



Report No.: SZ12070032S01



SAR TEST REPORT

Issued to

TCT Mobile Limited

For

HSPA USB Modem

Model Name : One Touch X230Y
 Trade Name : Alcatel
 Brand Name : Alcatel
 FCC ID : RAD306
 Standard : FCC Oet65 Supplement C Jun.2001
 47CFR 2.1093
 ANSI C95.1-1999
 IEEE 1528-2003
 MAX SAR : Body: 0.621 W/kg
 Test date : 2012.7.20
 Issue date : 2012.7.26



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Date 2012.7.26

Date 2012.7.26

Date 2012.7.26

CTIA Authorized Test Lab
 LAB CODE 20061223-00
 IEEE 1725

OFTA
 電訊管理局



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DIRECTORY

DIRECTORY.....	2
1. TESTING LABORATORY.....	4
1.1. Identification of the Responsible Testing Laboratory.....	4
1.2. Identification of the Responsible Testing Location.....	4
1.3. Accreditation Certificate.....	4
1.4. List of Test Equipments.....	4
2. TECHNICAL INFORMATION.....	5
2.1. Identification of Applicant.....	5
2.2. Identification of Manufacturer.....	5
2.3. Equipment Under Test (EUT).....	5
2.3.1. Photographs of the EUT.....	5
2.3.2. Identification of all used EUT.....	5
2.4. Applied Reference Documents.....	6
2.5. Device Category and SAR Limits.....	6
2.6. Test Environment/Conditions.....	7
3. SPECIFIC ABSORPTION RATE (SAR).....	8
3.1. Introduction.....	8
3.2. SAR Definition.....	8
4. SAR MEASUREMENT SETUP.....	9
4.1. The Measurement System.....	9
4.2. Probe.....	9
4.3. Phantom.....	11
4.4. Device Holder.....	11
5. TISSUE SIMULATING LIQUIDS.....	12
6. UNCERTAINTY ASSESSMENT.....	13
6.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST.....	13
6.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK.....	14
7. SAR MEASUREMENT EVALUATION.....	16
7.1. System Setup.....	16
7.2. Validation Results.....	16
8. OPERATIONAL CONDITIONS DURING TEST.....	18

8.1. Body-worn Configurations.....	18
8.2. Measurement procedure.....	18
8.3. Description of interpolation/extrapolation scheme.....	19
9. 3G MEASUREMENT PROCEDURES.....	19
9.1. Procedures Used To Establish Test Signal.....	19
9.2. SAR Measurement Conditions for WCDMA.....	19
9.3. Output Power Verification.....	19
9.4. Measurement Of Conducted Peak Output Power.....	20
1. WCDMA Mode.....	20
10. TEST RESULTS LIST.....	22
ANNEX A EUT SETUP PHOTOS.....	24
ANNEX B GRAPH TEST RESULTS.....	27

Change History		
Issue	Date	Reason for change
1.0	Jul. 26, 2012	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

1.4. List of Test Equipments

No.	Instrument	Type	Cal. Date	Cal. Due
1	PC	Dell (Pentium IV 2.4GHz, SN:X10-23533)	(n.a)	(n.a)
2	Network Emulator	Rohde&Schwarz (CMU200, SN:105894)	2011-9-26	1year
3	Voltmeter	Keithley (2000, SN:1000572)	2011-9-24	1year
4	Synthesizer	Rohde&Schwarz (SML_03, SN:101868)	2011-9-24	1year
5	Amplifier	Nucl udes (ALB216, SN:10800)	2011-9-24	1year
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)	2011-9-24	1year
7	Probe	Satimo (SN:SN_3708_EP80)	2011-9-24	1year
8	Phantom	Satimo (SN:SN_36_08_SAM62)	2011-9-24	1year
9	Liquid	Satimo (Last Calibration: 2012-7-20)	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: TCT Mobile Limited
Address: 5F, E building, No. 232, LiangJing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203

2.2. Identification of Manufacturer

Company Name: TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED
Address: 70 Huifeng 4rd,ZhongKai Hi-tech Development District ,Huizhou,
Guangdong 516006 P.R.China
(TCL Mobile Communication Co., LTD. Huizhou)

2.3. Equipment Under Test (EUT)

Model Name: One Touch X230Y
Trade Name: Alcatel
Brand Name: Alcatel
Hardware Version: PIO
Software Version: S1_B15001S_1110000_B10001S
Frequency Bands: GSM 850MHz / PCS 1900MHz;
WCDMA 850MHz/1900MHz;
Modulation Mode: GPRS: GMSK; EDGE: 8PSK
WCDMA:CDMA
3GPP version: Rel-6
Multislot Class: GPRS: Multislot Class 12; EDGE: Multislot Class 12
Antenna type: Fixed Internal Antenna
Development Stage: Identical prototype

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#	PIO	S1_B15001S_1110000_B10001S

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
2	FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
3	ANSI C95.1-1999	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz
4	IEEE 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.
5	KDB 447498 D02	SAR Measurement Procedures for USB Dongle Transmitters
6	KDB 941225 D01	SAR Measurement Procedures for 3G Device

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 850MHz WCDMA1900MHz
Operation mode:	Call established
Power Level:	GSM 850 MHz Maximum output power(level 5) PCS 1900 MHz Maximum output power(level 0) WCDMA Maximum output power(All up bits)

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 9262, 9400 and 9538 respectively in the case of WCDMA 19000, or to 4132, 4182 and 4233 respectively in the case of WCDMA 850. 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. 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/EDGE link mode, its crest factor is 2, because EUT is set in GPRS/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. ρ). 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, δT is the temperature rise and δt the exposure duration, or related to the electrical field in the tissue by

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

, where σ is the conductivity of the tissue, ρ 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

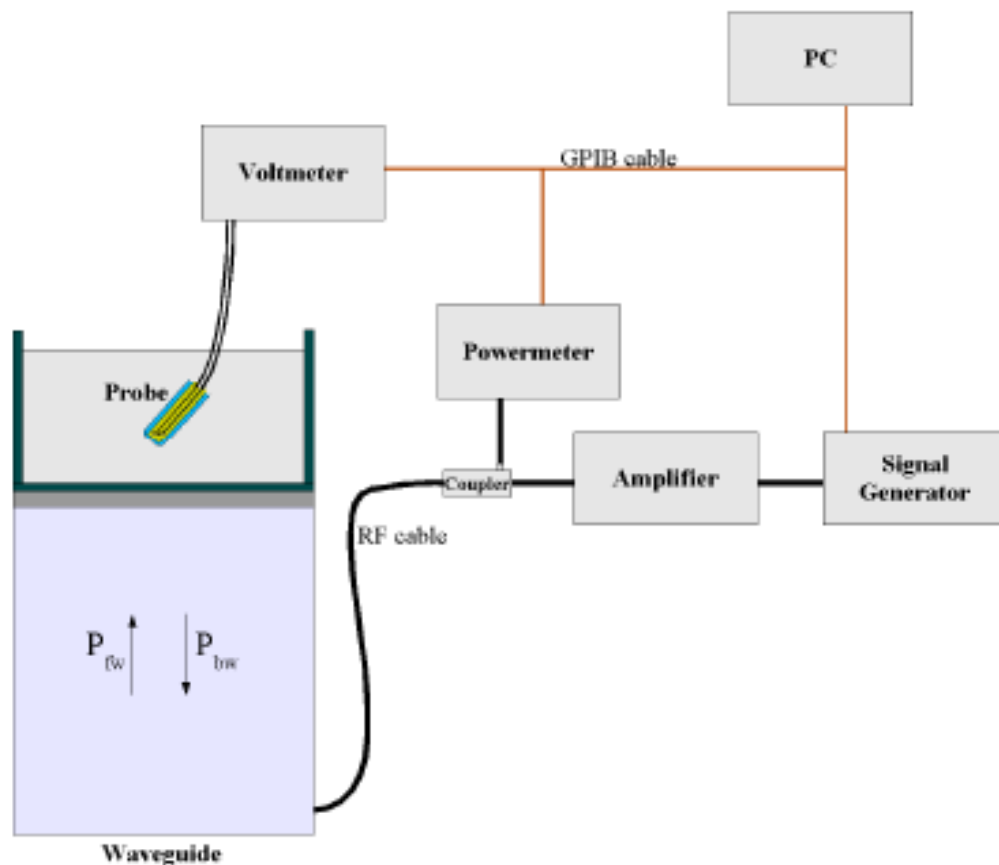
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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_{fw} = Forward Power

P_{bw} = Backward Power

a and b = Waveguide dimensions

δ = 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

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

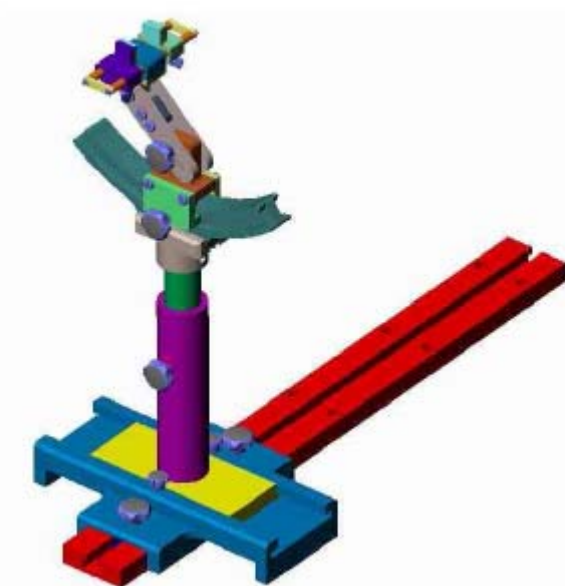
where DCP is the diode compression point in mV.

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

Simulating liquids used for testing at frequencies of 835MHz and 1900MHz, are made mainly of sugar, salt and water solutions may be left in the phantoms. Approximately 20litres are needed for an upright head compared to about 25 litres for a horizontal bath phantom. The liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is (head SAR) or from the flat phantom to the liquid top surface (body SAR) is 15cm.

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

Ingredients (% by weight)	Frequency Band	Frequency Band
	835MHz	1900MHz
Tissue Type	Body	Body
Water	52.4	40.4
Salt(NaCl)	1.4	0.5
Sugar	45.0	58.0
HEC	1.0	1.0
Bactericide	0.1	0.1
Triton	0.0	0.0
DGBE	0.0	0.0
Acticide SPX	0.0	0.0
Dielectric Constant	56.1	54.0
Conductivity (S/m)	0.95	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.

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 1: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.0~23.8°C, humidity: 54~60%.			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	835 MHz	56.1	0.95
Validation value (Jul. 20)	835 MHz	55.709999	0.999033
Target value	1900 MHz	54.0	1.45
Validation value (Jul. 20)	1900 MHz	52.548876	1.469533

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)	lg Ui (+-%)	10g Ui (+- %)	Vi
Measurement System									
Probe calibration	E.2.1	4.76	N	1	1	1	4.76	4.76	∞
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	∞
Test sample Related									
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	∞
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				11.55	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
Measurement System									
Probe calibration	E.2.1	4.76	N	1	1	1	4.76	4.76	∞
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	∞
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	∞

Input power and SAR drift measurement	8,6.6.2	4.04	R	$\sqrt{3}$	1	1	2.33	2.33	∞
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	$\sqrt{3}$	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	∞
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

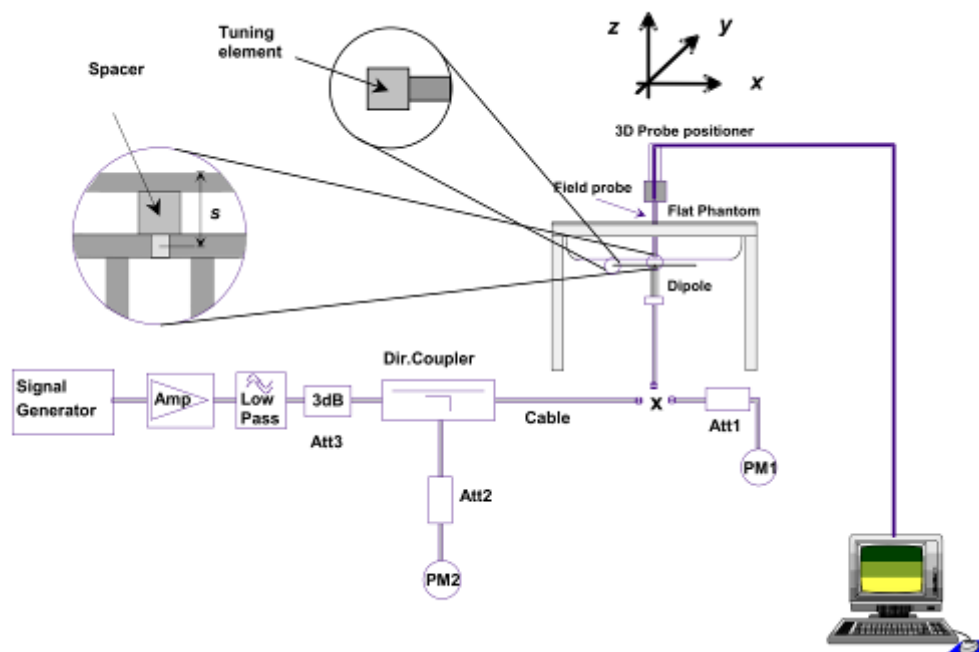
In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835 MHz and 1900 MHz. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin 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 1900MHz:SN 36/08 DIPF 102

7.2. Validation Results

System Verification Setup Block Diagram



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

Frequency	835MHz	1900MHz
Target value (1g)	9.2 W/Kg	39.7 W/Kg
250 mW input power	2.386 W/Kg	9.340 W/Kg
Test value (1g)	9.544 W/Kg	37.360 W/Kg

Note: System checks the specific test data please see page 77-80.

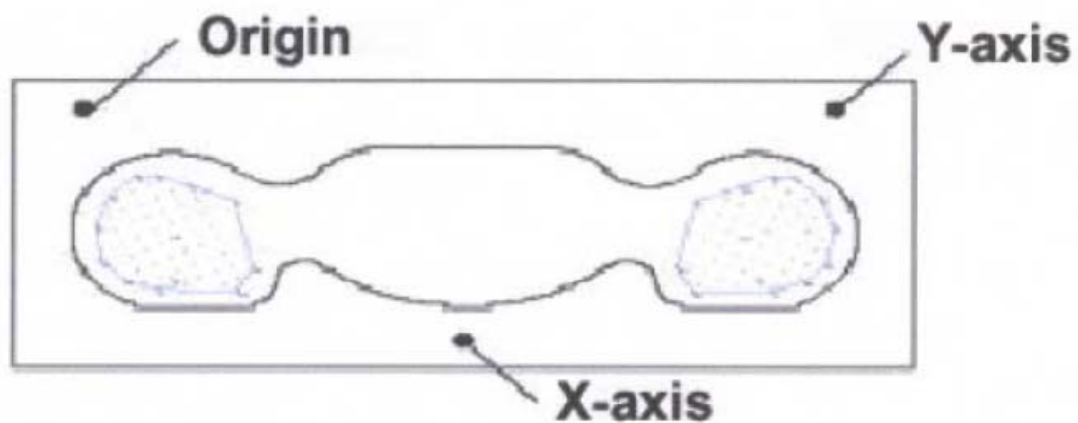
8. Operational Conditions During Test

8.1. Body-worn Configurations

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

The depth of the body tissue was 15.1cm. The distance between the back of the device and the bottom of the flat phantom is 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

8.2. Measurement procedure

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors can not directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

8.3. Description of interpolation/extrapolation scheme

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

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

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

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.

1. WCDMA Mode

Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4175	4233	9262	9400	9538
	subtest	dBm			dBm		
5.2(WCDMA)	non	22.79	22.82	22.76	21.65	21.68	21.67
HSDPA	1	22.76	22.75	22.75	21.62	21.63	21.62
	2	22.75	22.77	22.72	21.61	21.62	21.62
	3	22.26	22.23	22.22	21.12	21.13	21.15
	4	22.25	22.25	22.28	21.11	21.11	21.13
HSUPA	1	22.75	22.69	22.67	21.59	21.62	21.65
	2	20.65	20.56	20.63	19.57	19.59	19.63
	3	21.66	21.61	21.61	20.57	20.61	20.59
	4	20.65	20.67	20.65	19.52	19.59	19.61
	5	22.65	22.61	22.66	21.58	21.61	21.63

GPRS Mode

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	29.15	29.27	28.94	29.10
	190	836.6	29.08	29.14	29.16	29.17
	251	848.8	29.48	29.26	29.16	29.30
PCS 1900	512	1850.2	26.30	26.31	26.21	26.32
	661	1880.0	26.48	26.33	26.60	26.50
	810	1909.8	26.24	26.14	26.16	26.20

GPRS 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	20.15	23.25	24.68	26.09
	190	836.6	20.08	23.12	24.90	26.16
	251	848.8	20.48	23.24	24.90	26.29
PCS 1900	512	1850.2	17.30	20.29	21.95	23.31
	661	1880.0	17.48	20.31	22.34	23.49
	810	1909.8	17.24	20.12	21.90	23.19

Timeslot consignations:

No. Of Slots	Slot 1	Slot 2	Slot 3	Slot 4
Slot Consignation	1Up4Down	2Up2Down	3Up2Down	4Up1Down
Duty Cycle	1:8	1:4	1:2.67	1:2
Correct Factor	-9.00dB	-6.02dB	-4.26dB	-3.01dB

EGPRS Mode

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	33.15	33.06	32.87	32.80
	190	836.6	32.82	32.93	33.07	33.03
	251	848.8	33.43	33.37	33.41	33.25
PCS 1900	512	1850.2	29.04	29.09	29.15	29.24
	661	1880.0	29.04	29.30	29.20	29.21
	810	1909.8	28.53	28.71	28.63	28.61

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	24.15	27.04	28.61	29.79
	190	836.6	23.82	26.91	28.81	30.02
	251	848.8	24.43	27.35	29.15	30.24
PCS 1900	512	1850.2	20.04	23.07	24.89	26.23
	661	1880.0	20.04	23.28	24.94	26.20
	810	1909.8	19.53	22.69	24.37	25.60

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	Device Test channel	Operation Mode	SAR(W/Kg), 1g Peak	Scaling Factor	Scaled SAR(W/Kg), 1g
Body (5mm Separation)	Horizontal-Up	251	GPRS	0.308	1.175	0.362
	Horizontal-Down			0.334		0.392
	Vertical-Front			0.236		0.277
	Vertical-Back			0.228		0.268
	Horizontal-Up	251	EDGE	0.564	1.059	0.597
	Horizontal-Down			0.621		0.658
	Vertical-Front			0.534		0.566
	Vertical-Back			0.476		0.504

Summary of Measurement Results (GSM 1900MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.						
Phantom Configurations	Device Test Positions	Device Test channel	Operation Mode	SAR(W/Kg), 1g Peak	Scaling Factor	Scaled SAR(W/Kg), 1g
Body (5mm Separation)	Horizontal-Up	661	GPRS	0.225	1.122	0.252
	Horizontal-Down			0.325		0.365
	Vertical-Front			0.256		0.287
	Vertical-Back			0.235		0.264
	Horizontal-Up	512	EDGE	0.327	1.191	0.389
	Horizontal-Down			0.437		0.520
	Vertical-Front			0.426		0.507
	Vertical-Back			0.415		0.494

Summary of Measurement Results (WCDMA 850MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Device Test channel	SAR(W/Kg), 1g Peak	Scaling Factor	Scaled SAR(W/Kg), 1g
Body (5mm Separation)	Horizontal-Up	4175	0.311	1.042	0.324
	Horizontal-Down		0.444		0.463
	Vertical-Front		0.391		0.407
	Vertical-Back		0.376		0.392

Note: Maximum SAR for 12.2kbps RMC is $0.444 \text{ W/Kg} \leq 75\%$ of the SAR limit (i.e. $1.2 \text{ W/Kg } 1\text{g}$) and maximum average output of each RF channel with HSUPA/HSDPA active is less than $1/4 \text{ dB}$ higher than that measured without HSUPA/HSDPA using 12.2kbps RMC (refer to Page 20 of the report), according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.

Summary of Measurement Results (WCDMA 1900MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Device Test channel	SAR(W/Kg), 1g Peak	Scaling Factor	Scaled SAR(W/Kg), 1g
Body (5mm Separation)	Horizontal-Up	9400	0.574	1.076	0.618
	Horizontal-Down		0.547		0.589
	Vertical-Front		0.415		0.447
	Vertical-Back		0.501		0.539

Note: Maximum SAR for 12.2kbps RMC is $0.574 \text{ W/Kg} \leq 75\%$ of the SAR limit (i.e. $1.2 \text{ W/Kg } 1\text{g}$) and maximum average output of each RF channel with HSUPA/HSDPA active is less than $1/4 \text{ dB}$ higher than that measured without HSUPA/HSDPA using 12.2kbps RMC (refer to Page 20 of the report), according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.

Refer to 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 1.6 W/kg , where the transmission band corresponding to all channels is $\leq 100 \text{ MHz}$, testing for the other channels is not required.

Band	Tune-up power tolerance (dBm)	SAR test channel Power (dBm)	Scaling Factor
GPRS 850	Max output power <30	29.30	1.175
EDGE 850	Max output power <33.5	33.25	1.059
GPRS 1900	Max output power <27	26.50	1.122
EDGE 1900	Max output power <30	29.24	1.191
WCDMA 850	Max output power =22 (+1/-2)	22.82	1.042
WCDMA 1900	Max output power =21 (+1/-2)	21.68	1.076

Annex A EUT Setup Photos

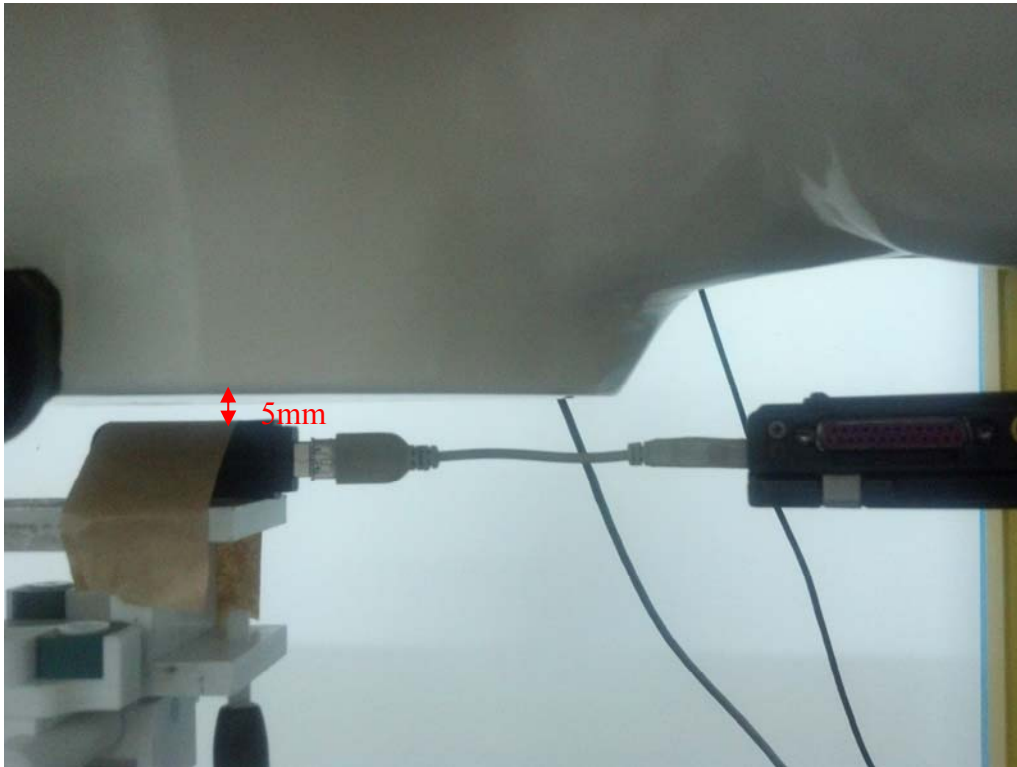
1 Horizontal-Up



2 Horizontal-Down



3 Vertical-Front



4 Vertical-Back



Liquid Level Photo



Annex B Graph Test Results

BAND	PARAMETERS
<u>GSM850</u>	<u>Measurement 1:</u> Body position on High Channel in GPRS mode (Horizontal-Up) <u>Measurement 2:</u> Body position on High Channel in GPRS mode (Horizontal-Down) <u>Measurement 3:</u> Body position on High Channel in GPRS mode (Vertical-Front) <u>Measurement 4:</u> Body position on High Channel in GPRS mode (Vertical-Back) <u>Measurement 5:</u> Body position on High Channel in EDGE mode (Horizontal-Up) <u>Measurement 6:</u> Body position on High Channel in EDGE mode (Horizontal-Down) <u>Measurement 7:</u> Body position on High Channel in EDGE mode (Vertical-Front) <u>Measurement 8:</u> Body position on High Channel in EDGE mode (Vertical-Back)
<u>GSM1900</u>	<u>Measurement 9:</u> Body position on Middle Channel in GPRS mode (Horizontal-Up) <u>Measurement 10:</u> Body position on Middle Channel in GPRS mode (Horizontal-Down) <u>Measurement 11:</u> Body position on Middle Channel in GPRS mode (Vertical-Front) <u>Measurement 12:</u> Body position on Middle Channel in GPRS mode (Vertical-Back) <u>Measurement 13:</u> Body position on Low Channel in EDGE mode (Horizontal-Up) <u>Measurement 14:</u> Body position on Low Channel in EDGE mode (Horizontal-Down) <u>Measurement 15:</u> Body position on Low Channel in EDGE mode (Vertical-Front) <u>Measurement 16:</u> Body position on Low Channel in EDGE mode (Vertical-Back)
<u>WCDMA 850</u>	<u>Measurement 17:</u> Body position on Middle Channel in WCDMA mode (Horizontal-Up) <u>Measurement 18:</u> Body position on Middle Channel in WCDMA mode (Horizontal-Down) <u>Measurement 19:</u> Body position on Middle Channel in WCDMA mode (Vertical-Front)

	<u>Measurement 20:</u> Body position on Middle Channel in WCDMA mode (Vertical-Back)
<u>WCDMA</u> <u>1900</u>	<u>Measurement 21:</u> Body position on Middle Channel in WCDMA mode (Horizontal-Up) <u>Measurement 22:</u> Body position on Middle Channel in WCDMA mode (Horizontal-Down) <u>Measurement 23:</u> Body position on Middle Channel in WCDMA mode (Vertical-Front) <u>Measurement 24:</u> Body position on Middle Channel in WCDMA mode (Vertical-Back)

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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

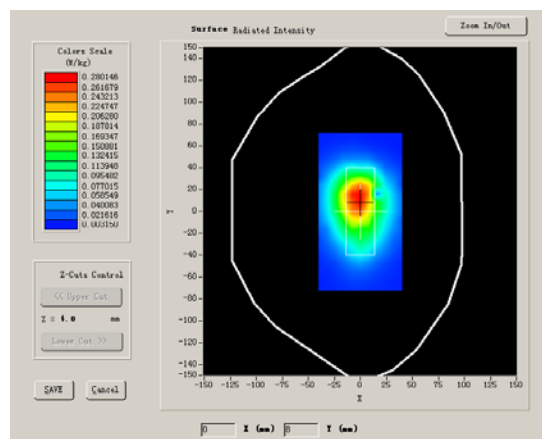
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

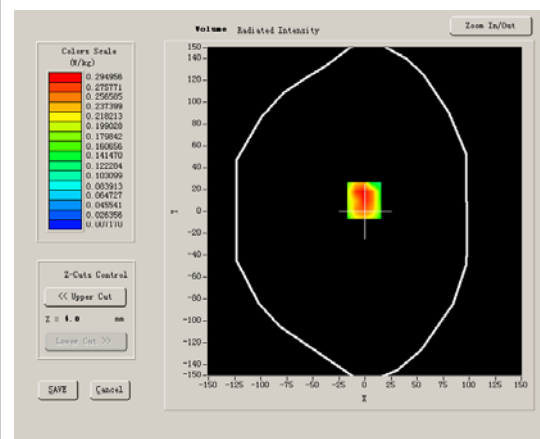
Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.280000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



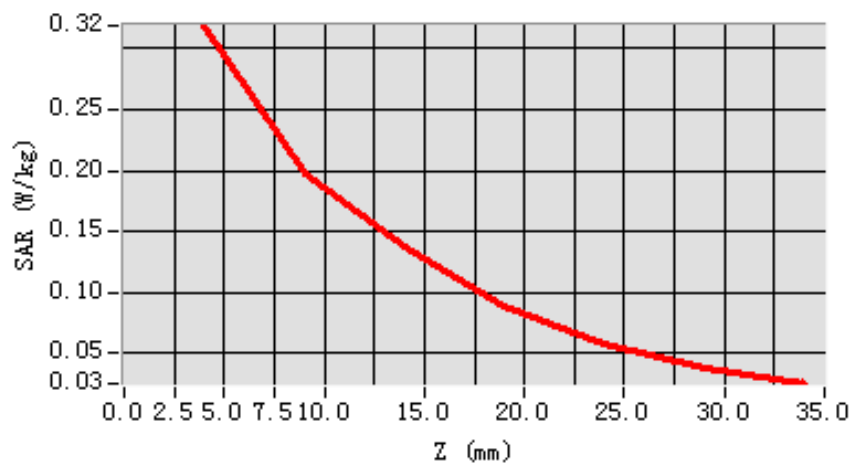
Maximum location: X=-1.00, Y=10.00

SAR 10g (W/Kg)	0.188169
SAR 1g (W/Kg)	0.308183

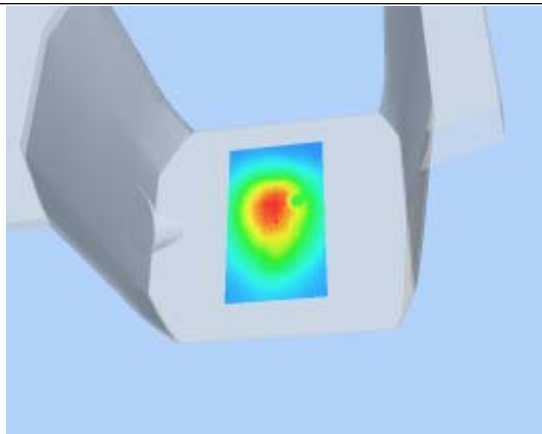
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3190	0.1978	0.1379	0.0893	0.0574	0.0380

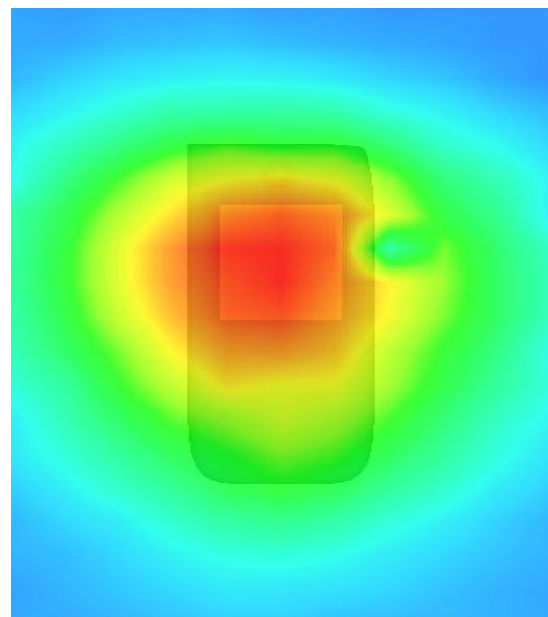
SAR, Z Axis Scan (X = -1, Y = 10)



3D scene shot



Hot spot position



MEASUREMENT 2

Type: Phone measurement (Complete)

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

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

Date of measurement: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

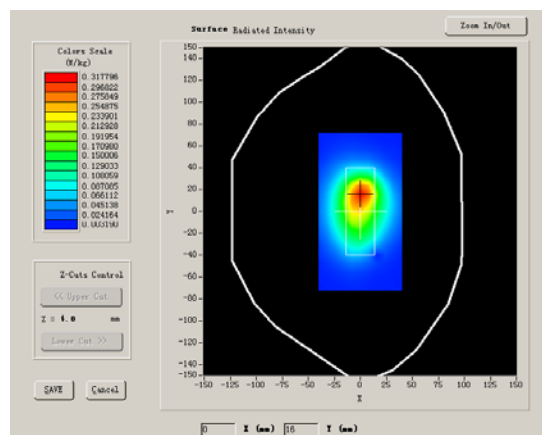
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

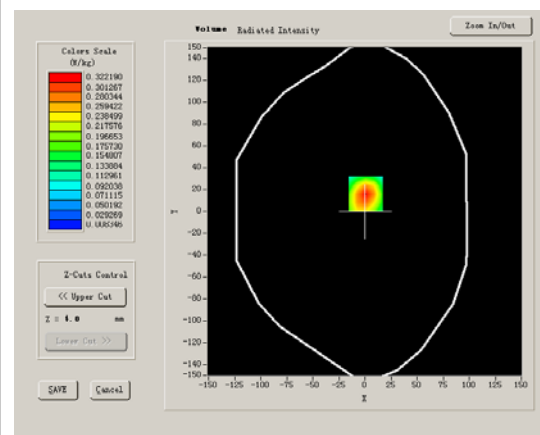
Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-2.590000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



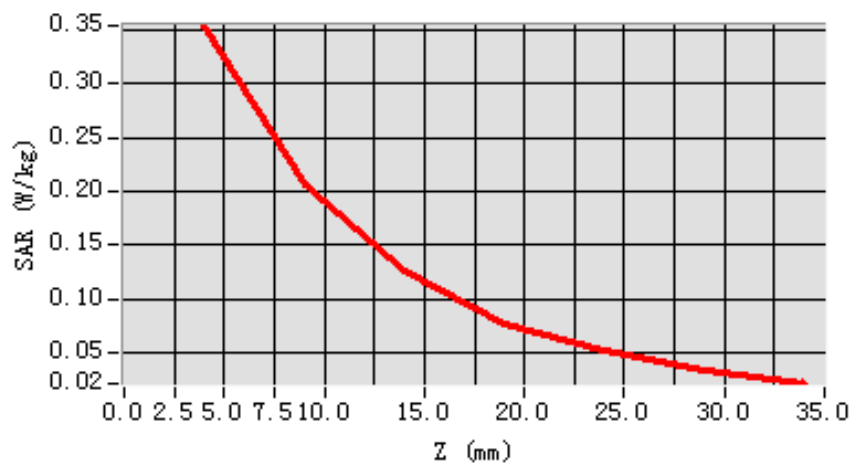
Maximum location: X=1.00, Y=16.00

SAR 10g (W/Kg)	0.195088
SAR 1g (W/Kg)	0.333927

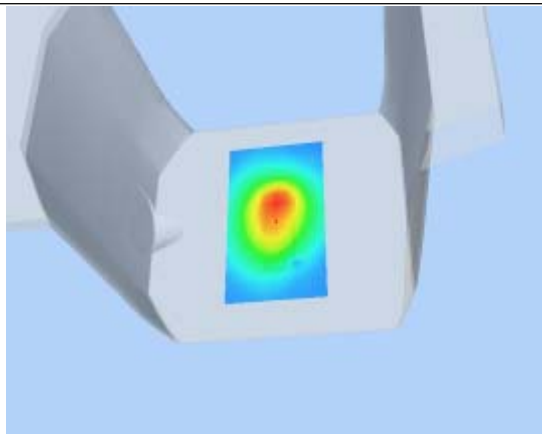
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3537	0.2058	0.1260	0.0776	0.0532	0.0339

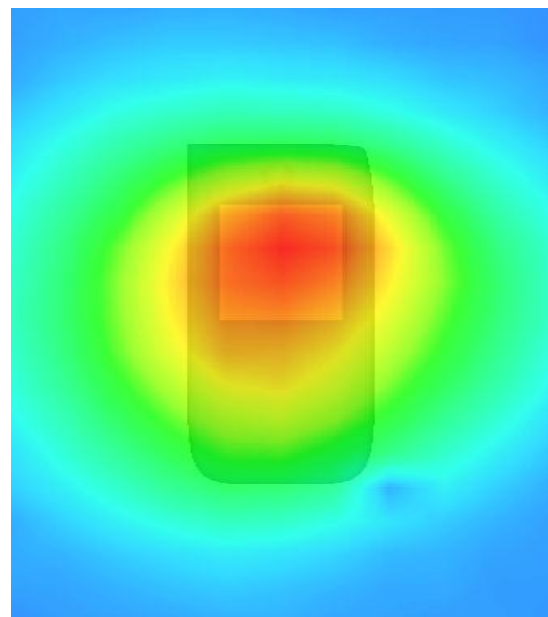
SAR, Z Axis Scan (X = 1, Y = 16)



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: 20/7/2012

Measurement duration: 9 minutes 9 seconds

A. Experimental conditions.

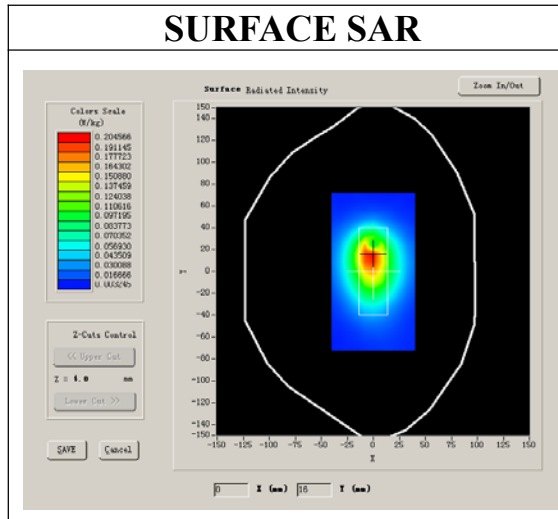
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

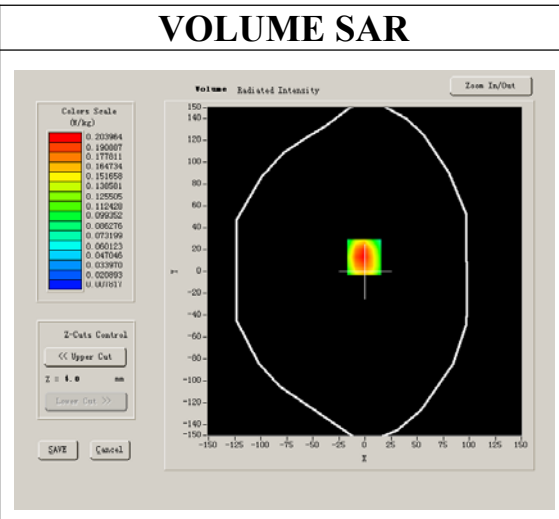
Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.690000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



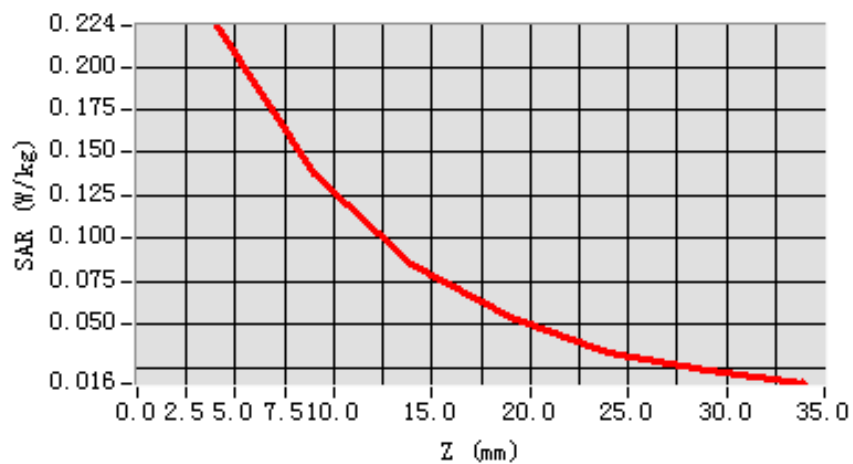
Maximum location: X=-1.00, Y=13.00

SAR 10g (W/Kg)	0.125843
SAR 1g (W/Kg)	0.235774

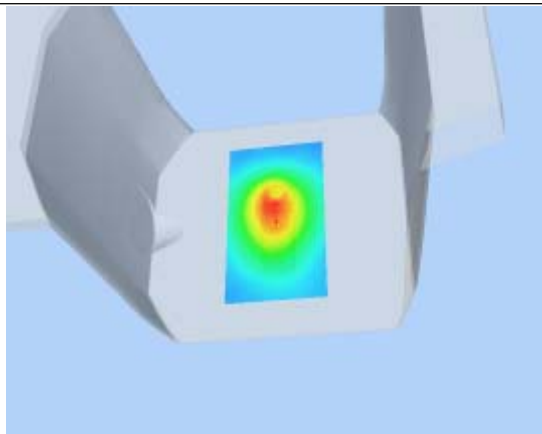
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2239	0.1371	0.0847	0.0536	0.0341	0.0233

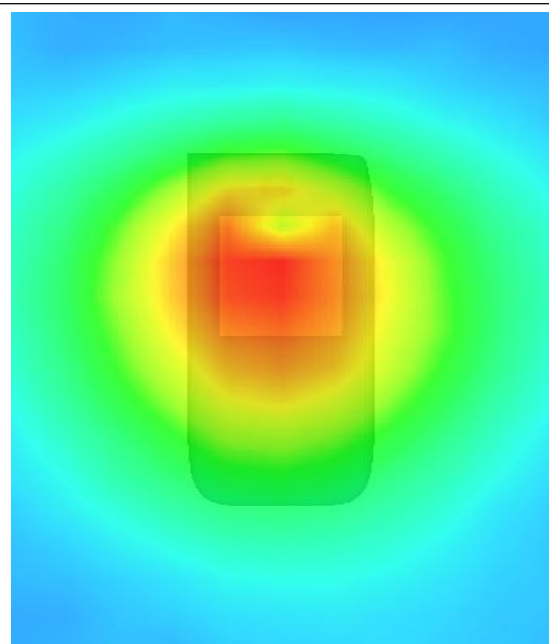
SAR, Z Axis Scan (X = -1, Y = 13)



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: 20/7/2012

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

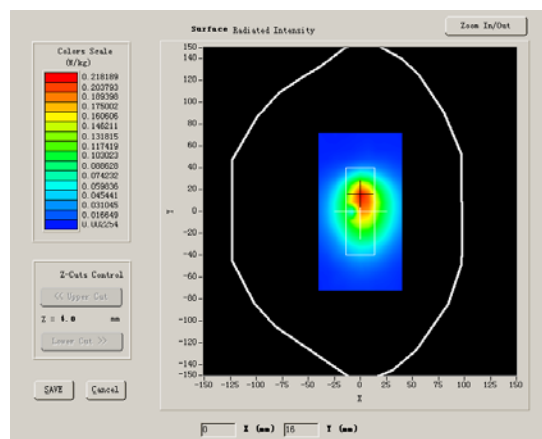
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

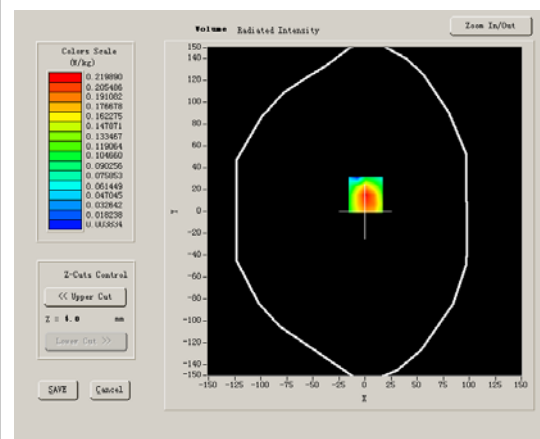
Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	0.310000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



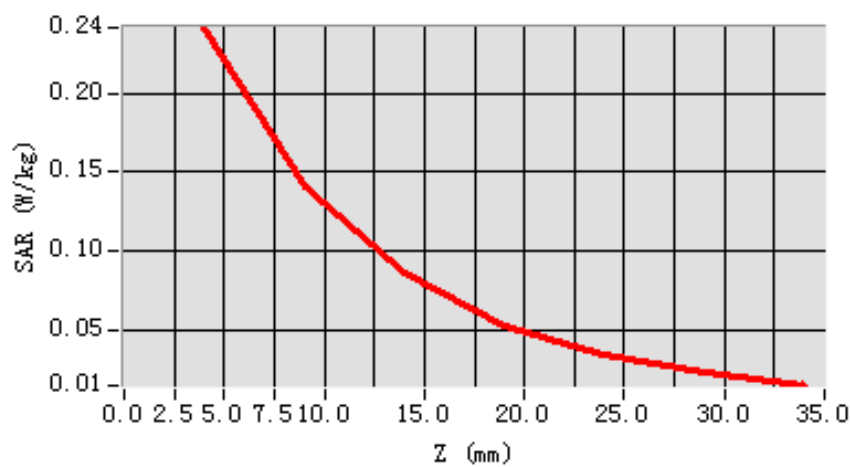
Maximum location: X=1.00, Y=15.00

SAR 10g (W/Kg)	0.132803
SAR 1g (W/Kg)	0.228277

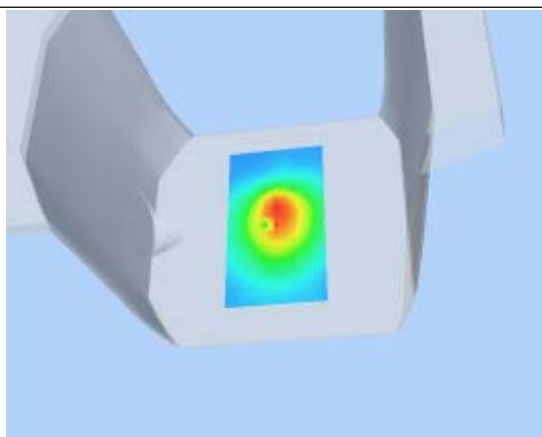
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2414	0.1399	0.0859	0.0528	0.0335	0.0223

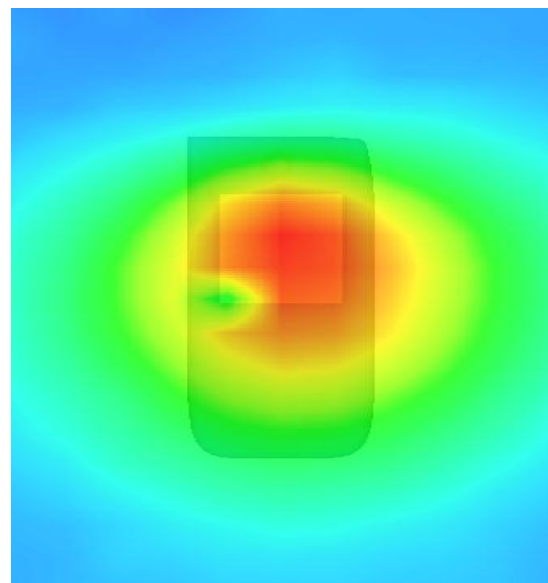
SAR, Z Axis Scan (X = 1, Y = 15)



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: 20/7/2012

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

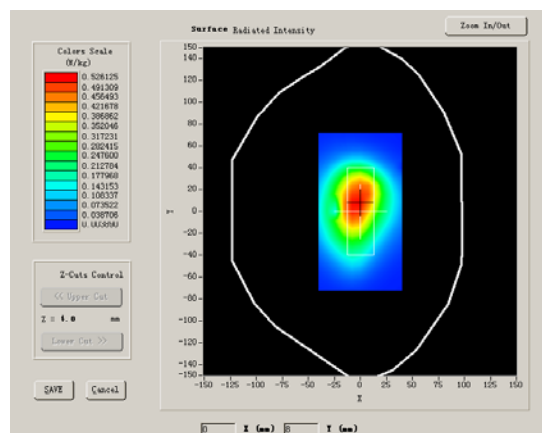
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

B. SAR Measurement Results

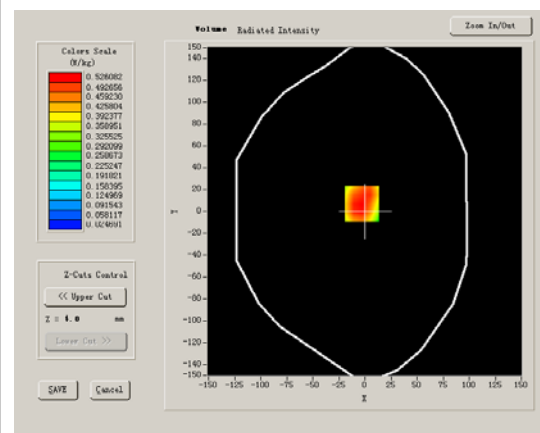
High Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.250000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



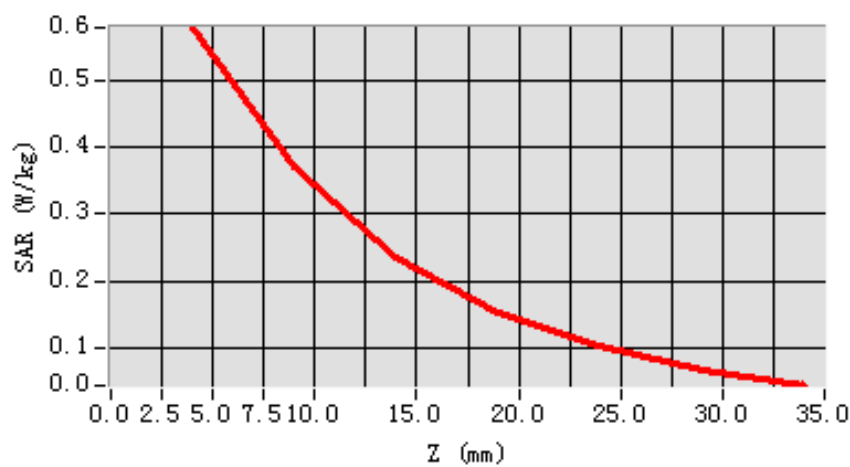
Maximum location: X=-3.00, Y=7.00

SAR 10g (W/Kg)	0.349518
SAR 1g (W/Kg)	0.564019

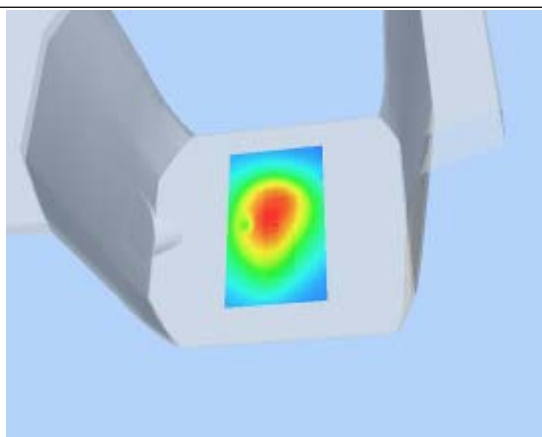
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5775	0.3714	0.2339	0.1542	0.1024	0.0670

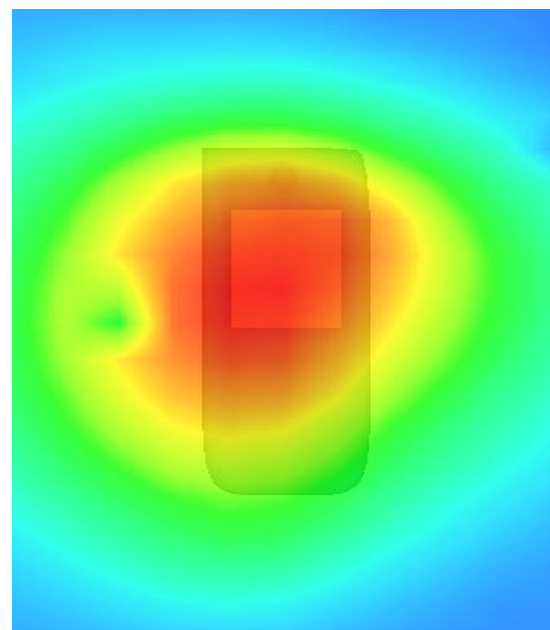
SAR, Z Axis Scan (X = -3, Y = 7)



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: 20/7/2012

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

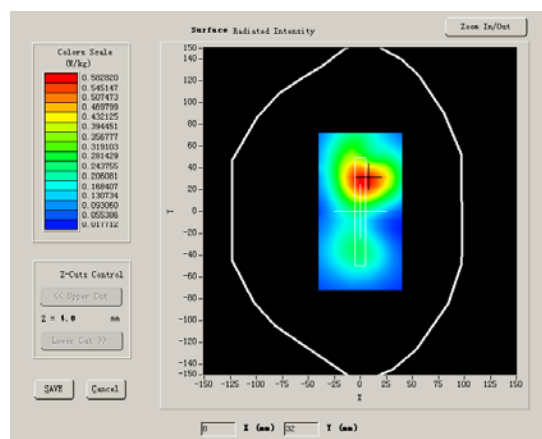
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

B. SAR Measurement Results

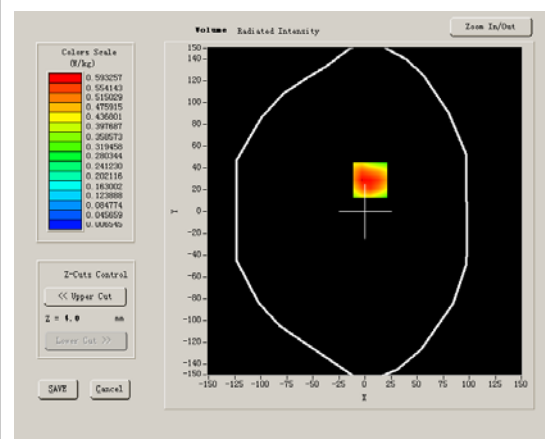
High Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.840000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



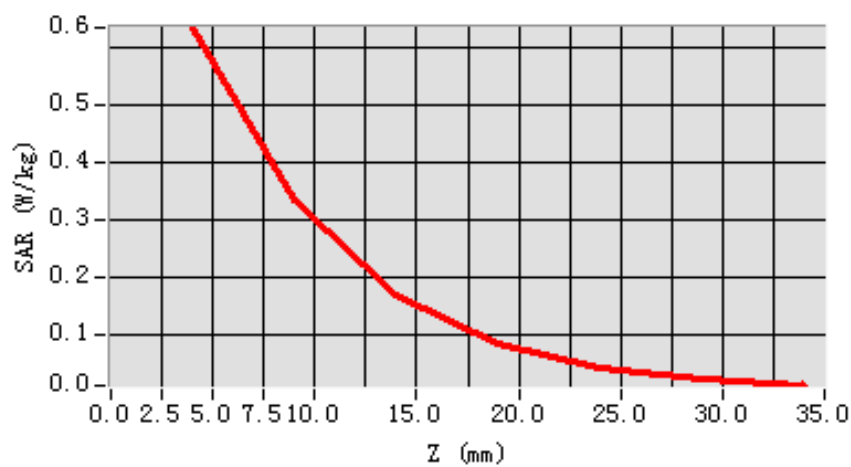
Maximum location: X=5.00, Y=29.00

SAR 10g (W/Kg)	0.337828
SAR 1g (W/Kg)	0.621266

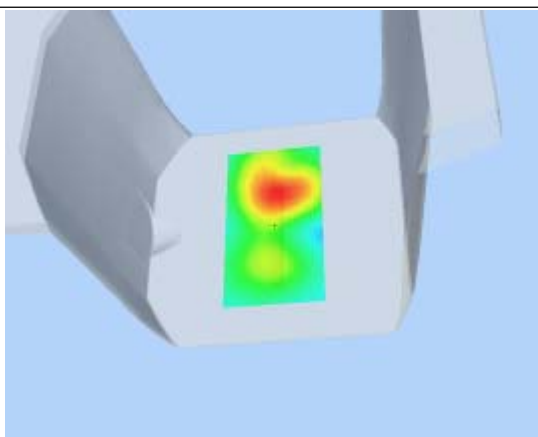
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6347	0.3332	0.1682	0.0848	0.0427	0.0236

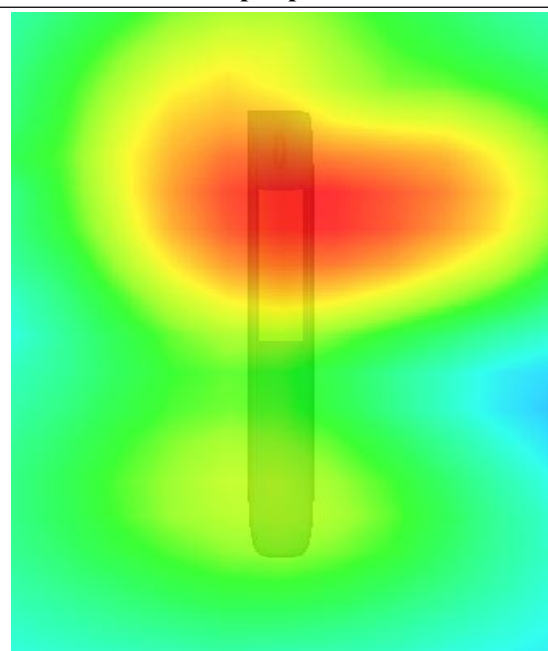
SAR, Z Axis Scan (X = 5, Y = 29)



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: 20/7/2012

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

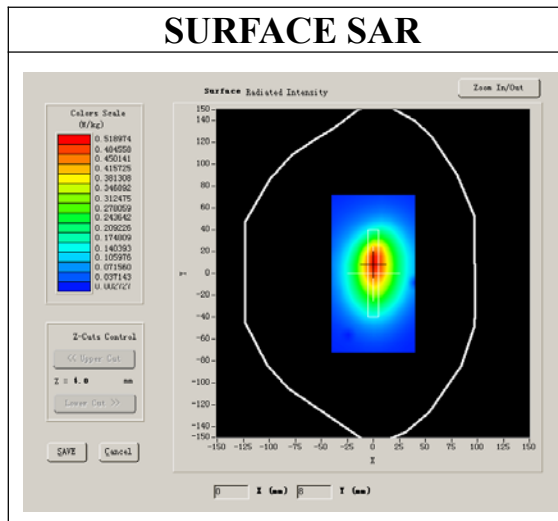
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

B. SAR Measurement Results

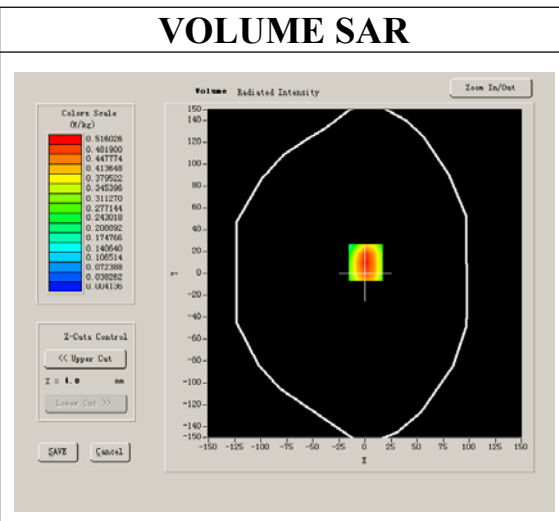
High Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-2.100000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



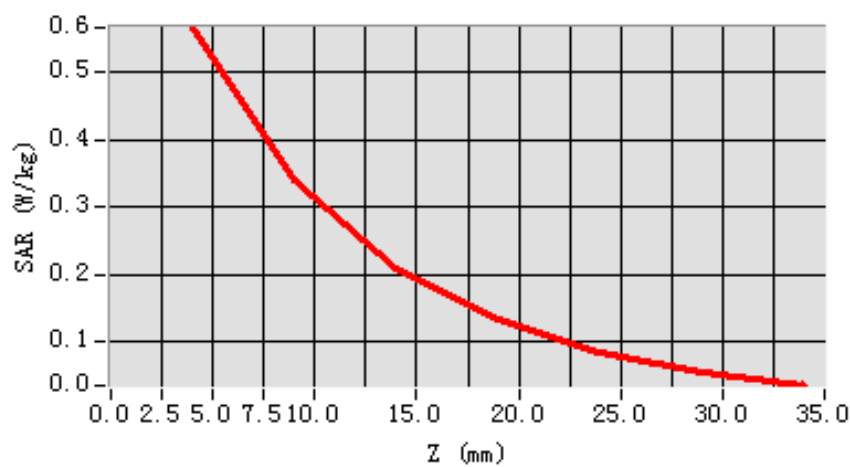
Maximum location: X=1.00, Y=10.00

SAR 10g (W/Kg)	0.315567
SAR 1g (W/Kg)	0.534371

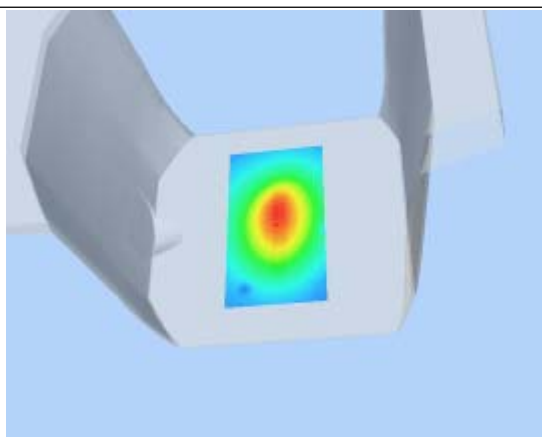
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5665	0.3387	0.2080	0.1324	0.0827	0.0546

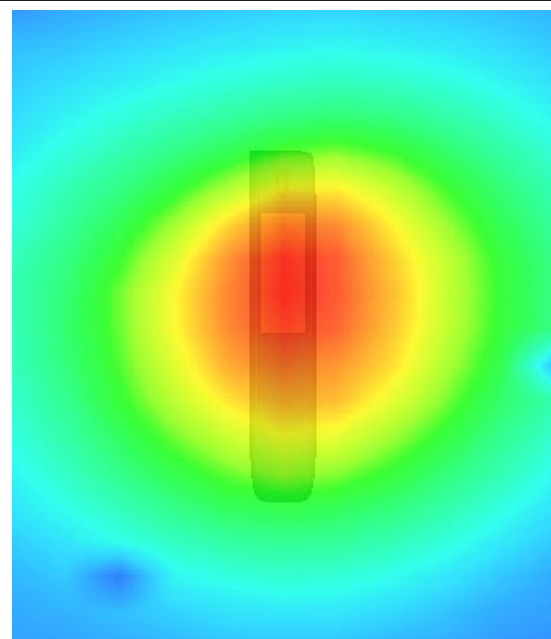
SAR, Z Axis Scan (X = 1, Y = 10)



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: 20/7/2012

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

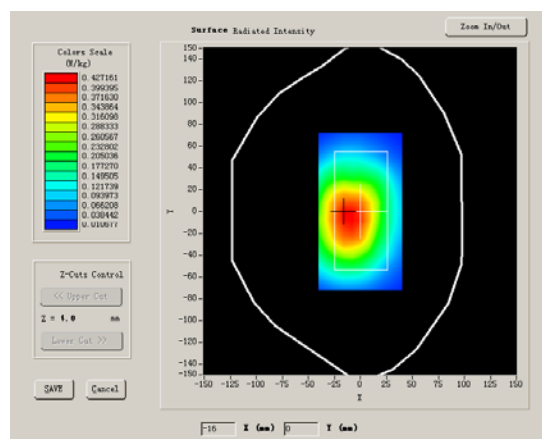
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

B. SAR Measurement Results

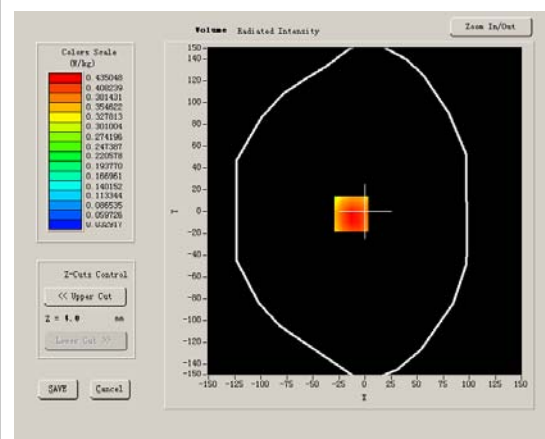
High Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	0.810000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



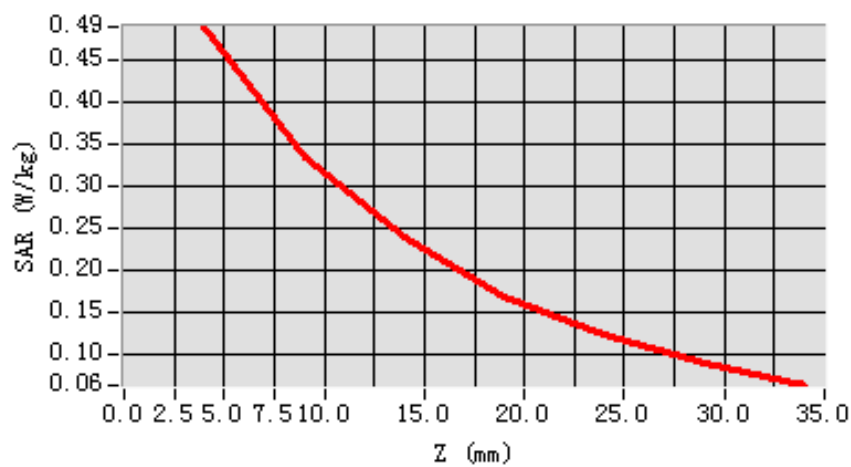
Maximum location: X=-13.00, Y=-2.00

SAR 10g (W/Kg)	0.326849
SAR 1g (W/Kg)	0.476199

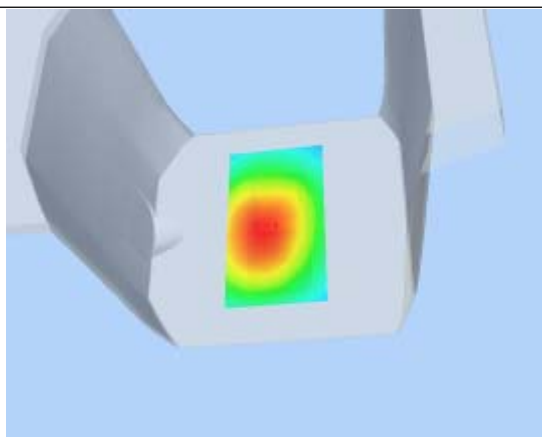
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4893	0.3357	0.2407	0.1702	0.1247	0.0896

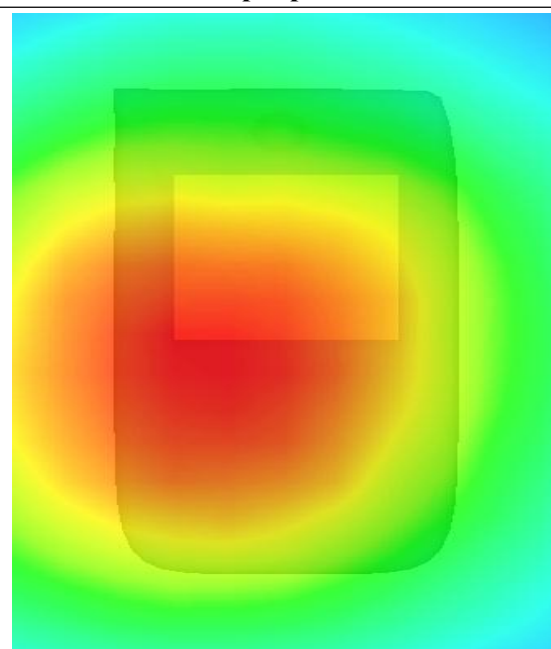
SAR, Z Axis Scan (X = -13, Y = -2)



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: 20/7/2012

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

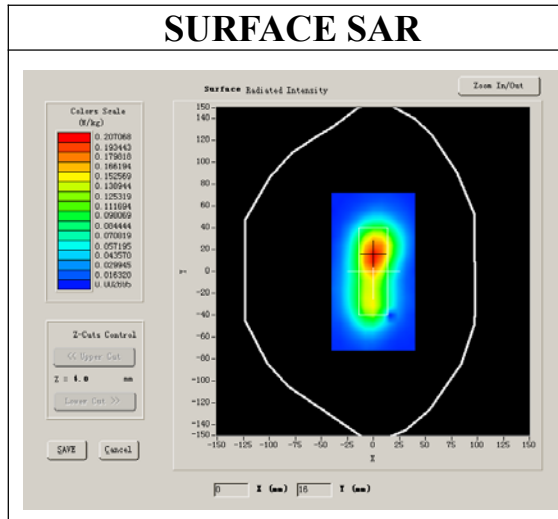
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

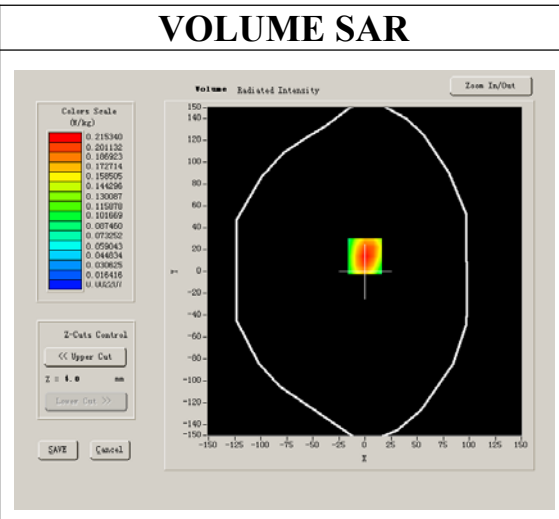
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.290000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



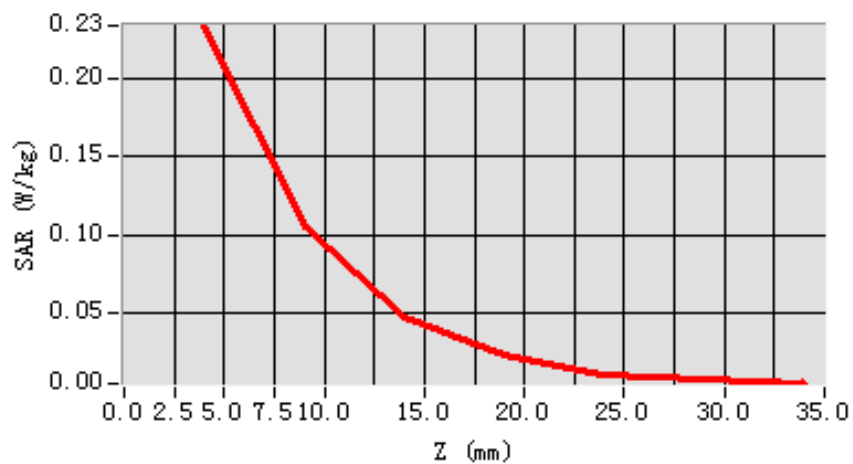
Maximum location: X=0.00, Y=14.00

SAR 10g (W/Kg)	0.114798
SAR 1g (W/Kg)	0.225001

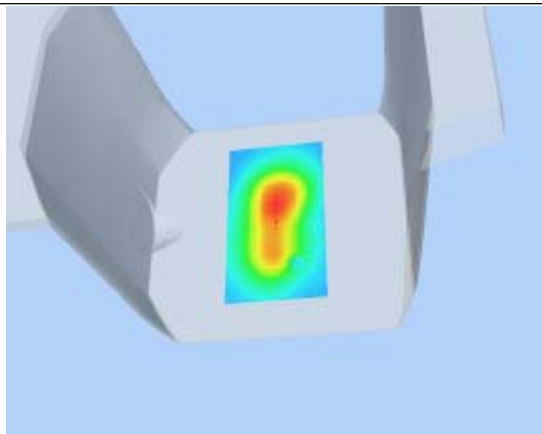
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2345	0.1047	0.0468	0.0226	0.0105	0.0068

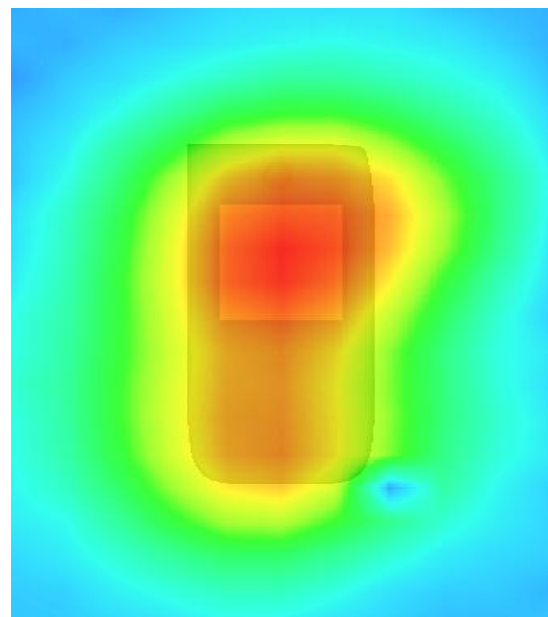
SAR, Z Axis Scan (X = 0, Y = 14)



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: 20/7/2012

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

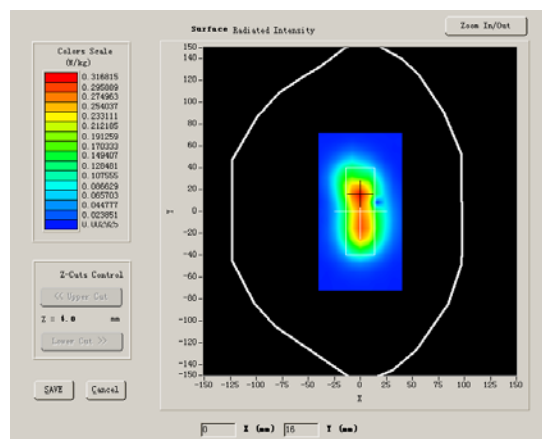
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

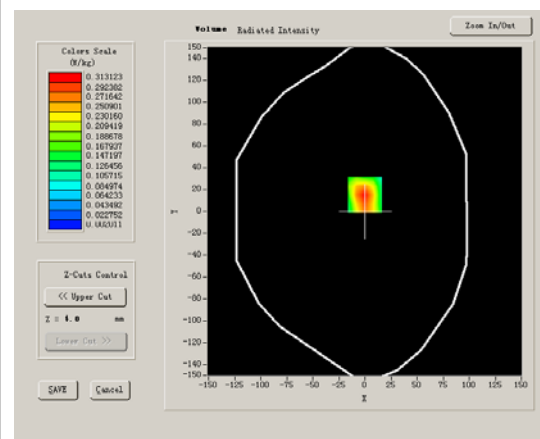
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-3.010000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



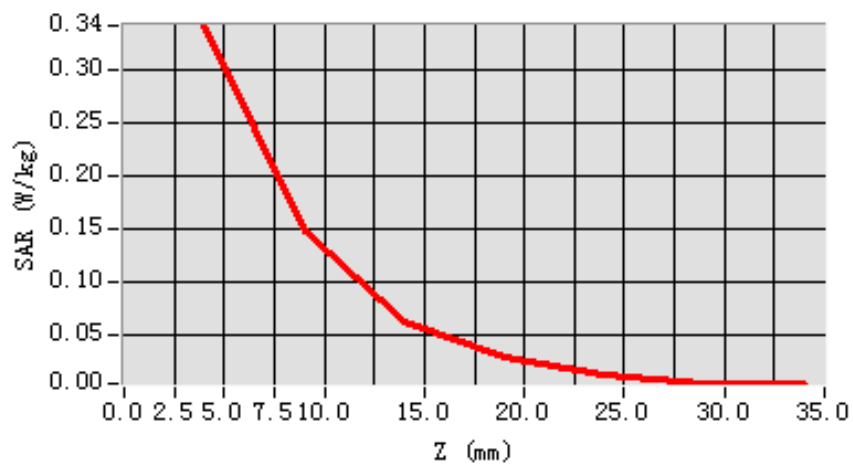
Maximum location: X=0.00, Y=15.00

SAR 10g (W/Kg)	0.160810
SAR 1g (W/Kg)	0.325023

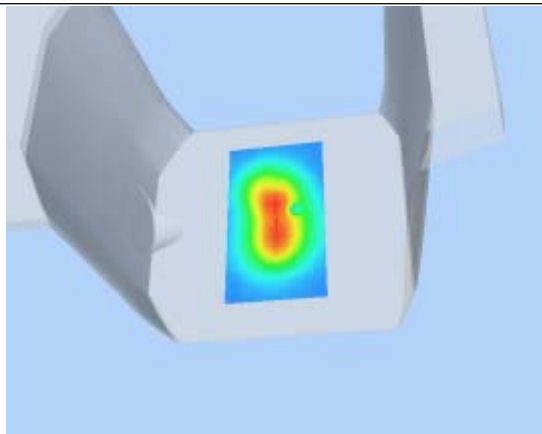
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3410	0.1475	0.0622	0.0289	0.0121	0.0049

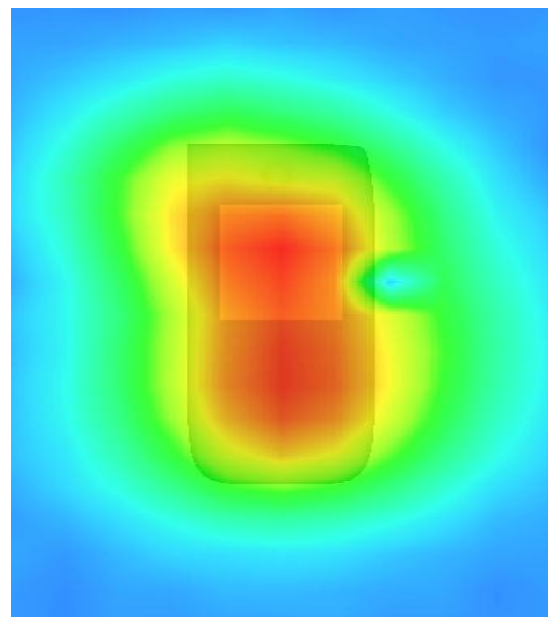
SAR, Z Axis Scan (X = 0, Y = 15)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

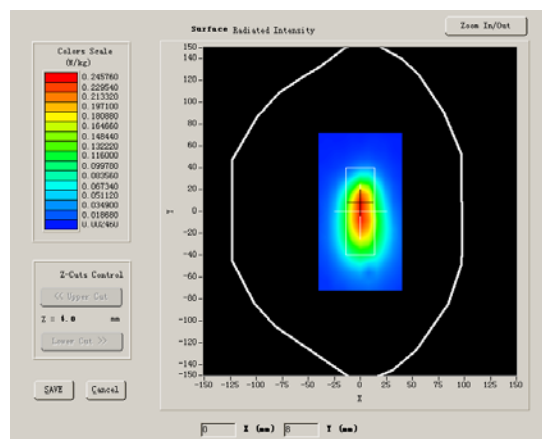
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

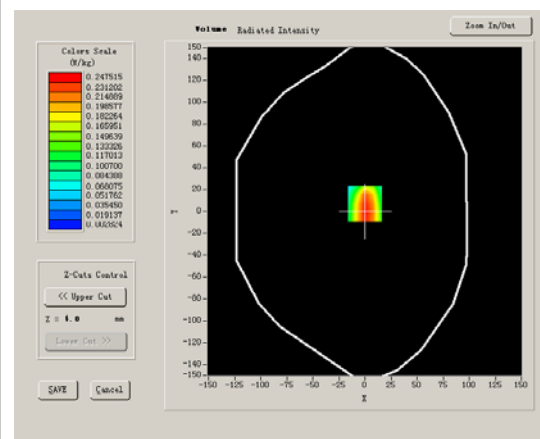
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	1.270000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



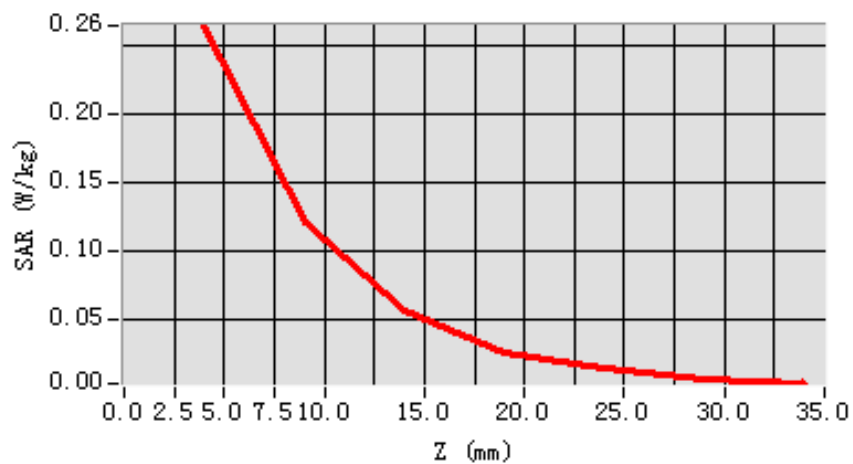
Maximum location: X=0.00, Y=7.00

SAR 10g (W/Kg)	0.131710
SAR 1g (W/Kg)	0.255541

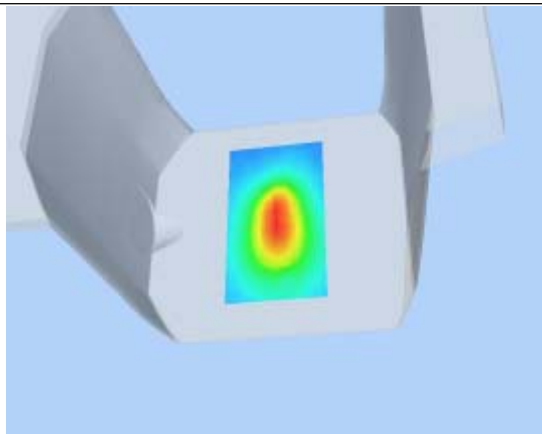
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2649	0.1216	0.0568	0.0266	0.0145	0.0064

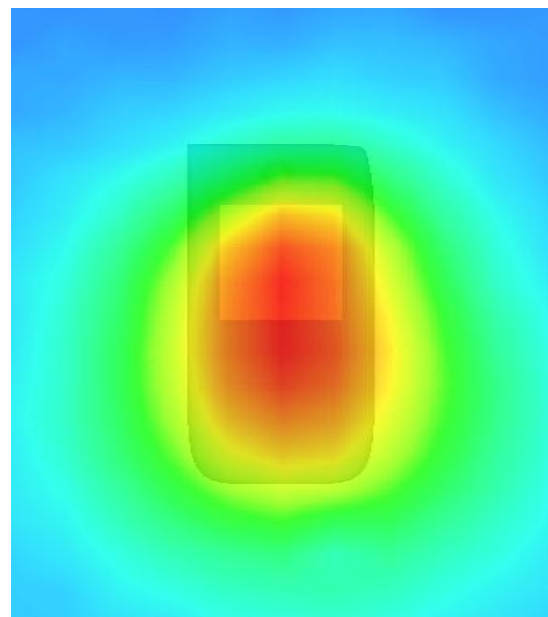
SAR, Z Axis Scan (X = 0, Y = 7)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

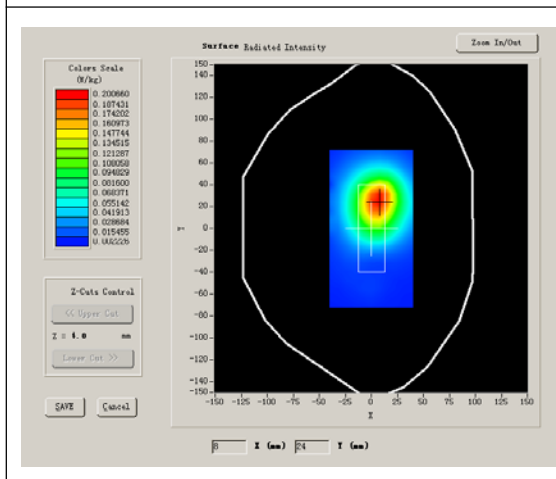
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

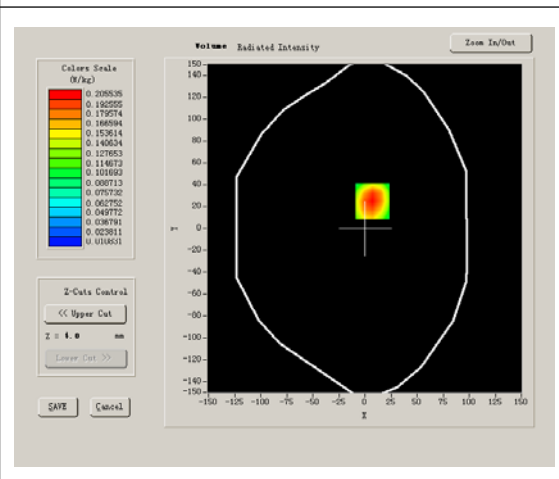
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.050000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



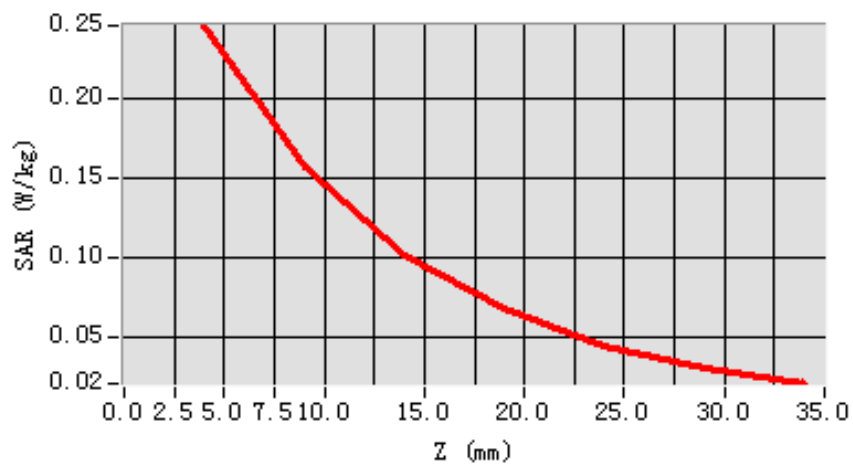
Maximum location: X=7.00, Y=25.00

SAR 10g (W/Kg)	0.144013
SAR 1g (W/Kg)	0.235114

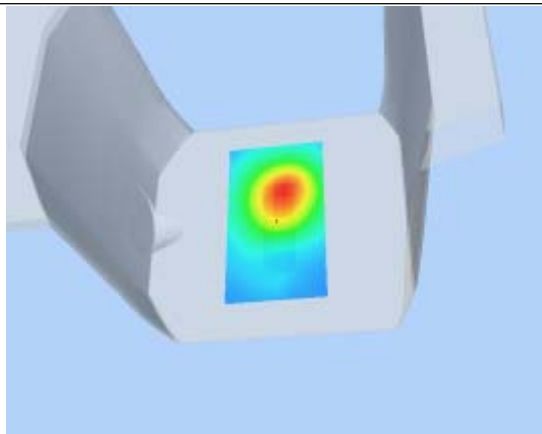
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2467	0.1571	0.1019	0.0672	0.0444	0.0308

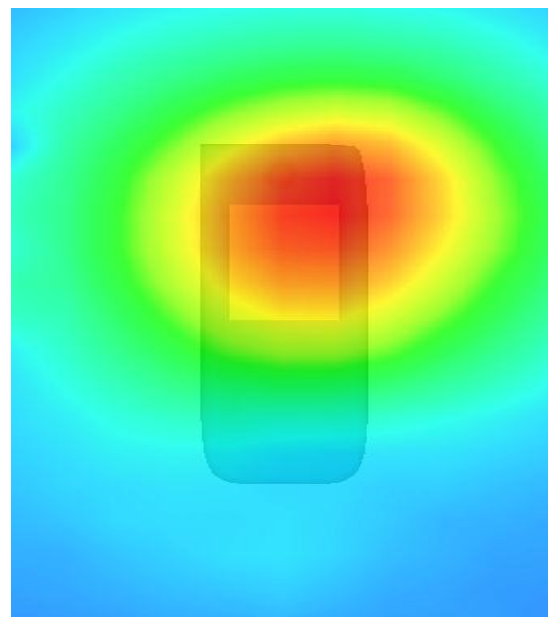
SAR, Z Axis Scan (X = 7, Y = 25)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

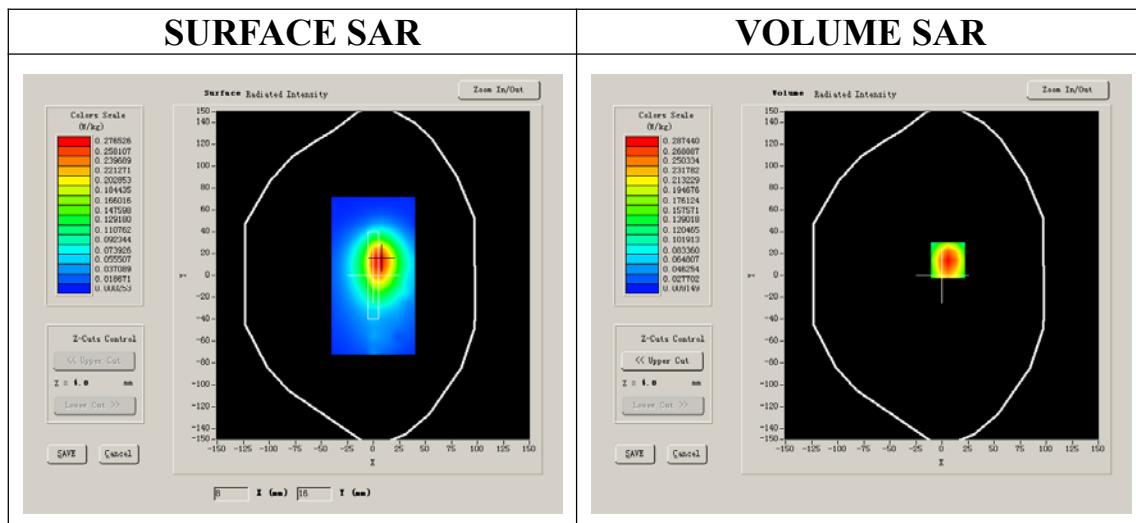
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.120000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2



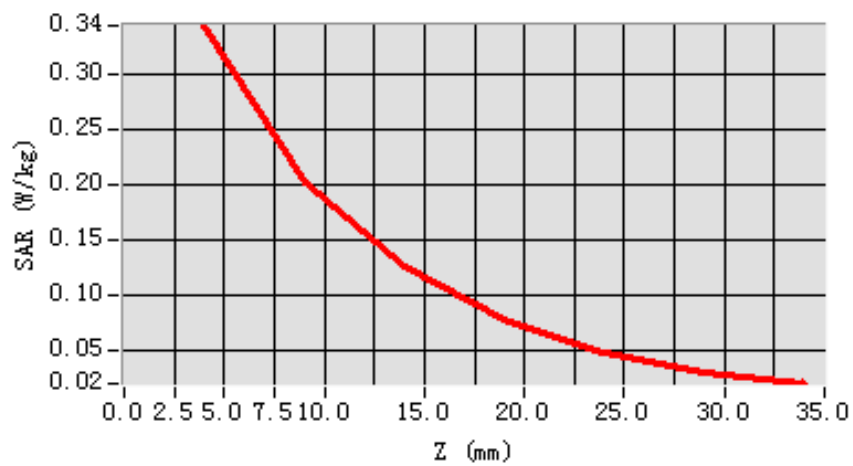
Maximum location: X=6.00, Y=14.00

SAR 10g (W/Kg)	0.190289
SAR 1g (W/Kg)	0.326644

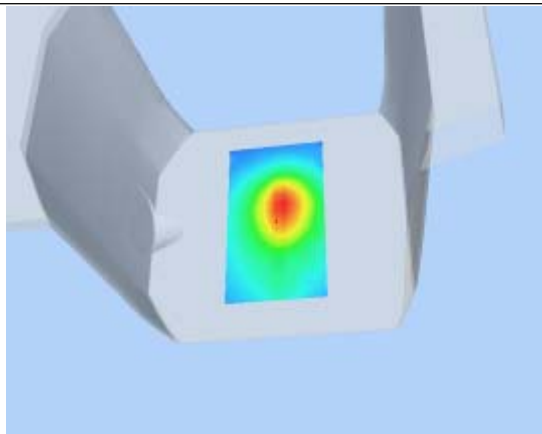
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3450	0.2029	0.1260	0.0780	0.0483	0.0305

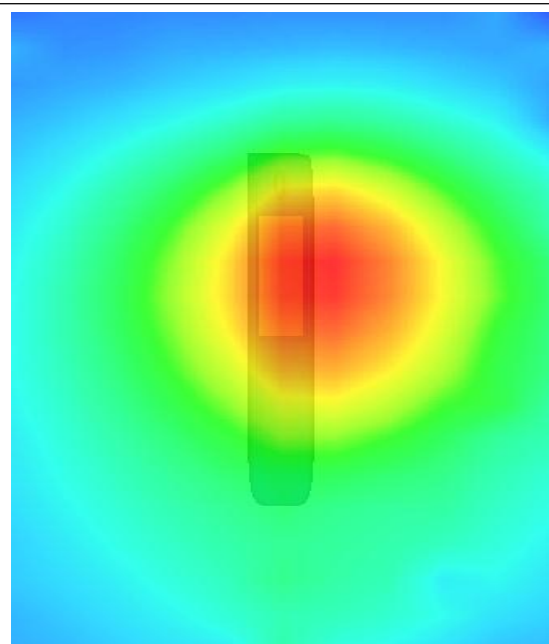
SAR, Z Axis Scan (X = 6, Y = 14)



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: 20/7/2012

Measurement duration: 9 minutes 9 seconds

A. Experimental conditions.

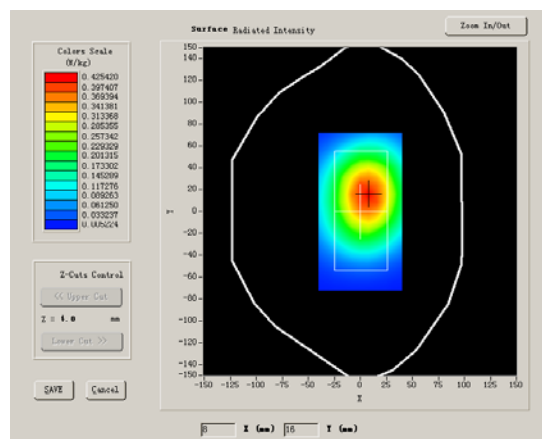
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	EDGE

B. SAR Measurement Results

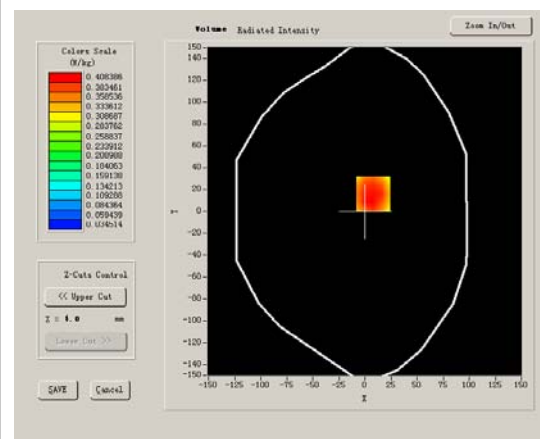
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.200000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



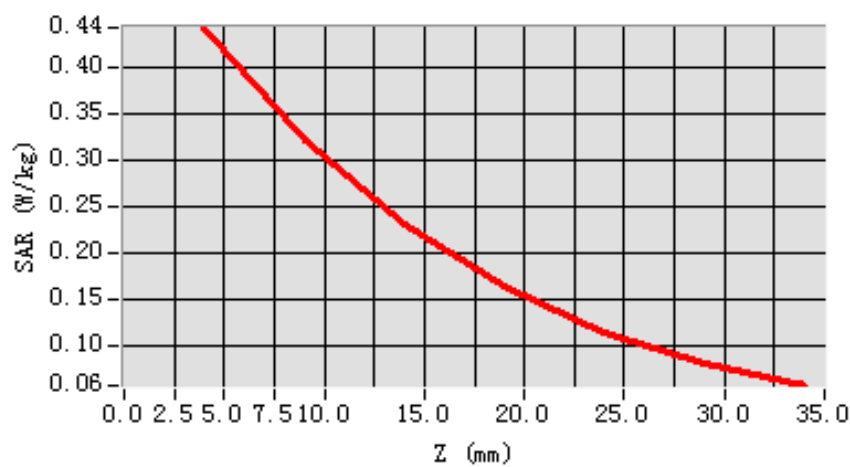
Maximum location: X=8.00, Y=16.00

SAR 10g (W/Kg)	0.300171
SAR 1g (W/Kg)	0.436802

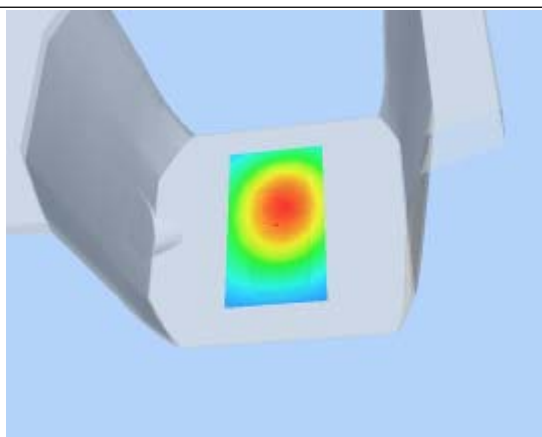
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4431	0.3217	0.2317	0.1653	0.1143	0.0806

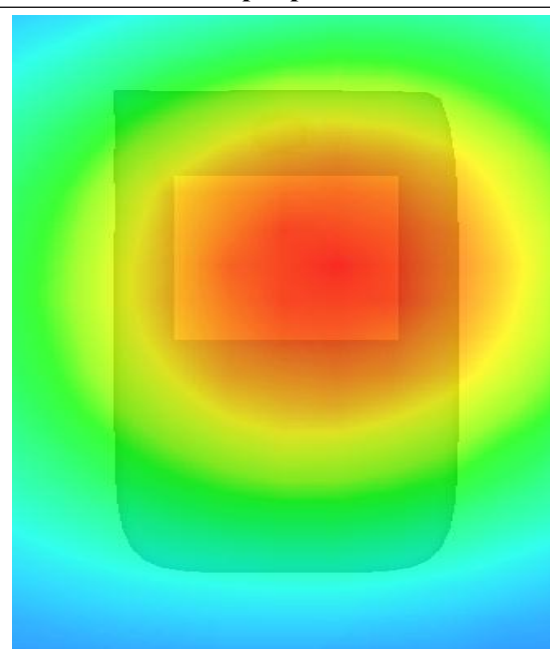
SAR, Z Axis Scan (X = 8, Y = 16)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

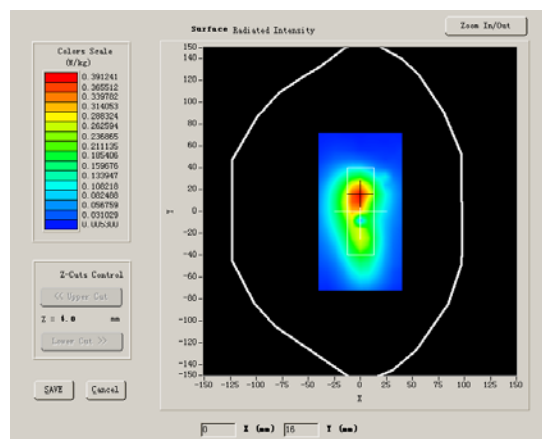
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	EDGE

B. SAR Measurement Results

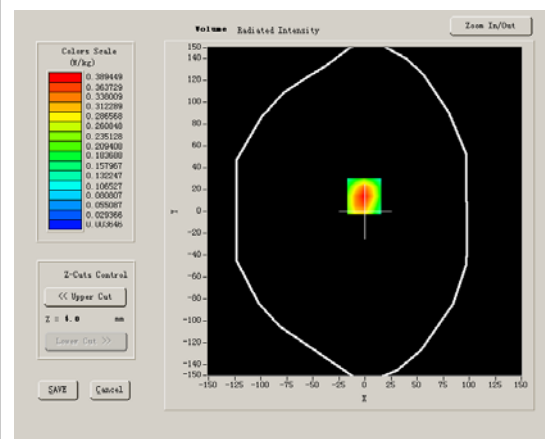
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.720000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



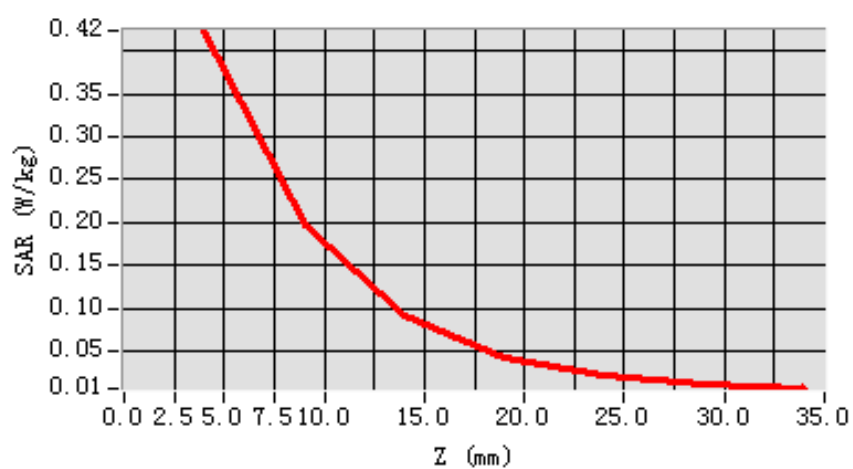
Maximum location: X=-1.00, Y=14.00

SAR 10g (W/Kg)	0.199764
SAR 1g (W/Kg)	0.425928

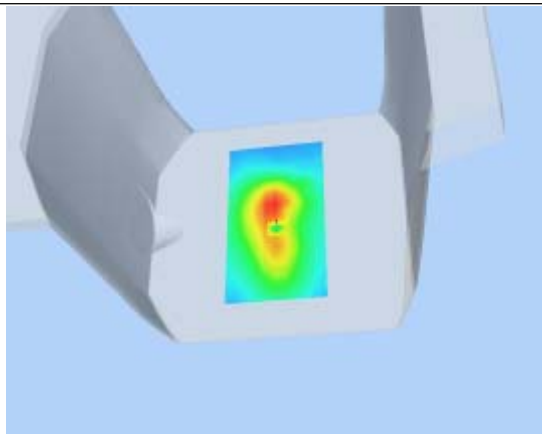
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4241	0.1963	0.0925	0.0436	0.0222	0.0108

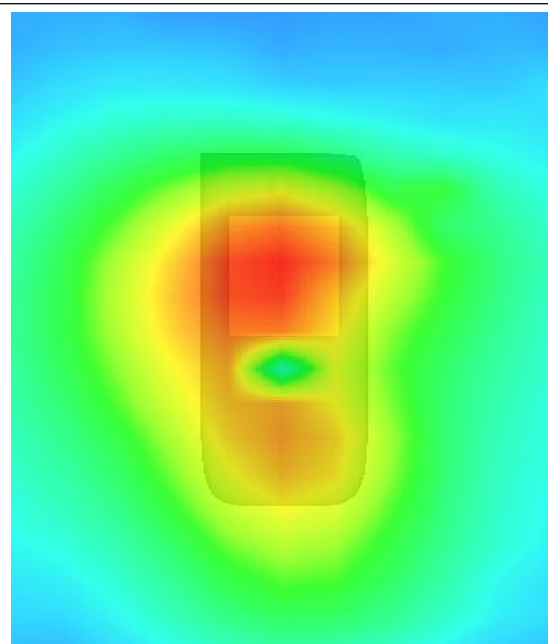
SAR, Z Axis Scan (X = -1, Y = 14)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

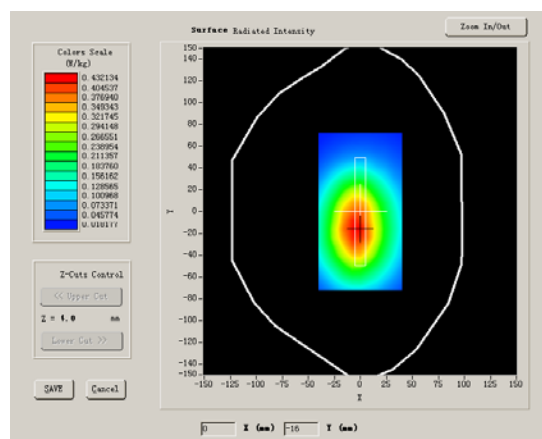
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	EDGE

B. SAR Measurement Results

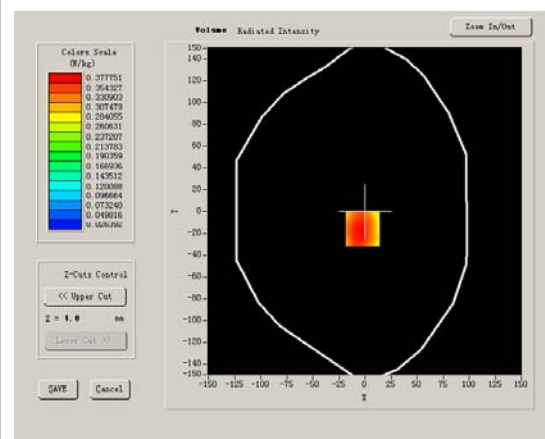
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.530000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



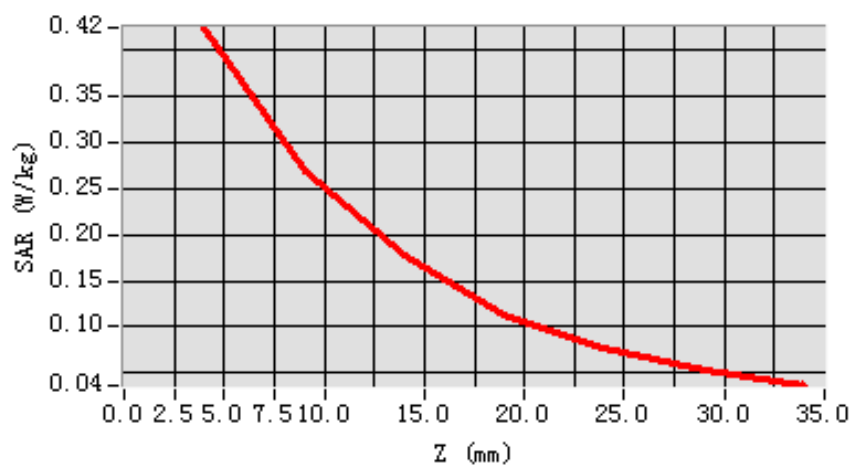
Maximum location: X=-2.00, Y=-16.00

SAR 10g (W/Kg)	0.264370
SAR 1g (W/Kg)	0.414649

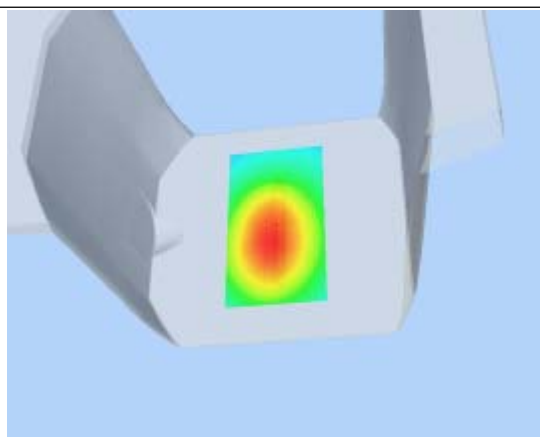
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4249	0.2686	0.1774	0.1134	0.0781	0.0536

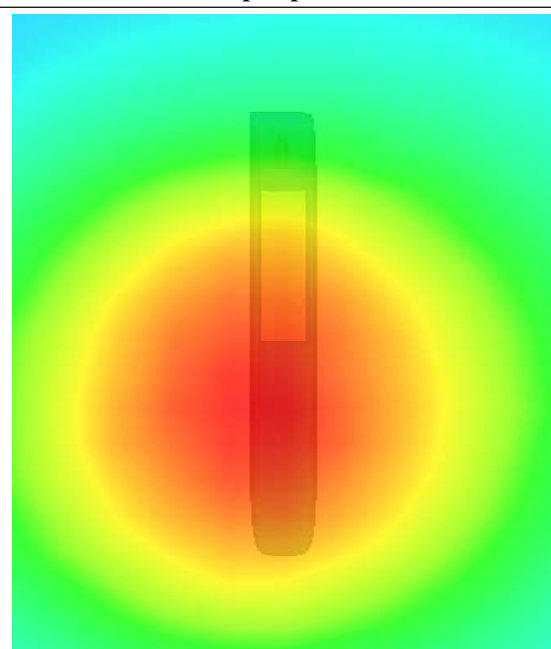
SAR, Z Axis Scan (X = -2, Y = -16)



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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

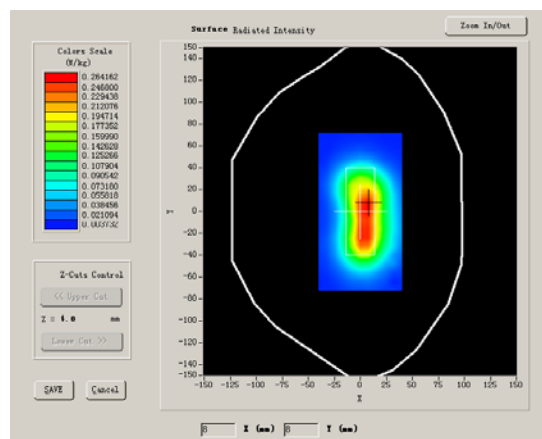
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

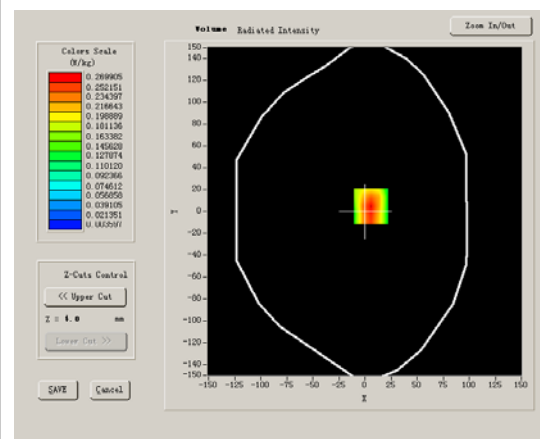
Middle Band SAR (Channel 4175):

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	0.390000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.1°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



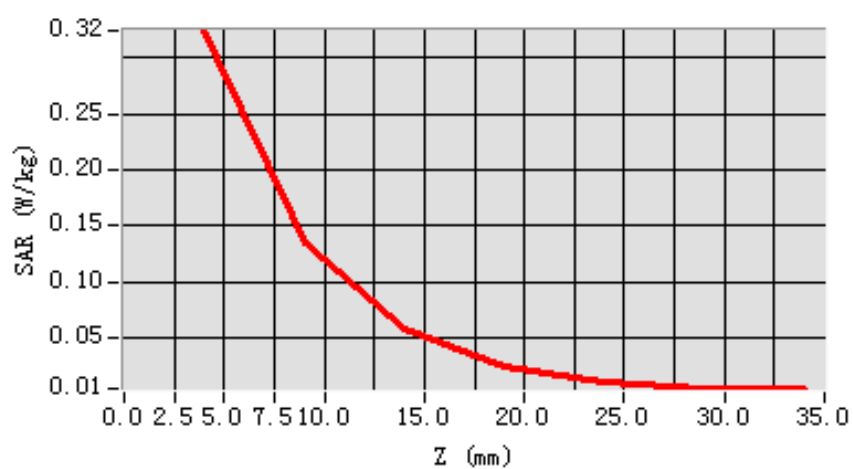
Maximum location: X=6.00, Y=5.00

SAR 10g (W/Kg)	0.155404
SAR 1g (W/Kg)	0.311329

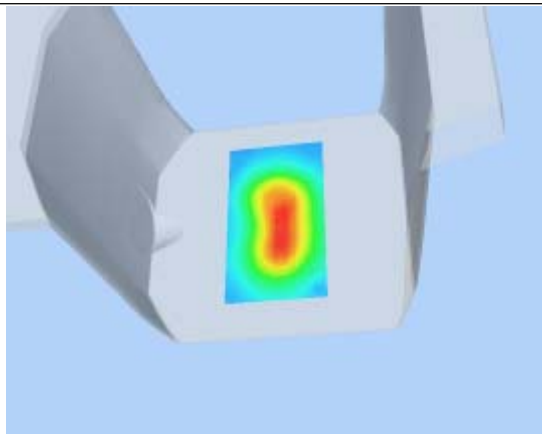
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3239	0.1347	0.0580	0.0255	0.0111	0.0059

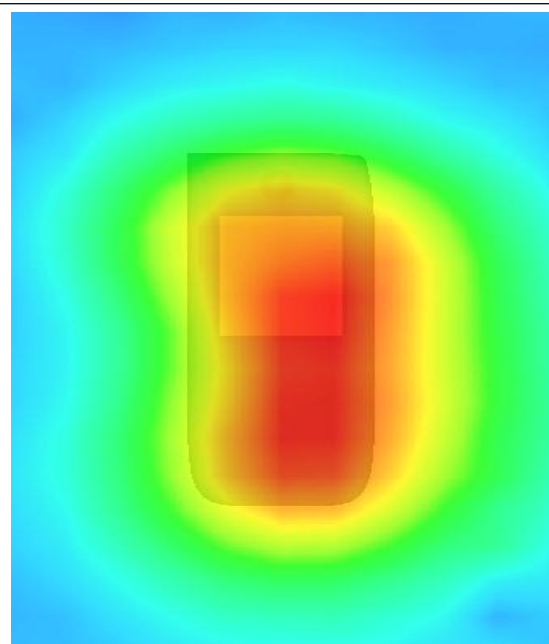
SAR, Z Axis Scan (X = 6, Y = 5)



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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

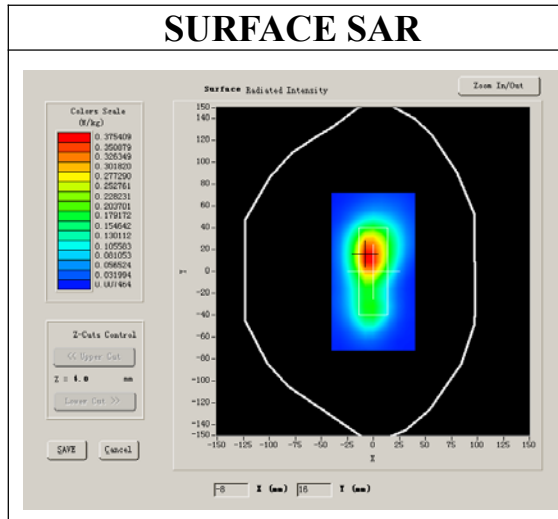
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

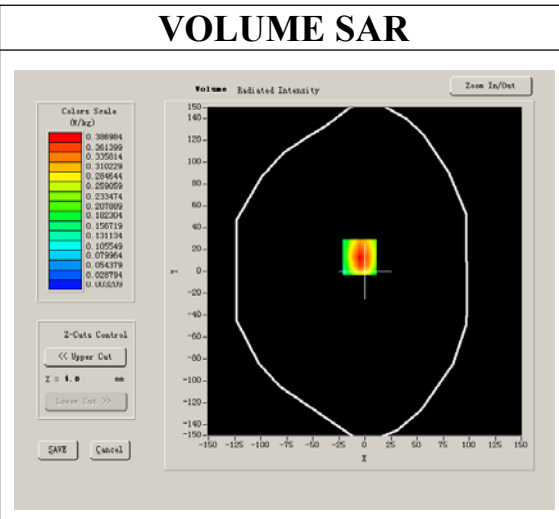
Middle Band SAR (Channel 4175):

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.890000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.8°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



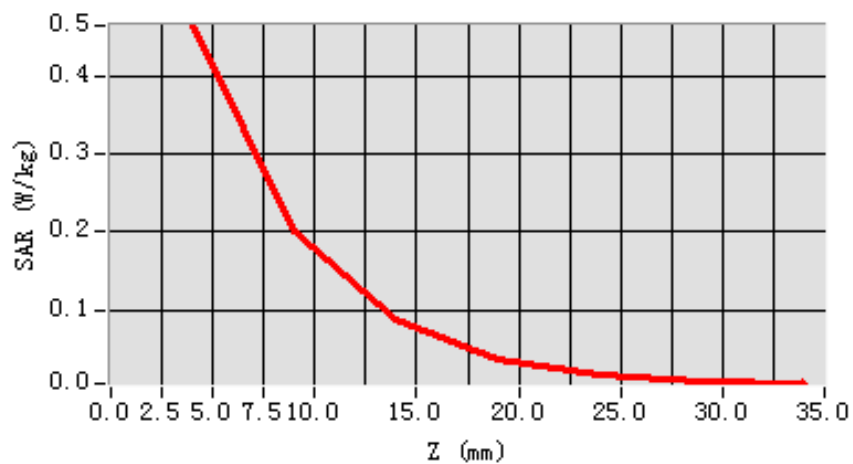
Maximum location: X=-5.00, Y=13.00

SAR 10g (W/Kg)	0.218790
SAR 1g (W/Kg)	0.444176

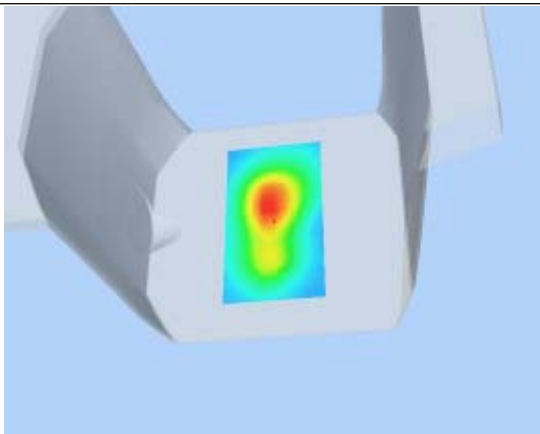
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4644	0.2010	0.0869	0.0373	0.0187	0.0098

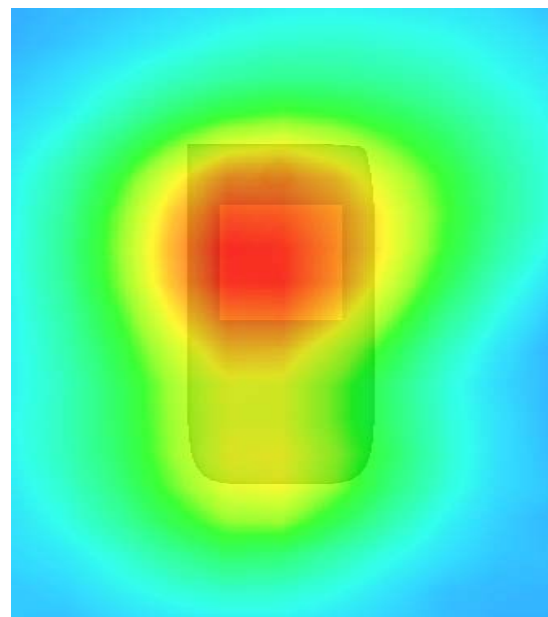
SAR, Z Axis Scan (X = -5, Y = 13)



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: 20/7/2012

Measurement duration: 9 minutes 4 seconds

A. Experimental conditions.

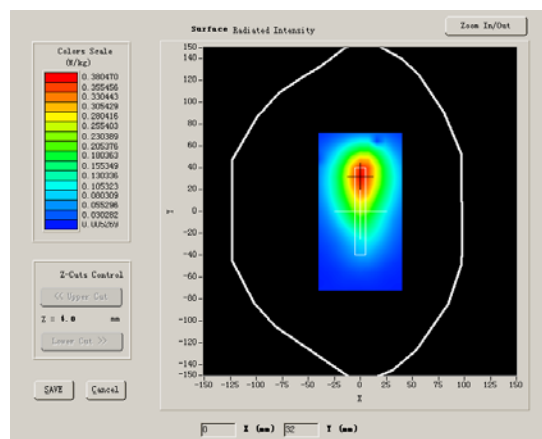
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

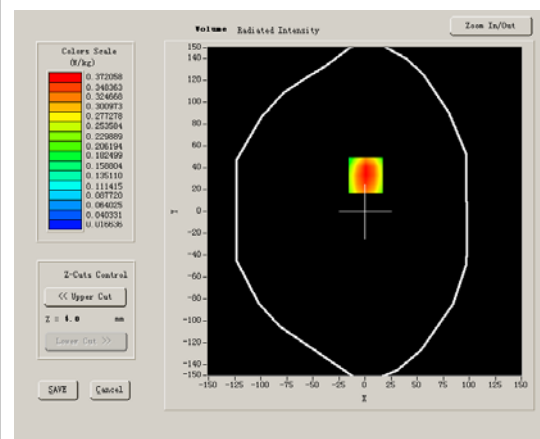
Middle Band SAR (Channel 4175):

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-1.780000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.8°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



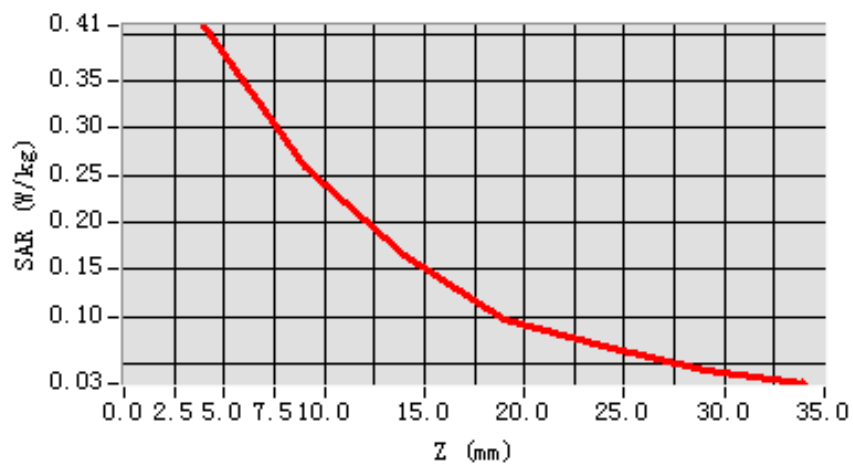
Maximum location: X=1.00, Y=33.00

SAR 10g (W/Kg)	0.237865
SAR 1g (W/Kg)	0.390918

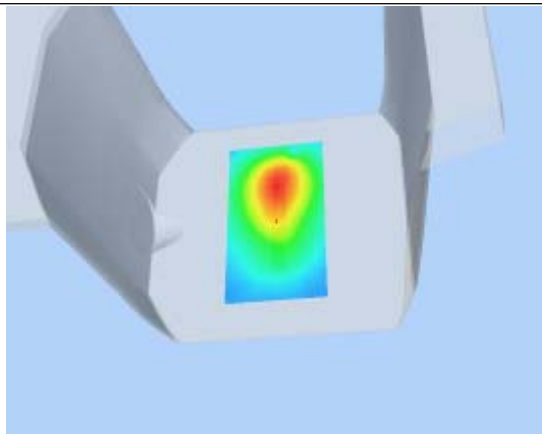
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4084	0.2592	0.1656	0.0967	0.0688	0.0437

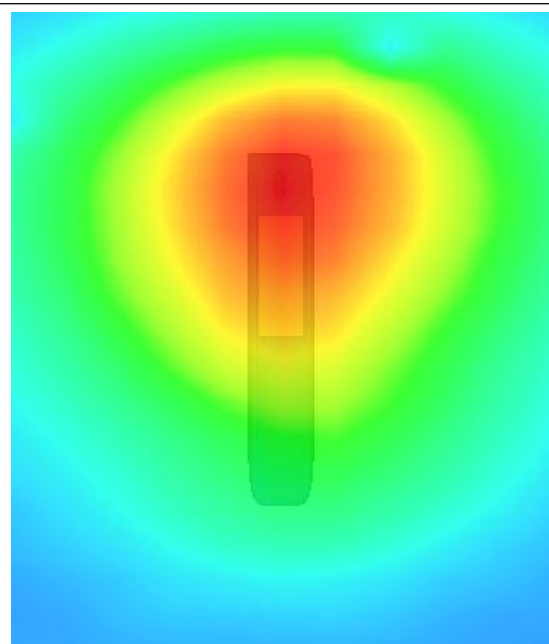
SAR, Z Axis Scan (X = 1, Y = 33)



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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

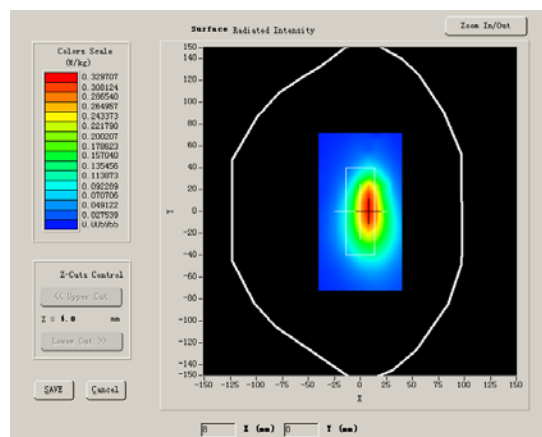
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

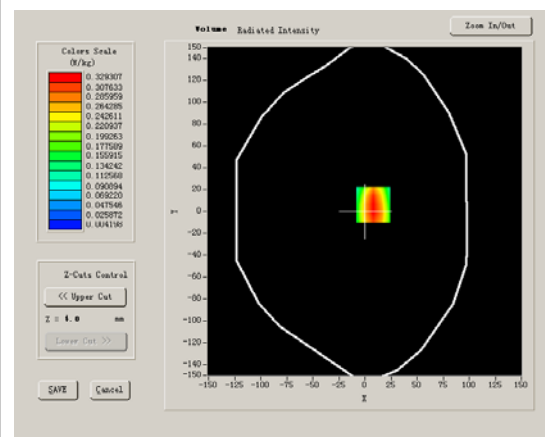
Middle Band SAR (Channel 4175):

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-2.070000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.8°C
ConvF:	28.559, 25.681, 27.588
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



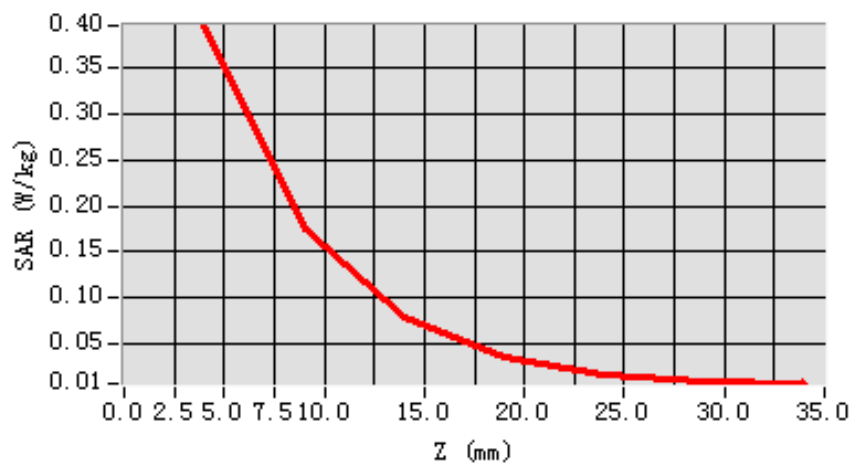
Maximum location: X=8.00, Y=6.00

SAR 10g (W/Kg)	0.190364
SAR 1g (W/Kg)	0.376270

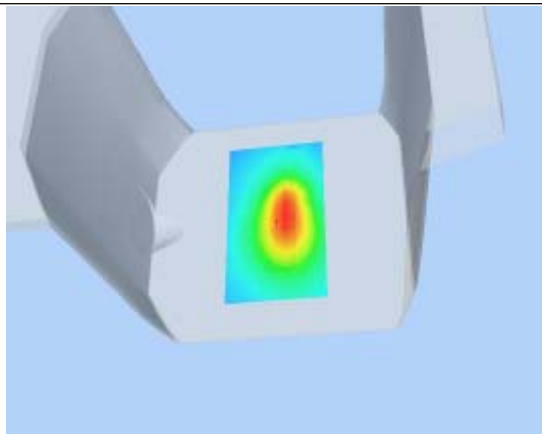
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3952	0.1756	0.0784	0.0371	0.0180	0.0100

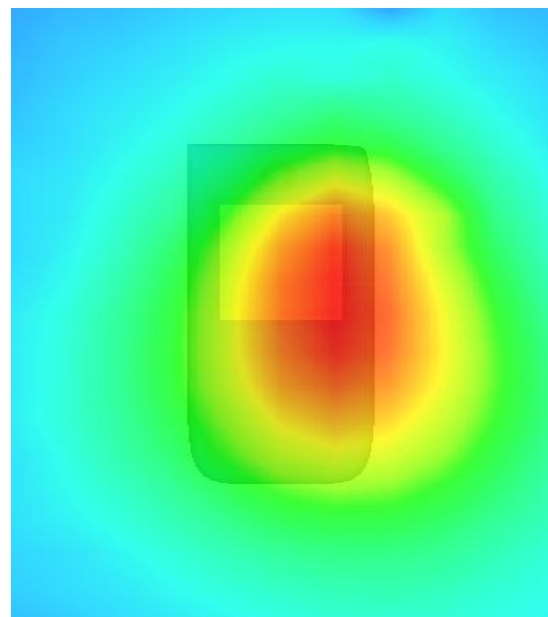
SAR, Z Axis Scan (X = 8, Y = 6)



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: 20/7/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

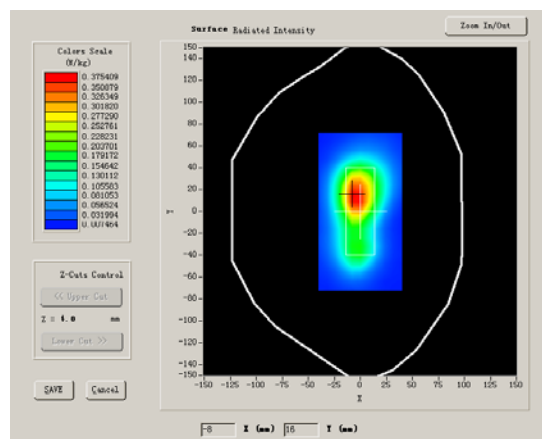
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

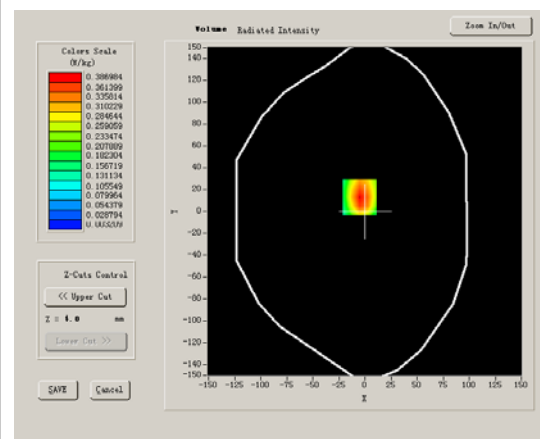
Middle Band SAR (Channel 9400):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.000000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



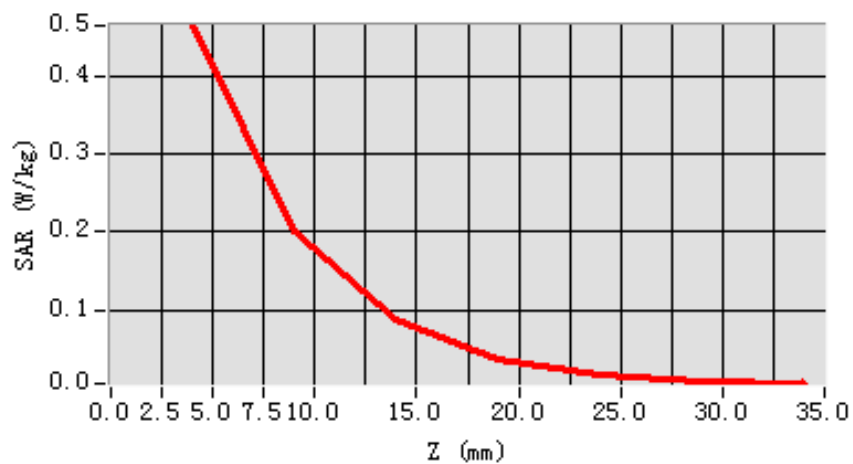
Maximum location: X=-5.00, Y=13.00

SAR 10g (W/Kg)	0.294622
SAR 1g (W/Kg)	0.574383

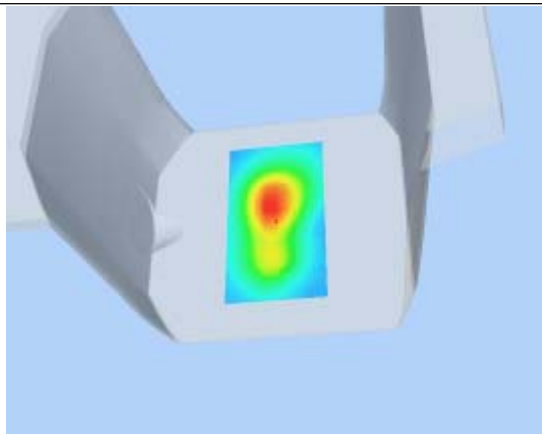
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4644	0.2010	0.0869	0.0373	0.0187	0.0098

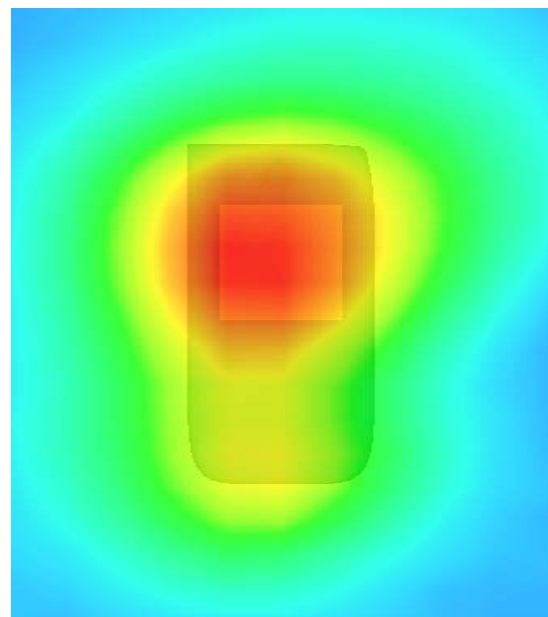
SAR, Z Axis Scan (X = -5, Y = 13)



3D sceen shot



Hot spot position



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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

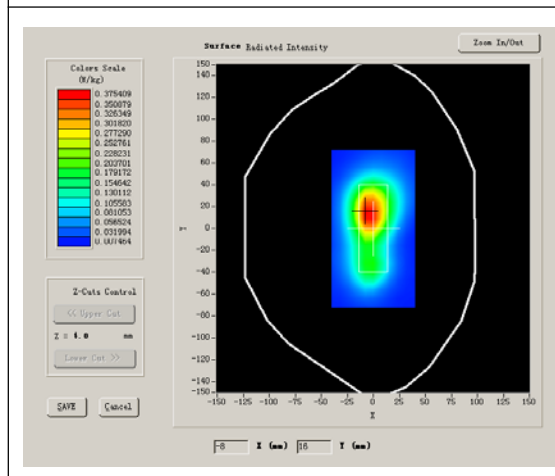
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

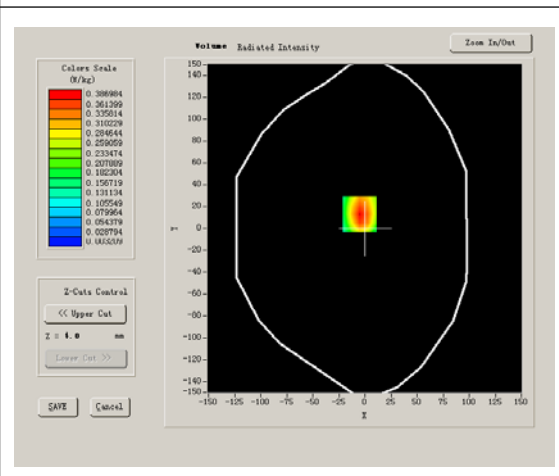
Middle Band SAR (Channel 9400):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.960000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



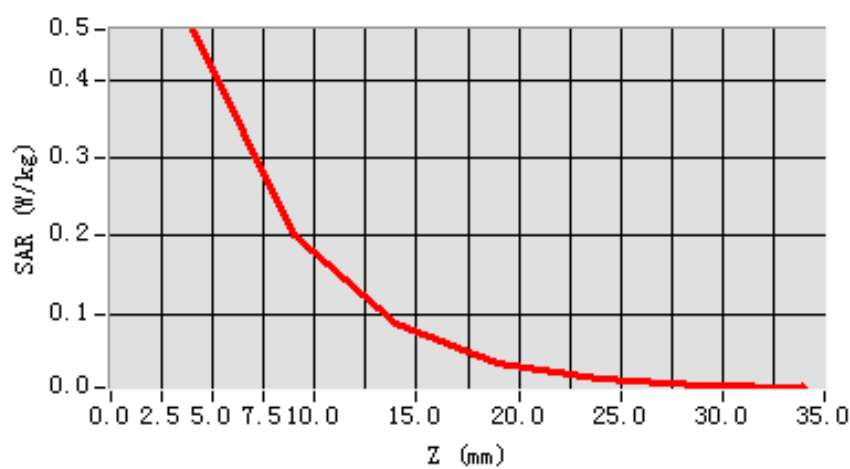
Maximum location: X=-5.00, Y=13.00

SAR 10g (W/Kg)	0.287492
SAR 1g (W/Kg)	0.547339

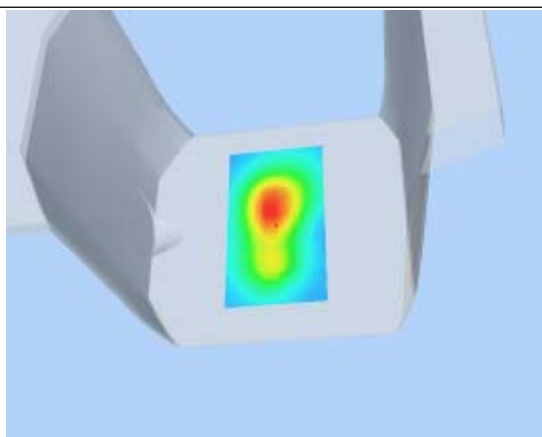
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4644	0.2010	0.0869	0.0373	0.0187	0.0098

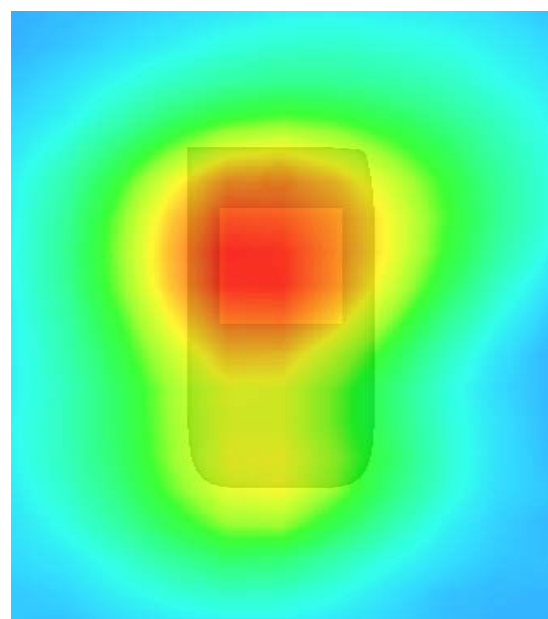
SAR, Z Axis Scan (X = -5, Y = 13)



3D scene 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: 20/7/2012

Measurement duration: 9 minutes 12 seconds

A. Experimental conditions.

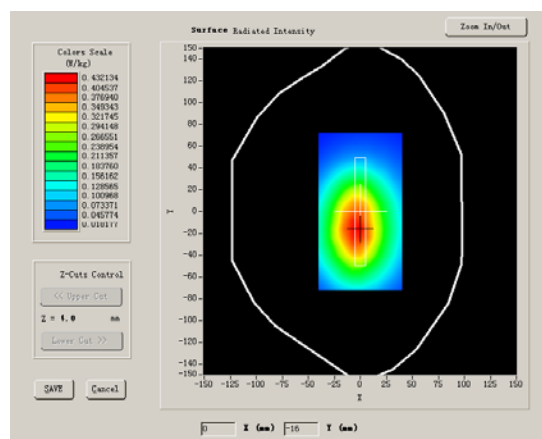
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

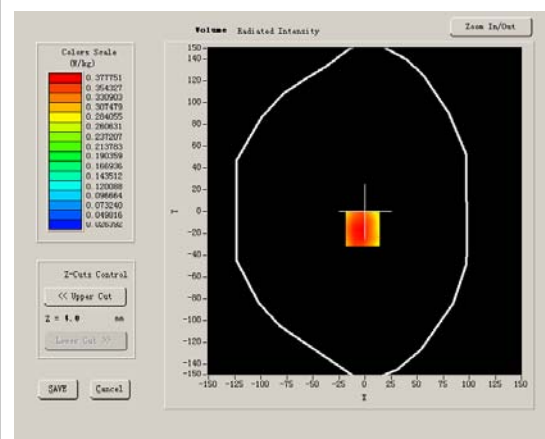
Middle Band SAR (Channel 9400):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-1.230000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



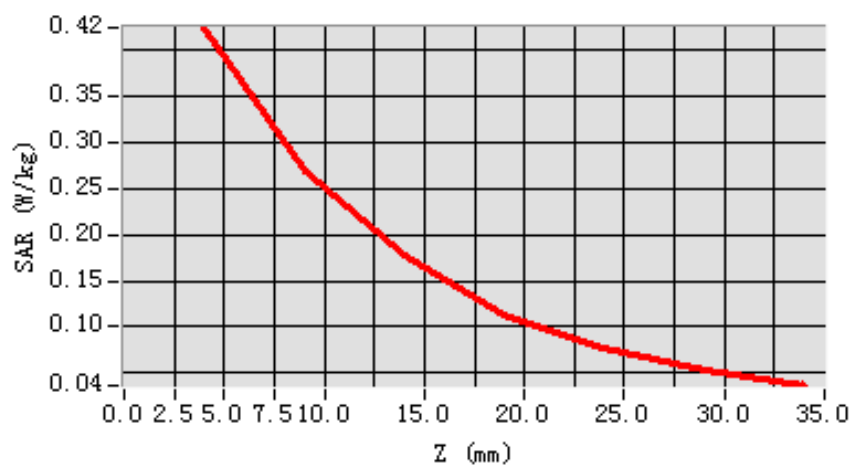
Maximum location: X=-2.00, Y=-16.00

SAR 10g (W/Kg)	0.264370
SAR 1g (W/Kg)	0.414649

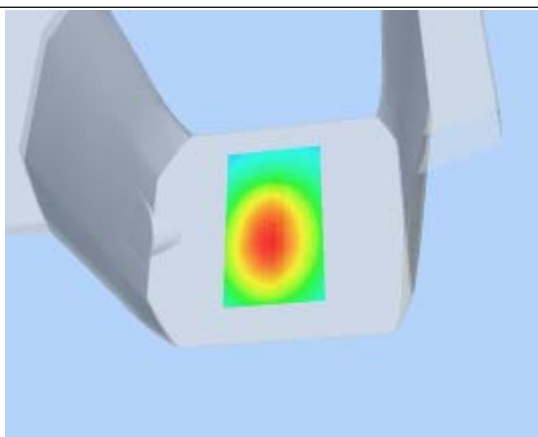
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4249	0.2686	0.1774	0.1134	0.0781	0.0536

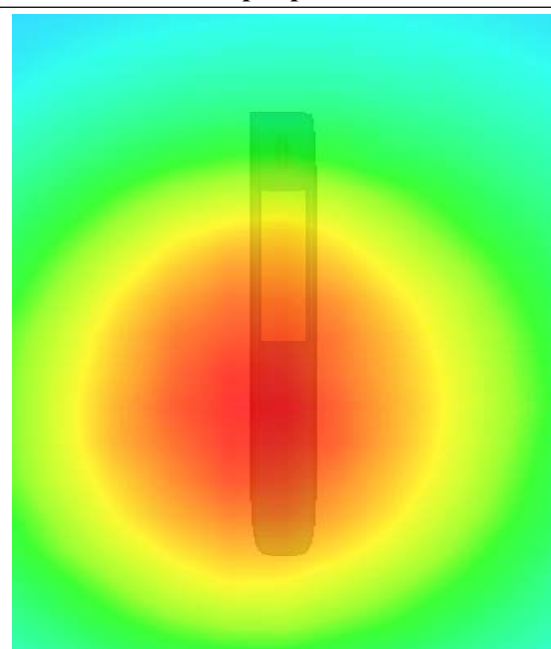
SAR, Z Axis Scan (X = -2, Y = -16)



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: 20/7/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

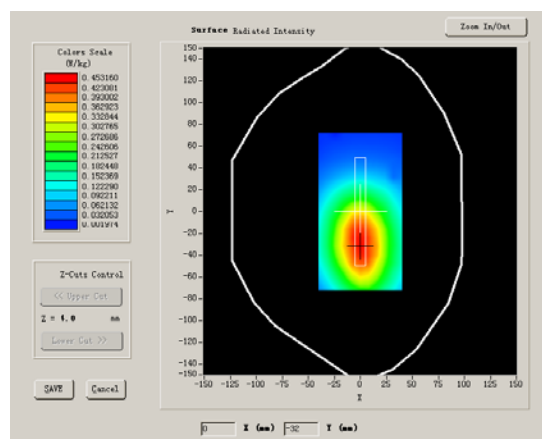
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

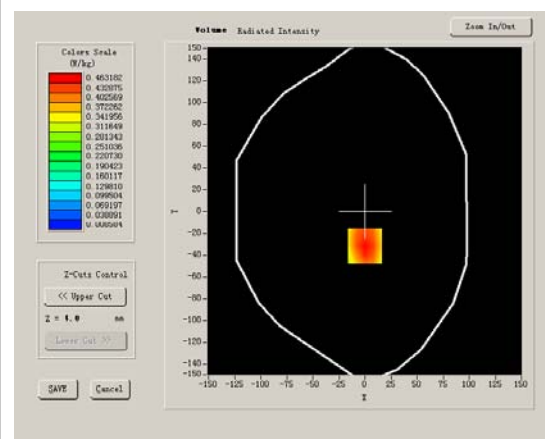
Middle Band SAR (Channel 9400):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	1.160000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



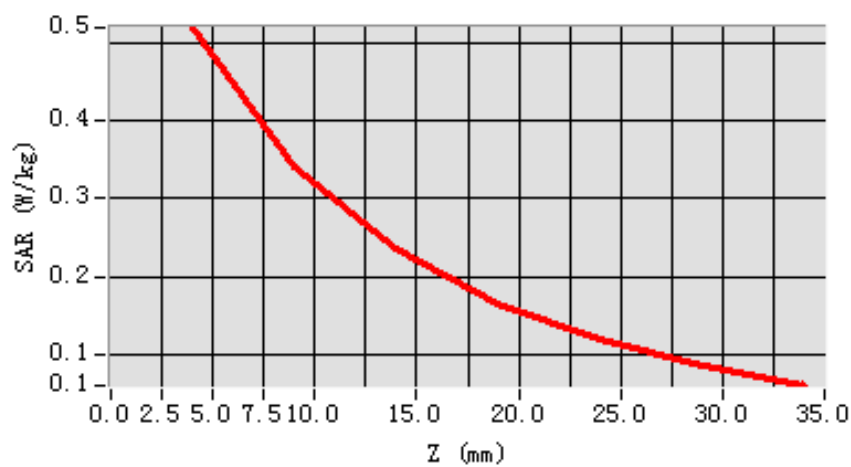
Maximum location: X=0.00, Y=-32.00

SAR 10g (W/Kg)	0.331629
SAR 1g (W/Kg)	0.501106

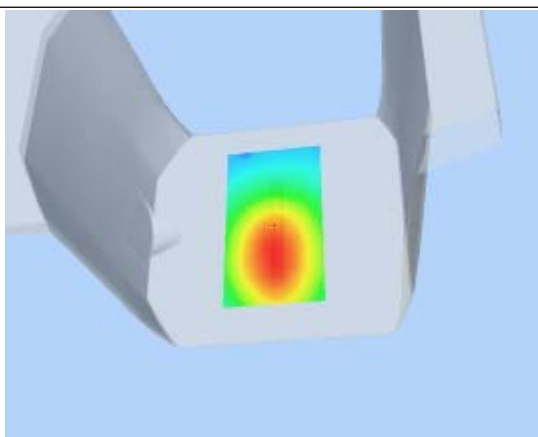
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5210	0.3410	0.2359	0.1656	0.1178	0.0842

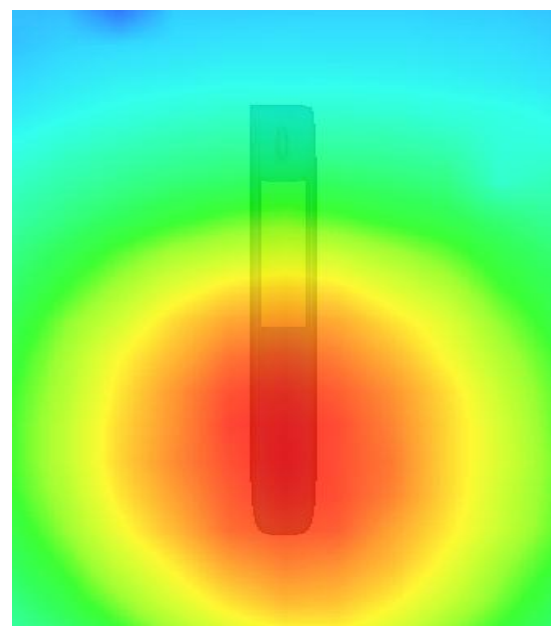
SAR, Z Axis Scan (X = 0, Y = -32)



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: 20/7/2012

Measurement duration: 13 minutes 27 seconds

A. Experimental conditions.

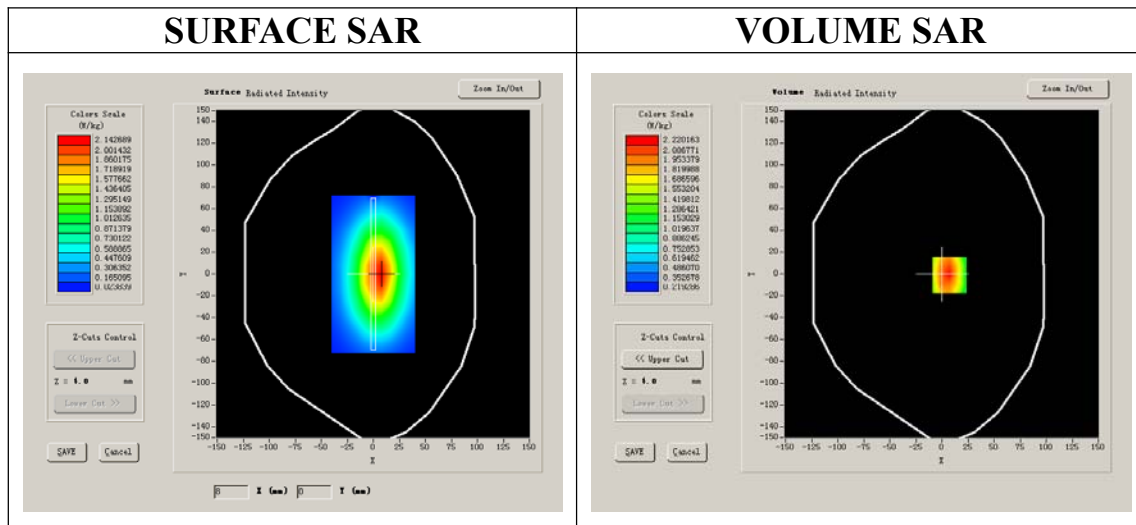
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

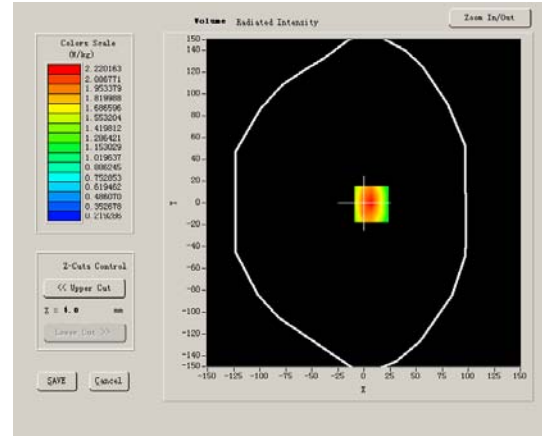
Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.999033
Power drift (%)	-0.170000
Ambient Temperature:	22.6°C
Liquid Temperature:	21.2°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



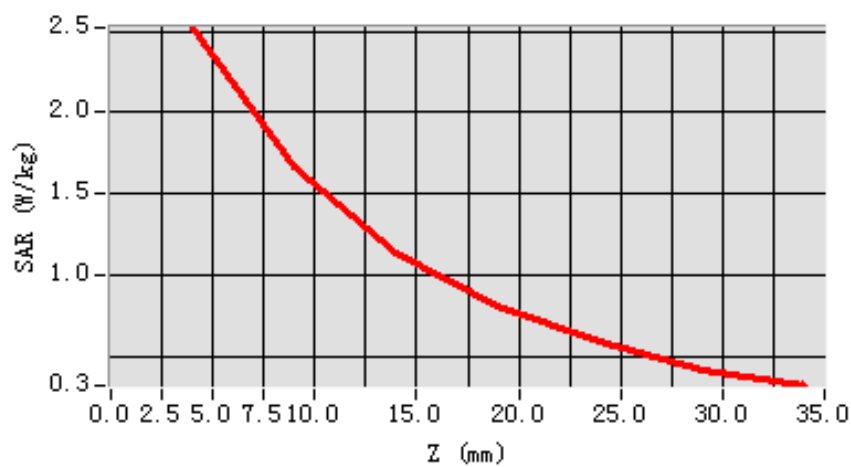
Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	1.539476
SAR 1g (W/Kg)	2.385979

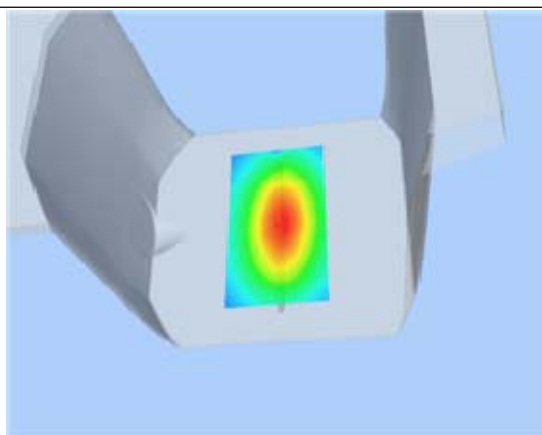
Z Axis Scan

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

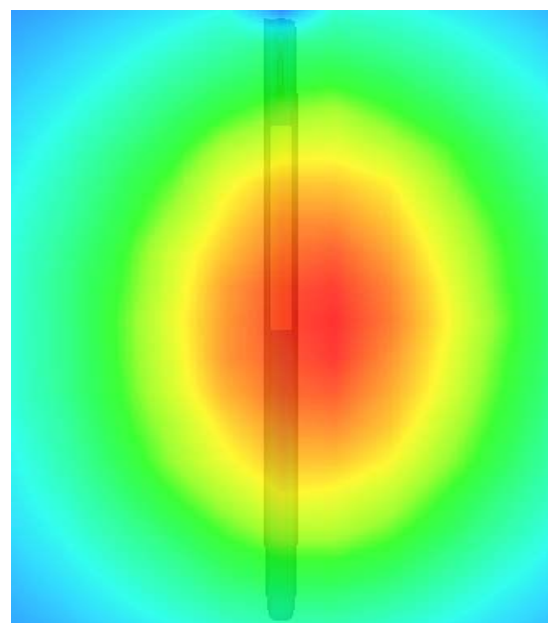
SAR, Z Axis Scan (X = 7, Y = -1)



3D scene shot



Hot spot position



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: 20/7/2012

Measurement duration: 13 minutes 27 seconds

A. Experimental conditions.

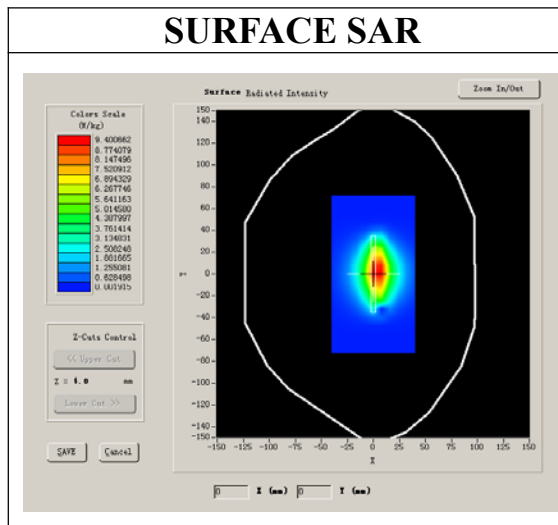
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

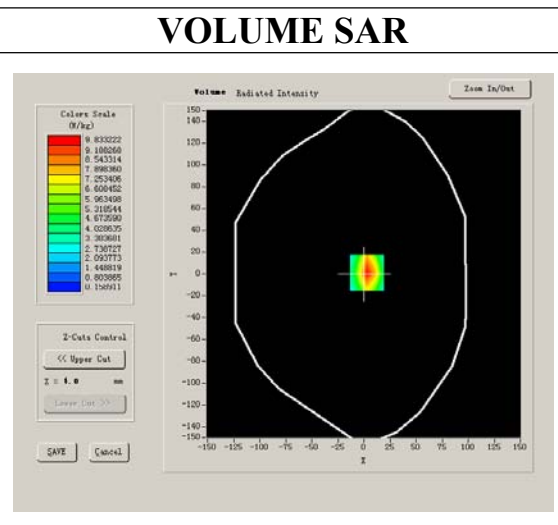
Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.230000
Ambient Temperature:	22.1°C
Liquid Temperature:	22.4°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



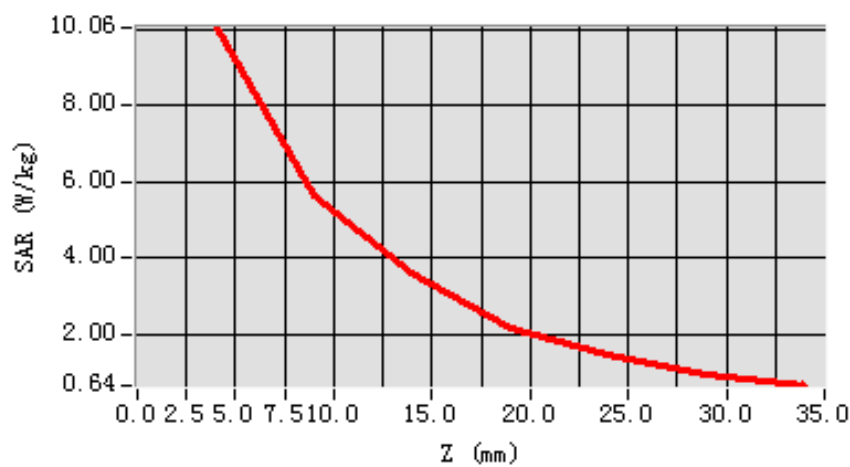
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	4.981611
SAR 1g (W/Kg)	9.340177

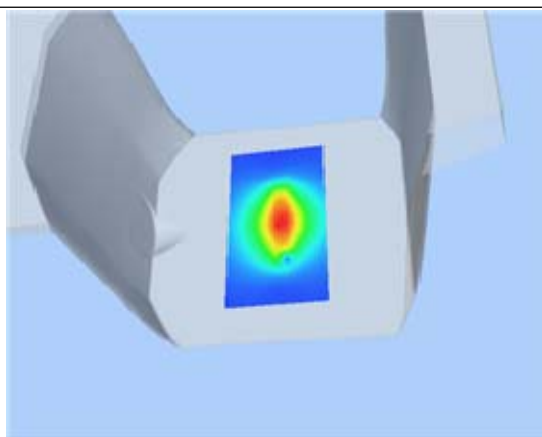
Z Axis Scan

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

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



3D scene shot



Hot spot position

