



Report No.: SZ12070093S01



# SAR TEST REPORT

Issued to

ARCHOS S.A

For

Internet Tablet

Model Name : AC97XEUS  
Trade Name : ARCHOS  
Brand Name : ARCHOS  
FCC ID : SOVAC97XEUS  
Standard : FCC Oet65 Supplement C Jun.2001  
47CFR 2.1093  
ANSI C95.1-1999  
IEEE 1528-2003  
MAX SAR : Body: 0.971W/kg  
Test date : 2012-9-5  
Issue date : 2012-9-5



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Date 2012.9.5

CTIA Authorized Test Lab  
LAB CODE 20061223-00  
IEEE 1725

OFTA  
電信管理局



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741109

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| Change History |              |                   |
|----------------|--------------|-------------------|
| Issue          | Date         | Reason for change |
| 1.0            | Sep. 5 ,2012 | First edition     |

## Testing Laboratory

### 1.1. Identification of the Responsible Testing Laboratory

Company Name: Shenzhen Morlab Communications Technology Co., Ltd.  
 Department: Morlab Laboratory  
 Address: 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China  
 Responsible Test Lab Manager: Mr. Shu Luan  
 Telephone: +86 755 86130268  
 Facsimile: +86 755 86130218

### 1.2. Identification of the Responsible Testing Location

Name: Shenzhen Morlab Communications Technology Co., Ltd.  
 Morlab Laboratory  
 Address: 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China

### 1.3. Accreditation Certificate

Accredited Testing Laboratory: No. CNAS L3572

### 1.4. List of Test Equipments

| No. | Instrument       | Type                                   | Cal. Date | Cal. Due |
|-----|------------------|----------------------------------------|-----------|----------|
| 1   | PC               | Dell (Pentium IV 2.4GHz, SN:X10-23533) | (n.a)     | (n.a)    |
| 2   | Network Emulator | Rohde&Schwarz (CMU200, SN:105894)      | 2011-9-26 | 1year    |
| 3   | Voltmeter        | Keithley (2000, SN:1000572)            | 2011-9-24 | 1year    |
| 4   | Synthesizer      | Rohde&Schwarz (SML_03, SN:101868)      | 2011-9-24 | 1year    |
| 5   | Amplifier        | Nucl udes (ALB216, SN:10800)           | 2011-9-24 | 1year    |
| 6   | Power Meter      | Rohde&Schwarz (NRVD, SN:101066)        | 2011-9-24 | 1year    |
| 7   | Probe            | Satimo (SN:SN_3708_EP80)               | 2011-9-24 | 1year    |
| 8   | Phantom          | Satimo (SN:SN_36_08_SAM62)             | 2011-9-24 | 1year    |
| 9   | Liquid           | Satimo (Last Calibration: 2012-9-5)    | N/A       | N.A      |
| 10  | Dipole 835MHz    | Satimo (SN 36/08 DIPC 99)              | 2011-9-24 | 1year    |
| 11  | Dipole 1900MHz   | Satimo (SN 36/08 DIPF 102)             | 2011-9-24 | 1year    |
| 12  | Dipole 2450MHz   | Satimo (SN 36/08 DIPJ 103)             | 2011-9-24 | 1year    |

## 2. Technical Information

Note: the following data is based on the information by the applicant.

### 2.1. Identification of Applicant

Company Name: ARCHOS S.A  
Address: 12 rue Ampère - 91430 Igny FRANCE

### 2.2. Identification of Manufacturer

Company Name: Foxda Technology Industrial (Shenzhen)Co., LTD  
Address: 4/F, Fuxing Bldg, Binlang Road, Futian Free Trade Zone, SHENZHEN, CHINA

### 2.3. Equipment Under Test (EUT)

Model Name: AC97XEUS  
Trade Name: ARCHOS  
Brand Name: ARCHOS  
Hardware Version: V0.3  
Software Version: FW8935-V0.4.3.0  
Frequency Bands: WCDMA 850MHz/1900MHz;  
WIFI802.11 B/G/N; Bluetooth;  
Modulation Mode: WCDMA: CDMA; WIFI802.11B: DSSS; WIFI802.11G: OFDM;  
WIFI 802.11N: OFDM; BT: GFSK/Π/4-DQPSK/8-DPSK;  
Antenna type: Fixed Internal Antenna  
Development Stage: Identical prototype  
Battery Model: AE4169100P  
Battery specification: 3000mAh3.7V  
3GPP version: Release 6

#### 2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

#### 2.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

| EUT Identity | Hardware Version | Software Version |
|--------------|------------------|------------------|
| 1#           | V0.3             | FW8935-V0.4.3.0  |

## 2.4. Applied Reference Documents

Leading reference documents for testing:

| No. | Identity                                                                 | Document Title                                                                                                                                                                 |
|-----|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | <b>47 CFR§2.1093</b>                                                     | Radiofrequency Radiation Exposure Evaluation: Portable Devices                                                                                                                 |
| 2   | <b>FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)</b> | Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields                                                                          |
| 3   | <b>ANSI C95.1-1999</b>                                                   | IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz                                                      |
| 4   | <b>IEEE 1528-2003</b>                                                    | Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques. |
| 5   | <b>KDB 616217 D03</b>                                                    | SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers                                                                                                 |
| 6   | <b>KDB 447498 D01</b>                                                    | Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies                                                                                         |
| 7   | <b>KDB 248227 D01</b>                                                    | SAR meas for 802.11 a/b/g v01r02                                                                                                                                               |
| 8   | <b>KDB 450824 D01</b>                                                    | SAR Probe Calibration and System Verification Considerations for Measurements at 150MHz - 3GHz                                                                                 |

## 2.5. Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

## 2.6. Test Environment/Conditions

|                          |                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Normal Temperature (NT): | 20 ... 25 °C                                                                                                                                       |
| Relative Humidity:       | 30 ... 75 %                                                                                                                                        |
| Air Pressure:            | 980 ... 1020 hPa                                                                                                                                   |
| Test frequency:          | WCDMA 850MHz    WCDMA1900MHz<br>WIFI 802.11B                                                                                                       |
| Operation mode:          | Call established                                                                                                                                   |
| Power Level:             | GSM 850 MHz Maximum output power(level 5)<br>PCS 1900 MHz Maximum output power(level 0)<br>WCDMA Maximum output power<br>WIFI Maximum output power |

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.

The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 9262, 9400 and 9538 respectively in the case of WCDMA 19000, or to 4132, 4175 and 4233 respectively in the case of WCDMA 850. The EUT is commanded to operate at maximum transmitting power.

During WIFI SAR test, the EUT was located at channel 1, 6, 11. And EUT was commanded to operate at maximum transmitting power.

The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 35 dB.

For SAR testing, EUT is in WCDMA/WIFI link mode, its crest factor is 1.

### 3. Specific Absorption Rate (SAR)

#### 3.1. Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

#### 3.2. SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density.  $\rho$ ). The equation description is as below:

$$\text{SAR} = \frac{d}{dt} \left( \frac{dW}{dm} \right) = \frac{d}{dt} \left( \frac{dW}{\rho dv} \right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$\text{SAR} = C \frac{\delta T}{\delta t}$$

, where C is the specific heat capacity,  $\delta T$  is the temperature rise and  $\delta t$  the exposure duration, or related to the electrical field in the tissue by

$$\text{SAR} = \frac{\sigma |E|^2}{\rho}$$

, where  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the rms electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.



## 4. SAR Measurement Setup

### 4.1. The Measurement System

Comosar is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Comosar system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 10g mass.

### 4.2. Probe

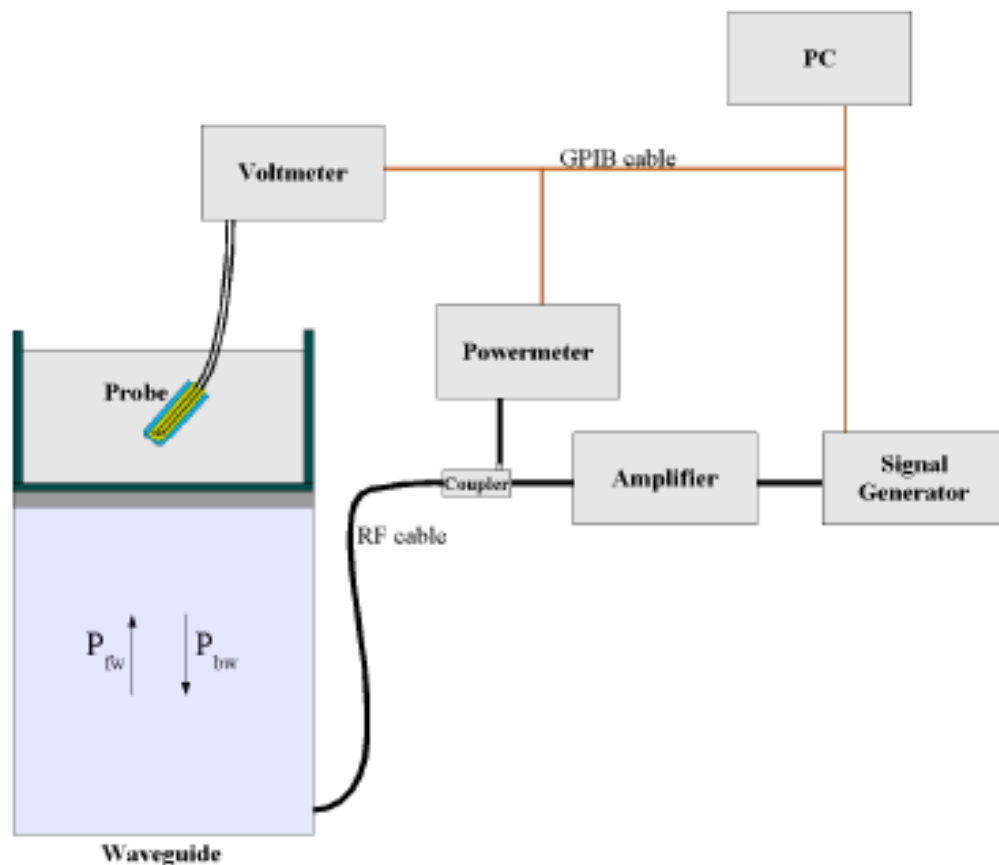
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter : 6.5 mm
- Distance between probe tip and sensor center: 2.5mm
- Distance between sensor center and the inner phantom surface: 4 mm  
(repeatability better than +/- 1mm)

- Probe linearity: <0.25 dB
- Axial Isotropy: <0.25 dB
- Spherical Isotropy: <0.25 dB
- Calibration range: 835to 2500MHz for head & body simulating liquid.

Angle between probe axis (evaluation axis) and surface normal line: less than 30°

Probe calibration is realized, in compliance with CENELEC EN 62209 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 622091 annexe technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-(2z/\delta)}$$

Where :

P<sub>fw</sub> = Forward Power

P<sub>bw</sub> = Backward Power

a and b = Waveguide dimensions

$\delta$  = Skin depth

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO

After each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

$$CF(N)=SAR(N)/V_{lin}(N) \quad (N=1,2,3)$$

The linearised output voltage  $V_{lin}(N)$  is obtained from the displayed output voltage  $V(N)$  using

$$V_{lin}(N)=V(N)*(1+V(N)/DCP(N)) \quad (N=1,2,3)$$

where DCP is the diode compression point in mV.

### 4.3. Probe Calibration Process

#### 4.3.1 Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm<sup>2</sup>) using an with CALISAR, Antenna proprietary calibration system.

#### 4.3.2 Free Space Assessment Procedure

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm<sup>2</sup>.

#### 4.3.2 Temperature Assessment Procedure

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

Where:

$$SAR = C \frac{\Delta T}{\Delta t}$$

$\Delta t$  = exposure time (30 seconds),

$C$  = heat capacity of tissue (brain or muscle),

$\Delta T$  = temperature increase due to RF exposure.

SAR is proportional to  $\Delta T / \Delta t$ , the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

$\sigma$  = simulated tissue conductivity,

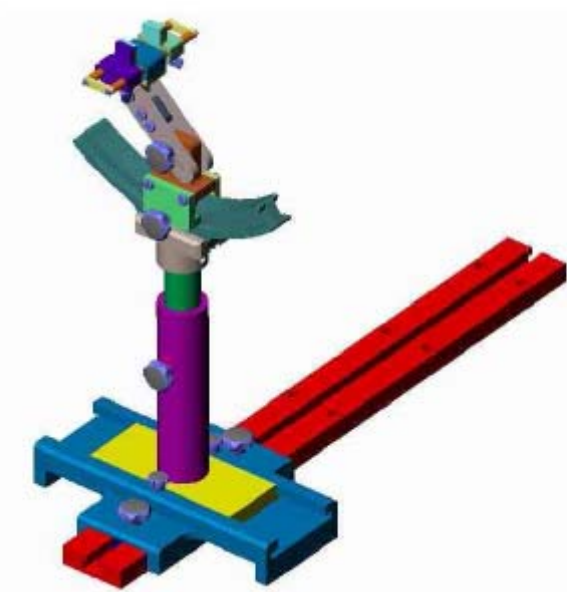
$\rho$  = Tissue density (1.25 g/cm<sup>3</sup> for brain tissue)

#### 4.4. Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

#### 4.5. Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1°.



Device holder

| System Material | Permittivity | Loss Tangent |
|-----------------|--------------|--------------|
| Delrin          | 3.7          | 0.005        |

## 5. Tissue Simulating Liquids

Simulant liquids that are used for testing at frequencies of 850MHz, 1900MHz and 2450MHz, which are made mainly of sugar, salt and water solutions may be left in the phantoms. Approximately 20litres are needed for an upright head compared to about 25 litres for a horizontal bath phantom. The liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is (head SAR) or from the flat phantom to the liquid top surface (body SAR) is 15cm.

Following are the recipes for one liter of head and body tissue simulating liquid for frequency band 835 MHz, 1900MHz and 2450 MHz.

| Ingredients<br>(% by weight ) | Frequency Band | Frequency Band | Frequency Band |
|-------------------------------|----------------|----------------|----------------|
|                               | 835MHz         | 1900MHz        | 2450MHz        |
| Tissue Type                   | Body           | Body           | Body           |
| Water                         | 52.4           | 40.4           | 73.2           |
| Salt(NaCl)                    | 1.4            | 0.5            | 0.04           |
| Sugar                         | 45.0           | 58.0           | 0.0            |
| HEC                           | 1.0            | 1.0            | 0.0            |
| Bactericide                   | 0.1            | 0.1            | 0.0            |
| Triton                        | 0.0            | 0.0            | 0.0            |
| DGBE                          | 0.0            | 0.0            | 0.0            |
| Acticide SPX                  | 0.0            | 0.0            | 26.7           |
| Dielectric Constant           | 56.1           | 54.0           | 52.5           |
| Conductivity (S/m)            | 0.95           | 1.45           | 1.78           |

Recipes for Tissue Simulating Liquid

**Table 1: Dielectric Performance of Body Tissue Simulating Liquid**

| Temperature: 22.0~23.8°C, humidity: 54~60%. |                                                               |                          |                             |
|---------------------------------------------|---------------------------------------------------------------|--------------------------|-----------------------------|
| Frequency                                   | Description                                                   | Permittivity $\epsilon$  | Conductivity $\sigma$ (S/m) |
| 835 MHz                                     | Reference result per OET65<br>$\pm 5\%$ window                | 55.2<br>52.44 to 57.96   | 0.97<br>0.9215 to 1.0185    |
|                                             | Reference result per probe<br>calibration<br>$\pm 5\%$ window | 56.1<br>53.295 to 58.905 | 0.95<br>0.905 to 0.998      |
|                                             | Validation value<br>(Sep. 5)                                  | 55.709999                | 0.9809033                   |
| 1900 MHz                                    | Reference result per OET65<br>$\pm 5\%$ window                | 53.3<br>50.635 to 55.965 | 1.52<br>1.444 to 1.596      |
|                                             | Reference result per probe<br>calibration<br>$\pm 5\%$ window | 54<br>51.3 to 56.7       | 1.45<br>1.378 to 1.523      |
|                                             | Validation value<br>(Sep. 5)                                  | 52.548876                | 1.513978                    |

|          |                                                                                   |                          |                        |
|----------|-----------------------------------------------------------------------------------|--------------------------|------------------------|
| 2450 MHz | <b>Reference result per OET65<br/><math>\pm 5\%</math> window</b>                 | 52.7<br>50.635 to 55.965 | 1.95<br>1.853 to 2.048 |
|          | <b>Reference result per probe<br/>calibration<br/><math>\pm 5\%</math> window</b> | 52.5<br>49.875 to 55.125 | 1.78<br>1.691 to 1.869 |
|          | <b>Validation value<br/>(Sep. 5)</b>                                              | 52.548876                | 1.853978               |

Note: 1. The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85033E Dielectric Probe Kit and an Agilent Network Analyzer.

2. Per KDB 450824 D01, tissue used during test are within 5% tolerances of probe calibration report, and also within 5% of the target dielectric parameters for OET65.

"when the actual tissue dielectric parameters are recorded for the probe calibration, the differences for  $\epsilon$  and  $\sigma$  between probe calibration and routine measurements should each be  $\leq 5\%$  while satisfying the required  $\pm 5\%$  tolerances in target dielectric parameters." (KDB 450824 D01)

## Uncertainty Assessment

The following table includes the uncertainty table of the IEEE 1528. The values are determined by Antennessa.

### 5.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

| a                                                                               | b       | c                 | d              | e= f(d,k)  | f          | g           | h= c*f/e       | i= c*g/e               | k        |
|---------------------------------------------------------------------------------|---------|-------------------|----------------|------------|------------|-------------|----------------|------------------------|----------|
| Uncertainty Component                                                           | Sec.    | Tol<br>(+- %<br>) | Prob.<br>Dist. | Div.       | Ci<br>(1g) | Ci<br>(10g) | lg Ui<br>(+-%) | 10g<br>Ui<br>(+-<br>%) | Vi       |
| <b>Measurement System</b>                                                       |         |                   |                |            |            |             |                |                        |          |
| Probe calibration                                                               | E.2.1   | 4.76              | N              | 1          | 1          | 1           | 4.76           | 4.76                   | $\infty$ |
| Axial Isotropy                                                                  | E.2.2   | 2.5               | R              | $\sqrt{3}$ | 0.7        | 0.7         | 1.01           | 1.01                   | $\infty$ |
| Hemispherical Isotropy                                                          | E.2.2   | 4.0               | R              | $\sqrt{3}$ | 0.7        | 0.7         | 1.62           | 1.62                   | $\infty$ |
| Boundary effect                                                                 | E.2.3   | 1.0               | R              | $\sqrt{3}$ | 1          | 1           | 0.58           | 0.58                   | $\infty$ |
| Linearity                                                                       | E.2.4   | 5.0               | R              | $\sqrt{3}$ | 1          | 1           | 2.89           | 2.89                   | $\infty$ |
| System detection limits                                                         | E.2.5   | 1.0               | R              | $\sqrt{3}$ | 1          | 1           | 0.58           | 0.58                   | $\infty$ |
| Readout Electronics                                                             | E.2.6   | 0.02              | N              | 1          | 1          | 1           | 0.02           | 0.02                   | $\infty$ |
| Reponse Time                                                                    | E.2.7   | 3.0               | R              | $\sqrt{3}$ | 1          | 1           | 1.73           | 1.73                   | $\infty$ |
| Integration Time                                                                | E.2.8   | 2.0               | R              | $\sqrt{3}$ | 1          | 1           | 1.15           | 1.15                   | $\infty$ |
| RF ambient Conditions                                                           | E.6.1   | 3.0               | R              | $\sqrt{3}$ | 1          | 1           | 1.73           | 1.73                   | $\infty$ |
| Probe positioner Mechanical Tolerance                                           | E.6.2   | 2.0               | R              | $\sqrt{3}$ | 1          | 1           | 1.15           | 1.15                   | $\infty$ |
| Probe positioning with respect to Phantom Shell                                 | E.6.3   | 0.05              | R              | $\sqrt{3}$ | 1          | 1           | 0.03           | 0.03                   | $\infty$ |
| Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation | E.5.2   | 5.0               | R              | $\sqrt{3}$ | 1          | 1           | 2.89           | 2.89                   | $\infty$ |
| <b>Test sample Related</b>                                                      |         |                   |                |            |            |             |                |                        |          |
| Test sample positioning                                                         | E.4.2.1 | 0.03              | N              | 1          | 1          | 1           | 0.03           | 0.03                   | N-1      |
| Device Holder Uncertainty                                                       | E.4.1.1 | 5.00              | N              | 1          | 1          | 1           | 5.00           | 5.00                   | N-1      |
| Output power Power drift - SAR drift measurement                                | 6.6.2   | 4.04              | R              | $\sqrt{3}$ | 1          | 1           | 2.33           | 2.33                   | $\infty$ |
| <b>Phantom and Tissue Parameters</b>                                            |         |                   |                |            |            |             |                |                        |          |
| Phantom Uncertainty (Shape and thickness tolerances)                            | E.3.1   | 0.05              | R              | $\sqrt{3}$ | 1          | 1           | 0.03           | 0.03                   | $\infty$ |

|                                                   |       |       |     |            |      |      |       |       |          |
|---------------------------------------------------|-------|-------|-----|------------|------|------|-------|-------|----------|
| Liquid conductivity - deviation from target value | E.3.2 | 4.57  | R   | $\sqrt{3}$ | 0.64 | 0.43 | 1.69  | 1.13  | $\infty$ |
| Liquid conductivity - measurement uncertainty     | E.3.3 | 5.00  | N   | 1          | 0.64 | 0.43 | 3.20  | 2.15  | M        |
| Liquid permittivity - deviation from target value | E.3.2 | 3.69  | R   | $\sqrt{3}$ | 0.6  | 0.49 | 1.28  | 1.04  | $\infty$ |
| Liquid permittivity - measurement uncertainty     | E.3.3 | 10.00 | N   | 1          | 0.6  | 0.49 | 6.00  | 4.90  | M        |
| Combined Standard Uncertainty                     |       |       | RSS |            |      |      | 11.55 | 10.67 |          |
| Expanded Uncertainty (95% Confidence interval)    |       |       | K=2 |            |      |      | 23.11 | 21.33 |          |

## 5.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK

| a                                                                               | b       | c            | d           | e= f(d,k)  | f       | g        | h= c*f/e    | i= c*g/e     | k        |
|---------------------------------------------------------------------------------|---------|--------------|-------------|------------|---------|----------|-------------|--------------|----------|
| Uncertainty Component                                                           | Sec.    | Tol (+ - % ) | Prob. Dist. | Div.       | Ci (1g) | Ci (10g) | 1g Ui (+-%) | 10g Ui (+-%) | Vi       |
| <b>Measurement System</b>                                                       |         |              |             |            |         |          |             |              |          |
| Probe calibration                                                               | E.2.1   | 4.76         | N           | 1          | 1       | 1        | 4.76        | 4.76         | $\infty$ |
| Axial Isotropy                                                                  | E.2.2   | 2.5          | R           | $\sqrt{3}$ | 0.7     | 0.7      | 1.01        | 1.01         | $\infty$ |
| Hemispherical Isotropy                                                          | E.2.2   | 4.0          | R           | $\sqrt{3}$ | 0.7     | 0.7      | 1.62        | 1.62         | $\infty$ |
| Boundary effect                                                                 | E.2.3   | 1.0          | R           | $\sqrt{3}$ | 1       | 1        | 0.58        | 0.58         | $\infty$ |
| Linearity                                                                       | E.2.4   | 5.0          | R           | $\sqrt{3}$ | 1       | 1        | 2.89        | 2.89         | $\infty$ |
| System detection limits                                                         | E.2.5   | 1.0          | R           | $\sqrt{3}$ | 1       | 1        | 0.58        | 0.58         | $\infty$ |
| Readout Electronics                                                             | E.2.6   | 0.02         | N           | 1          | 1       | 1        | 0.02        | 0.02         | $\infty$ |
| Reponse Time                                                                    | E.2.7   | 3.0          | R           | $\sqrt{3}$ | 1       | 1        | 1.73        | 1.73         | $\infty$ |
| Integration Time                                                                | E.2.8   | 2.0          | R           | $\sqrt{3}$ | 1       | 1        | 1.15        | 1.15         | $\infty$ |
| RF ambient Conditions                                                           | E.6.1   | 3.0          | R           | $\sqrt{3}$ | 1       | 1        | 1.73        | 1.73         | $\infty$ |
| Probe positioner Mechanical Tolerance                                           | E.6.2   | 2.0          | R           | $\sqrt{3}$ | 1       | 1        | 1.15        | 1.15         | $\infty$ |
| Probe positioning with respect to Phantom Shell                                 | E.6.3   | 0.05         | R           | $\sqrt{3}$ | 1       | 1        | 0.03        | 0.03         | $\infty$ |
| Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation | E.5.2   | 5.0          | R           | $\sqrt{3}$ | 1       | 1        | 2.89        | 2.89         | $\infty$ |
| <b>Dipole</b>                                                                   |         |              |             |            |         |          |             |              |          |
| Dipole axis to liquid Distance                                                  | 8,E.4.2 | 1.00         | N           | $\sqrt{3}$ | 1       | 1        | 0.58        | 0.58         | $\infty$ |



|                                                      |         |       |     |            |      |      |       |       |          |
|------------------------------------------------------|---------|-------|-----|------------|------|------|-------|-------|----------|
| Input power and SAR drift measurement                | 8,6.6.2 | 4.04  | R   | $\sqrt{3}$ | 1    | 1    | 2.33  | 2.33  | $\infty$ |
| <b>Phantom and Tissue Parameters</b>                 |         |       |     |            |      |      |       |       |          |
| Phantom Uncertainty (Shape and thickness tolerances) | E.3.1   | 0.05  | R   | $\sqrt{3}$ | 1    | 1    | 0.03  | 0.03  | $\infty$ |
| Liquid conductivity - deviation from target value    | E.3.2   | 4.57  | R   | $\sqrt{3}$ | 0.64 | 0.43 | 1.69  | 1.13  | $\infty$ |
| Liquid conductivity - measurement uncertainty        | E.3.3   | 5.00  | N   | $\sqrt{3}$ | 0.64 | 0.43 | 1.85  | 1.24  | M        |
| Liquid permittivity - deviation from target value    | E.3.2   | 3.69  | R   | $\sqrt{3}$ | 0.6  | 0.49 | 1.28  | 1.04  | $\infty$ |
| Liquid permittivity - measurement uncertainty        | E.3.3   | 10.00 | N   | $\sqrt{3}$ | 0.6  | 0.49 | 3.46  | 2.83  | M        |
| Combined Standard Uncertainty                        |         |       | RSS |            |      |      | 8.83  | 8.37  |          |
| Expanded Uncertainty (95% Confidence interval)       |         |       | K=2 |            |      |      | 17.66 | 16.73 |          |

## 6. SAR Measurement Evaluation

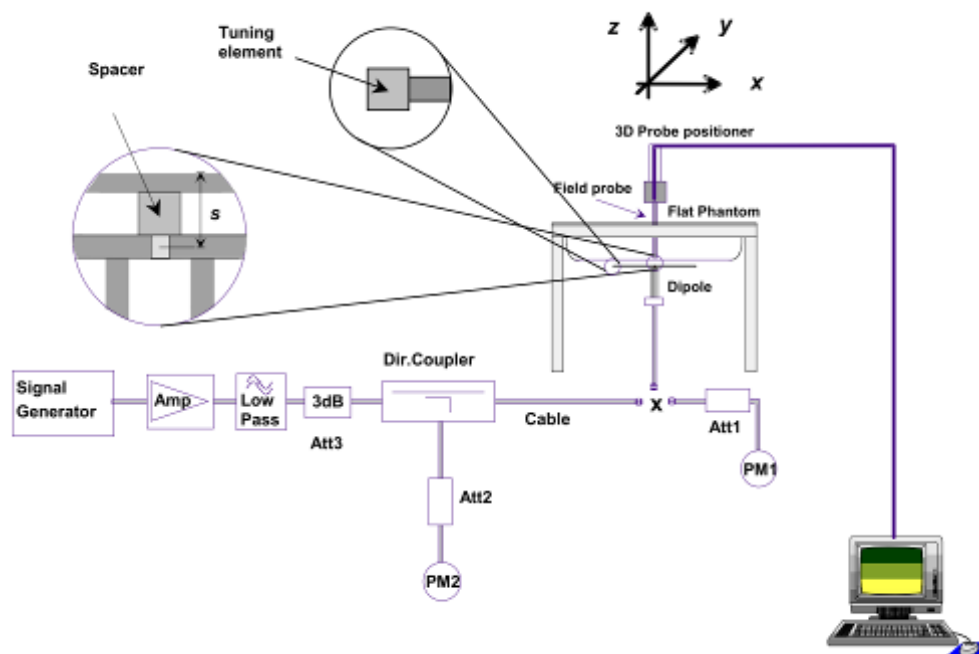
### 6.1. System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835 MHz, 1900 MHz and 2450MHz. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom.

Equipments:

| name                | Type and specification                               |
|---------------------|------------------------------------------------------|
| Signal generator    | E4433B                                               |
| Directional coupler | 450MHz-3GHz                                          |
| Amplifier           | 3W 502(10-2500MHz)                                   |
| Reference dipole    | 835MHz:SN 36/08 DIPC 99<br>2450MHz:SN 36/08 DIPJ 103 |

System Verification Setup Block Diagram



## 6.2. Validation Results

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %.

| Frequency          | 835MHz(Body) | 1900MHz(Body) | 2450MHz(Body) |
|--------------------|--------------|---------------|---------------|
| Target value (1g)  | 9.714 W/Kg   | 39.89 W/Kg    | 52.4 W/Kg     |
| 250 mW input power | 2.386 W/Kg   | 9.740 W/Kg    | 12.789 W/Kg   |
| Test value (1g)    | 9.544W/Kg    | 38.960 W/Kg   | 51.156 W/Kg   |

**Note:** System checks the specific test data please see page 60~65.

## 7. Operational Conditions During Test

The EUT antenna and battery are those specified by the manufacturer. The battery is fully charged before each measurement. The output power and frequency are controlled using a base station simulator. The EUT is set to transmit at its highest output peak power level.

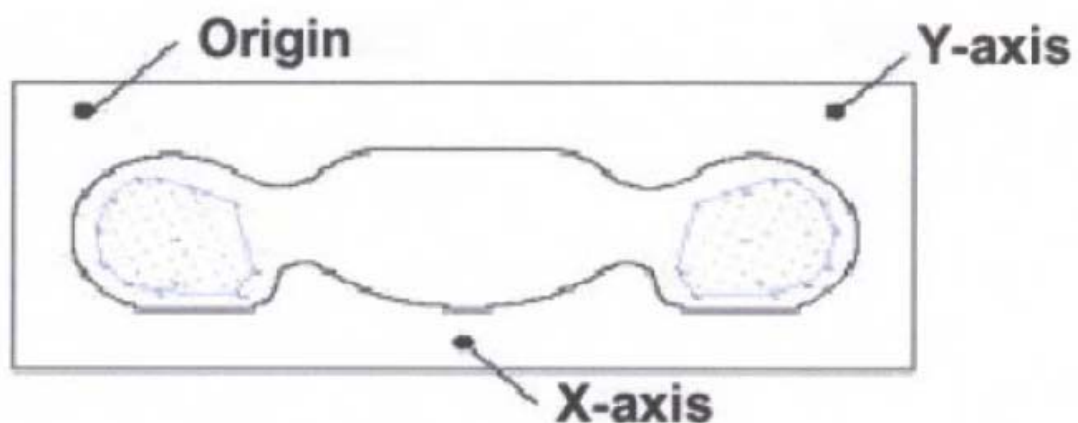
Remark: Please refer to Appendix B for the test setup photos.

### 7.1. Body-worn Configurations

The body-worn configurations shall be tested with the supplied accessories (belt-clips, holsters, etc.) attached to the device in normal use configuration.

The depth of the body tissue was 15.1cm. The distance between the back of the device and the bottom of the flat phantom is 0cm(taking into account of the IEEE 1528 and the place of the antenna)

For body-worn and other configurations a flat phantom shall be used which is comprised of material with electrical properties similar to the corresponding tissues.



SAR Measurement Points in Area Scan

### 7.2. Measurement procedure

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm \* 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors can not directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 \* 30 \* 30 mm or 32 \* 32 \* 32 mm is assessed by measuring 5 or 8

\* 5 or 8\*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

### **7.3. Description of interpolation/extrapolation scheme**

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

## **8. 3G MEASUREMENT PROCEDURES**

### **8.1. Procedures Used To Establish Test Signal**

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR. SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5% occurred, the tests were repeated.

### **8.2. SAR Measurement Conditions for WCDMA**

These procedures were followed according to FCC KDB 941225, October, 2007.

### **8.3. Output Power Verification**

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s”. Results for all applicable physical channel configurations (DPCCH, DPDCH and spreading codes) should be tabulated in the test report. All configurations that are not supported by the EUT or cannot be measured due to technical or equipment limitations should be clearly identified.

## 8.4. Measurement Of Conducted Peak Output Power.

### 1. WCDMA Conducted peak output power

| Item       | band    | WCDMA 850 |       |       | WCDMA 1900 |       |       |
|------------|---------|-----------|-------|-------|------------|-------|-------|
|            | ARFCN   | 4132      | 4175  | 4233  | 9262       | 9400  | 9538  |
|            | subtest | dBm       |       |       | dBm        |       |       |
| 5.2(WCDMA) | non     | 22.68     | 22.73 | 22.77 | 21.85      | 21.83 | 21.96 |
| HSDPA      | 1       | 22.63     | 22.67 | 22.68 | 21.81      | 21.79 | 21.88 |
|            | 2       | 22.63     | 22.66 | 22.69 | 21.80      | 21.77 | 21.89 |
|            | 3       | 22.16     | 22.15 | 22.52 | 21.33      | 21.28 | 21.35 |
|            | 4       | 22.19     | 22.17 | 22.58 | 21.32      | 21.27 | 21.39 |
| HSUPA      | 1       | 22.65     | 22.65 | 22.67 | 21.81      | 21.75 | 21.86 |
|            | 2       | 20.67     | 20.66 | 20.63 | 19.79      | 19.77 | 19.85 |
|            | 3       | 21.59     | 21.67 | 21.69 | 20.85      | 20.76 | 20.85 |
|            | 4       | 20.61     | 20.67 | 20.65 | 19.82      | 19.76 | 19.81 |
|            | 5       | 22.63     | 22.66 | 22.69 | 21.80      | 21.73 | 21.85 |

### 2. Wifi peak output power

| Band | Channel | Frequency (MHz) | Output Power(dBm) |                |                |
|------|---------|-----------------|-------------------|----------------|----------------|
|      |         |                 | 802.11B (DSSS)    | 802.11G (OFDM) | 802.11N (OFDM) |
| WiFi | 1       | 2412            | 12.84             | 11.33          | 8.02           |
|      | 6       | 2437            | 13.65             | 10.82          | 7.53           |
|      | 11      | 2462            | 14.68             | 12.17          | 8.72           |

### 3. Bluetooth peak output power

| Band | Channel | Frequency (MHz) | Output Power(dBm) |                |        |
|------|---------|-----------------|-------------------|----------------|--------|
|      |         |                 | GFSK              | $\Pi/4$ -DQPSK | 8-DPSK |
| BT   | 0       | 2402            | -1.278            | -1.578         | -2.308 |
|      | 38      | 2441            | -3.071            | -3.301         | -4.095 |
|      | 79      | 2480            | -2.036            | -2.259         | -2.992 |

## 9. Test Results List

### Summary of Measurement Results (WCDMA 850MHz Band)

| Temperature: 21.0~23.8°C, humidity: 54~60%. |                       |                     |                    |                |                     |
|---------------------------------------------|-----------------------|---------------------|--------------------|----------------|---------------------|
| Phantom Configurations                      | Device Test Positions | Device Test channel | SAR(W/Kg), 1g Peak | Scaling Factor | Scaled SAR(W/Kg),1g |
| Body (0mm Separation)                       | Back Upward           | 4132                | 0.952              | 1.076          | 1.024               |
|                                             |                       | 4175                | 0.902              | 1.064          | 0.960               |
|                                             |                       | 4233                | 0.971              | 1.054          | 1.023               |
|                                             | Face upward           | 4233                | 0.552              | 1.054          | 0.581               |
|                                             | Edge A                |                     | 0.283              |                | 0.298               |
|                                             | Edge C                |                     | 0.297              |                | 0.313               |

Note:

- Maximum SAR for 12.2kbps RMC is 0.971 W/Kg  $\leq$  75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSUPA/HSDPA active is less than 1/4 dB higher than that measured without HSUPA/HSDPA using 12.2kbps RMC (refer to Page 23 of the report), according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.

### Summary of Measurement Results (WCDMA 1900MHz Band)

| Temperature: 21.0~23.8°C, humidity: 54~60%. |                       |                     |                    |                |                     |
|---------------------------------------------|-----------------------|---------------------|--------------------|----------------|---------------------|
| Phantom Configurations                      | Device Test Positions | Device Test channel | SAR(W/Kg), 1g Peak | Scaling Factor | Scaled SAR(W/Kg),1g |
| Body (0mm Separation)                       | Face upward           | 9538                | 0.582              | 1.001          | 0.583               |
|                                             | Back Upward           |                     | 0.202              |                | 0.202               |
|                                             | Edge A                |                     | 0.268              |                | 0.268               |
|                                             | Edge C                |                     | 0.238              |                | 0.238               |

Note:

- Maximum SAR for 12.2kbps RMC is 0.582 W/Kg  $\leq$  75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSUPA/HSDPA active is less than 1/4 dB higher than that measured without HSUPA/HSDPA using 12.2kbps RMC (refer to Page 23 of the report), according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.
- For the antenna-to-edge distance is greater than 5 cm, the Edge B&D sides do not need to be tested for WCDMA.(please refer to test setup photo for antenna-to-edge distance)
- For the test distance is 0mm, the hotspot function SAR evaluation is covered by SAR evaluation considerations for tablet computers.



### Summary of Measurement Results (WLAN 802.11B Band)

| Temperature: 21.0~23.8°C, humidity: 54~60%. |                       |                   |                     |           |            |
|---------------------------------------------|-----------------------|-------------------|---------------------|-----------|------------|
| Phantom Configurations                      | Device Test Positions | Antenna Positions | SAR(W/Kg), 1g Peak  |           |            |
|                                             |                       |                   | Device Test channel |           |            |
|                                             |                       |                   | Channel 1           | Channel 6 | Channel 11 |
| Body (0mm separation)                       | Face upward           | Internal          | /                   | /         | 0.041      |
|                                             | Back Upward           | Internal          | /                   | /         | 0.035      |
|                                             | Edge A                | Internal          | /                   | /         | 0.025      |
|                                             | Edge B                | Internal          | /                   | /         | 0.024      |

### Note:

1. Based on the Measurement Of Conducted Peak Output Power, the max power of 801.11b is 29mW>24mW,the SAR test for 802.11b is required,but 802.11g/HT20 is not required, for the maximum average output power is not 1/4 dB higher than measured on the corresponding 802.11b channels.
2. For the antenna-to-edge distance is greater than 5 cm, the Edge C&D sides do not need to be tested for Wifi802.11B. (please refer to test setup photo for antenna-to-edge distance)

### 4. Scaled SAR calculation

| Band       | Tune-up power tolerance (dBm) | SAR test channel Power (dBm) | Scaling Factor |
|------------|-------------------------------|------------------------------|----------------|
| WCDMA 850  | Max output power =22 (+1/-2)  | 22.68                        | 1.076          |
|            |                               | 22.73                        | 1.064          |
|            |                               | 22.77                        | 1.054          |
| WCDMA 1900 | Max output power =21 (+1/-2)  | 21.96                        | 1.001          |

## 10. Multiple Transmitters Evaluation

The are two transmitters build in EUT, As follwing :



### Stand-alone SAR

The output power of Wifi transmitter is  $29\text{mW} > 2 \times \text{Pref}$  ( $\text{Pref} = 12\text{mW}$ ), stand-alone SAR evaluation is required for Wifi.

The BT Max. Peak output power is  $0.75\text{mW} \leq \text{Pref}$  ( $\text{Pref} = 12\text{mW}$ ), and the distance between BT antenna and main antenna is  $4.5\text{cm} < 2.5\text{cm}$  standalone SAR evaluation is not required for Bluetooth.

### Simultaneous SAR

The BT and Wifi can't simultaneous transmitting.

| Test Position | GSM&WCDMA SAR <sub>Max</sub> (W/Kg) | Bluetooth SAR(W/Kg) | WiFi SAR(W/Kg) | $\sum 1\text{-g SAR}_{\text{Max}}(\text{W/Kg})$ |               |
|---------------|-------------------------------------|---------------------|----------------|-------------------------------------------------|---------------|
|               |                                     |                     |                | BT&Main Ant                                     | WiFi&Main Ant |
| Body SAR      | 0.971                               | 0                   | 0.041          | 0.971                                           | 1.012         |

Simultaneous Transmission SAR evaluation is not required for BT and GSM, because the sum of  $1\text{g SAR}_{\text{Max}}$  is  $0.971\text{W/Kg} < 1.6\text{W/Kg}$  for BT and WCDMA.

Simultaneous Transmission SAR evaluation is not required for WiFi and GSM, because the sum of  $1\text{g SAR}_{\text{Max}}$  is  $1.012\text{W/Kg} < 1.6\text{W/Kg}$  for WiFi and WCDMA.

## Annex A EUT Setup Photos

1. Back upward



2. Face upward



3. Edge A



4. Edge B

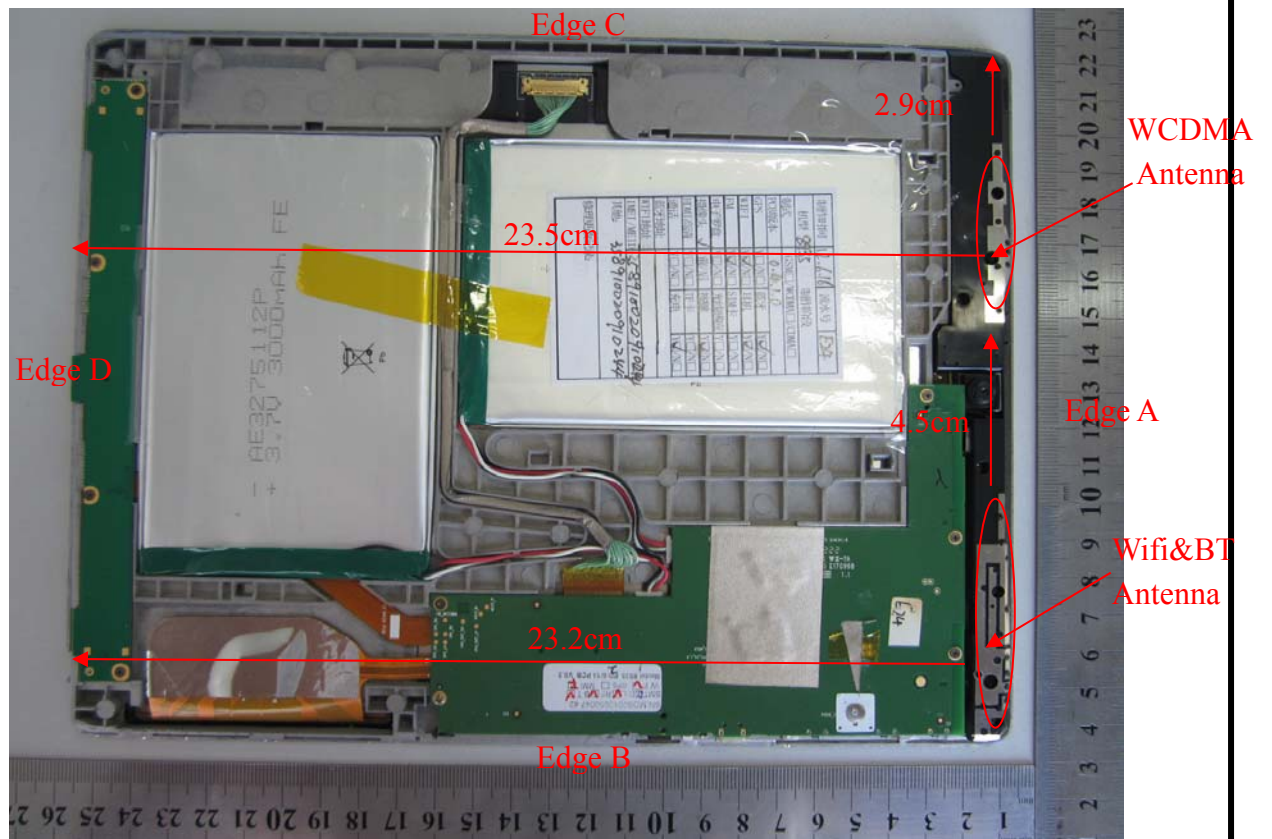


5. Edge C





## 6. Edge configuration



## Liquid Level Photo



## Annex B Graph Test Results

| BAND                                         | PARAMETERS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>WCDMA</u></b><br><b><u>850</u></b>     | <u>Measurement 1:</u> Validation Plane with Body device position on Low Channel in CDMA mode<br><u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in CDMA mode<br><u>Measurement 3:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 4:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 5:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 6:</u> Validation Plane with Body device position on High Channel in CDMA mode |
| <b><u>WCDMA</u></b><br><b><u>1900</u></b>    | <u>Measurement 7:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 8:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 9:</u> Validation Plane with Body device position on High Channel in CDMA mode<br><u>Measurement 10:</u> Validation Plane with Body device position on High Channel in CDMA mode                                                                                                                                                                                                   |
| <b><u>802.11</u></b><br><b><u>B Band</u></b> | <u>Measurement 11:</u> Validation Plane with Body device position on High Channel in DSSS mode<br><u>Measurement 12:</u> Validation Plane with Body device position on High Channel in DSSS mode<br><u>Measurement 13:</u> Validation Plane with Body device position on High Channel in DSSS mode<br><u>Measurement 14:</u> Validation Plane with Body device position on High Channel in DSSS mode                                                                                                                                                                                                |

# MEASUREMENT 1

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 7 seconds

## A. Experimental conditions.

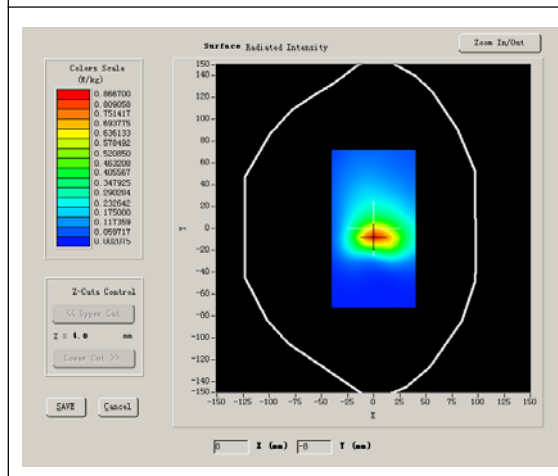
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | Low               |
| Signal          | CDMA              |

## B. SAR Measurement Results

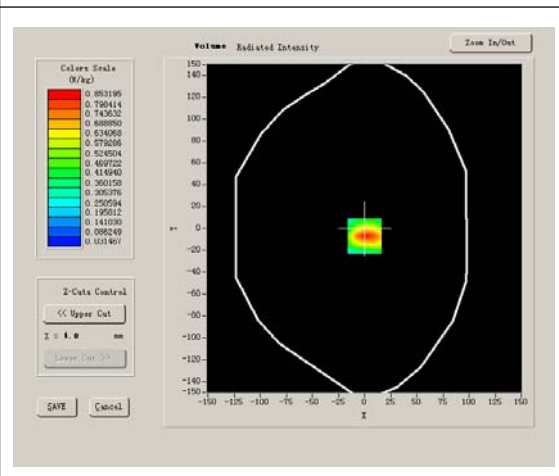
Lower Band SAR (Channel 4132):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 826.400000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | 0.090000               |
| Ambient Temperature:              | 22.7°C                 |
| Liquid Temperature:               | 22.8°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

### SURFACE SAR



### VOLUME SAR





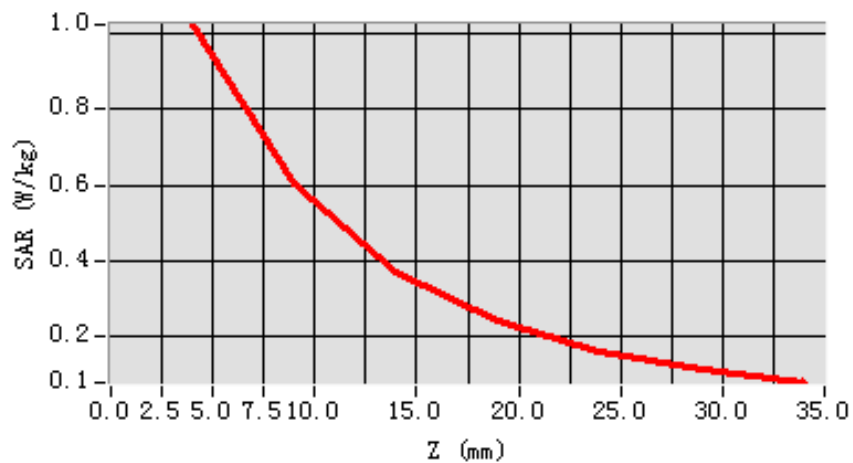
**Maximum location: X=0.00, Y=-7.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.542674 |
| <b>SAR 1g (W/Kg)</b>  | 0.952053 |

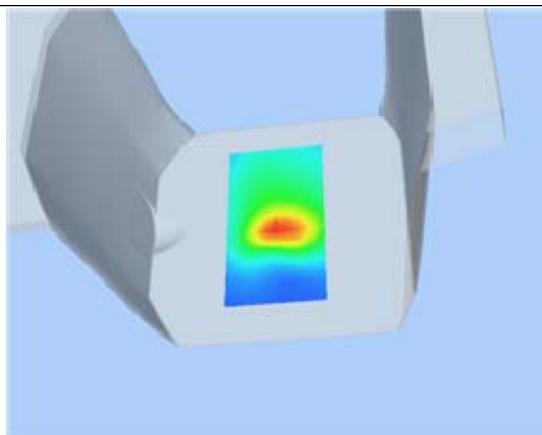
### Z Axis Scan

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>1.0239</b> | <b>0.6048</b> | <b>0.3696</b> | <b>0.2419</b> | <b>0.1628</b> | <b>0.1144</b> |

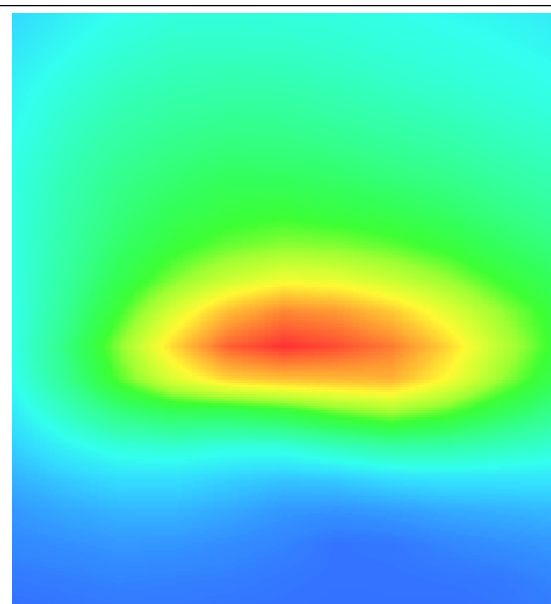
**SAR, Z Axis Scan (X = 0, Y = -7)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 2

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

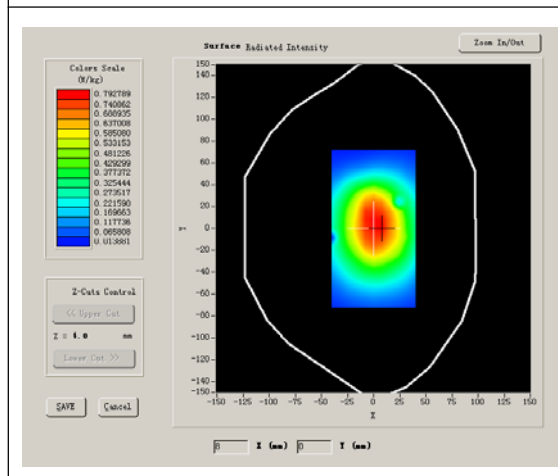
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | Middle            |
| Signal          | CDMA              |

### B. SAR Measurement Results

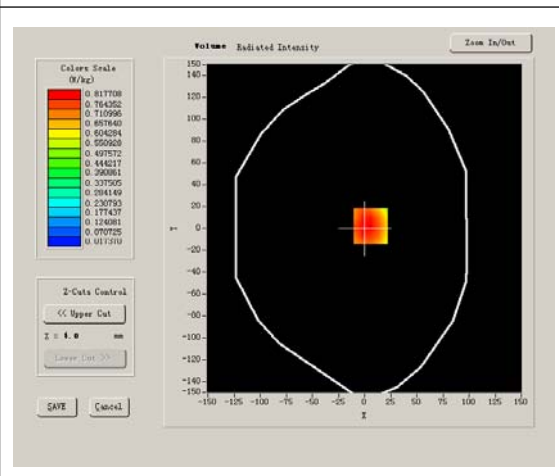
Middle Band SAR (Channel 4175):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 835.000000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | -0.150000              |
| Ambient Temperature:              | 22.3°C                 |
| Liquid Temperature:               | 22.6°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

#### SURFACE SAR



#### VOLUME SAR



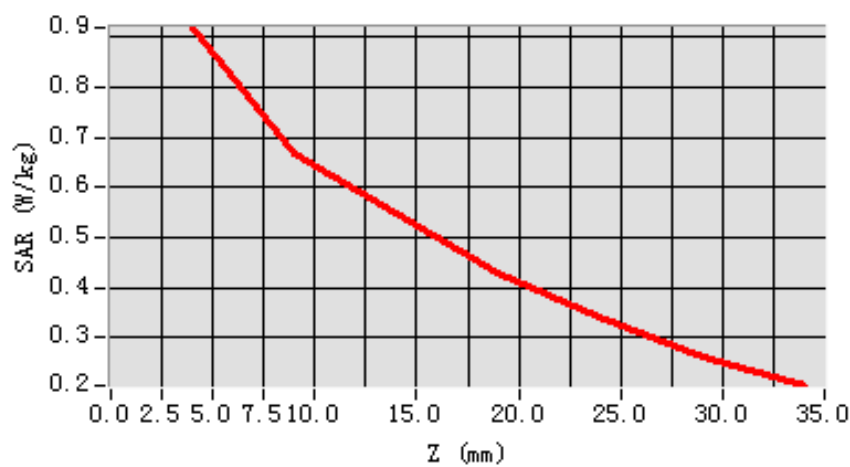
**Maximum location: X=6.00, Y=2.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.651197 |
| <b>SAR 1g (W/Kg)</b>  | 0.902163 |

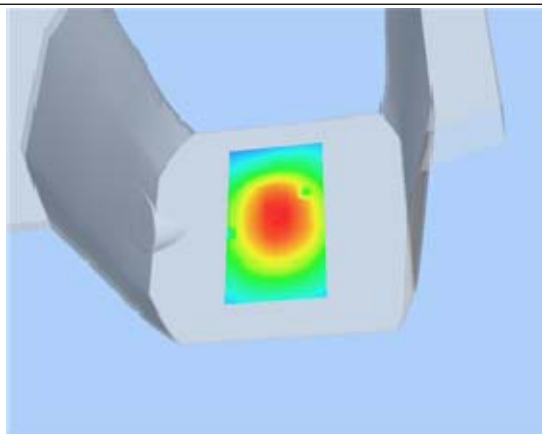
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.9196</b> | <b>0.6680</b> | <b>0.5471</b> | <b>0.4313</b> | <b>0.3402</b> | <b>0.2632</b> |

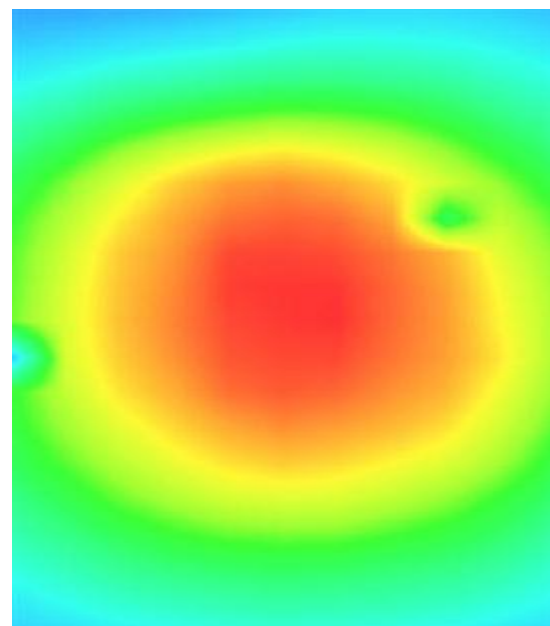
**SAR, Z Axis Scan (X = 6, Y = 2)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 3

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

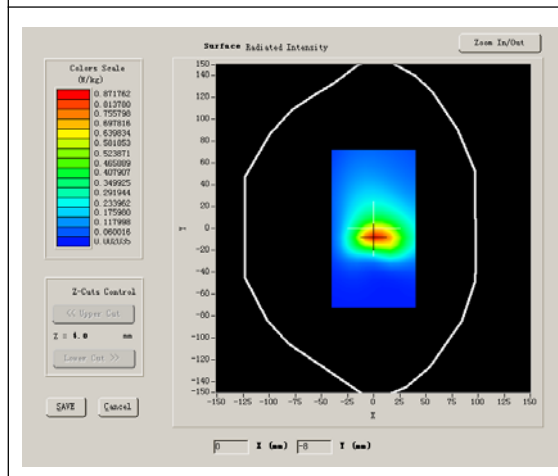
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

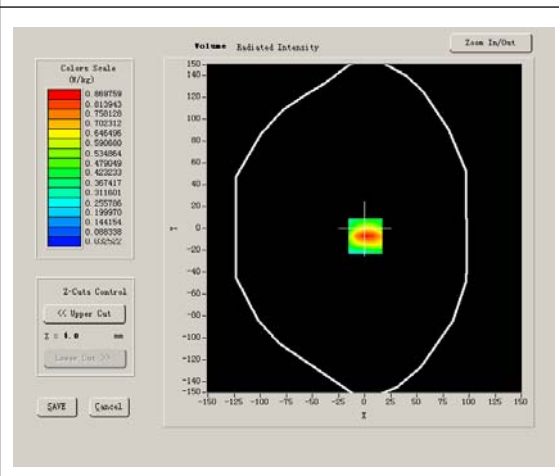
Higher Band SAR (Channel 4233):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 846.600000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | -0.390000              |
| Ambient Temperature:              | 22.7°C                 |
| Liquid Temperature:               | 22.8°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

#### SURFACE SAR



#### VOLUME SAR



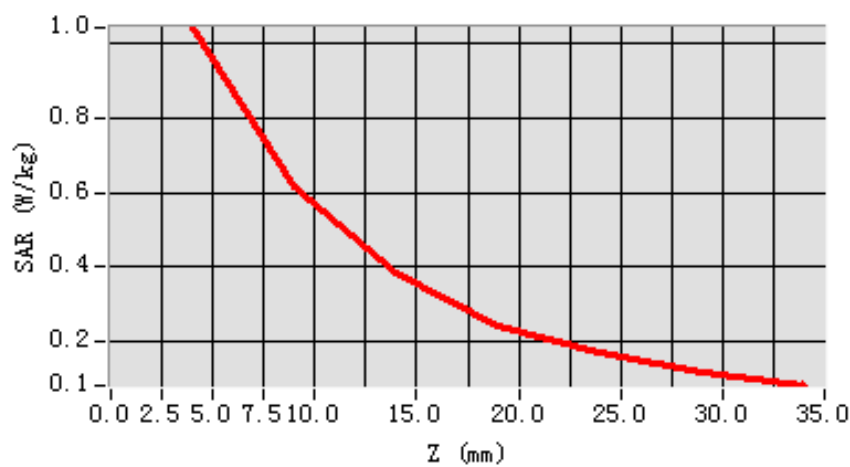
**Maximum location: X=1.00, Y=-7.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.554491 |
| <b>SAR 1g (W/Kg)</b>  | 0.970811 |

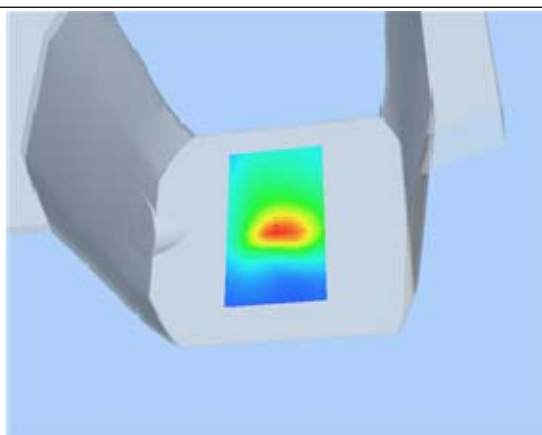
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>1.0438</b> | <b>0.6152</b> | <b>0.3828</b> | <b>0.2432</b> | <b>0.1680</b> | <b>0.1169</b> |

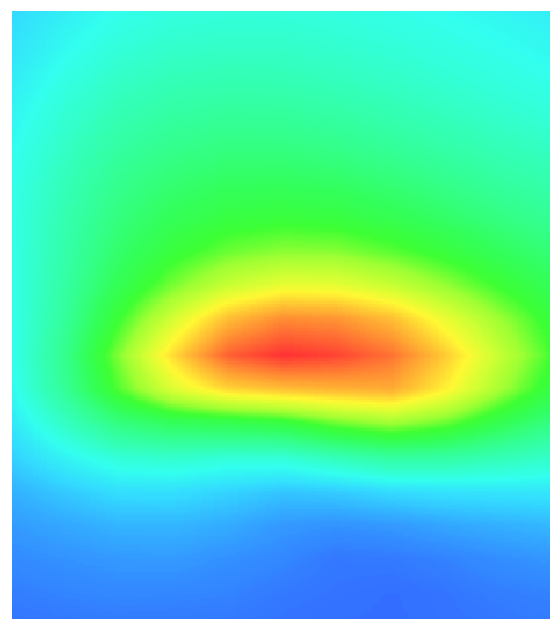
**SAR, Z Axis Scan (X = 1, Y = -7)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 4

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 6 seconds

### A. Experimental conditions.

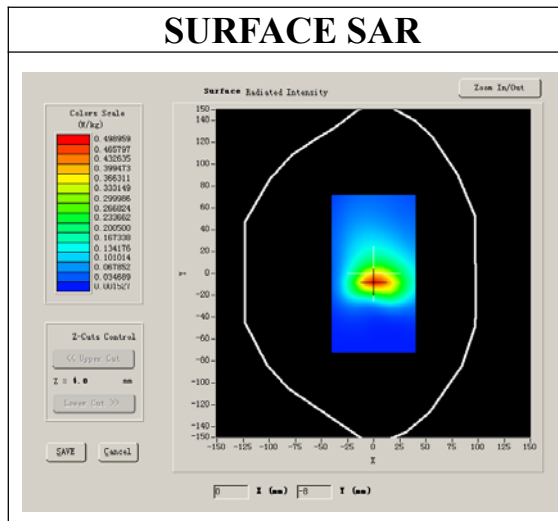
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

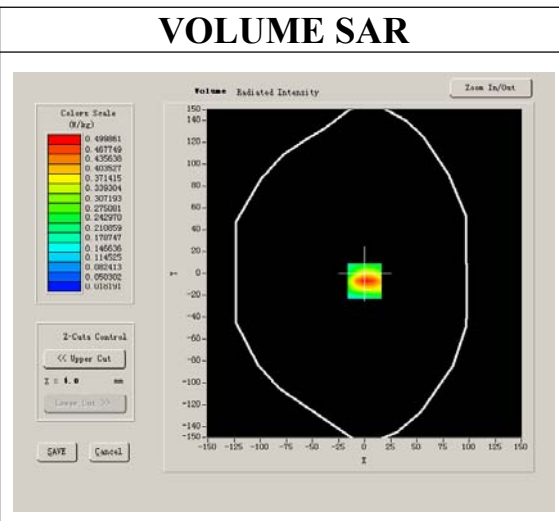
Higher Band SAR (Channel 4233):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 846.600000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | -0.020000              |
| Ambient Temperature:              | 22.3°C                 |
| Liquid Temperature:               | 22.6°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

#### SURFACE SAR



#### VOLUME SAR



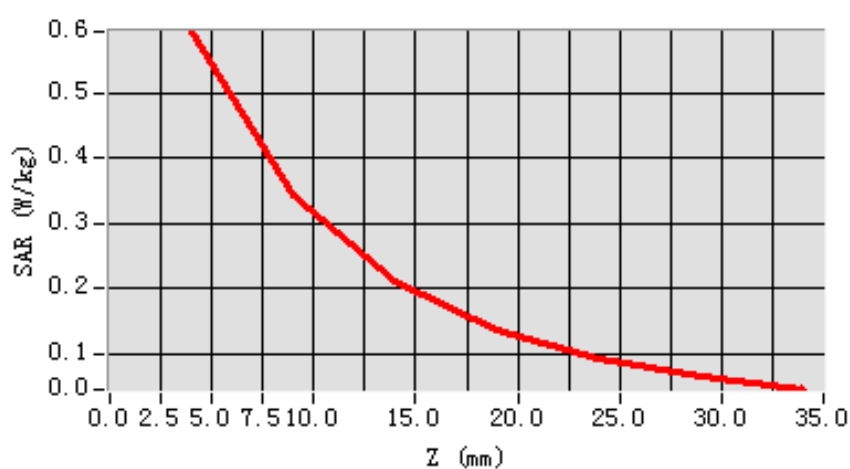
**Maximum location: X=0.00, Y=-7.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.311797 |
| <b>SAR 1g (W/Kg)</b>  | 0.552200 |

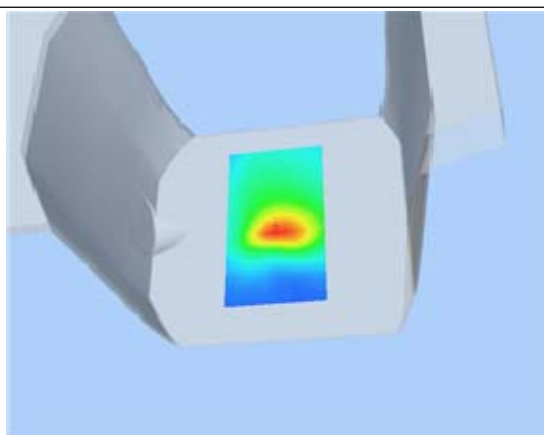
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.5931</b> | <b>0.3411</b> | <b>0.2120</b> | <b>0.1378</b> | <b>0.0932</b> | <b>0.0647</b> |

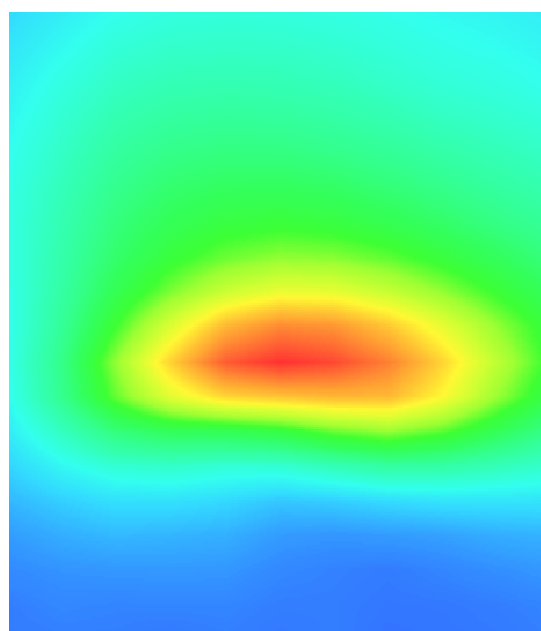
**SAR, Z Axis Scan (X = 0, Y = -7)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 5

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 4 seconds

### A. Experimental conditions.

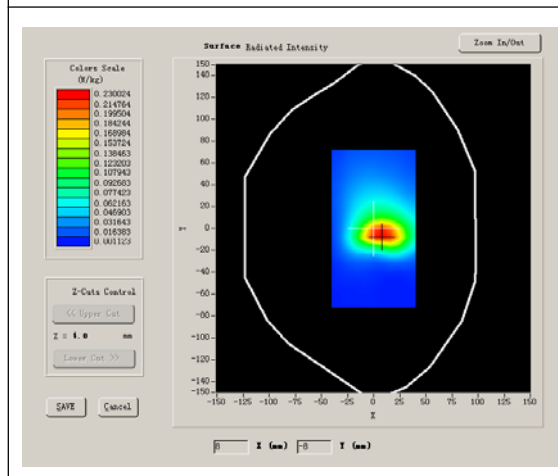
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

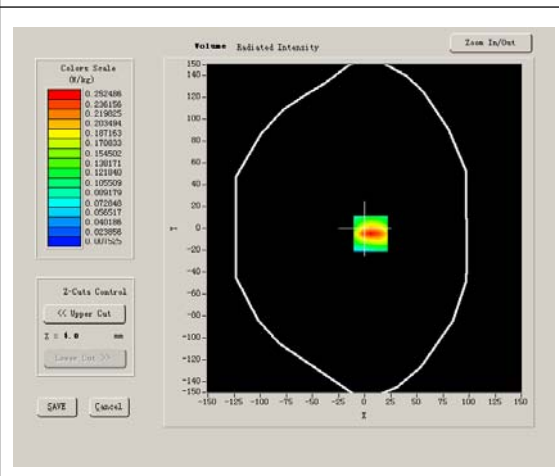
Higher Band SAR (Channel 4233):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 846.600000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | -0.320000              |
| Ambient Temperature:              | 22.3°C                 |
| Liquid Temperature:               | 22.6°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

#### SURFACE SAR



#### VOLUME SAR





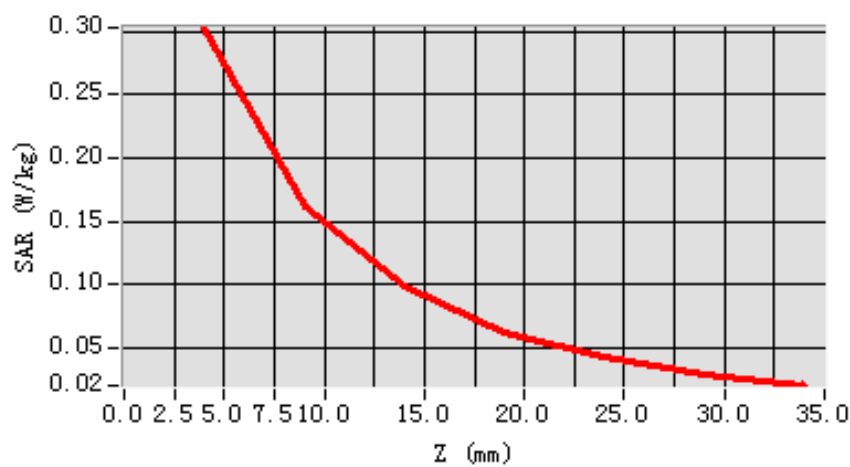
**Maximum location: X=6.00, Y=-5.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.154516 |
| <b>SAR 1g (W/Kg)</b>  | 0.283458 |

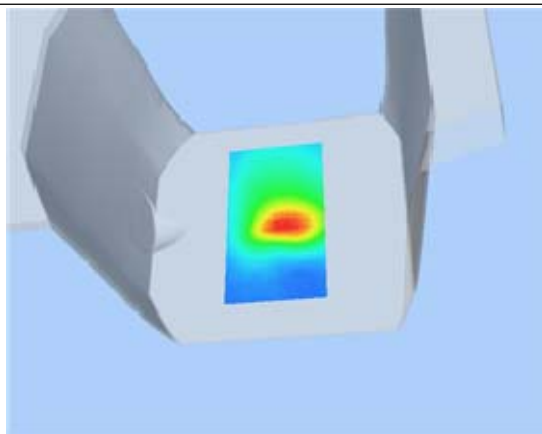
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.3030</b> | <b>0.1622</b> | <b>0.0980</b> | <b>0.0626</b> | <b>0.0421</b> | <b>0.0291</b> |

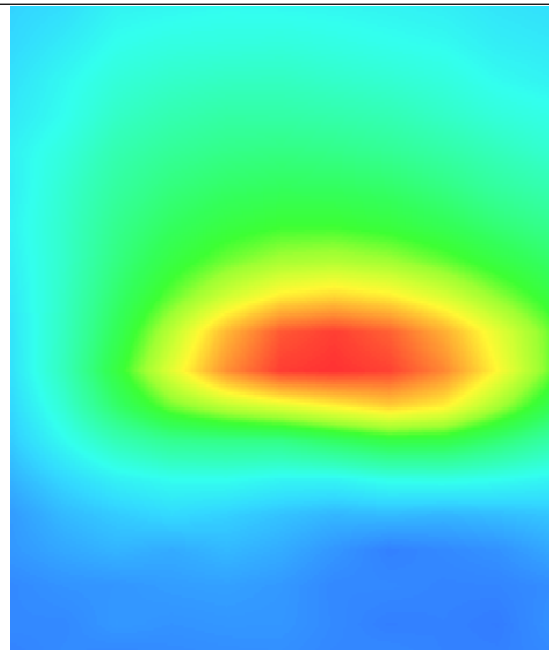
**SAR, Z Axis Scan (X = 6, Y = -5)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 6

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 4 seconds

### A. Experimental conditions.

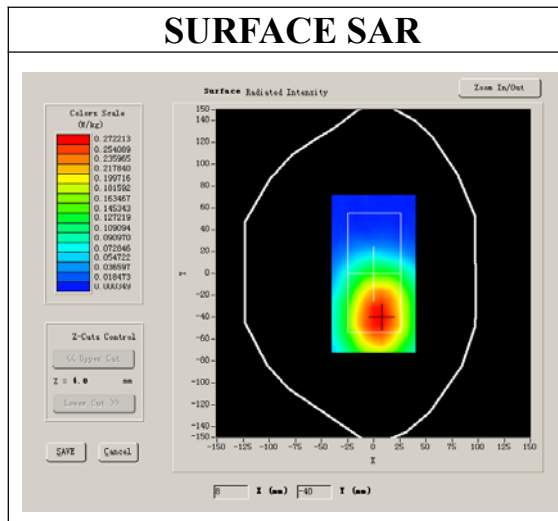
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA850          |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

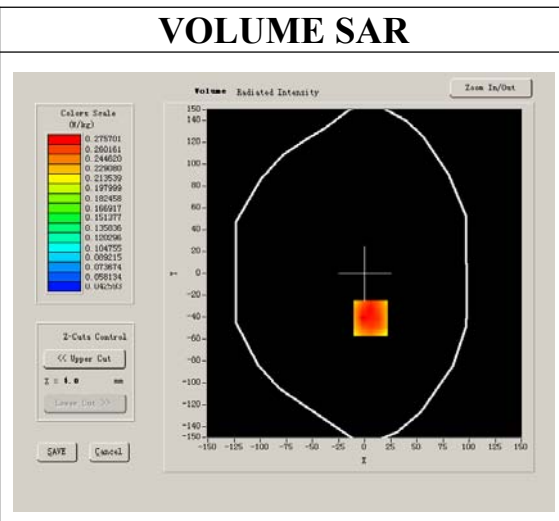
Higher Band SAR (Channel 4233):

|                                   |                        |
|-----------------------------------|------------------------|
| Frequency (MHz)                   | 846.600000             |
| Relative permittivity (real part) | 55.709999              |
| Relative permittivity             | 15.877050              |
| Conductivity (S/m)                | 0.980903               |
| Power drift (%)                   | -0.610000              |
| Ambient Temperature:              | 22.3°C                 |
| Liquid Temperature:               | 22.6°C                 |
| ConvF:                            | 28.559, 25.681, 27.588 |
| Crest factor:                     | 1:1                    |

#### SURFACE SAR



#### VOLUME SAR



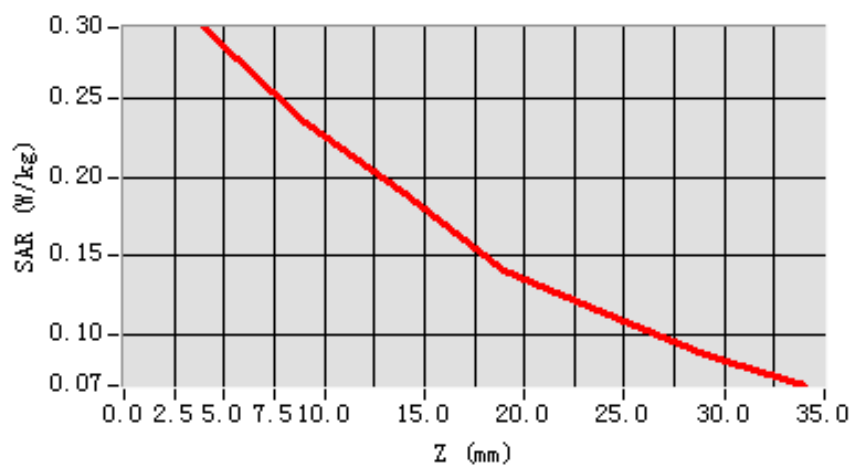
**Maximum location: X=6.00, Y=-41.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.217901 |
| <b>SAR 1g (W/Kg)</b>  | 0.296879 |

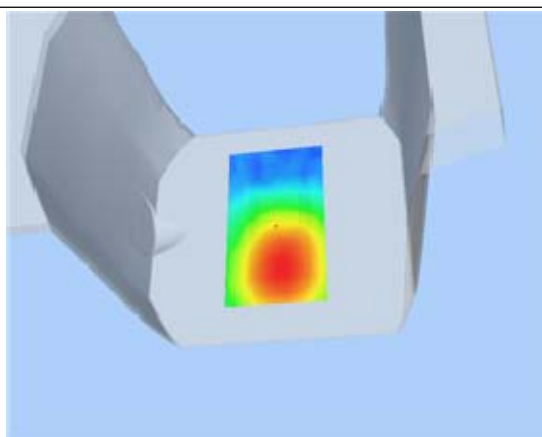
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.2960</b> | <b>0.2355</b> | <b>0.1892</b> | <b>0.1410</b> | <b>0.1132</b> | <b>0.0866</b> |

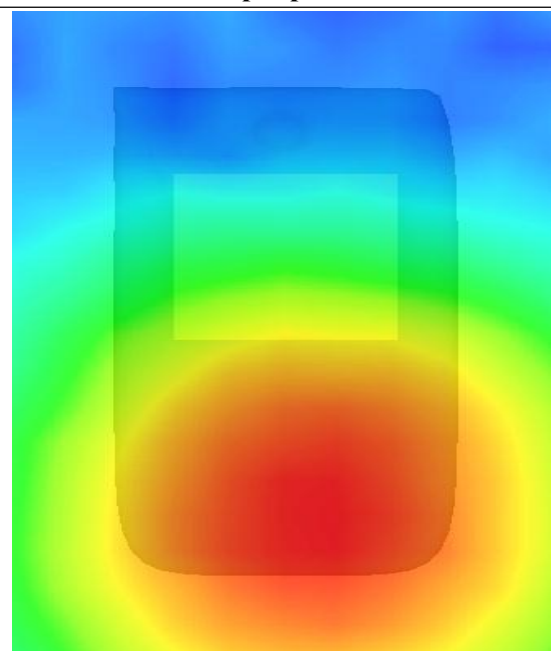
**SAR, Z Axis Scan (X = 6, Y = -41)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 7

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

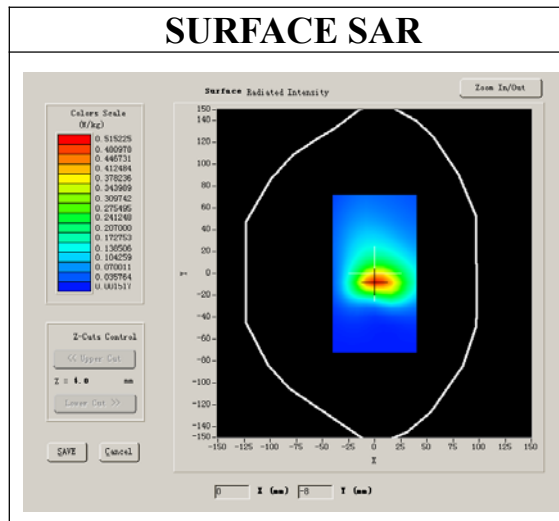
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA1900         |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

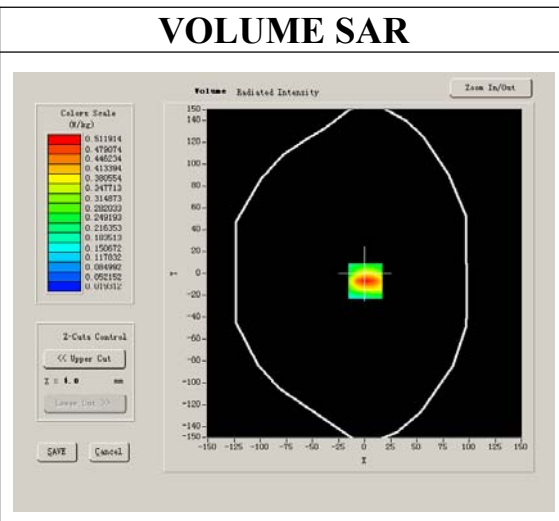
Higher Band SAR (Channel 9538):

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 1907.600000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.877050            |
| Conductivity (S/m)                | 1.513978             |
| Power drift (%)                   | -0.860000            |
| Ambient Temperature:              | 22.6°C               |
| Liquid Temperature:               | 22.7°C               |
| ConvF:                            | 40.625,34.773,38.535 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



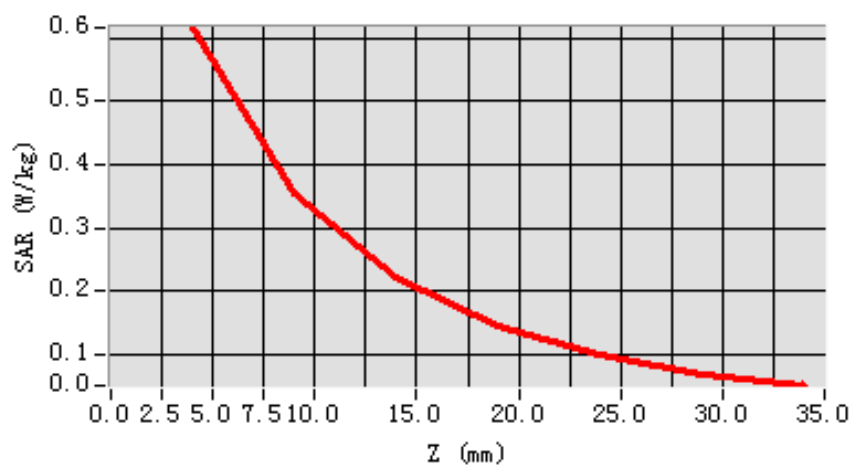
**Maximum location: X=1.00, Y=-7.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.326670 |
| <b>SAR 1g (W/Kg)</b>  | 0.582133 |

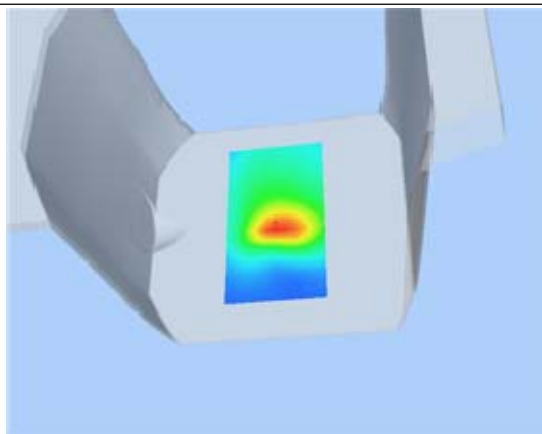
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.6171</b> | <b>0.3555</b> | <b>0.2224</b> | <b>0.1453</b> | <b>0.0977</b> | <b>0.0681</b> |

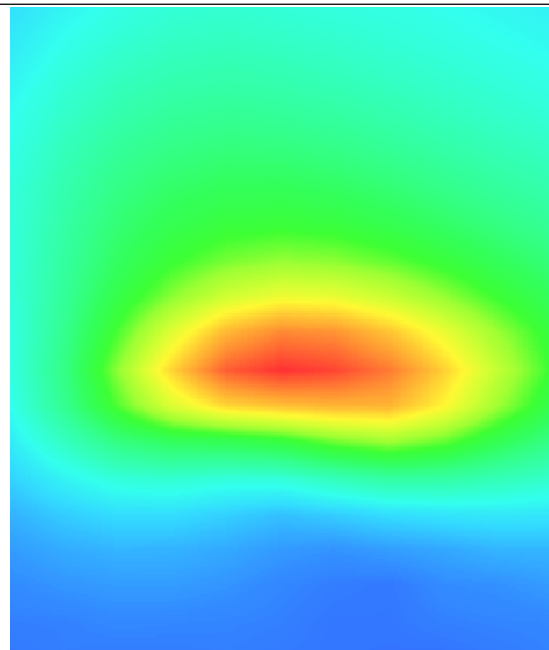
**SAR, Z Axis Scan (X = 1, Y = -7)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 8

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

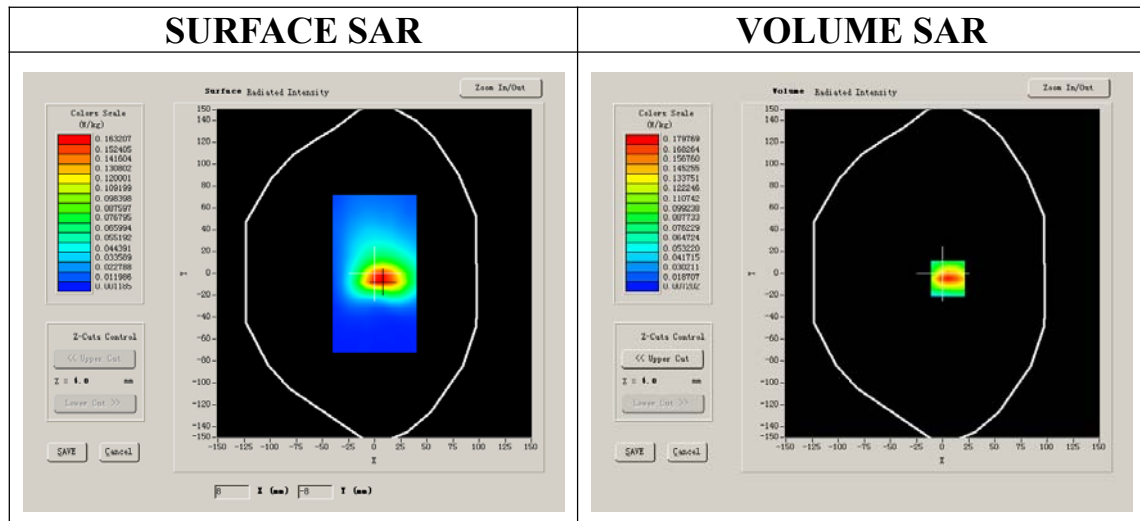
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA1900         |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

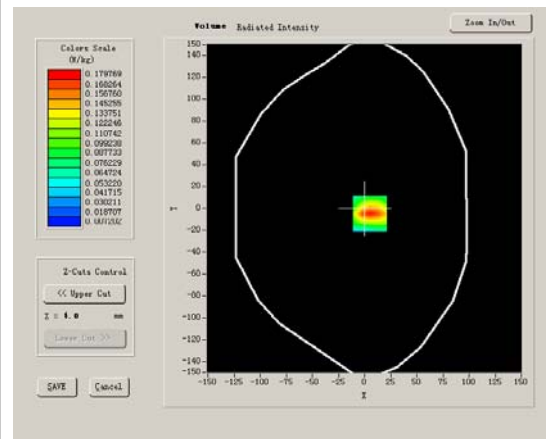
Higher Band SAR (Channel 9538):

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 1907.600000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.877050            |
| Conductivity (S/m)                | 1.513978             |
| Power drift (%)                   | -0.330000            |
| Ambient Temperature:              | 22.6°C               |
| Liquid Temperature:               | 22.7°C               |
| ConvF:                            | 40.625,34.773,38.535 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



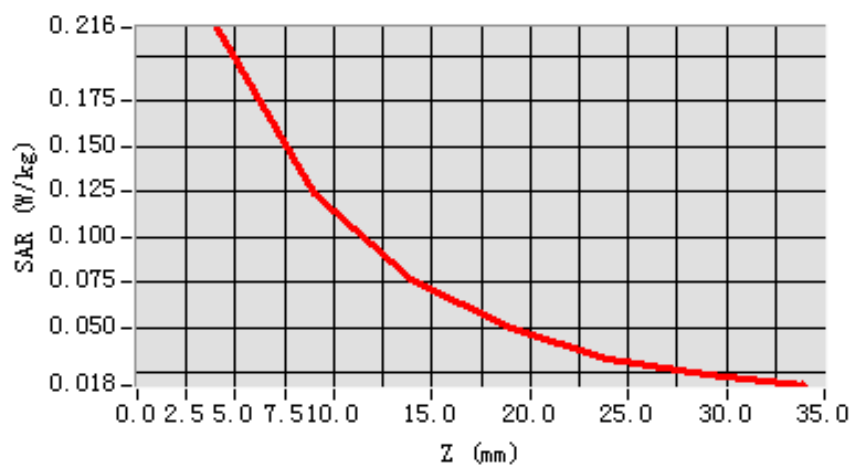
**Maximum location: X=5.00, Y=-5.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.113909 |
| <b>SAR 1g (W/Kg)</b>  | 0.201836 |

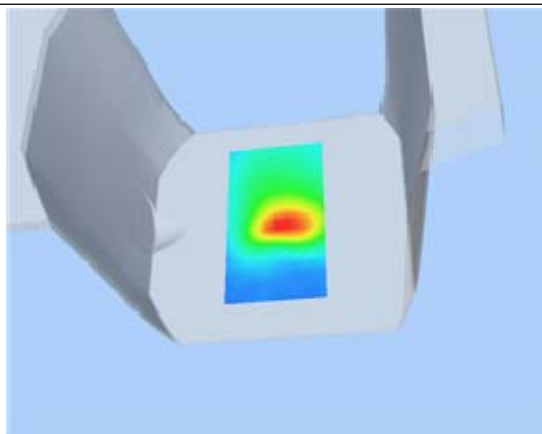
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.2157</b> | <b>0.1238</b> | <b>0.0768</b> | <b>0.0501</b> | <b>0.0326</b> | <b>0.0239</b> |

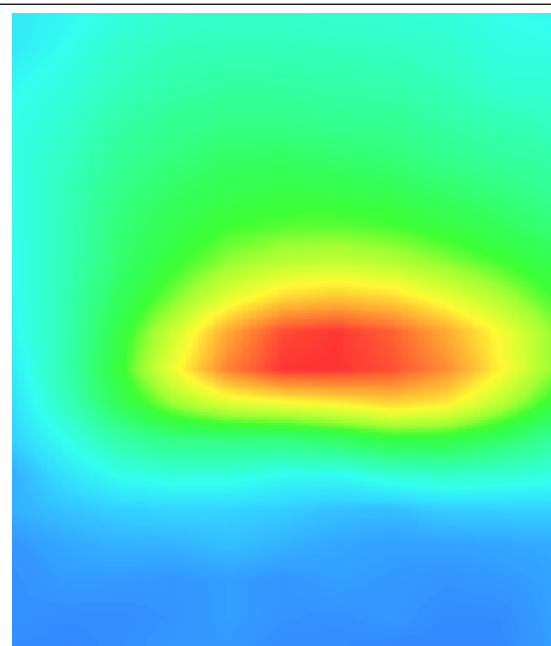
**SAR, Z Axis Scan (X = 5, Y = -5)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 9

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

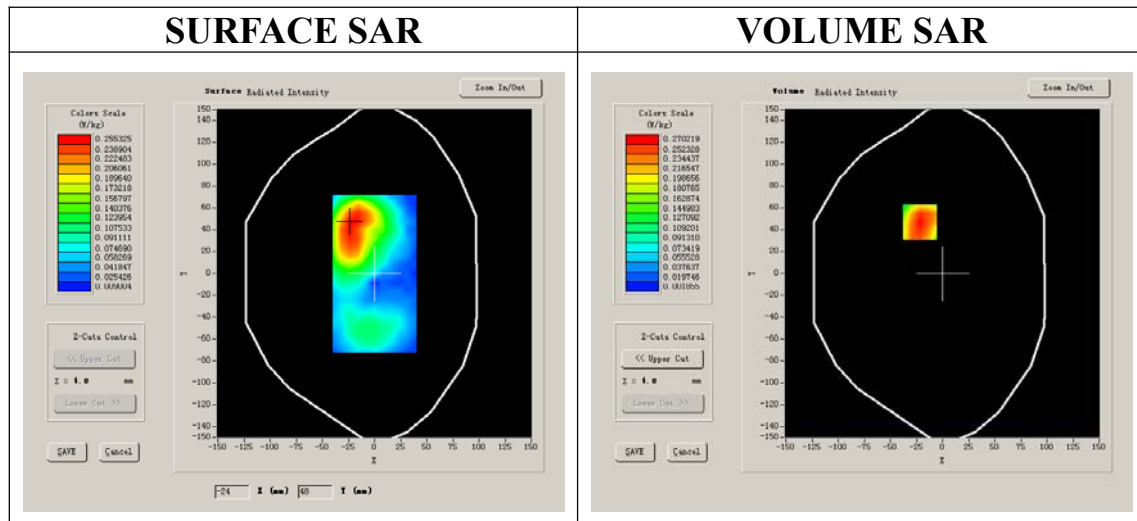
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA1900         |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

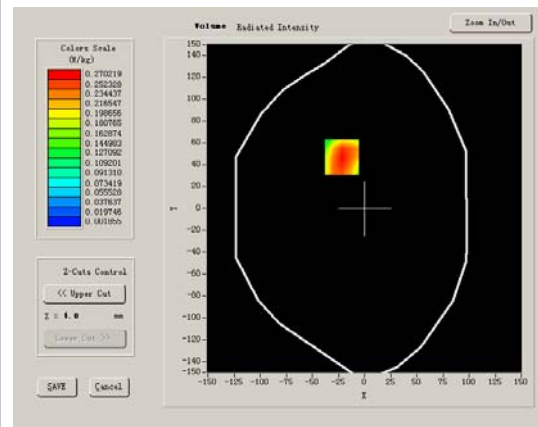
Higher Band SAR (Channel 9538):

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 1907.600000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.877050            |
| Conductivity (S/m)                | 1.513978             |
| Power drift (%)                   | -0.620000            |
| Ambient Temperature:              | 22.6°C               |
| Liquid Temperature:               | 22.7°C               |
| ConvF:                            | 40.625,34.773,38.535 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR





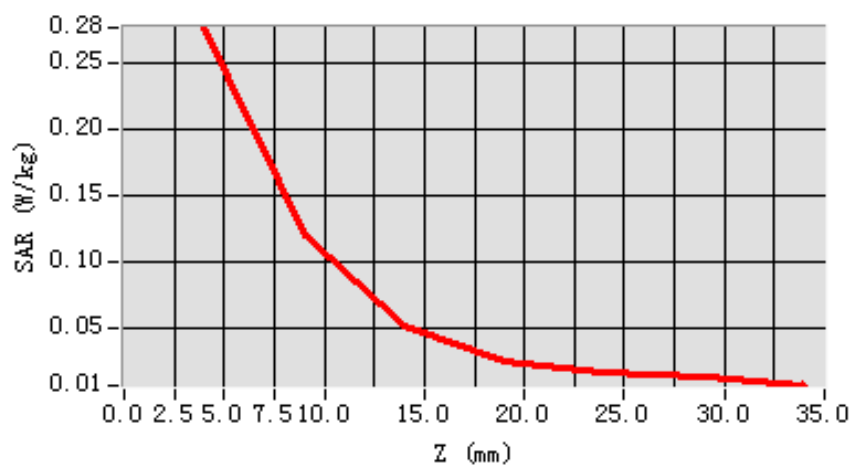
**Maximum location: X=-22.00, Y=47.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.137752 |
| <b>SAR 1g (W/Kg)</b>  | 0.267531 |

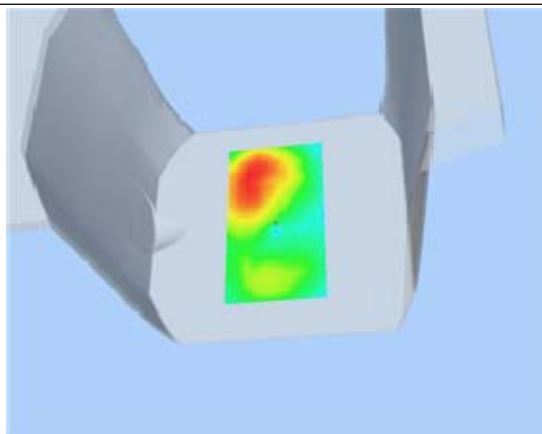
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.2765</b> | <b>0.1203</b> | <b>0.0526</b> | <b>0.0253</b> | <b>0.0164</b> | <b>0.0143</b> |

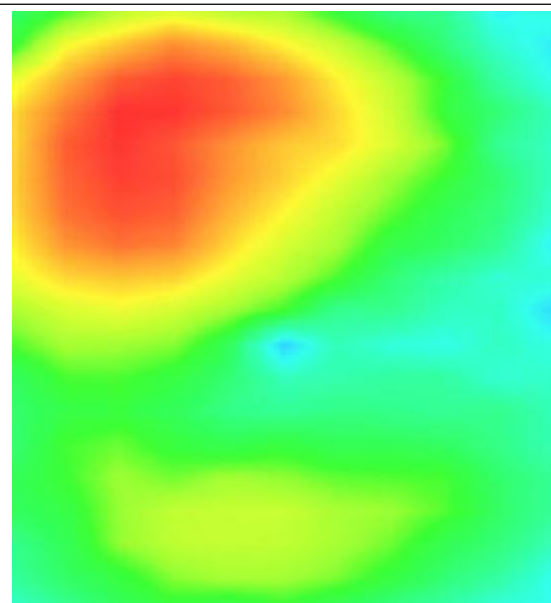
**SAR, Z Axis Scan (X = -22, Y = 47)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 10

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

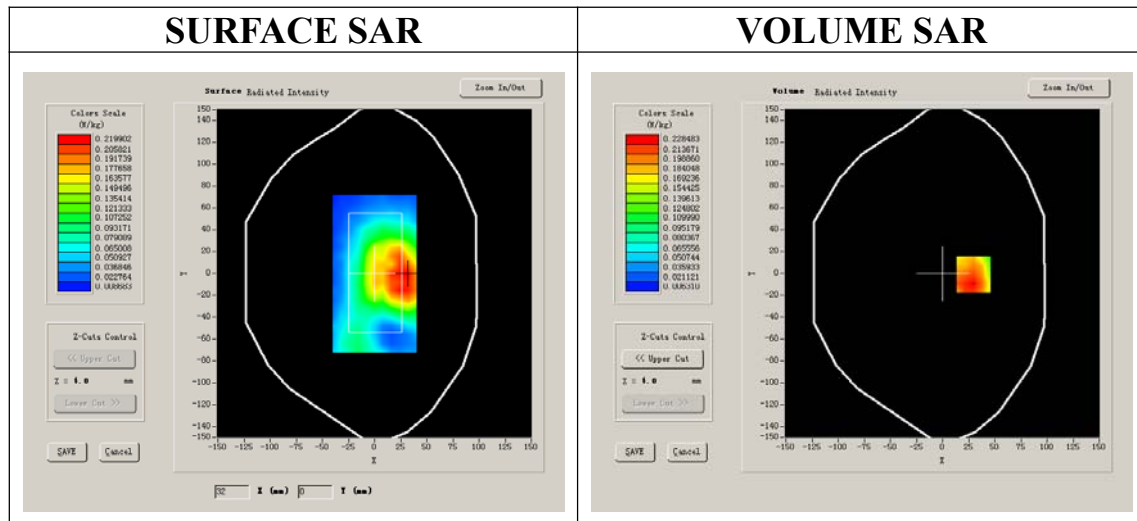
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | WCDMA1900         |
| Channels        | High              |
| Signal          | CDMA              |

### B. SAR Measurement Results

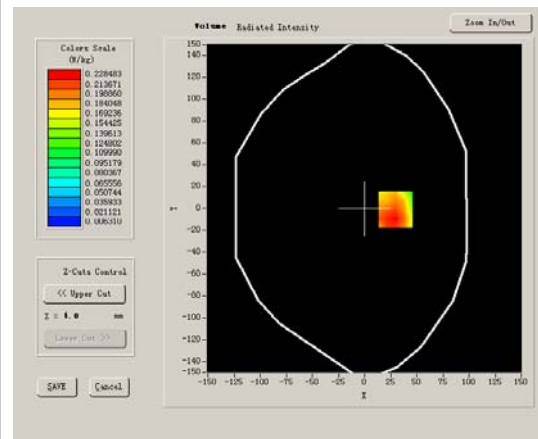
Higher Band SAR (Channel 9538):

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 1907.600000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.877050            |
| Conductivity (S/m)                | 1.513978             |
| Power drift (%)                   | -0.370000            |
| Ambient Temperature:              | 22.6°C               |
| Liquid Temperature:               | 22.7°C               |
| ConvF:                            | 40.625,34.773,38.535 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



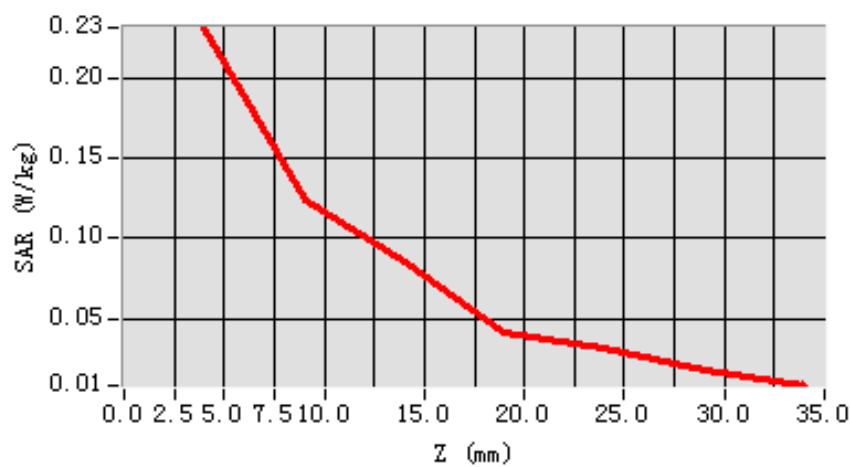
**Maximum location: X=30.00, Y=-1.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.139266 |
| <b>SAR 1g (W/Kg)</b>  | 0.237611 |

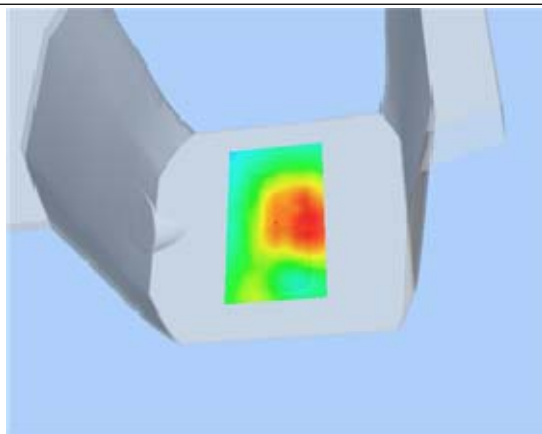
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.2313</b> | <b>0.1242</b> | <b>0.0855</b> | <b>0.0409</b> | <b>0.0323</b> | <b>0.0174</b> |

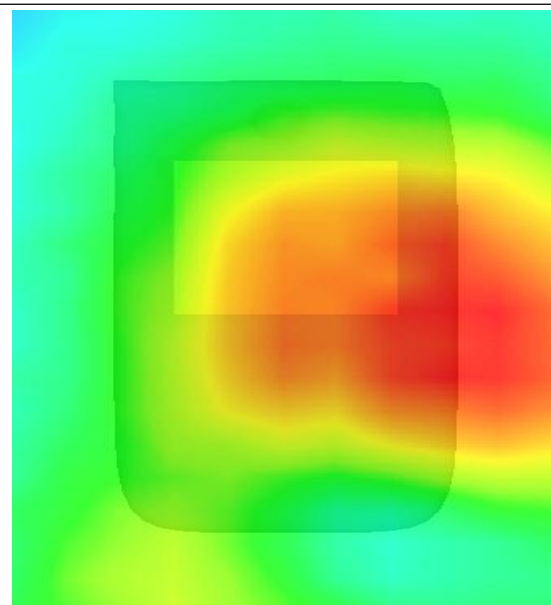
**SAR, Z Axis Scan (X = 30, Y = -1)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 11

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

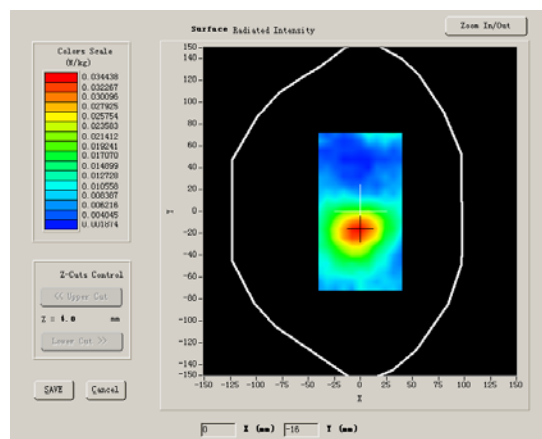
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | 802.11B           |
| Channels        | High              |
| Signal          | DSSS              |

### B. SAR Measurement Results

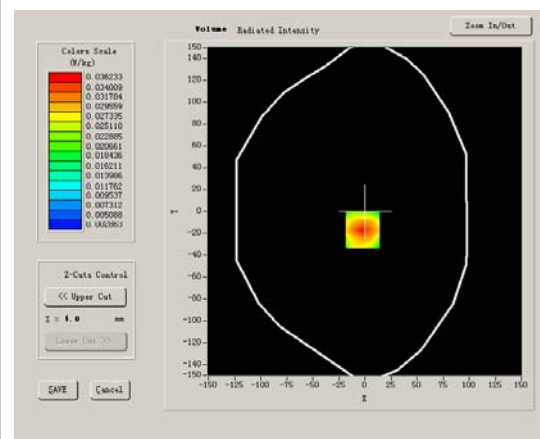
Higher Band SAR (Channel 11)

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 2462.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.500000            |
| Conductivity (S/m)                | 1.853978             |
| Power drift (%)                   | -1.520000            |
| Ambient Temperature:              | 22.0°C               |
| Liquid Temperature:               | 21.8°C               |
| ConvF:                            | 39.772,33.946,37.835 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



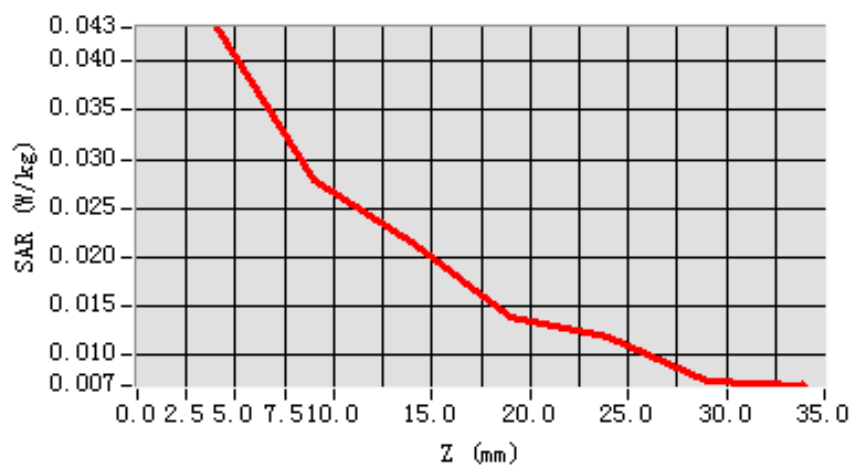
**Maximum location: X=-2.00, Y=-17.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.026378 |
| <b>SAR 1g (W/Kg)</b>  | 0.040954 |

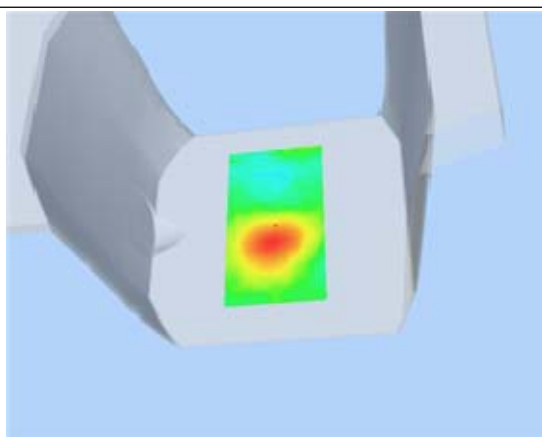
### **Z Axis Scan**

| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.0435</b> | <b>0.0279</b> | <b>0.0216</b> | <b>0.0139</b> | <b>0.0118</b> | <b>0.0073</b> |

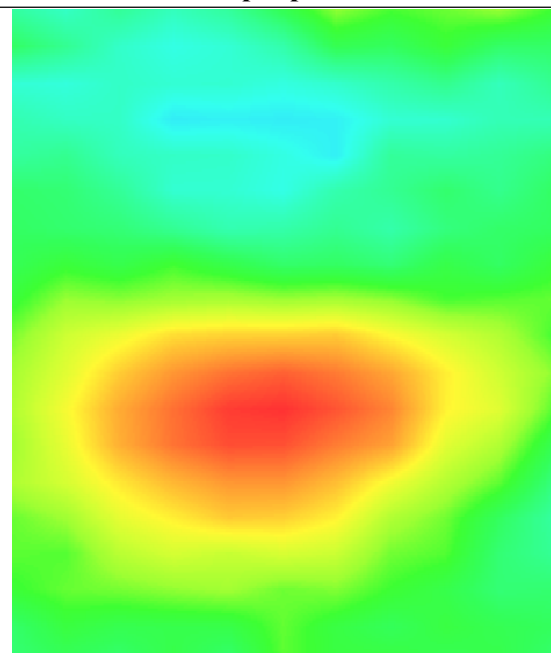
**SAR, Z Axis Scan (X = -2, Y = -17)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 12

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

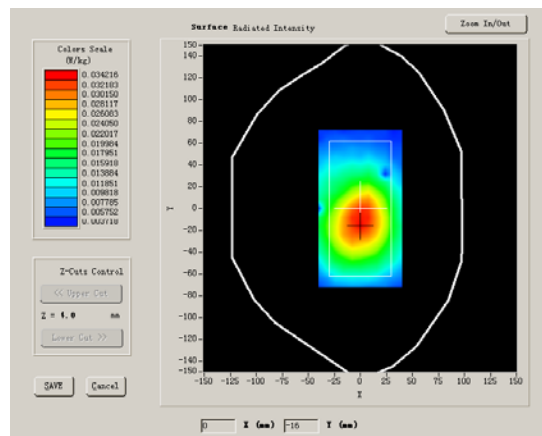
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | 802.11B           |
| Channels        | High              |
| Signal          | DSSS              |

### B. SAR Measurement Results

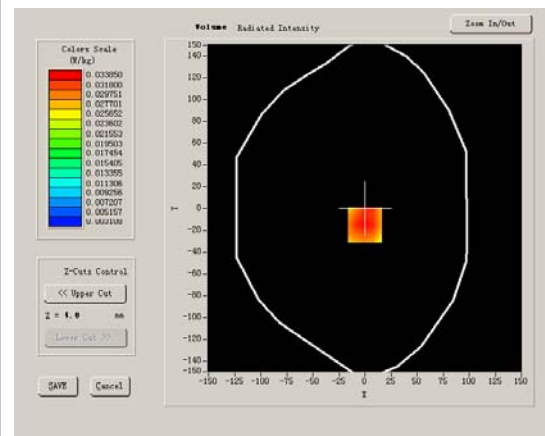
Higher Band SAR (Channel 11)

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 2462.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.500000            |
| Conductivity (S/m)                | 1.853978             |
| Power drift (%)                   | -1.360000            |
| Ambient Temperature:              | 22.0°C               |
| Liquid Temperature:               | 21.8°C               |
| ConvF:                            | 39.772,33.946,37.835 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



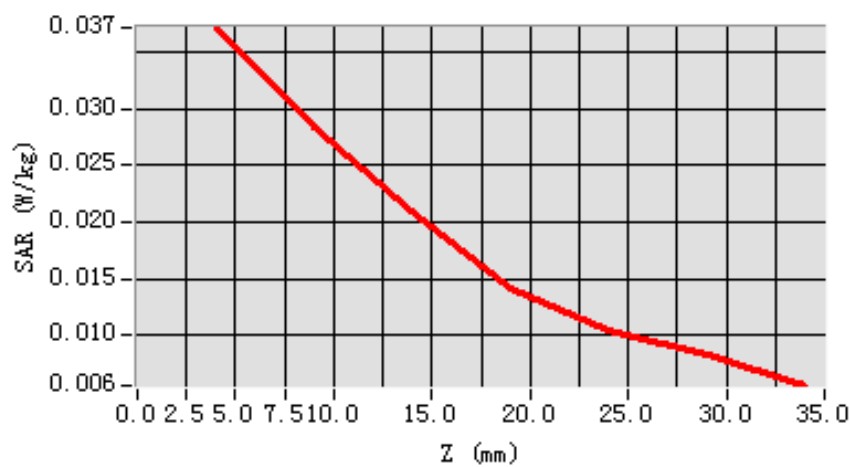
**Maximum location: X=0.00, Y=-15.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.024740 |
| <b>SAR 1g (W/Kg)</b>  | 0.035394 |

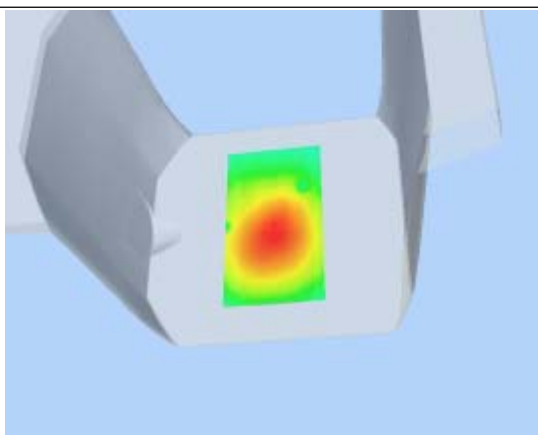
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.0372</b> | <b>0.0283</b> | <b>0.0209</b> | <b>0.0142</b> | <b>0.0105</b> | <b>0.0083</b> |

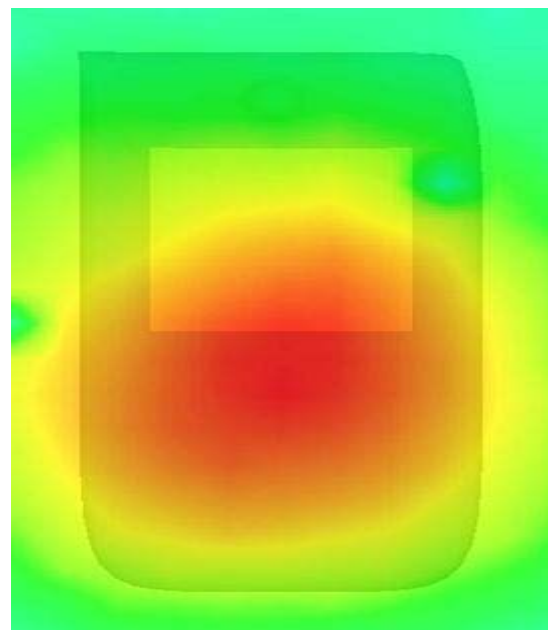
**SAR, Z Axis Scan (X = 0, Y = -15)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 13

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

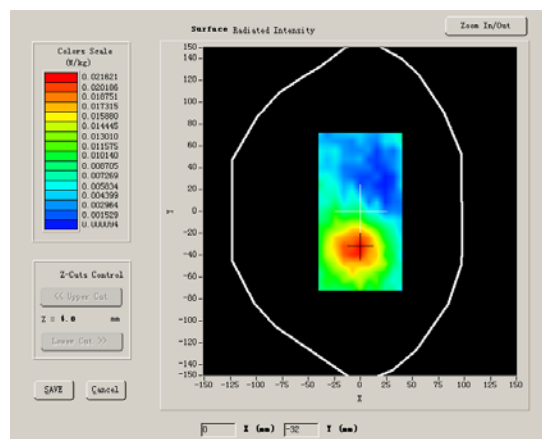
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | 802.11B           |
| Channels        | High              |
| Signal          | DSSS              |

### B. SAR Measurement Results

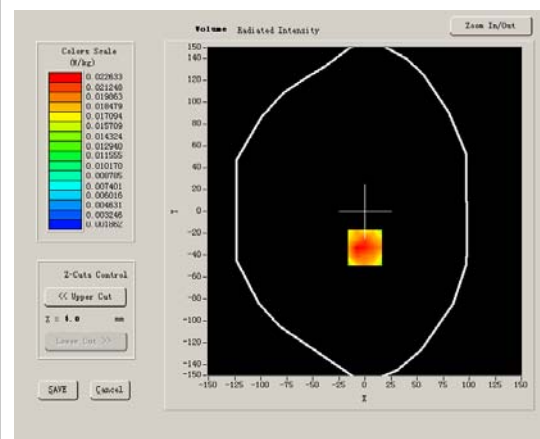
Higher Band SAR (Channel 11)

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 2462.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.500000            |
| Conductivity (S/m)                | 1.853978             |
| Power drift (%)                   | -1.090000            |
| Ambient Temperature:              | 22.0°C               |
| Liquid Temperature:               | 21.8°C               |
| ConvF:                            | 39.772,33.946,37.835 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR





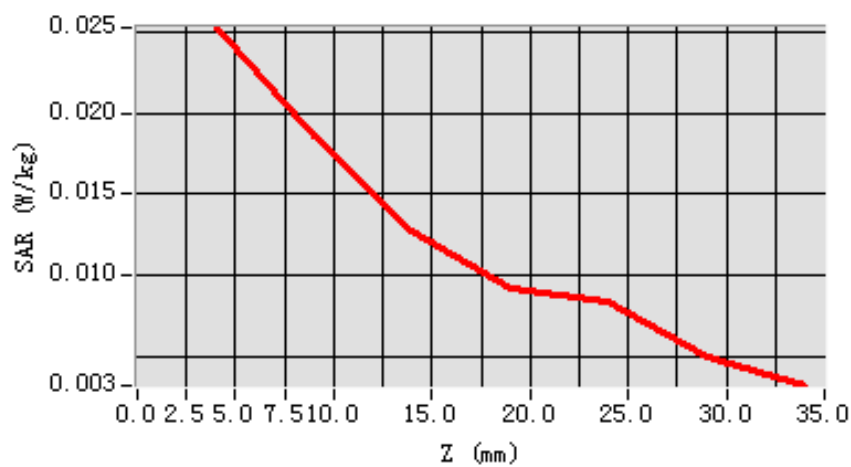
**Maximum location: X=0.00, Y=-33.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.016391 |
| <b>SAR 1g (W/Kg)</b>  | 0.024818 |

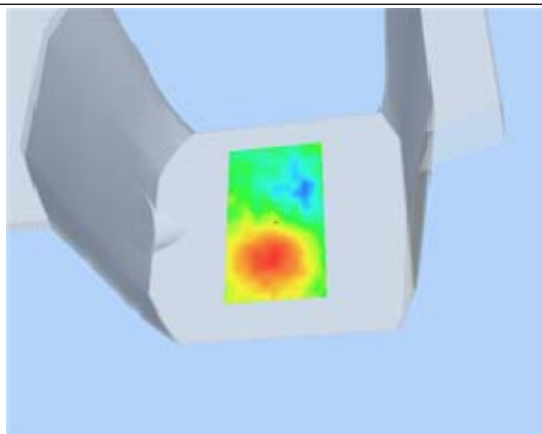
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.0252</b> | <b>0.0186</b> | <b>0.0128</b> | <b>0.0092</b> | <b>0.0084</b> | <b>0.0050</b> |

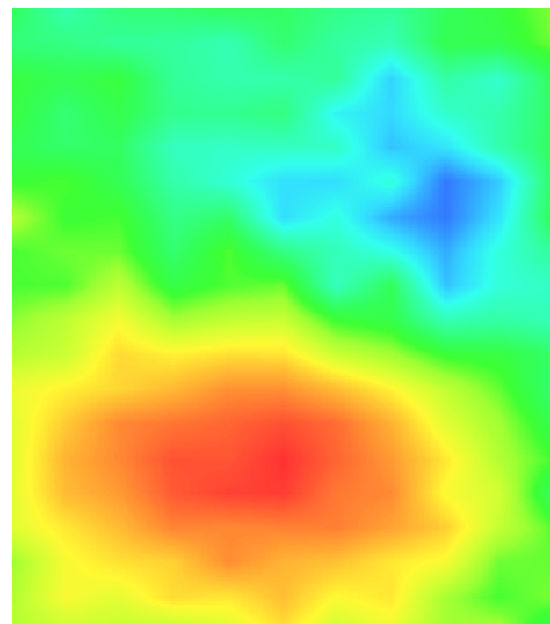
**SAR, Z Axis Scan (X = 0, Y = -33)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 14

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

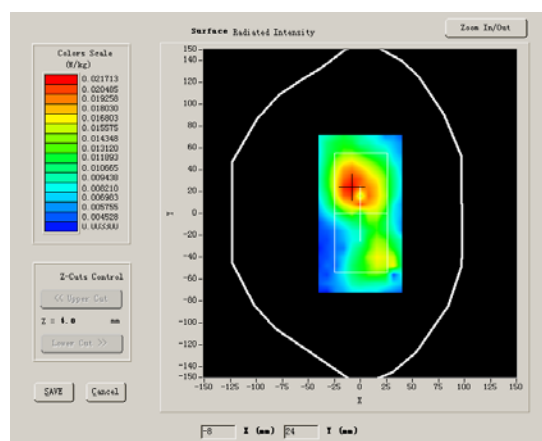
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position | Body              |
| Band            | 802.11B           |
| Channels        | High              |
| Signal          | DSSS              |

### B. SAR Measurement Results

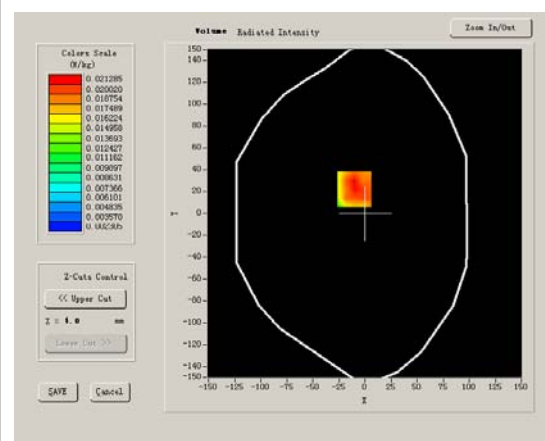
Higher Band SAR (Channel 11)

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 2462.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 15.500000            |
| Conductivity (S/m)                | 1.853978             |
| Power drift (%)                   | -0.890000            |
| Ambient Temperature:              | 22.0°C               |
| Liquid Temperature:               | 21.8°C               |
| ConvF:                            | 39.772,33.946,37.835 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



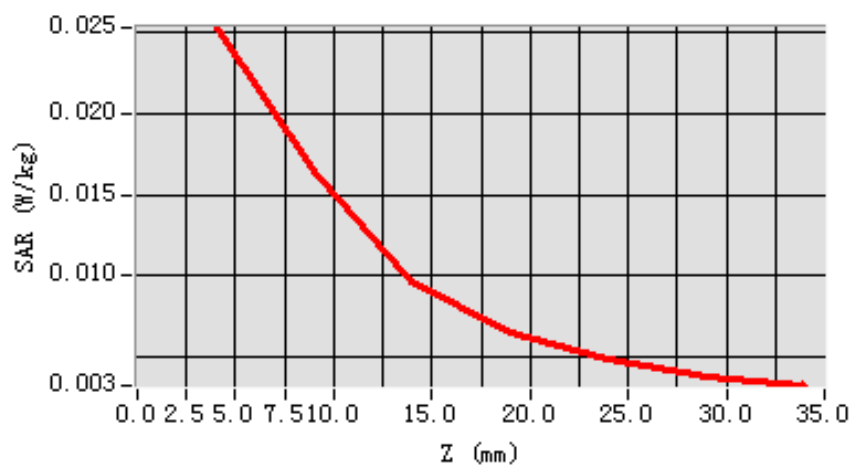
**Maximum location: X=-10.00, Y=22.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 0.015390 |
| <b>SAR 1g (W/Kg)</b>  | 0.024456 |

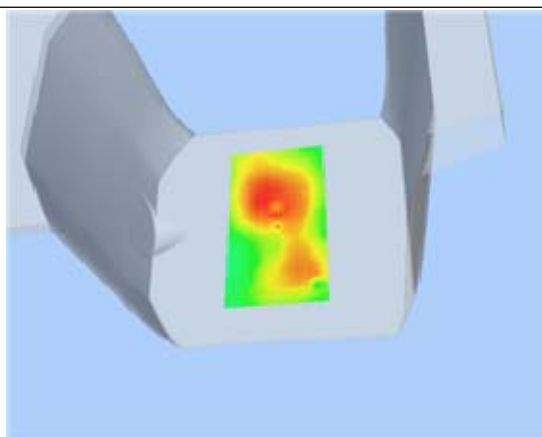
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>0.0253</b> | <b>0.0164</b> | <b>0.0097</b> | <b>0.0065</b> | <b>0.0049</b> | <b>0.0037</b> |

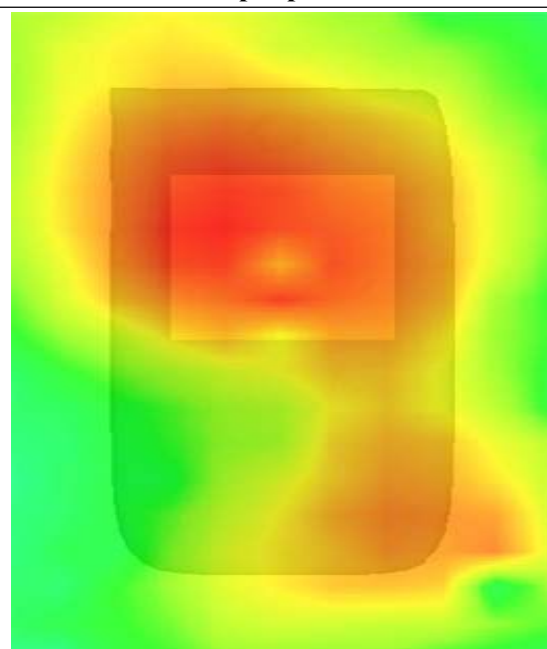
**SAR, Z Axis Scan (X = -10, Y = 22)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(Body)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

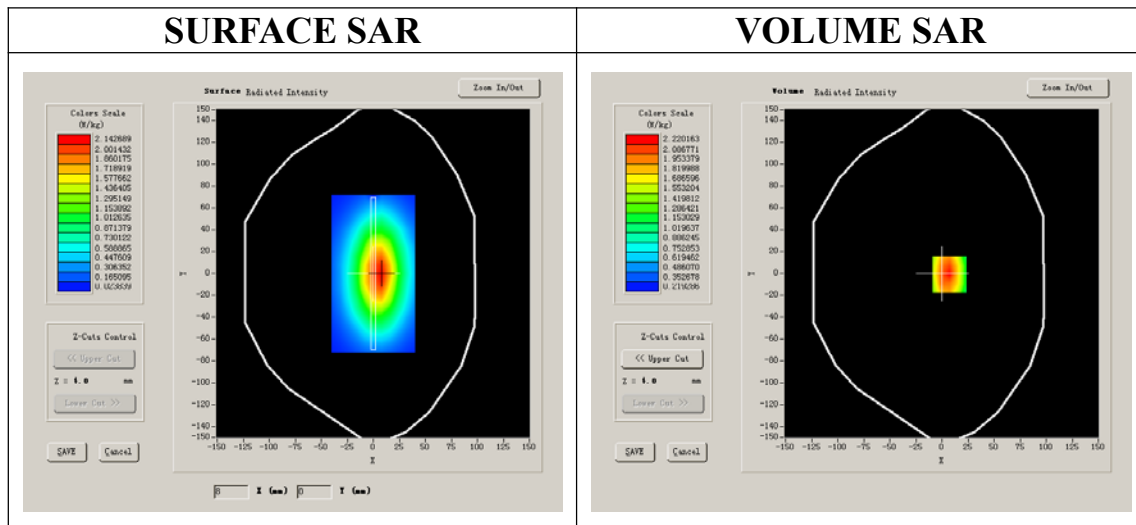
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position |                   |
| Band            | 835MHz            |
| Channels        |                   |
| Signal          | CW                |

### B. SAR Measurement Results

#### Band SAR

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 835.000000           |
| Relative permittivity (real part) | 55.709999            |
| Relative permittivity             | 21.709999            |
| Conductivity (S/m)                | 0.980903             |
| Power drift (%)                   | -0.170000            |
| Ambient Temperature:              | 22.4°C               |
| Liquid Temperature:               | 21.5°C               |
| ConvF:                            | 28.559,25.681,27.588 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



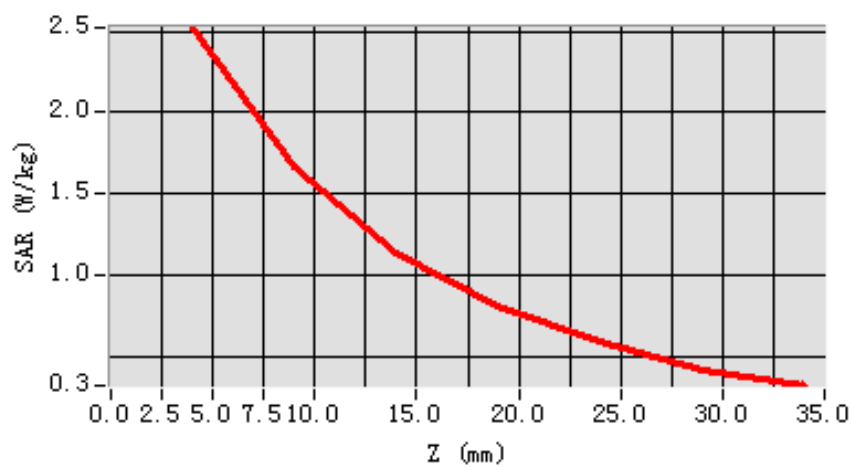
**Maximum location: X=7.00, Y=-1.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 1.539476 |
| <b>SAR 1g (W/Kg)</b>  | 2.385979 |

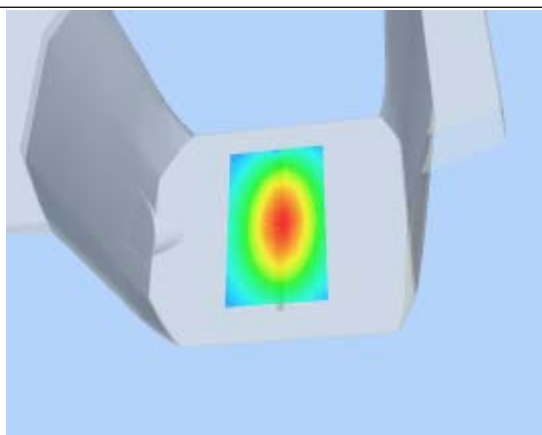
### **Z Axis Scan**

|                   |               |               |               |               |               |               |               |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>   | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>2.5209</b> | <b>1.6629</b> | <b>1.1437</b> | <b>0.8075</b> | <b>0.5889</b> | <b>0.4143</b> |

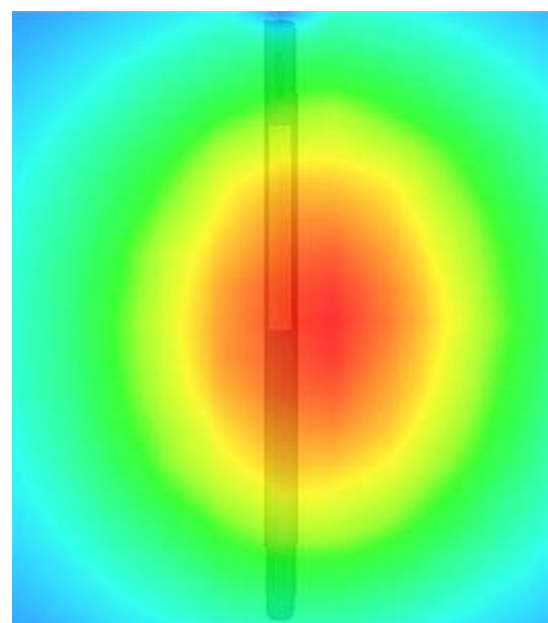
**SAR, Z Axis Scan (X = 7, Y = -1)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(Body)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 26 seconds

### A. Experimental conditions.

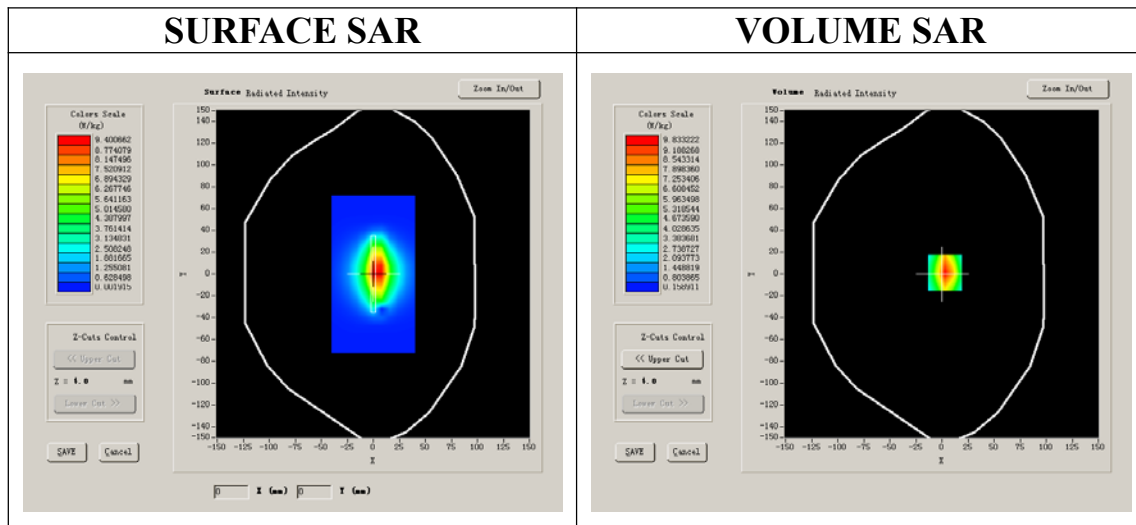
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Flat Plane        |
| Device Position |                   |
| Band            | 1900MHz           |
| Channels        |                   |
| Signal          | CW                |

### B. SAR Measurement Results

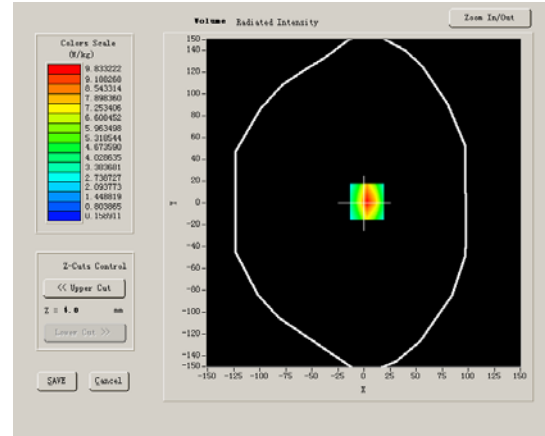
#### Band SAR

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 1900.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 14.070000            |
| Conductivity (S/m)                | 1.513978             |
| Power drift (%)                   | -0.030000            |
| Ambient Temperature:              | 22.3°C               |
| Liquid Temperature:               | 22.6°C               |
| ConvF:                            | 40.625,34.773,38.535 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR



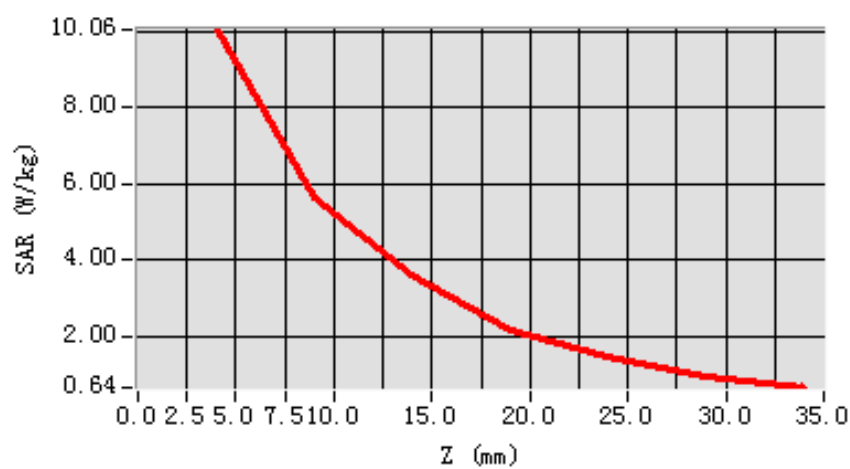
**Maximum location: X=3.00, Y=1.00**

|                       |          |
|-----------------------|----------|
| <b>SAR 10g (W/Kg)</b> | 4.981611 |
| <b>SAR 1g (W/Kg)</b>  | 9.740177 |

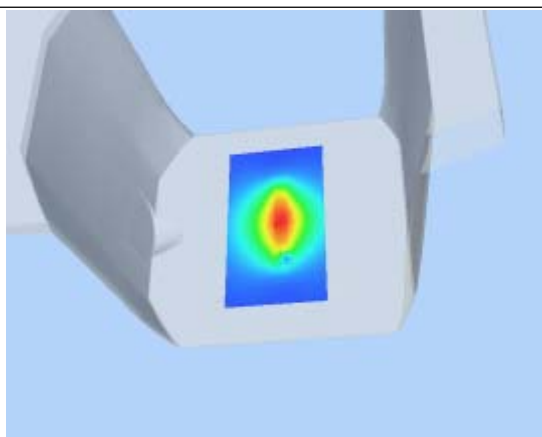
### **Z Axis Scan**

|                   |               |                |               |               |               |               |               |
|-------------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>    | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  | <b>24.00</b>  | <b>29.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>10.0621</b> | <b>5.6445</b> | <b>3.6226</b> | <b>2.1642</b> | <b>1.4521</b> | <b>0.9078</b> |

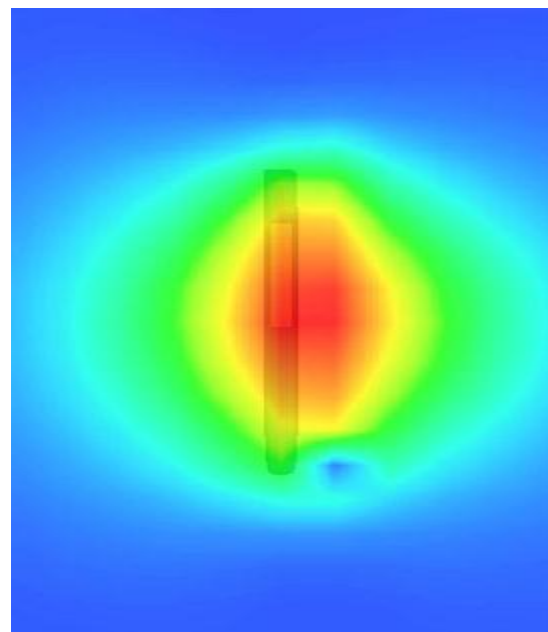
**SAR, Z Axis Scan (X = 3, Y = 1)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(Body)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

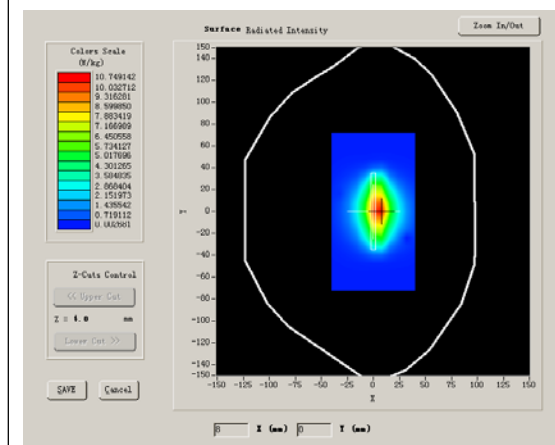
|                 |                   |
|-----------------|-------------------|
| Phantom File    | surf_sam_plan.txt |
| Phantom         | Validation plane  |
| Device Position |                   |
| Band            | 2450MHz           |
| Channels        |                   |
| Signal          | CW                |

### B. SAR Measurement Results

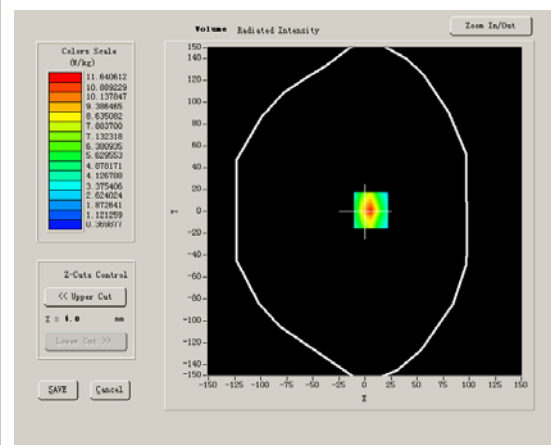
#### Band SAR

|                                   |                      |
|-----------------------------------|----------------------|
| Frequency (MHz)                   | 2450.000000          |
| Relative permittivity (real part) | 52.548876            |
| Relative permittivity             | 12.991650            |
| Conductivity (S/m)                | 1.853978             |
| Power Drift (%)                   | 1.080000             |
| Ambient Temperature:              | 22.0°C               |
| Liquid Temperature:               | 21.8°C               |
| ConvF:                            | 39.772,33.946,37.835 |
| Crest factor:                     | 1:1                  |

#### SURFACE SAR



#### VOLUME SAR





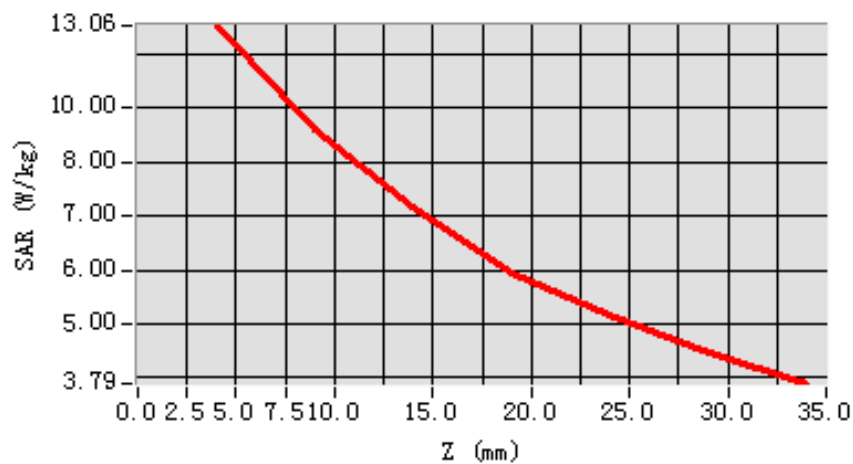
**Maximum location: X=-1.00, Y=-50.00**

|                       |           |
|-----------------------|-----------|
| <b>SAR 10g (W/Kg)</b> | 6.256773  |
| <b>SAR 1g (W/Kg)</b>  | 12.789110 |

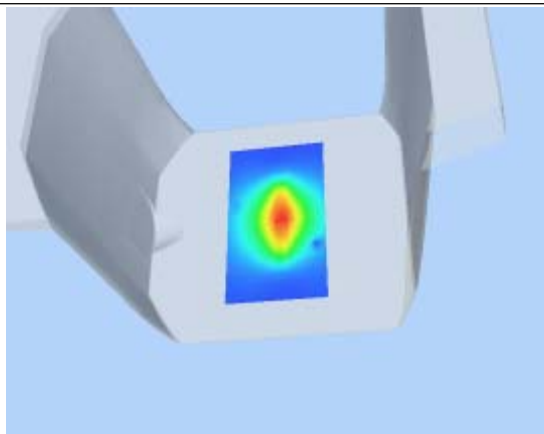
### **Z Axis Scan**

|                   |               |                |               |               |               |
|-------------------|---------------|----------------|---------------|---------------|---------------|
| <b>Z (mm)</b>     | <b>0.00</b>   | <b>4.00</b>    | <b>9.00</b>   | <b>14.00</b>  | <b>19.00</b>  |
| <b>SAR (W/Kg)</b> | <b>0.0000</b> | <b>13.1279</b> | <b>6.8312</b> | <b>3.5991</b> | <b>1.3473</b> |

**SAR, Z Axis Scan (X = -1, Y = -50)**



**3D scene shot**



**Hot spot position**

