



Report No.: SZ12070093S01



SAR TEST REPORT

Issued to

ARCHOS S.A

For

Internet Tablet

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



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Date 2012.9.5

Date 2012.09.05

Date 2012.9.5

CTIA Authorized Test Lab
LAB CODE 20061223-00
IEEE 1725

OFTA
電信管理局



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741109

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

Testing Laboratory

1.1. Identification of the Responsible Testing Laboratory

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

1.2. Identification of the Responsible Testing Location

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

1.3. Accreditation Certificate

Accredited Testing Laboratory: No. CNAS L3572

1.4. List of Test Equipments

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

2. Technical Information

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

2.1. Identification of Applicant

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

2.2. Identification of Manufacturer

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

2.3. Equipment Under Test (EUT)

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

2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

2.3.2. Identification of all used EUT

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

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

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	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 616217 D03	SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers
6	KDB 447498 D01	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
7	KDB 248227 D01	SAR meas for 802.11 a/b/g v01r02
8	KDB 450824 D01	SAR Probe Calibration and System Verification Considerations for Measurements at 150MHz - 3GHz

2.5. Device Category and SAR Limits

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

2.6. Test Environment/Conditions

Normal Temperature (NT):	20 ... 25 °C
Relative Humidity:	30 ... 75 %
Air Pressure:	980 ... 1020 hPa
Test frequency:	WCDMA 850MHz WCDMA1900MHz WIFI 802.11B
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 WIFI Maximum output power

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

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

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

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

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

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

3. Specific Absorption Rate (SAR)

3.1. Introduction

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

3.2. SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density. 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

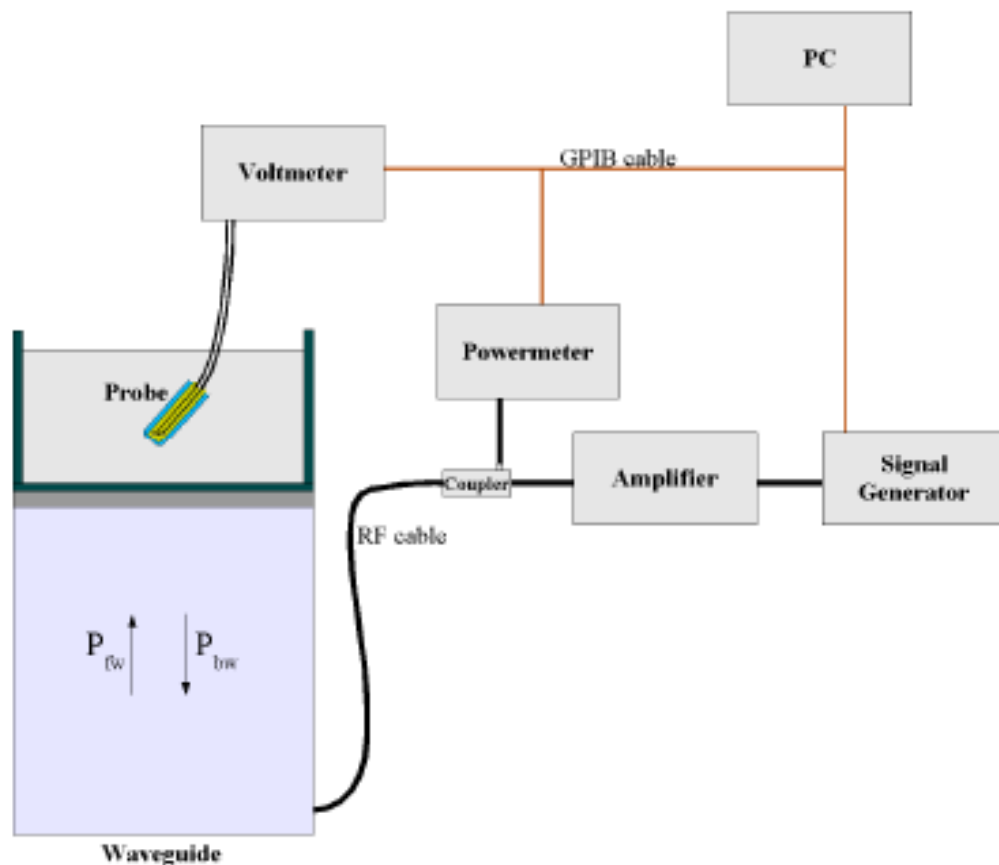
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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. Probe Calibration Process

4.3.1 Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm²) using an with CALISAR, Antenna proprietary calibration system.

4.3.2 Free Space Assessment Procedure

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm².

4.3.2 Temperature Assessment Procedure

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

Where:

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

Δt = exposure time (30 seconds),

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

ΔT = temperature increase due to RF exposure.

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

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

Where:

σ = simulated tissue conductivity,

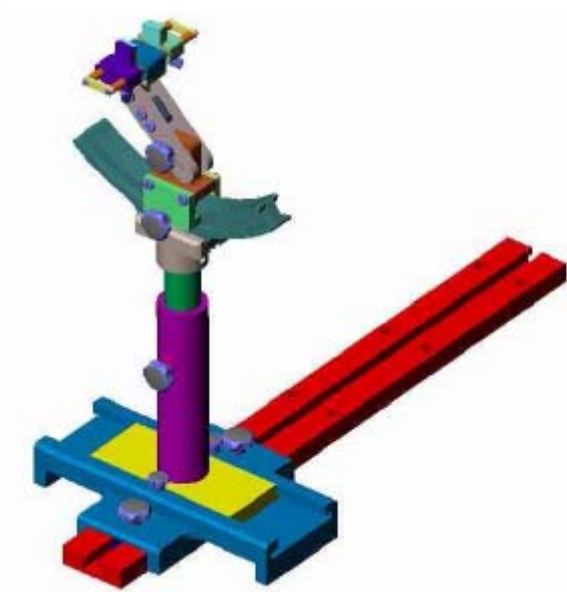
ρ = Tissue density (1.25 g/cm³ for brain tissue)

4.4. Phantom

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

4.5. Device Holder

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



Device holder

System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

5. Tissue Simulating Liquids

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

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

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

Recipes for Tissue Simulating Liquid

Table 1: Dielectric Performance of Body Tissue Simulating Liquid

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

2450 MHz	Reference result per OET65 $\pm 5\%$ window	52.7 50.635 to 55.965	1.95 1.853 to 2.048
	Reference result per probe calibration $\pm 5\%$ window	52.5 49.875 to 55.125	1.78 1.691 to 1.869
	Validation value (Sep. 5)	52.548876	1.853978

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

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

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

Uncertainty Assessment

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

5.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	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	

5.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+ - %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
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	

6. SAR Measurement Evaluation

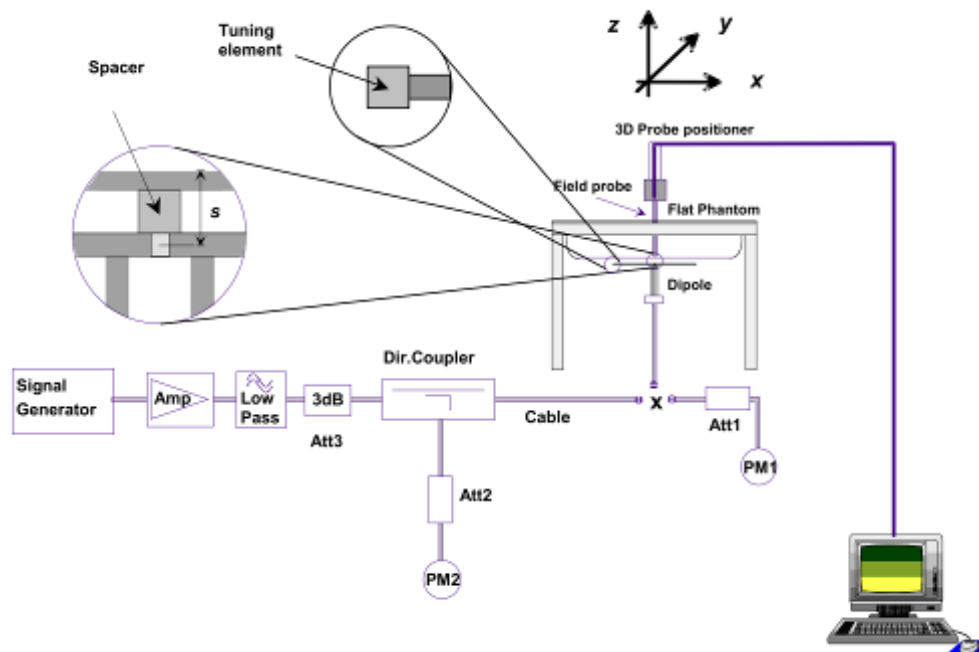
6.1. System Setup

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

Equipments:

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

System Verification Setup Block Diagram



6.2. Validation Results

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

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

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

7. Operational Conditions During Test

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

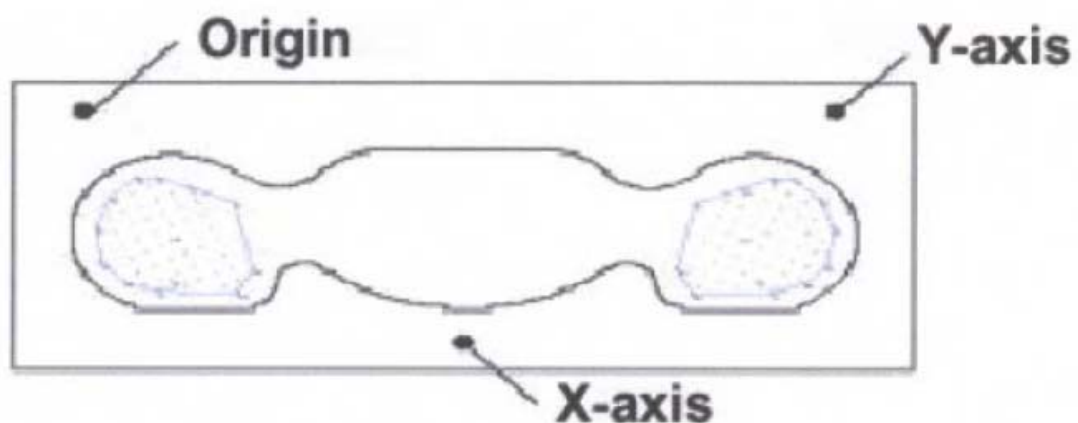
Remark: Please refer to Appendix B for the test setup photos.

7.1. Body-worn Configurations

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

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

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



SAR Measurement Points in Area Scan

7.2. Measurement procedure

The following steps are used for each test position

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

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

7.3. Description of interpolation/extrapolation scheme

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

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

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

8. 3G MEASUREMENT PROCEDURES

8.1. Procedures Used To Establish Test Signal

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

8.2. SAR Measurement Conditions for WCDMA

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

8.3. Output Power Verification

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

8.4. Measurement Of Conducted Peak Output Power.

1. WCDMA Conducted peak output power

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

2. Wifi peak output power

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

3. Bluetooth peak output power

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

9. Test Results List

Summary of Measurement Results (WCDMA 850MHz Band)

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

Note:

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

Summary of Measurement Results (WCDMA 1900MHz Band)

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

Note:

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

Summary of Measurement Results (WLAN 802.11B Band)

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

Note:

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

4. Scaled SAR calculation

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

10. Multiple Transmitters Evaluation

The are two transmitters build in EUT, As follwing :



Stand-alone SAR

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

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

Simultaneous SAR

The BT and Wifi can't simultaneous transmitting.

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

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

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

Annex A EUT Setup Photos

1. Back upward



2. Face upward



3. Edge A



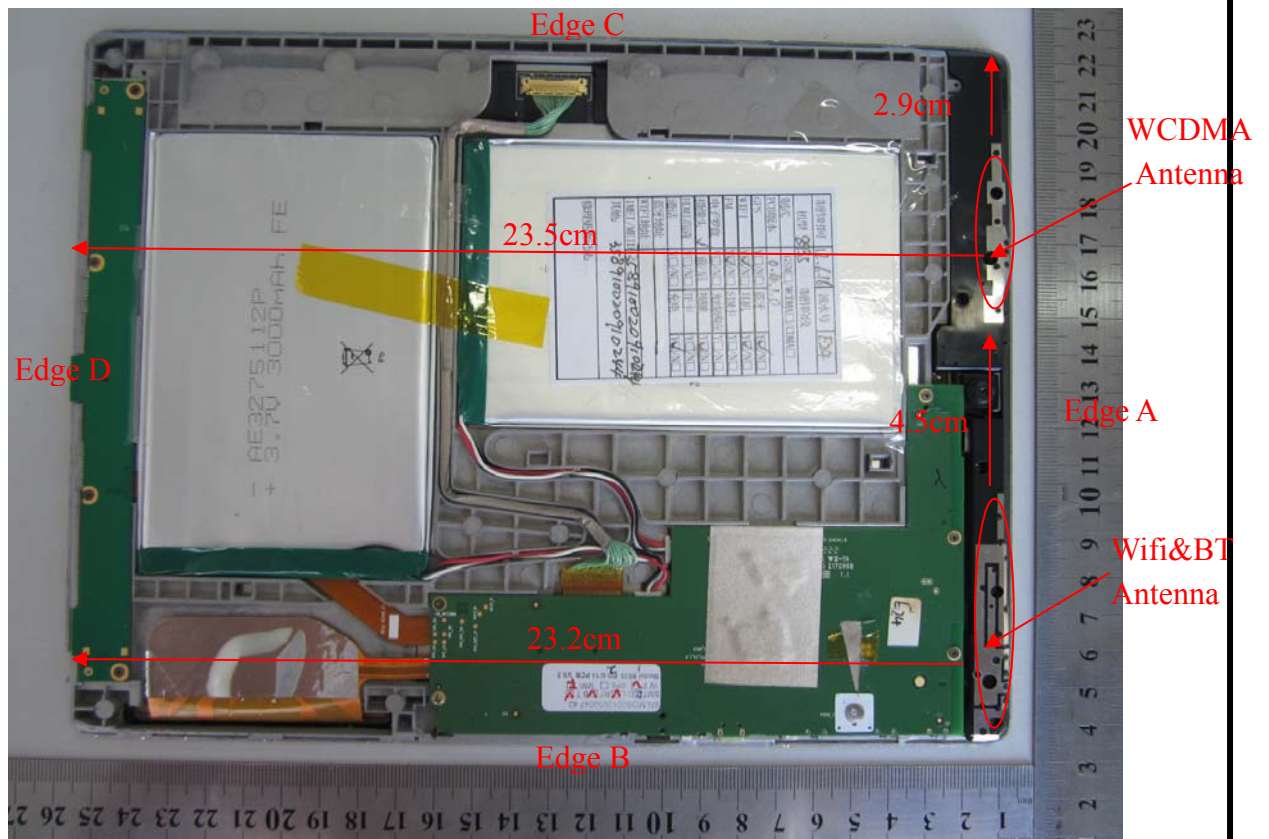
4. Edge B



5. Edge C



6. Edge configuration



Liquid Level Photo



Annex B Graph Test Results

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

MEASUREMENT 1

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

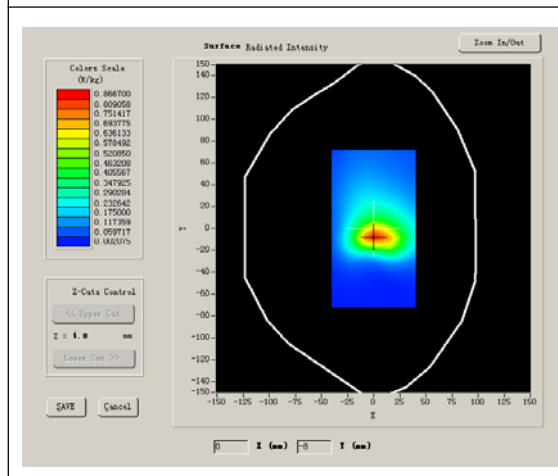
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Low
Signal	CDMA

B. SAR Measurement Results

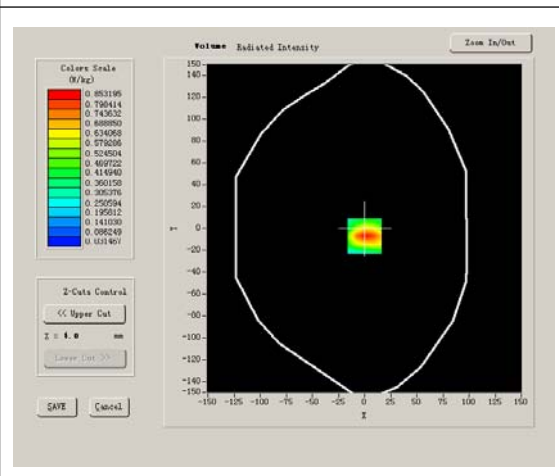
Lower Band SAR (Channel 4132):

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

SURFACE SAR



VOLUME SAR



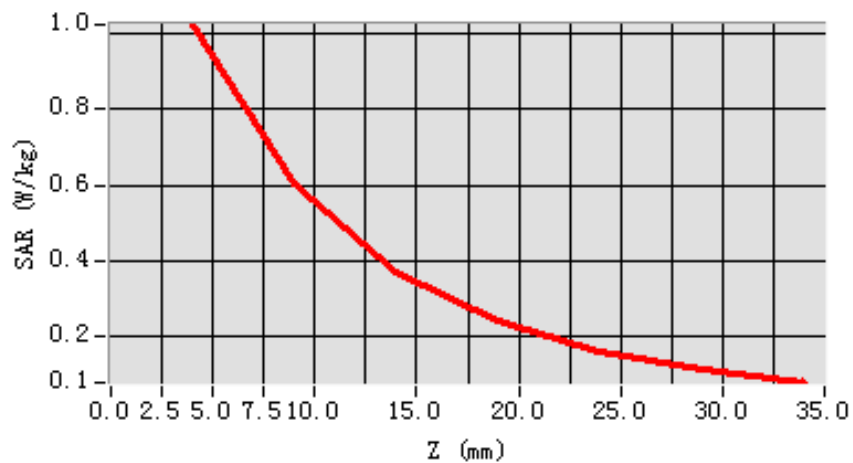
Maximum location: X=0.00, Y=-7.00

SAR 10g (W/Kg)	0.542674
SAR 1g (W/Kg)	0.952053

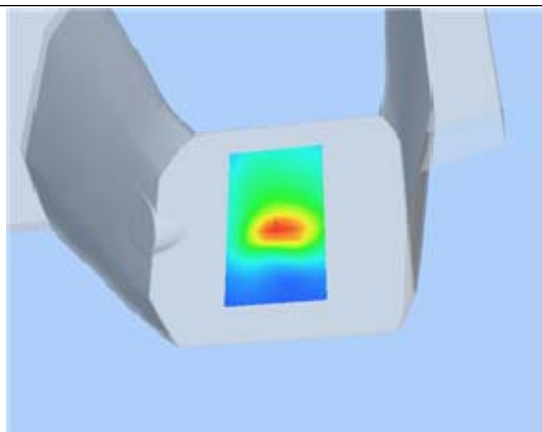
Z Axis Scan

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

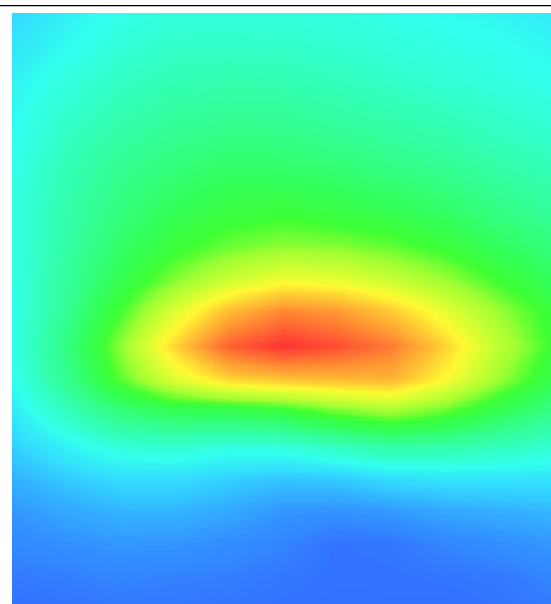
SAR, Z Axis Scan (X = 0, Y = -7)



3D scene shot



Hot spot position



MEASUREMENT 2

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 5 seconds

A. Experimental conditions.

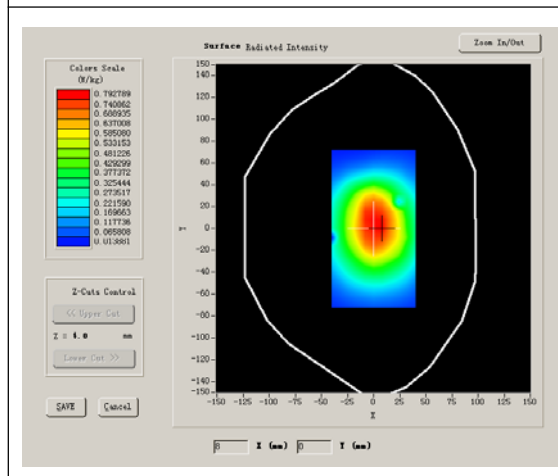
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

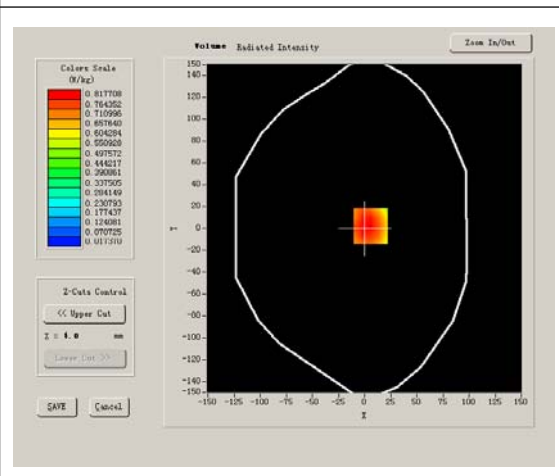
Middle Band SAR (Channel 4175):

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

SURFACE SAR



VOLUME SAR



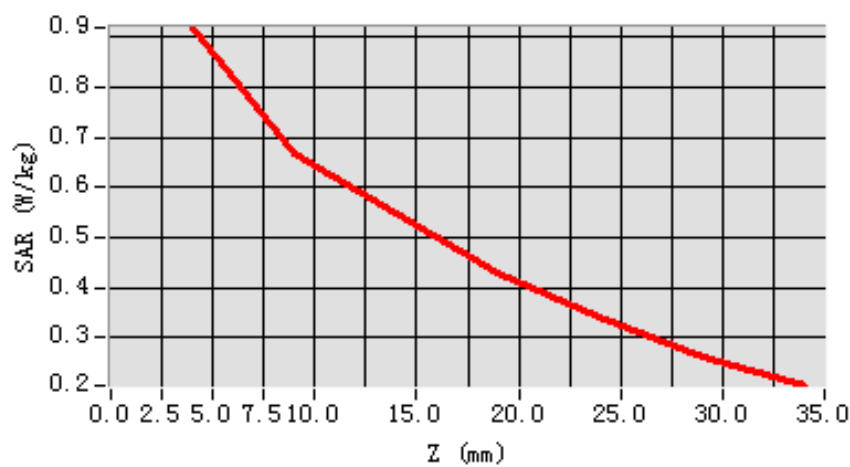
Maximum location: X=6.00, Y=2.00

SAR 10g (W/Kg)	0.651197
SAR 1g (W/Kg)	0.902163

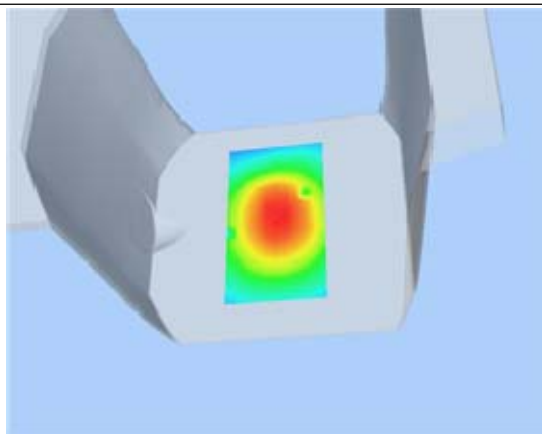
Z Axis Scan

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

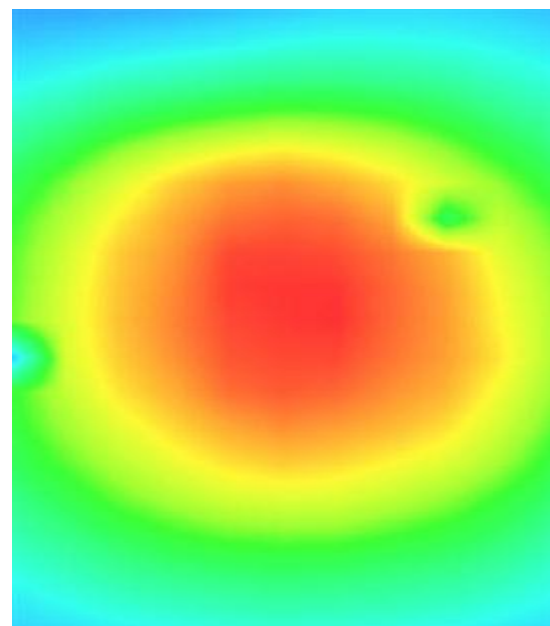
SAR, Z Axis Scan (X = 6, Y = 2)



3D scene shot



Hot spot position



MEASUREMENT 3

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 5 seconds

A. Experimental conditions.

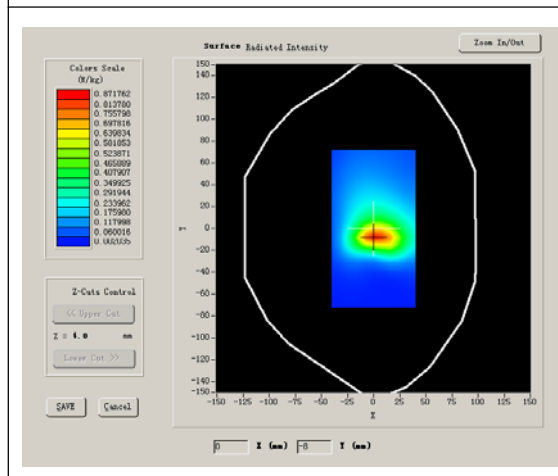
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	High
Signal	CDMA

B. SAR Measurement Results

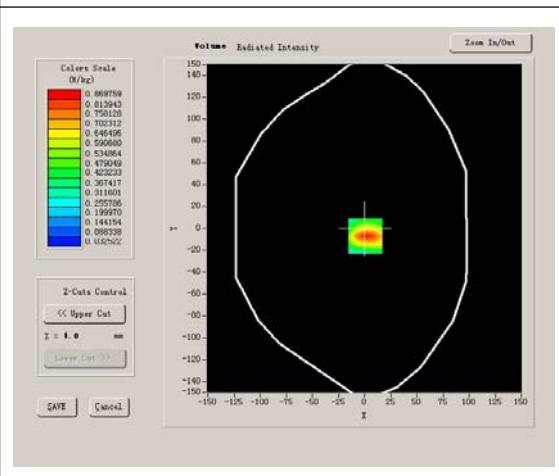
Higher Band SAR (Channel 4233):

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

SURFACE SAR



VOLUME SAR



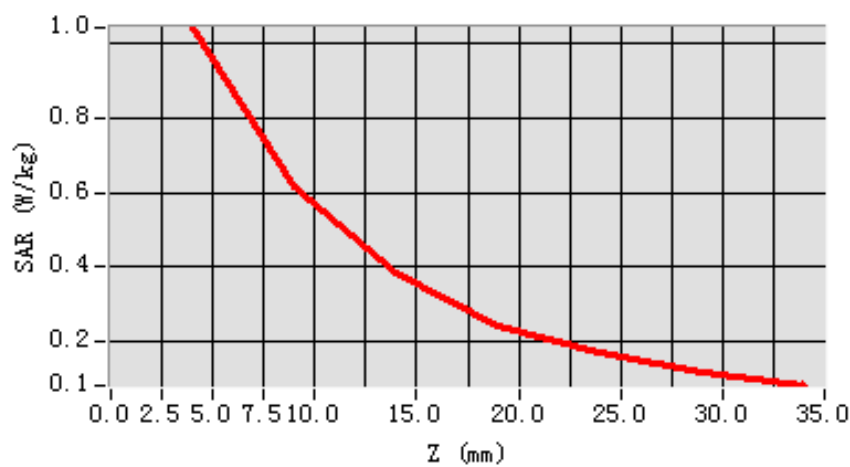
Maximum location: X=1.00, Y=-7.00

SAR 10g (W/Kg)	0.554491
SAR 1g (W/Kg)	0.970811

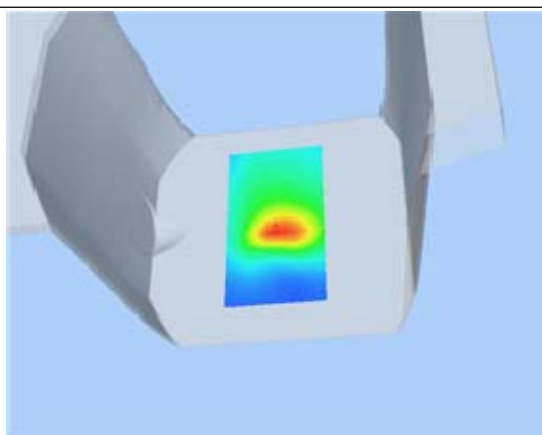
Z Axis Scan

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

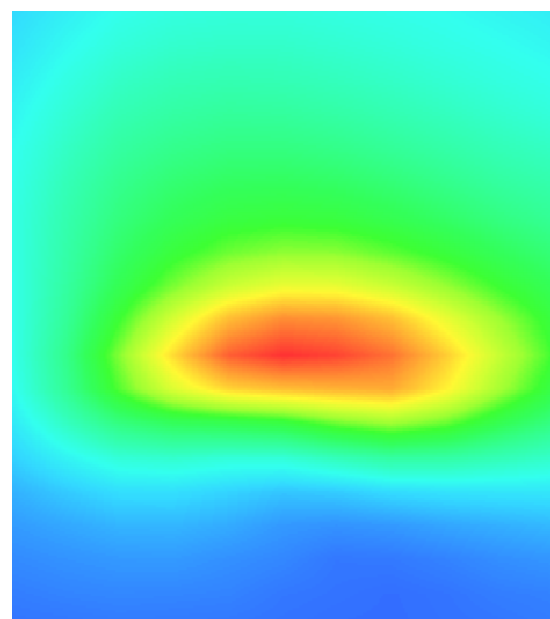
SAR, Z Axis Scan (X = 1, Y = -7)



3D scene shot



Hot spot position



MEASUREMENT 4

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 6 seconds

A. Experimental conditions.

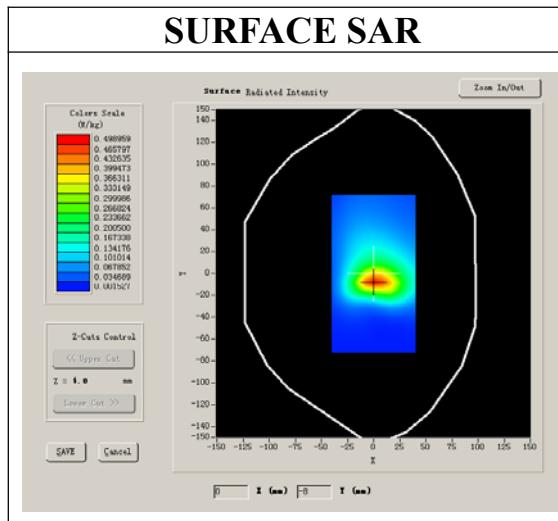
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	High
Signal	CDMA

B. SAR Measurement Results

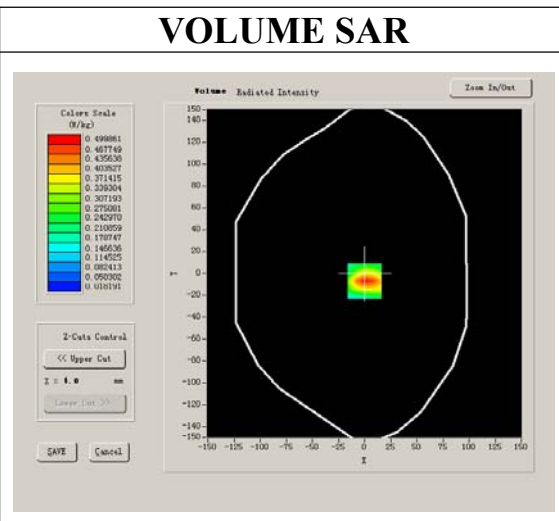
Higher Band SAR (Channel 4233):

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

SURFACE SAR



VOLUME SAR



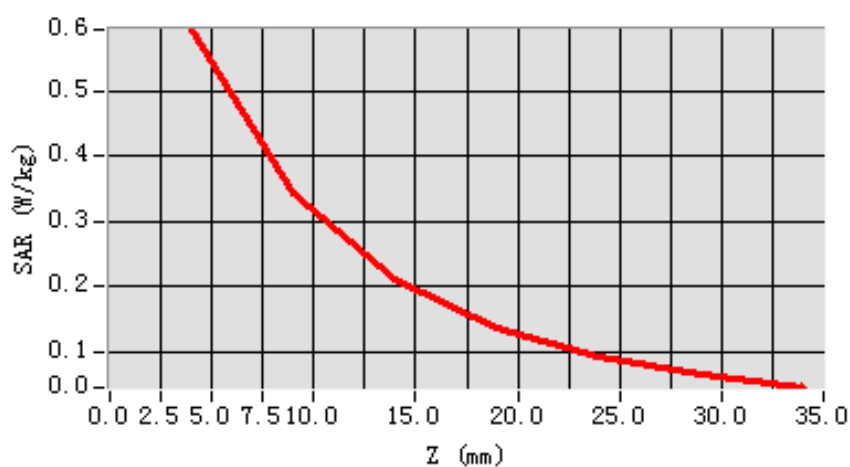
Maximum location: X=0.00, Y=-7.00

SAR 10g (W/Kg)	0.311797
SAR 1g (W/Kg)	0.552200

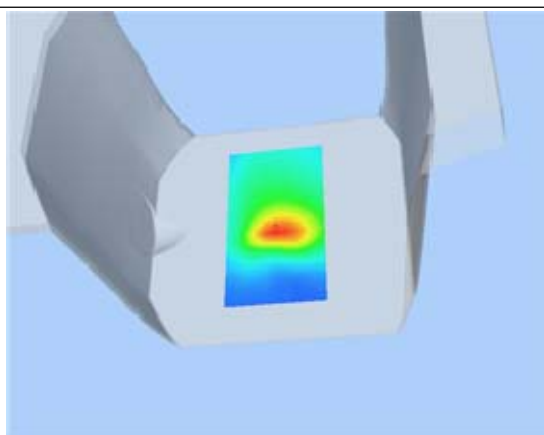
Z Axis Scan

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

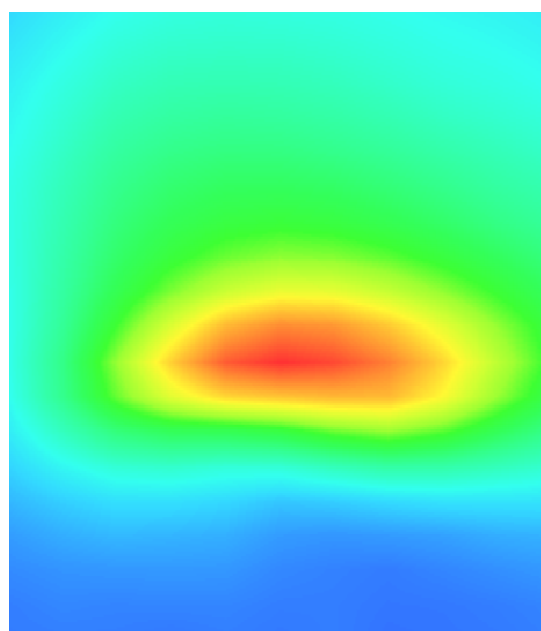
SAR, Z Axis Scan (X = 0, Y = -7)



3D scene shot



Hot spot position



MEASUREMENT 5

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 4 seconds

A. Experimental conditions.

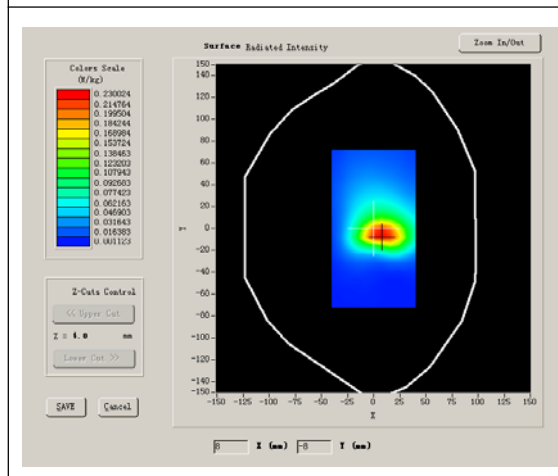
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	High
Signal	CDMA

B. SAR Measurement Results

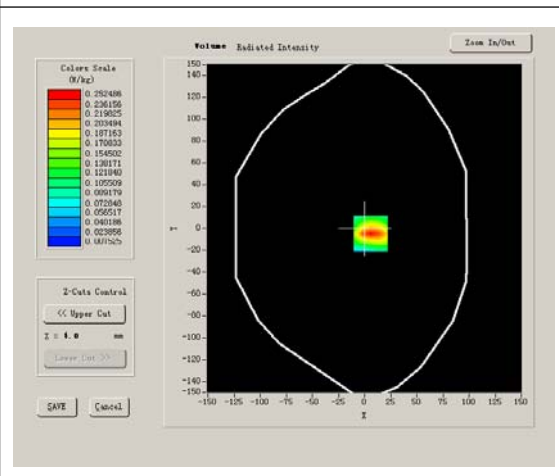
Higher Band SAR (Channel 4233):

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

SURFACE SAR



VOLUME SAR



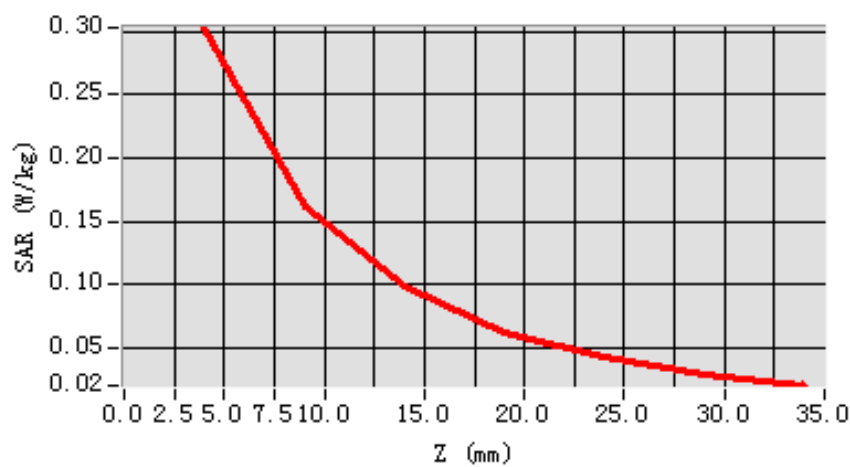
Maximum location: X=6.00, Y=-5.00

SAR 10g (W/Kg)	0.154516
SAR 1g (W/Kg)	0.283458

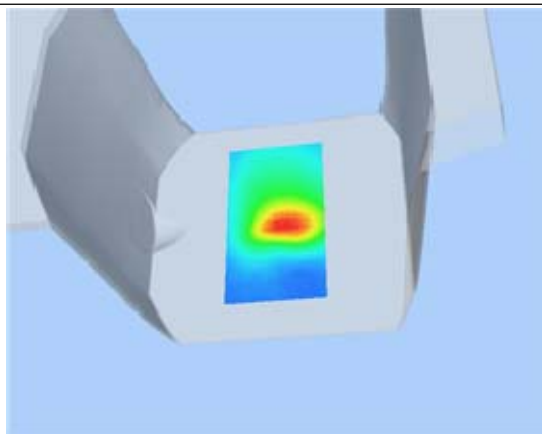
Z Axis Scan

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

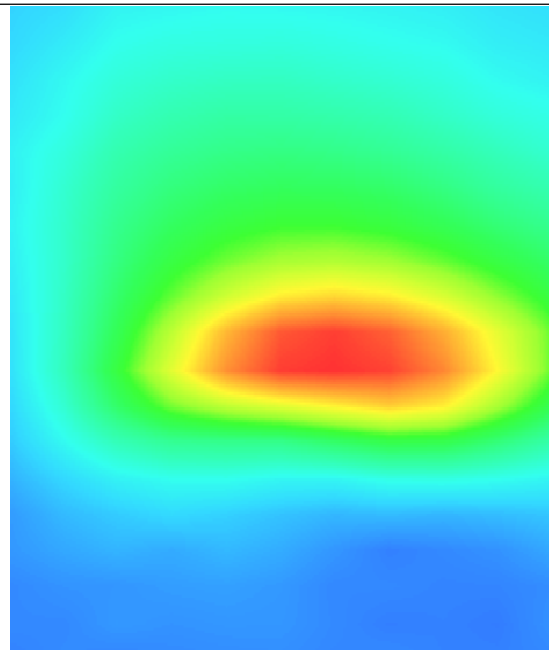
SAR, Z Axis Scan (X = 6, Y = -5)



3D scene shot



Hot spot position



MEASUREMENT 6

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 4 seconds

A. Experimental conditions.

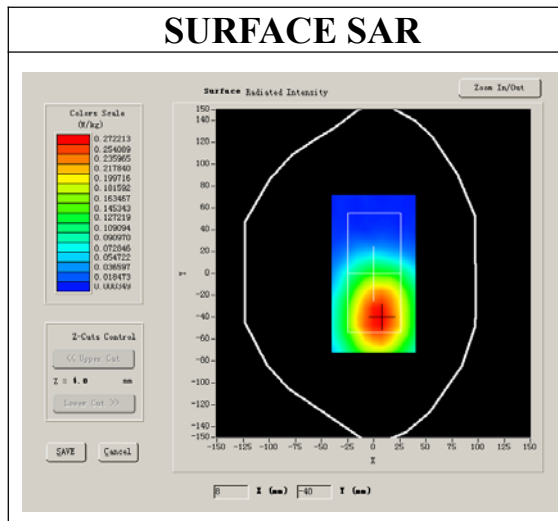
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA850
Channels	High
Signal	CDMA

B. SAR Measurement Results

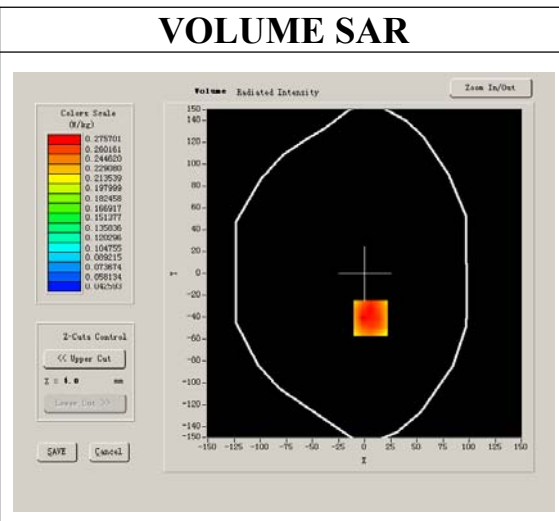
Higher Band SAR (Channel 4233):

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

SURFACE SAR



VOLUME SAR



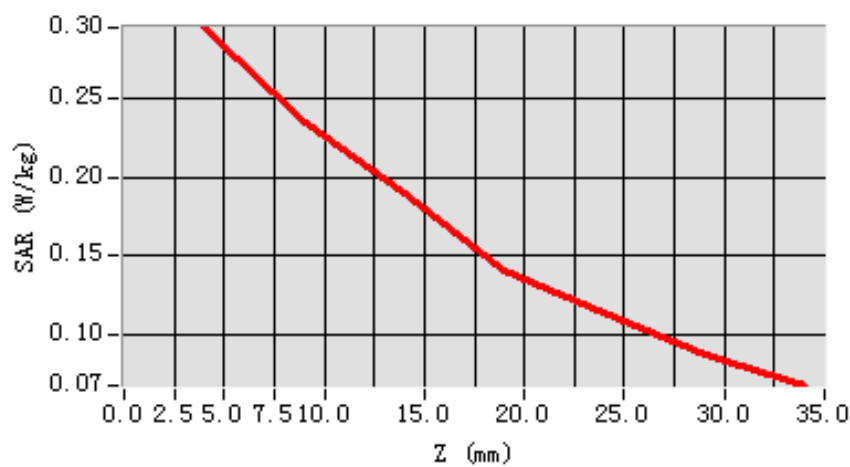
Maximum location: X=6.00, Y=-41.00

SAR 10g (W/Kg)	0.217901
SAR 1g (W/Kg)	0.296879

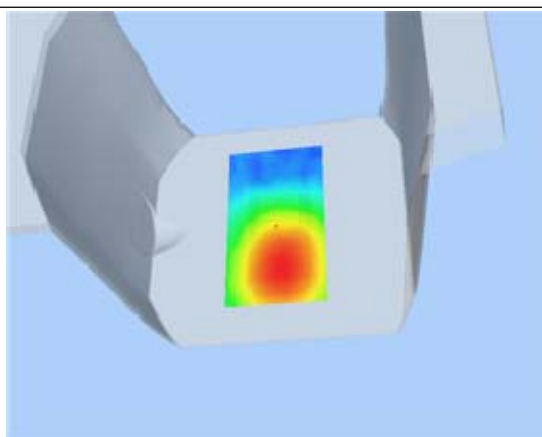
Z Axis Scan

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

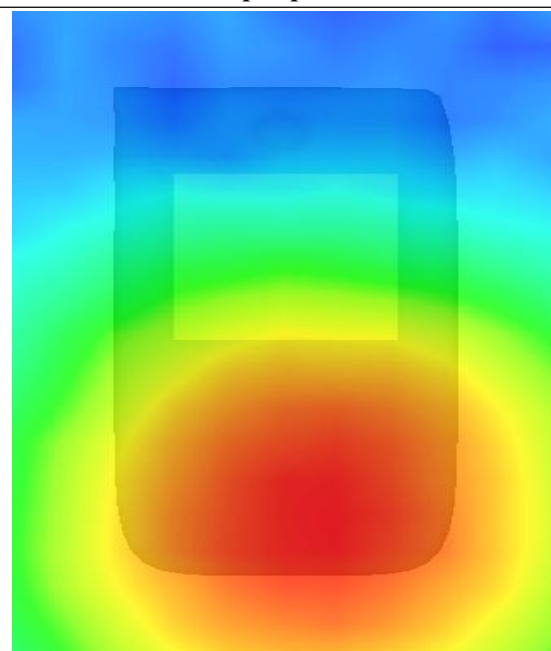
SAR, Z Axis Scan (X = 6, Y = -41)



3D scene shot



Hot spot position



MEASUREMENT 7

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

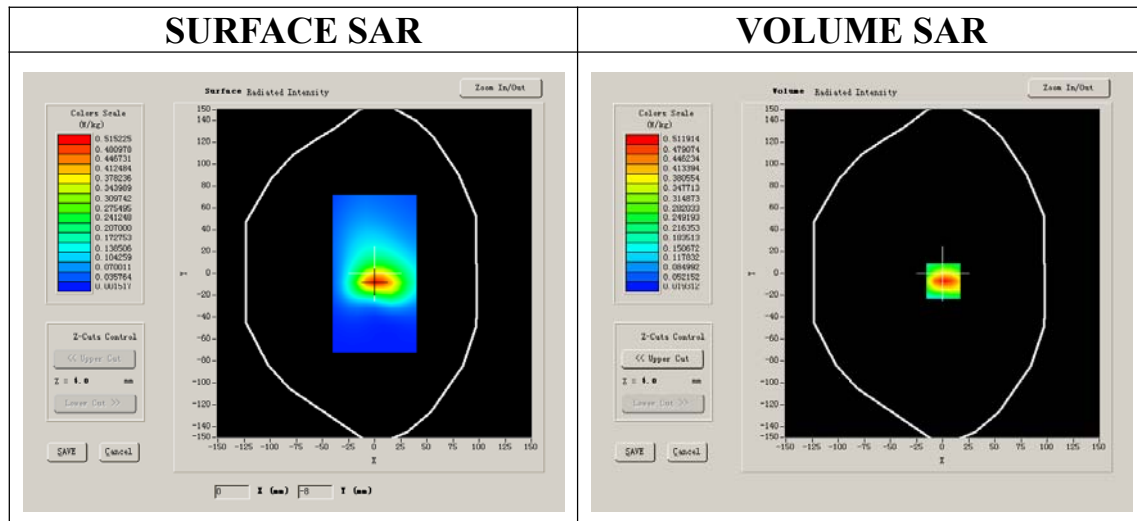
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	High
Signal	CDMA

B. SAR Measurement Results

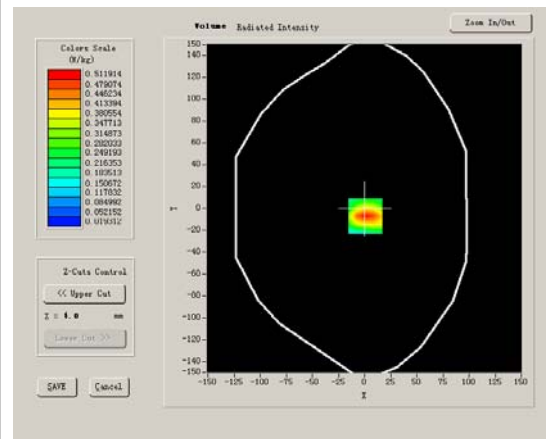
Higher Band SAR (Channel 9538):

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

SURFACE SAR



VOLUME SAR



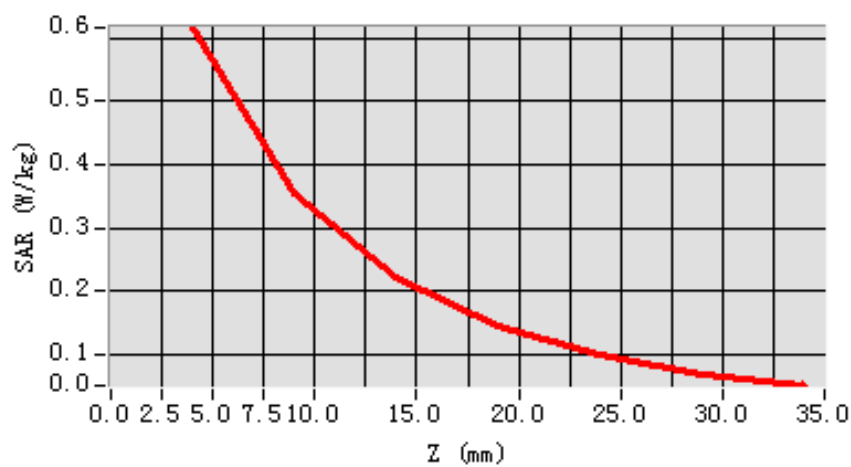
Maximum location: X=1.00, Y=-7.00

SAR 10g (W/Kg)	0.326670
SAR 1g (W/Kg)	0.582133

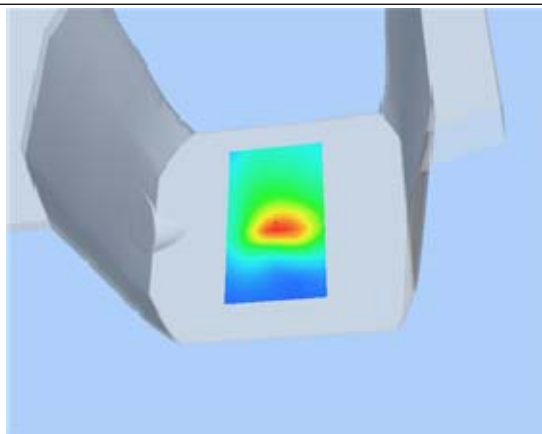
Z Axis Scan

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

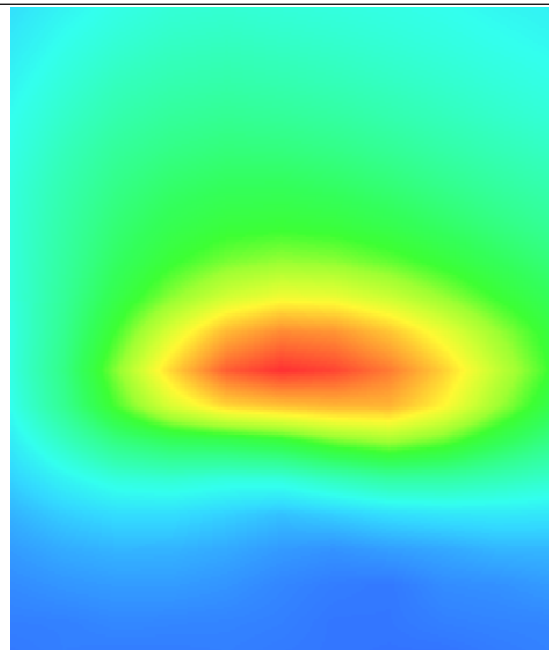
SAR, Z Axis Scan (X = 1, Y = -7)



3D scene shot



Hot spot position



MEASUREMENT 8

Type: Phone measurement (Complete)

Area scan resolution: $dx=8\text{mm}, dy=8\text{mm}$

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

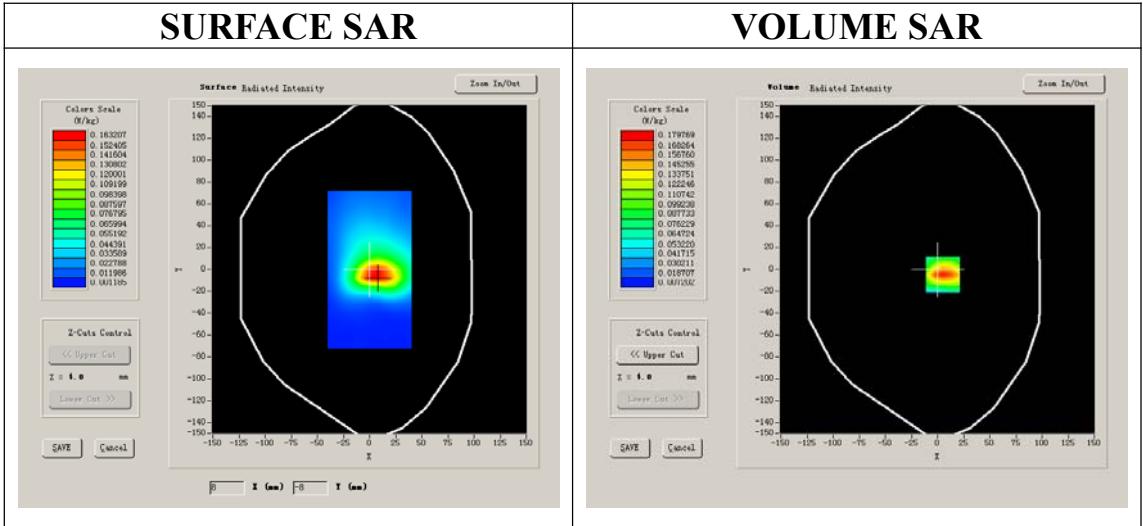
A. Experimental conditions.

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

B. SAR Measurement Results

Higher Band SAR (Channel 9538):

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



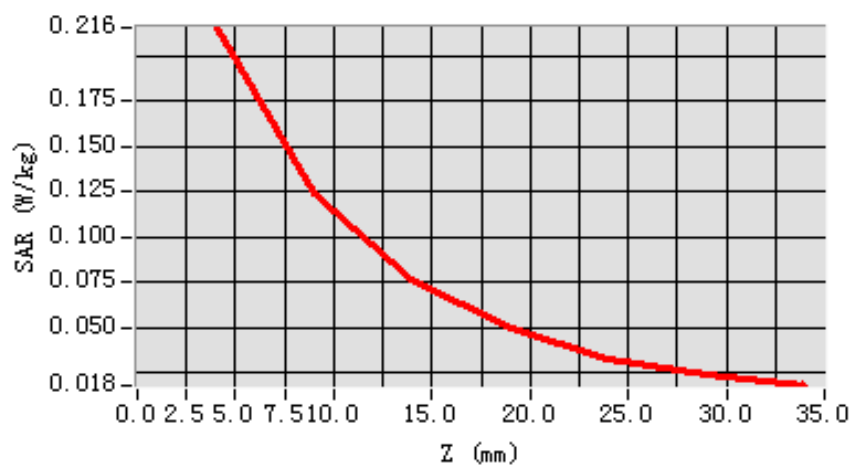
Maximum location: X=5.00, Y=-5.00

SAR 10g (W/Kg)	0.113909
SAR 1g (W/Kg)	0.201836

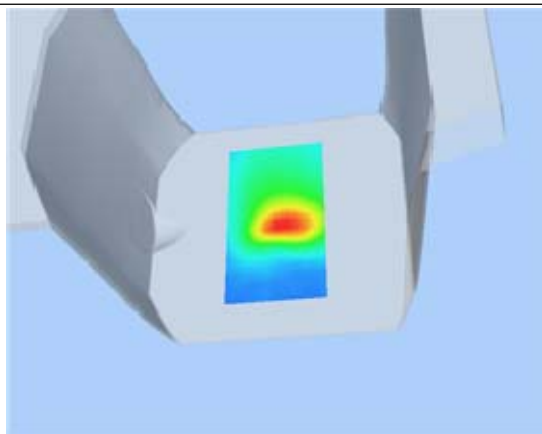
Z Axis Scan

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

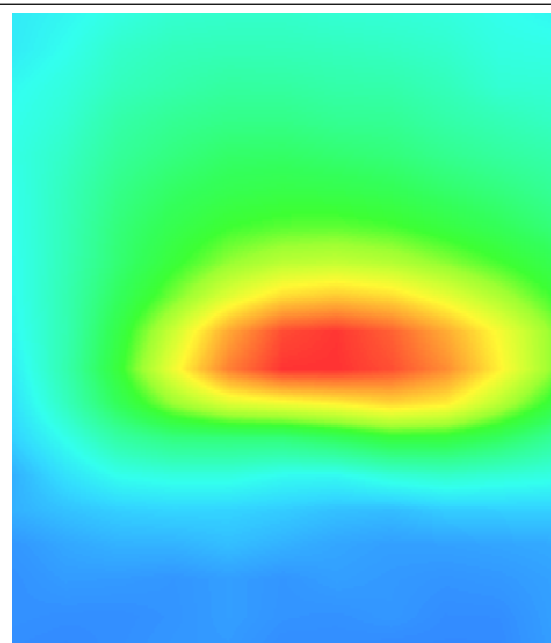
SAR, Z Axis Scan (X = 5, Y = -5)



3D scene shot



Hot spot position



MEASUREMENT 9

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

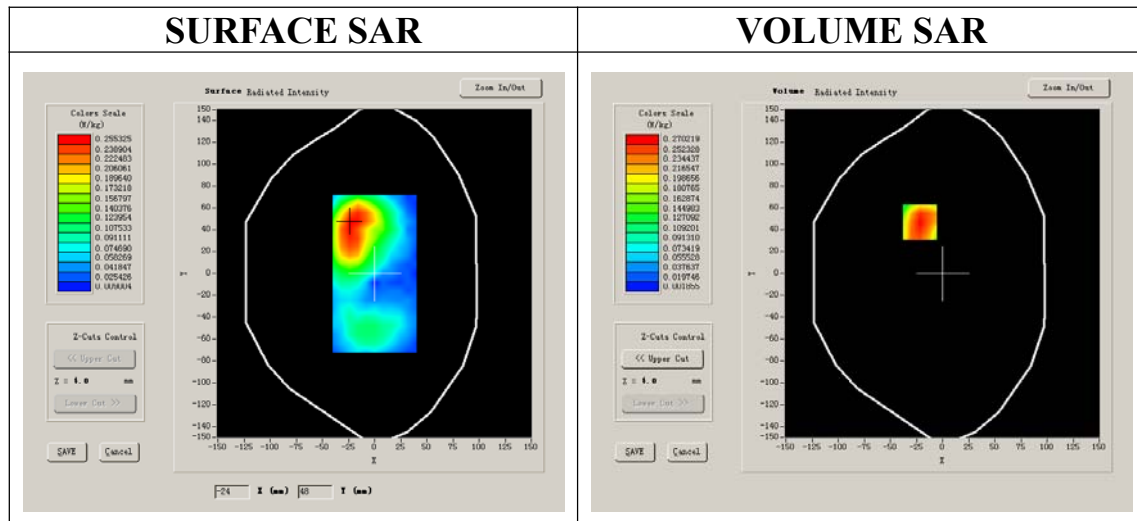
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	High
Signal	CDMA

B. SAR Measurement Results

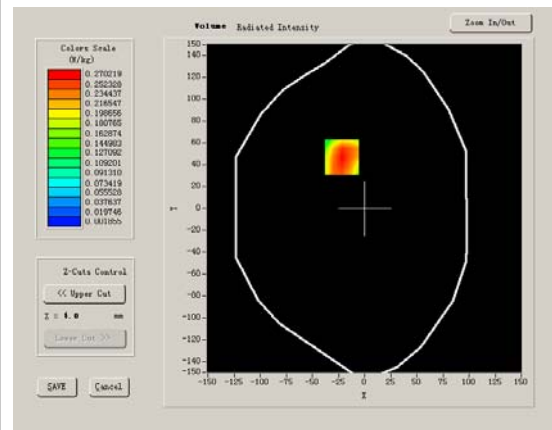
Higher Band SAR (Channel 9538):

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

SURFACE SAR



VOLUME SAR



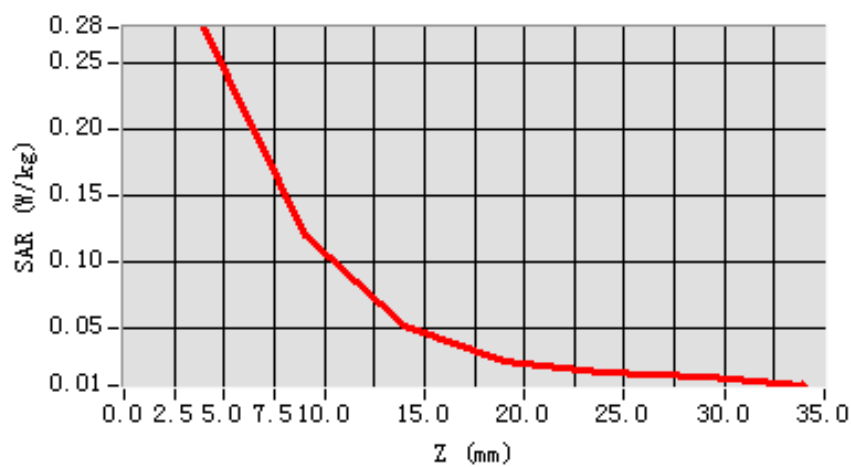
Maximum location: X=-22.00, Y=47.00

SAR 10g (W/Kg)	0.137752
SAR 1g (W/Kg)	0.267531

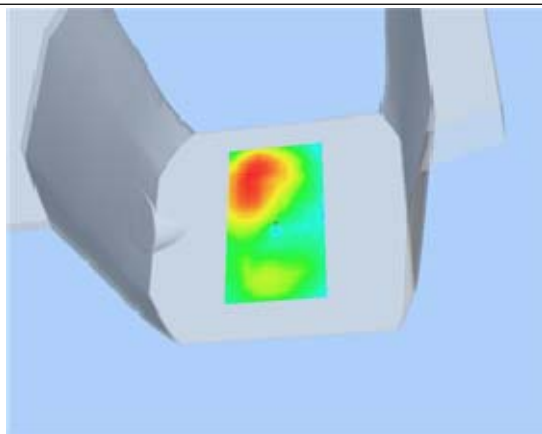
Z Axis Scan

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

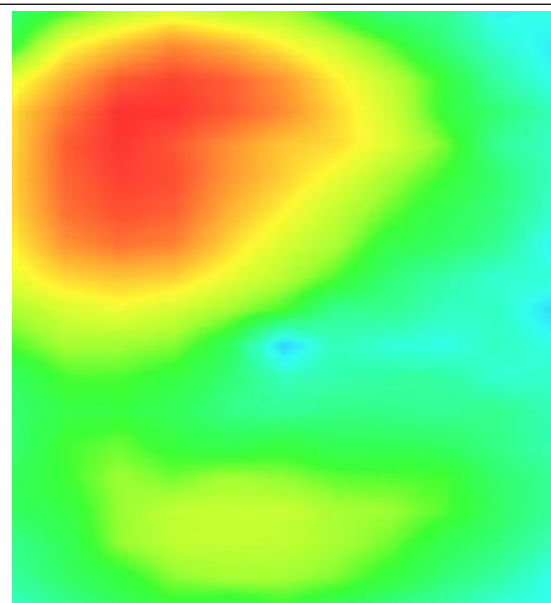
SAR, Z Axis Scan (X = -22, Y = 47)



3D scene shot



Hot spot position



MEASUREMENT 10

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

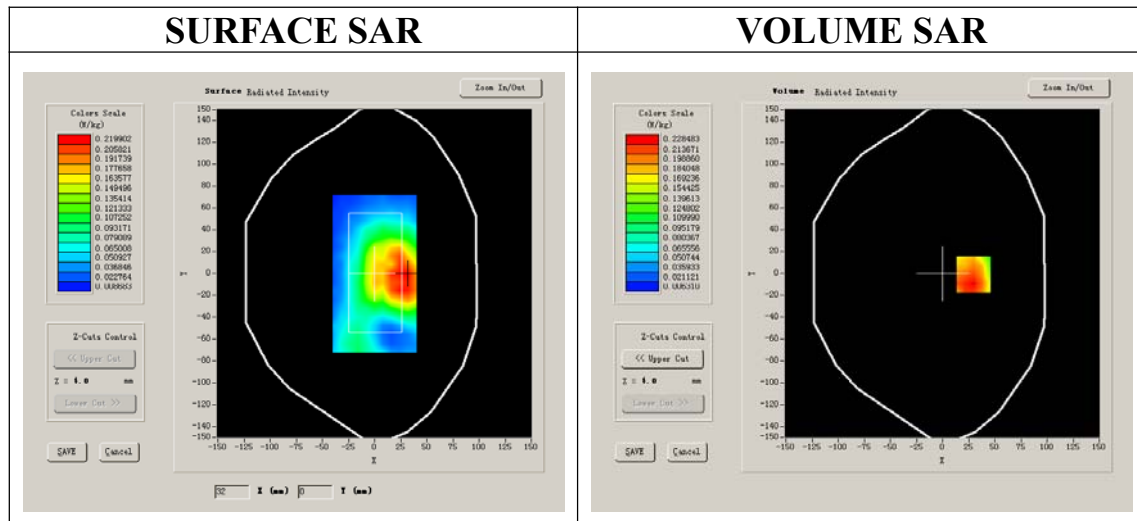
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	High
Signal	CDMA

B. SAR Measurement Results

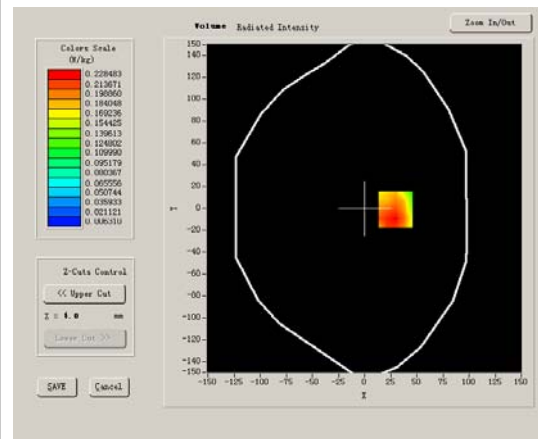
Higher Band SAR (Channel 9538):

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

SURFACE SAR



VOLUME SAR



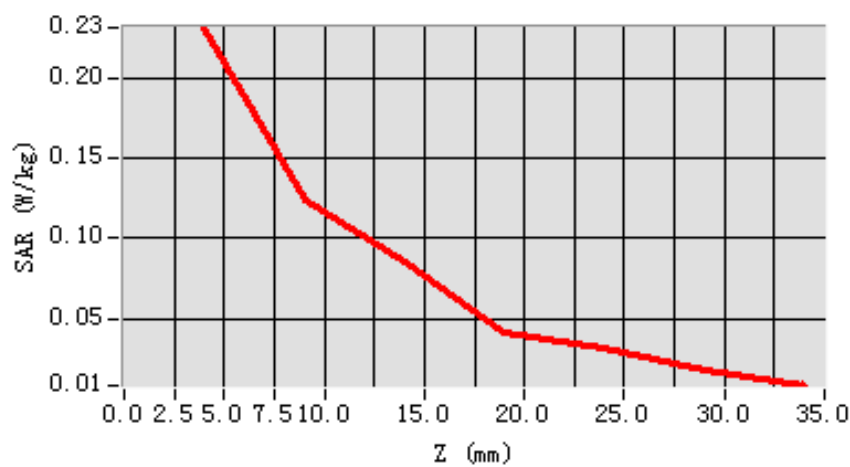
Maximum location: X=30.00, Y=-1.00

SAR 10g (W/Kg)	0.139266
SAR 1g (W/Kg)	0.237611

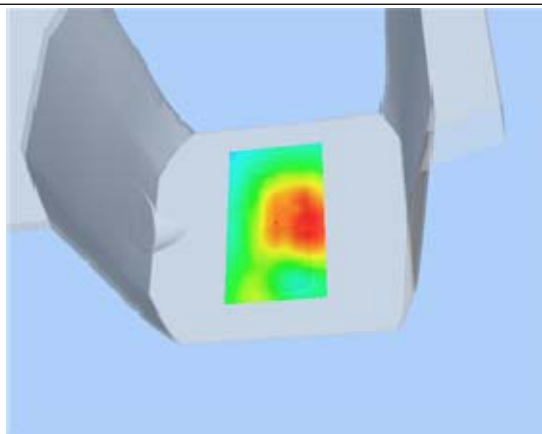
Z Axis Scan

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

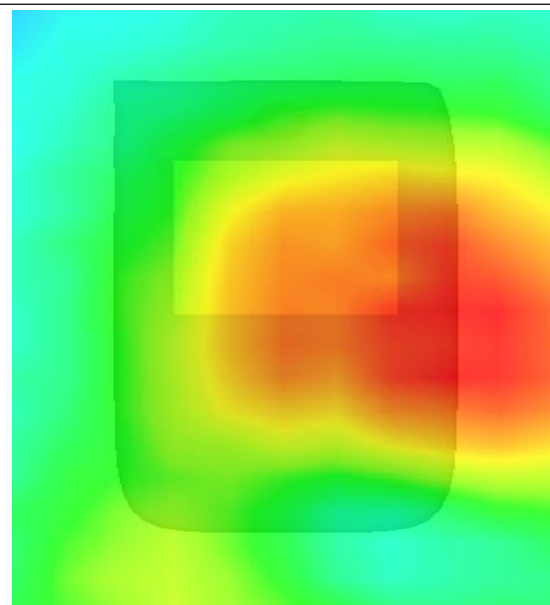
SAR, Z Axis Scan (X = 30, Y = -1)



3D scene shot



Hot spot position



MEASUREMENT 11

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

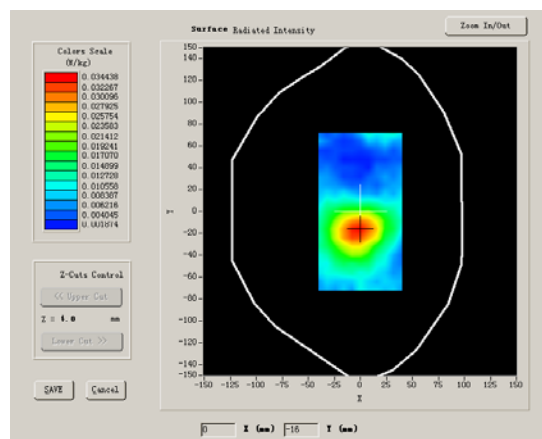
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	802.11B
Channels	High
Signal	DSSS

B. SAR Measurement Results

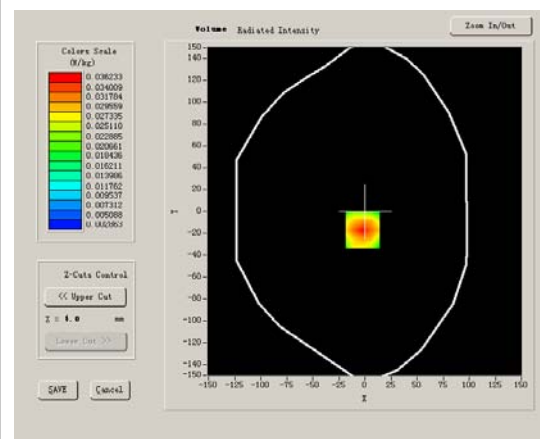
Higher Band SAR (Channel 11)

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

SURFACE SAR



VOLUME SAR



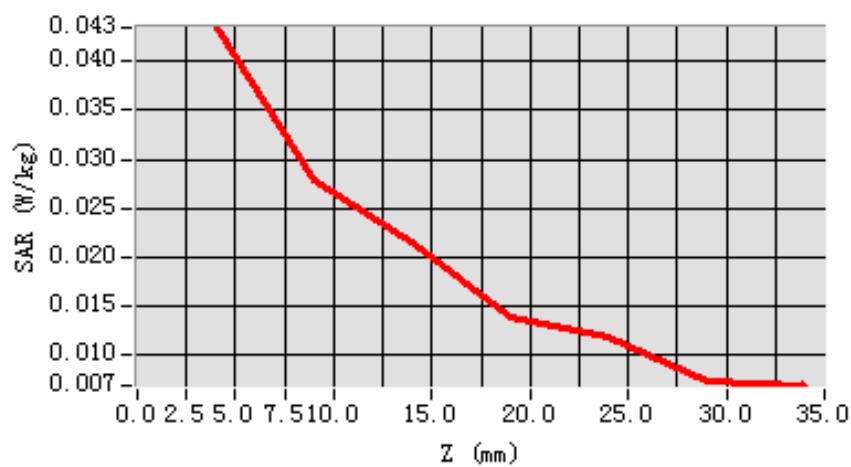
Maximum location: X=-2.00, Y=-17.00

SAR 10g (W/Kg)	0.026378
SAR 1g (W/Kg)	0.040954

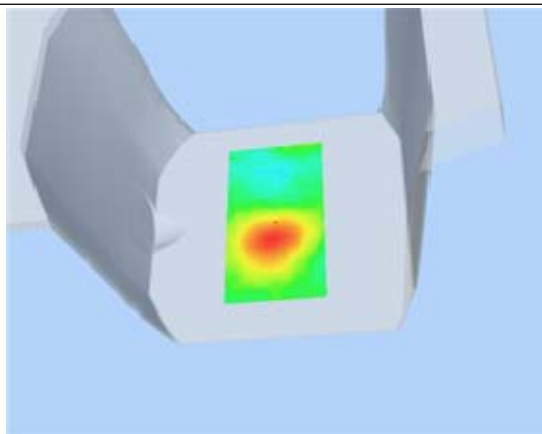
Z Axis Scan

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

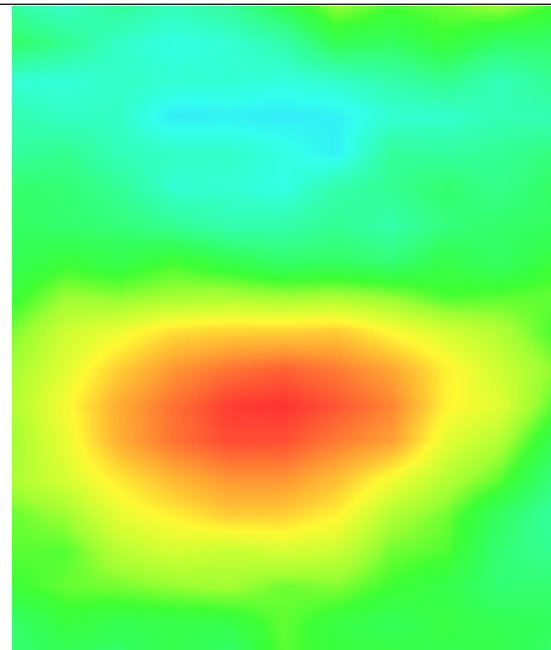
SAR, Z Axis Scan (X = -2, Y = -17)



3D scene shot



Hot spot position



MEASUREMENT 12

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

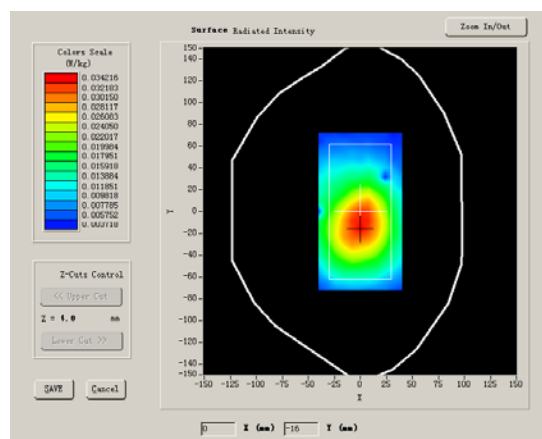
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	802.11B
Channels	High
Signal	DSSS

B. SAR Measurement Results

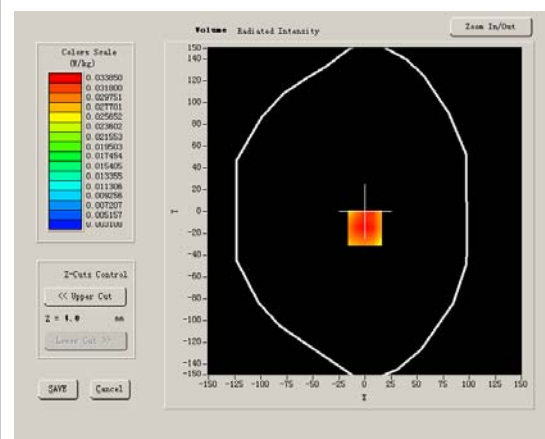
Higher Band SAR (Channel 11)

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

SURFACE SAR



VOLUME SAR



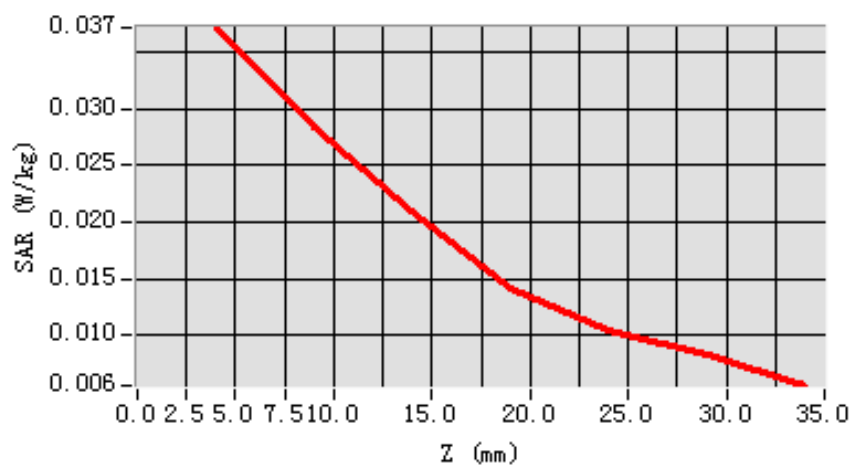
Maximum location: X=0.00, Y=-15.00

SAR 10g (W/Kg)	0.024740
SAR 1g (W/Kg)	0.035394

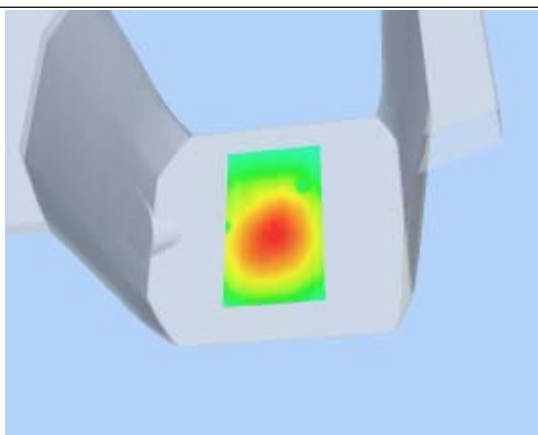
Z Axis Scan

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

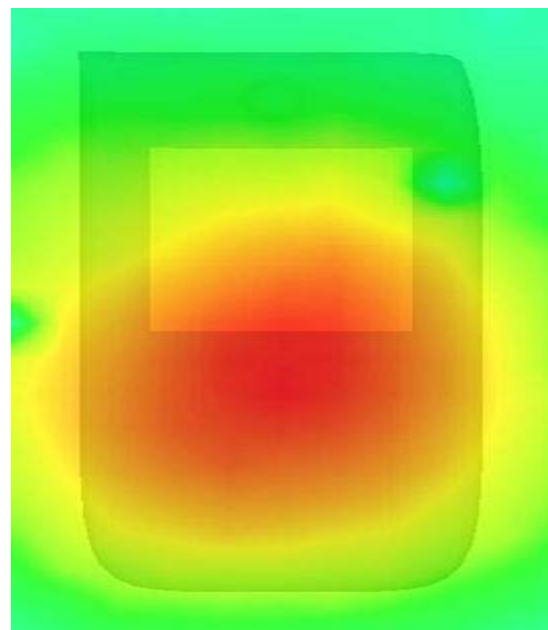
SAR, Z Axis Scan (X = 0, Y = -15)



3D scene shot



Hot spot position



MEASUREMENT 13

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

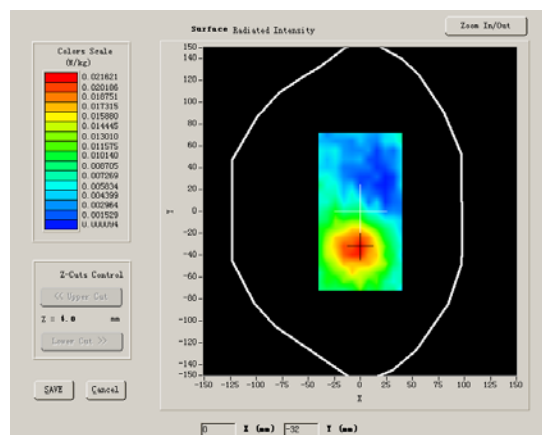
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	802.11B
Channels	High
Signal	DSSS

B. SAR Measurement Results

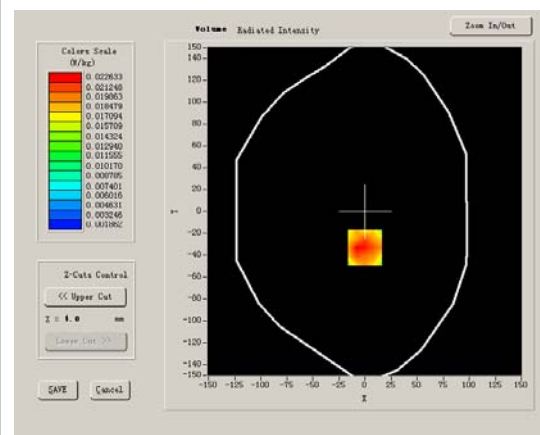
Higher Band SAR (Channel 11)

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

SURFACE SAR



VOLUME SAR



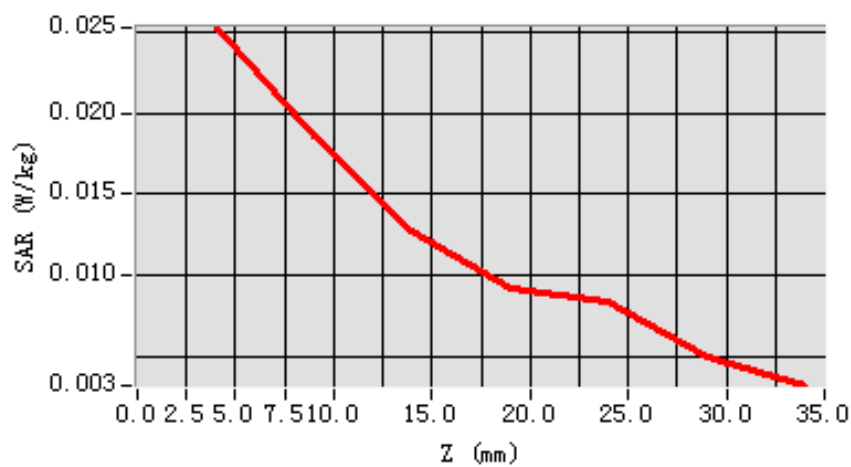
Maximum location: X=0.00, Y=-33.00

SAR 10g (W/Kg)	0.016391
SAR 1g (W/Kg)	0.024818

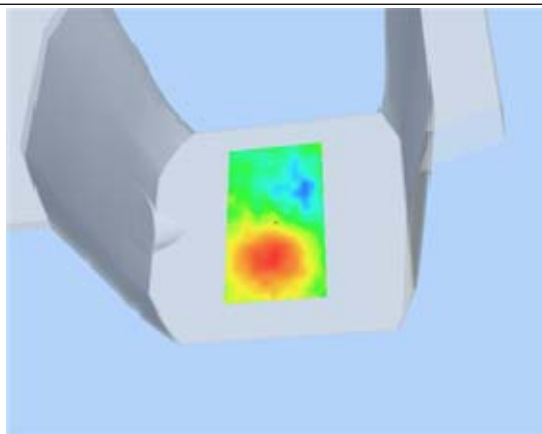
Z Axis Scan

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

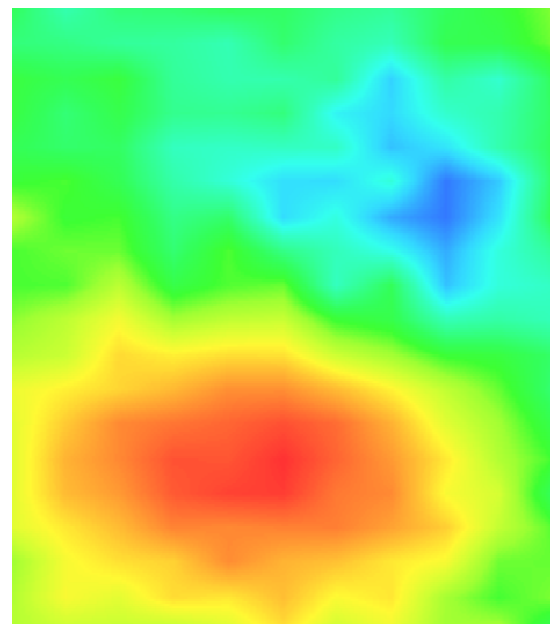
SAR, Z Axis Scan (X = 0, Y = -33)



3D scene shot



Hot spot position



MEASUREMENT 14

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

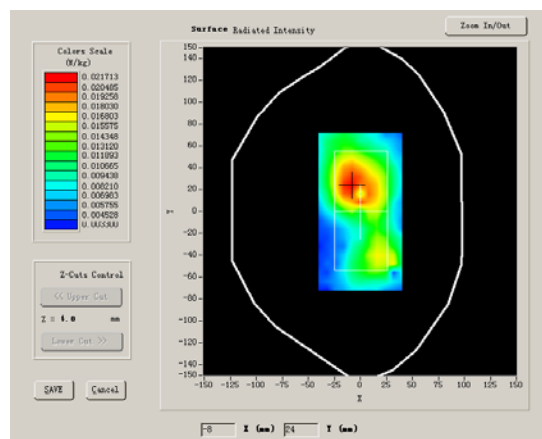
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	802.11B
Channels	High
Signal	DSSS

B. SAR Measurement Results

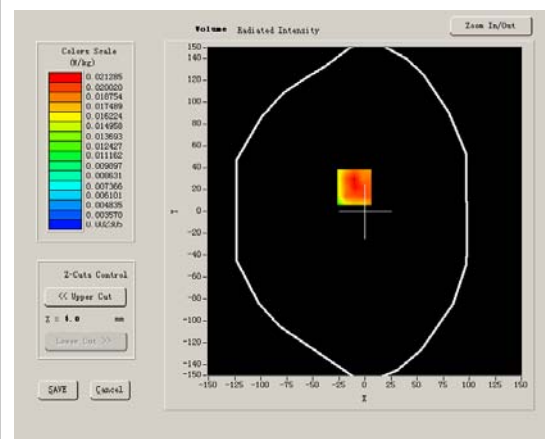
Higher Band SAR (Channel 11)

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

SURFACE SAR



VOLUME SAR



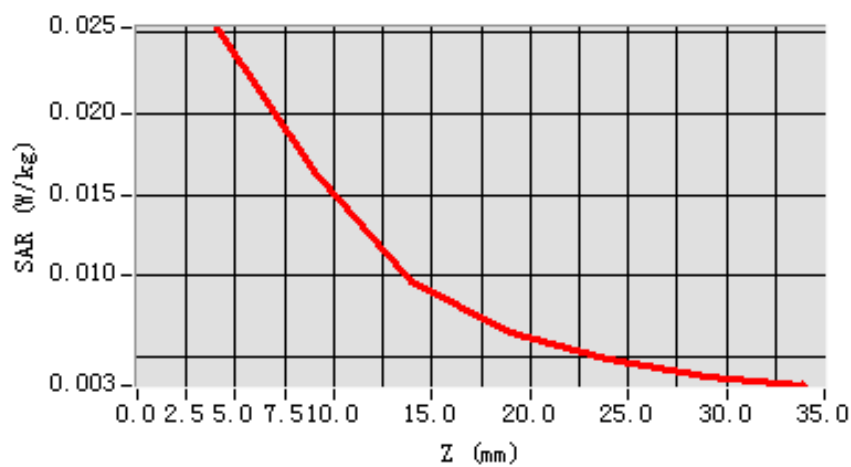
Maximum location: X=-10.00, Y=22.00

SAR 10g (W/Kg)	0.015390
SAR 1g (W/Kg)	0.024456

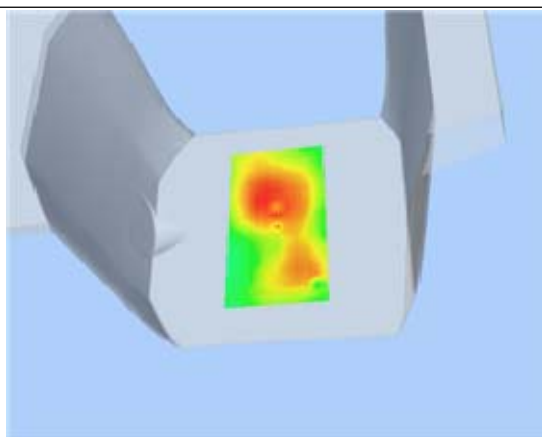
Z Axis Scan

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

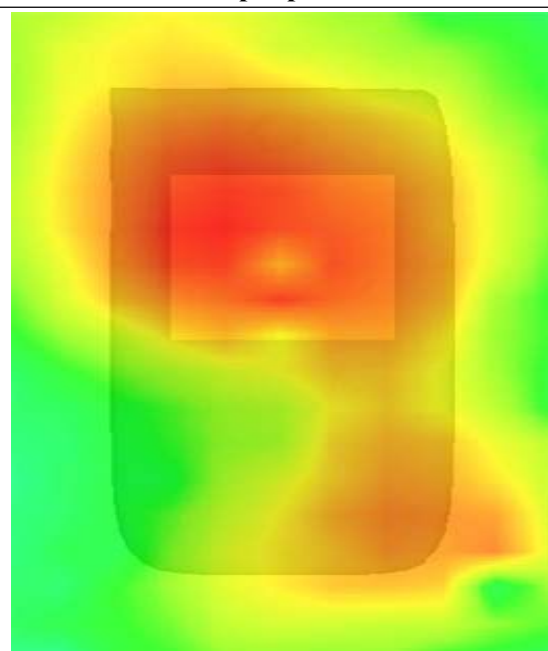
SAR, Z Axis Scan (X = -10, Y = 22)



3D scene shot



Hot spot position



System Performance Check Data(Body)

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 27 seconds

A. Experimental conditions.

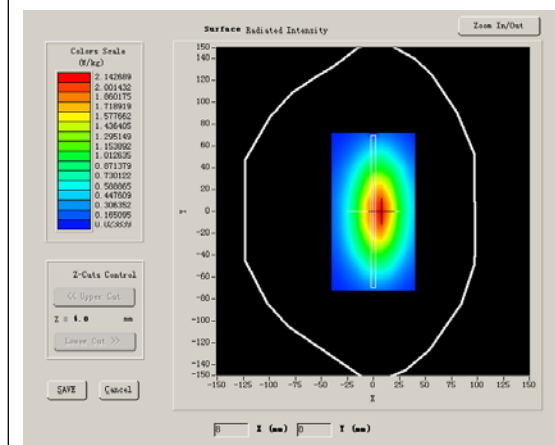
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

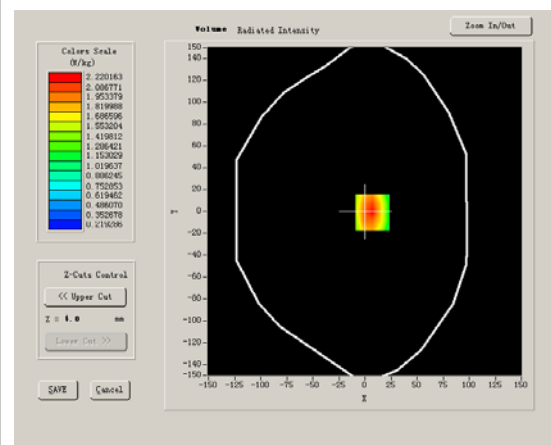
Band SAR

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

SURFACE SAR



VOLUME SAR



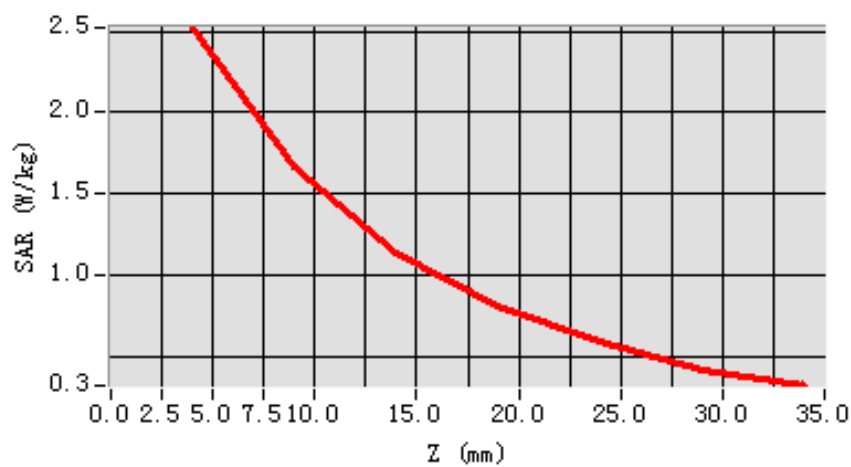
Maximum location: X=7.00, Y=-1.00

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

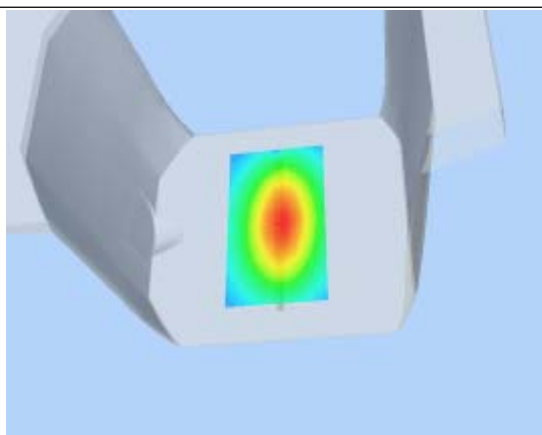
Z Axis Scan

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

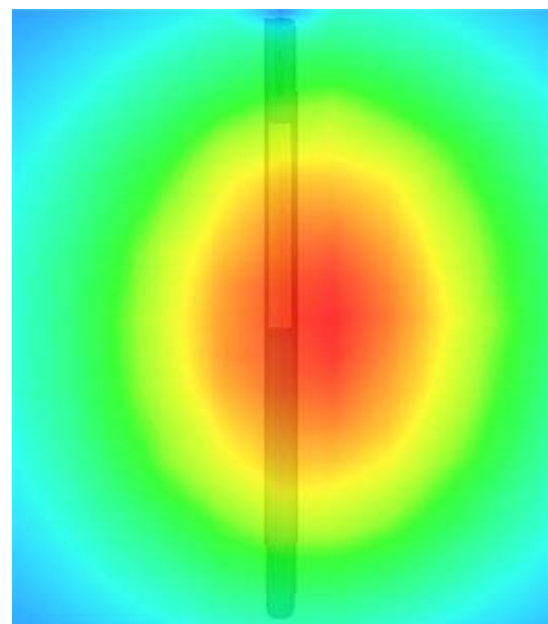
SAR, Z Axis Scan (X = 7, Y = -1)



3D scene shot



Hot spot position



System Performance Check Data(Body)

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 26 seconds

A. Experimental conditions.

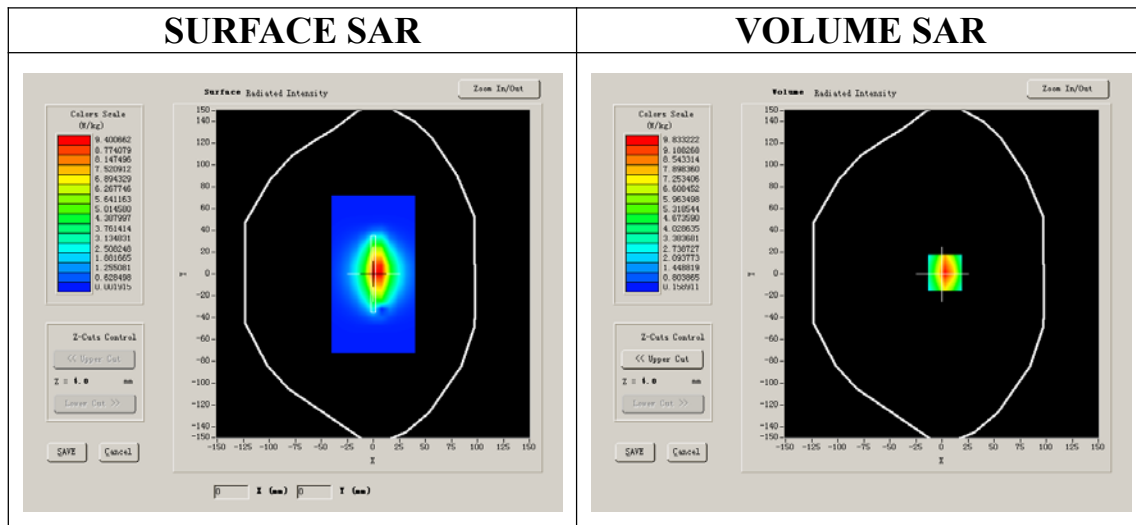
Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

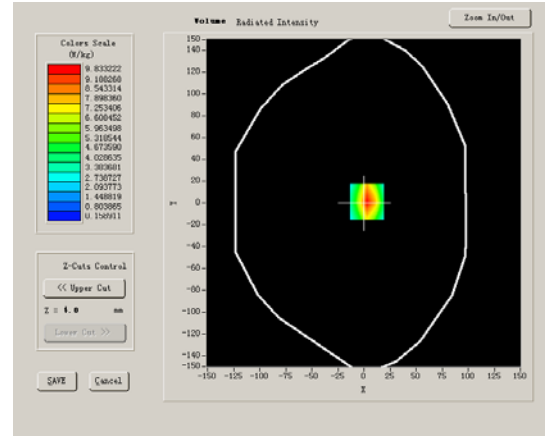
Band SAR

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

SURFACE SAR



VOLUME SAR



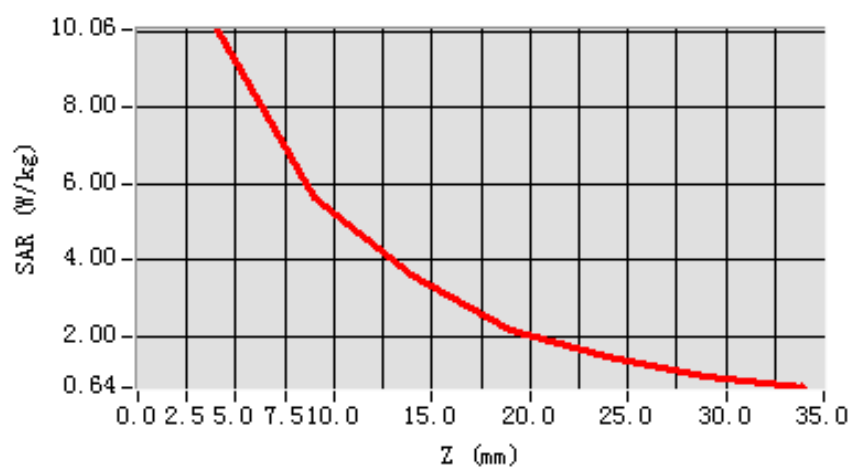
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	4.981611
SAR 1g (W/Kg)	9.740177

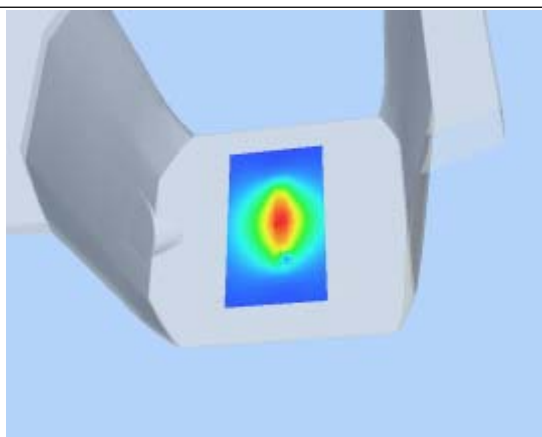
Z Axis Scan

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

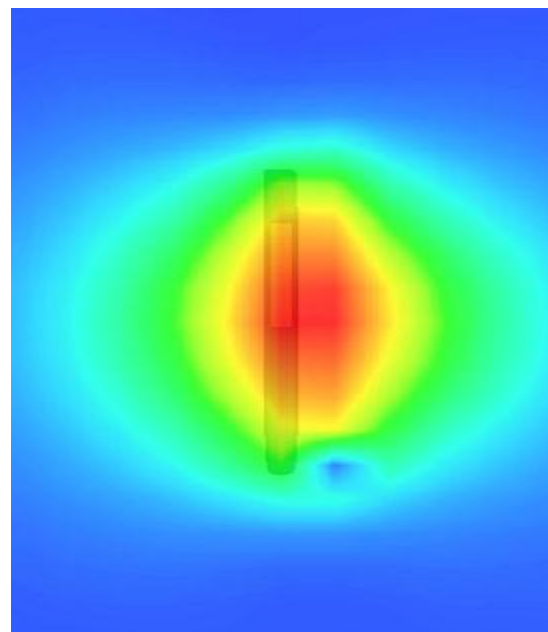
SAR, Z Axis Scan (X = 3, Y = 1)



3D scene shot



Hot spot position



System Performance Check Data(Body)

Type: Phone measurement (Complete)

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

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

Date of measurement: 5/9/2012

Measurement duration: 13 minutes 27 seconds

A. Experimental conditions.

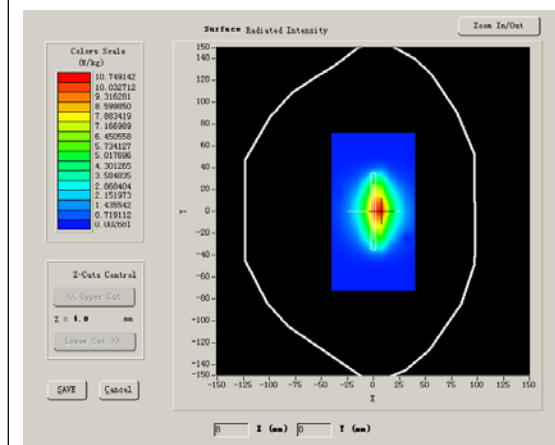
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	2450MHz
Channels	
Signal	CW

B. SAR Measurement Results

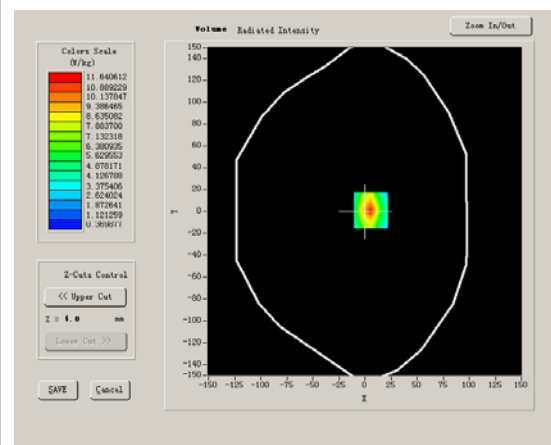
Band SAR

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

SURFACE SAR



VOLUME SAR



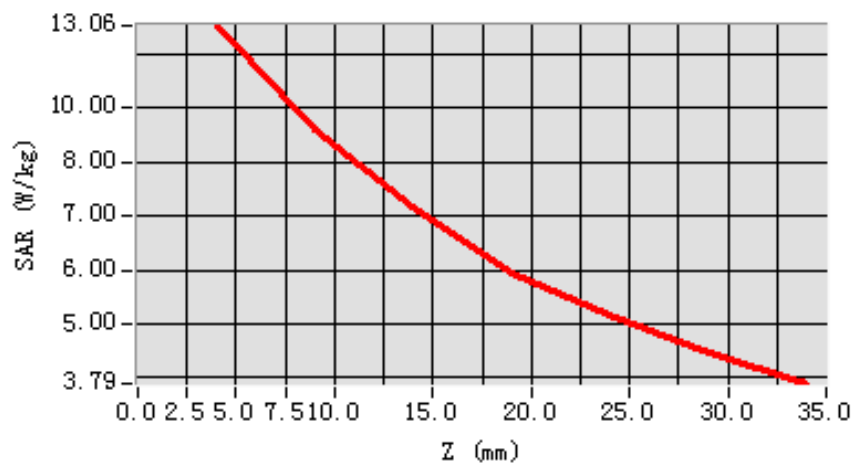
Maximum location: X=-1.00, Y=-50.00

SAR 10g (W/Kg)	6.256773
SAR 1g (W/Kg)	12.789110

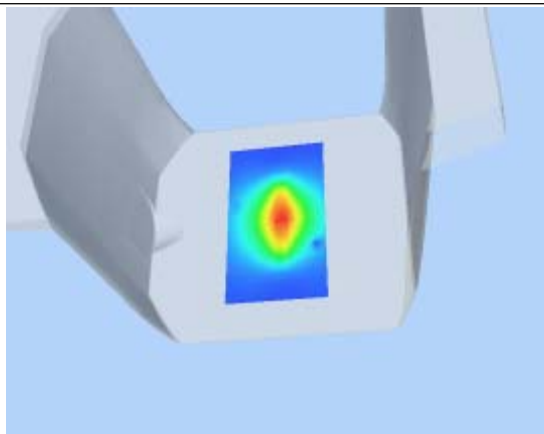
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	13.1279	6.8312	3.5991	1.3473

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



3D scene shot



Hot spot position

