



# SAR TEST REPORT

TESTING  
CNAS L3572

Issued to

REACH Tech (Xiamen) Co., Ltd.

For

A58w

Model Name : A58w  
Trade Name : CINCINNATI BELL HOLA  
Brand Name : CINCINNATI BELL  
FCC ID : Z5J-A58W  
Standard : FCC Oet65 Supplement C Jun.2001  
47CFR 2.1093  
ANSI C95.1-1999  
IEEE 1528-2003  
MAX SAR : Head: 0.652W/kg  
Body: 0.660W/kg  
Test date : 2011-10-18  
Issue date : 2011-12-8

Shenzhen MORLAB Communication Technology Co., Ltd.



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Date 2011.12.8

CTIA Authorized Test Lab  
LAB CODE 20081223-00  
IEEE 1725

OFTA  
電訊管理局



GCF  
Official Observer of  
Global Certification Forum

Bluetooth  
BQTF

FCC  
Reg. No.  
741109

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Change History		
Issue	Date	Reason for change
1.0	Oct. 21, 2011	First edition
1.1	Oct. 26, 2011	Add Multiple Transmitters Evaluation and Bluetooth peak output power measurement result. Correct GSM850 EDGE Body SAR result list form. Correct the Measurement list form of Annex C in Page 30 and Page 31.
2.0	Dec. 8,2011	Add System Performance Check Data of 1700MHz.

## 1. 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: 2011-10-18)	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

## 2. Technical Information

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

### 2.1. Identification of Applicant

Company Name: AEG Portuguesa de Telecomunicações, SA  
Address: Rua João Saraiva, 4-6 1700-249 Lisboa Portugal

### 2.2. Identification of Manufacturer

Company Name: Chi Hang Technology Co., Ltd. Shenzhen  
Address: Longhua Big Wave Science and Technology Industrial Park, Hua Rong Lu Detai 5

### 2.3. Equipment Under Test (EUT)

Brand Name: CINCINNATI BELL  
Type Name: CINCINNATI BELL HOLA  
Marking Name: A58w  
Hardware Version: E407mb\_v2.0  
Software Version: E407RWLite\_SS\_V0.1.0.22090  
Frequency Bands: GSM 850MHz / PCS 1900MHz; WCDMA 1700  
Modulation Mode: GSM/GPRS: GMSK; WCDMA:CDMA;  
EDGE: 8PSK  
Multislot Class: GPRS: Multislot Class 10; EDGE: Multislot Class 12;  
Antenna type: Fixed Internal Antenna  
Development Stage: Identical prototype  
Battery Model: BTR2105  
Battery specification: 1200mAh 3.7V

#### 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#	E407mb_v2.0	E407RWLite_SS_V0.1.0.22090

## 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.

## 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:	GSM 850MHz   PCS 1900MHz WCDMA 1700
Operation mode:	Call established
Power Level:	GSM 850 MHz Maximum output power(level 5) PCS 1900 MHz Maximum output power(level 0) WCDMA 1700 MHz 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 125, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz, or to 1313, 1450 and 1512 respectively in the case of WCDMA 1700. The EUT is 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 GPRS/EDGE or WCDMA link mode. In GPRS link mode, its crest factor is 4, because EUT is set in GPRS multi-slot class 10 with 2 uplink slots. In EDGE link mode, its crest factor is 2, because EUT is set in EDGE multi-slot class 12 with 4 uplink slots. In WCDMA 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

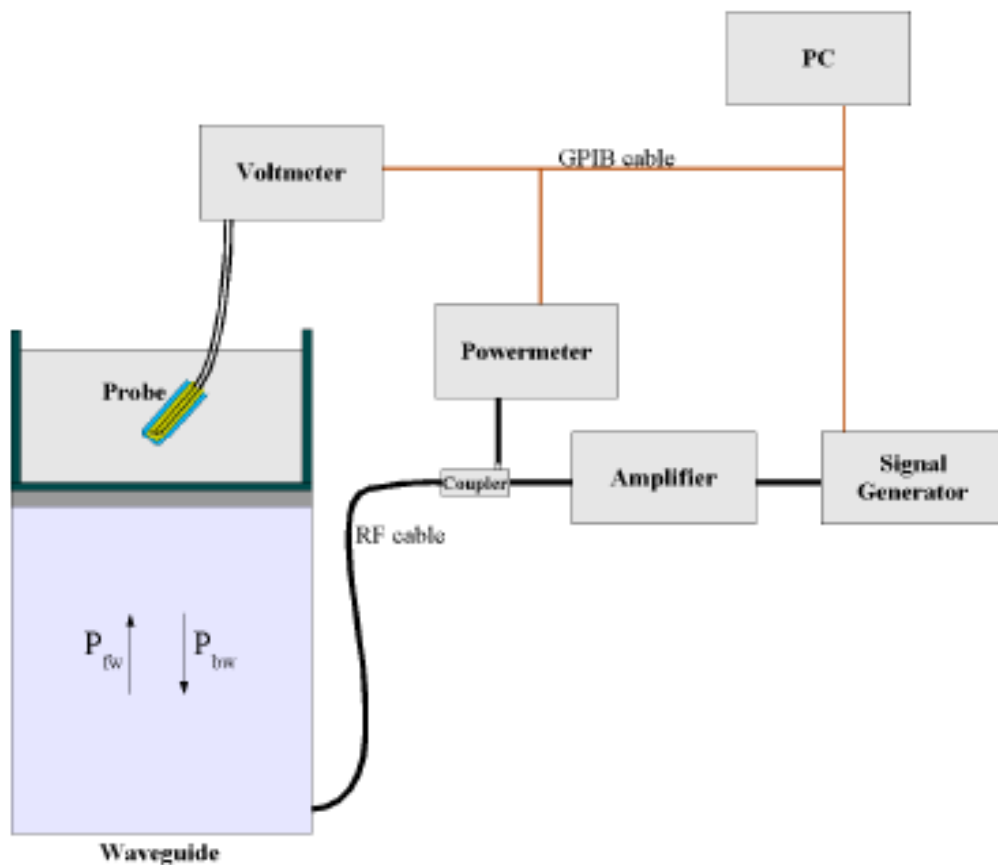
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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

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

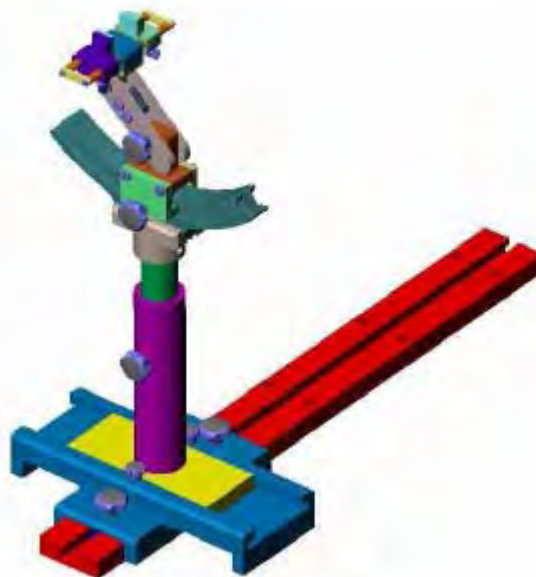
where DCP is the diode compression point in mV.

### 4.3. 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.

### 4.4. 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 and 1800 to 1900MHz, 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.

Gives the recipes for one liter of head and body tissue simulating liquid for frequency band 835 MHz and 1800- 1900 MHz

Ingredients (% by weight )	Frequency Band		Frequency Band	
	835MHz		1800-1900MHz	
Tissue Type	Head	Body	Head	Body
Water	41.45	52.4	54.9	40.4
Salt(NaCl)	1.49	1.4	0.18	0.5
Sugar	46.78	45.0	0.0	58.0
HEC	0.52	1.0	0.0	1.0
Bactericide	0.05	0.1	0.0	0.1
Triton	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	44.92	0.0
Acticide SPX	0.0	0.0	0.0	0.0
Dielectric Constant	42.54	56.1	39.9	54.0
Conductivity (S/m)	0.91	0.95	1.42	1.45

Recipes for Tissue Simulating Liquid

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.

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

Temperature: 23.0~23.8°C, humidity: 54~60%.			
/	Frequency	Permittivity $\epsilon$	Conductivity $\sigma$ (S/m)
<b>Target value</b>	835 MHZ	41.5	0.90
<b>Validation value</b> (Oct. 18)	835 MHZ	41.675999	0.894409
<b>Target value</b>	1800 MHZ	40	1.40
<b>Validation value</b> (Oct. 18)	1800 MHZ	38.509998	1.416111
<b>Target value</b>	1900 MHZ	40	1.40
<b>Validation value</b> (Oct. 18)	1900 MHZ	38.509998	1.436111

For body-worn measurements, the device was tested against flat phantom representing the user body. Under measurement phone was put on in the phone holder.

**Table 2: Dielectric Performance of Body Tissue Simulating Liquid**

<b>Temperature: 23.0~23.8°C, humidity: 54~60%.</b>			
<b>/</b>	<b>Frequency</b>	<b>Permittivity <math>\epsilon</math></b>	<b>Conductivity <math>\sigma</math> (S/m)</b>
<b>Target value</b>	835 MHz	55.2	0.97
<b>Validation value (Oct. 18)</b>	835 MHz	55.709999	1.009033
<b>Target value</b>	1800 MHz	54.0	1.45
<b>Validation value (Oct. 18)</b>	1800 MHz	52.949998	1.436111
<b>Target value</b>	1900 MHz	53.3	1.52
<b>Validation value (Oct. 18)</b>	1900 MHz	52.548876	1.573978

## 6. Uncertainty Assessment

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

### 6.1. 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 (+- % )	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>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	

## 6.2. 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	

## 7. SAR Measurement Evaluation

### 7.1. 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 and 1900 MHz. 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.

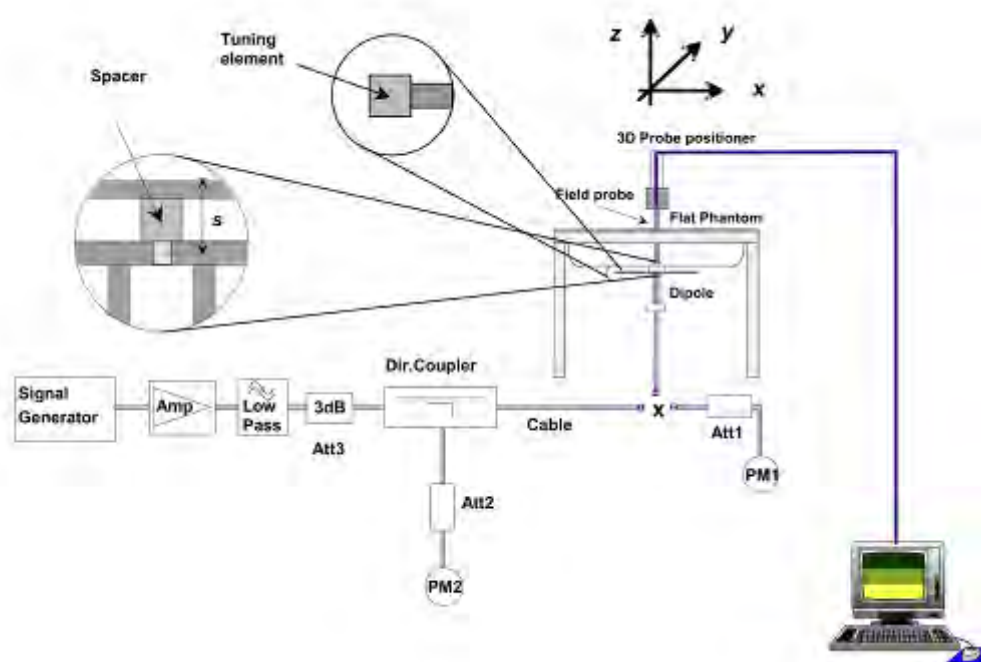
Equipments :

name	Type and specification
Signal generator	E4433B
Directional coupler	450MHz-3GHz
Amplifier	3W 502(10-2500MHz)
Reference dipole	835MHz:SN 36/08 DIPC 99 1700MHz:SN 36/08 DIPF 101 1900MHz:SN 36/08 DIPF 102

### 7.2. Validation Results

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

System Verification Setup Block Diagram



Frequency	835MHz	1700MHz	1900MHz
Target value (1g)	9.5 W/Kg	38.1 W/Kg	39.7 W/Kg
250 mW input power	2.278 W/Kg)	8.857 W/Kg	9.556 W/Kg
Test value (1g)	9.112W/Kg)	35.428 W/Kg	38.224 W/Kg

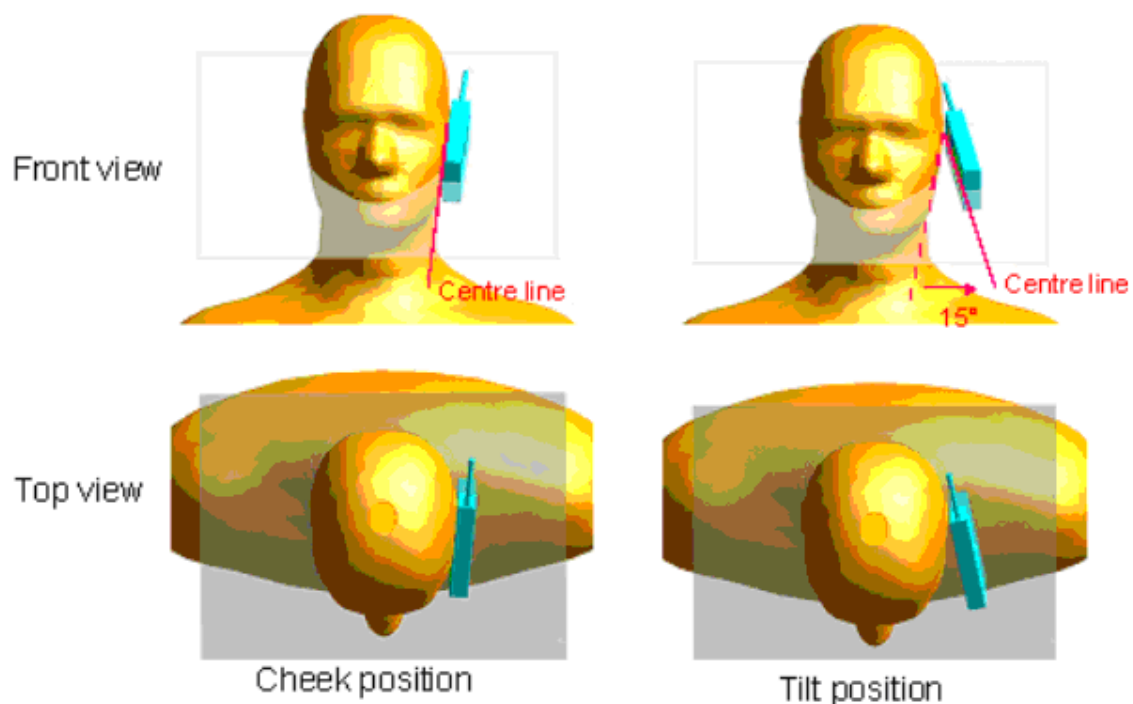
**Note:** System checks the specific test data please see page 83-90.

## 8. Operational Conditions During Test

### 8.1. Informations on the testing

The mobile phone 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 mobile phone is set to transmit at its highest output peak power level.

The mobile phone is test in the “cheek” and “tilted” positions on the left and right sides of the phantom. The mobile phone is placed with the vertical centre line of the body of the mobile phone and the horizontal line crossing the centre of the earpiece in a plane parallel to the sagittal plane of the phantom.



Description of the “cheek” position:

The mobile phone is well placed in the reference plane and the earpiece is in contact with the ear. Then the mobile phone is moved until any point on the front side get in contact with the cheek of the phantom or until contact with the ear is lost.

Description of the “tilted” position:

The mobile phone is well placed in the “cheek” position as described above. Then the mobile phone is moved outward away from the month by an angle of 15 degrees or until contact with the ear lost.

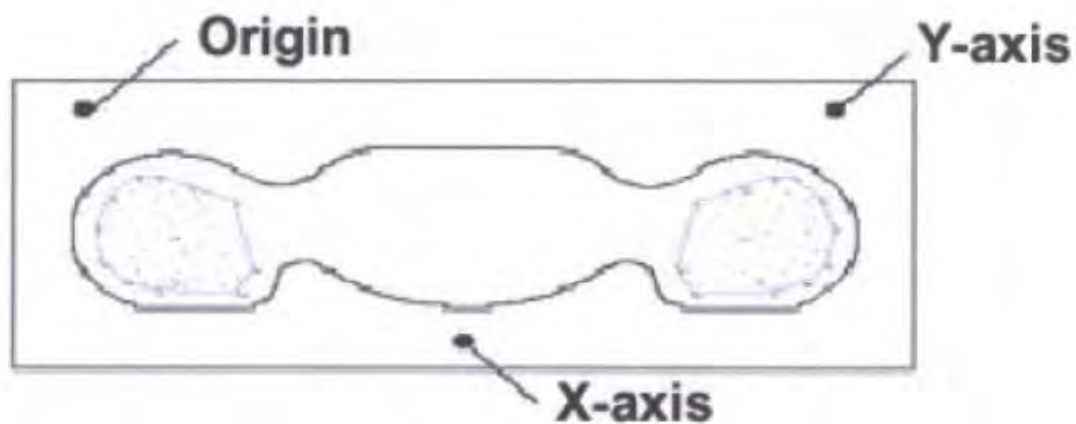
Remark: Please refer to Appendix B for the test setup photos.

### 8.2. 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 1.5cm(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

### 8.3. 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.

### 8.4. 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.

## 9. 3G MEASUREMENT PROCEDURES

### 9.1. 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.

### 9.2. SAR Measurement Conditions for WCDMA

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

### 9.3. 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, DPDCHn 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.

### 9.4. Measurement Of Conducted Peak Output Power.

WCDMA Mode

Item	band	WCDMA 1700		
	ARFCN	1537	1637	1738
	subtest	dBm		
5.2(WCDMA)	non	22.44	22.78	22.22

### GSM Mode

Band	Channel	Frequency (MHz)	Output Power
			(dBm)
GSM 850	128	824.2	31.96
	190	836.6	31.92
	251	848.8	32.10
PCS 1900	512	1850.2	27.49
	661	1880.0	29.23
	810	1909.8	28.86

### GPRS Mode

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			Slot 1	Slot 2
GSM 850	128	824.2	32.04	32.56
	190	836.6	31.99	32.52
	251	848.8	32.20	32.64
PCS 1900	512	1850.2	27.60	29.54
	661	1880.0	29.29	29.93
	810	1909.8	28.98	29.71

### GPRS Mode Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			Slot 1	Slot 2
GSM 850	128	824.2	23.04	26.56
	190	836.6	22.99	26.52
	251	848.8	23.20	26.64
PCS 1900	512	1850.2	18.60	23.54
	661	1880.0	20.29	23.93
	810	1909.8	19.98	23.71

### EGPRS Mode

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	29.08	29.08	29.55	30.35
	190	836.6	29.87	29.87	29.71	30.14
	251	848.8	30.18	30.18	30.39	30.47
PCS 1900	512	1850.2	25.77	25.77	25.83	26.18
	661	1880.0	26.50	26.50	26.53	27.07
	810	1909.8	26.77	26.77	27.21	27.35



# EGPRS Mode Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	20.08	23.08	25.29	27.35
	190	836.6	20.87	23.87	25.45	27.14
	251	848.8	21.18	24.18	26.13	27.47
PCS 1900	512	1850.2	16.77	19.77	21.57	23.18
	661	1880.0	17.50	20.50	22.27	24.07
	810	1909.8	17.77	20.77	22.95	24.35

# Bluetooth peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)		
			GFSK	$\Pi/4$ -DQPSK	8-DPSK
BT	0	2402	8.587	7.671	6.646
	38	2441	4.618	3.591	2.686
	79	2480	7.865	7.400	6.490

## 10. Test Results List

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

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg)		
			Device Test channel		
			Channel 128	Channel 190	Channel 251
Left Side Of Head	Cheek/Touch	Internal	/	/	0.129
	Ear/Tilt	Internal	/	/	0.096
Right Side Of Head	Cheek/Touch	Internal	/	/	0.170
	Ear/Tilt	Internal	/	/	0.095
Body(GSM) (1.5cm separation)	Back upward	Internal	/	/	0.452
	Face Upward	Internal	/	/	0.343
Body(GPRS) (1.5cm separation)	Back upward	Internal	/	/	0.608
	Face Upward	Internal	/	/	0.109
Body(EDGE) (1.5cm separation)	Back upward	Internal	/	/	0.660
	Face Upward	Internal	/	/	0.225

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

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg)		
			Device Test channel		
			Channel 512	Channel 661	Channel 810
Left Side Of Head	Cheek/Touch	Internal	/	0.652	/
	Ear/Tilt	Internal	/	0.129	/
Right Side Of Head	Cheek/Touch	Internal	/	0.588	/
	Ear/Tilt	Internal	/	0.132	/
Body(GSM) (1.5cm separation)	Back upward	Internal	/	0.454	/
	Face Upward	Internal	/	0.248	/
Body(GPRS) (1.5cm separation)	Back upward	Internal	/	0.517	/
	Face Upward	Internal	/	0.286	/
Body(EDGE) (1.5cm separation)	Back upward	Internal	/	/	0.584
	Face Upward	Internal	/	/	0.169

# Summary of Measurement Results (WCDMA 1700MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg)		
			Device Test channel		
			Channel 1313	Channel 1450	Channel 1512
Left Side Of Head	Cheek/Touch	Internal	/	0.347	/
	Ear/Tilt	Internal	/	0.187	/
Right Side Of Head	Cheek/Touch	Internal	/	0.306	/
	Ear/Tilt	Internal	/	0.211	/
Body) (1.5cm separation)	Back upward	Internal	/	0.521	/
	Face Upward	Internal	/	0.117	/

**Note:** 1. Refer KDB 447498, when the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg and peak SAR is less than 1.6W/kg, where the transmission band corresponding to all channels is  $\leq 100$  MHz, testing for the other channels is not required.

## 11. Multiple Transmitters Evaluation

The are two antennas build in EUT, Main antenna and BT antenna, As follwing :



1. Accord with KDB 648474 D01, for Unlicensed Transmitters, when output  $\leq P_{Ref}$  and antenna is  $\geq 2.5$  cm from other antennas. The Stand-alone SAR is not required.
2. The BT Max. Peak output power is 8.587dBm (7.2mW) less than 12mW, and the distance between BT antenna and main antenna is 6.1 cm larger than 2.5 cm. Accord with KDB 648474 D01, Bluetooth Stand-alone SAR is not required.

Note :  $P_{Ref}$  for bluetooth is 12mW.

## Annex A EUT Setup Photos

### 1 EUT Left Head Touch Cheek Position



### 2 EUT Left Head Tilt15 Position



### 3 EUT Right Head Touch Cheek Position



### 4 EUT Right Head Tilt15 Position





## 5 Side Position With Headphone



## 6 Side Position





Liquid Level Photo



## Annex C Graph Test Results

BAND	PARAMETERS
<b><u>GSM850</u></b>	<p><u>Measurement 1:</u> Right Head with Cheek device position on High Channel in GSM mode</p> <p><u>Measurement 2:</u> Right Head with Tilt device position on High Channel in GSM mode</p> <p><u>Measurement 3:</u> Left Head with Cheek device position on High Channel in GSM mode</p> <p><u>Measurement 4:</u> Left Head with Tilt device position on High Channel in GSM mode</p> <p><u>Measurement 5:</u> Validation Plane with Body device position on High Channel in GSM mode</p> <p><u>Measurement 6:</u> Validation Plane with Body device position on High Channel in GSM mode</p> <p><u>Measurement 7:</u> Validation Plane with Body device position on High Channel in GPRS mode</p> <p><u>Measurement 8:</u> Validation Plane with Body device position on High Channel in GPRS mode</p> <p><u>Measurement 9:</u> Validation Plane with Body device position on High Channel in EDGE mode</p> <p><u>Measurement 10:</u> Validation Plane with Body device position on High Channel in EDGE mode</p>
<b><u>GSM1900</u></b>	<p><u>Measurement 11:</u> Right Head with Cheek device position on Middle Channel in GSM mode</p> <p><u>Measurement 12:</u> Right Head with Tilt device position on Middle Channel in GSM mode</p> <p><u>Measurement 13:</u> Left Head with Cheek device position on Middle Channel in GSM mode</p> <p><u>Measurement 14:</u> Left Head with Tilt device position on Middle Channel in GSM mode</p> <p><u>Measurement 15:</u> Validation Plane with Body device position on Middle Channel in GSM mode</p> <p><u>Measurement 16:</u> Validation Plane with Body device position on Middle Channel in GSM mode</p> <p><u>Measurement 17:</u> Validation Plane with Body device position on Middle Channel in GPRS mode</p> <p><u>Measurement 18:</u> Validation Plane with Body device position on Middle Channel in GPRS mode</p> <p><u>Measurement 19:</u> Validation Plane with Body device position on High Channel in EDGE mode</p> <p><u>Measurement 20:</u> Validation Plane with Body device position on High Channel in EDGE mode</p>

**WCDMA**  
**1700**

Measurement 21: Right Head with Cheek device position on Middle Channel in CDMA mode

Measurement 22: Right Head with Tilt device position on Middle Channel in CDMA mode

Measurement 23: Left Head with Cheek device position on Middle Channel in CDMA mode

Measurement 24: Left Head with Tilt device position on Middle Channel in CDMA mode

Measurement 25: Validation Plane with Body device position on Middle Channel in CDMA mode

Measurement 26: Validation Plane with Body device position on Middle Channel in CDMA 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: 18/10/2011

Measurement duration: 8 minutes 2 seconds

## A. Experimental conditions.

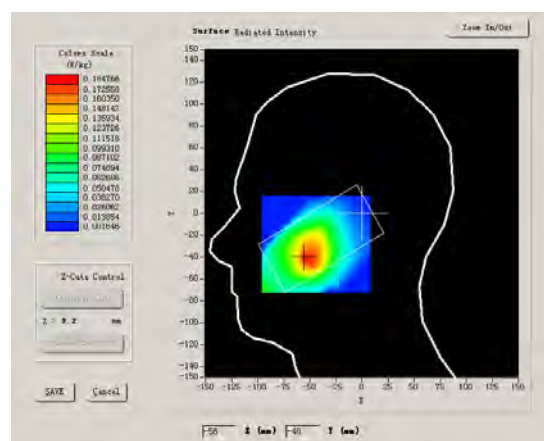
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	High
Signal	GSM

## B. SAR Measurement Results

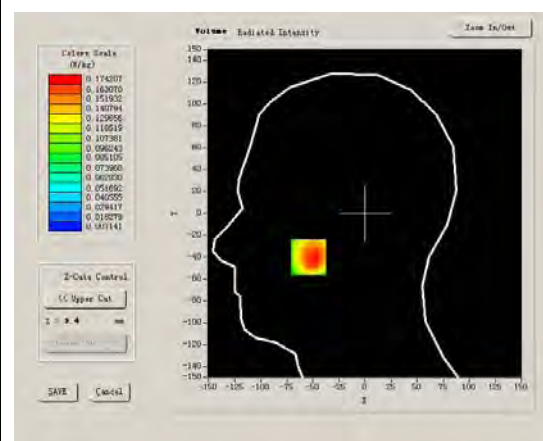
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	41.675999
Relative permittivity	18.967199
Conductivity (S/m)	0.894409
Power drift (%)	-6.790000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

### SURFACE SAR



### VOLUME SAR



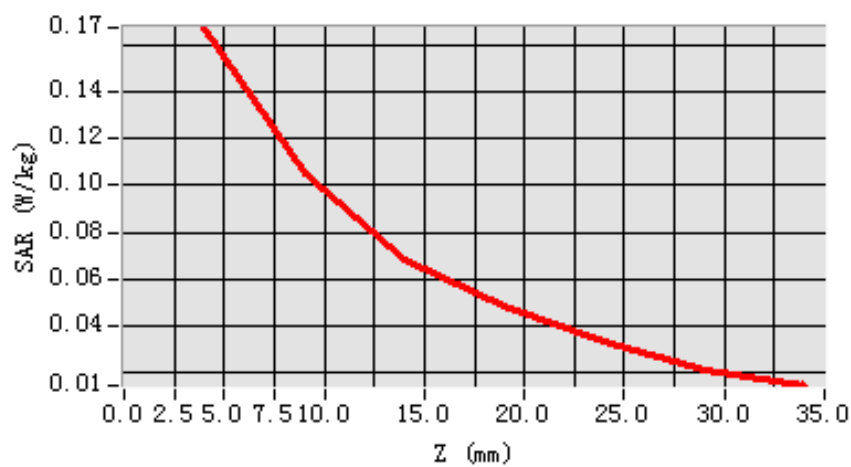
**Maximum location: X=-54.00, Y=-40.00**

<b>SAR 10g (W/Kg)</b>	0.104490
<b>SAR 1g (W/Kg)</b>	0.170059

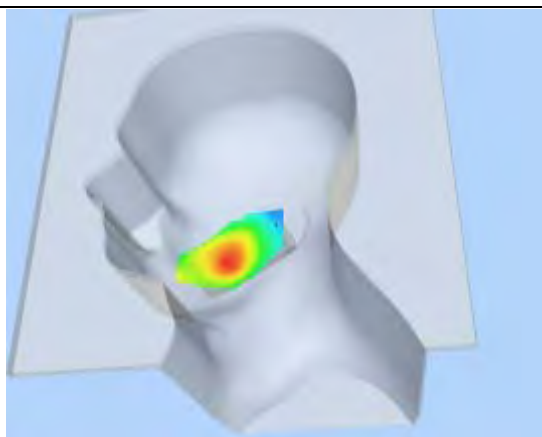
### **Z Axis Scan**

<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>0.1673</b>	<b>0.1048</b>	<b>0.0684</b>	<b>0.0482</b>	<b>0.0336</b>	<b>0.0212</b>

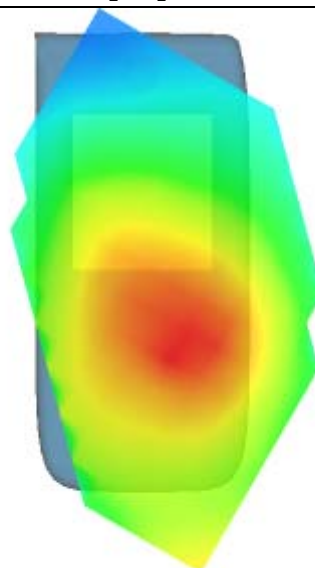
**SAR, Z Axis Scan (X = -54, Y = -40)**



**3D sceen 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: 18/10/2011

Measurement duration: 7 minutes 35 seconds

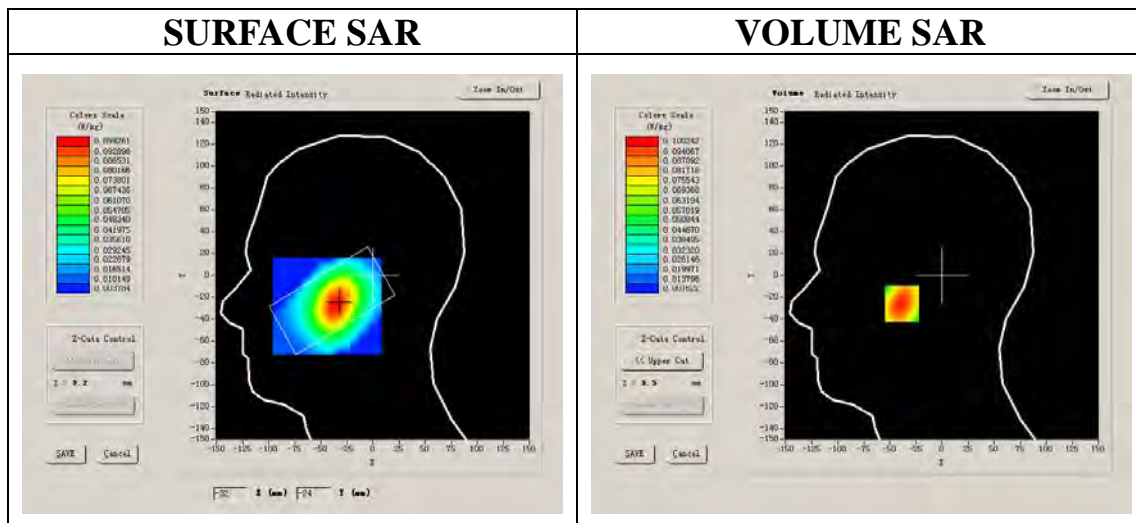
### A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Tilt
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	41.675999
Relative permittivity	18.967199
Conductivity (S/m)	0.894409
Power drift (%)	-0.520000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



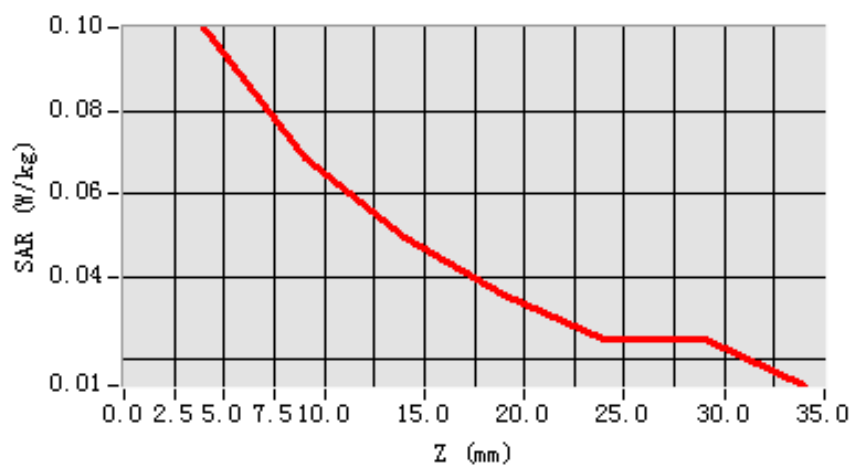
**Maximum location: X=-35.00, Y=-26.00**

<b>SAR 10g (W/Kg)</b>	0.062920
<b>SAR 1g (W/Kg)</b>	0.094611

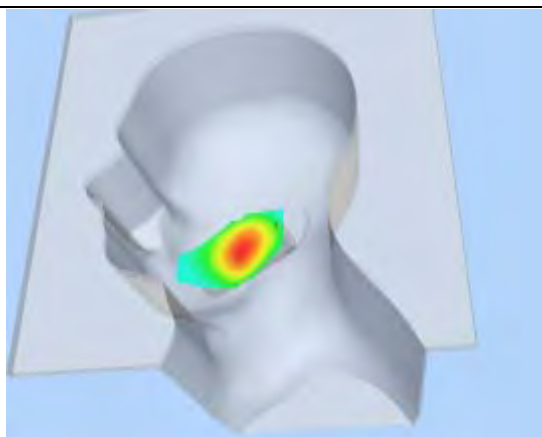
### **Z Axis Scan**

<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>0.1002</b>	<b>0.0689</b>	<b>0.0496</b>	<b>0.0352</b>	<b>0.0249</b>	<b>0.0250</b>

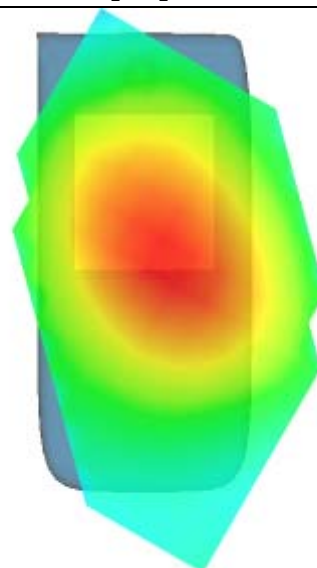
**SAR, Z Axis Scan (X = -35, Y = -26)**



**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: 18/10/2011

Measurement duration: 7 minutes 45 seconds

### A. Experimental conditions.

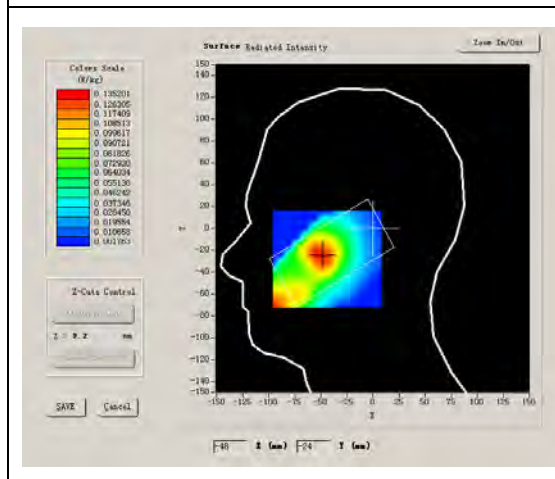
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

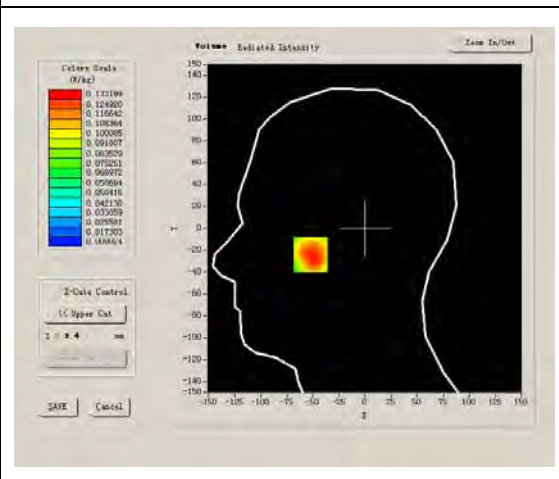
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	41.675999
Relative permittivity	18.967199
Conductivity (S/m)	0.894409
Power drift (%)	-0.170000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR



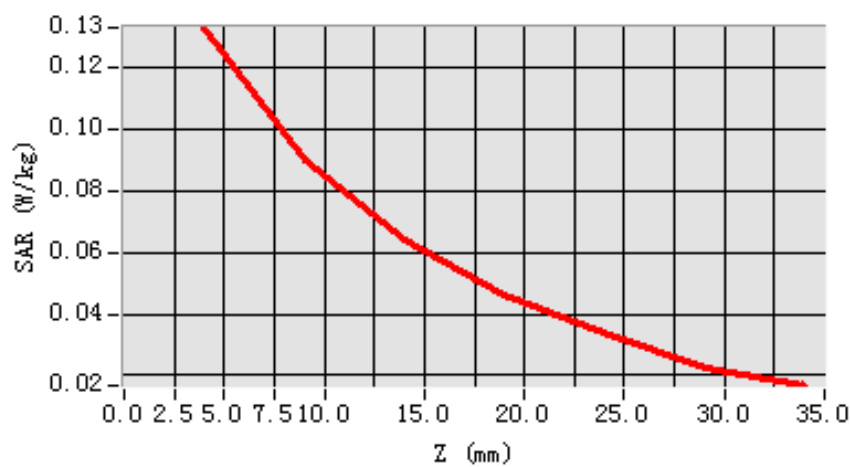
**Maximum location: X=-52.00, Y=-24.00**

<b>SAR 10g (W/Kg)</b>	0.084705
<b>SAR 1g (W/Kg)</b>	0.129117

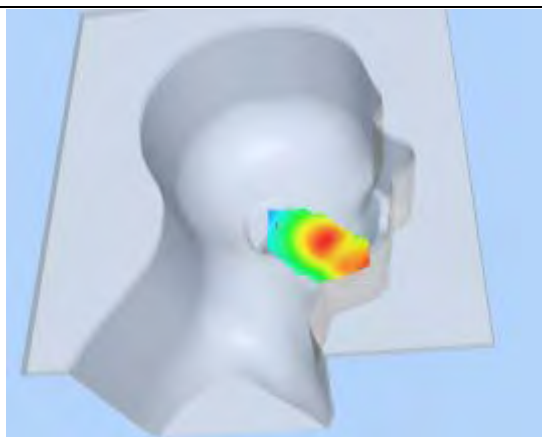
### **Z Axis Scan**

<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>0.1332</b>	<b>0.0901</b>	<b>0.0643</b>	<b>0.0462</b>	<b>0.0337</b>	<b>0.0228</b>

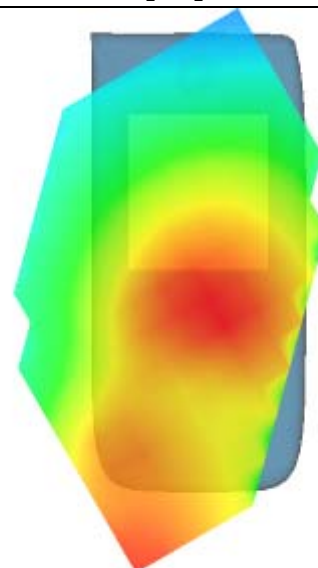
**SAR, Z Axis Scan (X = -52, Y = -24)**



**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: 18/10/2011

Measurement duration: 7 minutes 35 seconds

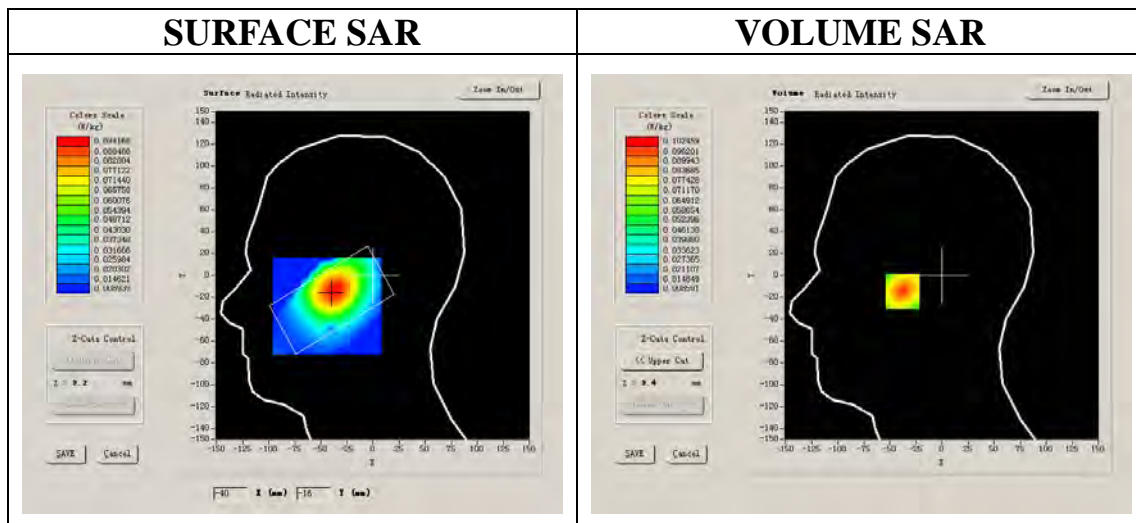
### A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Tilt
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	41.675999
Relative permittivity	18.967199
Conductivity (S/m)	0.894409
Power drift (%)	-0.150000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



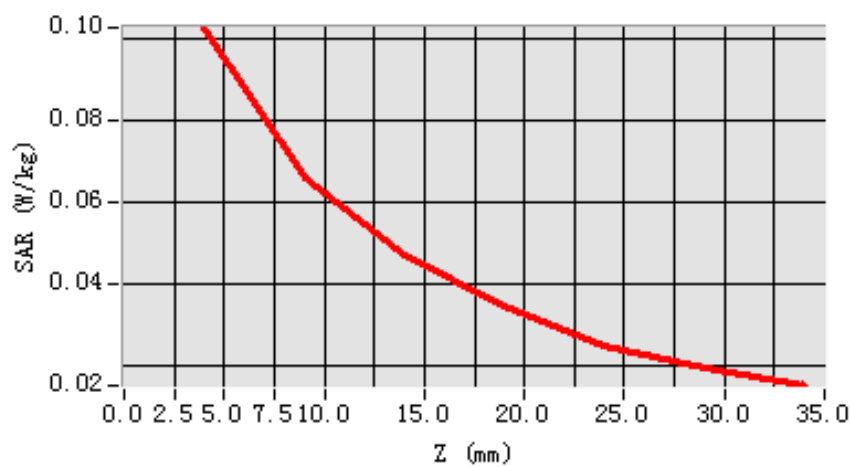
**Maximum location: X=-37.00, Y=-14.00**

<b>SAR 10g (W/Kg)</b>	0.061233
<b>SAR 1g (W/Kg)</b>	0.095564

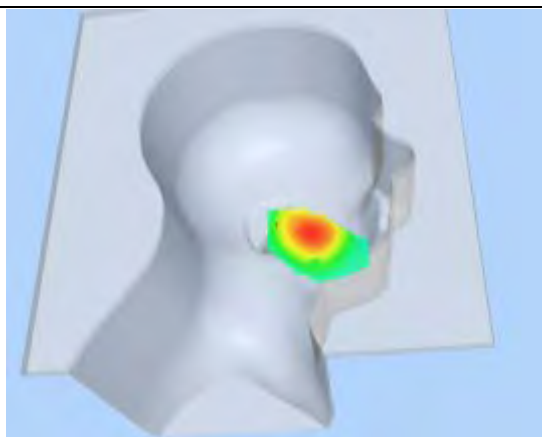
### **Z Axis Scan**

<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>0.1025</b>	<b>0.0659</b>	<b>0.0470</b>	<b>0.0342</b>	<b>0.0247</b>	<b>0.0191</b>

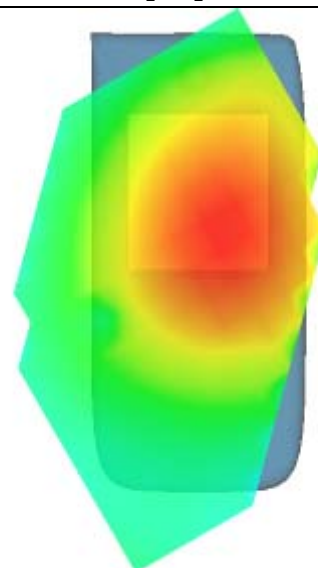
**SAR, Z Axis Scan (X = -37, Y = -14)**



**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: 18/10/2011

Measurement duration: 9 minutes 9 seconds

### A. Experimental conditions.

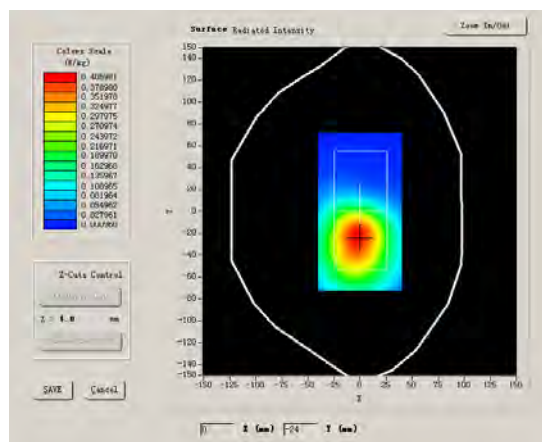
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

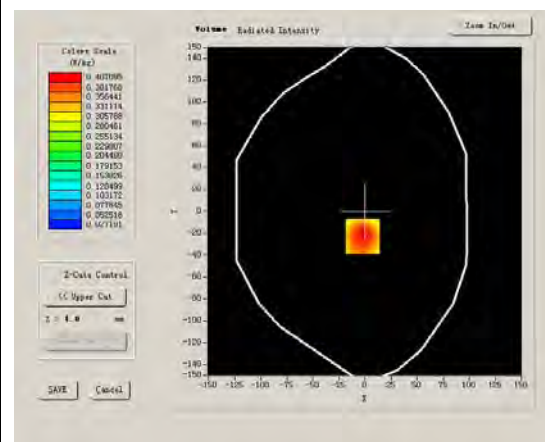
Higher Band SAR (Channel 190):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	0.120000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR



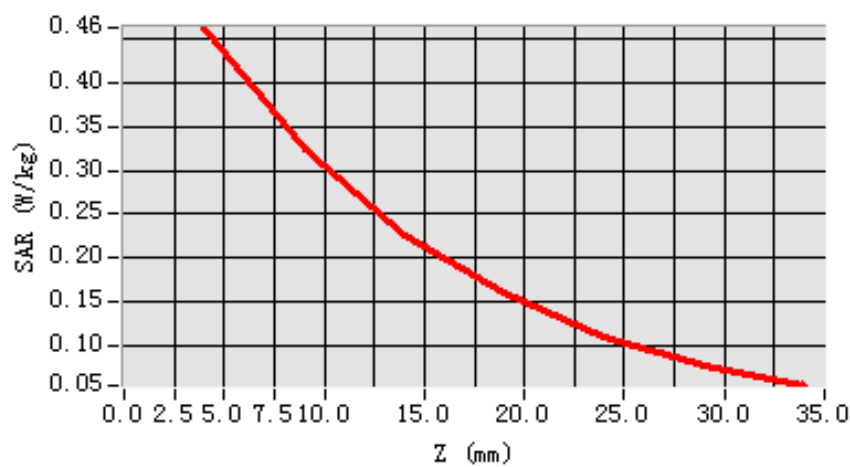
**Maximum location: X=-2.00, Y=-23.00**

<b>SAR 10g (W/Kg)</b>	0.300793
<b>SAR 1g (W/Kg)</b>	0.451556

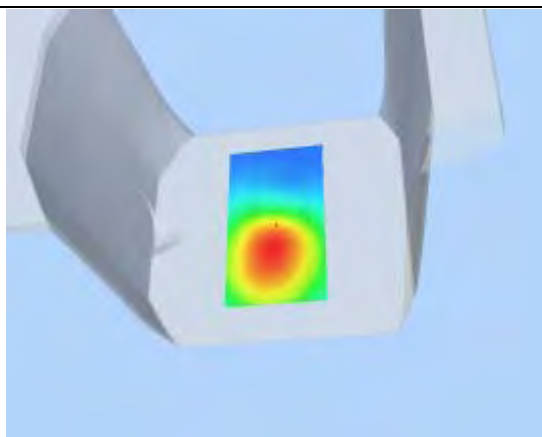
### **Z Axis Scan**

<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>0.4622</b>	<b>0.3228</b>	<b>0.2248</b>	<b>0.1616</b>	<b>0.1102</b>	<b>0.0775</b>

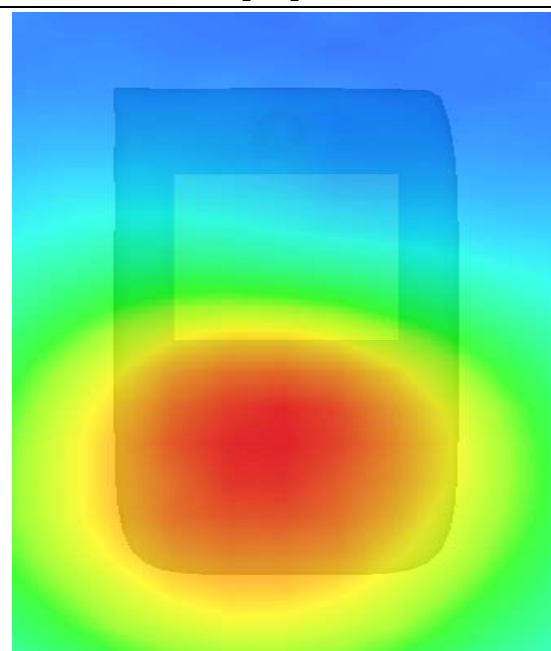
**SAR, Z Axis Scan (X = -2, Y = -23)**



**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: 18/10/2011

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

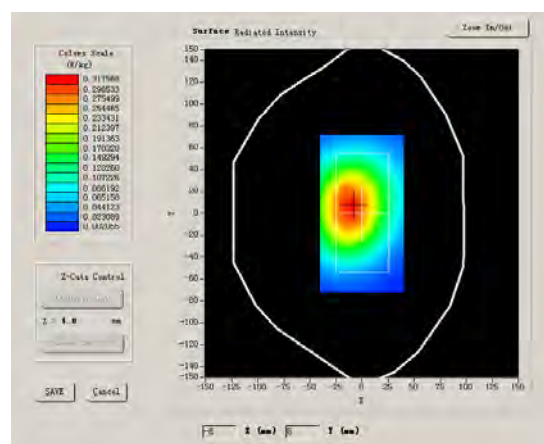
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

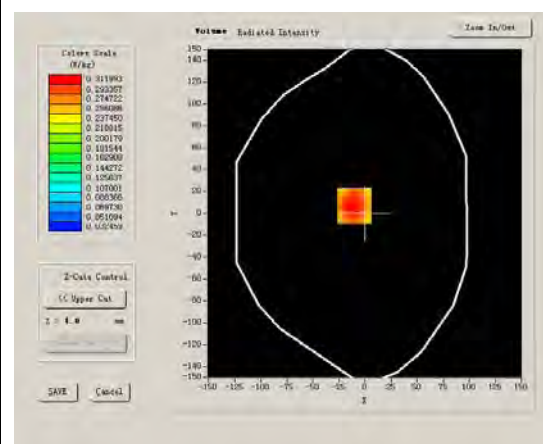
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-2.310000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR





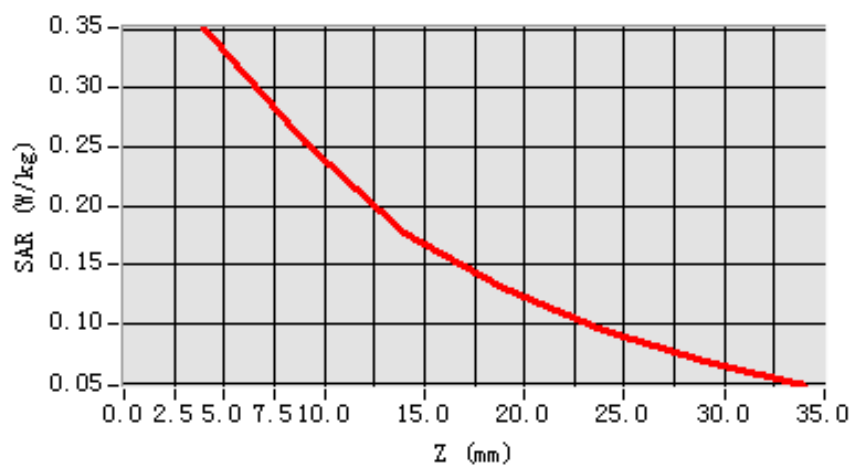
**Maximum location: X=-10.00, Y=7.00**

<b>SAR 10g (W/Kg)</b>	0.236199
<b>SAR 1g (W/Kg)</b>	0.343479

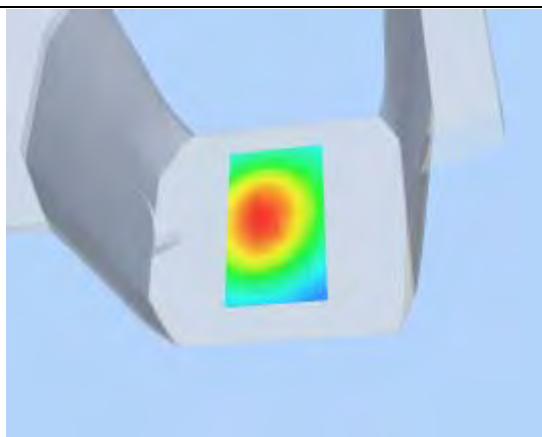
### **Z Axis Scan**

<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>0.3515</b>	<b>0.2531</b>	<b>0.1773</b>	<b>0.1306</b>	<b>0.0936</b>	<b>0.0686</b>

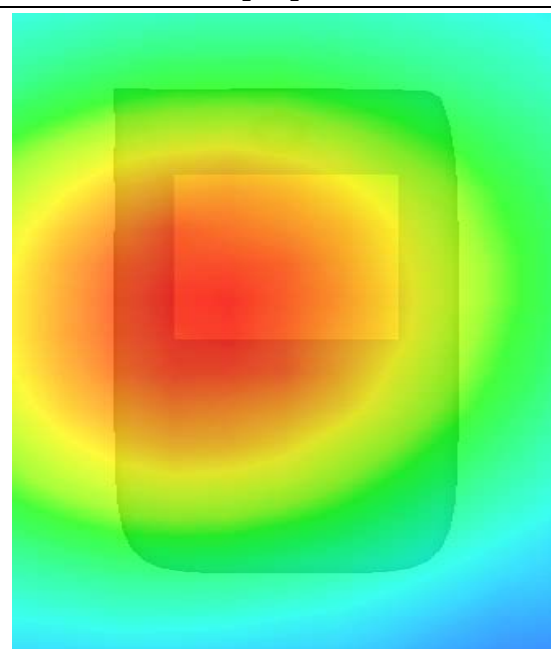
**SAR, Z Axis Scan (X = -10, Y = 7)**



**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: 18/10/2011

Measurement duration: 9 minutes 22 seconds

### A. Experimental conditions.

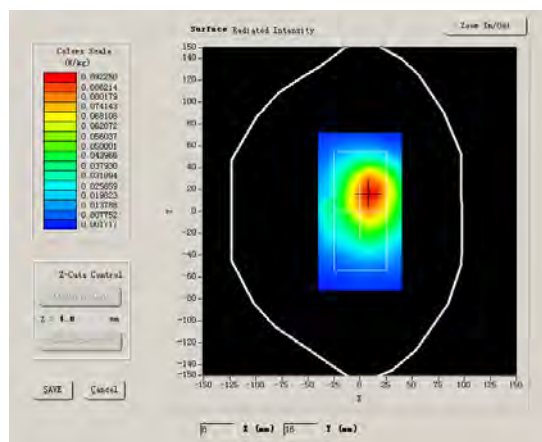
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

### B. SAR Measurement Results

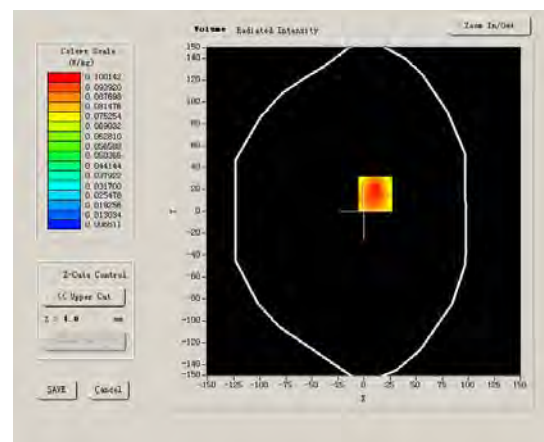
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	1.600000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:4

#### SURFACE SAR



#### VOLUME SAR



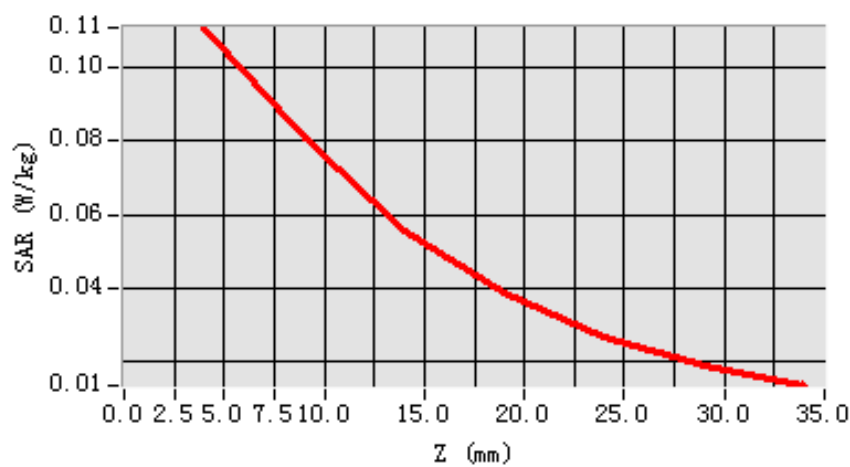
**Maximum location: X=11.00, Y=16.00**

<b>SAR 10g (W/Kg)</b>	0.072942
<b>SAR 1g (W/Kg)</b>	0.109045

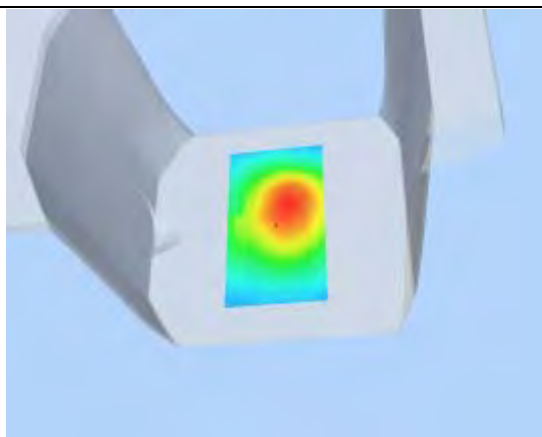
### **Z Axis Scan**

<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>0.1109</b>	<b>0.0808</b>	<b>0.0558</b>	<b>0.0387</b>	<b>0.0269</b>	<b>0.0190</b>

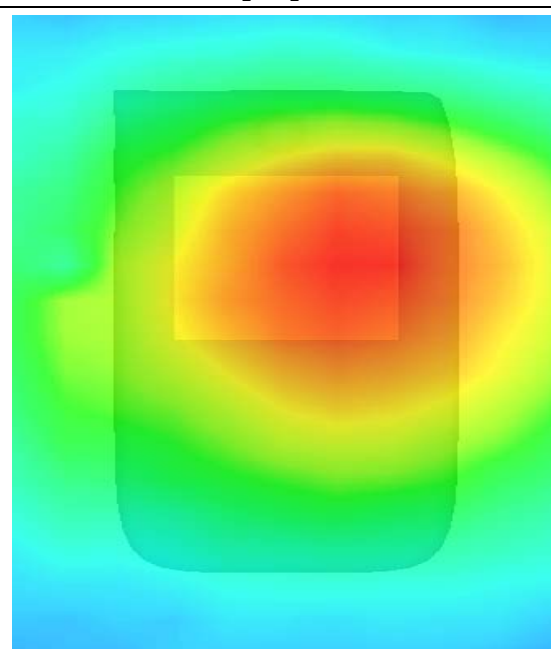
**SAR, Z Axis Scan (X = 11, Y = 16)**



**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: 18/10/2011

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

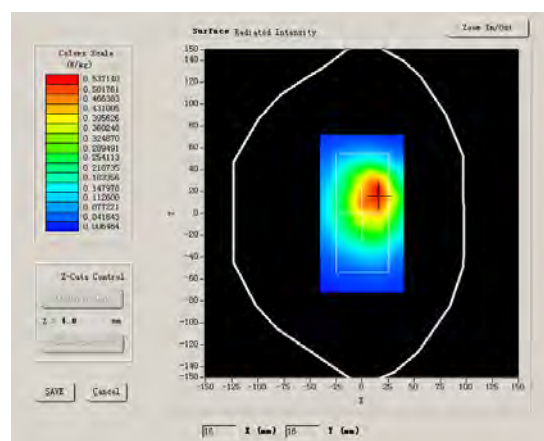
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

### B. SAR Measurement Results

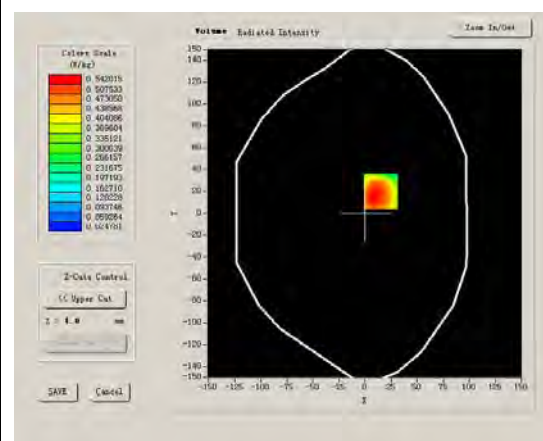
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-11.010000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:4

#### SURFACE SAR



#### VOLUME SAR



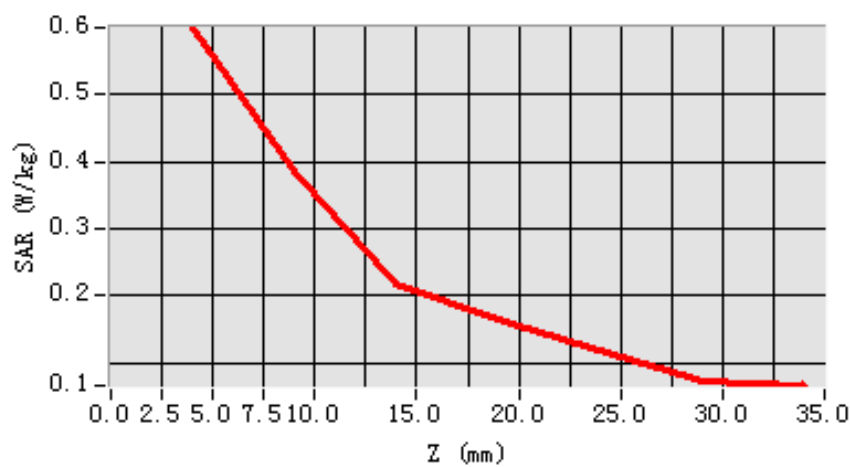
**Maximum location: X=15.00, Y=20.00**

<b>SAR 10g (W/Kg)</b>	0.382176
<b>SAR 1g (W/Kg)</b>	0.607994

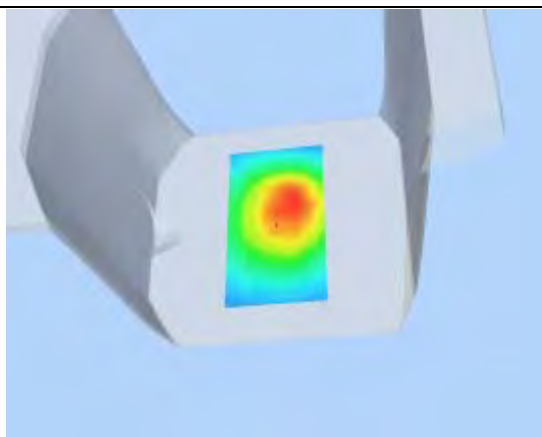
### **Z Axis Scan**

<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>0.6004</b>	<b>0.3849</b>	<b>0.2175</b>	<b>0.1662</b>	<b>0.1204</b>	<b>0.0723</b>

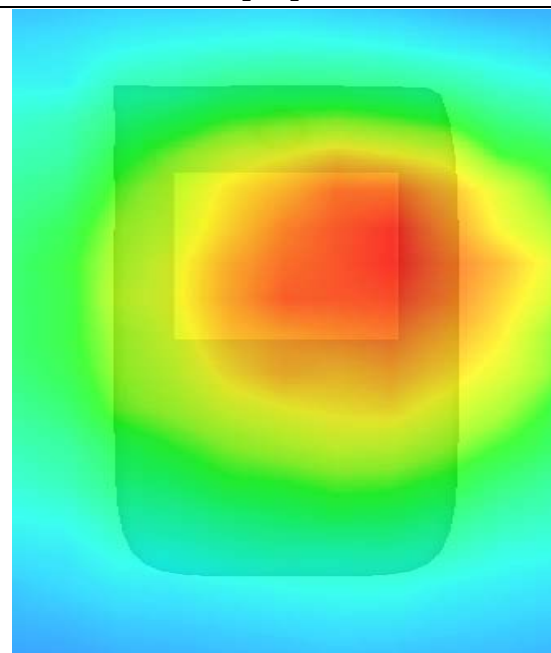
**SAR, Z Axis Scan (X = 15, Y = 20)**



**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: 18/10/2011

Measurement duration: 9 minutes 5 seconds

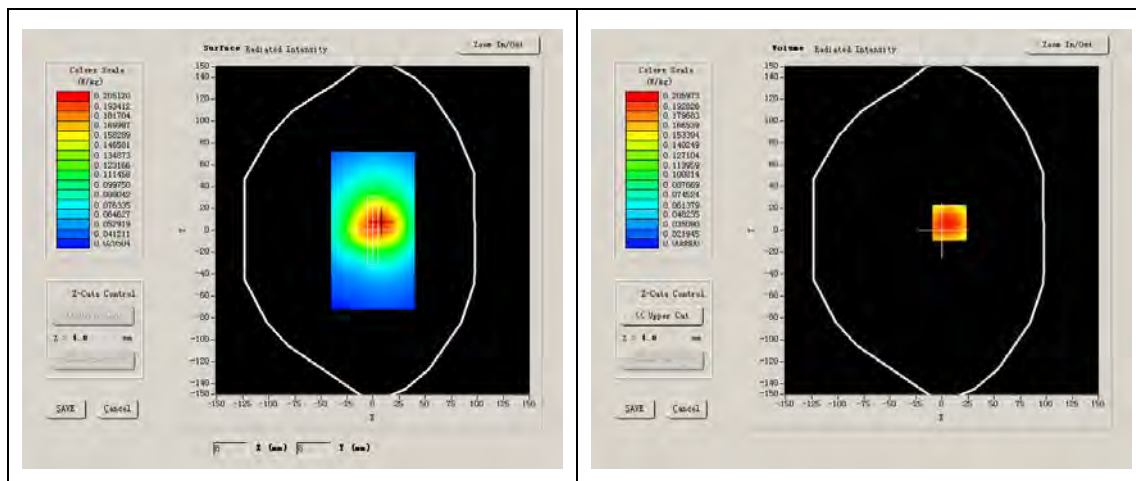
### A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

### B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-11.010000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:2



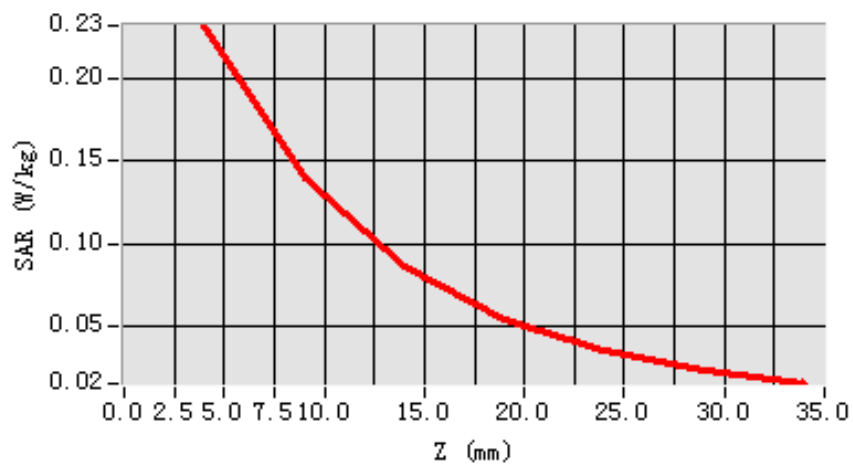
**Maximum location: X=7.00, Y=7.00**

<b>SAR 10g (W/Kg)</b>	0.139478
<b>SAR 1g (W/Kg)</b>	0.224720

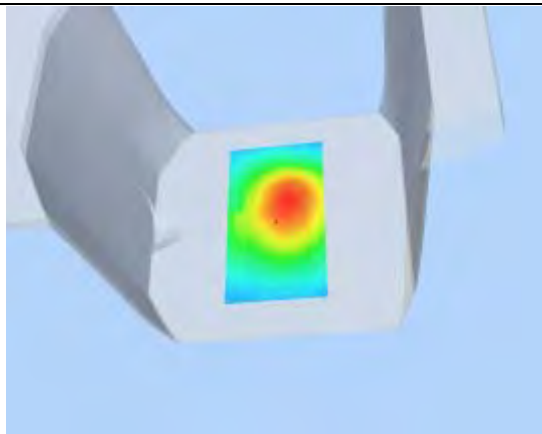
### **Z Axis Scan**

<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>0.2316</b>	<b>0.1396</b>	<b>0.0857</b>	<b>0.0543</b>	<b>0.0346</b>	<b>0.0230</b>

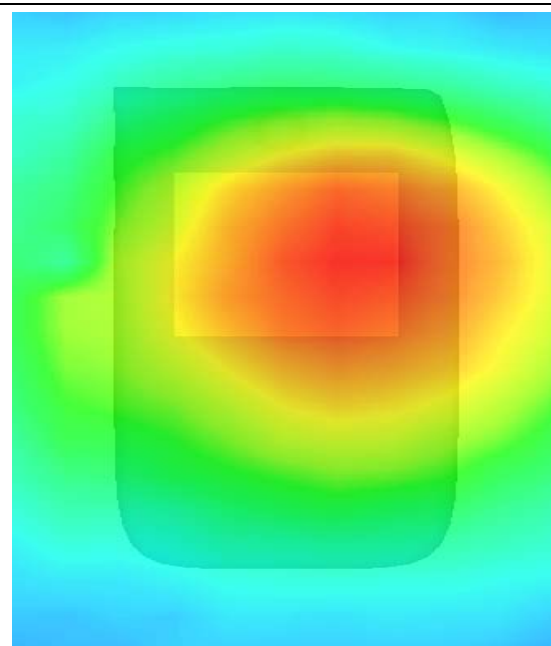
**SAR, Z Axis Scan (X = 7, Y = 7)**



**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: 18/10/2011

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

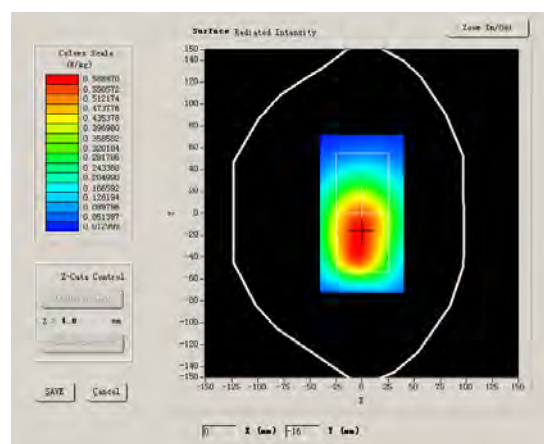
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

### B. SAR Measurement Results

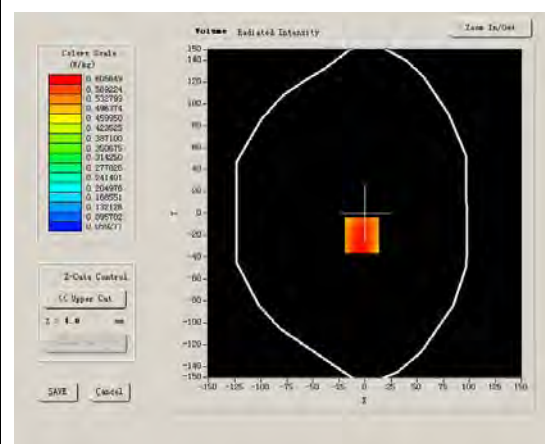
Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-11.010000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.8°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



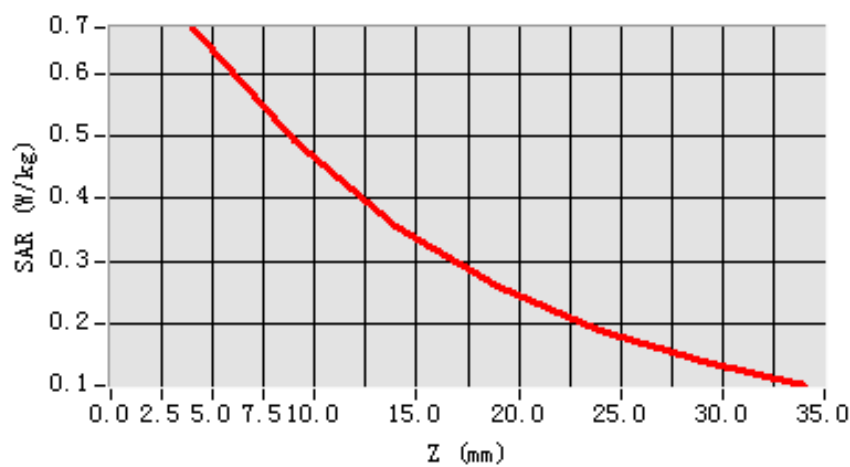
**Maximum location: X=-3.00, Y=-20.00**

<b>SAR 10g (W/Kg)</b>	0.467085
<b>SAR 1g (W/Kg)</b>	0.660292

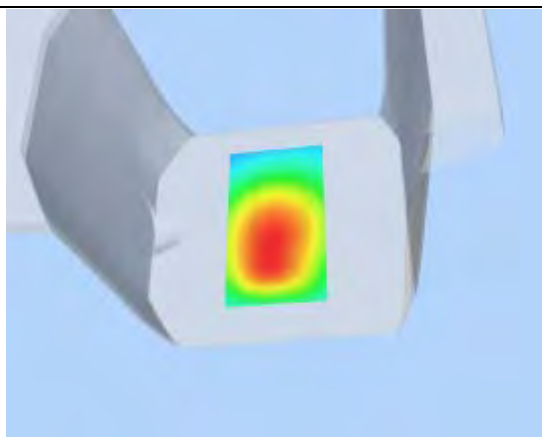
### **Z Axis Scan**

<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>0.6739</b>	<b>0.4938</b>	<b>0.3534</b>	<b>0.2584</b>	<b>0.1897</b>	<b>0.1378</b>

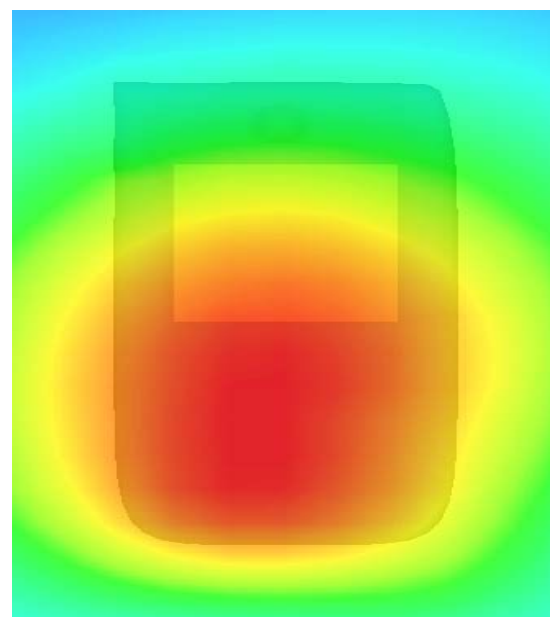
**SAR, Z Axis Scan (X = -3, Y = -20)**



**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: 9/10/2011

Measurement duration: 8 minutes 40 seconds

### A. Experimental conditions.

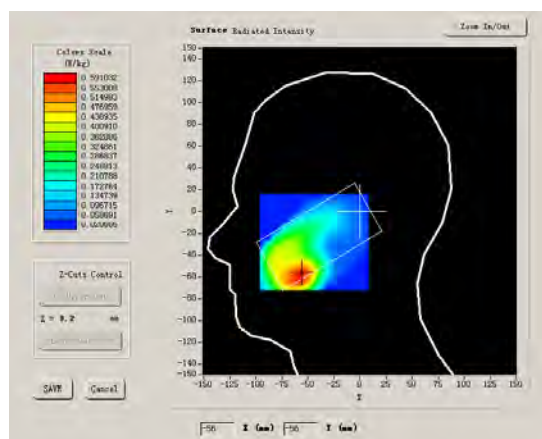
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

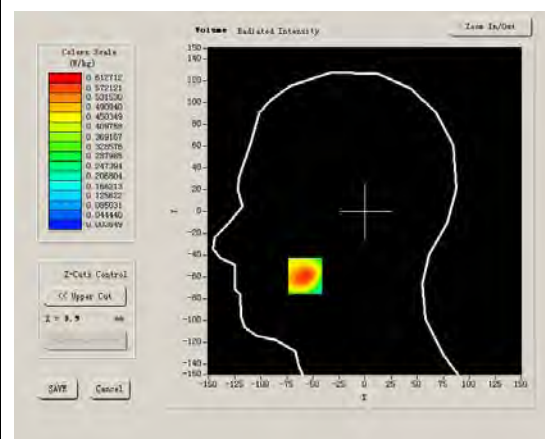
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.43611
Power drift (%)	-0.460000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



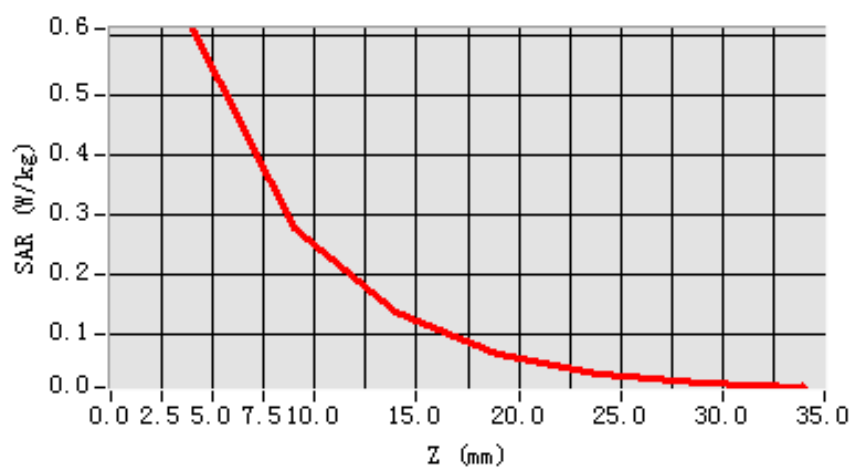
**Maximum location: X=-57.00, Y=-59.00**

<b>SAR 10g (W/Kg)</b>	0.298854
<b>SAR 1g (W/Kg)</b>	0.587641

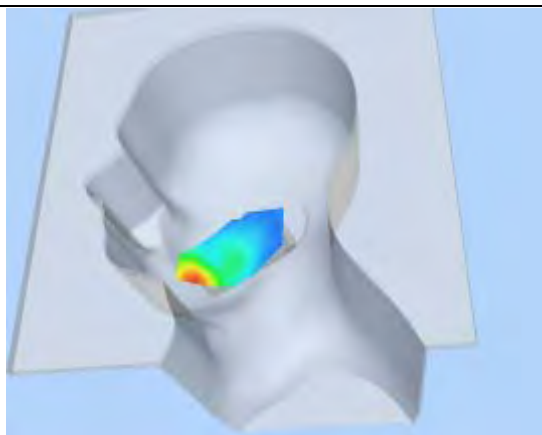
### **Z Axis Scan**

<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>0.6127</b>	<b>0.2775</b>	<b>0.1364</b>	<b>0.0670</b>	<b>0.0334</b>	<b>0.0174</b>

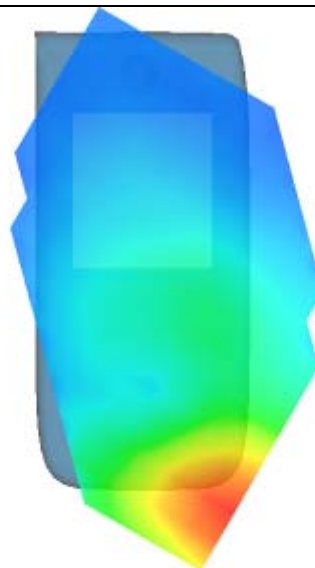
**SAR, Z Axis Scan (X = -57, Y = -59)**



**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: 9/10/2011

Measurement duration: 8 minutes 42 seconds

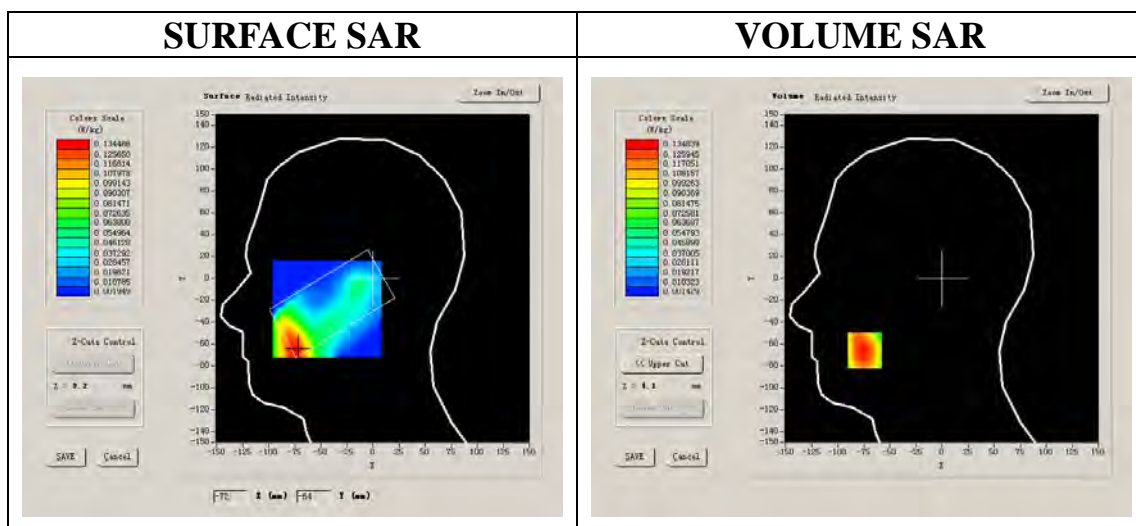
### A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Tilt
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	0.010000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1



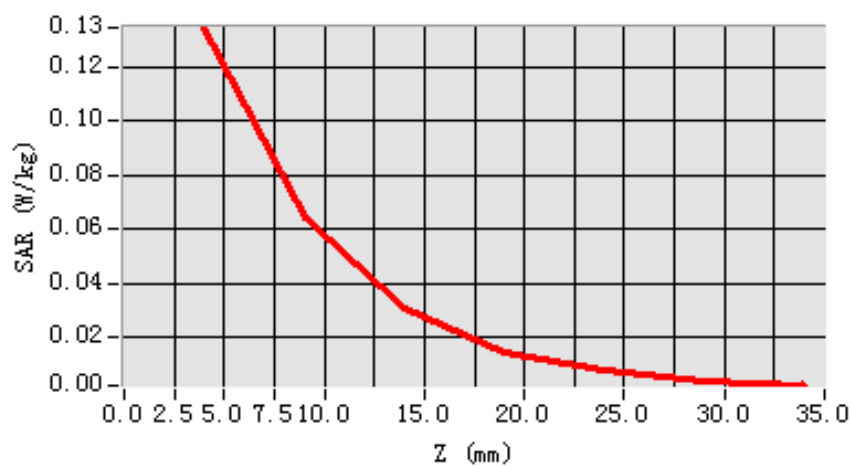
**Maximum location: X=-74.00, Y=-66.00**

<b>SAR 10g (W/Kg)</b>	0.070591
<b>SAR 1g (W/Kg)</b>	0.131663

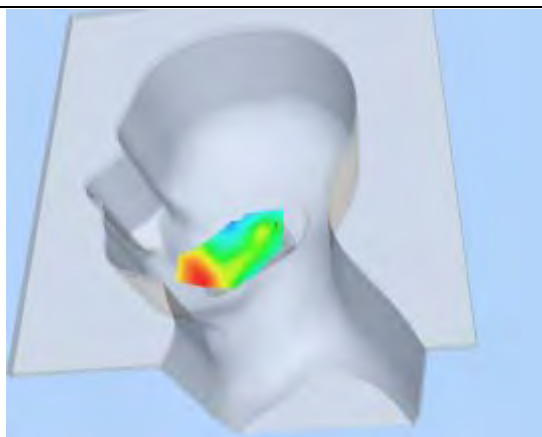
### **Z Axis Scan**

<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>0.1348</b>	<b>0.0641</b>	<b>0.0305</b>	<b>0.0141</b>	<b>0.0076</b>	<b>0.0034</b>

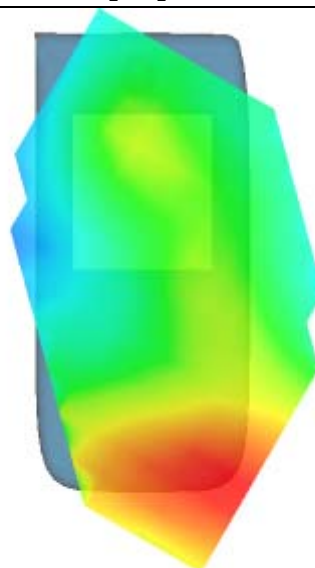
**SAR, Z Axis Scan (X = -74, Y = -66)**



**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: 9/10/2011

Measurement duration: 8 minutes 39 seconds

### A. Experimental conditions.

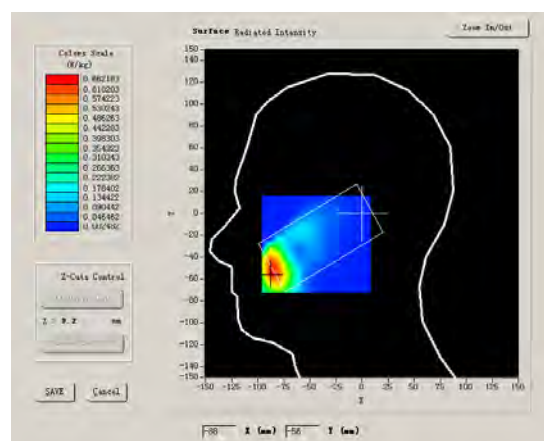
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

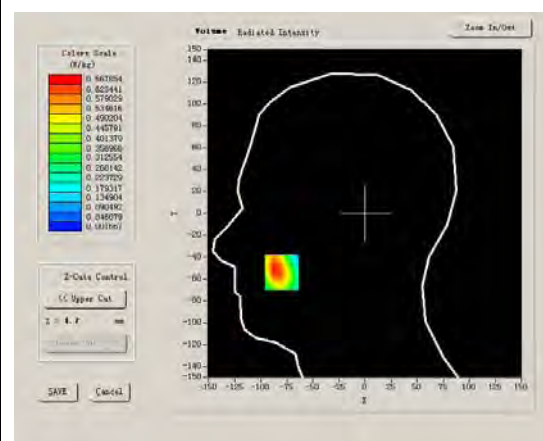
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-0.100000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



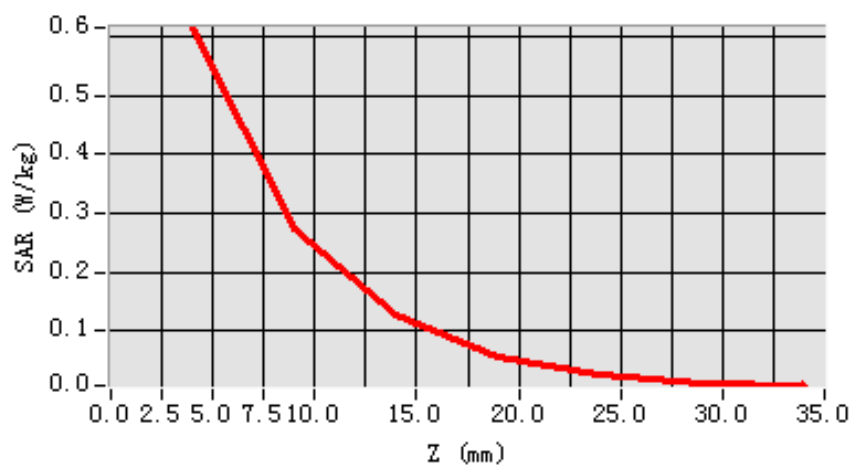
**Maximum location: X=-80.00, Y=-54.00**

<b>SAR 10g (W/Kg)</b>	0.327666
<b>SAR 1g (W/Kg)</b>	0.652278

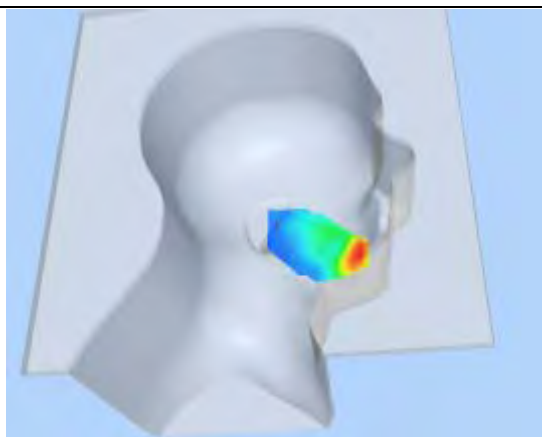
### **Z Axis Scan**

<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>0.6158</b>	<b>0.2733</b>	<b>0.1282</b>	<b>0.0570</b>	<b>0.0259</b>	<b>0.0112</b>

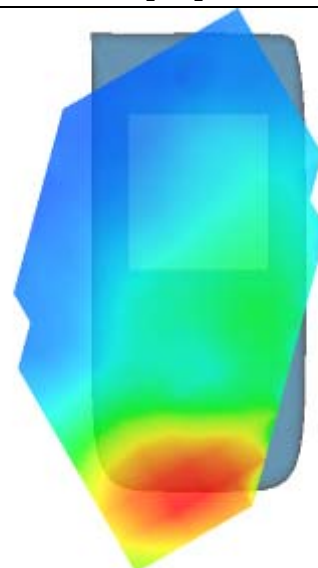
**SAR, Z Axis Scan (X = -80, Y = -54)**



**3D sceen 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: 9/10/2011

Measurement duration: 8 minutes 42 seconds

### A. Experimental conditions.

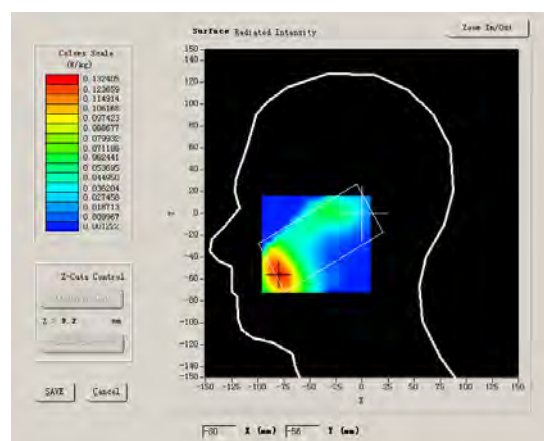
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Tilt
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

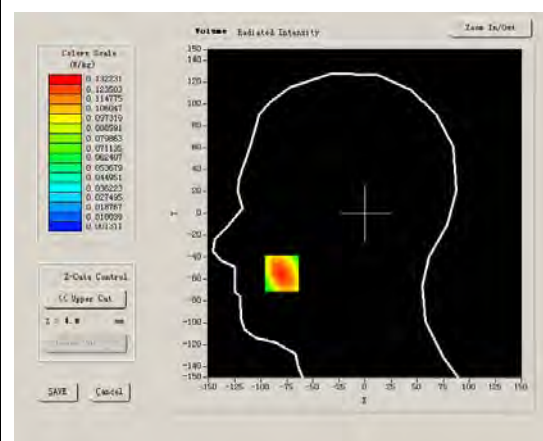
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-0.470000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR





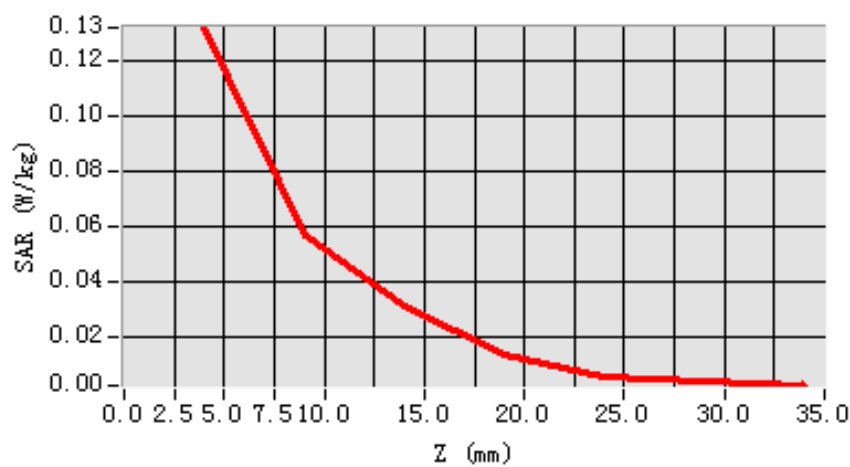
**Maximum location: X=-80.00, Y=-55.00**

<b>SAR 10g (W/Kg)</b>	0.067605
<b>SAR 1g (W/Kg)</b>	0.128588

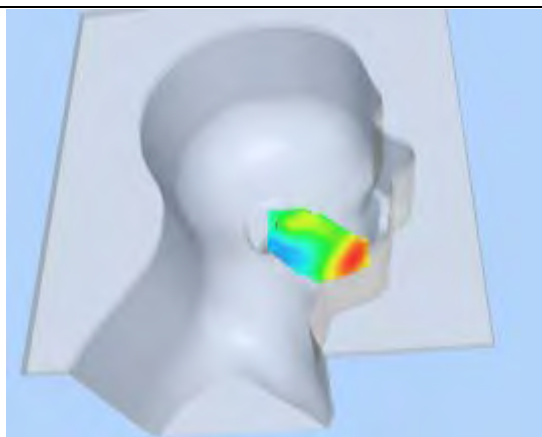
### **Z Axis Scan**

<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>0.1322</b>	<b>0.0571</b>	<b>0.0313</b>	<b>0.0140</b>	<b>0.0058</b>	<b>0.0042</b>

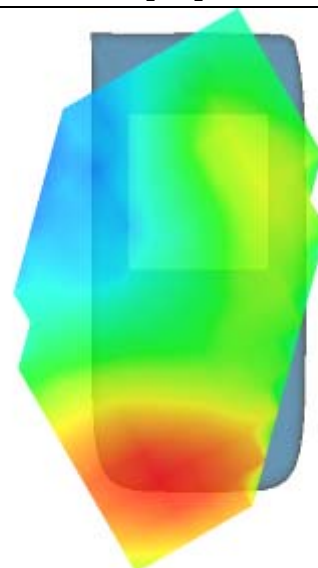
**SAR, Z Axis Scan (X = -80, Y = -55)**



**3D scene shot**



**Hot spot position**





## MEASUREMENT 15

Type: Phone measurement (Complete)

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

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

Date of measurement: 9/10/2011

Measurement duration: 9 minutes 9 seconds

### A. Experimental conditions.

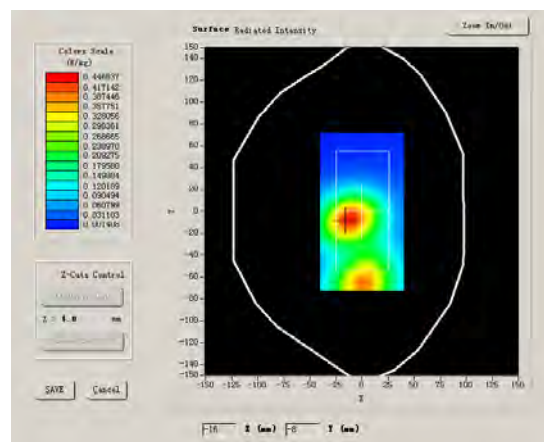
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

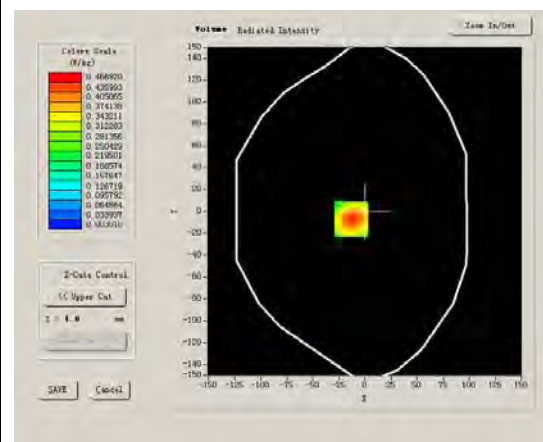
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.670000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR



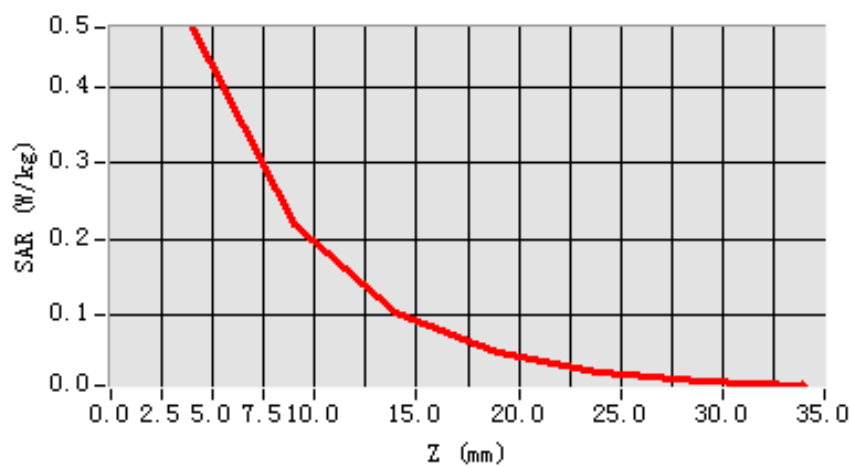
**Maximum location: X=-13.00, Y=-7.00**

<b>SAR 10g (W/Kg)</b>	0.232468
<b>SAR 1g (W/Kg)</b>	0.454134

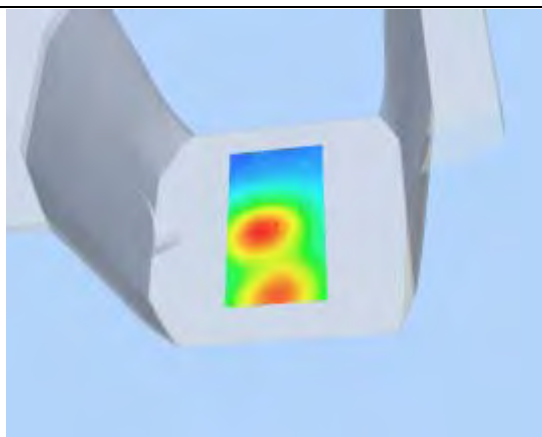
### **Z Axis Scan**

<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>0.4778</b>	<b>0.2193</b>	<b>0.1034</b>	<b>0.0497</b>	<b>0.0243</b>	<b>0.0119</b>

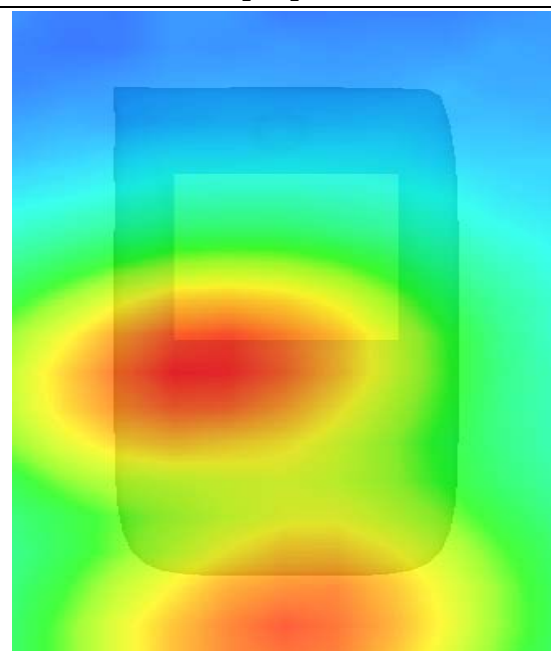
**SAR, Z Axis Scan (X = -13, Y = -7)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 16

Type: Phone measurement (Complete)

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

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

Date of measurement: 9/10/2011

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

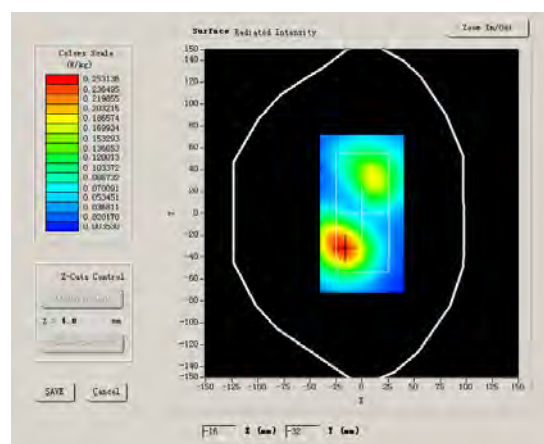
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GSM

### B. SAR Measurement Results

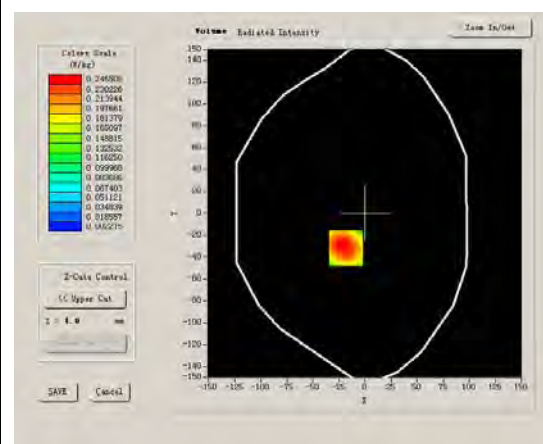
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.900000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR



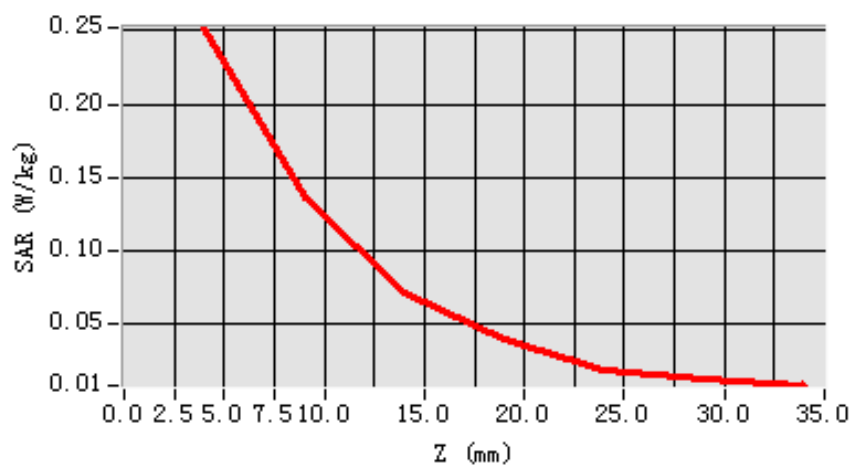
**Maximum location: X=-18.00, Y=-32.00**

<b>SAR 10g (W/Kg)</b>	0.136079
<b>SAR 1g (W/Kg)</b>	0.248094

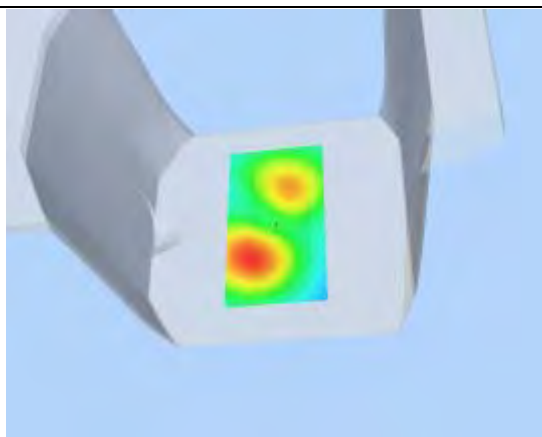
### **Z Axis Scan**

<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>0.2522</b>	<b>0.1355</b>	<b>0.0701</b>	<b>0.0387</b>	<b>0.0182</b>	<b>0.0120</b>

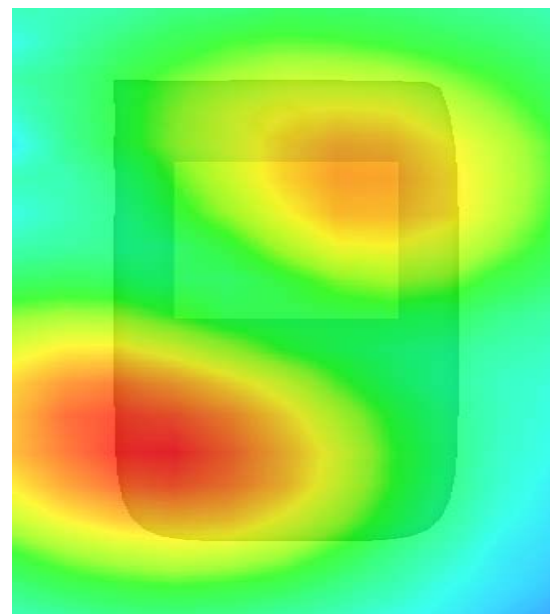
**SAR, Z Axis Scan (X = -18, Y = -32)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 17

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

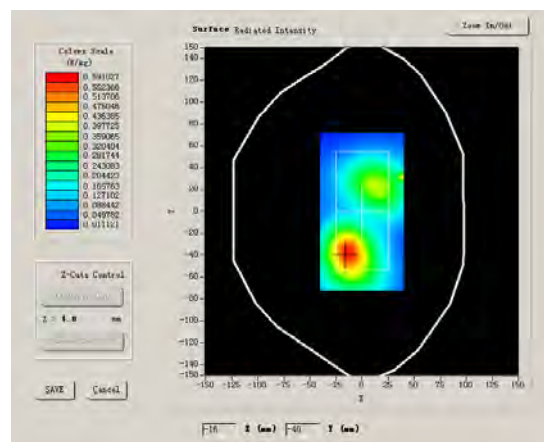
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

### B. SAR Measurement Results

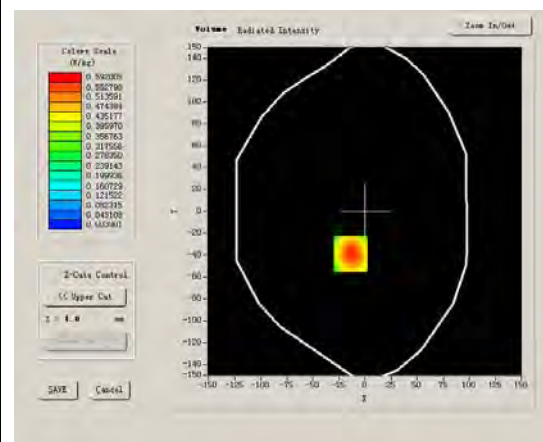
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.570000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:4

#### SURFACE SAR



#### VOLUME SAR

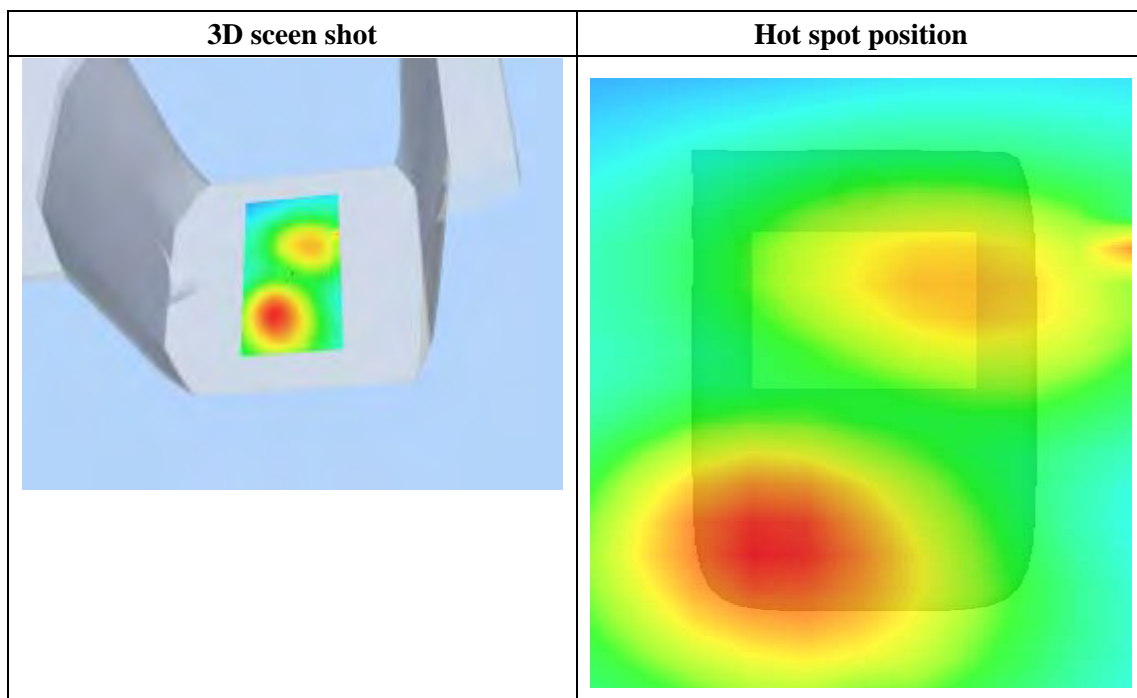
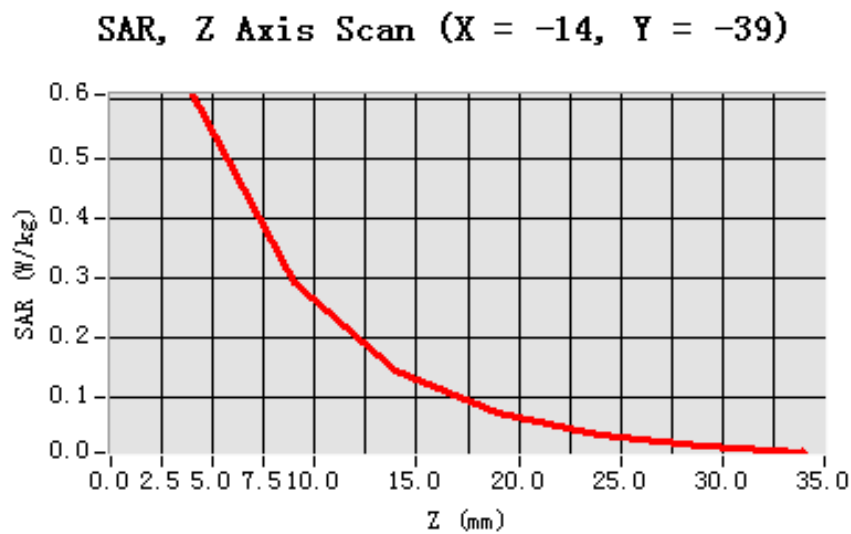


**Maximum location: X=-14.00, Y=-39.00**

<b>SAR 10g (W/Kg)</b>	0.305011
<b>SAR 1g (W/Kg)</b>	0.576505

### **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>0.6058</b>	<b>0.2927</b>	<b>0.1438</b>	<b>0.0729</b>	<b>0.0373</b>	<b>0.0191</b>





## MEASUREMENT 18

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

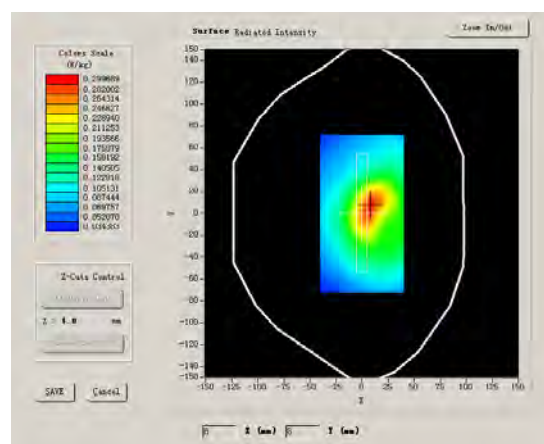
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

### B. SAR Measurement Results

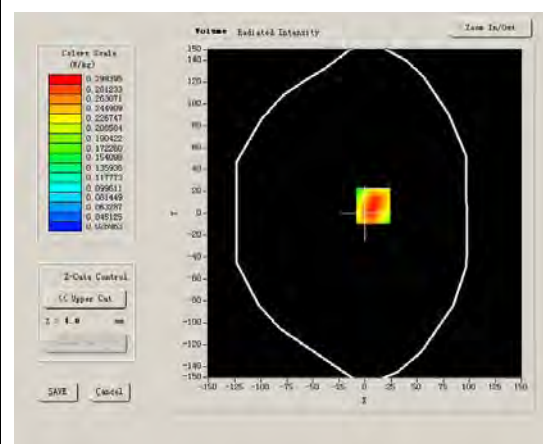
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.570000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:4

#### SURFACE SAR



#### VOLUME SAR



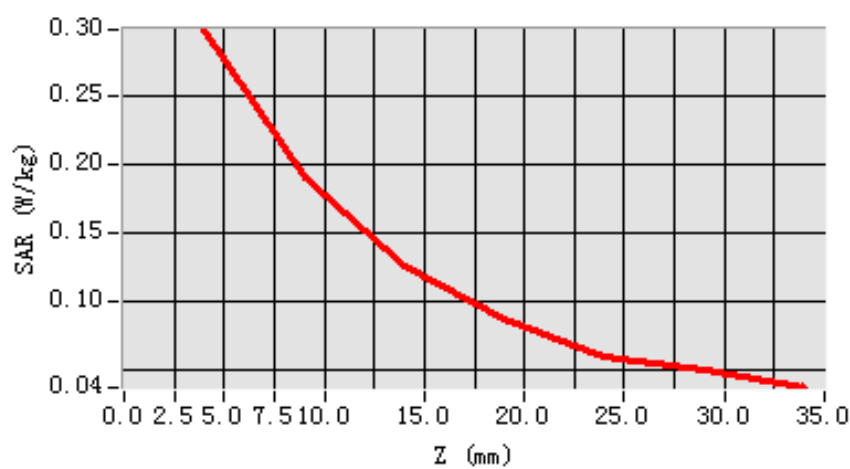
**Maximum location: X=8.00, Y=7.00**

<b>SAR 10g (W/Kg)</b>	0.185646
<b>SAR 1g (W/Kg)</b>	0.286416

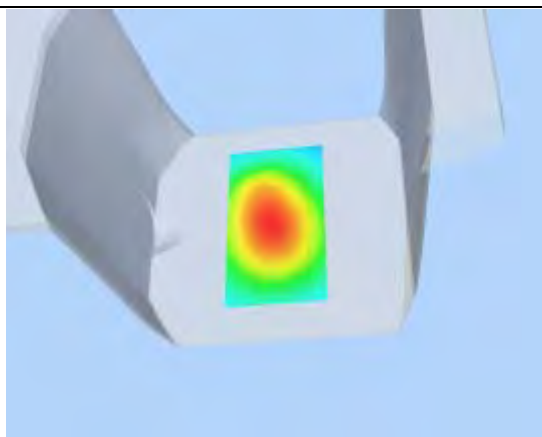
### Z Axis Scan

<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>0.2994</b>	<b>0.1902</b>	<b>0.1258</b>	<b>0.0876</b>	<b>0.0590</b>	<b>0.0498</b>

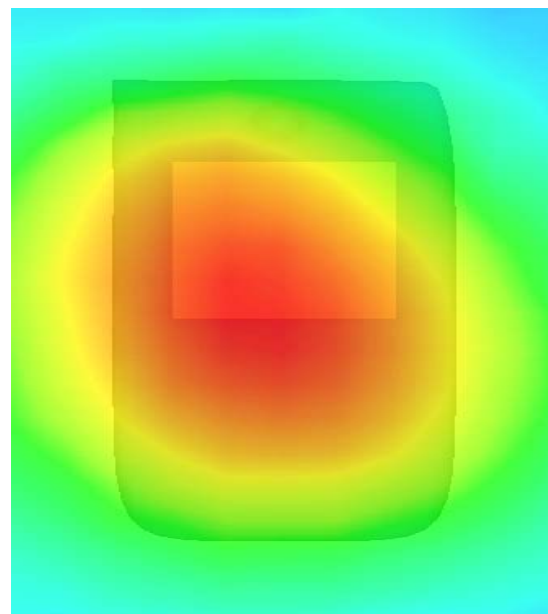
**SAR, Z Axis Scan (X = 8, Y = 7)**



**3D scene shot**



**Hot spot position**





## MEASUREMENT 19

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

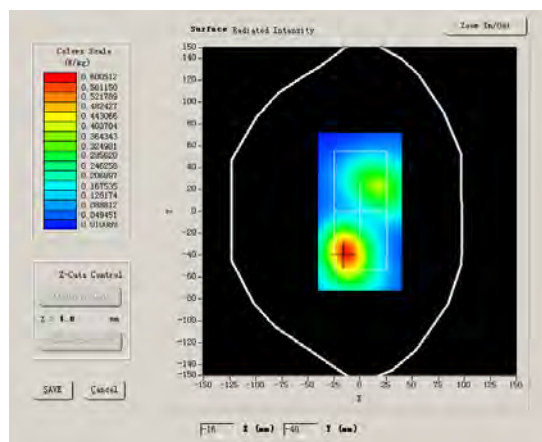
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	EDGE

### B. SAR Measurement Results

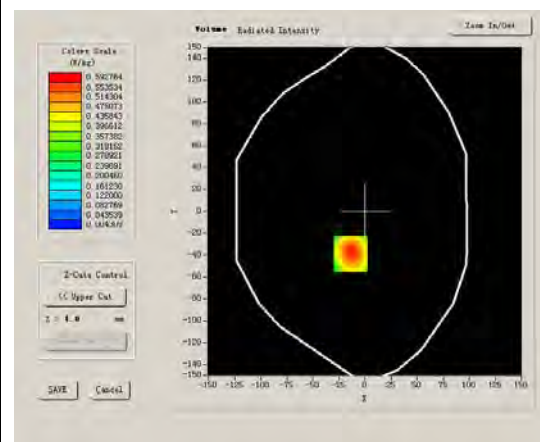
Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.400000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR

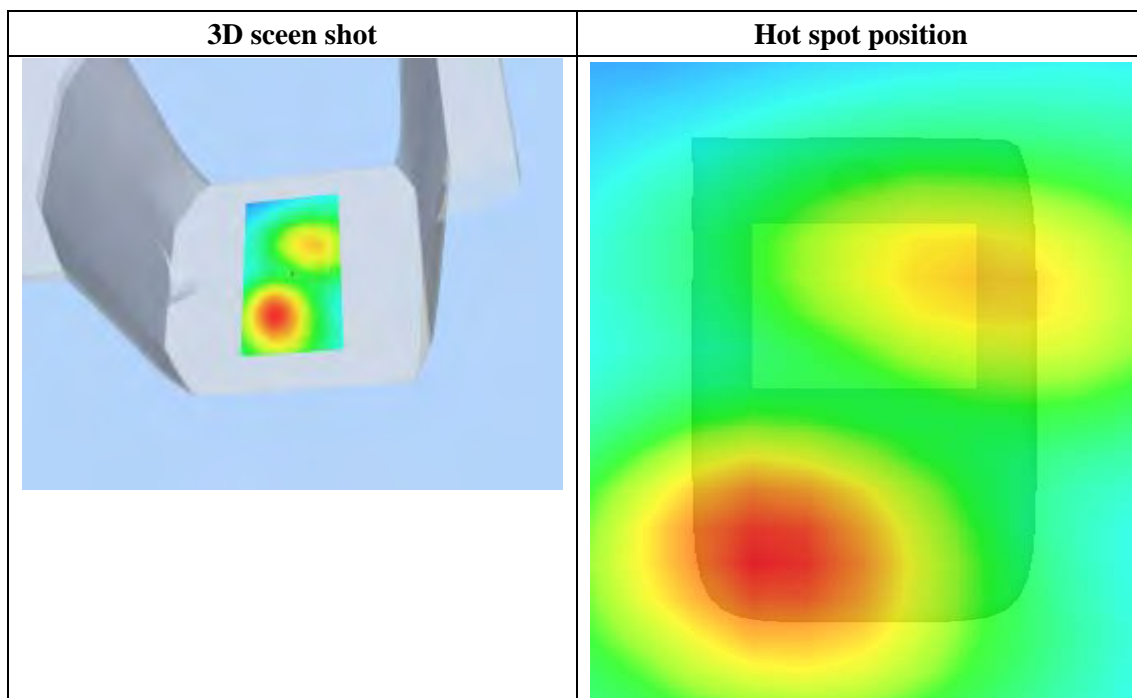
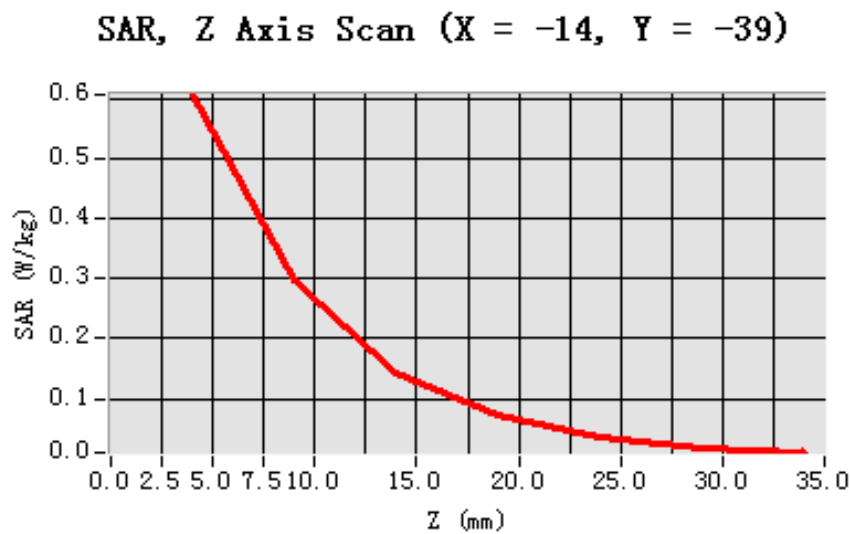


**Maximum location: X=-14.00, Y=-39.00**

<b>SAR 10g (W/Kg)</b>	0.306300
<b>SAR 1g (W/Kg)</b>	0.584205

### **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>0.6066</b>	<b>0.2967</b>	<b>0.1440</b>	<b>0.0727</b>	<b>0.0359</b>	<b>0.0186</b>



## MEASUREMENT 20

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 9 seconds

### A. Experimental conditions.

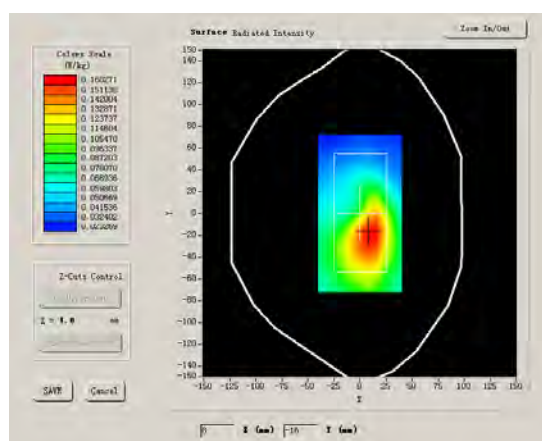
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	EDGE

### B. SAR Measurement Results

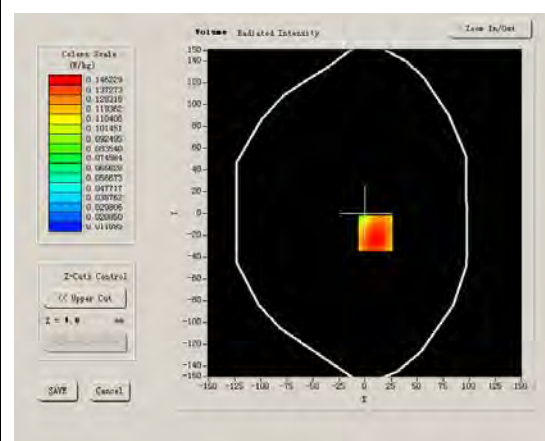
Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.492827
Power drift (%)	0.250000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



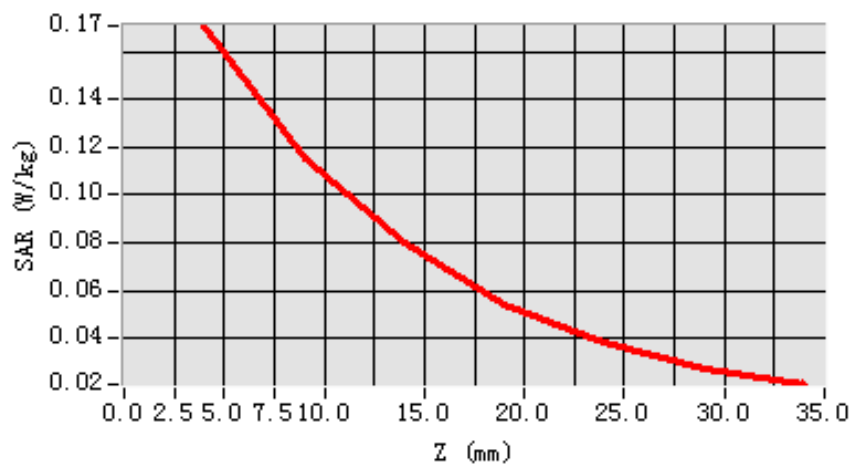
**Maximum location: X=10.00, Y=-18.00**

<b>SAR 10g (W/Kg)</b>	0.112887
<b>SAR 1g (W/Kg)</b>	0.168692

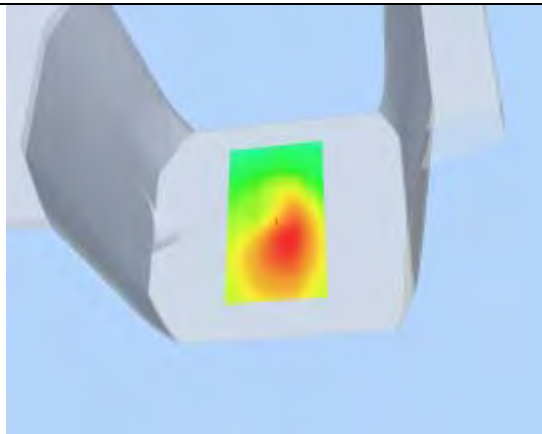
### **Z Axis Scan**

<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>0.1710</b>	<b>0.1156</b>	<b>0.0804</b>	<b>0.0537</b>	<b>0.0384</b>	<b>0.0270</b>

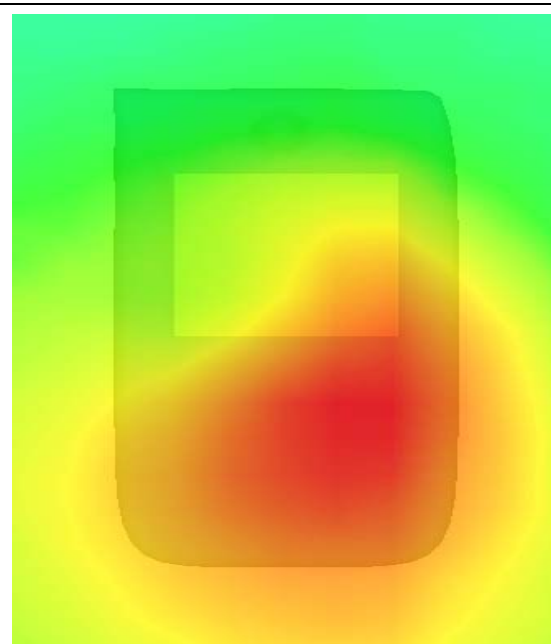
**SAR, Z Axis Scan (X = 10, Y = -18)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 21

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 8 minutes 39 seconds

### A. Experimental conditions.

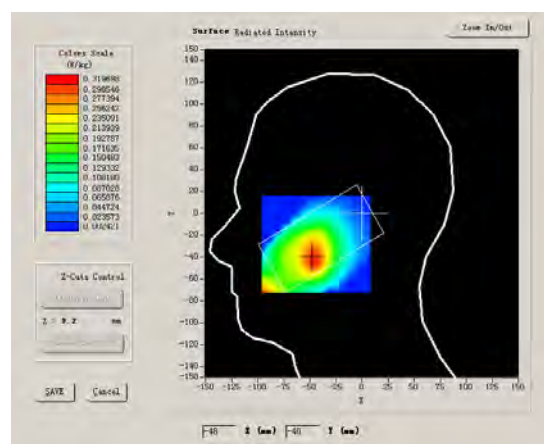
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WCDMA1700
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

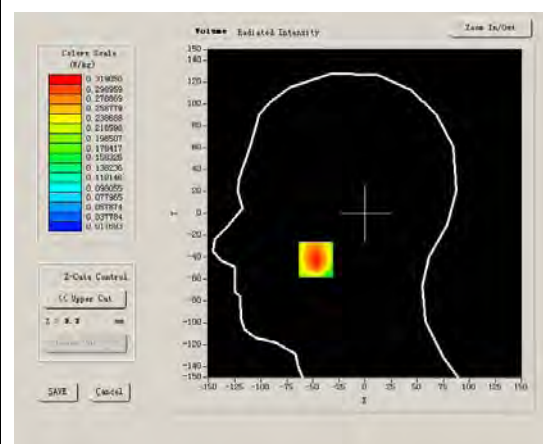
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	38.930000
Relative permittivity	13.610000
Conductivity (S/m)	1.309584
Power drift (%)	-0.020000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR

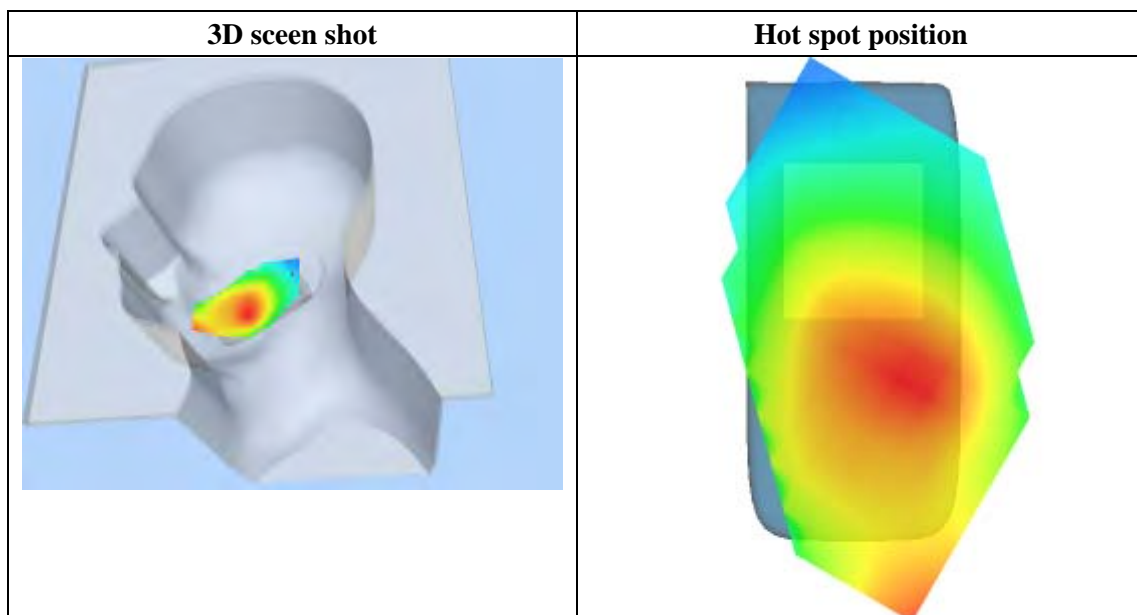
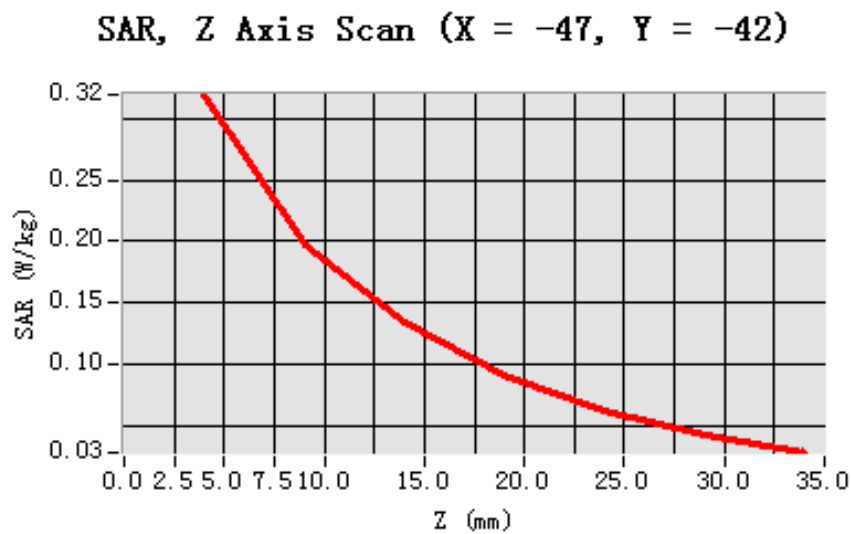


**Maximum location: X=-47.00, Y=-42.00**

<b>SAR 10g (W/Kg)</b>	0.187851
<b>SAR 1g (W/Kg)</b>	0.306066

### **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>0.3191</b>	<b>0.1963</b>	<b>0.1346</b>	<b>0.0911</b>	<b>0.0627</b>	<b>0.0433</b>



## MEASUREMENT 22

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 8 minutes 42 seconds

### A. Experimental conditions.

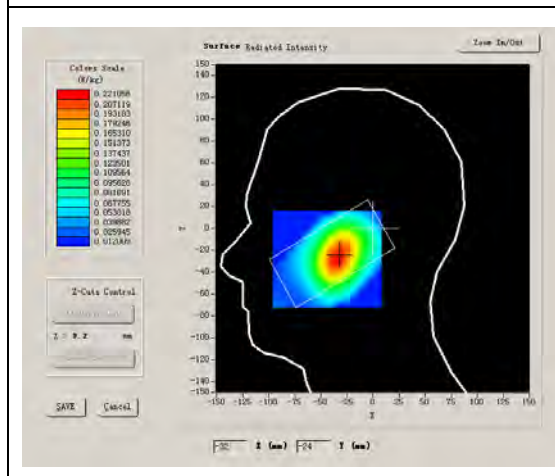
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Tilt
Band	WCDMA
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

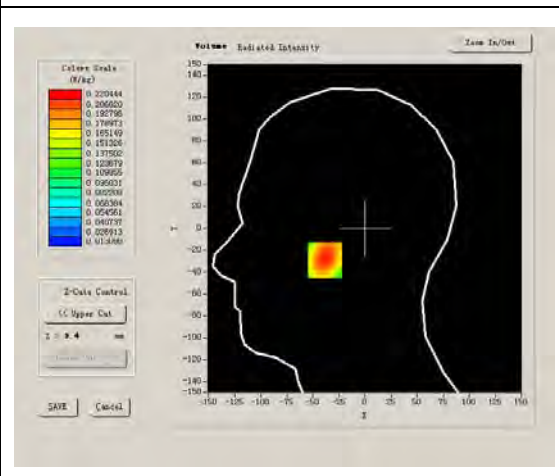
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	38.930000
Relative permittivity	13.610000
Conductivity (S/m)	1.309584
Power drift (%)	-0.940000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR





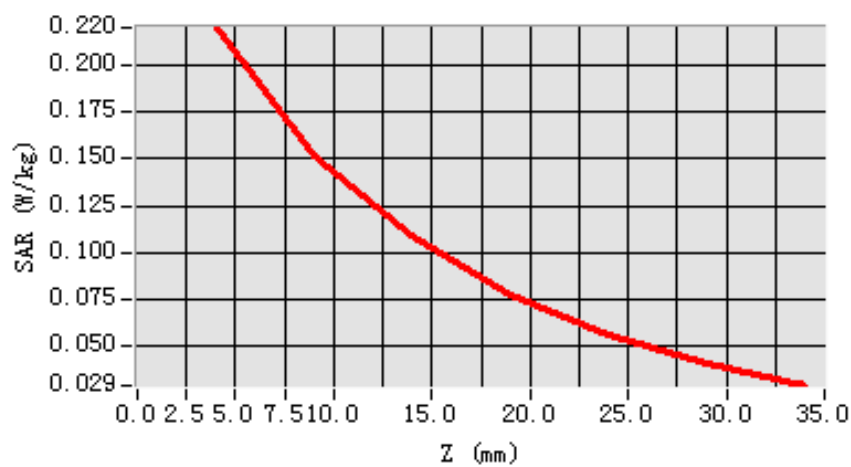
**Maximum location: X=-34.00, Y=-29.00**

<b>SAR 10g (W/Kg)</b>	0.140056
<b>SAR 1g (W/Kg)</b>	0.210843

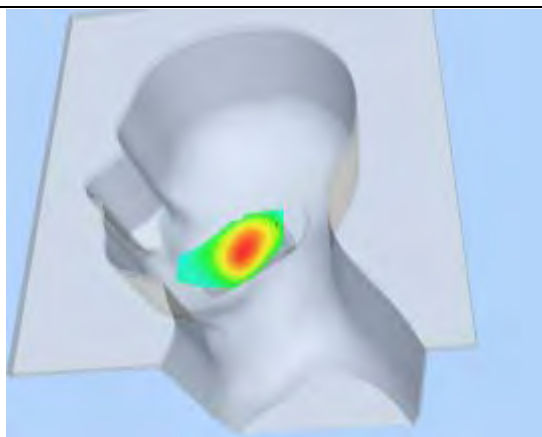
### **Z Axis Scan**

<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>0.2204</b>	<b>0.1515</b>	<b>0.1090</b>	<b>0.0768</b>	<b>0.0563</b>	<b>0.0400</b>

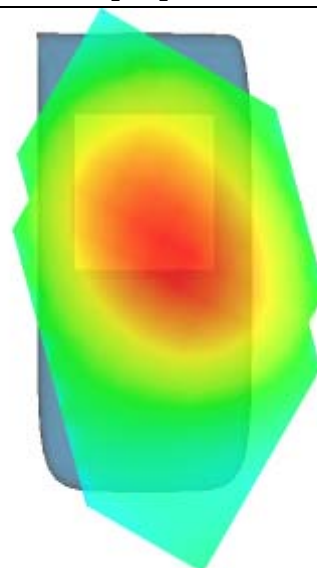
**SAR, Z Axis Scan (X = -34, Y = -29)**



**3D sceen shot**



**Hot spot position**





## MEASUREMENT 23

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 8 minutes 39 seconds

### A. Experimental conditions.

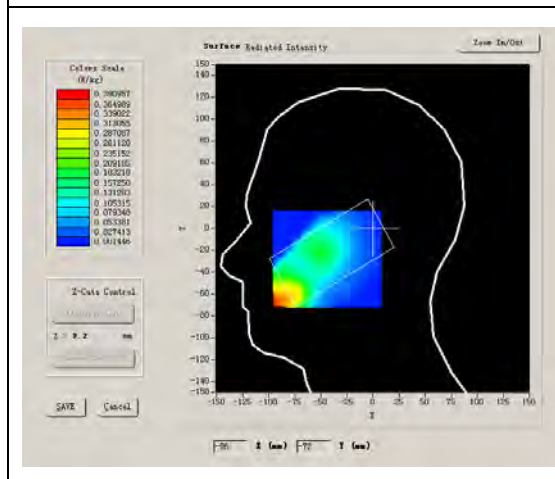
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	WCDMA1700
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

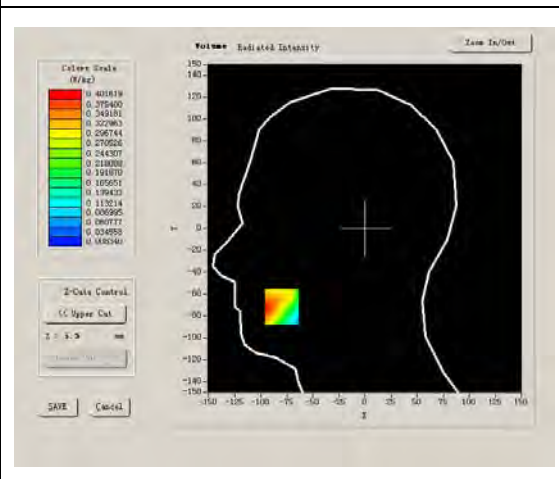
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	38.930000
Relative permittivity	13.610000
Conductivity (S/m)	1.309584
Power drift (%)	-0.020000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



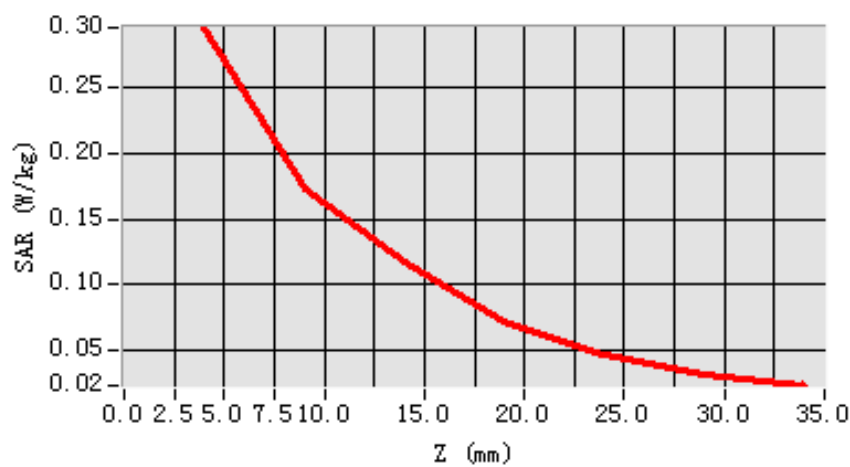
**Maximum location: X=-80.00, Y=-72.00**

<b>SAR 10g (W/Kg)</b>	0.221460
<b>SAR 1g (W/Kg)</b>	0.347467

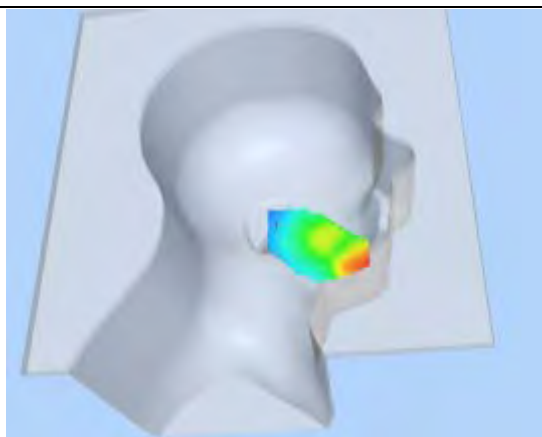
### **Z Axis Scan**

<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>0.2963</b>	<b>0.1735</b>	<b>0.1169</b>	<b>0.0716</b>	<b>0.0469</b>	<b>0.0306</b>

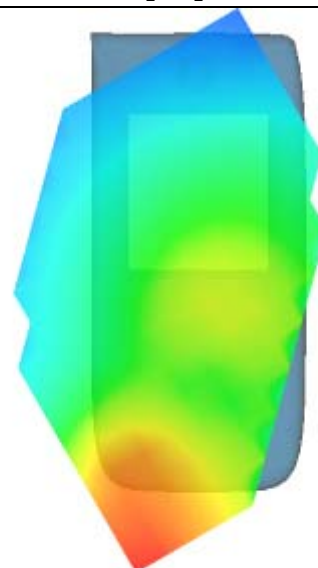
**SAR, Z Axis Scan (X = -80, Y = -72)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 24

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 8 minutes 42 seconds

### A. Experimental conditions.

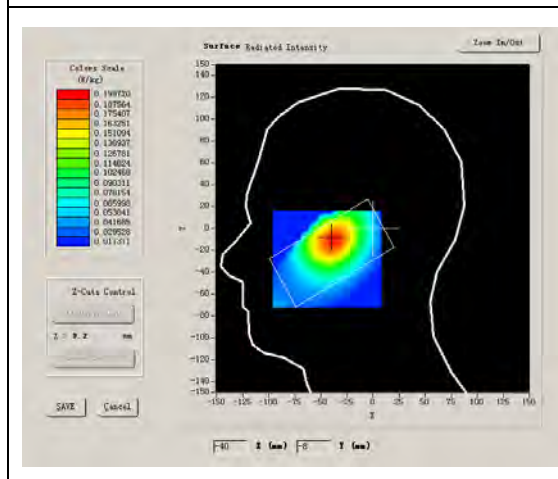
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Tilt
Band	WCDMA1700
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

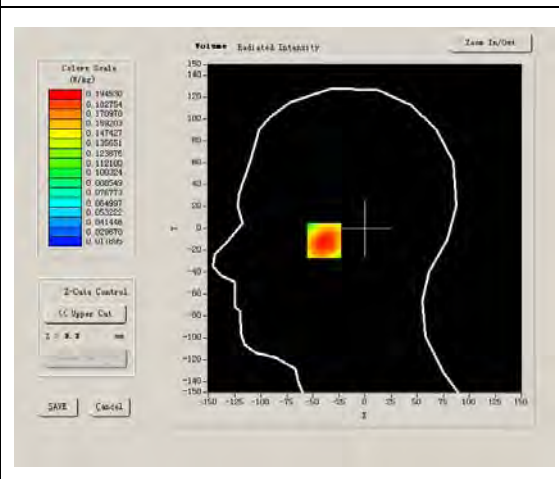
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	38.930000
Relative permittivity	13.610000
Conductivity (S/m)	1.309584
Power drift (%)	-0.940000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



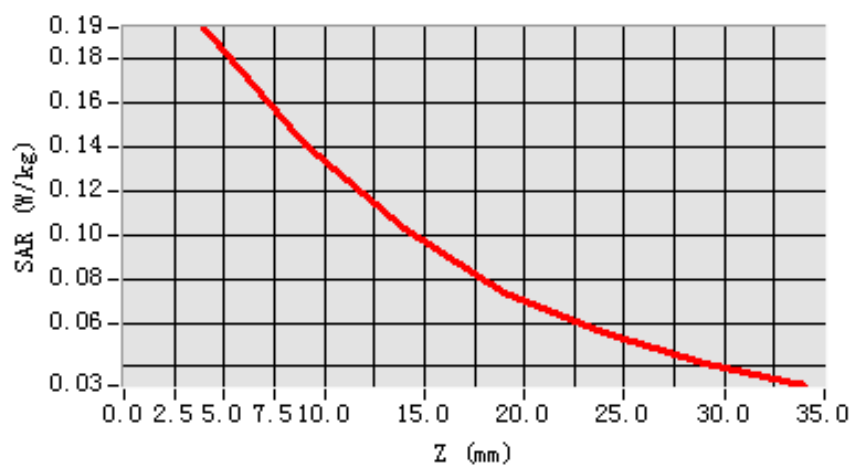
**Maximum location: X=-39.00, Y=-10.00**

<b>SAR 10g (W/Kg)</b>	0.128662
<b>SAR 1g (W/Kg)</b>	0.187148

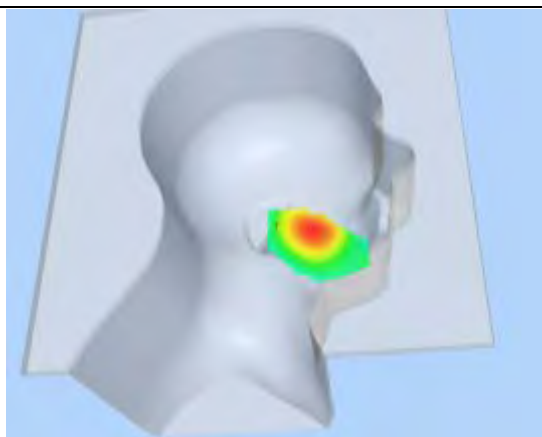
### **Z Axis Scan**

<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>0.1945</b>	<b>0.1411</b>	<b>0.1031</b>	<b>0.0740</b>	<b>0.0558</b>	<b>0.0412</b>

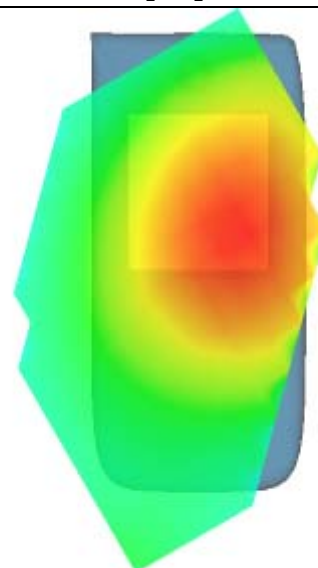
**SAR, Z Axis Scan (X = -39, Y = -10)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 25

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

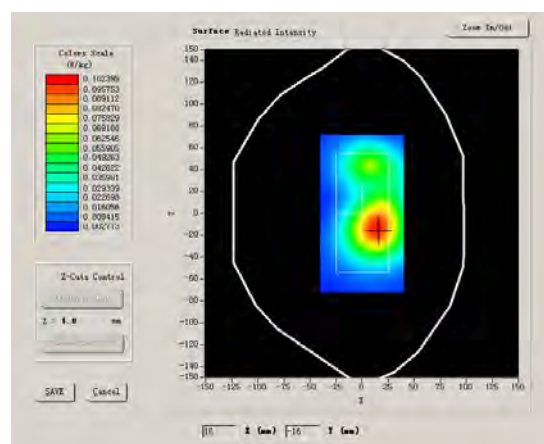
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

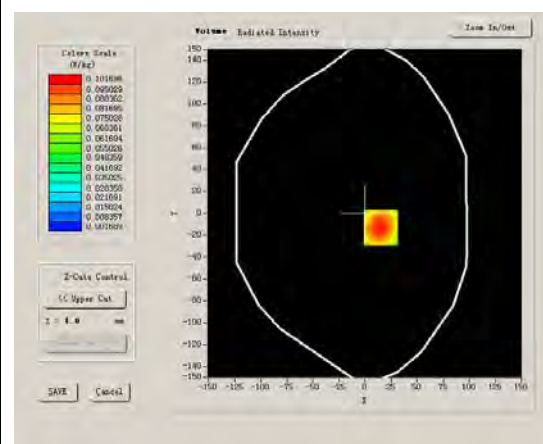
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.400000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



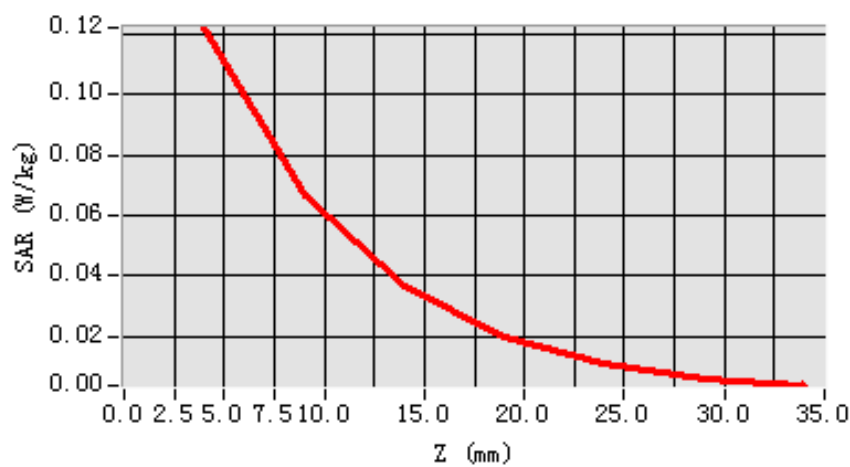
**Maximum location: X=15.00, Y=-13.00**

<b>SAR 10g (W/Kg)</b>	0.066132
<b>SAR 1g (W/Kg)</b>	0.117129

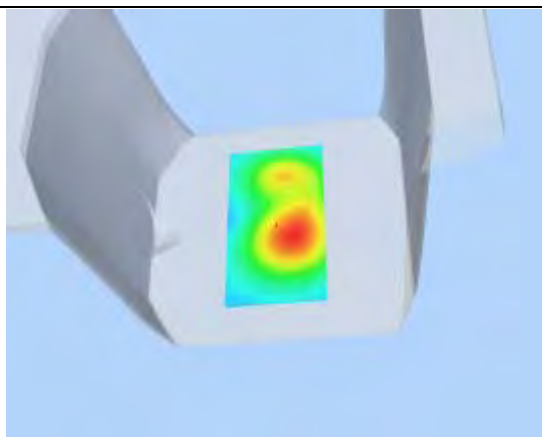
### **Z Axis Scan**

<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>0.1220</b>	<b>0.0664</b>	<b>0.0368</b>	<b>0.0200</b>	<b>0.0110</b>	<b>0.0058</b>

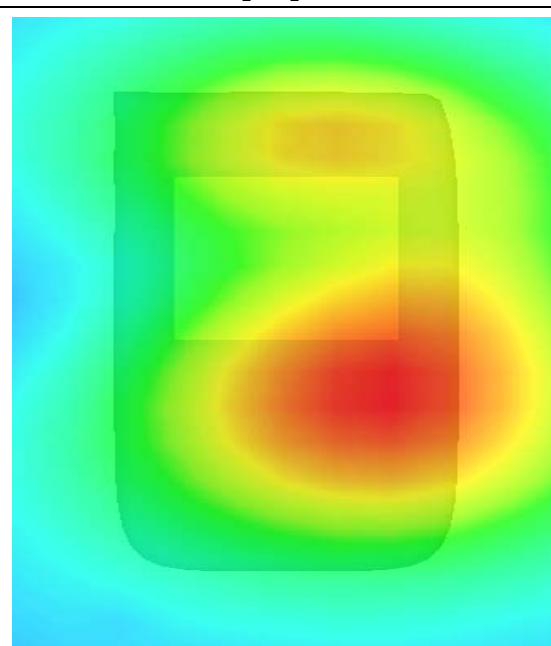
**SAR, Z Axis Scan (X = 15, Y = -13)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 26

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 9 minutes 10 seconds

### A. Experimental conditions.

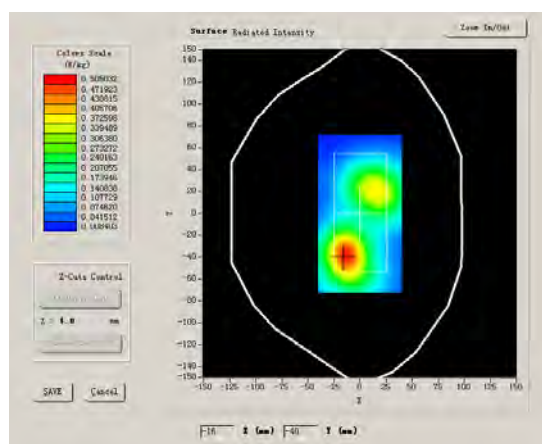
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA
Channels	Middle
Signal	CDMA

### B. SAR Measurement Results

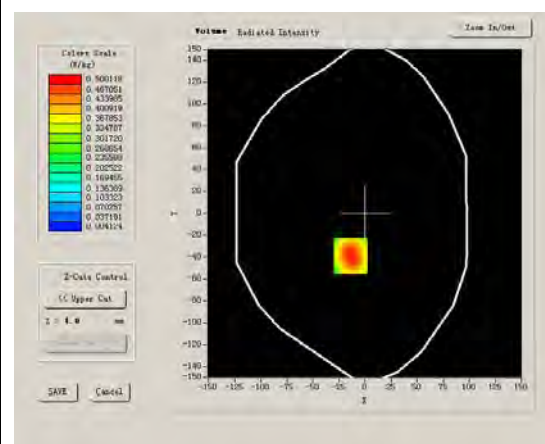
Middle Band SAR (Channel 1450):

Frequency (MHz)	1732.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	1.70000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR





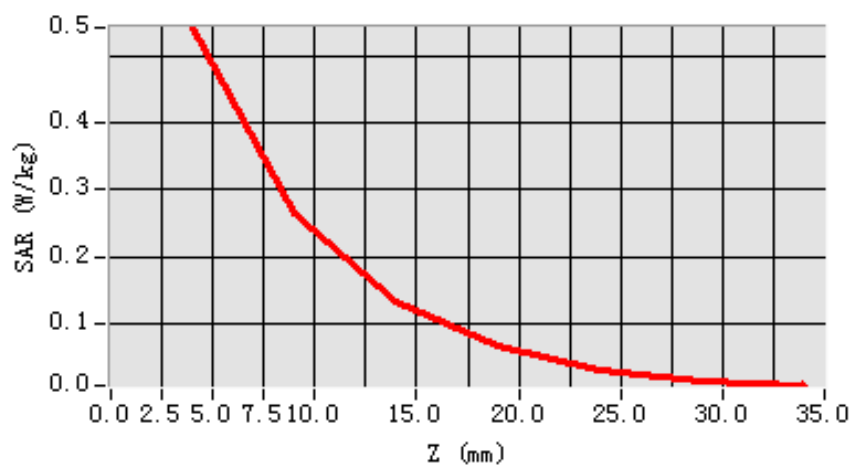
**Maximum location: X=-14.00, Y=-39.00**

<b>SAR 10g (W/Kg)</b>	0.277139
<b>SAR 1g (W/Kg)</b>	0.520518

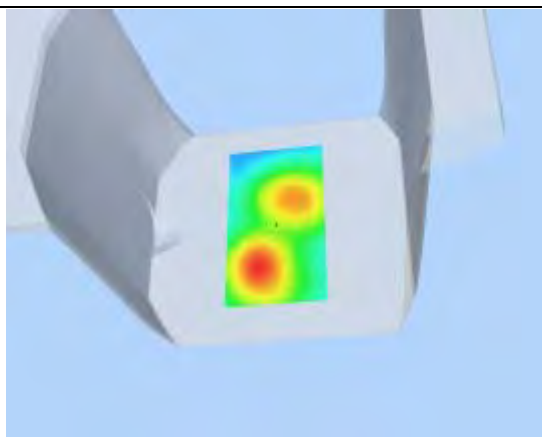
### **Z Axis Scan**

<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>0.5416</b>	<b>0.2652</b>	<b>0.1353</b>	<b>0.0668</b>	<b>0.0332</b>	<b>0.0164</b>

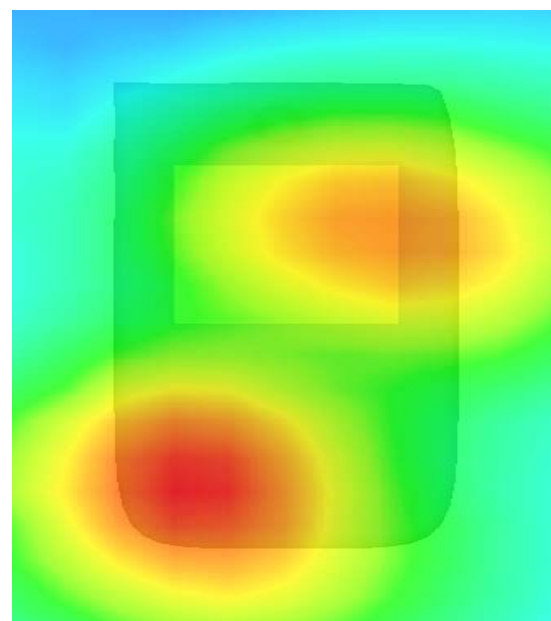
**SAR, Z Axis Scan (X = -14, Y = -39)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(835MHz)

Type: Phone measurement (Complete)

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

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

Date of measurement: 18/10/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

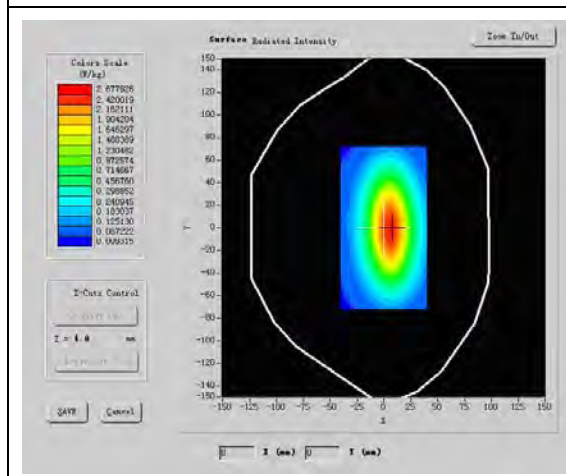
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	835MHz
Channels	
Signal	CW

### B. SAR Measurement Results

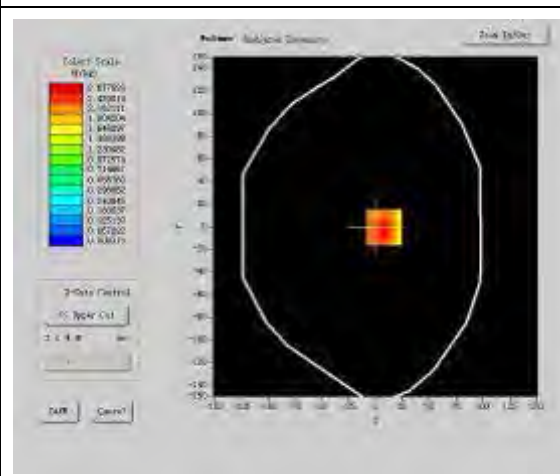
#### Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	40.490002
Relative permittivity	15.070000
Conductivity (S/m)	0.983918
Power drift (%)	-0.050000
Ambient Temperature:	22.4°C
Liquid Temperature:	21.5°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



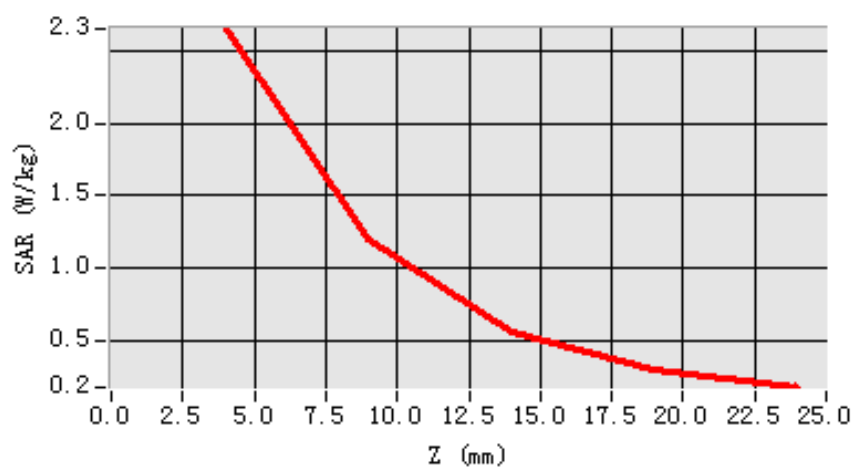
**Maximum location: X=5.00, Y=1.00**

<b>SAR 10g (W/Kg)</b>	1.685732
<b>SAR 1g (W/Kg)</b>	2.278462

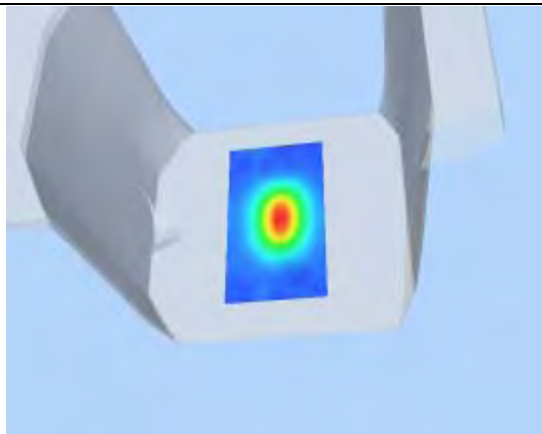
### Z Axis Scan

<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>2.2754</b>	<b>1.2251</b>	<b>0.5857</b>	<b>0.3114</b>

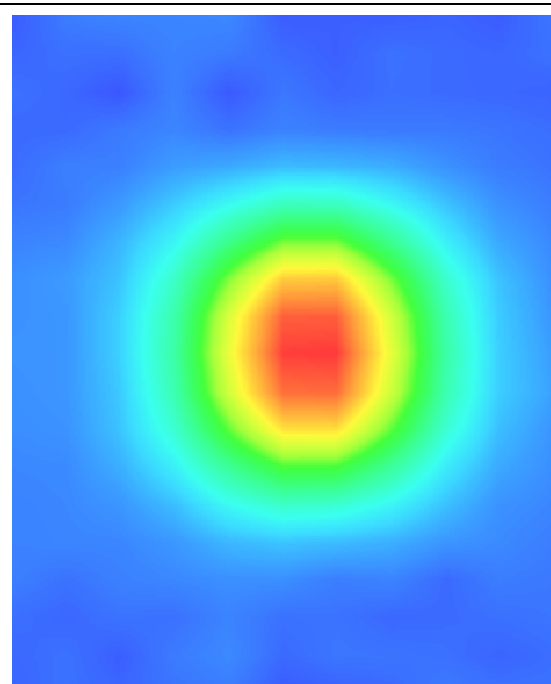
**SAR, Z Axis Scan (X = 5, Y = 1)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(1700MHz)

Type: Phone measurement (Complete)

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

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

Date of measurement: 13/10/2011

Measurement duration: 13 minutes 27 seconds

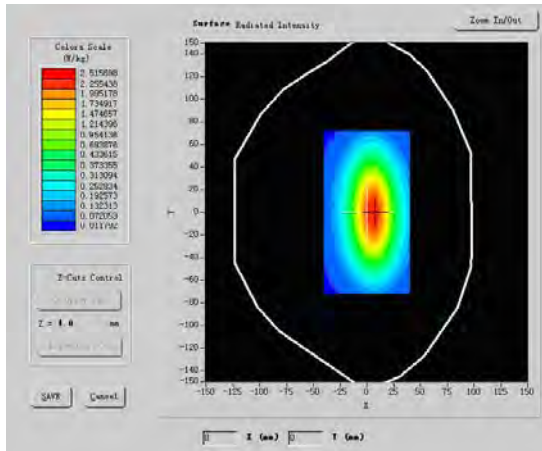
### A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1700MHz
Channels	
Signal	CW

### B. SAR Measurement Results

#### Band SAR

Frequency (MHz)	1700.000000
Relative permittivity (real part)	39.930000
Relative permittivity	15.070000
Conductivity (S/m)	1.341229
Power Drift (%)	-0.140000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.8°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

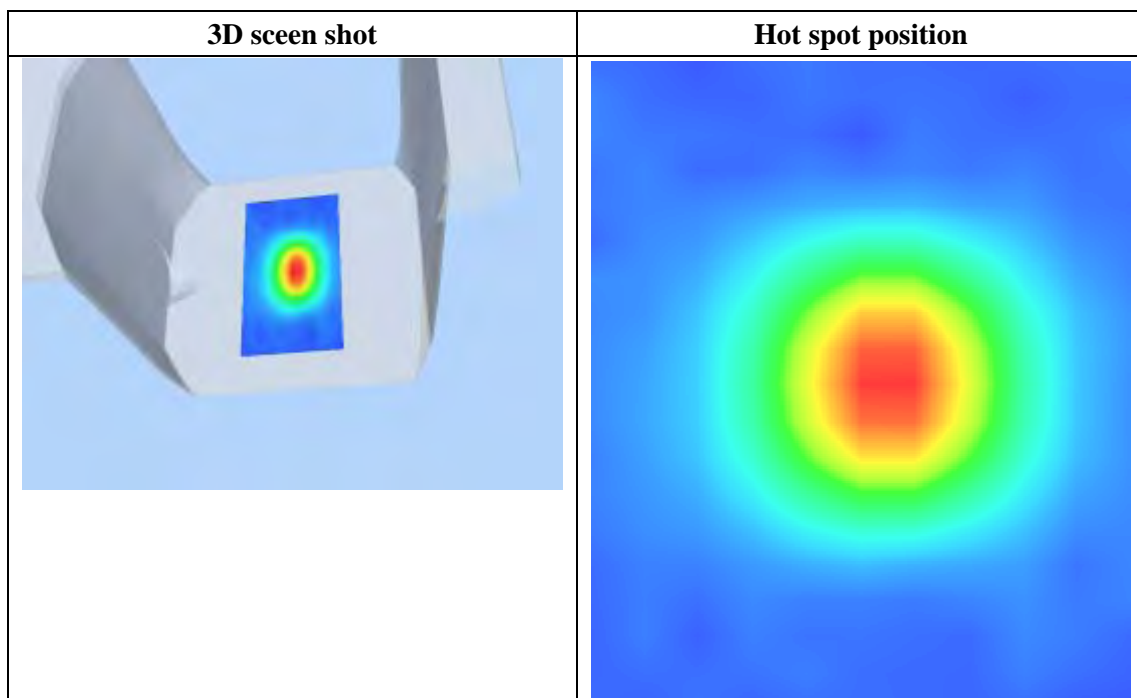
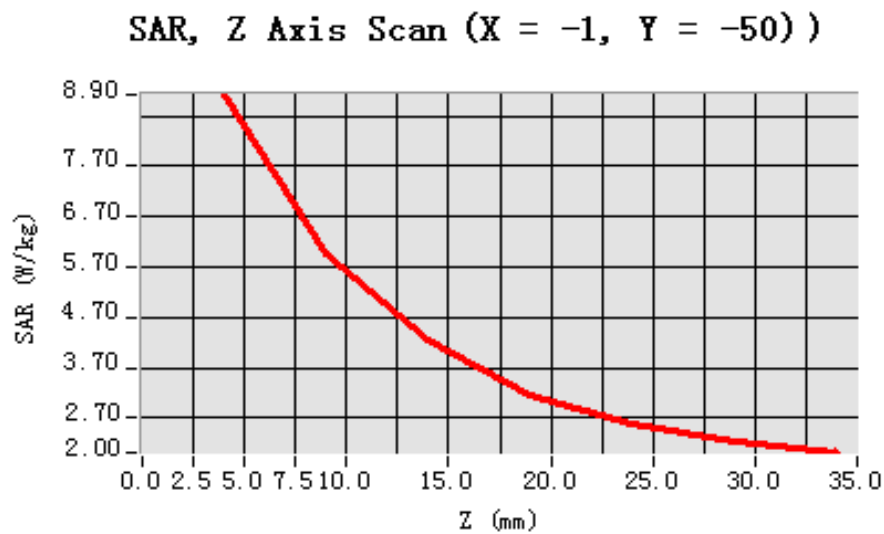
SURFACE SAR	VOLUME SAR
	

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

<b>SAR 10g (W/Kg)</b>	4.845273
<b>SAR 1g (W/Kg)</b>	8.857267

### 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>8.8528</b>	<b>5.9541</b>	<b>4.1275</b>	<b>2.8571</b>



## System Performance Check Data(1900MHz)

Type: Phone measurement (Complete)

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

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

Date of measurement: 13/10/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

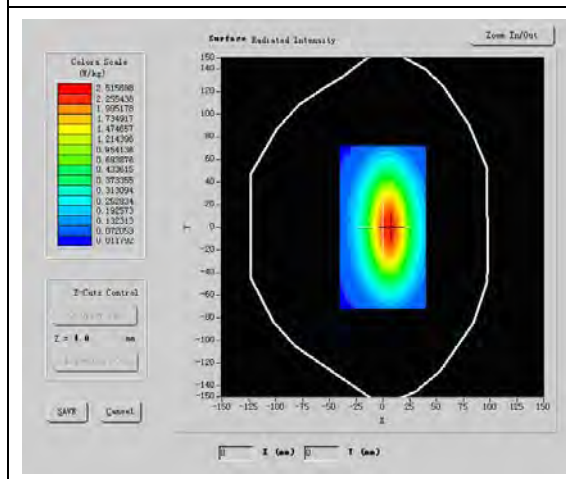
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1800MHz
Channels	
Signal	CW

### B. SAR Measurement Results

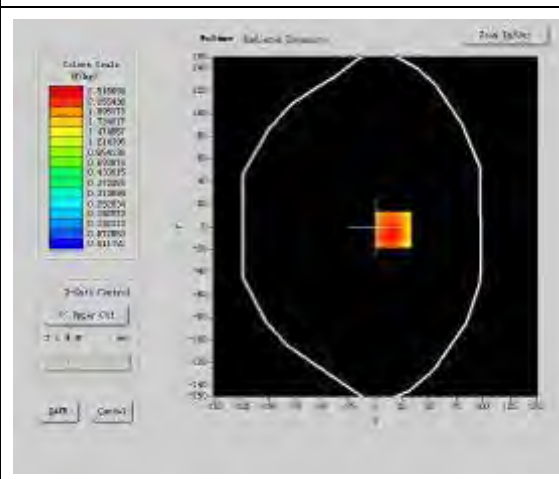
#### Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.930000
Relative permittivity	15.070000
Conductivity (S/m)	1.321229
Power Drift (%)	-0.140000
Ambient Temperature:	22.3°C
Liquid Temperature:	22.6°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR



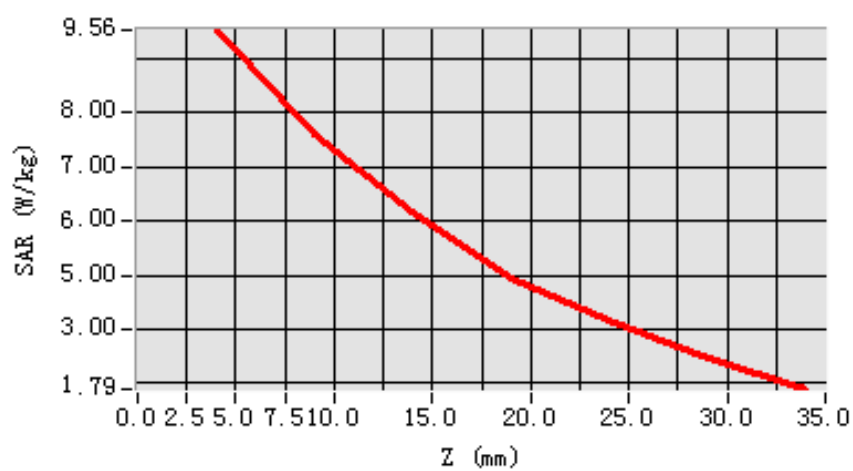
**Maximum location: X=-1.00, Y=-50.00**

<b>SAR 10g (W/Kg)</b>	4.910003
<b>SAR 1g (W/Kg)</b>	9.555521

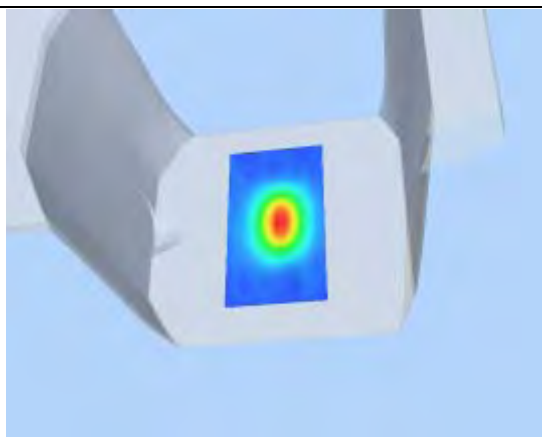
### Z Axis Scan

<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>9.5536</b>	<b>5.3061</b>	<b>2.6041</b>	<b>0.3211</b>

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



**3D scene shot**



**Hot spot position**

