



Report No.: SZ11060057S01



# SAR TEST REPORT

Issued to

Cellon Communications Technology(ShenZhen)Co., Ltd.

For

C1020

Model Name : CL1135EN;PCD1135;CL1135;TE1135;PCD1135PE;PCD1135AL;PCD1135CL;  
PCD1135EC;PCD1135MV;PCD1135OM;PCD1135MX;PCD1135CR;  
TE1135PE;AL1135AL;CL1135CL;CL1135EV;MV1135MV;TE1135MX;CL1135CR;

Trade Name : N/A

Brand Name : PCD/Claro

FCC ID : T38PCD1020

Standard : FCC Oet65 Supplement C Jun.2001  
47CFR 2.1093  
ANSI C95.1-1999  
IEEE 1528-2003

MAX SAR : Head: 1.109W/kg  
Body: 0.694W/kg

Test date : 2011-06-21

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Shenzhen MORLAB Communication Technology Co., Ltd.



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Date 2011.06.22

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Change History		
Issue	Date	Reason for change
1.0	Jun 22, 2011	First edition

## 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 (see Annex A)

### 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)	2010-9-26	1year
3	Voltmeter	Keithley (2000, SN:1000572)	2010-9-24	1year
4	Synthesizer	Rohde&Schwarz (SML_03, SN:101868)	2010-9-24	1year
5	Amplifier	Nucl udes (ALB216, SN:10800)	2010-9-24	1year
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)	2010-9-24	1year
7	Probe	Satimo (SN:SN_3708_EP80)	2010-9-24	1year
8	Phantom	Satimo (SN:SN_36_08_SAM62)	2010-9-24	1year
9	Liquid	Satimo (Last Calibration:21 08 08)	2010-8-21	1year
10	Dipole 835MHz	Satimo (SN 36/08 DIPC 99)	2010-9-23	1year
11	Dipole 1900MHz	Satimo (SN 36/08 DIPF 102)	2010-9-23	1year

## 2. Technical Information

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

### 2.1. Identification of Applicant

Company Name: Cellon Communications Technology(ShenZhen)Co., Ltd.  
Address: 13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park NanShan, ShenZhen

### 2.2. Identification of Manufacturer

Company Name: Cellon Communications Technology(ShenZhen)Co., Ltd.  
Address: 13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park NanShan, ShenZhen

### 2.3. Equipment Under Test (EUT)

Brand Name: PCD/Claro  
Type Name: N/A  
Marking Name: CL1135EN;PCD1135;CL1135;TE1135;PCD1135PE;PCD1135AL;PCD1135CL;PCD1135EC;PCD1135MV;PCD1135OM;PCD1135MX;PCD1135CR;TE1135PE;AL1135AL;CL1135CL;CL1135EV;MV1135MV;TE1135MX;CL1135CR;  
Hardware Version: P1  
Software Version: V1.05  
Frequency Bands: GSM 850MHz / PCS 1900MHz  
Modulation Mode: GSM/GPRS: GMSK  
Multislot Class: GPRS: Class 12,  
Antenna type: Fixed Internal Antenna  
Development Stage: Identical prototype  
Battery Model: BTR1031  
Battery specification: 400mAh 3.7V

#### 2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

#### 2.3.2. Identification of all used EUTs

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#	P1	V1.05

## 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
Operation mode:	Call established
Power Level:	GSM 850 MHz Maximum output power(level 5) PCS 1900 MHz Maximum output power(level 0)

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, The EUT, 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.

### 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 High 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

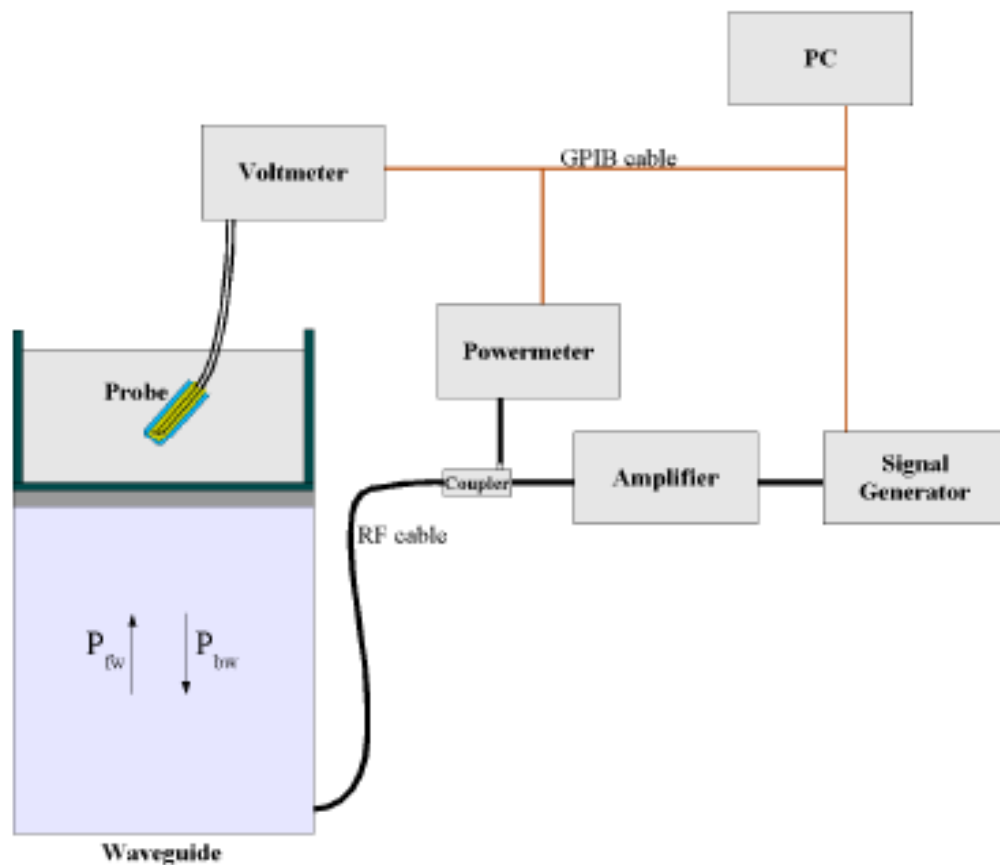
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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

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

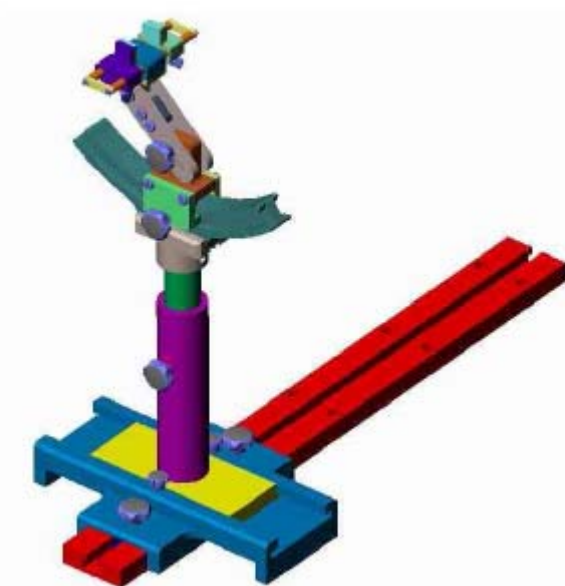
where DCP is the diode compression point in mV.

### 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 GSM 850MHz PCS 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 1900 MHz.

Ingredients (% by weight )	Frequency Band		Frequency Band	
	835MHz		1900MHz	
Tissue Type	Head	Body	Head	Body
Water	41.45	52.4	55.36	40.4
Salt(NaCl)	1.45	1.4	0.35	0.5
Sugar	56.0	45.0	30.45	58.0
HEC	1.0	1.0	0.0	1.0
Bactericide	0.1	0.1	0.0	0.1
Triton	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	13.84	0.0
Acticide SPX	0.0	0.0	0.0	0.0
Dielectric Constant	42.45	56.1	41.00	54.0
Conductivity (S/m)	0.91	0.95	1.38	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 (Jun 21)</b>	835 MHZ	41.675999	0.894409
<b>Target value</b>	1900 MHZ	40	1.40
<b>Validation value (Jun 21)</b>	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 (Jun 21)</b>	835 MHz	55.709999	1.009033
<b>Target value</b>	1900 MHz	53.3	1.52
<b>Validation value (Jun 21)</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 (+-%)	V i
<b>Measurement System</b>									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
<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	
Output power Power drift - SAR drift measurement	6.6.2	2.74	R	$\sqrt{3}$	1	1	1.58	1.58	
<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	
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	

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	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				12.52	11.71	
Expanded Uncertainty (95% Confidence interval)			k				25.05	23.42	

## 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 (+-%)	V i
<b>Measurement System</b>									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
<b>Dipole</b>									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	N - 1
Input power and SAR drift measurement	8,6.6.2	2.74	R	$\sqrt{3}$	1	1	1.58	1.58	

Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	
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	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				11.50	10.61	
Expanded Uncertainty (95% Confidence interval)			k				23.00	21.21	



## 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 1900MHz:SN 36/08 DIPF 102

### 7.2. Validation Results

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

Frequency	835MHz	1900MHz
Target value (1g)	9.5 W/Kg	38.1 W/Kg
250 mW input power	2.678 W/Kg (head) 2.694 W/Kg (body)	9.456 W/Kg (head) 9.574 W/Kg (body)
Test value (1g)	10.712 W/Kg (head) 10.776 W/Kg (body)	37.824 W/Kg (head) 38.296 W/Kg (body)

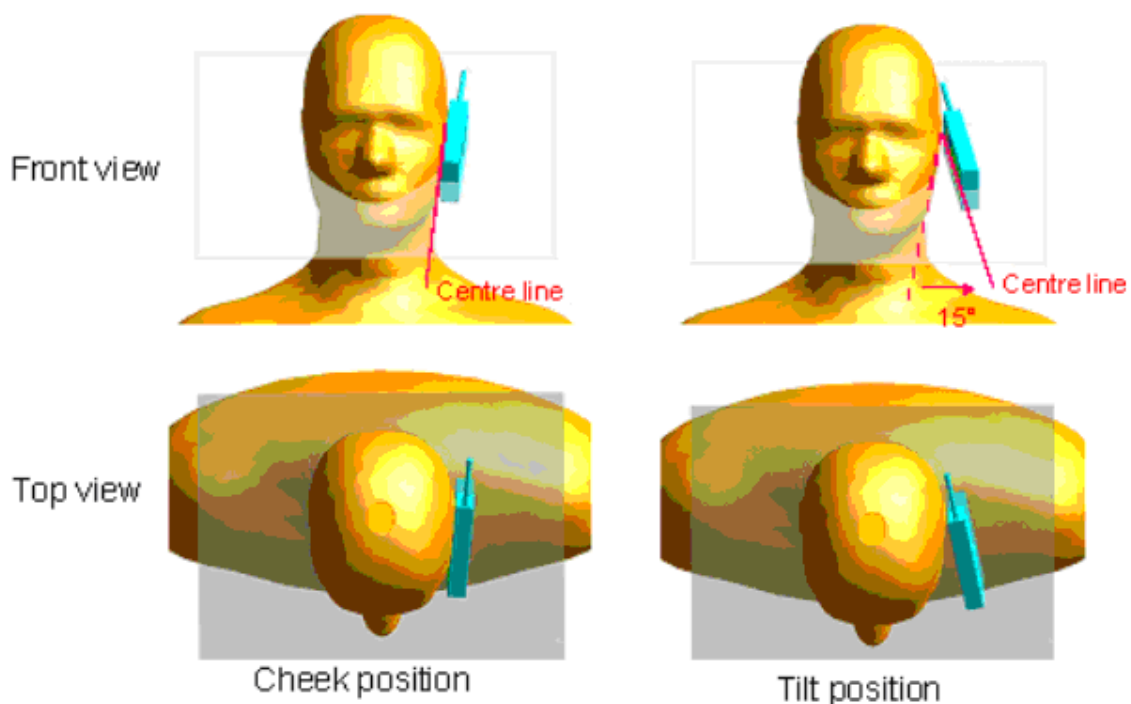
**Note:** System checks the specific test data please see page 69-76.

## 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.

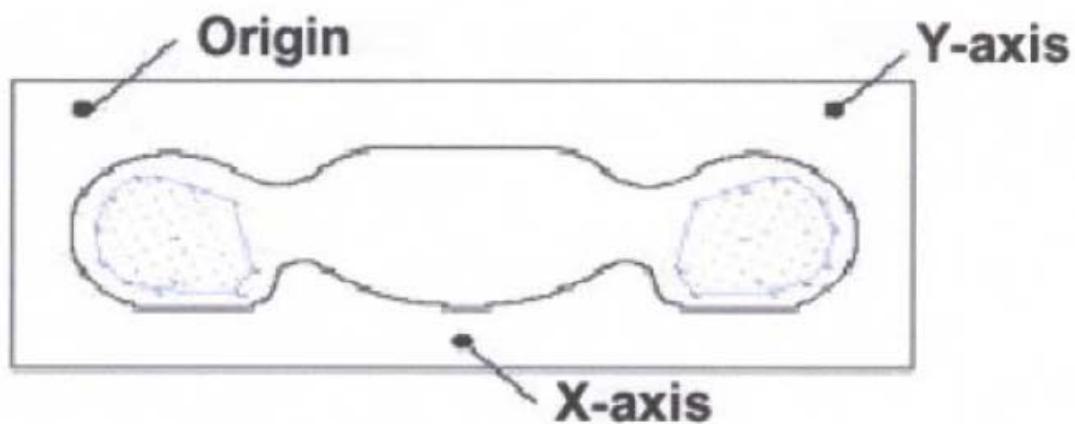
Remark: Please refer to Appendix B for the test setup photos.

### 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. Measurement Of Conducted Output Power

### GSM Mode

Band	Channel	Frequency (MHz)	Output Power
			(dBm)
GSM 850	128	824.2	31.80
	190	836.6	31.82
	251	848.8	31.66
PCS 1900	512	1850.2	28.88
	661	1880.0	28.26
	810	1909.8	29.11

### GPRS Mode

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	31.86	30.41	30.52	31.98
	190	836.6	31.82	30.39	30.35	31.89
	251	848.8	31.65	30.22	30.16	31.89
PCS 1900	512	1850.2	28.34	26.90	26.96	26.95
	661	1880.0	28.69	27.27	27.31	27.35
	810	1909.8	28.63	27.33	27.36	27.35

### GPRS Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	22.86	24.41	27.02	29.98
	190	836.6	22.82	24.39	26.85	29.89
	251	848.8	22.65	24.22	26.66	29.89
PCS 1900	512	1850.2	19.34	20.90	23.46	24.95
	661	1880.0	19.69	21.27	23.81	25.35
	810	1909.8	19.63	21.33	23.86	25.35

## 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, Frequency and Power		
			Channel 128	Channel 192	Channel 251
Left Side Of Head	Cheek/Touch	Internal	0.680	0.915	1.022
	Ear/Tilt	Internal	/	0.695	/
Right Side Of Head	Cheek/Touch	Internal	0.738	0.953	1.109
	Ear/Tilt	Internal	/	0.694	/
Body (GPRS)	Back upward	Internal	0.629	/	/
	Face Upward	Internal	0.421	/	/
Body (GSM)	Back upward	Internal	/	0.692	/
	Face Upward	Internal	/	0.443	/

### 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, Frequency and Power		
			Channel 512	Channel 810	Channel 810
Left Side Of Head	Cheek/Touch	Internal	/	/	0.553
	Ear/Tilt	Internal	/	/	0.485
Right Side Of Head	Cheek/Touch	Internal	/	/	0.368
	Ear/Tilt	Internal	/	/	0.415
Body (GPRS)	Back upward	Internal	/	/	0.371
	Face Upward	Internal	/	/	0.153
Body (GSM)	Back upward	Internal	/	/	0.429
	Face Upward	Internal	/	/	0.182

**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.

## Annex A Accreditation Certificate






**China National Accreditation Service for Conformity Assessment**

**LABORATORY ACCREDITATION CERTIFICATE**

**(No. CNAS L3572 )**

*China National Accreditation Service for Conformity Assessment has accredited*

**Morlab Laboratory Shenzhen Morlab Communications  
Technology Co., Ltd.**

3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District,  
Shenzhen, Guangdong, China

*to ISO/IEC 17025:2005 General Requirements for the Competence of  
Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria  
for the Competence of Testing and Calibration Laboratories) for the  
competence in the field of testing and/or calibration.*

*The scope of accreditation is detailed in the attached schedule bearing the same  
accreditation number as above. The schedule forms an integral part of this  
certificate.*

Date of Issue: 2008-07-01

Date of Expiry: 2011-06-30

Date of Initial Accreditation: 2008-07-01



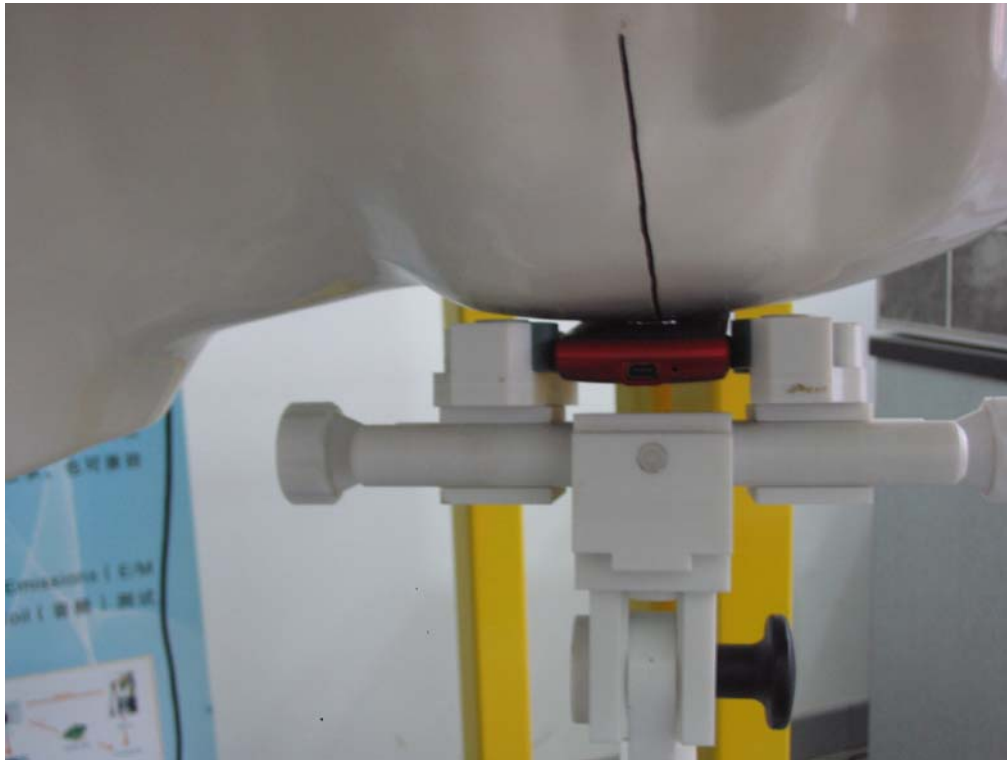
Signed on behalf of China National Accreditation Service  
for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CACA) to operate the national accreditation systems for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC-MRA), and the signatory to Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC-MRA).

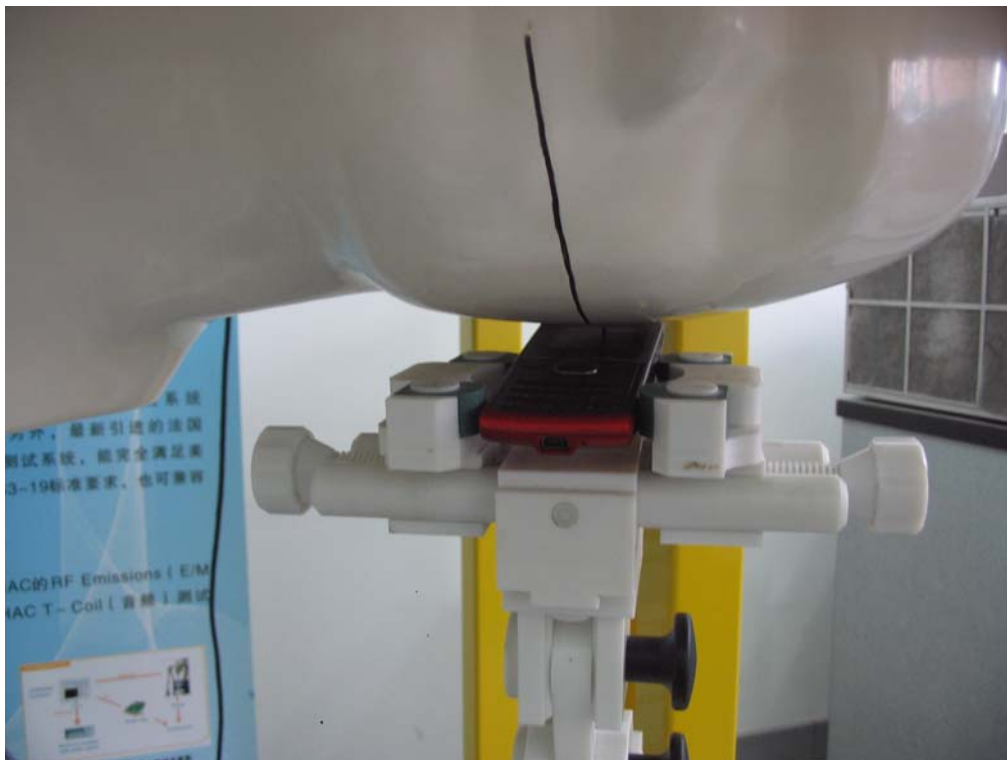


## Annex B EUT Setup Photos

### 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



## 6 With Headphone



Liquid Level Photo



## Annex C Graph Test Results

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

# 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: 21/6/2011

Measurement duration: 7 minutes 35 seconds

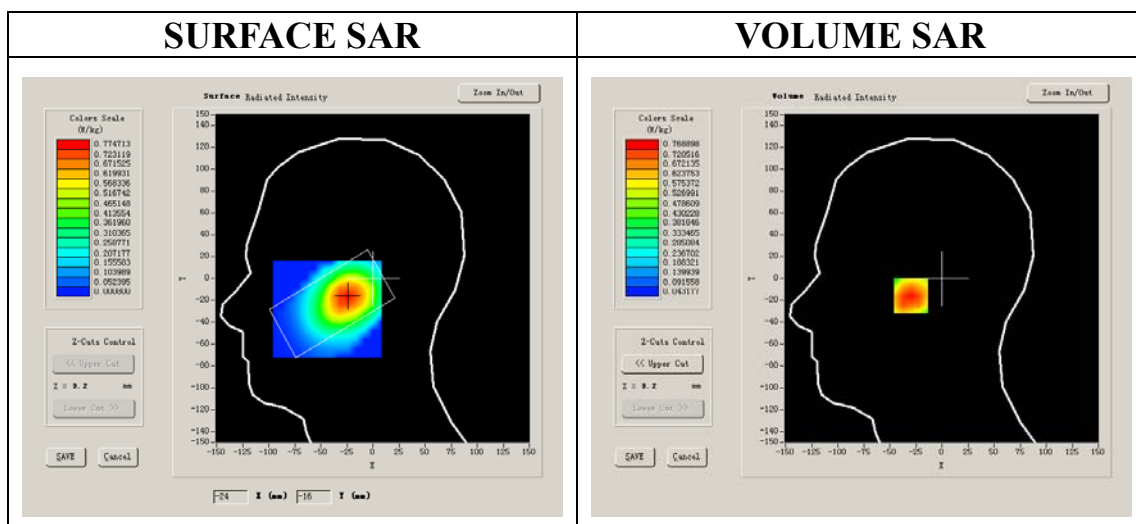
## A. Experimental conditions.

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

## B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	41.790001
Relative permittivity	18.926250
Conductivity (S/m)	0.866612
Power drift (%)	-3.100000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

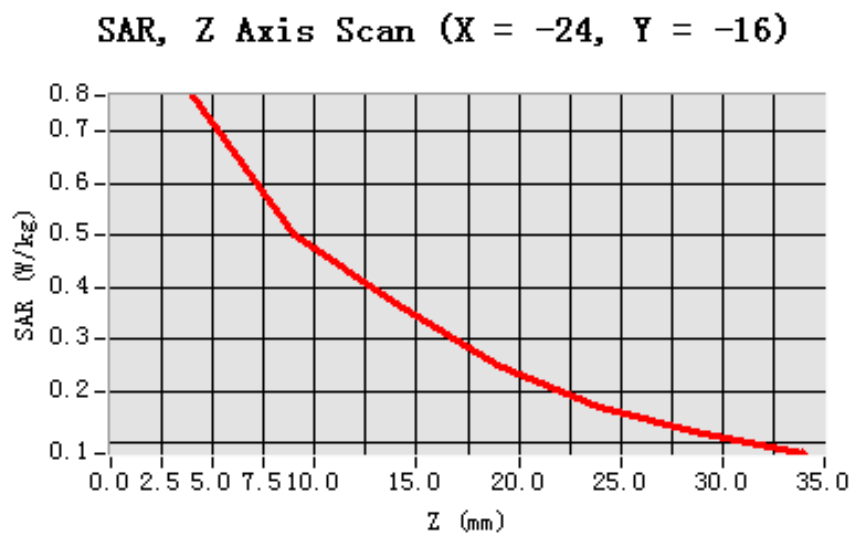


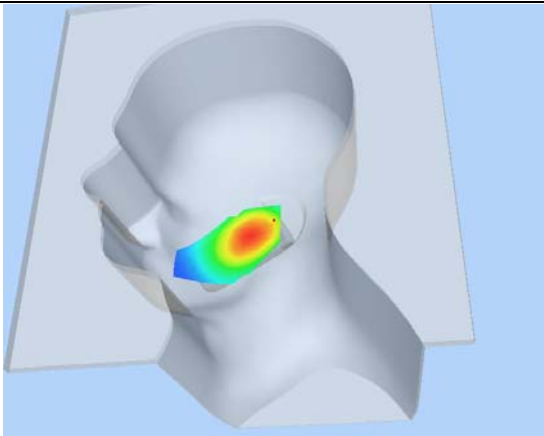
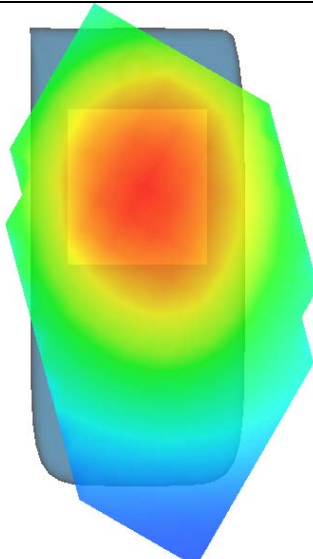
**Maximum location: X=-24.00, Y=-16.00**

<b>SAR 10g (W/Kg)</b>	0.479041
<b>SAR 1g (W/Kg)</b>	0.738083

### **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>0.7689</b>	<b>0.4993</b>	<b>0.3697</b>	<b>0.2515</b>	<b>0.1699</b>	<b>0.1175</b>



<b>3D scene shot</b>	<b>Hot spot position</b>
	

## 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: 21/6/2011

Measurement duration: 7 minutes 36 seconds

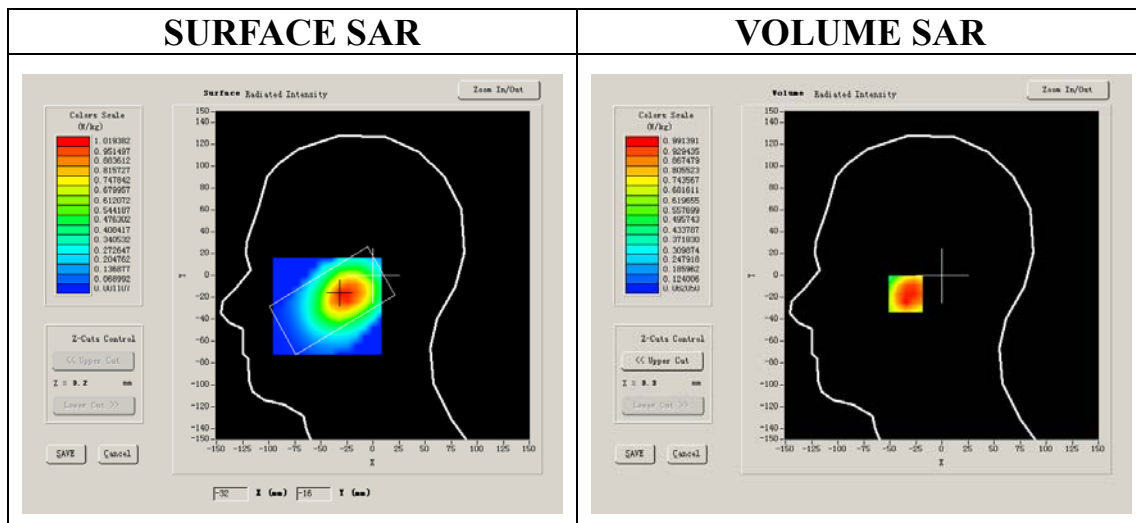
### A. Experimental conditions.

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

### B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001
Conductivity (S/m)	0.888655
Power drift (%)	-3.990000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



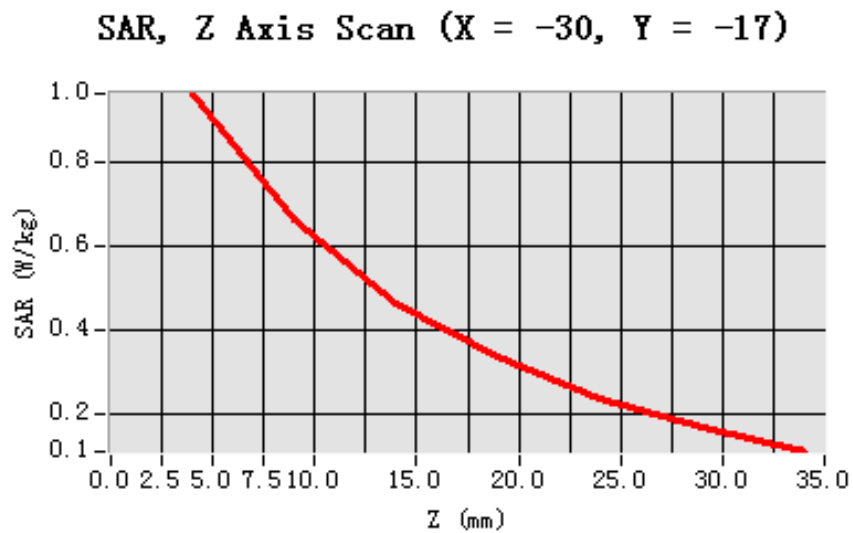


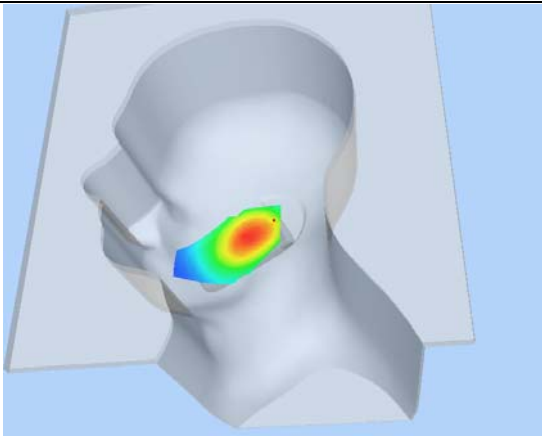
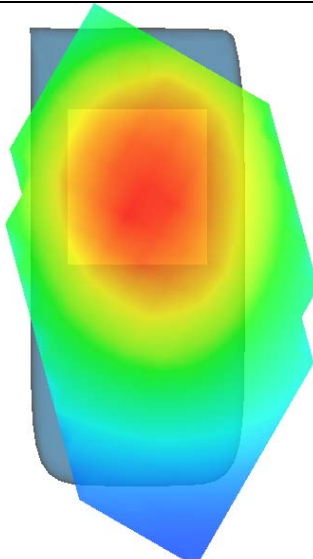
**Maximum location: X=-30.00, Y=-17.00**

<b>SAR 10g (W/Kg)</b>	0.621786
<b>SAR 1g (W/Kg)</b>	0.953094

### **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>0.9657</b>	<b>0.6622</b>	<b>0.4633</b>	<b>0.3394</b>	<b>0.2345</b>	<b>0.1675</b>



<b>3D scene shot</b>	<b>Hot spot position</b>
	



## 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: 21/6/2011

Measurement duration: 7 minutes 28 seconds

### A. Experimental conditions.

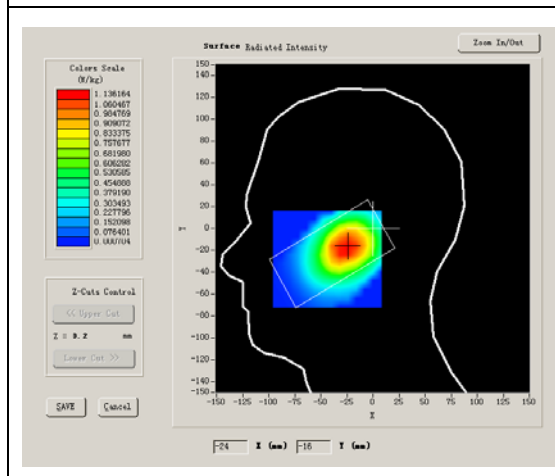
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	High
Signal	GSM

### B. SAR Measurement Results

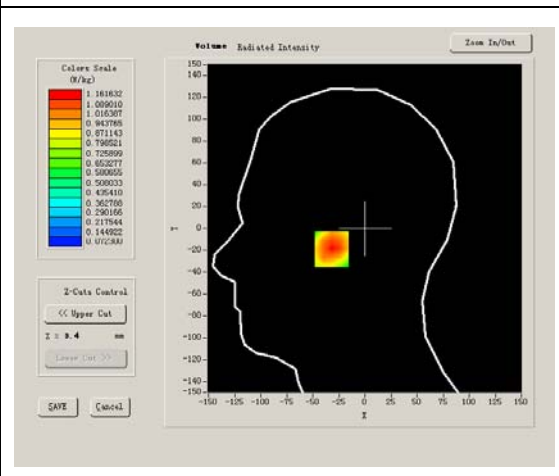
High Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	41.675999
Relative permittivity	18.967199
Conductivity (S/m)	0.894409
Power drift (%)	0.080000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

#### SURFACE SAR



#### VOLUME SAR



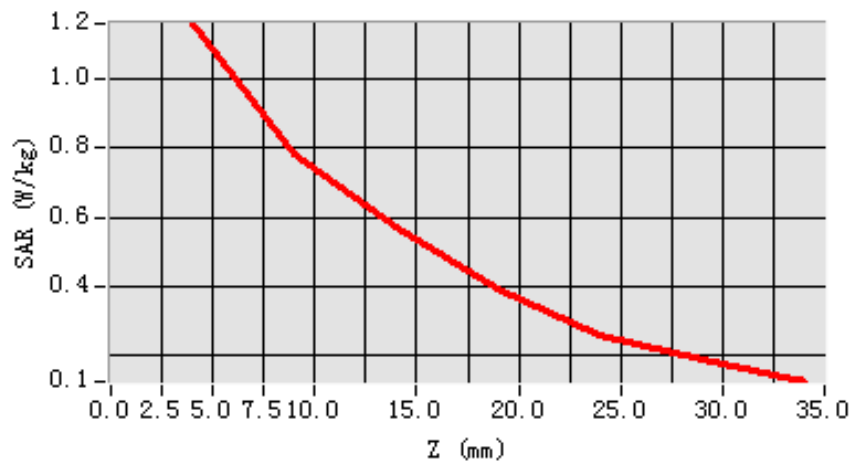
**Maximum location: X=-26.00, Y=-19.00**

<b>SAR 10g (W/Kg)</b>	0.725400
<b>SAR 1g (W/Kg)</b>	1.108511

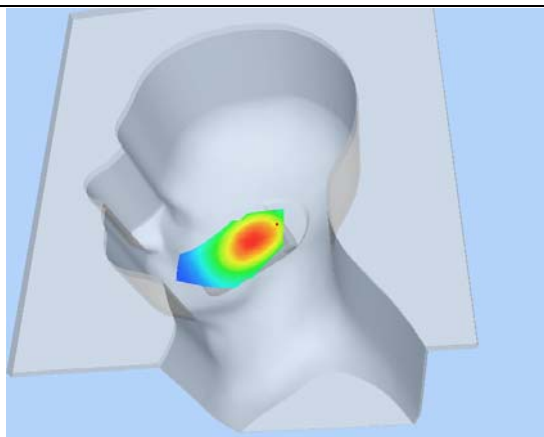
### **Z Axis Scan**

<b>Z (mm)</b>	<b>0.00</b>	<b>4.00</b>	<b>9.00</b>	<b>14.00</b>	<b>19.00</b>	<b>24.00</b>	<b>29.00</b>
<b>SAR (W/Kg)</b>	<b>0.0000</b>	<b>1.1616</b>	<b>0.7852</b>	<b>0.5747</b>	<b>0.3922</b>	<b>0.2614</b>	<b>0.1871</b>

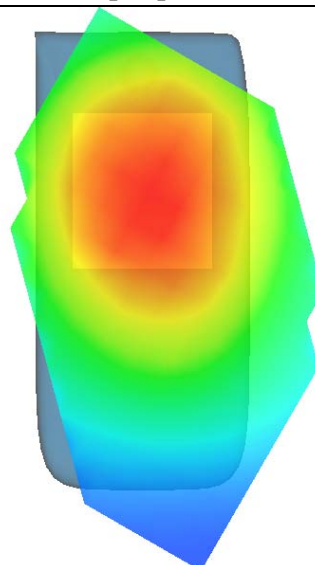
**SAR, Z Axis Scan (X = -26, Y = -19)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 4

Type: Phone measurement (Complete)

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

Zoom scan resolution:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ 

Date of measurement: 21/6/2011

Measurement duration: 7 minutes 28 seconds

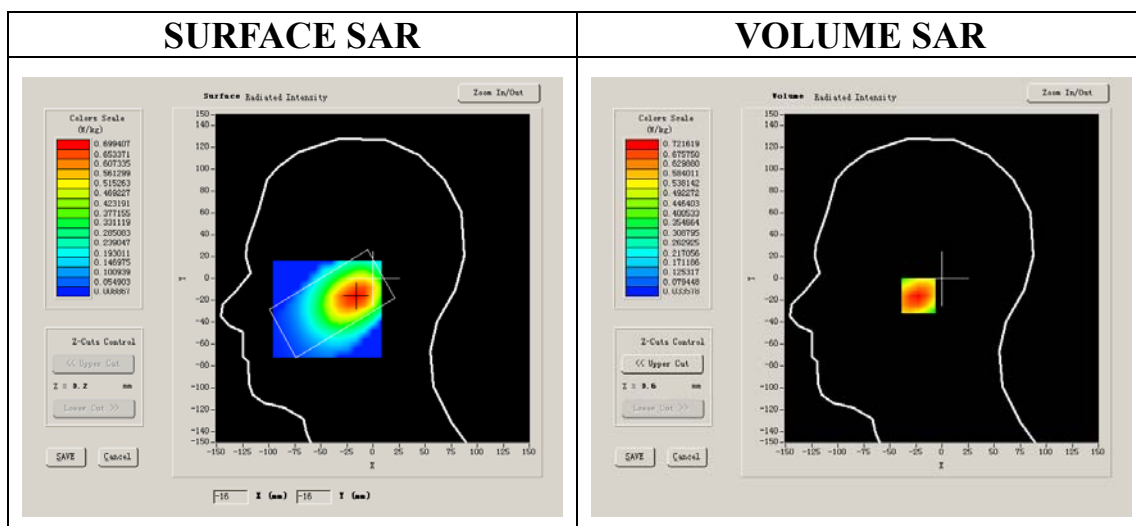
### **A. Experimental conditions.**

<b>Phantom File</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Right head
<b>Device Position</b>	Tilt
<b>Band</b>	GSM850
<b>Channels</b>	Middle
<b>Signal</b>	GSM

## SAR Measurement Results

**Middle Band SAR (Channel 190):**

<b>Frequency (MHz)</b>	836.599976
<b>Relative permittivity (real part)</b>	40.669998
<b>Relative permittivity</b>	19.120001
<b>Conductivity (S/m)</b>	0.888655
<b>Power drift (%)</b>	1.570000
<b>Ambient Temperature:</b>	22.2°C
<b>Liquid Temperature:</b>	21.5C
<b>ConvF:</b>	28.479,25.214,27.196
<b>Crest factor:</b>	1:8

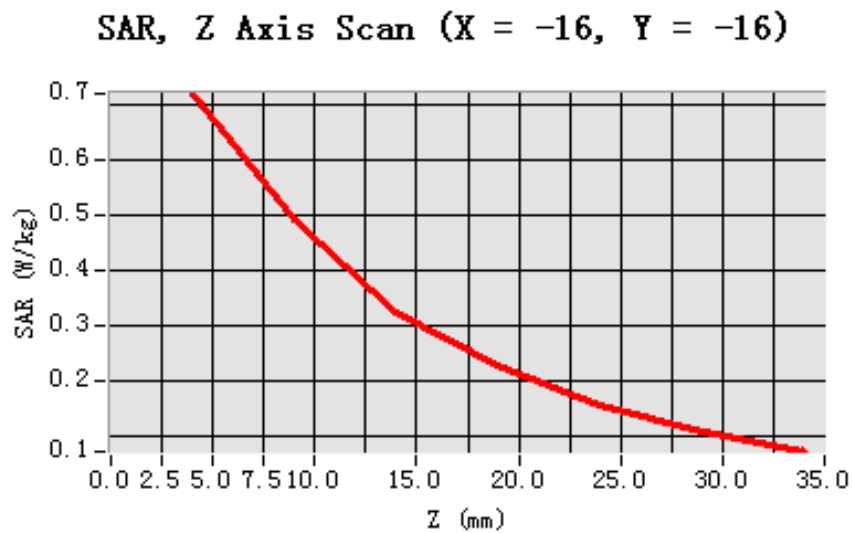


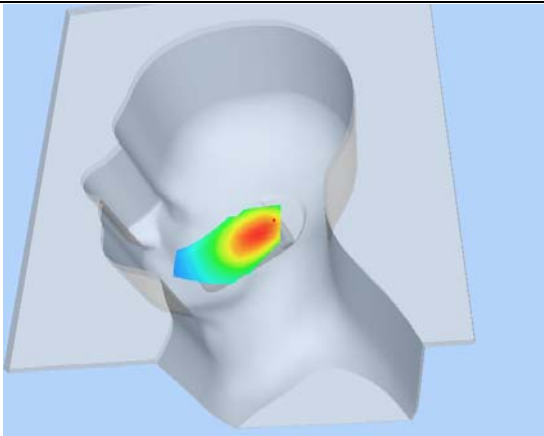
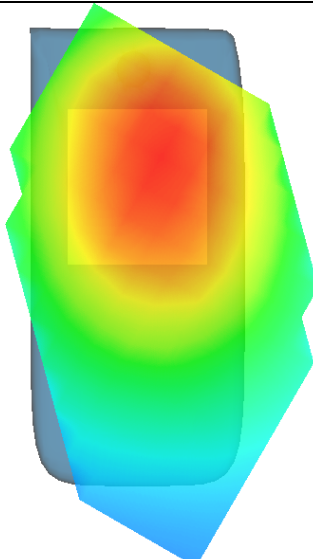
**Maximum location: X=-16.00, Y=-16.00**

<b>SAR 10g (W/Kg)</b>	0.451891
<b>SAR 1g (W/Kg)</b>	0.693979

### **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>0.7216</b>	<b>0.4932</b>	<b>0.3260</b>	<b>0.2288</b>	<b>0.1582</b>	<b>0.1098</b>



<b>3D scene shot</b>	<b>Hot spot position</b>
	

## 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: 21/6/2011

Measurement duration: 7 minutes 33 seconds

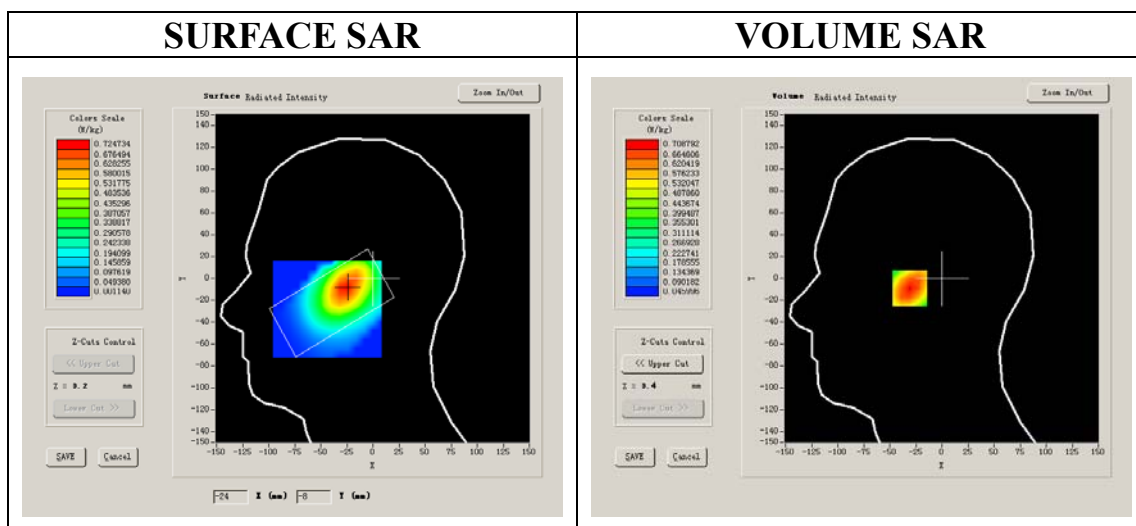
### A. Experimental conditions.

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

### B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	41.790001
Relative permittivity	18.926250
Conductivity (S/m)	0.866612
Power drift (%)	-1.660000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



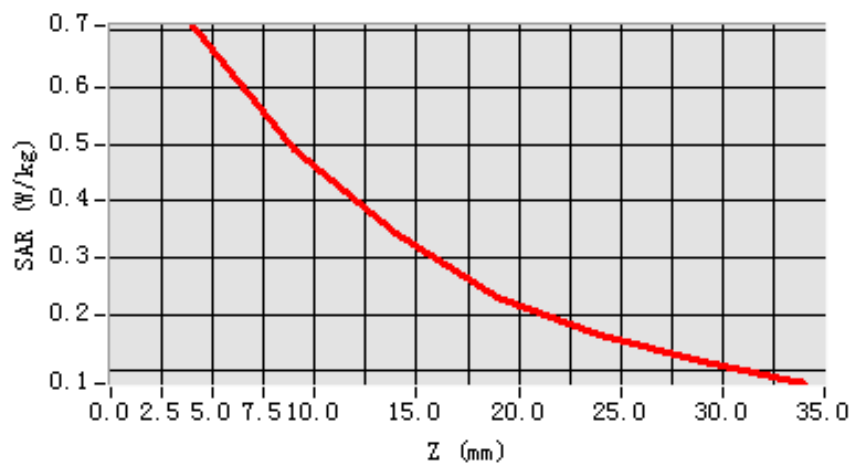
**Maximum location: X=-26.00, Y=-9.00**

<b>SAR 10g (W/Kg)</b>	0.446728
<b>SAR 1g (W/Kg)</b>	0.680002

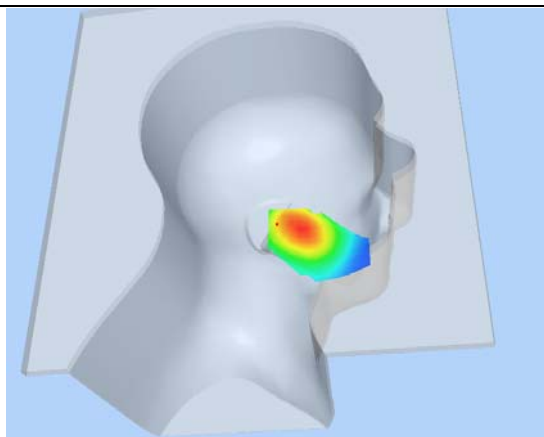
### **Z Axis Scan**

<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>0.7088</b>	<b>0.4901</b>	<b>0.3410</b>	<b>0.2310</b>	<b>0.1634</b>	<b>0.1149</b>

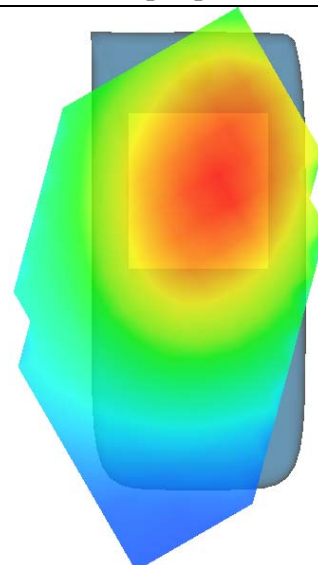
**SAR, Z Axis Scan (X = -26, Y = -9)**



**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: 21/6/2011

Measurement duration: 7 minutes 31 seconds

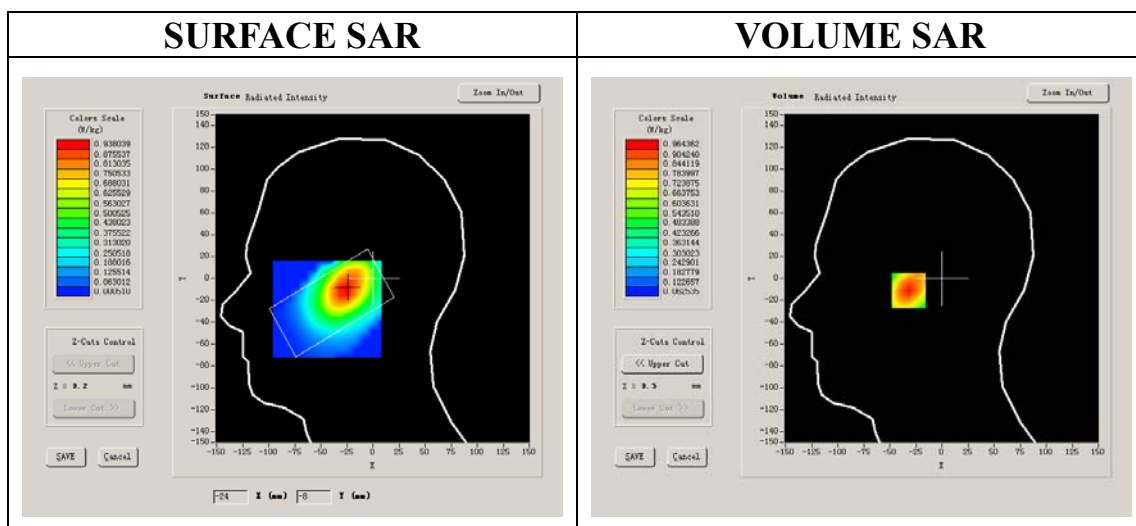
### A. Experimental conditions.

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

### B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001
Conductivity (S/m)	0.888655
Power drift (%)	0.120000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8

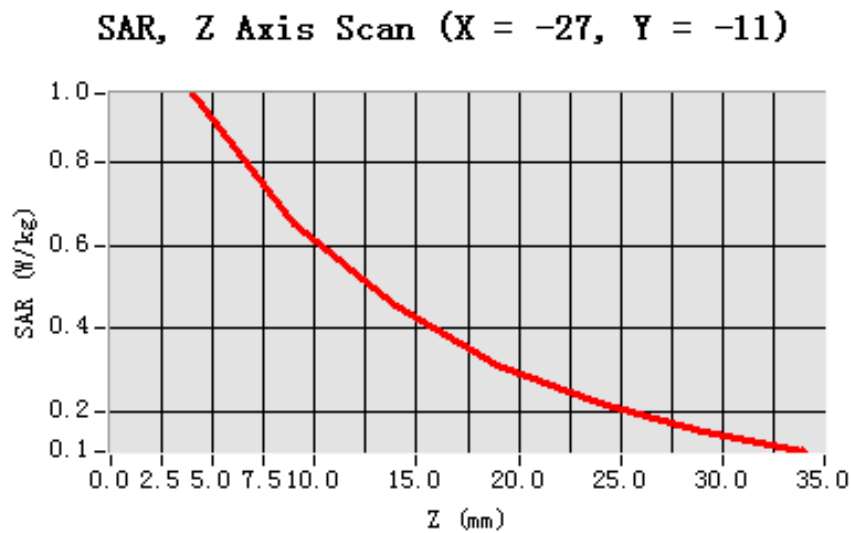


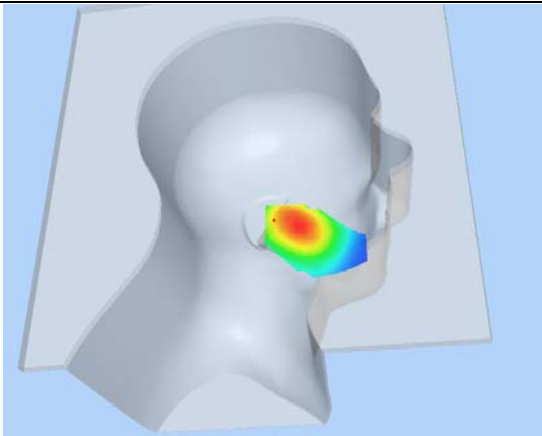
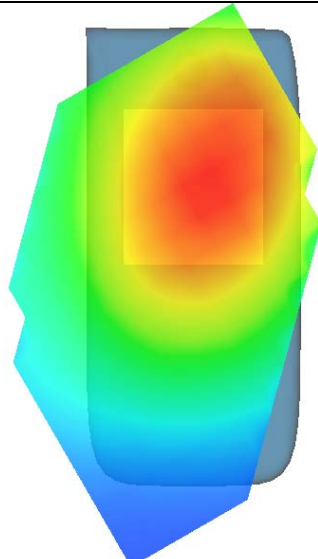
**Maximum location: X=-27.00, Y=-11.00**

<b>SAR 10g (W/Kg)</b>	0.592583
<b>SAR 1g (W/Kg)</b>	0.915450

### **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>0.9644</b>	<b>0.6494</b>	<b>0.4513</b>	<b>0.3125</b>	<b>0.2183</b>	<b>0.1494</b>



<b>3D scene shot</b>	<b>Hot spot position</b>
	



## 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: 21/6/2011

Measurement duration: 7 minutes 34 seconds

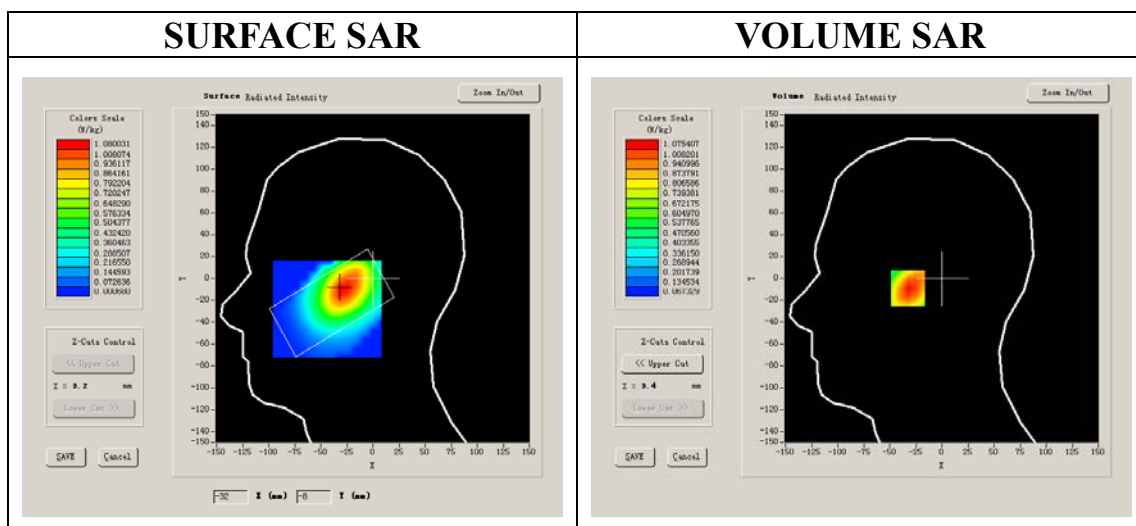
### A. Experimental conditions.

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

### B. SAR Measurement Results

High 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 (%)	-1.720000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



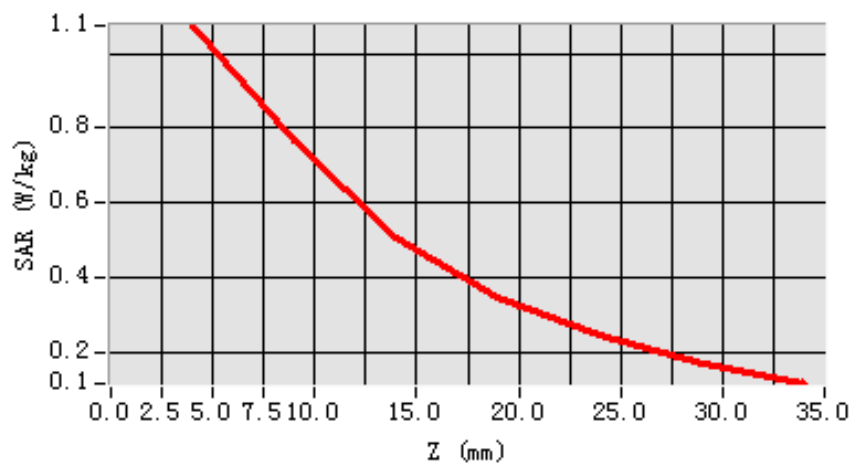
**Maximum location: X=-29.00, Y=-9.00**

<b>SAR 10g (W/Kg)</b>	0.670336
<b>SAR 1g (W/Kg)</b>	1.021852

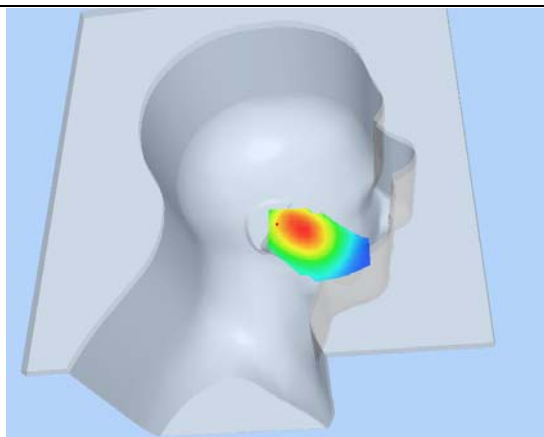
### **Z Axis Scan**

<b>Z (mm)</b>	<b>0.00</b>	<b>4.00</b>	<b>9.00</b>	<b>14.00</b>	<b>19.00</b>	<b>24.00</b>	<b>29.00</b>
<b>SAR (W/Kg)</b>	<b>0.0000</b>	<b>1.0754</b>	<b>0.7648</b>	<b>0.5045</b>	<b>0.3474</b>	<b>0.2474</b>	<b>0.1690</b>

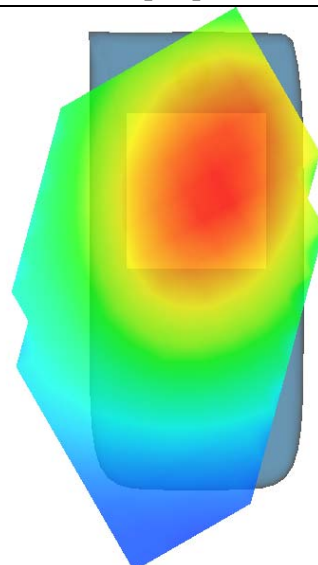
**SAR, Z Axis Scan (X = -29, Y = -9)**



**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: 21/6/2011

Measurement duration: 7 minutes 28 seconds

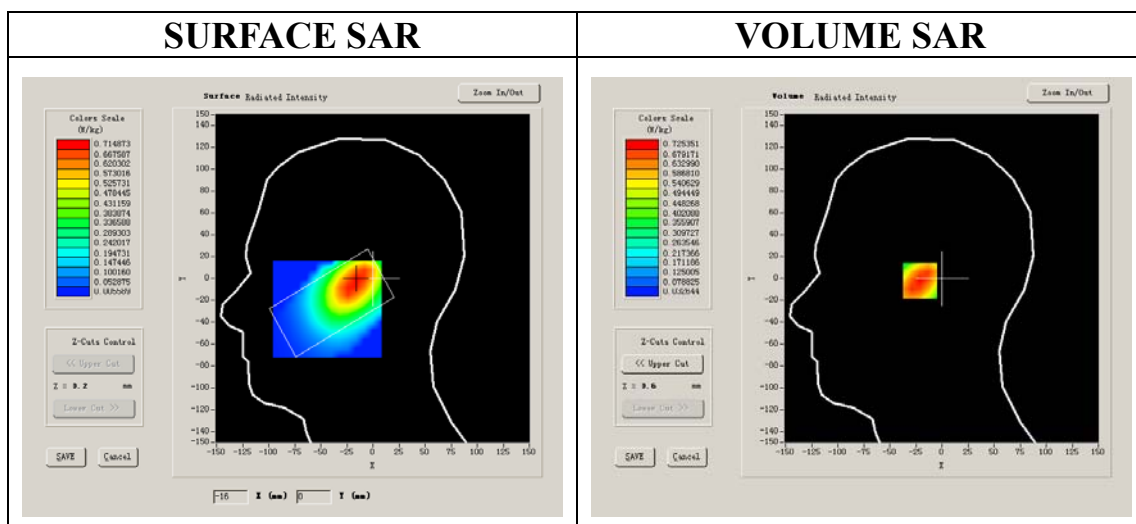
### A. Experimental conditions.

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

### B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001
Conductivity (S/m)	0.888655
Power drift (%)	-1.080000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



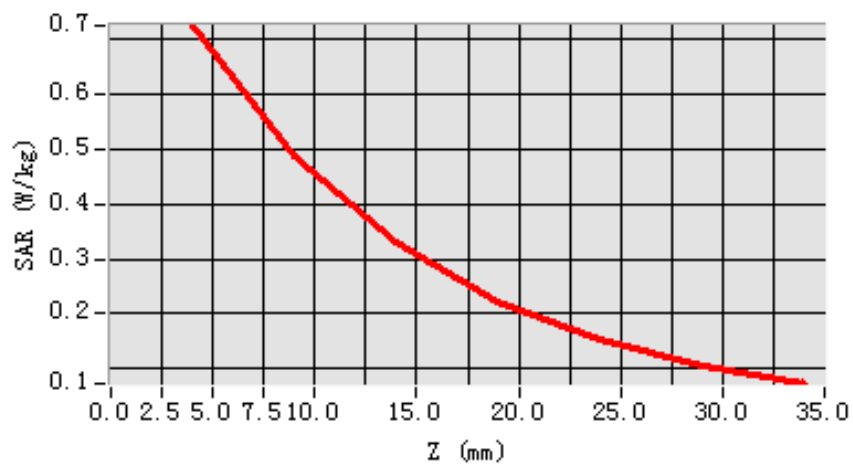
**Maximum location: X=-16.00, Y=-2.00**

<b>SAR 10g (W/Kg)</b>	0.455295
<b>SAR 1g (W/Kg)</b>	0.695408

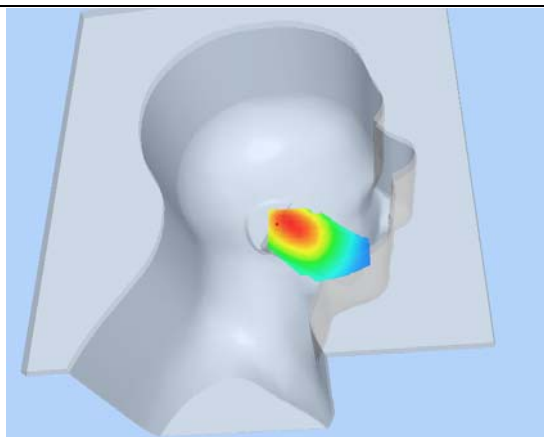
### **Z Axis Scan**

<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>0.7254</b>	<b>0.4887</b>	<b>0.3287</b>	<b>0.2237</b>	<b>0.1537</b>	<b>0.1066</b>

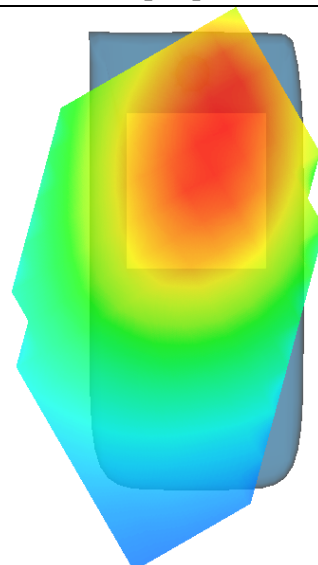
**SAR, Z Axis Scan (X = -16, Y = -2)**



**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: 21/6/2011

Measurement duration: 9 minutes 6 seconds

### A. Experimental conditions.

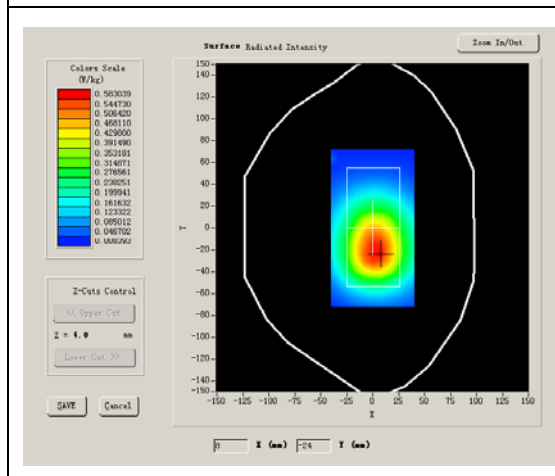
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GPRS

### B. SAR Measurement Results

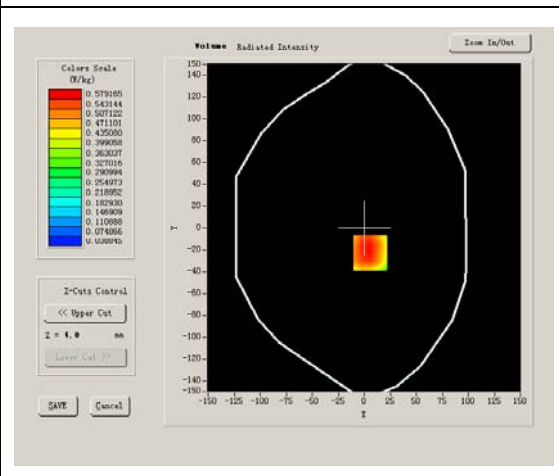
Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550
Conductivity (S/m)	0.974596
Power drift (%)	-2.420000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



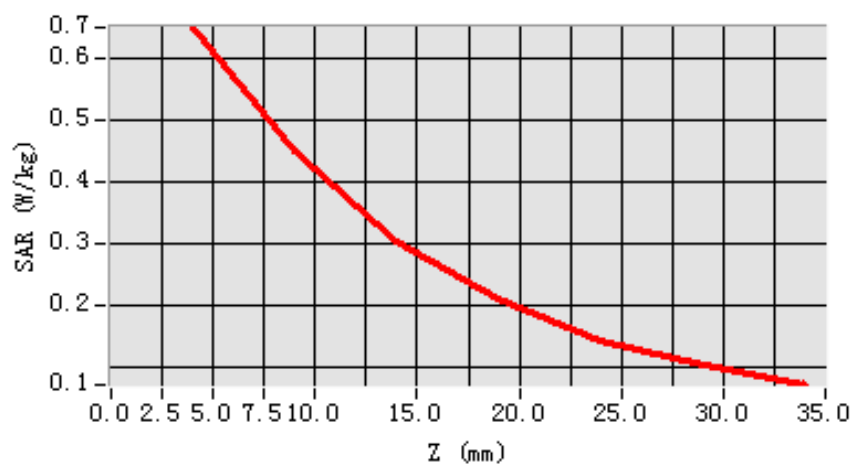
**Maximum location: X=1.00, Y=-24.00**

<b>SAR 10g (W/Kg)</b>	0.462987
<b>SAR 1g (W/Kg)</b>	0.691528

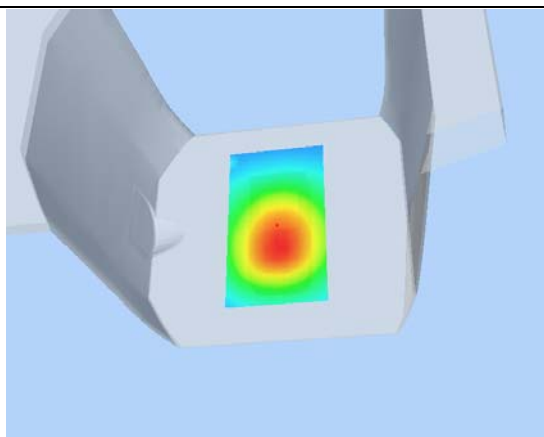
### **Z Axis Scan**

<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>0.6514</b>	<b>0.4507</b>	<b>0.3056</b>	<b>0.2116</b>	<b>0.1454</b>	<b>0.1041</b>

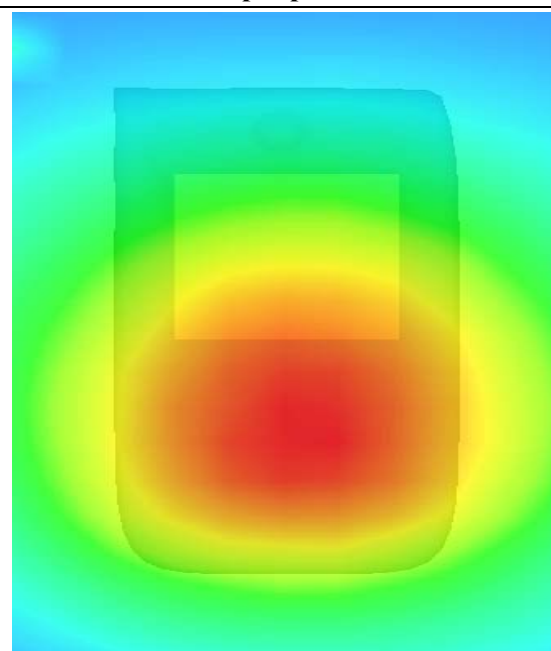
**SAR, Z Axis Scan (X = 6, Y = -23)**



**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: 21/6/2011

Measurement duration: 9 minutes 5 seconds

### A. Experimental conditions.

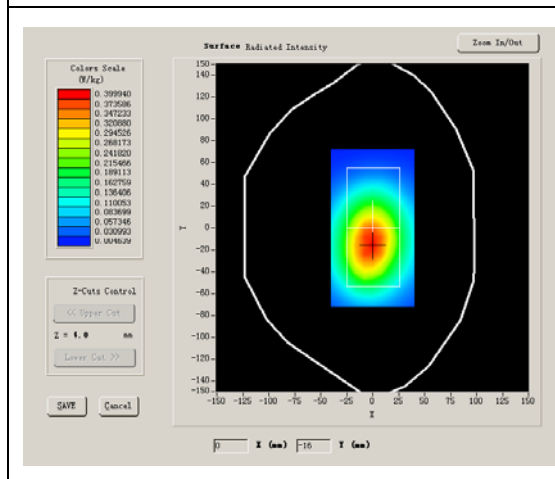
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GPRS

### B. SAR Measurement Results

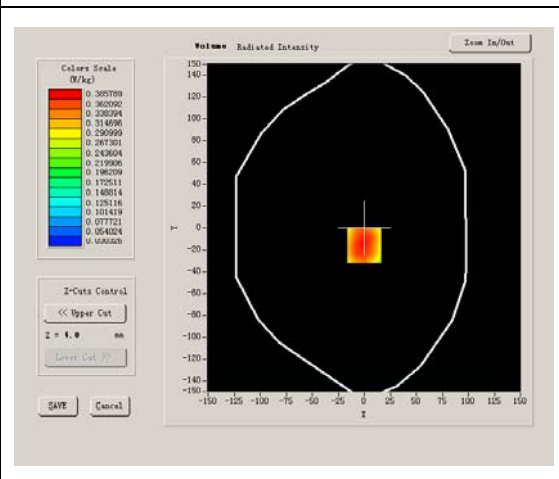
Low Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550
Conductivity (S/m)	0.974596
Power drift (%)	-1.580000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



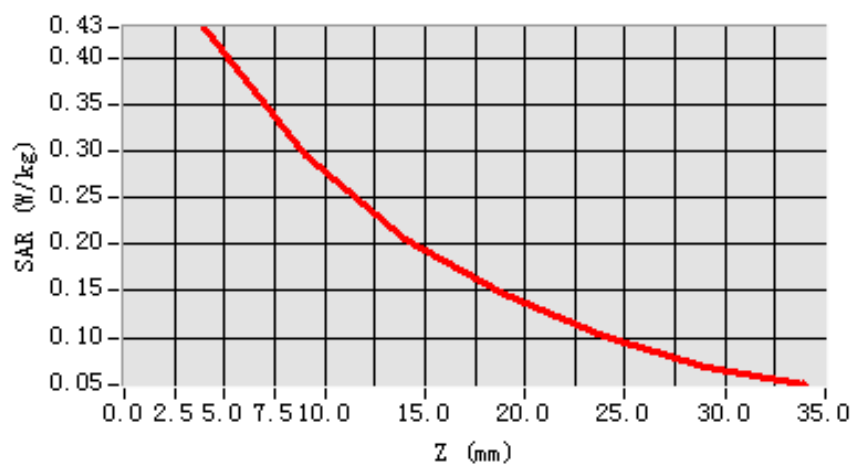
**Maximum location: X=-1.00, Y=-16.00**

<b>SAR 10g (W/Kg)</b>	0.281606
<b>SAR 1g (W/Kg)</b>	0.421231

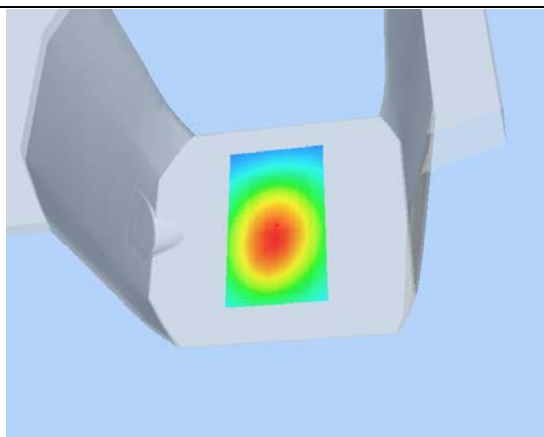
### **Z Axis Scan**

<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>0.4339</b>	<b>0.2953</b>	<b>0.2063</b>	<b>0.1459</b>	<b>0.1022</b>	<b>0.0675</b>

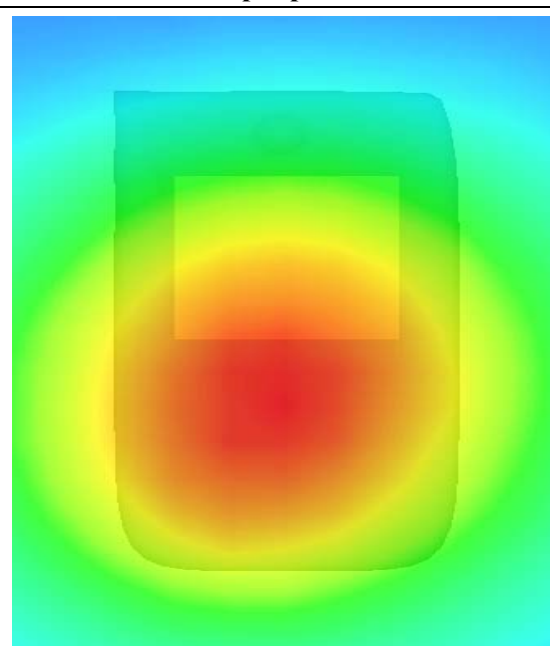
**SAR, Z Axis Scan (X = 0, Y = -16)**



**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: 21/6/2011

Measurement duration: 9 minutes 9 seconds

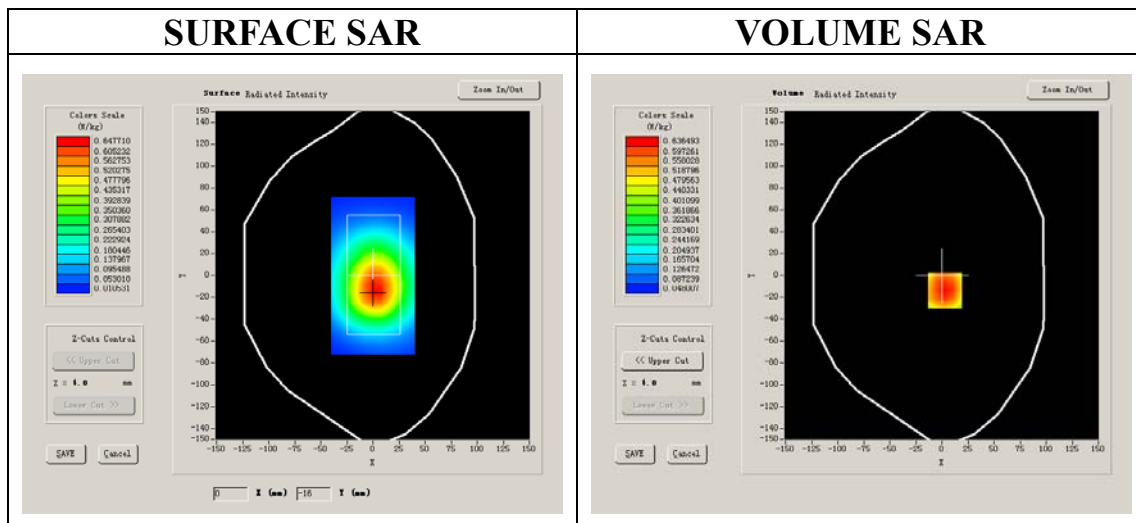
### A. Experimental conditions.

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

### B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	54.014999
Relative permittivity	21.332850
Conductivity (S/m)	1.005962
Power drift (%)	-0.220000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



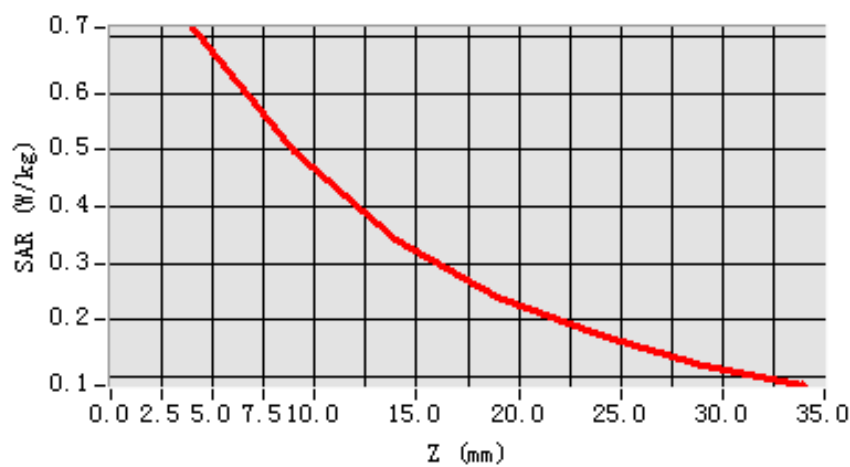
**Maximum location: X=3.00, Y=-14.00**

<b>SAR 10g (W/Kg)</b>	0.462987
<b>SAR 1g (W/Kg)</b>	0.691528

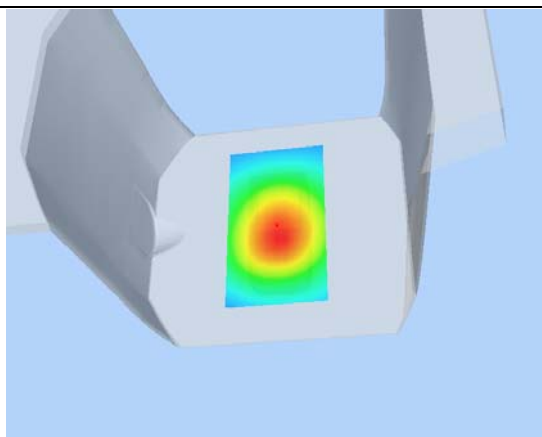
### **Z Axis Scan**

<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>0.7159</b>	<b>0.4955</b>	<b>0.3415</b>	<b>0.2407</b>	<b>0.1739</b>	<b>0.1182</b>

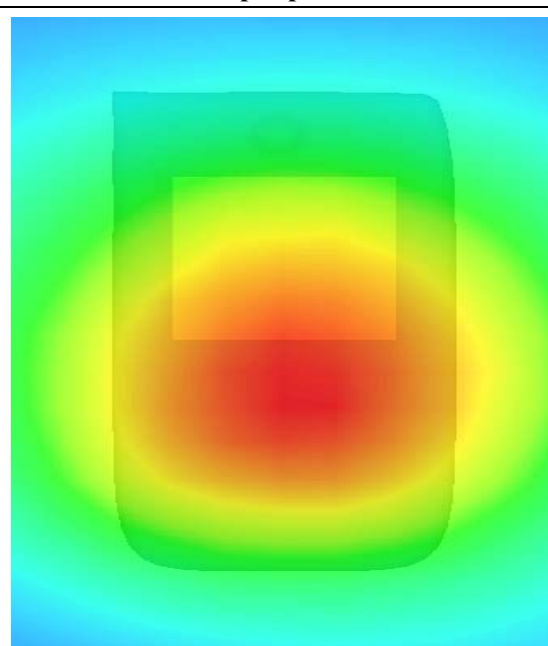
**SAR, Z Axis Scan (X = 3, Y = -14)**



**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: 21/6/2011

Measurement duration: 9 minutes 11 seconds

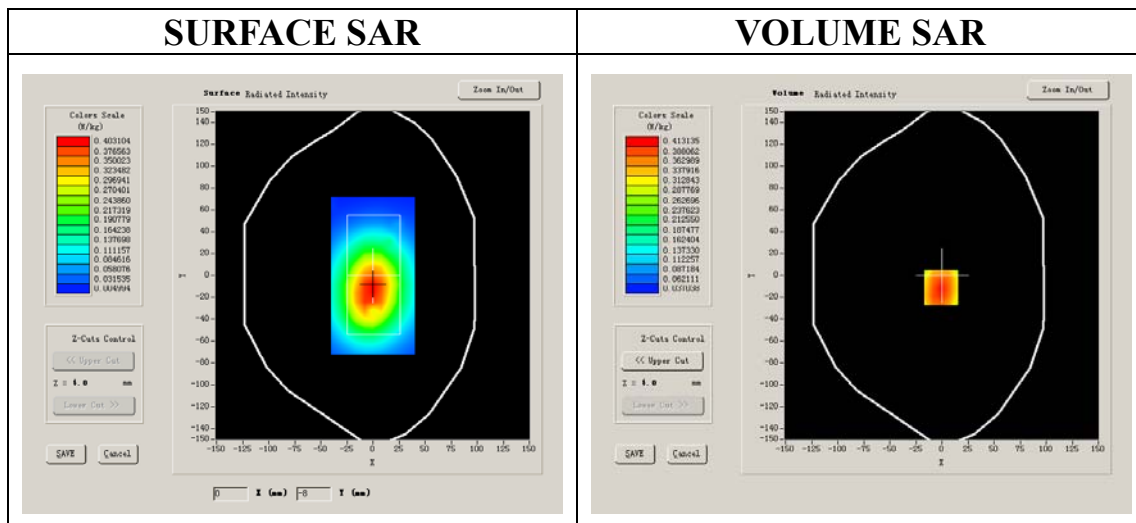
### A. Experimental conditions.

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

### B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	54.014999
Relative permittivity	21.332850
Conductivity (S/m)	1.005962
Power drift (%)	0.430000
Ambient Temperature:	22.2°C
Liquid Temperature:	21.5C
ConvF:	28.479,25.214,27.196
Crest factor:	1:8



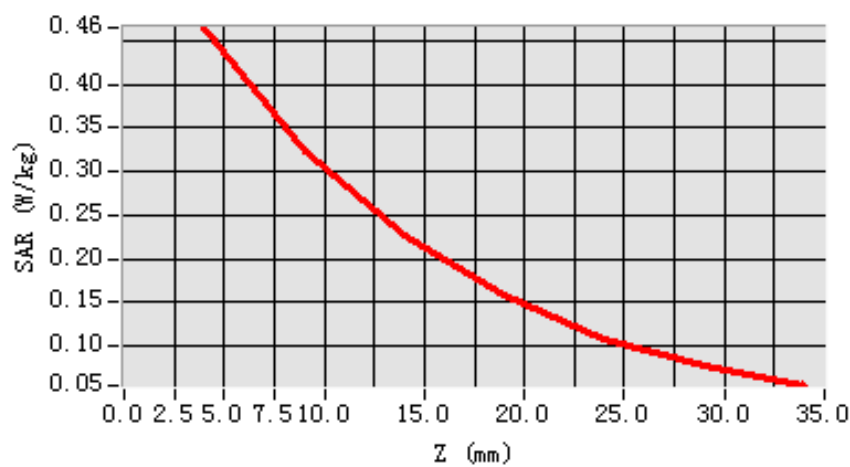
**Maximum location: X=-1.00, Y=-11.00**

<b>SAR 10g (W/Kg)</b>	0.298577
<b>SAR 1g (W/Kg)</b>	0.443469

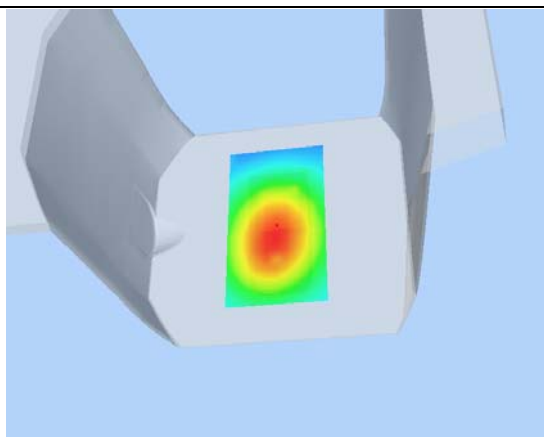
### **Z Axis Scan**

<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>0.4647</b>	<b>0.3228</b>	<b>0.2267</b>	<b>0.1576</b>	<b>0.1088</b>	<b>0.0767</b>

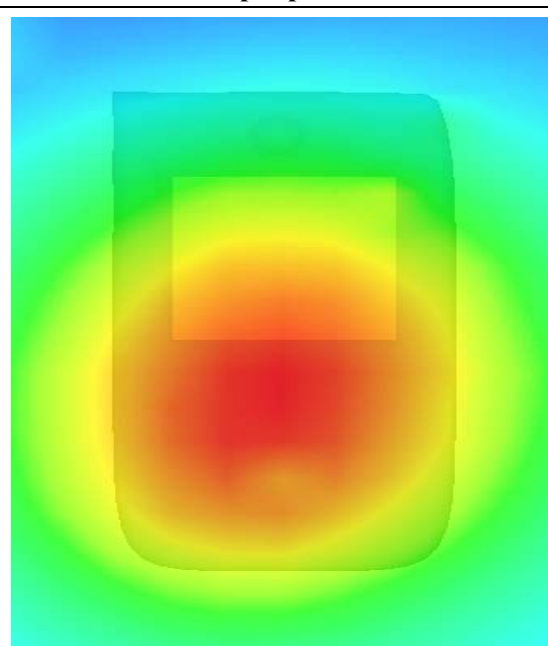
**SAR, Z Axis Scan (X = -1, Y = -11)**



**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: 21/6/2011

Measurement duration: 7 minutes 27 seconds

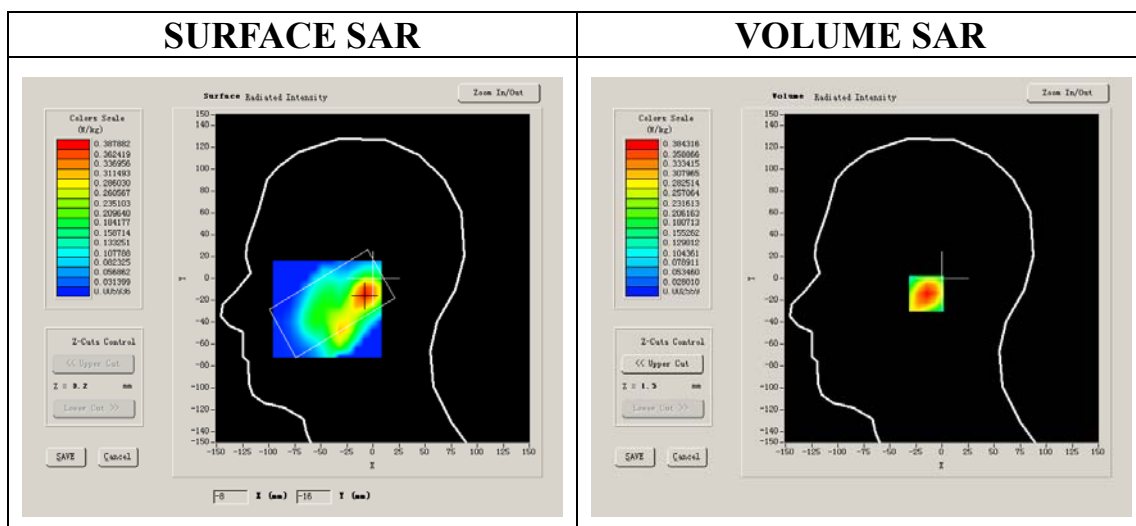
### A. Experimental conditions.

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

### B. SAR Measurement Results

High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-0.020000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



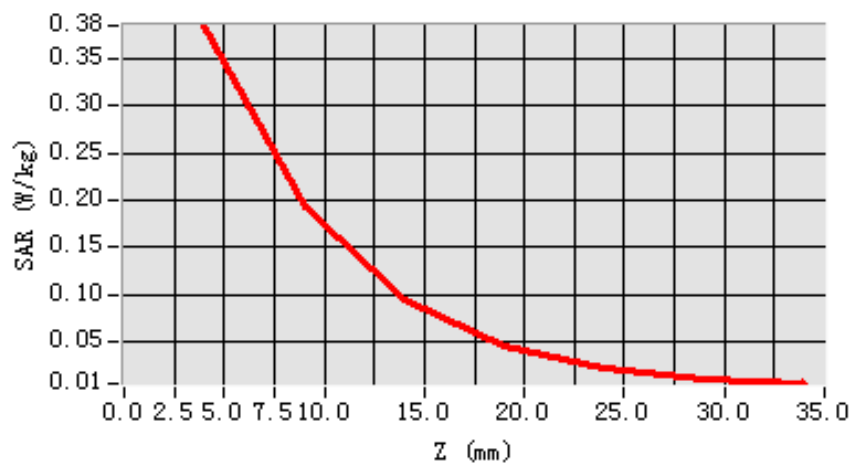
**Maximum location: X=-7.00, Y=-14.00**

<b>SAR 10g (W/Kg)</b>	0.190434
<b>SAR 1g (W/Kg)</b>	0.367671

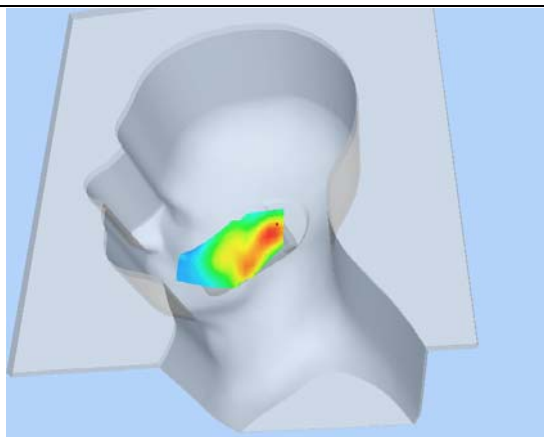
### **Z Axis Scan**

<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>0.3843</b>	<b>0.1940</b>	<b>0.0952</b>	<b>0.0473</b>	<b>0.0225</b>	<b>0.0113</b>

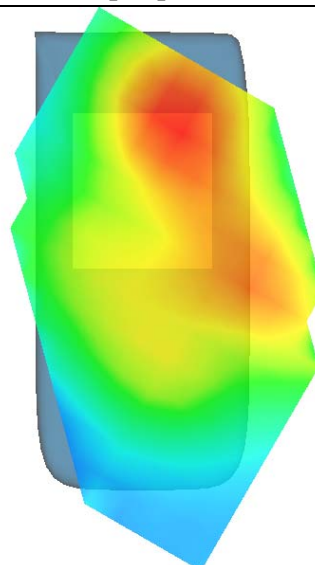
**SAR, Z Axis Scan (X = -7, Y = -14)**



**3D scene shot**



**Hot spot position**



## MEASUREMENT 14

Type: Phone measurement (Complete)

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

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

Date of measurement: 21/6/2011

Measurement duration: 7 minutes 27 seconds

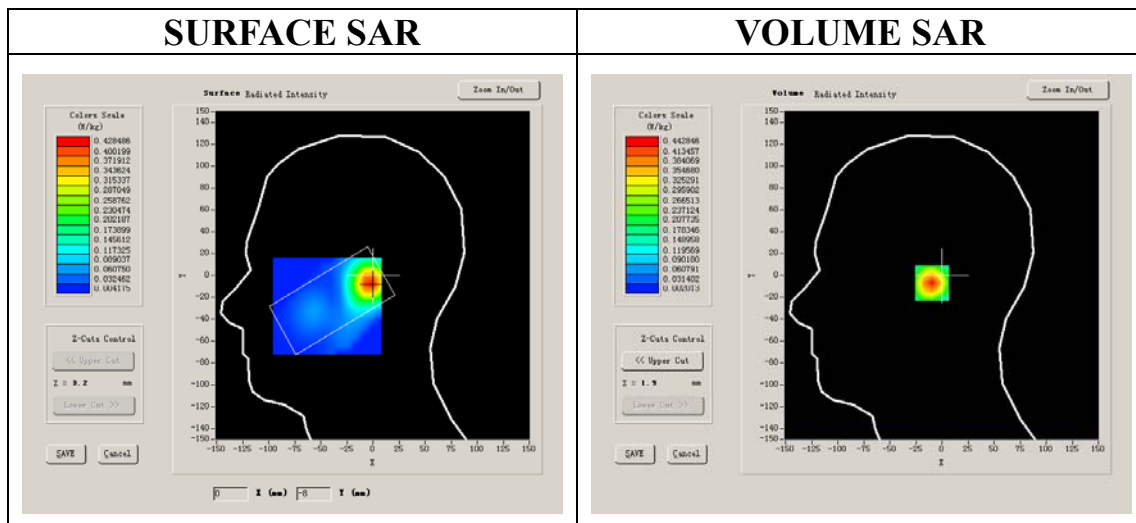
### A. Experimental conditions.

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

### B. SAR Measurement Results

High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-0.620000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



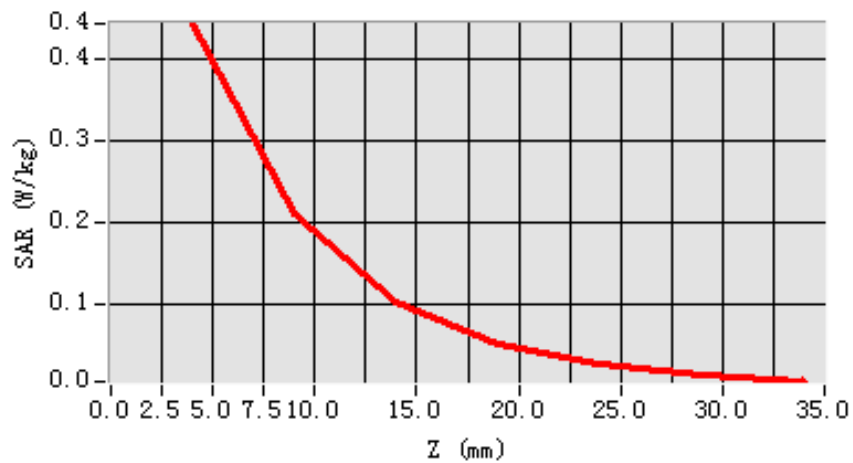
**Maximum location: X=-2.00, Y=-7.00**

<b>SAR 10g (W/Kg)</b>	0.205477
<b>SAR 1g (W/Kg)</b>	0.414674

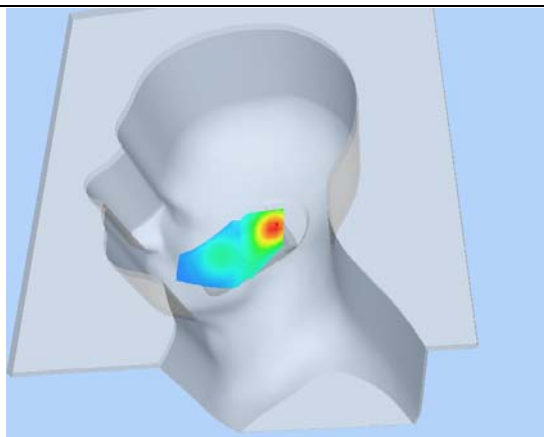
### Z Axis Scan

<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>0.4428</b>	<b>0.2096</b>	<b>0.1026</b>	<b>0.0529</b>	<b>0.0263</b>	<b>0.0136</b>

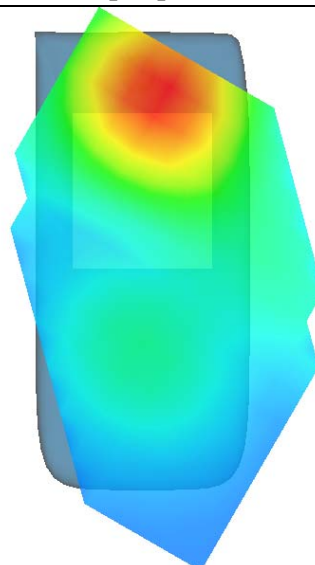
**SAR, Z Axis Scan (X = -2, Y = -7)**



**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: 21/6/2011

Measurement duration: 7 minutes 26 seconds

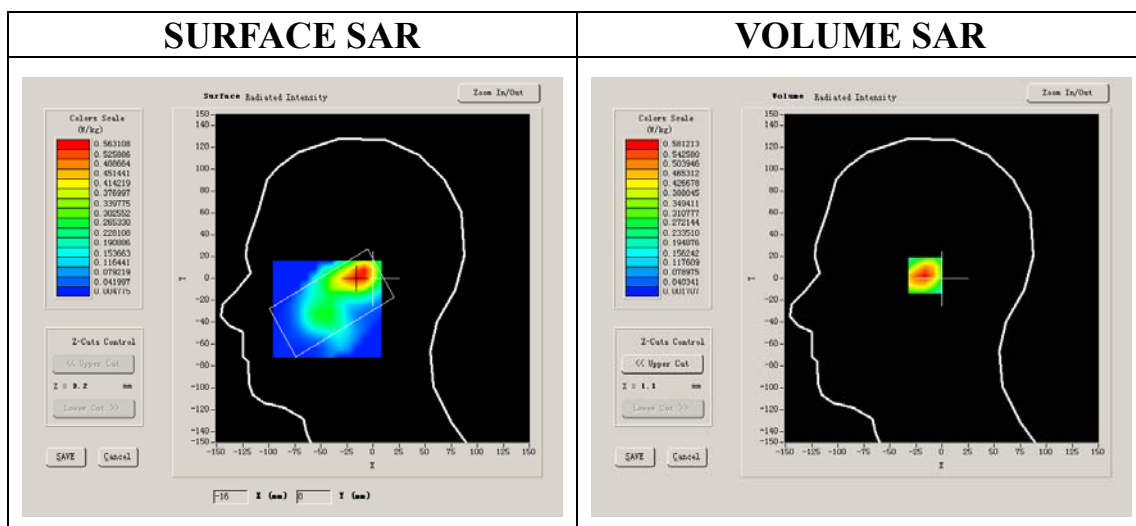
### A. Experimental conditions.

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

### B. SAR Measurement Results

High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-0.140000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



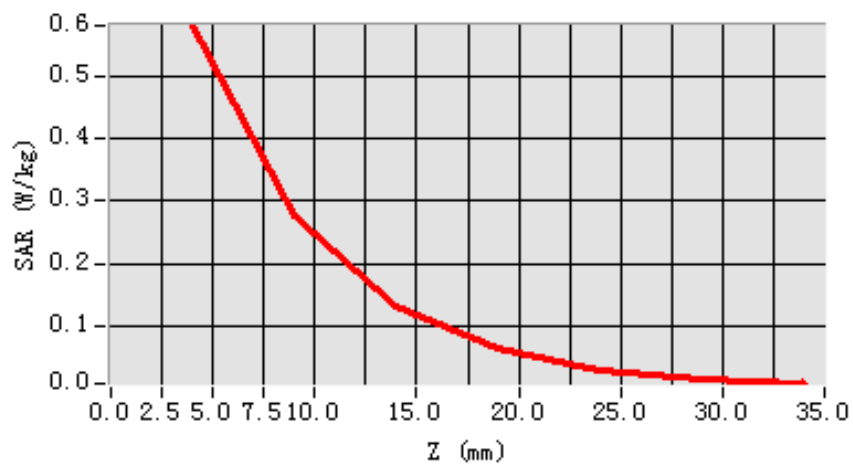
**Maximum location: X=-11.00, Y=3.00**

<b>SAR 10g (W/Kg)</b>	0.278096
<b>SAR 1g (W/Kg)</b>	0.552967

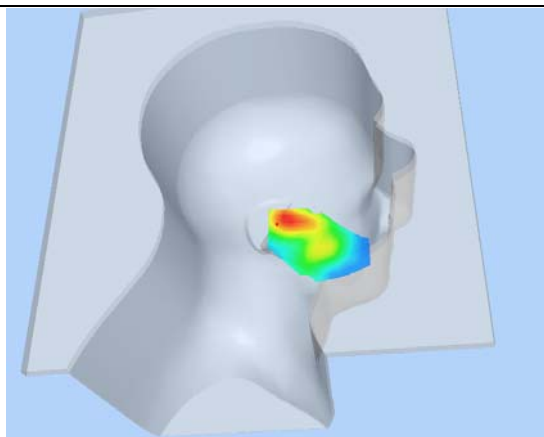
### Z Axis Scan

<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>0.5812</b>	<b>0.2781</b>	<b>0.1320</b>	<b>0.0638</b>	<b>0.0291</b>	<b>0.0153</b>

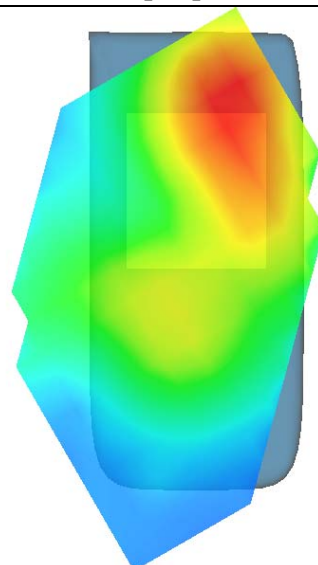
**SAR, Z Axis Scan (X = -11, Y = 3)**



**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: 21/6/2011

Measurement duration: 7 minutes 24 seconds

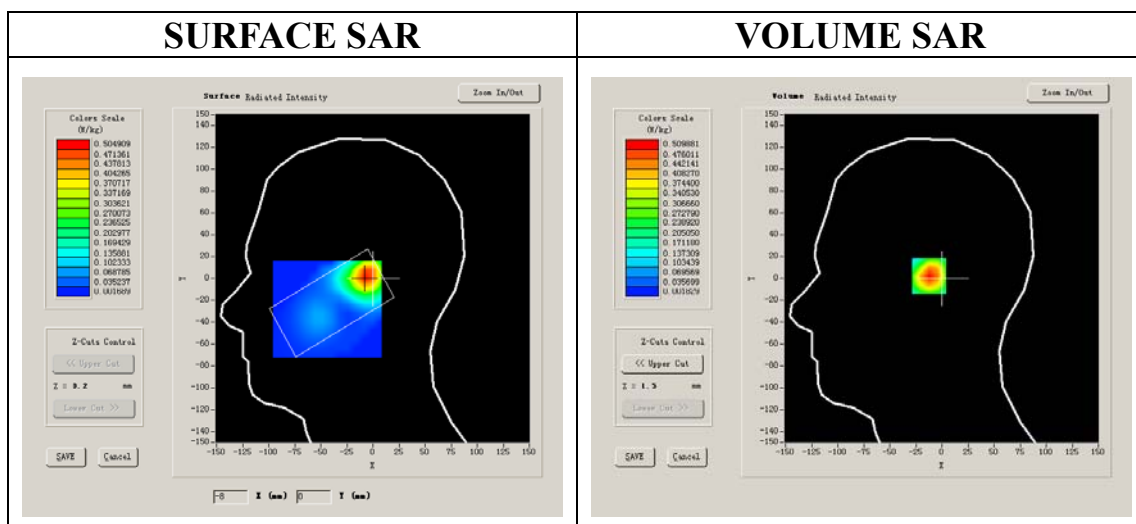
### A. Experimental conditions.

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

### B. SAR Measurement Results

High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000
Conductivity (S/m)	1.436111
Power drift (%)	-2.110000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



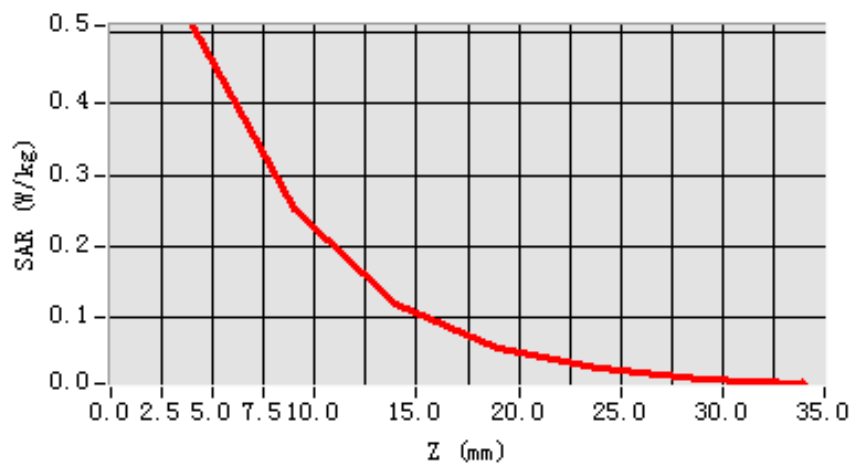
**Maximum location: X=-7.00, Y=2.00**

<b>SAR 10g (W/Kg)</b>	0.241831
<b>SAR 1g (W/Kg)</b>	0.484774

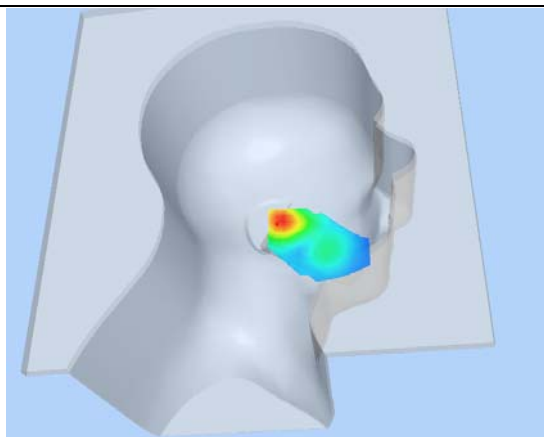
### **Z Axis Scan**

<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>0.5099</b>	<b>0.2524</b>	<b>0.1193</b>	<b>0.0567</b>	<b>0.0277</b>	<b>0.0129</b>

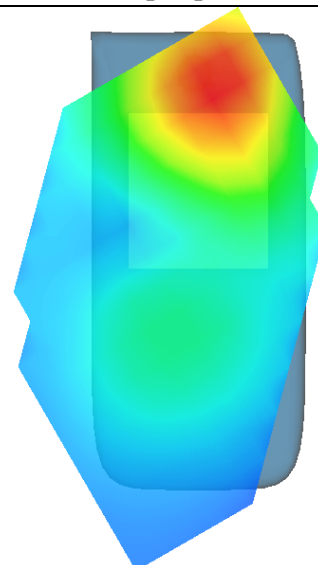
**SAR, Z Axis Scan (X = -7, Y = 2)**



**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: 21/6/2011

Measurement duration: 9 minutes 9 seconds

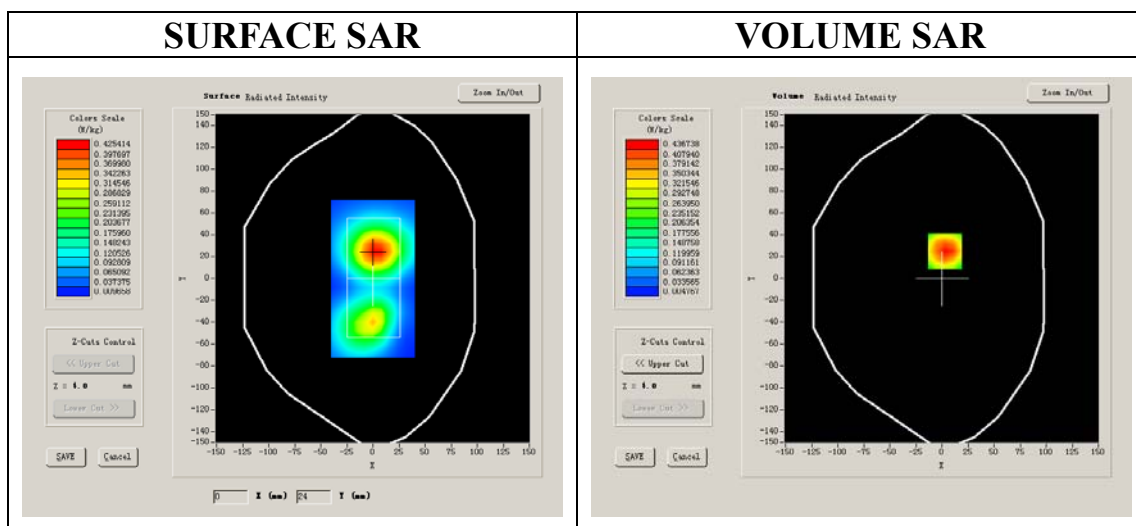
### A. Experimental conditions.

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

### B. SAR Measurement Results

High 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 (%)	-0.550000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



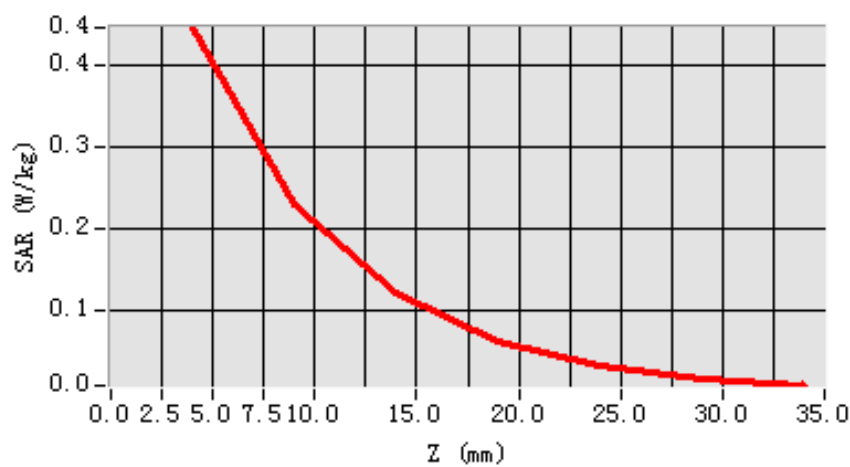
**Maximum location: X=3.00, Y=25.00**

<b>SAR 10g (W/Kg)</b>	0.230089
<b>SAR 1g (W/Kg)</b>	0.428629

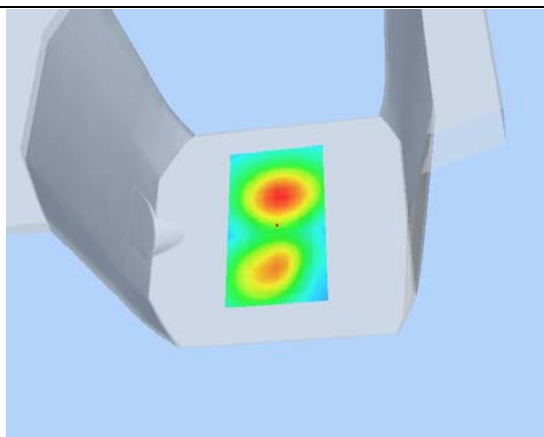
### **Z Axis Scan**

<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>0.4469</b>	<b>0.2301</b>	<b>0.1212</b>	<b>0.0615</b>	<b>0.0324</b>	<b>0.0168</b>

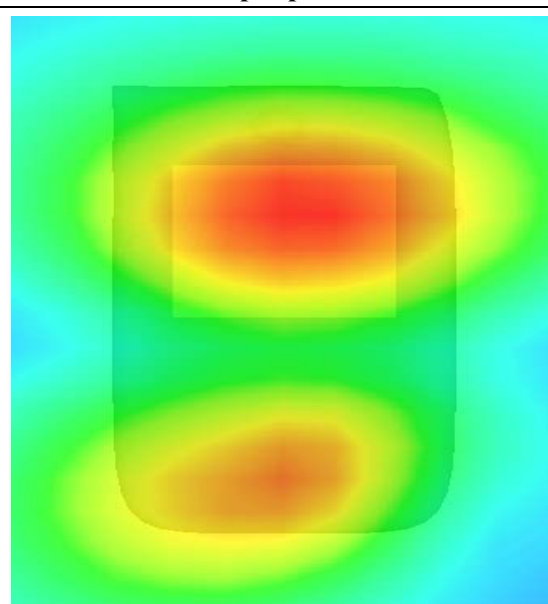
**SAR, Z Axis Scan (X = 3, Y = 25)**



**3D scene shot**



**Hot spot position**



## 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: 21/6/2011

Measurement duration: 9 minutes 9 seconds

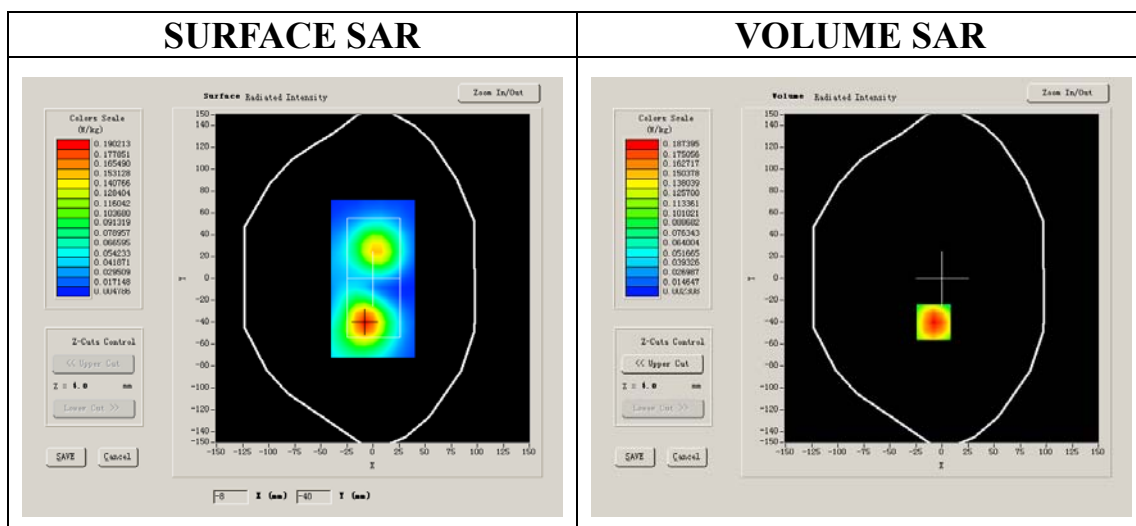
### A. Experimental conditions.

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

### B. SAR Measurement Results

High 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 (%)	0.150000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8



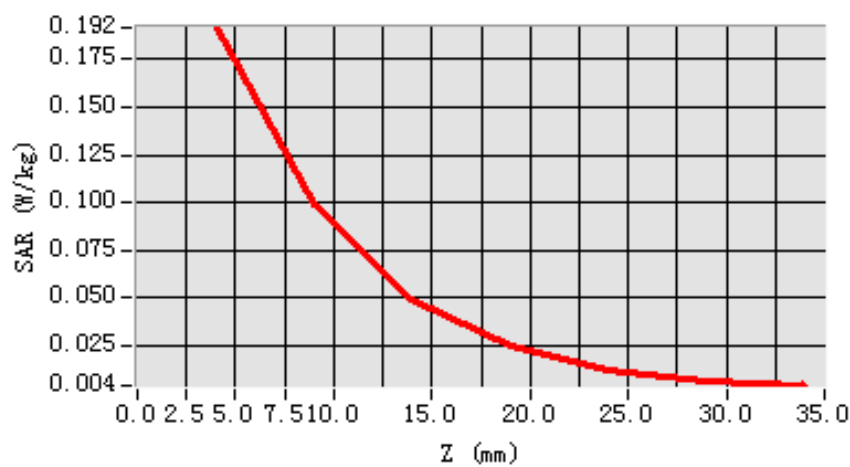
**Maximum location: X=-8.00, Y=-40.00**

<b>SAR 10g (W/Kg)</b>	0.097469
<b>SAR 1g (W/Kg)</b>	0.182404

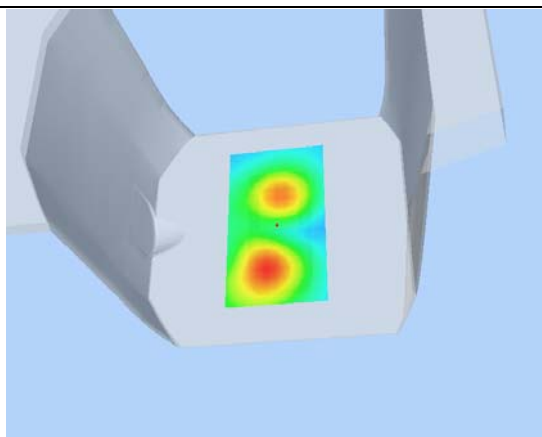
### **Z Axis Scan**

<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>0.1918</b>	<b>0.0988</b>	<b>0.0493</b>	<b>0.0247</b>	<b>0.0126</b>	<b>0.0062</b>

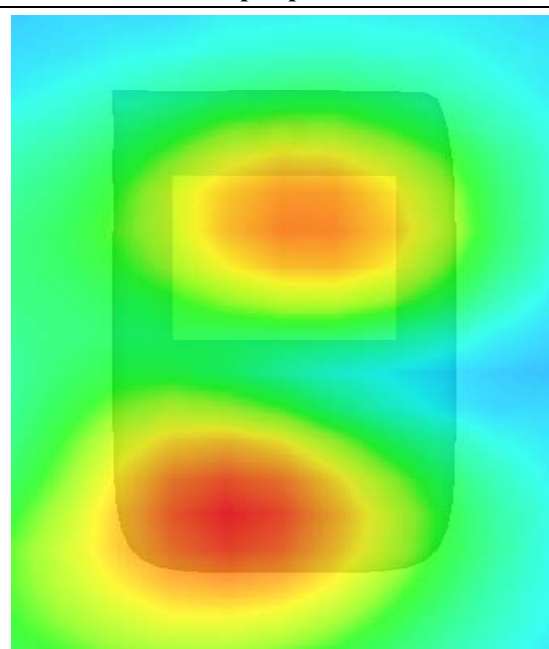
**SAR, Z Axis Scan (X = -8, Y = -40)**



**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: 21/6/2011

Measurement duration: 9 minutes 6 seconds

### A. Experimental conditions.

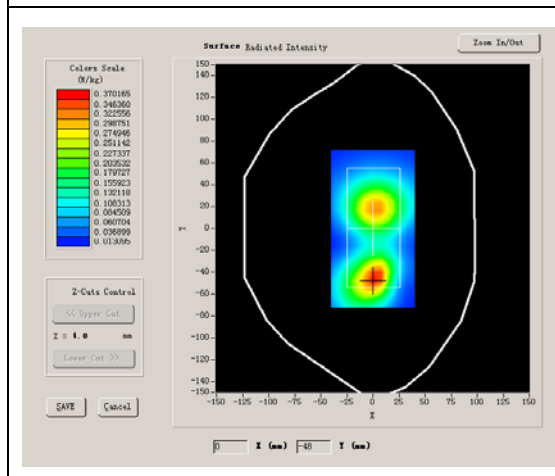
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GPRS

### B. SAR Measurement Results

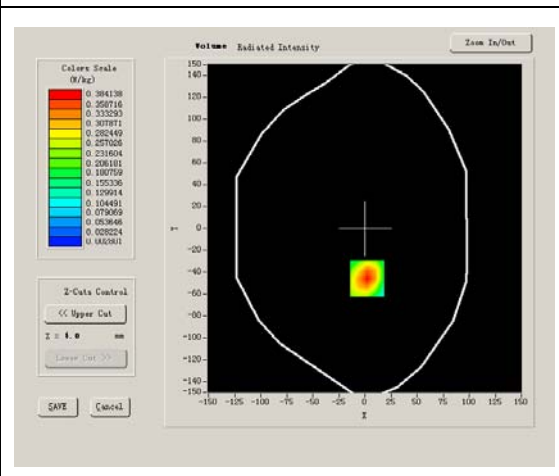
High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	0.760000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



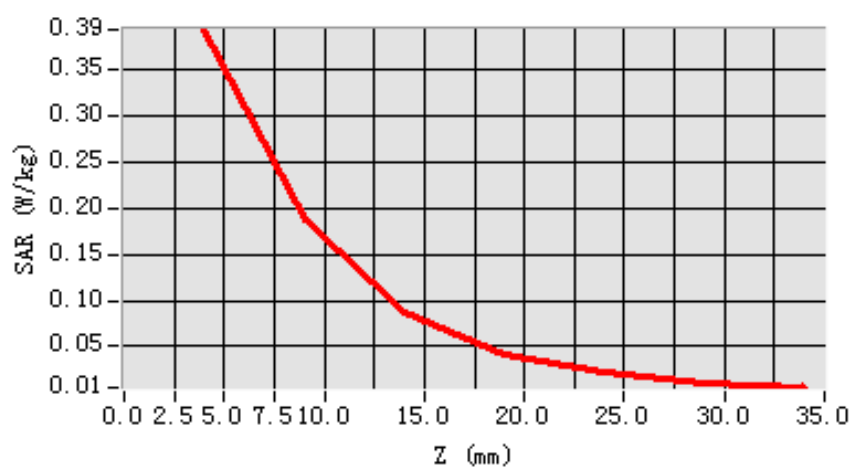
**Maximum location: X=2.00, Y=-46.00**

<b>SAR 10g (W/Kg)</b>	0.186129
<b>SAR 1g (W/Kg)</b>	0.371127

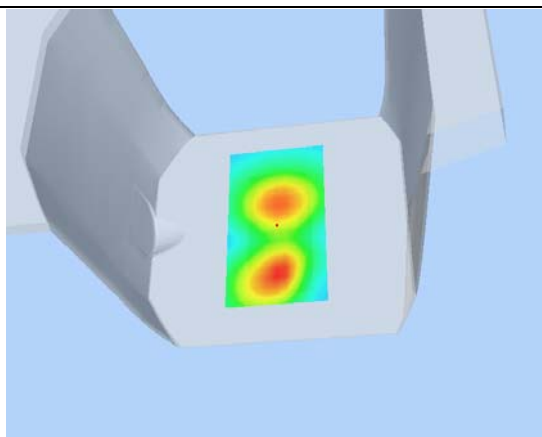
### **Z Axis Scan**

<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>0.3931</b>	<b>0.1879</b>	<b>0.0871</b>	<b>0.0416</b>	<b>0.0214</b>	<b>0.0097</b>

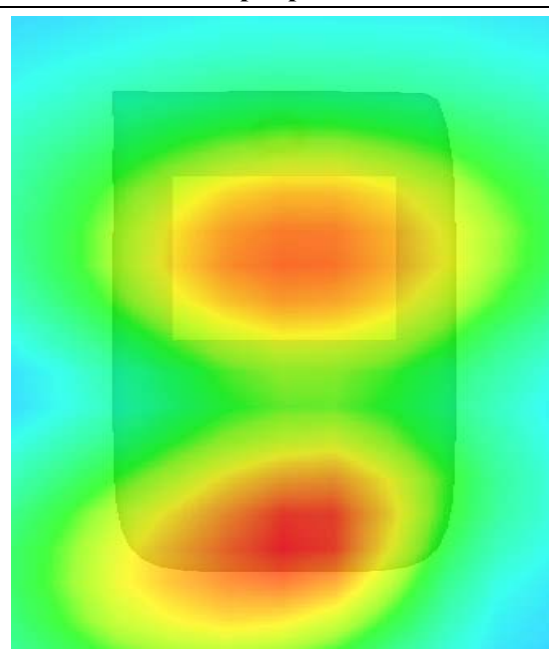
**SAR, Z Axis Scan (X = 2, Y = -46)**



**3D scene shot**



**Hot spot position**



## 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: 21/6/2011

Measurement duration: 9 minutes 8 seconds

### A. Experimental conditions.

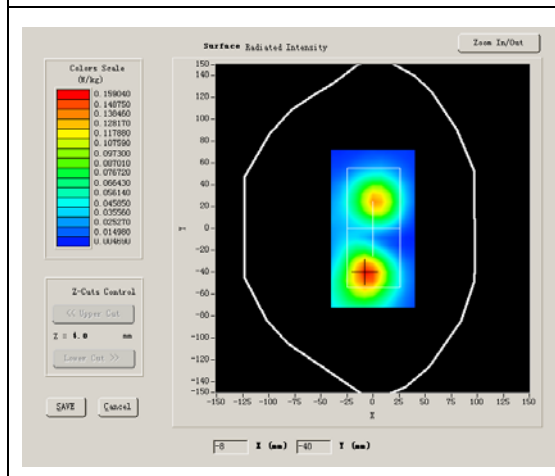
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GPRS

### B. SAR Measurement Results

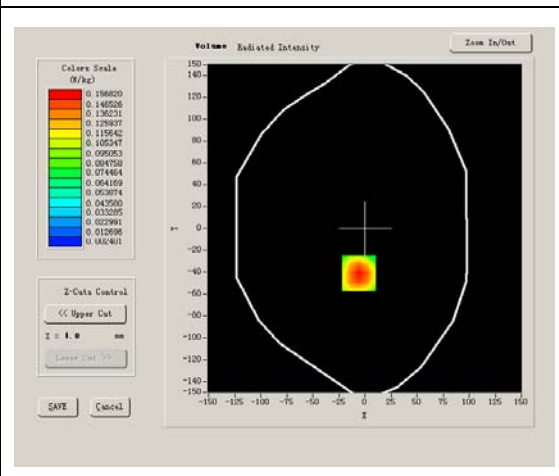
High Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.800000
Ambient Temperature:	22.0°C
Liquid Temperature:	21.7C
ConvF:	40.136,34.843,38.721
Crest factor:	1:2

#### SURFACE SAR



#### VOLUME SAR



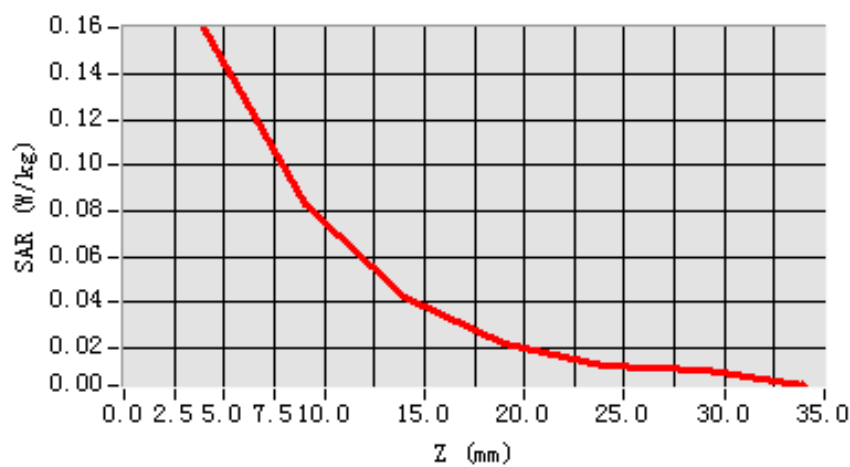
**Maximum location: X=-6.00, Y=-41.00**

<b>SAR 10g (W/Kg)</b>	0.082731
<b>SAR 1g (W/Kg)</b>	0.152521

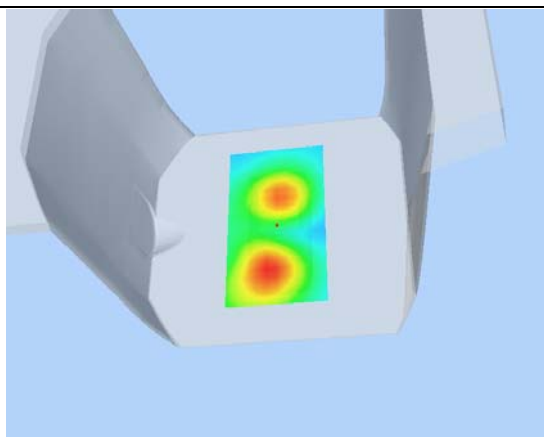
### **Z Axis Scan**

<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>0.1605</b>	<b>0.0834</b>	<b>0.0421</b>	<b>0.0220</b>	<b>0.0120</b>	<b>0.0103</b>

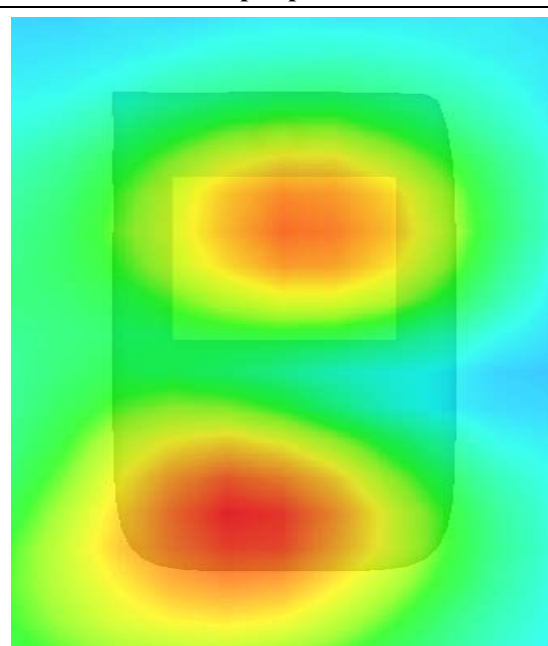
**SAR, Z Axis Scan (X = -6, Y = -41)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(Head)

Type: Phone measurement (Complete)

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

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

Date of measurement: 21/6/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

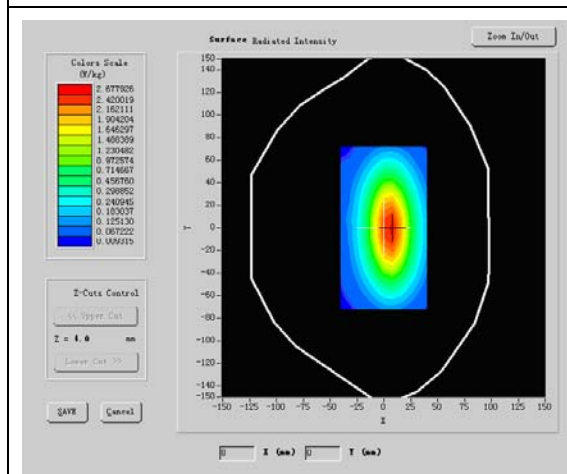
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	835MHz
Channels	
Signal	CW

### 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:	22.2°C
Liquid Temperature:	21.5°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:1

#### SURFACE SAR



#### VOLUME SAR

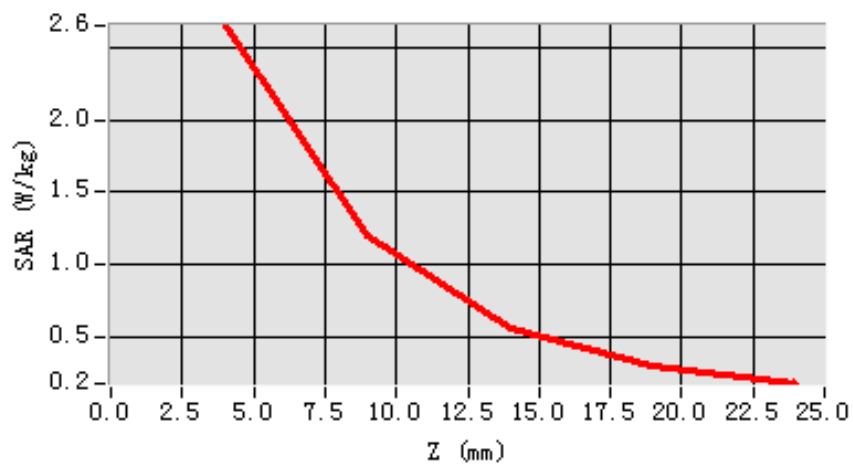
**Maximum location: X=5.00, Y=1.00**

<b>SAR 10g (W/Kg)</b>	1.715223
<b>SAR 1g (W/Kg)</b>	2.677926

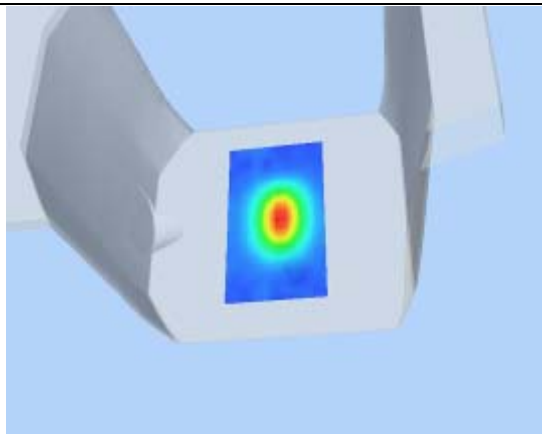
### Z Axis Scan

<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>2.6486</b>	<b>1.2069</b>	<b>0.5583</b>	<b>0.3002</b>

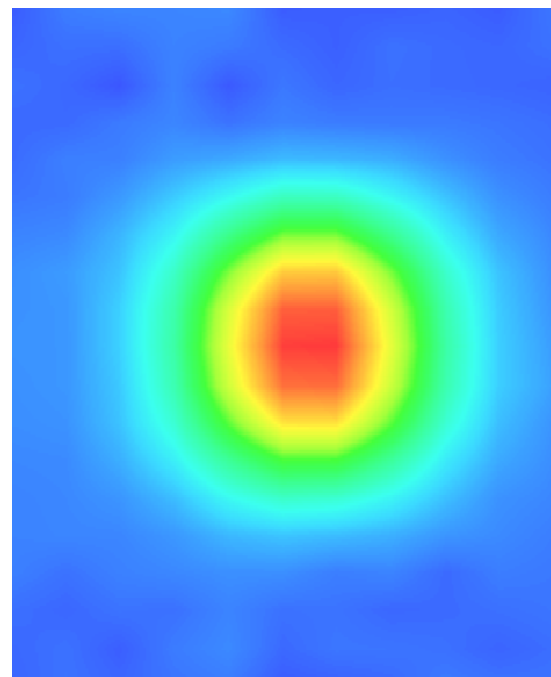
**SAR, Z Axis Scan (X = 5, Y = 1)**



**3D sceen shot**



**Hot spot position**



## System Performance Check Data(Body)

Type: Phone measurement (Complete)

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

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

Date of measurement: 21/6/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

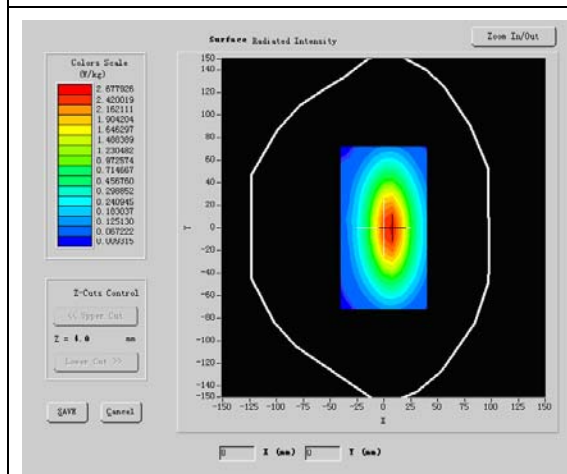
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	835MHz
Channels	
Signal	CW

### 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

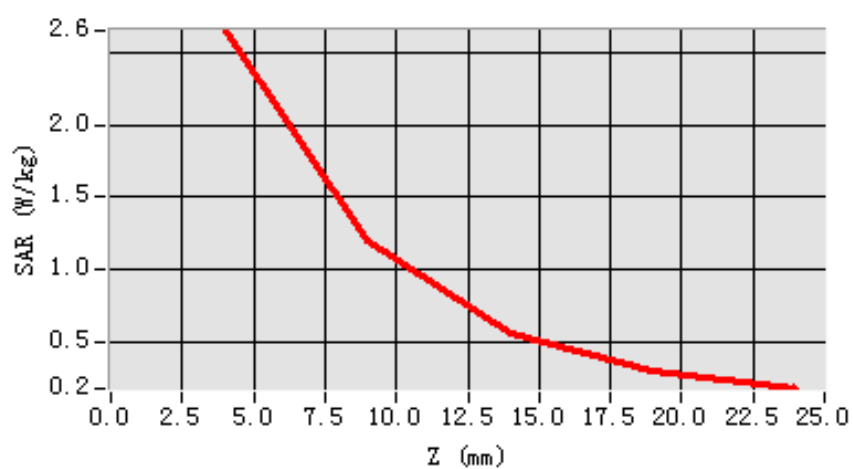
**Maximum location: X=5.00, Y=1.00**

<b>SAR 10g (W/Kg)</b>	1.725475
<b>SAR 1g (W/Kg)</b>	2.694964

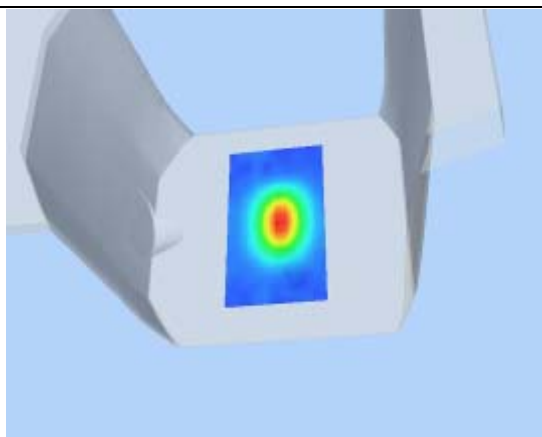
### Z Axis Scan

<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>2.6857</b>	<b>1.2427</b>	<b>0.5685</b>	<b>0.35242</b>

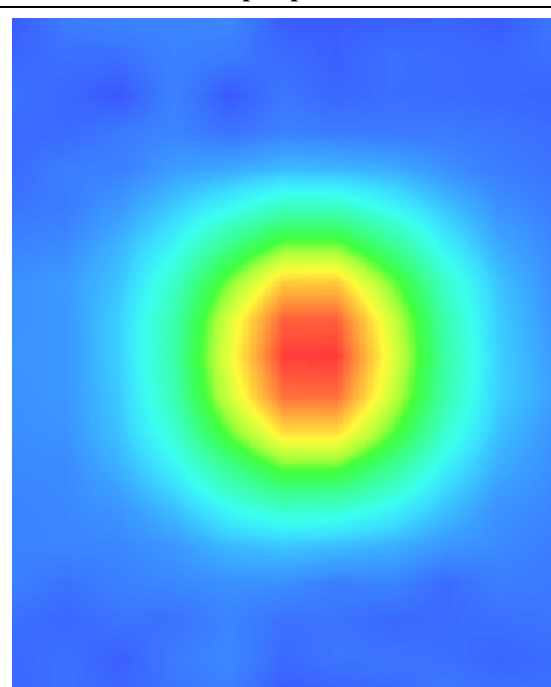
**SAR, Z Axis Scan (X = 5, Y = 1)**



**3D scene shot**



**Hot spot position**





## System Performance Check Data(Head)

Type: Phone measurement (Complete)

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

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

Date of measurement: 21/6/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

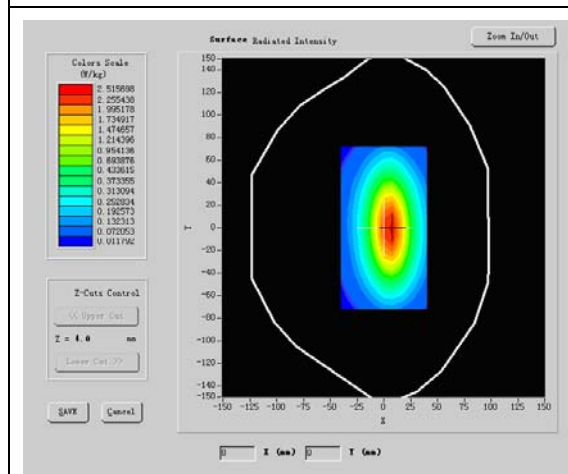
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

### 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

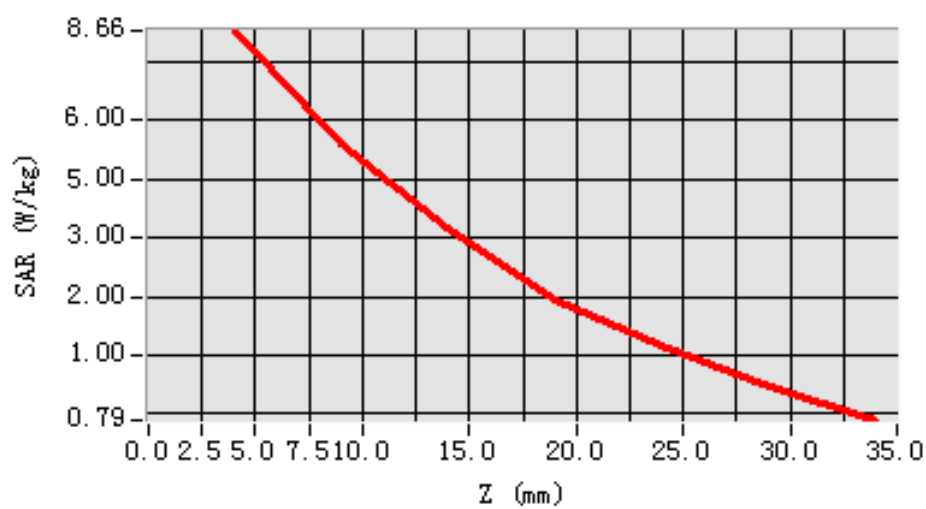
**Maximum location: X=5.00, Y=1.00**

<b>SAR 10g (W/Kg)</b>	4.910003
<b>SAR 1g (W/Kg)</b>	9.455521

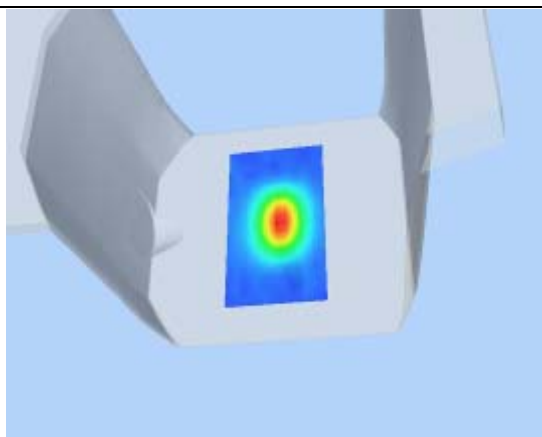
### Z Axis Scan

<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>8.8536</b>	<b>5.3061</b>	<b>3.6041</b>	<b>1.3211</b>

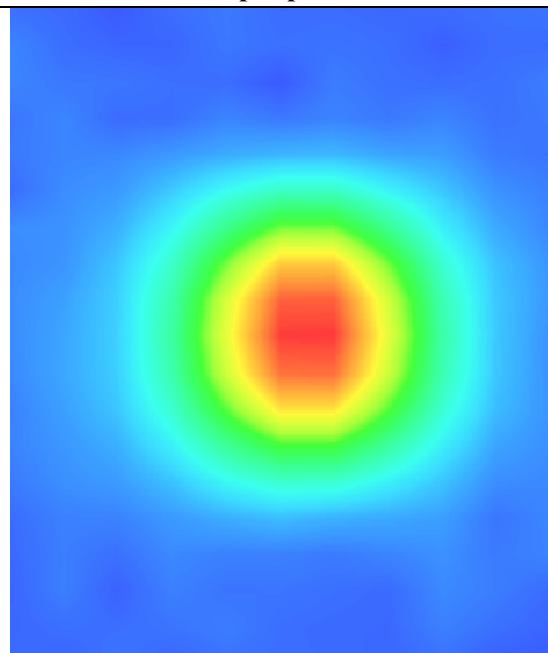
**SAR, Z Axis Scan (X = -1, Y = -50)**



**3D scene shot**



**Hot spot position**



## System Performance Check Data(Body)

Type: Phone measurement (Complete)

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

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

Date of measurement: 7/6/2011

Measurement duration: 13 minutes 27 seconds

### A. Experimental conditions.

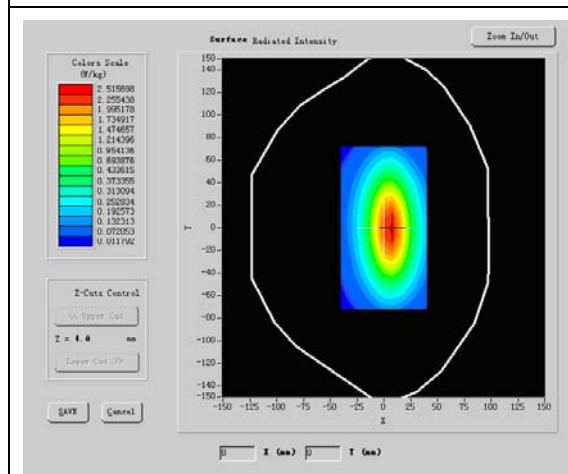
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

### B. SAR Measurement Results

#### Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
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

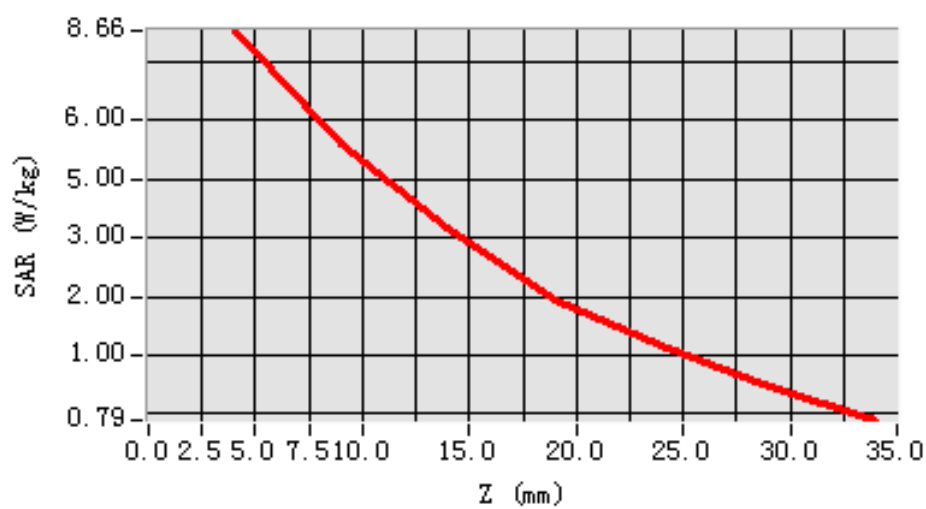
**Maximum location: X=5.00, Y=1.00**

<b>SAR 10g (W/Kg)</b>	4.957452
<b>SAR 1g (W/Kg)</b>	9.574524

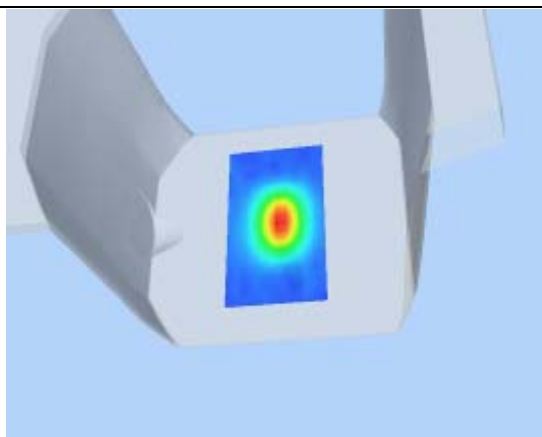
### **Z Axis Scan**

<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>8.8536</b>	<b>5.3061</b>	<b>3.6041</b>	<b>1.3211</b>

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



**3D scene shot**



**Hot spot position**

