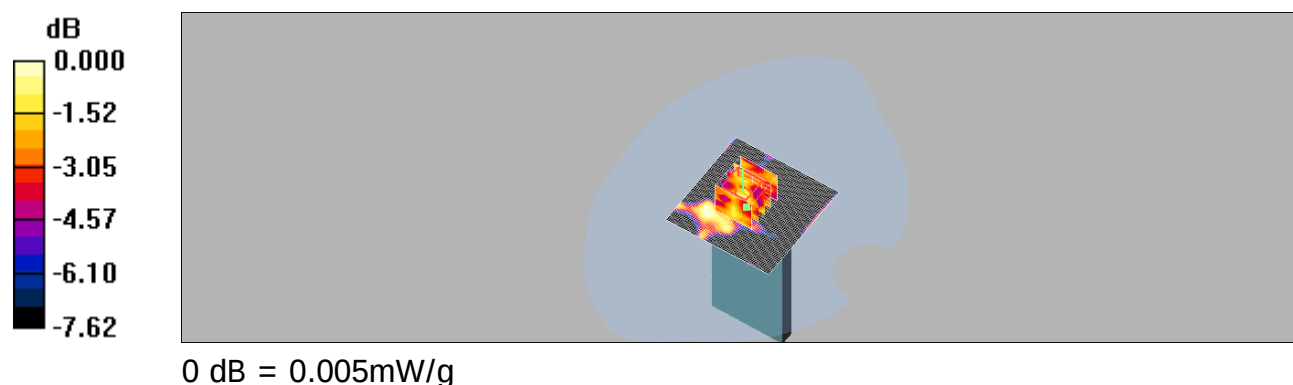
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1  
Medium: Muscle 2450 Medium parameters used:  $f = 2441$  MHz;  $\sigma = 1.958$  mho/m;  $\epsilon_r = 51.81$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.007 mW/g

**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 1.31 V/m; Power Drift = 0.15 dB  
Peak SAR (extrapolated) = 0.015 W/kg

**SAR(1 g) = 0.00375 mW/g; SAR(10 g) = 0.00184 mW/g**  
Maximum value of SAR (measured) = 0.005 mW/g



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Date: 8/23/2011

## Body\_Right side\_Bluetooth\_CH39

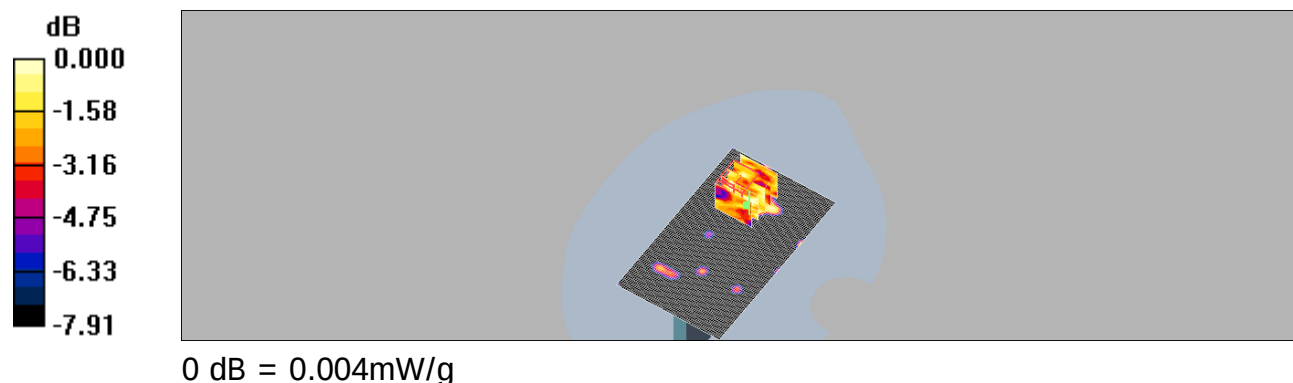
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1  
Medium: Muscle 2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.958 \text{ mho/m}$ ;  $\epsilon_r = 51.81$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x101x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
Maximum value of SAR (interpolated) =  $0.011 \text{ mW/g}$

**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value =  $0.980 \text{ V/m}$ ; Power Drift =  $-0.049 \text{ dB}$   
Peak SAR (extrapolated) =  $0.010 \text{ W/kg}$

**SAR(1 g) =  $0.00267 \text{ mW/g}$ ; SAR(10 g) =  $0.00153 \text{ mW/g}$**   
Maximum value of SAR (measured) =  $0.004 \text{ mW/g}$



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Date: 8/23/2011

## Body\_Left side\_Bluetooth\_CH39

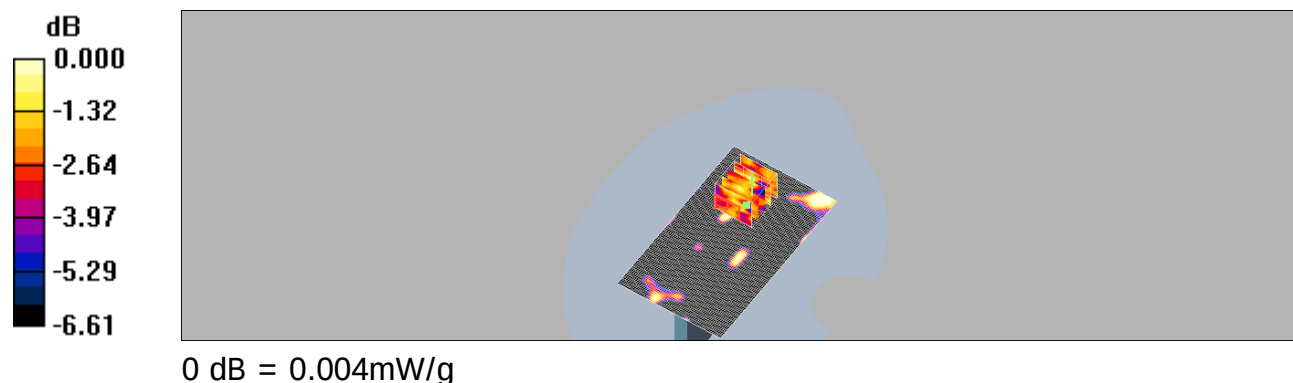
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1  
Medium: Muscle 2450 Medium parameters used:  $f = 2441$  MHz;  $\sigma = 1.958$  mho/m;  $\epsilon_r = 51.81$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)  
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 0.009 mW/g

**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 1.27 V/m; Power Drift = 0.18 dB  
Peak SAR (extrapolated) = 0.004 W/kg

**SAR(1 g) = 0.00245 mW/g; SAR(10 g) = 0.00101 mW/g**  
Maximum value of SAR (measured) = 0.004 mW/g



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Date: 8/20/2011

## RE Cheek\_CH251\_DTM

Communication System: Generic GSM; Frequency: 848.6 MHz

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.911$  mho/m;  $\epsilon_r = 41.608$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.256 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

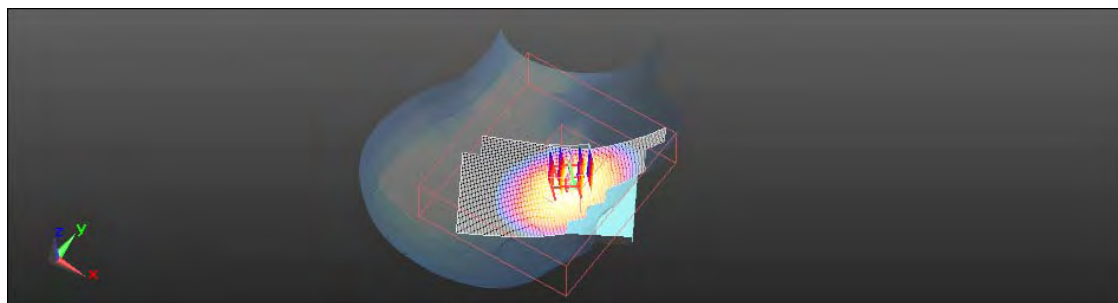
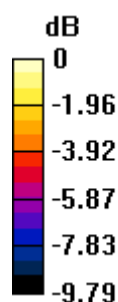
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.230 V/m; Power Drift = -0.0083 dB

Peak SAR (extrapolated) = 0.321 W/kg

**SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.185 mW/g**

Maximum value of SAR (measured) = 0.263 mW/g



0 dB = 0.260mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/20/2011

## RE Cheek\_CH128\_GPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

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

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

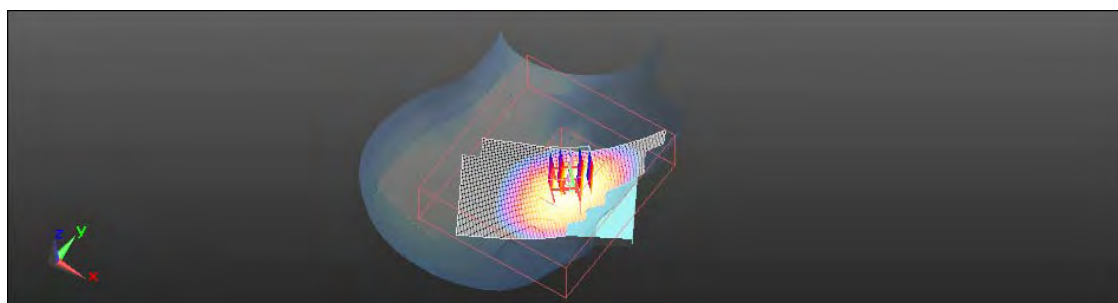
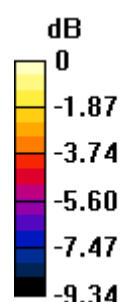
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.911 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.463 W/kg

**SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.265 mW/g**

Maximum value of SAR (measured) = 0.371 mW/g



0 dB = 0.370mW/g

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Date: 8/20/2011

## RE Cheek\_CH128\_EGPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.104 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

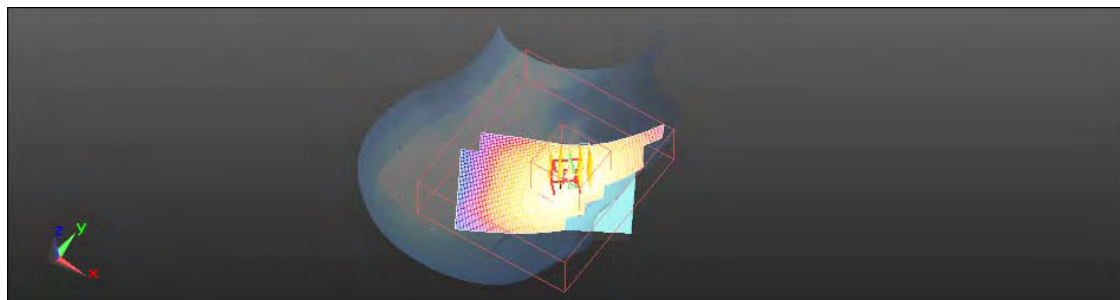
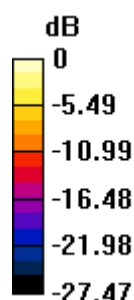
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.337 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.130 W/kg

**SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.073 mW/g**

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



0 dB = 0.100mW/g

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Date: 8/21/2011

## RE Cheek\_CH512\_DTM

Communication System: Generic GSM; Frequency: 1850.2 MHz

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.362$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.405 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

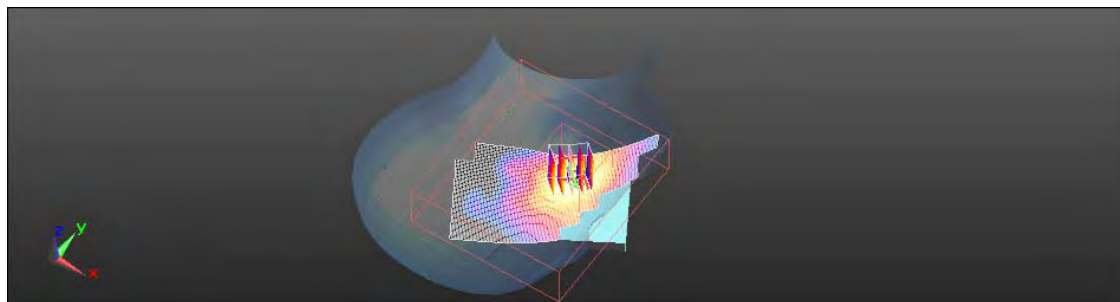
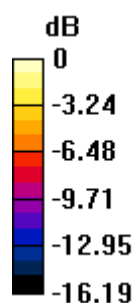
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.658 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.539 W/kg

**SAR(1 g) = 0.356 mW/g; SAR(10 g) = 0.218 mW/g**

Maximum value of SAR (measured) = 0.384 mW/g



0 dB = 0.380mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/21/2011

## RE Cheek\_CH661\_GPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.525 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

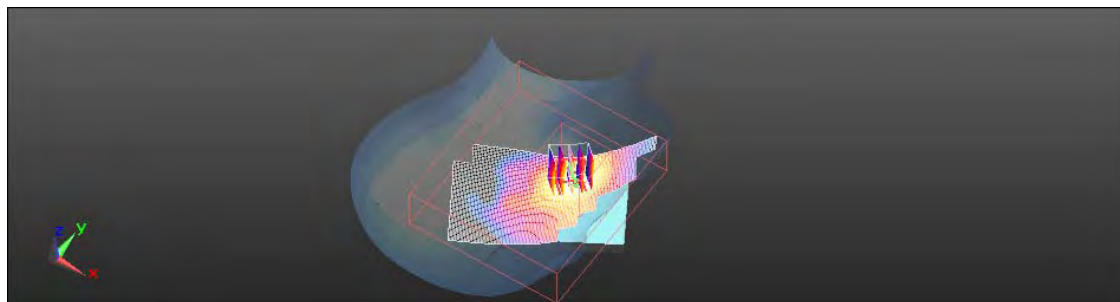
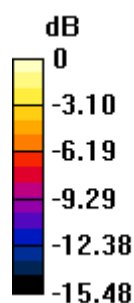
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.067 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.730 W/kg

**SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.291 mW/g**

Maximum value of SAR (measured) = 0.528 mW/g



0 dB = 0.530mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/21/2011

## RE Cheek\_CH661\_EGPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.399$  mho/m;  $\epsilon_r = 39.243$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

### Configuration/RE Cheek/Area Scan (61x111x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.170 mW/g

### Configuration/RE Cheek/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

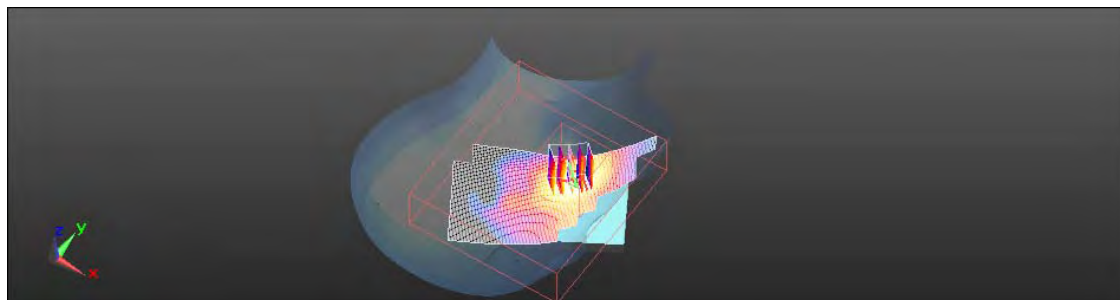
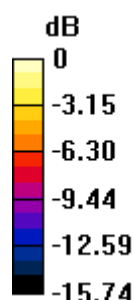
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.224 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.241 W/kg

**SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.097 mW/g**

Maximum value of SAR (measured) = 0.173 mW/g



0 dB = 0.170mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

[www.sgs.com.tw](http://www.sgs.com.tw)

Date: 8/20/2011

## Body\_CH128\_Back Side\_GSM\_DTM

Communication System: Generic GSM; Frequency: 848.6 MHz

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.018$  mho/m;  $\epsilon_r = 53.71$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

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

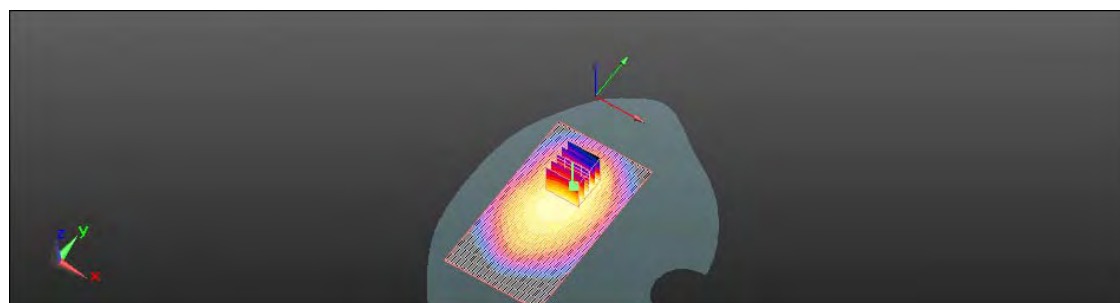
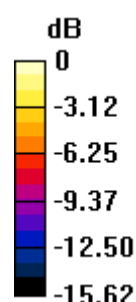
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.867 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.868 W/kg

**SAR(1 g) = 0.488 mW/g; SAR(10 g) = 0.291 mW/g**

Maximum value of SAR (measured) = 0.524 mW/g



0 dB = 0.520mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## Body\_CH128\_Back Side\_DTM

Communication System: GPRS(Class 10); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.910 mW/g

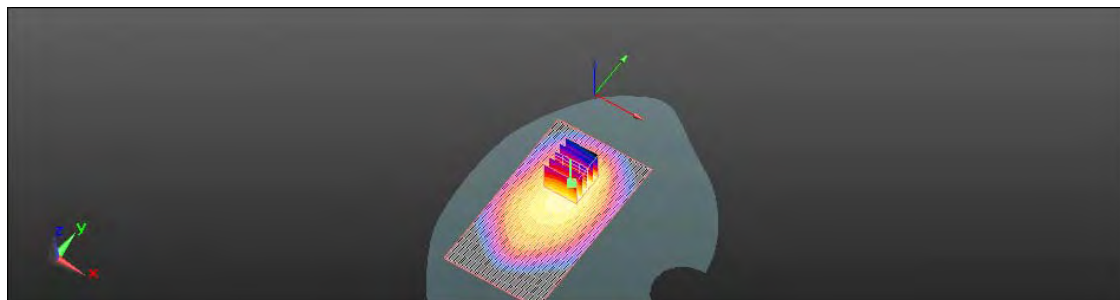
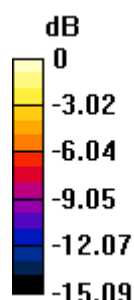
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.285 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 1.444 W/kg

**SAR(1 g) = 0.817 mW/g; SAR(10 g) = 0.486 mW/g**

Maximum value of SAR (measured) = 0.883 mW/g



0 dB = 0.880mW/g

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No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan. / 台北縣五股工業區五工路136之1號

t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

## Body\_CH128\_Back Side\_EGPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 824.2 MHz

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.999$  mho/m;  $\epsilon_r = 53.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.224 mW/g

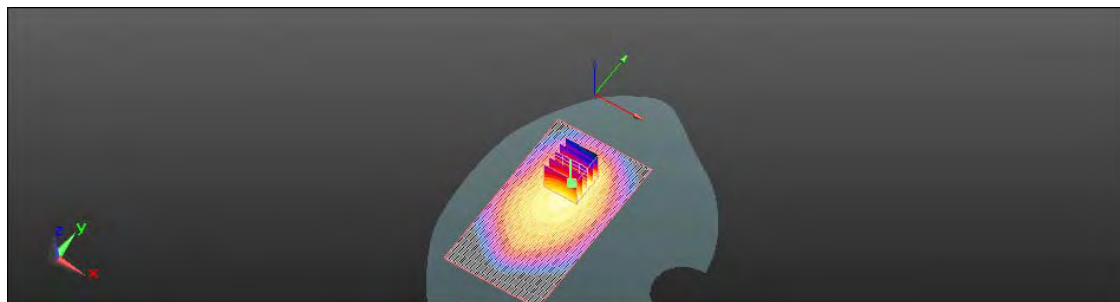
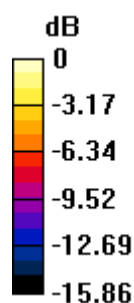
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.561 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.362 W/kg

**SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.123 mW/g**

Maximum value of SAR (measured) = 0.226 mW/g



0 dB = 0.230mW/g

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Date: 8/21/2011

## Body\_CH512\_Back Side\_GSM\_DTM

Communication System: Generic GSM; Frequency: 1850.2 MHz

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.465$  mho/m;  $\epsilon_r = 51.568$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.441 mW/g

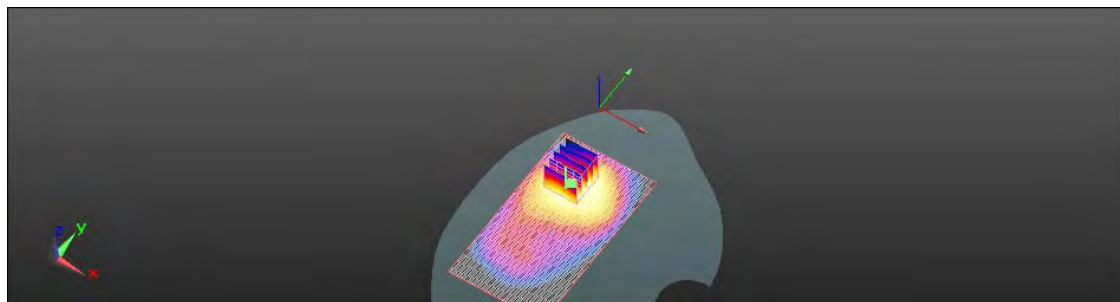
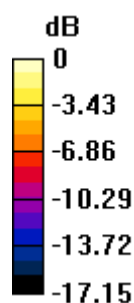
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.946 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.622 W/kg

**SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.208 mW/g**

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



0 dB = 0.390mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH661\_Back Side\_DTM

Communication System: GPRS(Class 10); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.749 mW/g

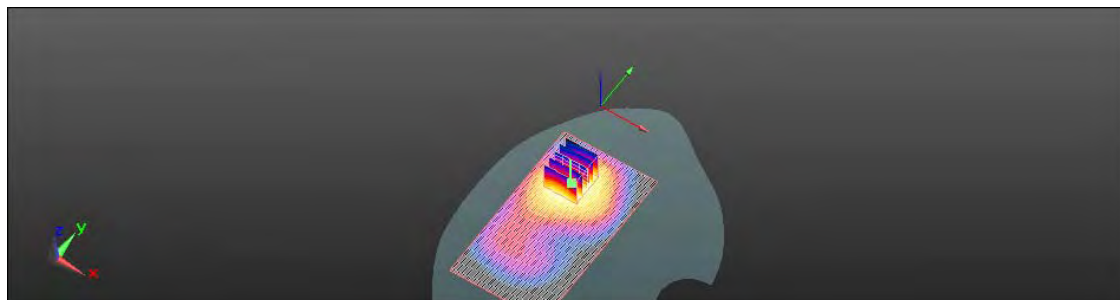
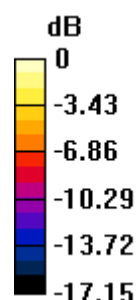
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.070 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.158 W/kg

**SAR(1 g) = 0.648 mW/g; SAR(10 g) = 0.365 mW/g**

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



0 dB = 0.690mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/21/2011

## Body\_CH661\_Back Side\_EGPRS\_DTM

Communication System: GPRS(Class 10); Frequency: 1880 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.497$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration/Body/Area Scan (61x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.222 mW/g

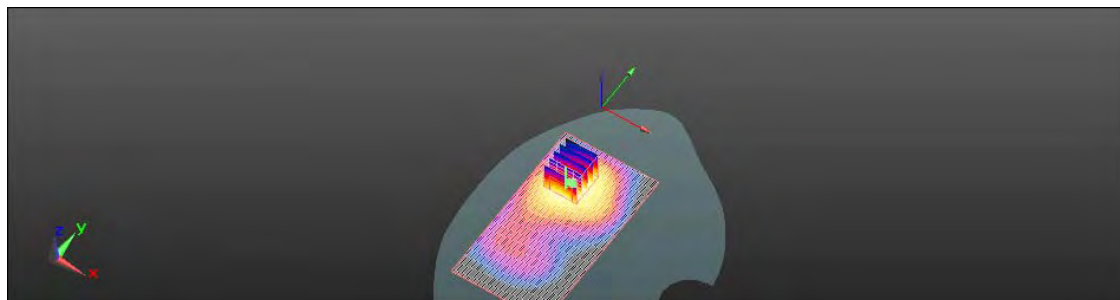
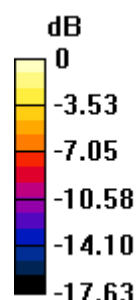
**Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.121 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.332 W/kg

**SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.108 mW/g**

Maximum value of SAR (measured) = 0.213 mW/g



0 dB = 0.210mW/g

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## 5. System Verification

Date: 8/20/2011

Communication System: CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.898 \text{ mho/m}$ ;  $\epsilon_r = 41.806$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.25, 9.25, 9.25); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration /d=15mm, Pin=250mW, dist=4mm:** Measurement grid:

$dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.468 mW/g

**Configuration /d=15mm, Pin=250mW, dist=4mm:** Measurement grid:

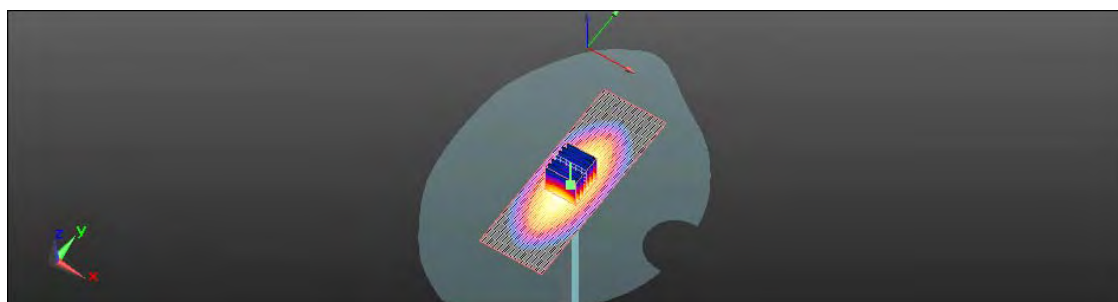
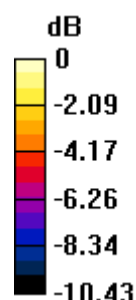
$dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.614 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 3.213 W/kg

**SAR(1 g) = 2.34 mW/g; SAR(10 g) = 1.53 mW/g**

Maximum value of SAR (measured) = 2.421 mW/g



0 dB = 2.420mW/g

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t (886-2) 2299-3939

f (886-2) 2299-9489

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Date: 8/20/2011

Communication System: CW; Frequency: 835 MHz

Medium parameters used:  $f = 835$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 53.842$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration / d=15mm, Pin=250mW, dist=4mm:** Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.682 mW/g

**Configuration / d=15mm, Pin=250mW, dist=4mm:** Measurement grid:

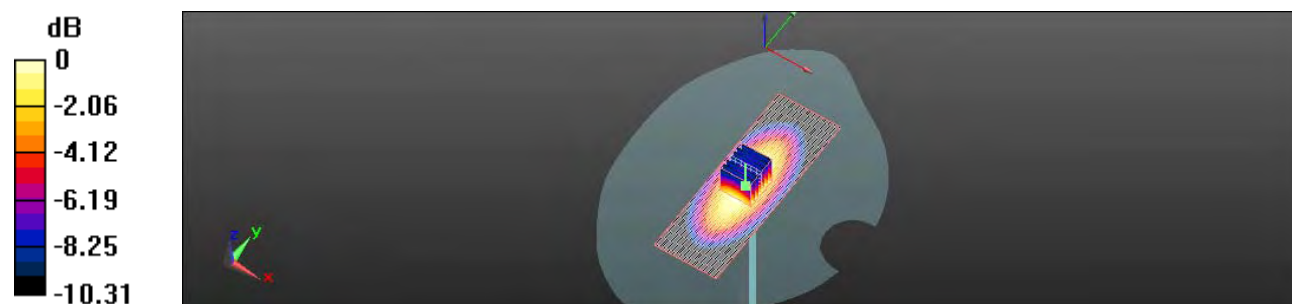
dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.102 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.693 W/kg

**SAR(1 g) = 2.49 mW/g; SAR(10 g) = 1.62 mW/g**

Maximum value of SAR (measured) = 2.689 mW/g



0 dB = 2.690mW/g

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Date: 8/21/2011

Communication System: CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.419$  mho/m;  $\epsilon_r = 39.216$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration /d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.789 mW/g

**Configuration /d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

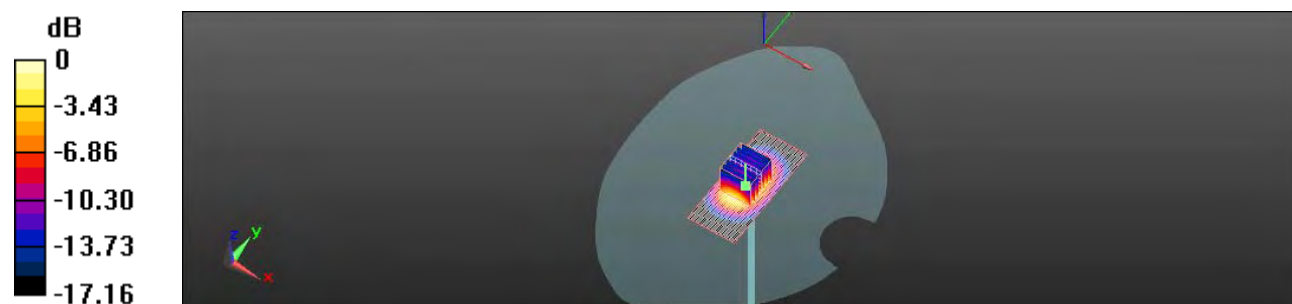
dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.752 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 17.691 W/kg

**SAR(1 g) = 9.7 mW/g; SAR(10 g) = 5.08 mW/g**

Maximum value of SAR (measured) = 10.962 mW/g



0 dB = 10.960mW/g

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Date: 8/21/2011

Communication System: CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.521$  mho/m;  $\epsilon_r = 51.436$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration /d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.098 mW/g

**Configuration /d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

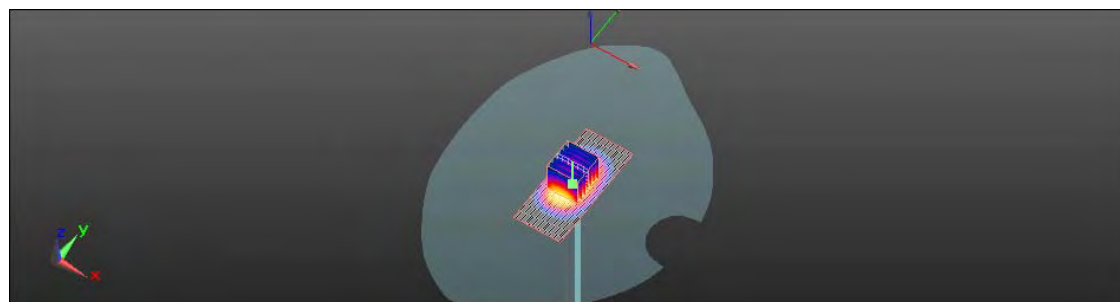
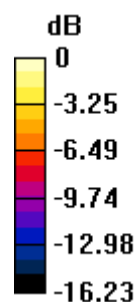
dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.866 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 16.962 W/kg

**SAR(1 g) = 9.83 mW/g; SAR(10 g) = 5.24 mW/g**

Maximum value of SAR (measured) = 11.189 mW/g



0 dB = 11.190mW/g

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Date: 8/23/2011

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.788$  mho/m;  $\epsilon_r = 37.268$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.99, 6.99, 6.99); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration / d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 18.362 mW/g

**Configuration / d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

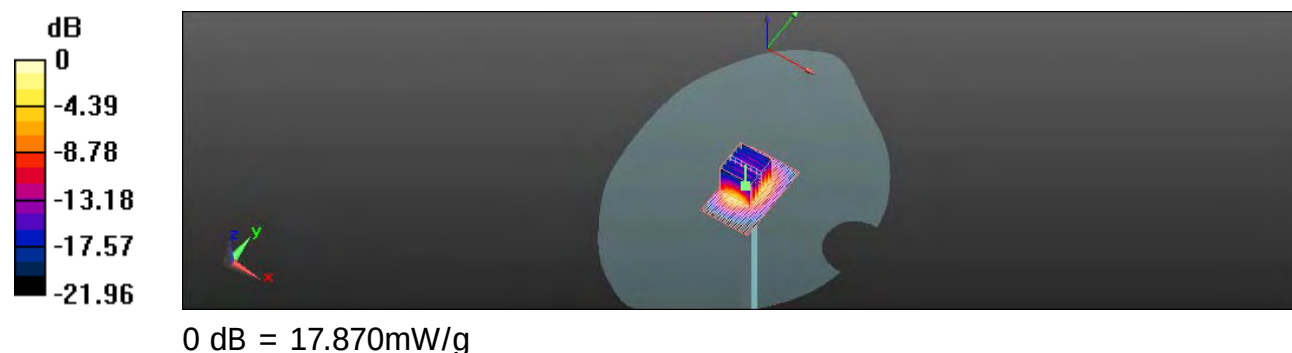
dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.880 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 28.224 W/kg

**SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.3 mW/g**

Maximum value of SAR (measured) = 17.874 mW/g



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Date: 8/23/2011

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.971$  mho/m;  $\epsilon_r = 51.762$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(6.96, 6.96, 6.96); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Configuration / d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 16.297 mW/g

**Configuration / d=10mm, Pin=250mW, dist=4mm:** Measurement grid:

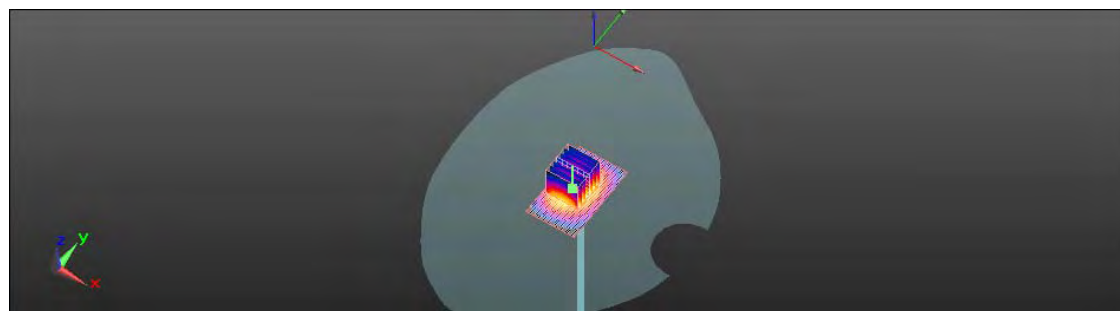
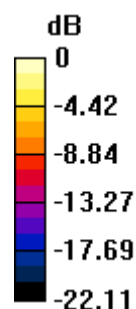
dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.877 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 29.115 W/kg

**SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.7 mW/g**

Maximum value of SAR (measured) = 15.306 mW/g



0 dB = 15.310mW/g

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## 6. DAE & Probe Calibration certificate

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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: DAE4-856\_May11

### CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BJ - SN: 856**

Calibration procedure(s) **QA CAL-06.v23  
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **May 18, 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 | 07-Jun-10 (in house check) | In house check: Jun-11 |

|                |                           |                        |                                                                                                    |
|----------------|---------------------------|------------------------|----------------------------------------------------------------------------------------------------|
| Calibrated by: | Name<br>Dominique Steffen | Function<br>Technician | Signature<br> |
| Approved by:   | Fin Bomholt               | R&D Director           |                |

Issued: May 18, 2011

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Certificate No: DAE4-856\_May11

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Accreditation No.: SCS 108

Client **SGS-TW (Auden)**

Certificate No: **EX3-3770\_Apr11**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3770**

Calibration procedure(s) **QA CAL-01.v7, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v3**  
Calibration procedure for dosimetric E-field probes

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 E4419B         | GB41293874      | 31-Mar-11 (No. 217-01372)         | Apr-12                 |
| Power sensor E4412A        | MY41495277      | 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         | 23-Apr-10 (No. DAE4-654_Apr10)    | Apr-11                 |
| 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 |

Calibrated by: **Name** **Function** **Signature**  
**Katja Pokovic** **Technical Manager**

Approved by: **Fin Bomholt** **R&D Director**

Issued: April 19, 2011

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Certificate No: EX3-3770\_Apr11

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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 $\phi$      | $\phi$ rotation around probe axis                                                                                                                       |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\vartheta = 0$ 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  $\vartheta = 0$  ( $f \leq 900$  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> are numerical linearization parameters in dB assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- VR: VR is the validity range of the calibration related to the average diode voltage or DAE voltage in mV.
- 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.

Certificate No: EX3-3770\_Apr11

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t (886-2) 2299-3939

f (886-2) 2299-9489

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EX3DV4 – SN:3770

April 19, 2011

# Probe EX3DV4

## SN:3770

Manufactured: July 6, 2010  
Calibrated: April 19, 2011

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)

Certificate No: EX3-3770\_Apr11

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EX3DV4- SN:3770

April 19, 2011

**DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770****Basic Calibration Parameters**

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|-----------------------------------------------------------|----------|----------|----------|-----------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.32     | 0.62     | 0.40     | ± 10.1 %  |
| DCP (mV) <sup>B</sup>                                     | 106.6    | 98.3     | 102.8    |           |

**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    | 120.8    | ±2.7 %                    |
|       |                           |      | Y | 0.00    | 0.00    | 1.00    | 134.3    |                           |
|       |                           |      | Z | 0.00    | 0.00    | 1.00    | 133.5    |                           |

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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f (886-2) 2299-9489

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EX3DV4- SN:3770

April 19, 2011

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

### 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                            | 9.58    | 9.58    | 9.58    | 0.80  | 0.70       | ± 12.0 %    |
| 835                  | 41.5                               | 0.90                            | 9.25    | 9.25    | 9.25    | 0.80  | 0.67       | ± 12.0 %    |
| 900                  | 41.5                               | 0.97                            | 9.06    | 9.06    | 9.06    | 0.76  | 0.71       | ± 12.0 %    |
| 1750                 | 40.1                               | 1.37                            | 7.97    | 7.97    | 7.97    | 0.80  | 0.61       | ± 12.0 %    |
| 1900                 | 40.0                               | 1.40                            | 7.78    | 7.78    | 7.78    | 0.71  | 0.62       | ± 12.0 %    |
| 2000                 | 40.0                               | 1.40                            | 7.79    | 7.79    | 7.79    | 0.75  | 0.58       | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 6.99    | 6.99    | 6.99    | 0.80  | 0.56       | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 6.95    | 6.95    | 6.95    | 0.66  | 0.62       | ± 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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## DASY/EASY - Parameters of Probe: EX3DV4- SN:3770

### 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                            | 9.42    | 9.42    | 9.42    | 0.73  | 0.72       | ± 12.0 %    |
| 835                  | 55.2                               | 0.97                            | 9.30    | 9.30    | 9.30    | 0.72  | 0.72       | ± 12.0 %    |
| 900                  | 55.0                               | 1.05                            | 9.12    | 9.12    | 9.12    | 0.73  | 0.75       | ± 12.0 %    |
| 1750                 | 53.4                               | 1.49                            | 7.84    | 7.84    | 7.84    | 0.80  | 0.68       | ± 12.0 %    |
| 1900                 | 53.3                               | 1.52                            | 7.51    | 7.51    | 7.51    | 0.80  | 0.62       | ± 12.0 %    |
| 2000                 | 53.3                               | 1.52                            | 7.44    | 7.44    | 7.44    | 0.80  | 0.66       | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 6.96    | 6.96    | 6.96    | 0.80  | 0.50       | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 6.78    | 6.78    | 6.78    | 0.80  | 0.50       | ± 12.0 %    |
| 5200                 | 49.0                               | 5.30                            | 4.42    | 4.42    | 4.42    | 0.50  | 1.90       | ± 13.1 %    |
| 5300                 | 48.9                               | 5.42                            | 4.12    | 4.12    | 4.12    | 0.52  | 1.90       | ± 13.1 %    |
| 5600                 | 48.5                               | 5.77                            | 3.54    | 3.54    | 3.54    | 0.60  | 1.90       | ± 13.1 %    |
| 5800                 | 48.2                               | 6.00                            | 3.80    | 3.80    | 3.80    | 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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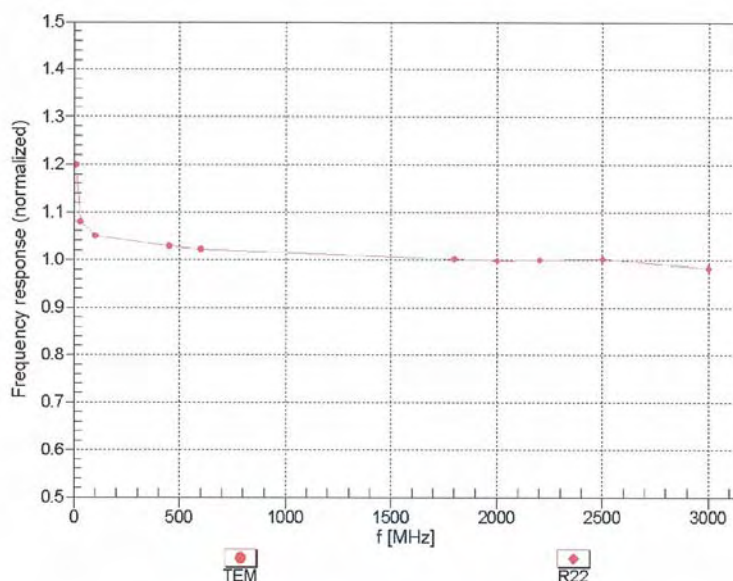
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### Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)

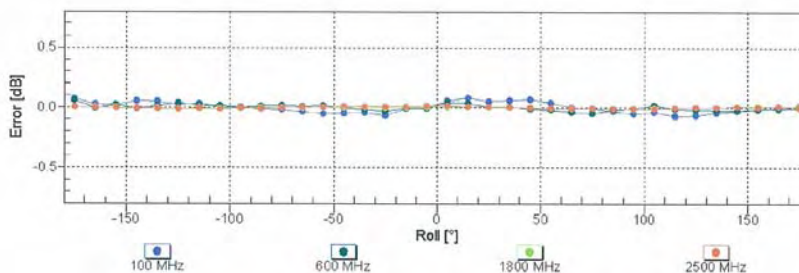
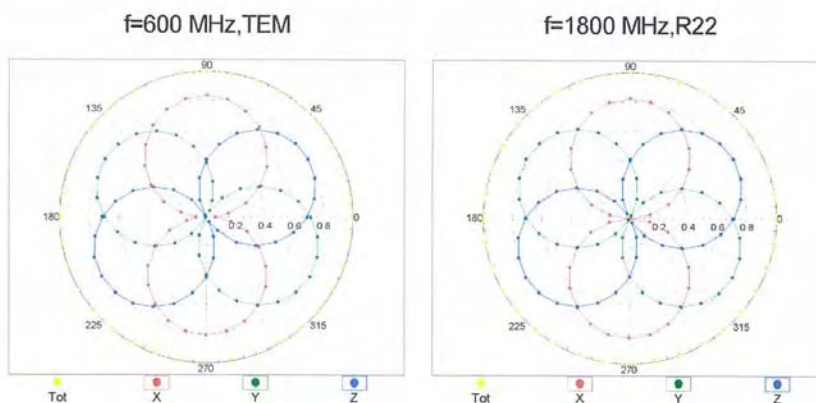


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

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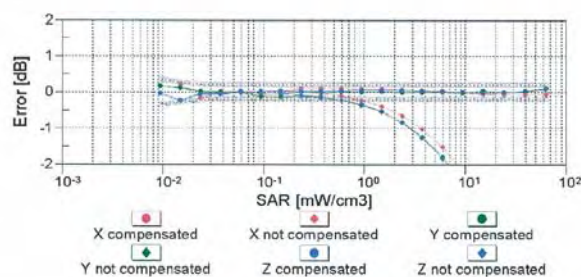
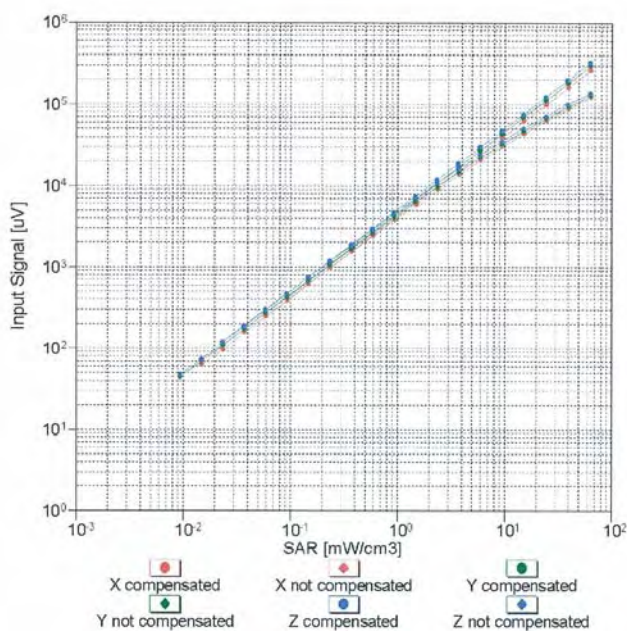
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## Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$ )



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

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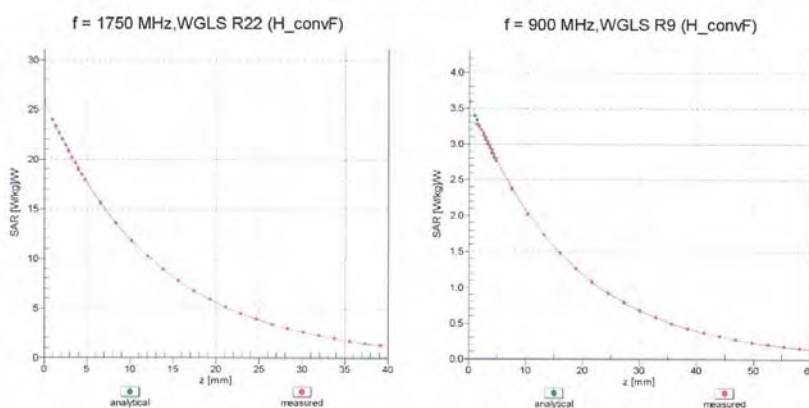
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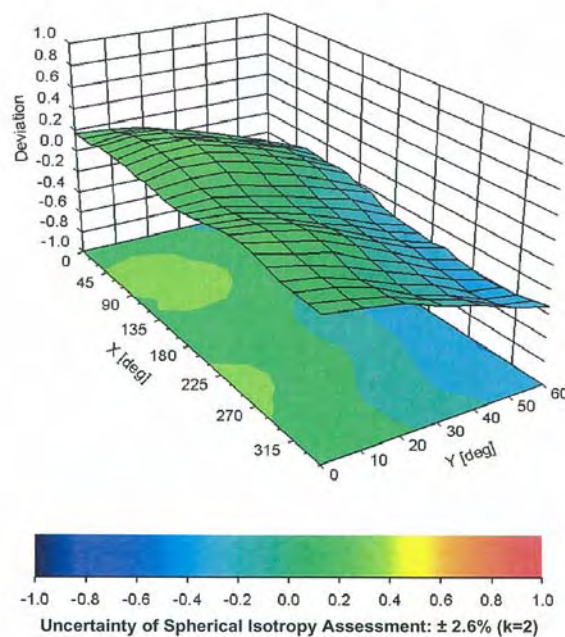
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## Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi, \theta$ ), $f = 900 \text{ MHz}$



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## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

### 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           |

## 7. Uncertainty Budget

**DASY5 Uncertainty Budget**  
According to IEEE 1528 [1]

| Error Description                | Uncertainty value | Prob. Dist. | Div.       | ( $c_1$ ) 1g | ( $c_1$ ) 10g | Std. Unc. (1g) | Std. Unc. (10g) | ( $v_i$ ) $v_{eff}$ |
|----------------------------------|-------------------|-------------|------------|--------------|---------------|----------------|-----------------|---------------------|
| <b>Measurement System</b>        |                   |             |            |              |               |                |                 |                     |
| Probe Calibration                | ±5.9 %            | N           | 1          | 1            | 1             | ±5.9 %         | ±5.9 %          | ∞                   |
| Axial Isotropy                   | ±4.7 %            | R           | $\sqrt{3}$ | 0.7          | 0.7           | ±1.9 %         | ±1.9 %          | ∞                   |
| Hemispherical Isotropy           | ±9.6 %            | R           | $\sqrt{3}$ | 0.7          | 0.7           | ±3.9 %         | ±3.9 %          | ∞                   |
| Boundary Effects                 | ±1.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±0.6 %         | ±0.6 %          | ∞                   |
| Linearity                        | ±4.7 %            | R           | $\sqrt{3}$ | 1            | 1             | ±2.7 %         | ±2.7 %          | ∞                   |
| System Detection Limits          | ±1.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±0.6 %         | ±0.6 %          | ∞                   |
| Readout Electronics              | ±0.3 %            | N           | 1          | 1            | 1             | ±0.3 %         | ±0.3 %          | ∞                   |
| Response Time                    | ±0.8 %            | R           | $\sqrt{3}$ | 1            | 1             | ±0.5 %         | ±0.5 %          | ∞                   |
| Integration Time                 | ±2.6 %            | R           | $\sqrt{3}$ | 1            | 1             | ±1.5 %         | ±1.5 %          | ∞                   |
| RF Ambient Noise                 | ±3.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| RF Ambient Reflections           | ±3.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| Probe Positioner                 | ±0.4 %            | R           | $\sqrt{3}$ | 1            | 1             | ±0.2 %         | ±0.2 %          | ∞                   |
| Probe Positioning                | ±2.9 %            | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| Max. SAR Eval.                   | ±1.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±0.6 %         | ±0.6 %          | ∞                   |
| <b>Test Sample Related</b>       |                   |             |            |              |               |                |                 |                     |
| Device Positioning               | ±2.9 %            | N           | 1          | 1            | 1             | ±2.9 %         | ±2.9 %          | 145                 |
| Device Holder                    | ±3.6 %            | N           | 1          | 1            | 1             | ±3.6 %         | ±3.6 %          | 5                   |
| Power Drift                      | ±5.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±2.9 %         | ±2.9 %          | ∞                   |
| <b>Phantom and Setup</b>         |                   |             |            |              |               |                |                 |                     |
| Phantom Uncertainty              | ±4.0 %            | R           | $\sqrt{3}$ | 1            | 1             | ±2.3 %         | ±2.3 %          | ∞                   |
| Liquid Conductivity (target)     | ±5.0 %            | R           | $\sqrt{3}$ | 0.64         | 0.43          | ±1.8 %         | ±1.2 %          | ∞                   |
| Liquid Conductivity (meas.)      | ±2.5 %            | N           | 1          | 0.64         | 0.43          | ±1.6 %         | ±1.1 %          | ∞                   |
| Liquid Permittivity (target)     | ±5.0 %            | R           | $\sqrt{3}$ | 0.6          | 0.49          | ±1.7 %         | ±1.4 %          | ∞                   |
| Liquid Permittivity (meas.)      | ±2.5 %            | N           | 1          | 0.6          | 0.49          | ±1.5 %         | ±1.2 %          | ∞                   |
| <b>Combined Std. Uncertainty</b> |                   |             |            |              |               | ±10.9 %        | ±10.7 %         | 387                 |
| <b>Expanded STD Uncertainty</b>  |                   |             |            |              |               | ±21.9 %        | ±21.4 %         |                     |

Table 19.6: Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528 [1]. The budget is valid for the frequency range 300 MHz - 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

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## 8. Phantom description

Schmid & Partner Engineering AG

**s p e a g**

Zeughausstrasse 43, 8004 Zurich, Switzerland  
Phone +41 1 245 9700, Fax +41 1 245 9779  
info@speag.com, http://www.speag.com

### 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 Zurich<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'S 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. | DEGMBE 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'S 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 Zurich, Switzerland  
Phone +41 1 245 9700, Fax +41 1 245 9779  
info@speag.com, http://www.speag.com

Doc No 861 – QD 000 P40 C – F

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t (886-2) 2299-3939

f (886-2) 2299-9489

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## 9. System Validation from Original equipment supplier

**Calibration Laboratory of**  
Schmid & Partner  
Engineering AG  
Zeughausstrasse 43, 8004 Zurich, Switzerland



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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)  (Signature)

Approved by: **Katja Pokovic** (Name) **Technical Manager** (Function)  (Signature)

Issued: May 25, 2011

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Certificate No: D835V2-4d063\_May11

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f (886-2) 2299-9489

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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 | 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 |

**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:**

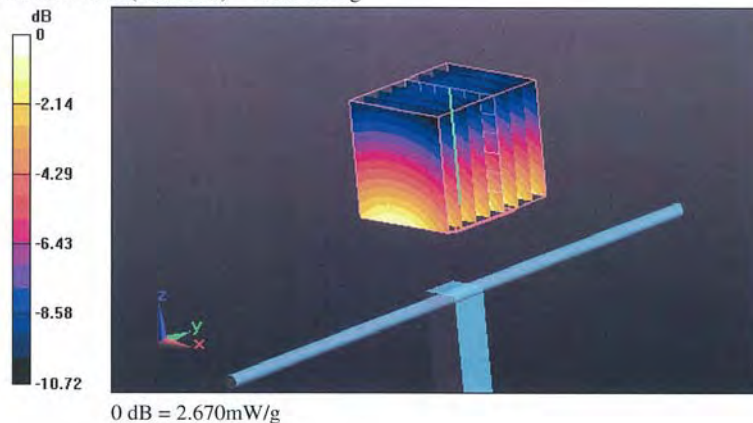
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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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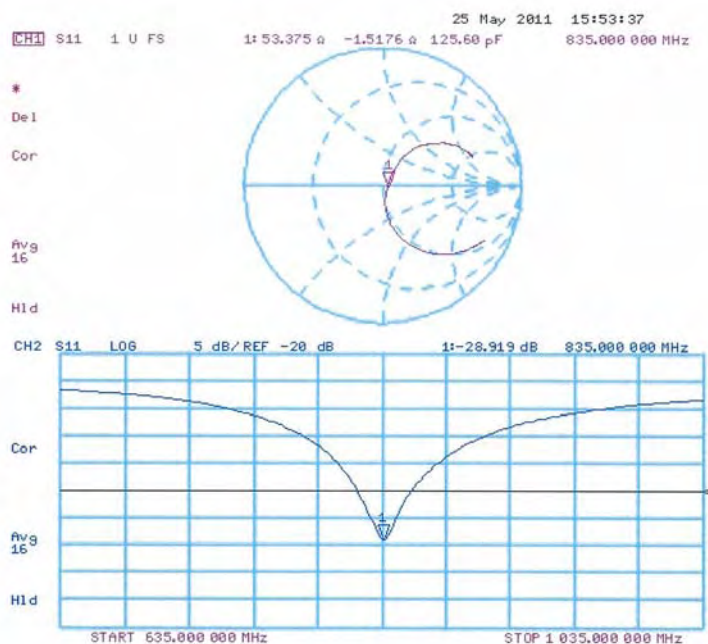
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f (886-2) 2299-9489

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## Impedance Measurement Plot for Head TSL



## 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:

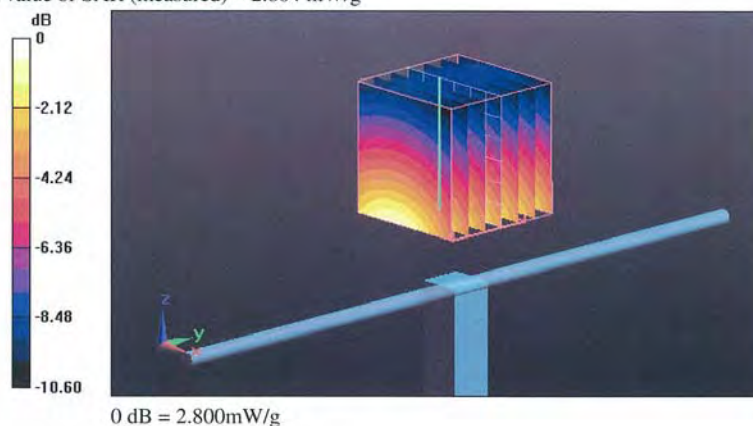
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.297 V/m; Power Drift = 0.06 dB

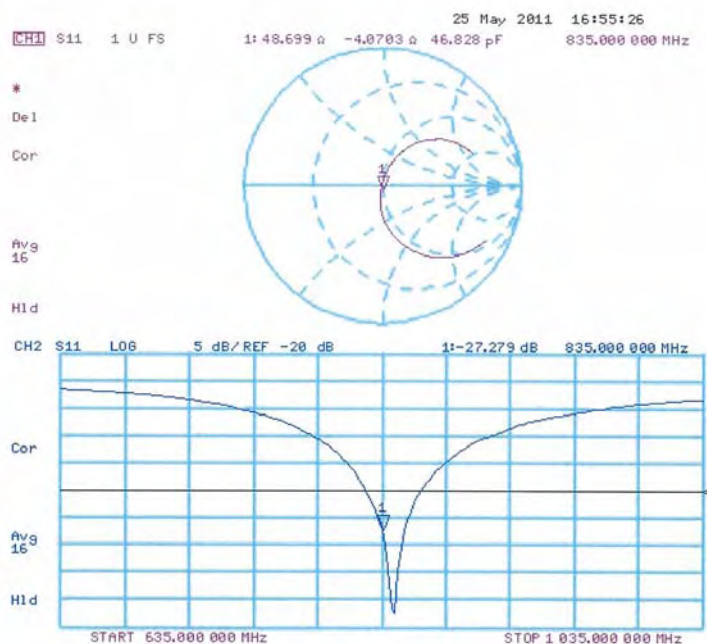
Peak SAR (extrapolated) = 3.530 W/kg

**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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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** Laboratory Technician 

Approved by: **Katja Pokovic** Technical Manager 

Issued: April 19, 2011

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Certificate No: D1900V2-5d027\_Apr11

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**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 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) |

**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   | 39.4 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 | 5.18 mW / g                |
| SAR normalized                                          | normalized to 1W   | 20.7 mW / g                |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 20.6 mW / g ± 16.5 % (k=2) |

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t (886-2) 2299-3939

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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:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.41 \text{ mho/m}$ ;  $\epsilon_r = 39$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(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:

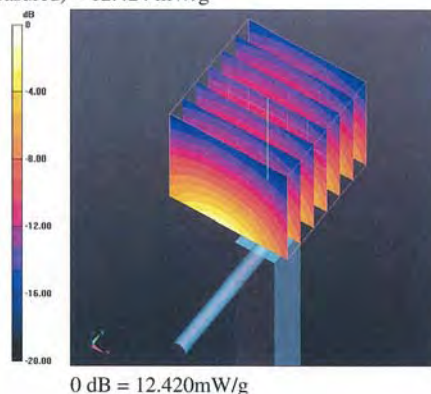
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 97.235 V/m; Power Drift = 0.05 dB

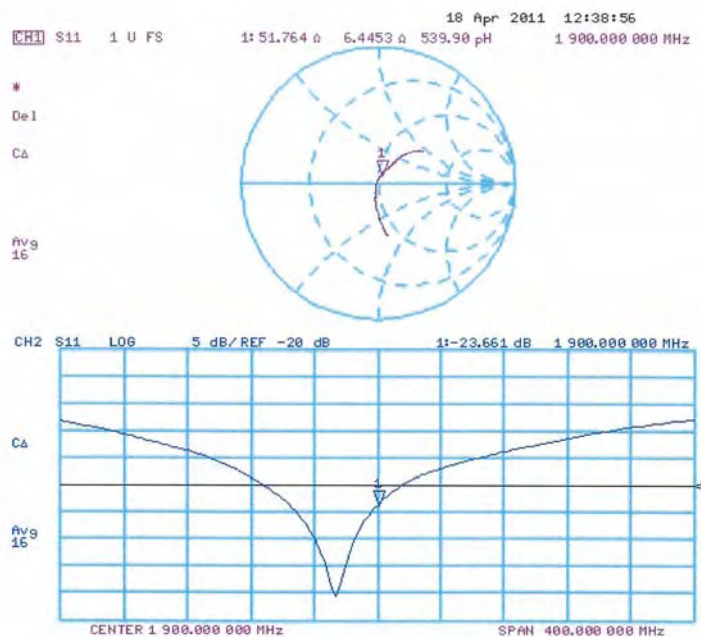
Peak SAR (extrapolated) = 18.650 W/kg

**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:

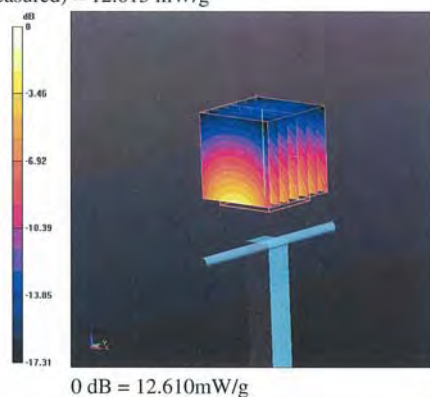
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.170 V/m; Power Drift = 0.01 dB

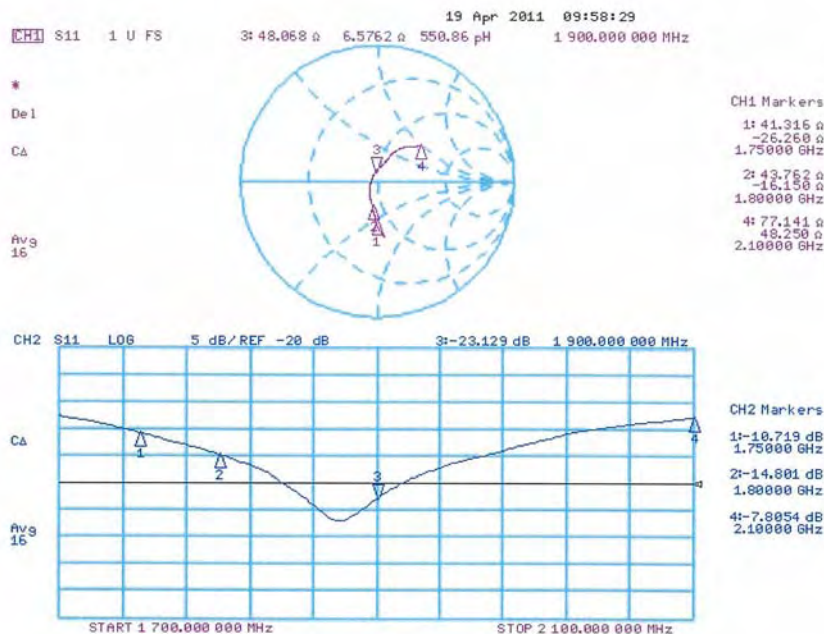
Peak SAR (extrapolated) = 17.156 W/kg

**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



**Calibration Laboratory of**  
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**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: **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 |

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

|              |                       |                               |               |
|--------------|-----------------------|-------------------------------|---------------|
| Approved by: | Name<br>Katja Pokovic | Function<br>Technical Manager | Signature<br> |
|--------------|-----------------------|-------------------------------|---------------|

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.

|                                     |                           |             |
|-------------------------------------|---------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                     | V52.6.2     |
| <b>Extrapolation</b>                | Advanced Extrapolation    |             |
| <b>Phantom</b>                      | Modular Flat Phantom V5.0 |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                     | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm         |             |
| <b>Frequency</b>                    | 2450 MHz $\pm$ 1 MHz      |             |

### Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>      | 22.0 °C             | 39.2           | 1.80 mho/m           |
| <b>Measured Head TSL parameters</b>     | (22.0 $\pm$ 0.2) °C | 38.7 $\pm$ 6 % | 1.72 mho/m $\pm$ 6 % |
| <b>Head TSL temperature during test</b> | (21.0 $\pm$ 0.2) °C | ----           | ----                 |

### SAR result with Head TSL

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | 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   | <b>55.8 mW / g <math>\pm</math> 17.0 % (k=2)</b> |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | 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   | <b>25.7 mW / g <math>\pm</math> 16.5 % (k=2)</b> |

#### 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) |

## 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:**

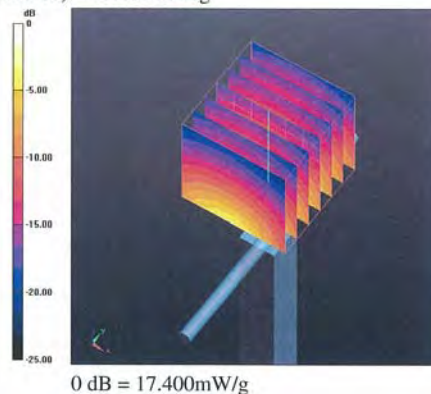
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.6 V/m; Power Drift = 0.04 dB

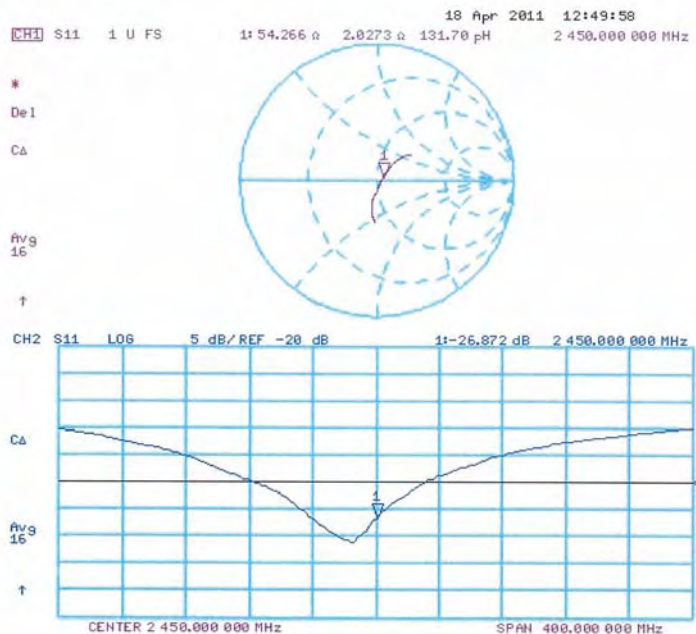
Peak SAR (extrapolated) = 27.919 W/kg

**SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.39 mW/g**

Maximum value of SAR (measured) = 17.401 mW/g



## Impedance Measurement Plot for Head TSL



## 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:

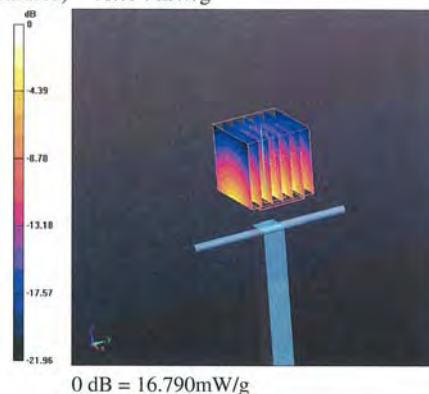
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.949 V/m; Power Drift = -0.04 dB

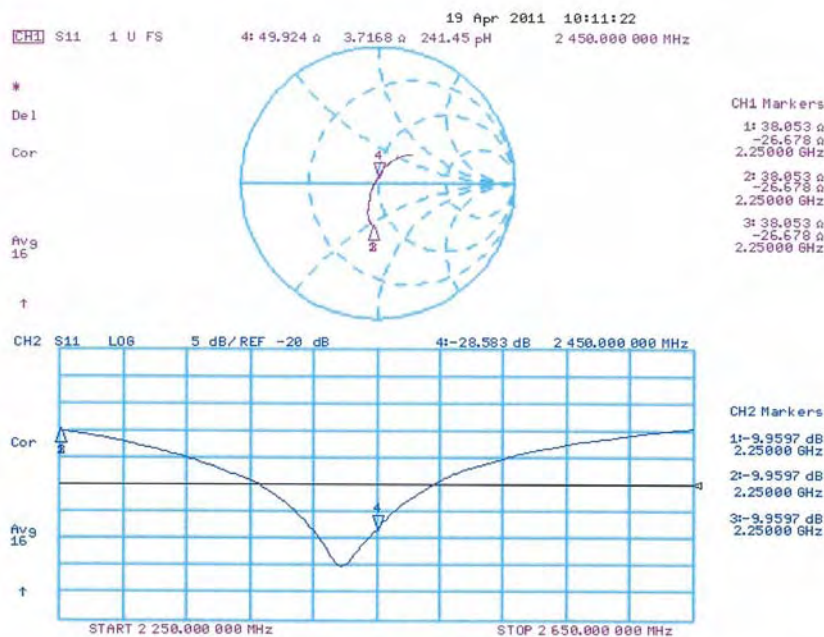
Peak SAR (extrapolated) = 26.888 W/kg

**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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