



SAR TEST REPORT



Issued to

TCT Mobile Limited

For

HSPA+ USB Modem

Model Name : One Touch X500F
 Trade Name : Alcatel
 Brand Name : Alcatel
 FCC ID : RAD228
 Standard : FCC Oet65 Supplement C Jun.2001
 47CFR 2.1093
 ANSI C95.1-1999
 IEEE 1528-2003
 MAX SAR : Body: 1.095W/kg
 Test date : 2011-10-29
 Issue date : 2011-11-4

Shenzhen MORLAB Communication Technology Co., Ltd.



Tested by Zhu Zhan
 Zhu Zhan
 Date 2011.11.4

Approved by Zeng Dexin
 Zeng Dexin
 Date 2011.11.4

Review by Samuel Peng
 Samuel Peng
 Date 2011.11.4

CTIA Authorized Test Lab
 LAB CODE 28881223-00
 IEEE 1725

OFTA
 電訊管理局



GCF
 Official Observer of
 Global Certification Forum

Bluetooth
 BQTF

FCC
 Reg. No.
 741109

The report refers only to the sample tested and does not apply to the bulk. This report is issued in confidence to the client and it will be strictly treated as such by the Shenzhen MORLAB Communication Technology Co., Ltd. It may not be reproduced in its entirety or in part and it may not be used for advertising. The client to whom the report is issued may, however, show or send it, or a certified copy thereof prepared by the Shenzhen MORLAB Telecommunication Co., Ltd to his customer. Supplier or others persons directly concerned. Shenzhen MORLAB Telecommunication Co., Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report. In the event of the improper use of the report, Shenzhen MORLAB Telecommunication Co., Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

DIRECTORY

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 EUTs	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	14
6.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST	14
6.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK	15
7. SAR MEASUREMENT EVALUATION	17
7.1. System Setup	17
7.2. Validation Results	17
8. OPERATIONAL CONDITIONS DURING TEST	18
8.1. Informations on the testing	18

8.2. Body-worn Configurations	18
8.3. Measurement procedure	19
8.4. Description of interpolation/extrapolation scheme	19
9. 3G MEASUREMENT PROCEDURES	21
9.1. Procedures Used To Establish Test Signal	21
9.2. SAR Measurement Conditions for WCDMA	21
9.3. Output Power Verification	21
9.4. Tablet PC with HSUPA	21
9.5. conducted output power	21
10. TEST RESULTS LIST	24
ANNEX A PHOTOGRAPHS OF THE EUT	25
ANNEX B GRAPH TEST RESULTS	28

Change History		
Issue	Date	Reason for change
1.0	2011-11-4	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:2011-10-8)	NA	NA
10	Dipole 835MHz	Satimo (SN 36/08 DIPC 99)	2011-9-23	1year
11	Dipole 1800MHz	Satimo (SN 36/08 DIPF 101)	2011-9-23	1year
12	Dipole 2450MHz	Satimo (SN 36/08 DIPJ 103)	2011-9-23	1year

2. Technical Information

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

2.1. Identification of Applicant

Company Name: TCT Mobile Limited
Address: 5F, E building, No. 232, Liang Jing 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

2.3. Equipment Under Test (EUT)

Brand Name: Alcatel
Type Name: Alcatel
Marking Name: One Touch X500F
Hardware Version: PIO
Software Version: S1_B15001S_1110000_B10001S
Frequency Bands: GSM 850MHz / PCS 1900MHz
WCDMA 1900MHz
Modulation Mode: GSM / GPRS : GMSK, EDGE : 8PSK
WCDMA : QPSK
HSDPA : QPSK / 16QAM, HSUPA : BPSK
Multislot Class GPRS: Multislot Class 12: EDGE: Multislot Class 12
GPRS operation mode: Class B
HSPA release: Rel-6
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 EUTs

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

EUT Identity	Hardware Version	Software Version
1#	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.

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 1900MHz
Operation mode:	Data transmitting
Power Level:	GSM 850 MHz Maximum output power(level 5) PCS 1900 MHz Maximum output power(level 0) WCDMA 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 data is transmitting.

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 is allocated to 9262, 9400 and 9538 respectively in the case of WCDMA 1900MHz, The EUT, The EUT is commanded to operate at maximum transmitting power.

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

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

For SAR testing, EUT is in GPRS/EDGE or WCDMA/HSDPA/HSUPA 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/HSDPA/HSUPA 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

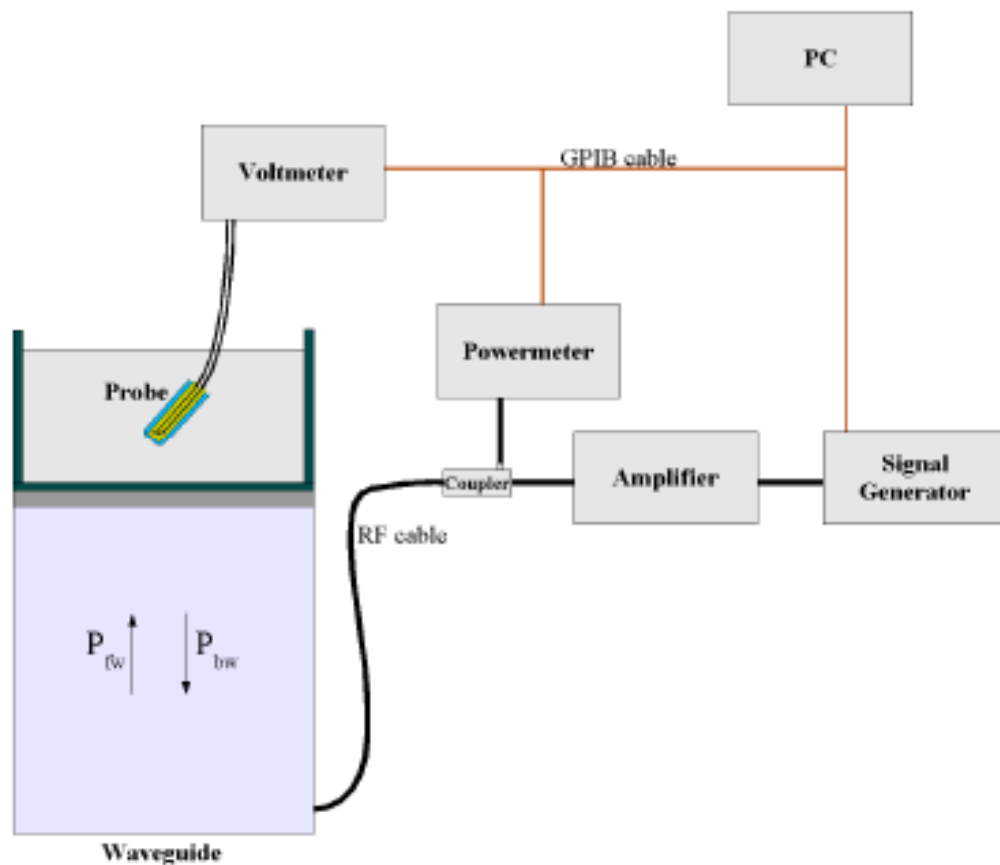
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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

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

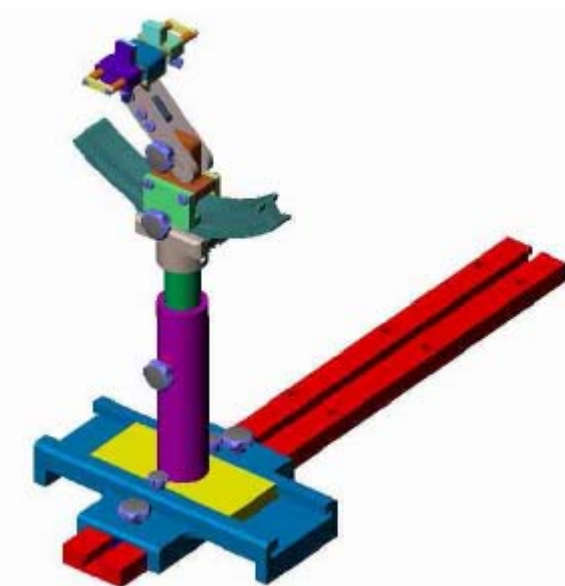
where DCP is the diode compression point in mV.

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

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

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

Ingredients (% by weight)	Frequency Band		Frequency Band	
	835MHz		1900MHz	
Tissue Type	Head	Body	Head	Body
Water	41.45	52.4	55.36	40.4
Salt(NaCl)	1.45	1.4	0.35	0.5
Sugar	56.0	45.0	30.45	58.0
HEC	1.0	1.0	0.0	1.0
Bactericide	0.1	0.1	0.0	0.1
Triton	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	13.84	0.0
Acticide SPX	0.0	0.0	0.0	0.0
Dielectric Constant	42.45	56.1	41.00	54.0
Conductivity (S/m)	0.91	0.95	1.38	1.45

Recipes for Tissue Simulating Liquid

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

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

Table 2: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.0~23.8°C, humidity: 54~60%.

/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	835 MHz	55. 2	0. 97
Validation value (Oct. 29)	835 MHz	55. 709999	1. 009033
Target value	1900 MHz	53. 3	1. 52

Validation value (Oct. 29)	1900 MHz	52.548876	1.573978

6. Uncertainty Assessment

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

6.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	V i
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
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	
Output power Power drift - SAR drift measurement	6.6.2	2.74	R	$\sqrt{3}$	1	1	1.58	1.58	
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	

Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				12.52	11.71	
Expanded Uncertainty (95% Confidence interval)			k				25.05	23.42	

6.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+ - %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	V i
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	N - 1
Input power and SAR drift measurement	8,6.6.2	2.74	R	$\sqrt{3}$	1	1	1.58	1.58	

Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				11.50	10.61	
Expanded Uncertainty (95% Confidence interval)			k				23.00	21.21	

7. SAR Measurement Evaluation

7.1. System Setup

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

Equipments :

name	Type and specification
Signal generator	E4433B
Directional coupler	450MHz-3GHz
Amplifier	3W 502(10-2500MHz)
Reference dipole	835MHz:SN 36/08 DIPC 99 1800MHz:SN 36/08 DIPF 101

7.2. Validation Results

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

Frequency	835MHz	1900MHz
Target value (1g)	9.5 W/Kg	38.1 W/Kg
250 mW input power (Oct. 29, 2011)	2.512 W/Kg	9.846 W/Kg
Test value (1g)	10.048 W/Kg	39.612 W/Kg

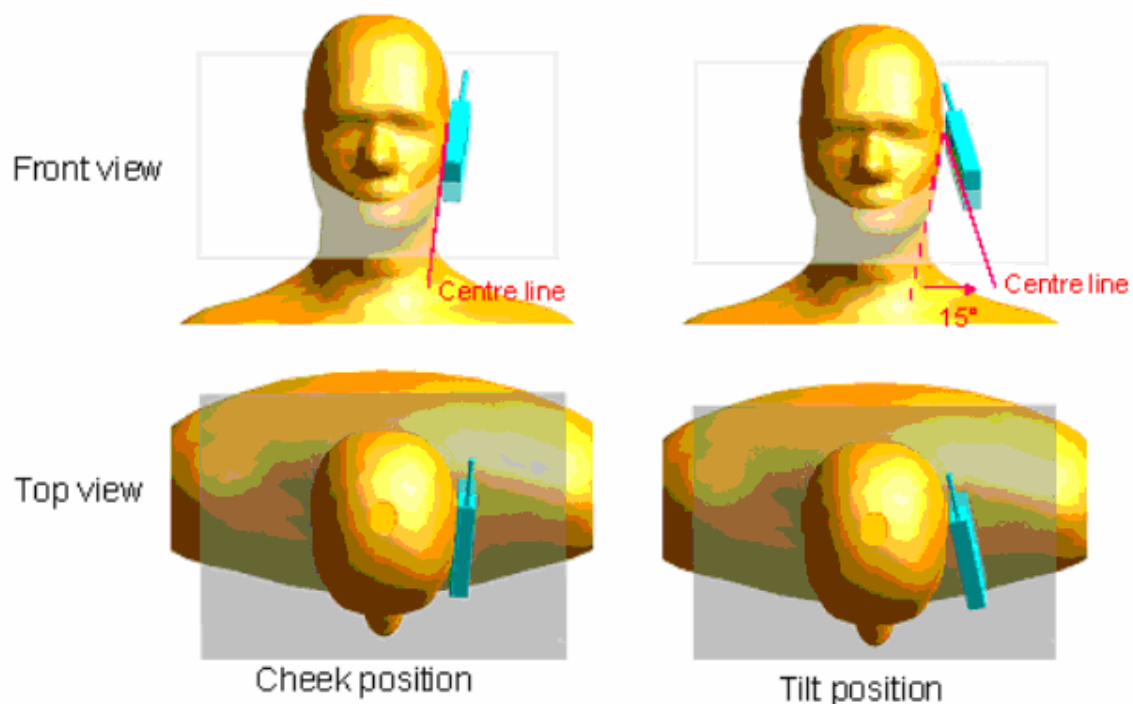
Note: System checks the specific test data please see page 69-72

8. Operational Conditions During Test

8.1. Informations on the testing

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

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



Description of the “cheek” position:

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

Description of the “tilted” position:

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

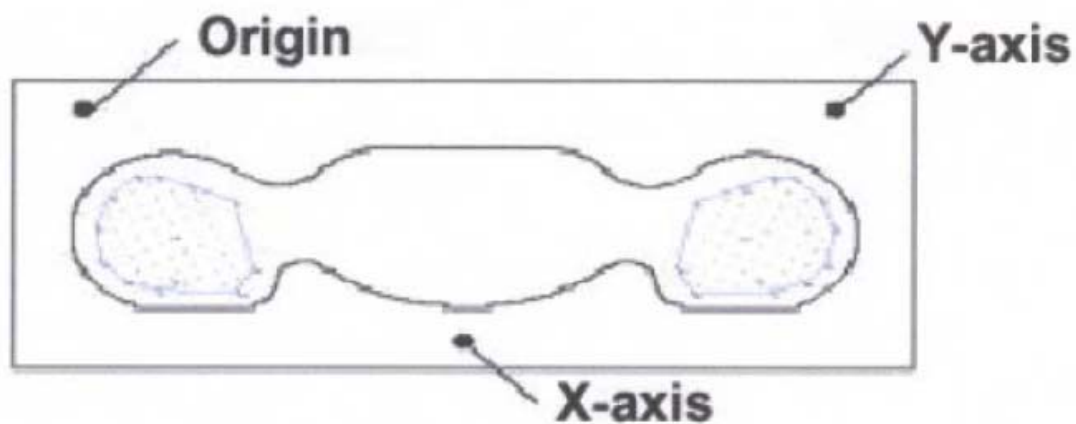
Remark: Please refer to Appendix B for the test setup photos.

8.2. Body-worn Configurations

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

The depth of the body tissue was 15.1cm. The distance between the back of the device and the bottom of the flat phantom is 5mm(taking into account of the IEEE 1528 and the place of the antenna)

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



SAR Measurement Points in Area Scan

8.3. Measurement procedure

The following steps are used for each test position

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

8.4. Description of interpolation/extrapolation scheme

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

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated

from the liquid surface with a 1mm step.

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

9. 3G MEASUREMENT PROCEDURES

9.1. Procedures Used To Establish Test Signal

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

9.2. SAR Measurement Conditions for WCDMA

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

9.3. Output Power Verification

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

9.4. Tablet PC with HSUPA

Body SAR is also measured for HSUPA when the maximum average output of each RF channel with HSUPA active is at least 1/4 dB higher than that measured without HSUPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2kbps RMC without HSD-PA

9.5. conducted output power

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 33dBm, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), the rated conducted RF output power is 30dBm.

Band	Channel	Frequency (MHz)	Measured Output Power		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 850MHz	128	824.2	32.31	Plot A1 to A3	35	PASS
	190	836.6	31.86			PASS
	251	848.8	32.05			PASS
GSM 1900MHz	512	1850.2	29.60	Plot B1 to B3	32	PASS
	661	1880.0	29.82			PASS
	810	1909.8	29.81			PASS
GPRS 850MHz	128	824.2	28.57	Plot C1 to C3 1down link 4up link	35	PASS
	190	836.6	28.21			PASS
	251	848.8	28.35			PASS
GPRS 1900MHz	512	1850.2	26.84	Plot D1 to D3 1down link 4up link	32	PASS
	661	1880.0	27.02			PASS
	810	1909.8	27.16			PASS
GPRS 850MHz	128	824.2	28.50	Plot E1 to E3 2down link 3up link	35	PASS
	190	836.6	28.16			PASS
	251	848.8	27.75			PASS
GPRS 1900MHz	512	1850.2	26.88	Plot F1 to F3 2down link 3up link	32	PASS
	661	1880.0	27.07			PASS
	810	1909.8	27.17			PASS
GPRS 850MHz	128	824.2	28.49	Plot G1 to G3 3down link 2up link	35	PASS
	190	836.6	28.14			PASS
	251	848.8	28.33			PASS
GPRS 1900MHz	512	1850.2	26.87	Plot H1 to H3 3down link 2up link	32	PASS
	661	1880.0	27.07			PASS
	810	1909.8	27.20			PASS
GPRS 850MHz	128	824.2	32.28	Plot I1 to I3 4down link 1up link	35	PASS
	190	836.6	31.95			PASS
	251	848.8	32.19			PASS
GPRS 1900MHz	512	1850.2	29.71	Plot J1 to J3 4down link 1up link	32	PASS
	661	1880.0	29.97			PASS
	810	1909.8	30.04			PASS
EGPRS 850MHz	128	824.2	25.48	Plot K1 to K3 1down link 4up link	35	PASS
	190	836.6	25.10			PASS
	251	848.8	25.36			PASS
EGPRS 1900MHz	512	1850.2	23.91	Plot L1 to L3 1down link 4up link	32	PASS
	661	1880.0	23.89			PASS
	810	1909.8	23.98			PASS
EGPRS 850MHz	128	824.2	26.37	Plot M1 to M3 2down link 3up link	35	PASS
	190	836.6	26.05			PASS
	251	848.8	26.34			PASS
EGPRS 1900MHz	512	1850.2	24.83	Plot N1 to N3 2down link	32	PASS
	661	1880.0	24.85			PASS

Band	Channel	Frequency (MHz)	Measured Output Power		Limit dBm	Verdict
			dBm	Refer to Plot		
	810	1909.8	24.97	3up link		PASS
EGPRS 850MHz	128	824.2	28.33	Plot O1 to O3	35	PASS
	190	836.6	28.02	3down link		PASS
	251	848.8	28.26	2up link		PASS
EGPRS 1900MHz	512	1850.2	28.68	Plot P1 to P3	32	PASS
	661	1880.0	26.90	3down link		PASS
	810	1909.8	26.94	2up link		PASS
EGPRS 850MHz	128	824.2	32.12	Plot Q1 to Q3	35	PASS
	190	836.6	31.87	4down link		PASS
	251	848.8	32.17	1up link		PASS
EGPRS 1900MHz	512	1850.2	29.76	Plot R1 to R3	32	PASS
	661	1880.0	29.58	4down link		PASS
	810	1909.8	29.87	1up link		PASS

Item	band	WCDMA 1900		
	ARFCN	9262	9400	9538
	subtest	dBm		
5.2(WCDMA)	non	23.41	22.33	22.26
5.2AA(HSDPA)	1	22.73	21.95	21.86
	2	22.69	21.89	21.83
	3	22.15	21.42	21.33
	4	22.11	21.36	21.31
5.2B(HSUPA)	1	22.14	21.65	21.45
	2	20.24	19.62	19.44
	3	21.21	20.59	20.38
	4	20.17	19.72	19.49
	5	22.24	21.58	21.40
HSPA+	1	22.34	21.56	21.44

10. Test Results List

Summary of Measurement Results (GSM 850MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg), 1g Peak		
			Device Test channel		
			Channel 128	Channel 190	Channel 251
Body (GPRS)	Horizontal-Up	Internal	0.784	/	/
	Horizontal-Down	Internal	0.788	/	/
	Vertical-Front	Internal	0.388	/	/
	Vertical-Back	Internal	0.330	/	/
Body (EDGE)	Horizontal-Up	Internal	0.715	/	/

Summary of Measurement Results (GSM 1900MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg), 1g Peak		
			Device Test channel		
			Channel 512	Channel 661	Channel 810
Body (GPRS)	Horizontal-Up	Internal	/	/	0.720
	Horizontal-Down	Internal	0.817	0.926	0.904
	Vertical-Front	Internal	/	/	0.276
	Vertical-Back	Internal	/	/	0.497
Body (EDGE)	Horizontal-Up	Internal	/	/	0.628

Summary of Measurement Results (WCDMA Band II)

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 9262	Channel 9400	Channel 9538
Body (WCDMA)	Horizontal-Up	Internal	1.042	1.095	0.784
	Horizontal-Down	Internal	0.811	0.845	0.750
	Vertical-Front	Internal	/	0.573	/
	Vertical-Back	Internal	/	0.489	/

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

Annex A Photographs of the EUT

1 EUT Horizontal-Up



2 EUT Horizontal-Down



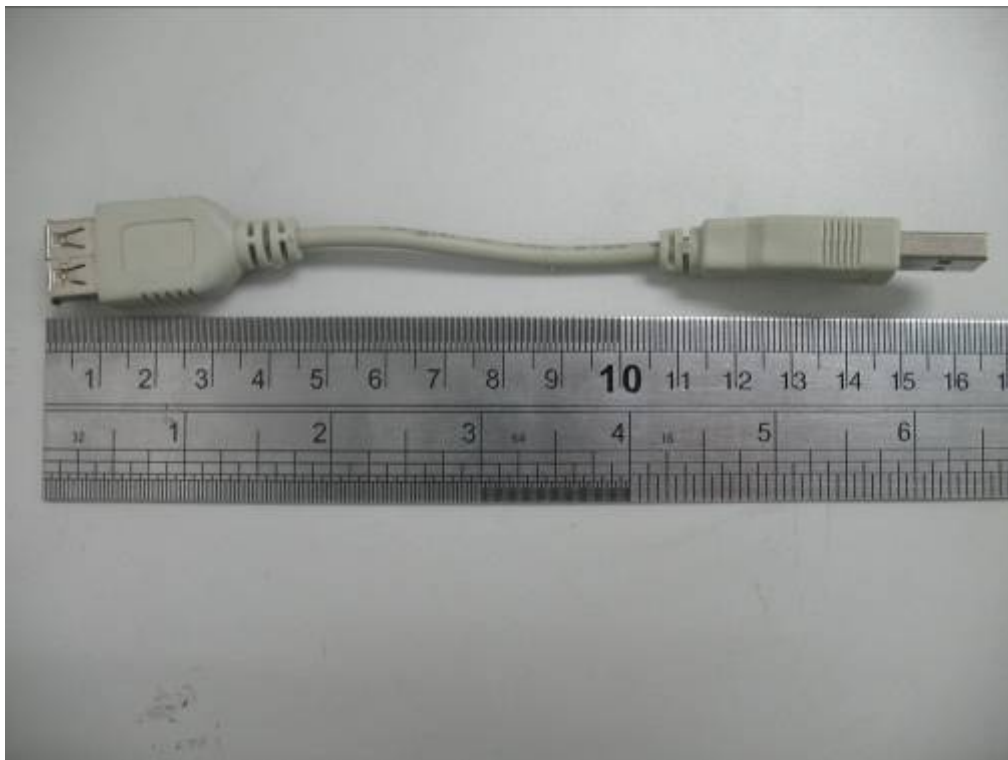
3 EUT Vertical-Front



4 EUT Vertical-Back



5 Data line



Liquid Level Photo



Annex B Graph Test Results

BAND	PARAMETERS
<u>GSM850</u>	<u>Measurement 1:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Horizontal-Up <u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Horizontal-Down <u>Measurement 3:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Vertical-Front <u>Measurement 4:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Vertical-Back <u>Measurement 5:</u> Validation Plane with Body device position on Low Channel in EDGE mode Horizontal-Up
<u>GSM1900</u>	<u>Measurement 6:</u> Validation Plane with Body device position on Low Channel in GPRS mode Horizontal-Down <u>Measurement 7:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Horizontal-Up <u>Measurement 8:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Horizontal-Down <u>Measurement 9:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Vertical-Front <u>Measurement 10:</u> Validation Plane with Body device position on Middle Channel in GPRS mode Vertical-Back <u>Measurement 11:</u> Validation Plane with Body device position on High Channel in GPRS mode Horizontal-Down <u>Measurement 12:</u> Validation Plane with Body device position on Middle Channel in EDGE mode Horizontal-Up
<u>WCDMA 1900</u>	<u>Measurement 13:</u> Validation Plane with Body device position on Low Channel in WCDMA mode Horizontal-Up <u>Measurement 14:</u> Validation Plane with Body device position on Low Channel in WCDMA mode Horizontal-Down <u>Measurement 15:</u> Validation Plane with Body device position on Middle Channel in WCDMA mode Horizontal-Up <u>Measurement 16:</u> Validation Plane with Body device position on Middle Channel in WCDMA mode Horizontal-Down <u>Measurement 17:</u> Validation Plane with Body device position on Middle Channel in WCDMA mode Vertical-Front <u>Measurement 18:</u> Validation Plane with Body device position on Middle Channel in WCDMA mode Vertical-Back <u>Measurement 19:</u> Validation Plane with Body device position on High Channel in WCDMA mode Horizontal-Up <u>Measurement 20:</u> Validation Plane with Body device position on High Channel in WCDMA mode Horizontal-Down

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: 29/10/2011

Measurement duration: 9 minutes 12 seconds

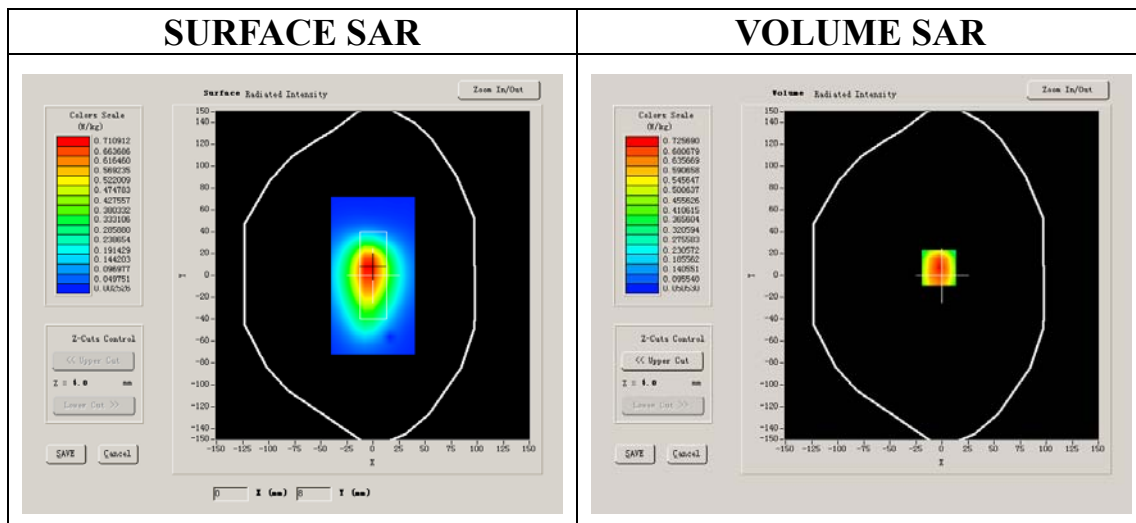
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	0.230000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.7°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2



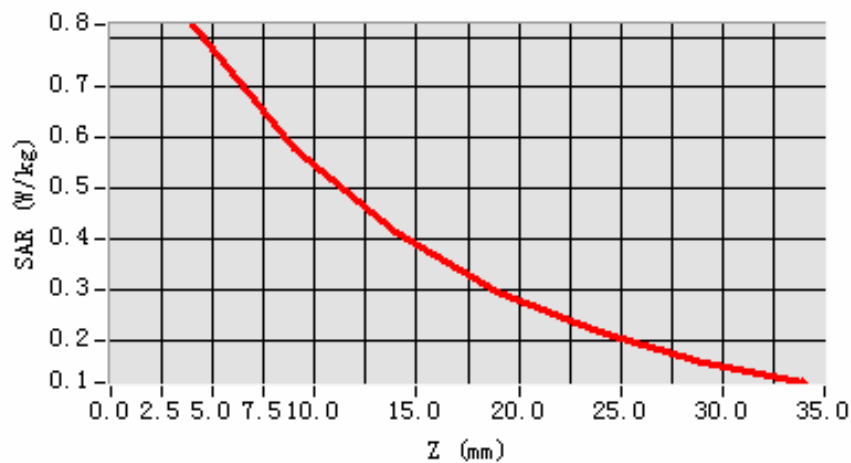
Maximum location: X=-3.00, Y=7.00

SAR 10g (W/Kg)	0.521913
SAR 1g (W/Kg)	0.784331

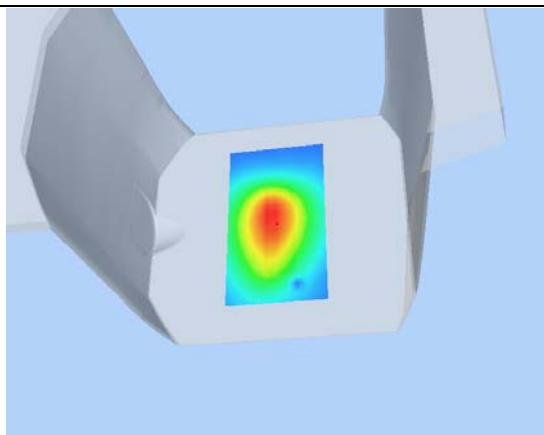
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8240	0.5803	0.4132	0.2969	0.2164	0.1579

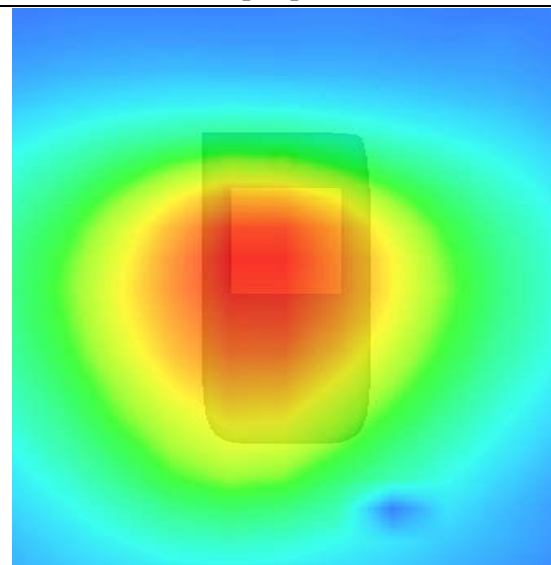
SAR, Z Axis Scan (X = -3, Y = 7)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

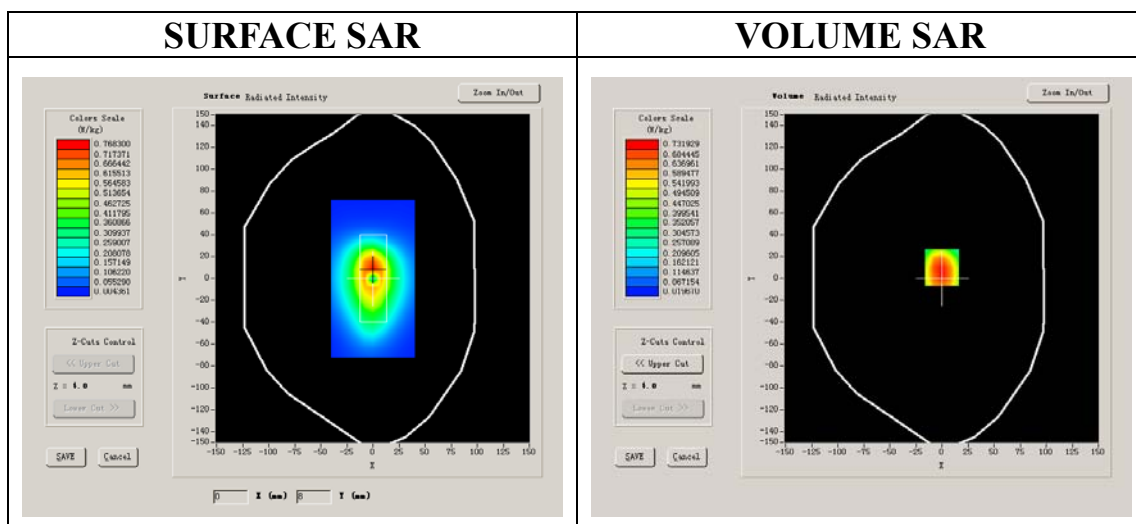
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-2.570000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.7°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2



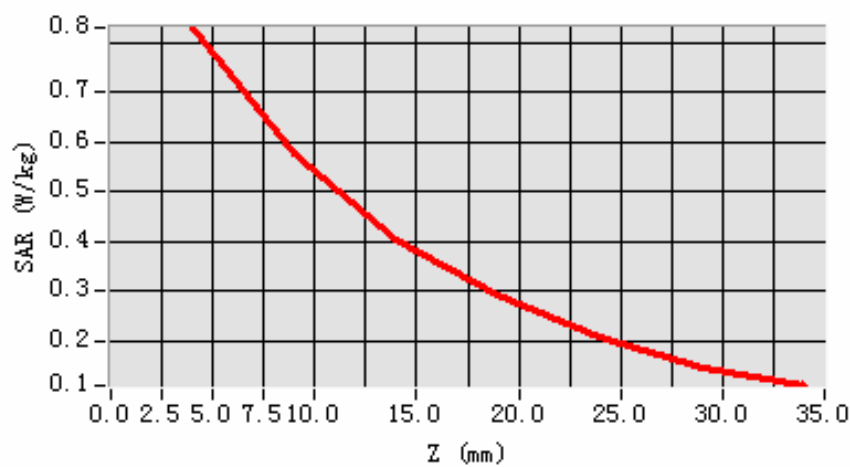
Maximum location: X=0.00, Y=10.00

SAR 10g (W/Kg)	0.535602
SAR 1g (W/Kg)	0.788034

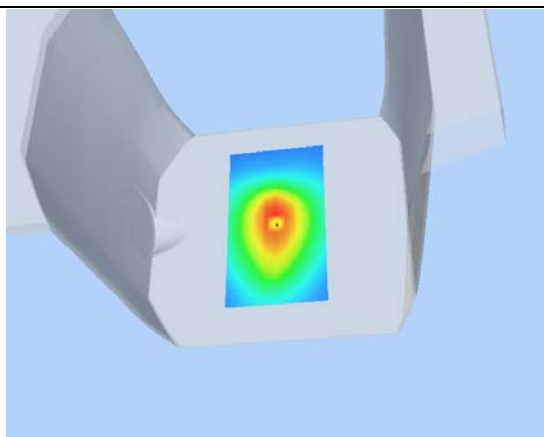
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8311	0.5790	0.4054	0.2931	0.2086	0.1467

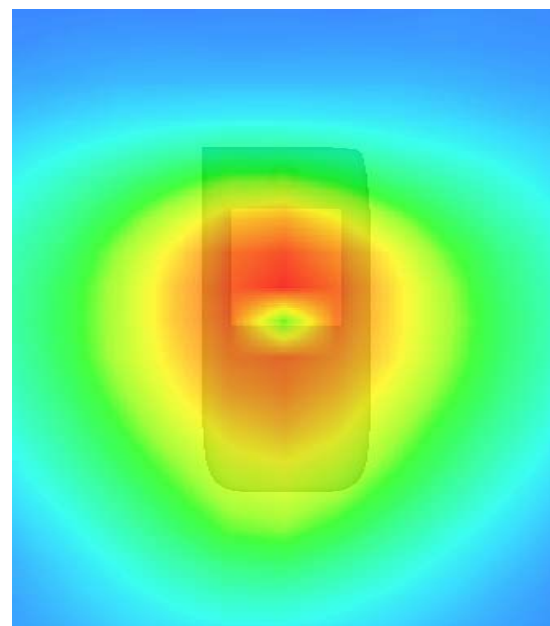
SAR, Z Axis Scan (X = 0, Y = 10)



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: 29/10/2011

Measurement duration: 9 minutes 12 seconds

A. Experimental conditions.

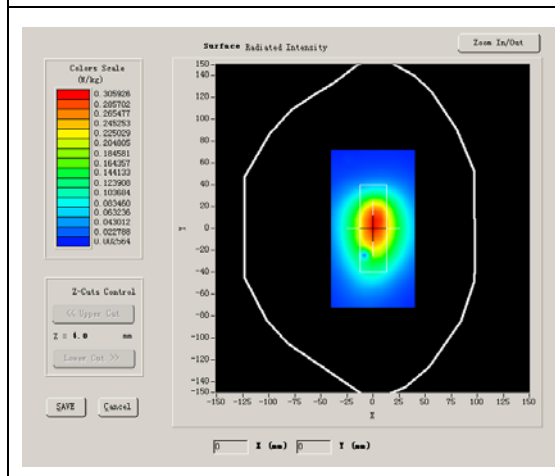
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

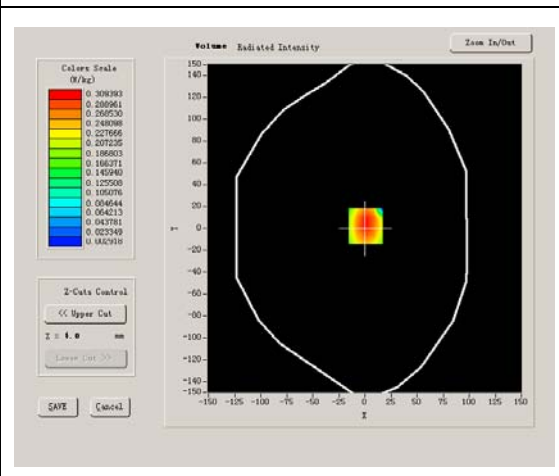
Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-11.180000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.7°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



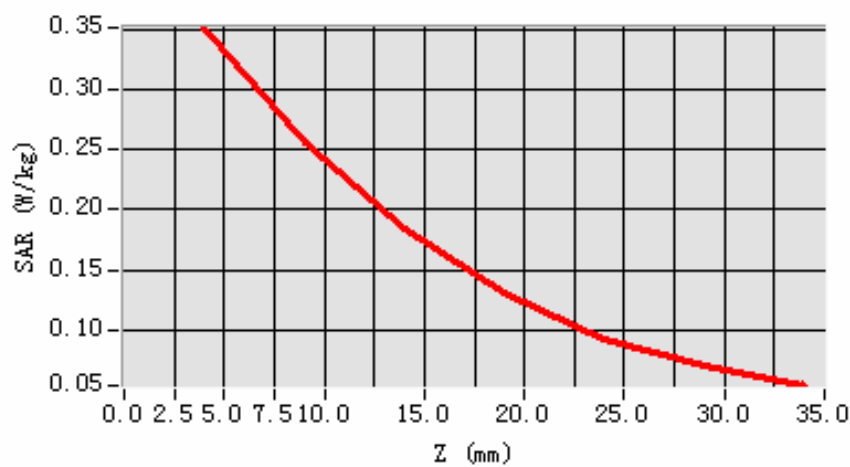
Maximum location: X=1.00, Y=2.00

SAR 10g (W/Kg)	0.228229
SAR 1g (W/Kg)	0.337951

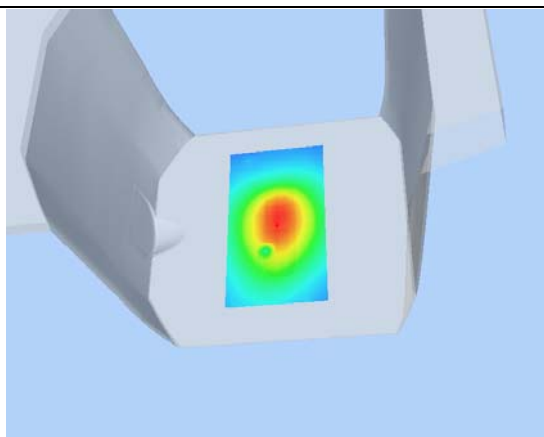
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3513	0.2566	0.1847	0.1310	0.0916	0.0697

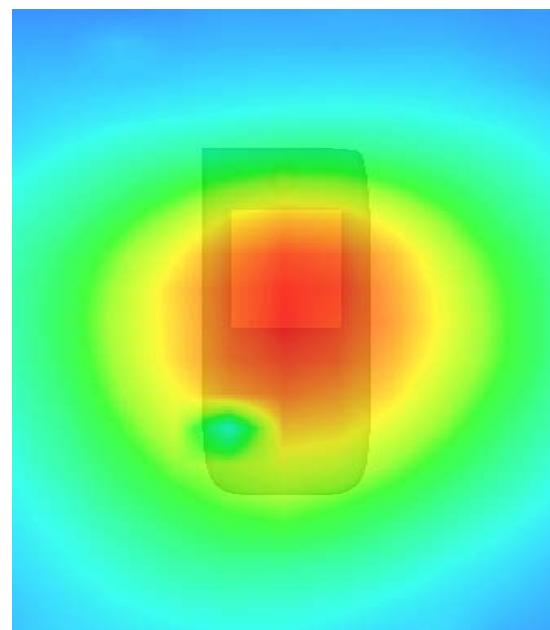
SAR, Z Axis Scan (X = 1, Y = 2)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

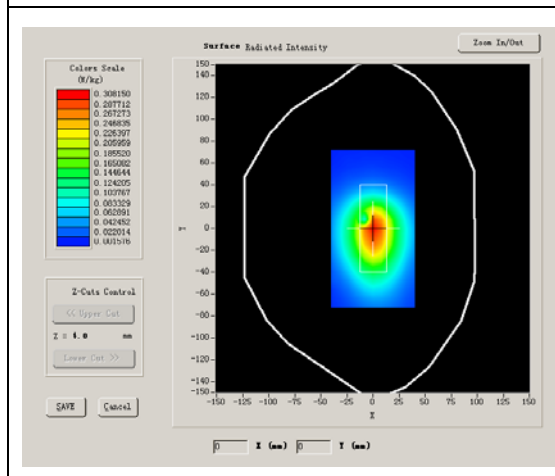
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

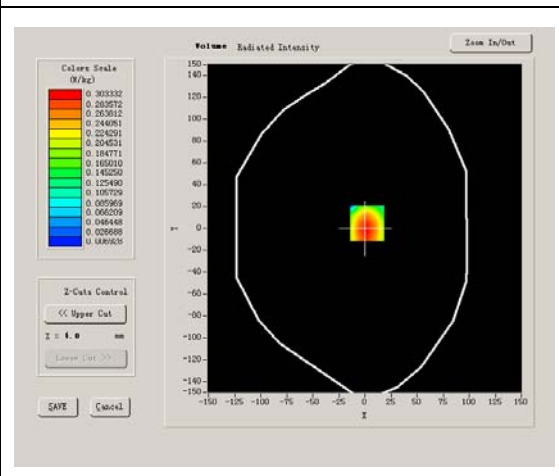
Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-0.970000
Ambient Temperature:	22.4°C
Liquid Temperature:	22.7°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



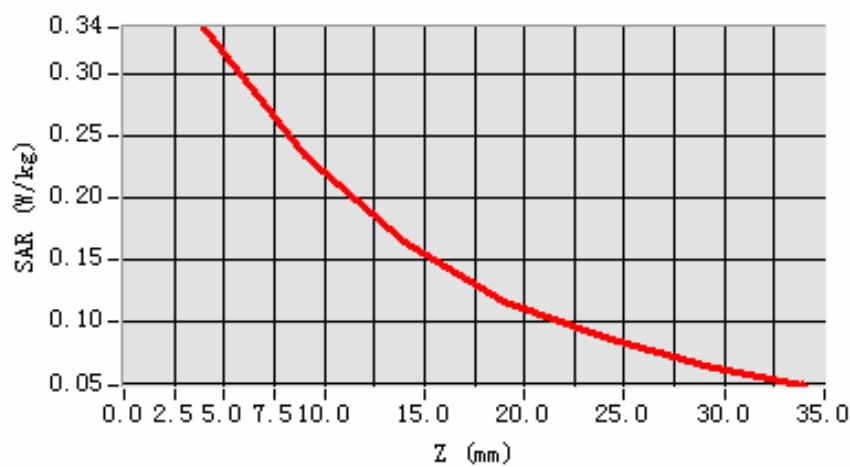
Maximum location: X=2.00, Y=5.00

SAR 10g (W/Kg)	0.220828
SAR 1g (W/Kg)	0.329814

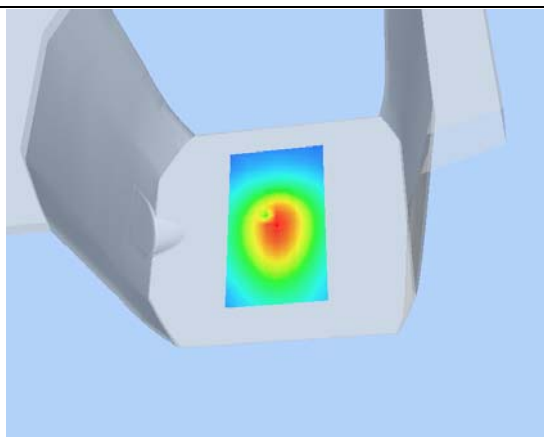
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3369	0.2326	0.1634	0.1153	0.0871	0.0642

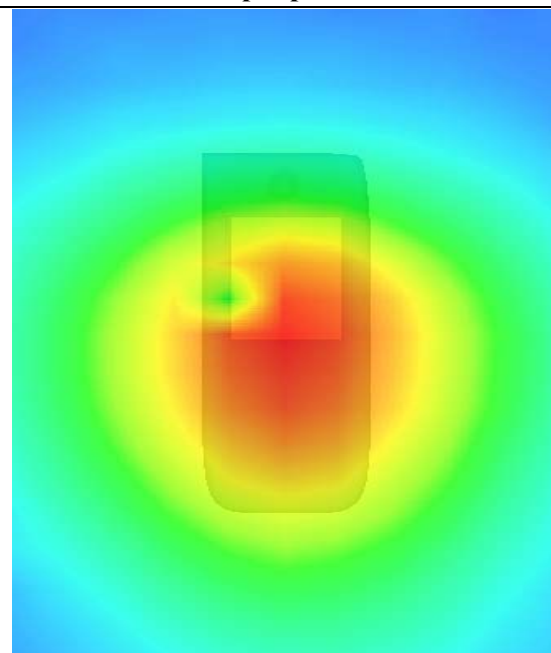
SAR, Z Axis Scan (X = 2, Y = 5)



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: 29/10/2011

Measurement duration: 9 minutes 7 seconds

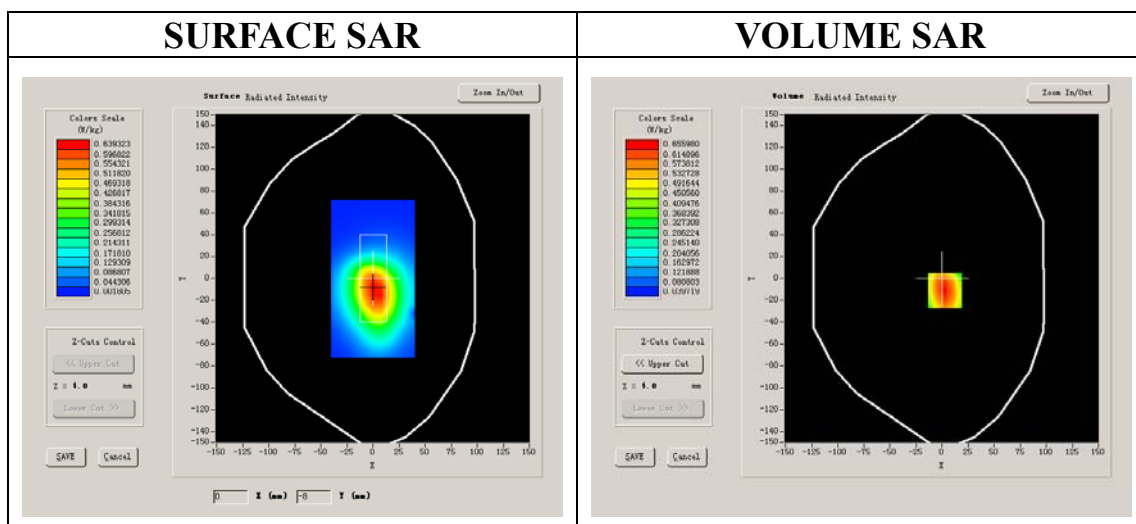
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power drift (%)	-0.990000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.5°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2



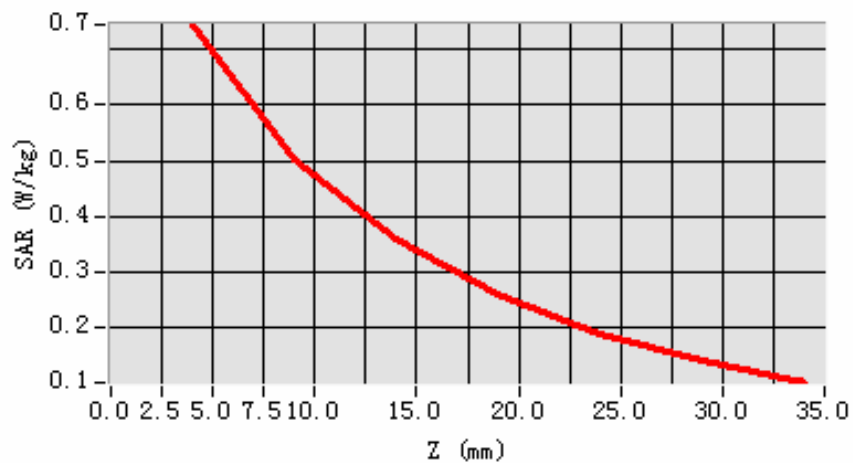
Maximum location: X=3.00, Y=-11.00

SAR 10g (W/Kg)	0.474410
SAR 1g (W/Kg)	0.715475

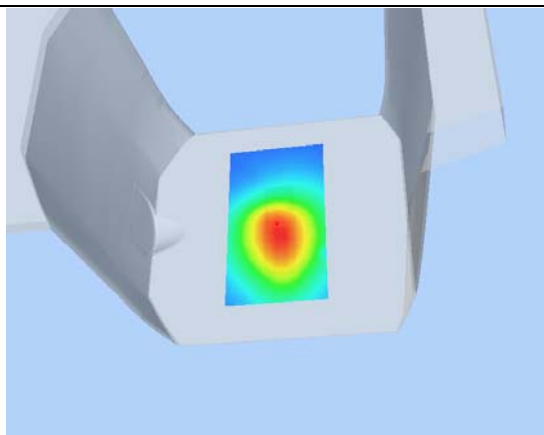
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7448	0.5023	0.3598	0.2584	0.1868	0.1384

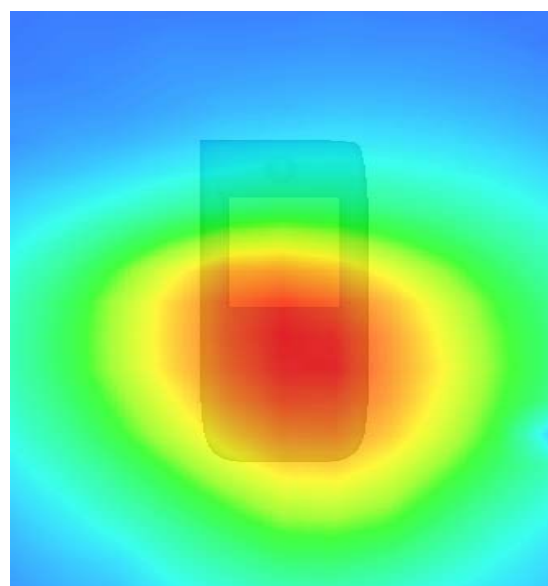
SAR, Z Axis Scan (X = 3, Y = -11)



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: 29/10/2011

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

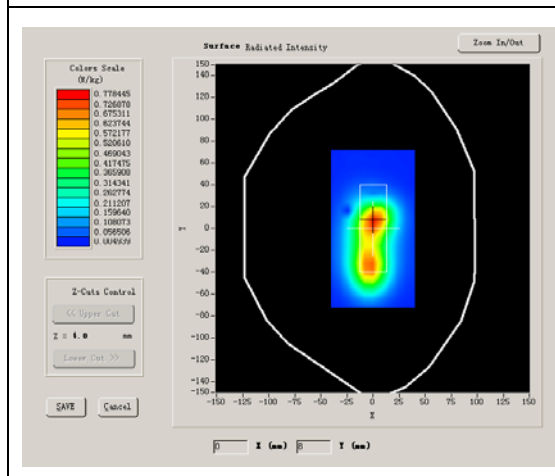
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

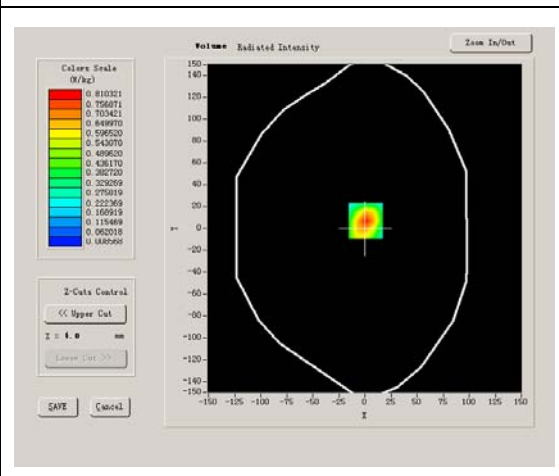
Lower Band SAR (Channel 512):

Frequency (MHz)	1850.199951
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.446240
Power drift (%)	-0.680000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



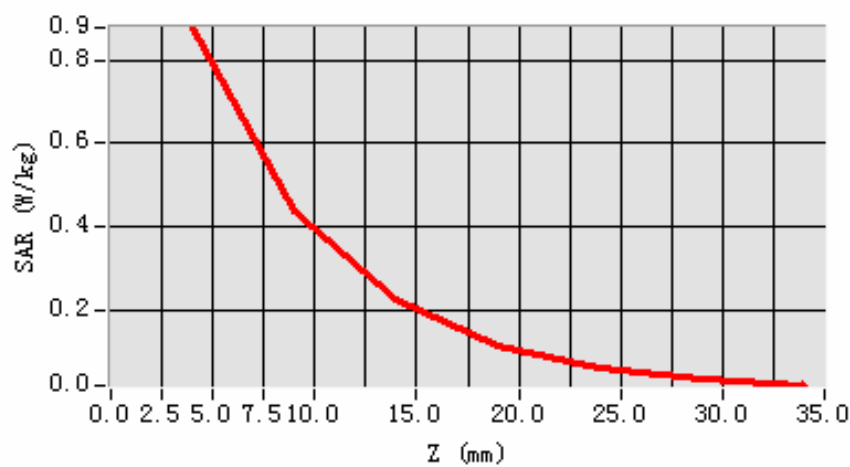
Maximum location: X=1.00, Y=7.00

SAR 10g (W/Kg)	0.417068
SAR 1g (W/Kg)	0.816618

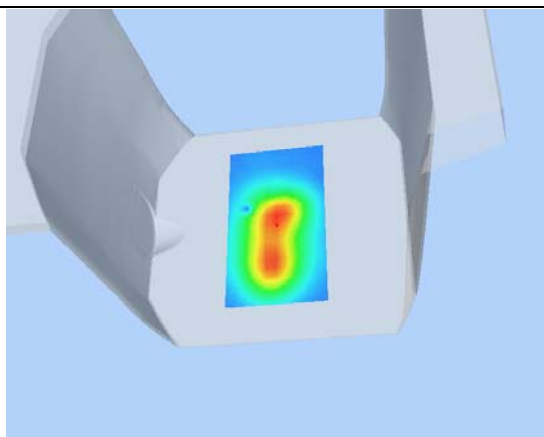
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8776	0.4346	0.2226	0.1136	0.0586	0.0339

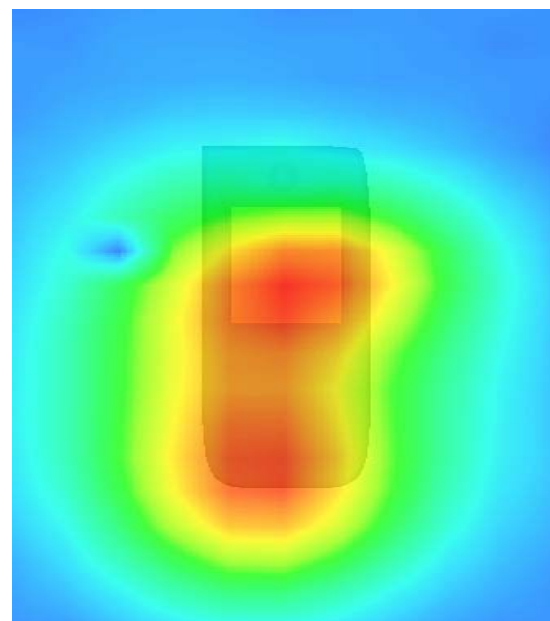
SAR, Z Axis Scan (X = 1, Y = 7)



3D scene shot



Hot spot position



MEASUREMENT 7

Type: Phone measurement (Complete)

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

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

Date of measurement: 29/10/2011

Measurement duration: 9 minutes 8 seconds

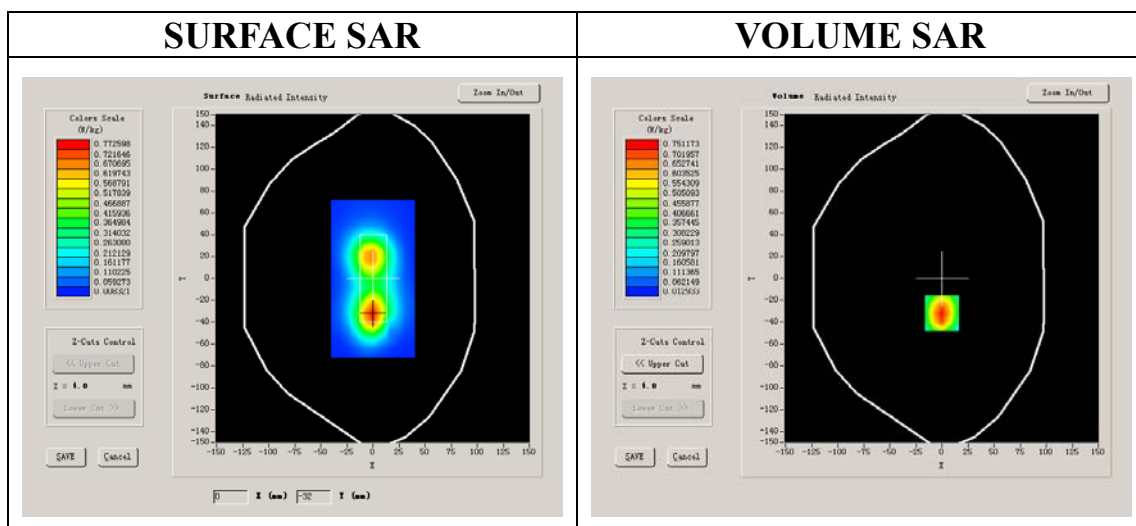
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-3.000000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2



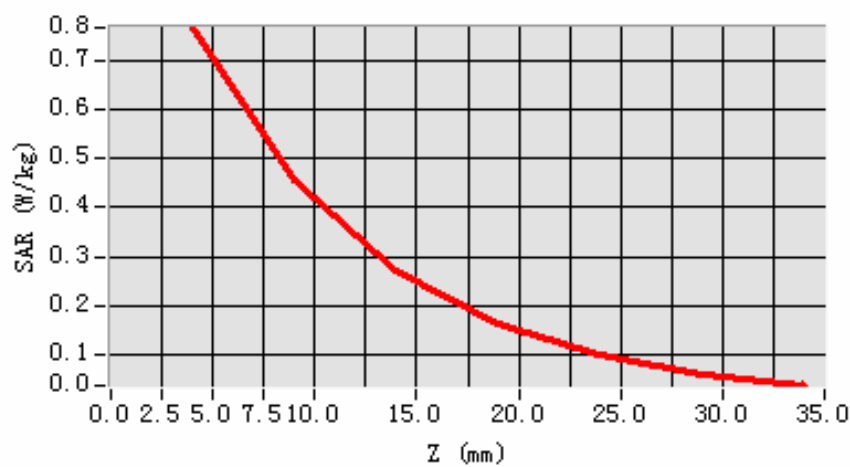
Maximum location: X=0.00, Y=-32.00

SAR 10g (W/Kg)	0.396237
SAR 1g (W/Kg)	0.720090

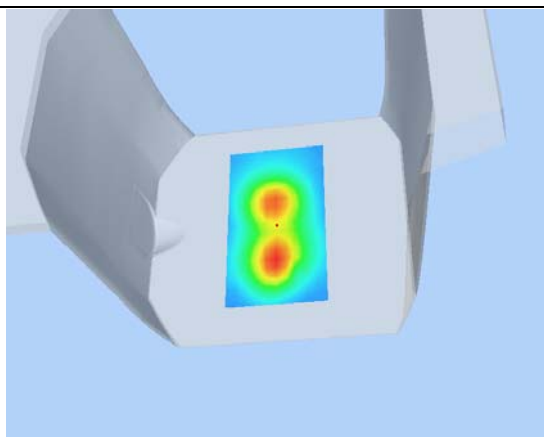
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7687	0.4576	0.2729	0.1609	0.0977	0.0580

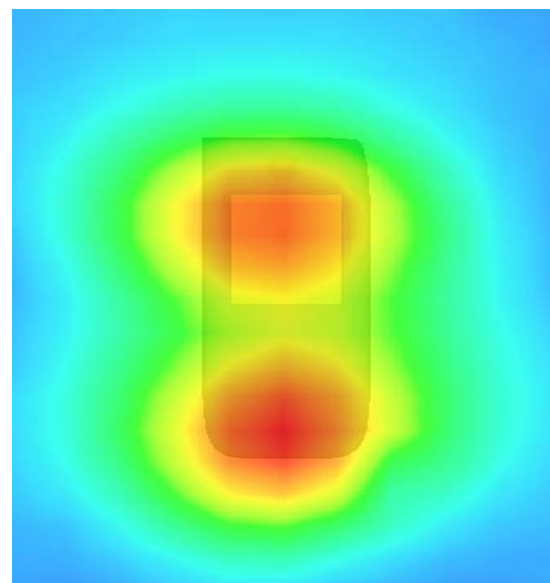
SAR, Z Axis Scan (X = 0, Y = -32)



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: 29/10/2011

Measurement duration: 9 minutes 9 seconds

A. Experimental conditions.

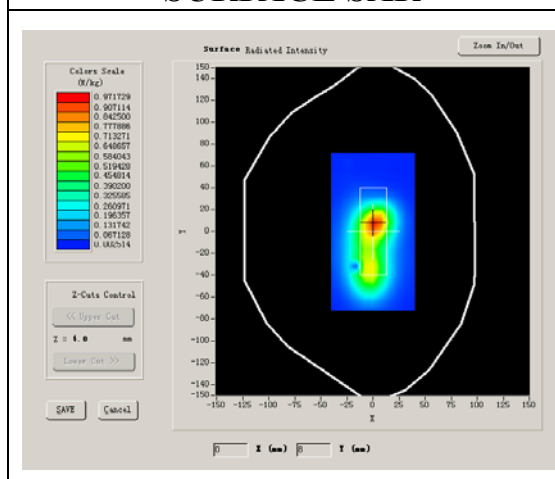
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

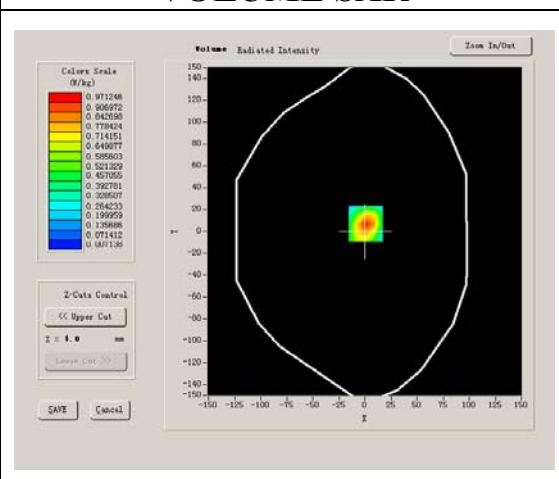
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-3.280000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



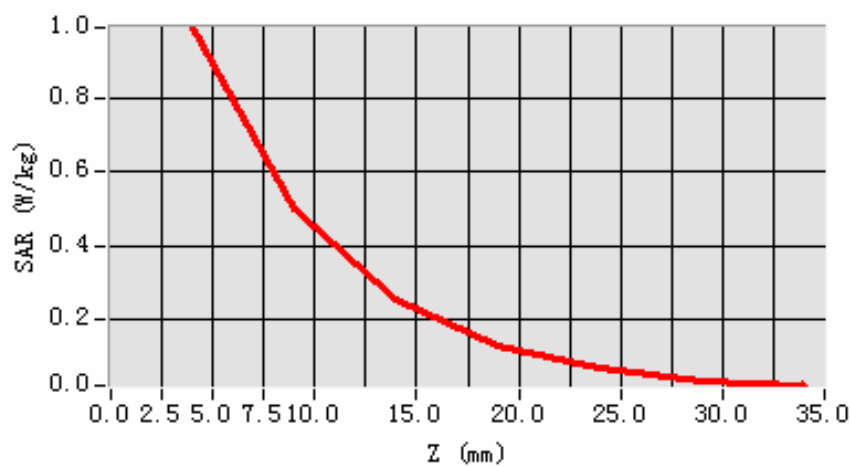
Maximum location: X=1.00, Y=7.00

SAR 10g (W/Kg)	0.467023
SAR 1g (W/Kg)	0.926157

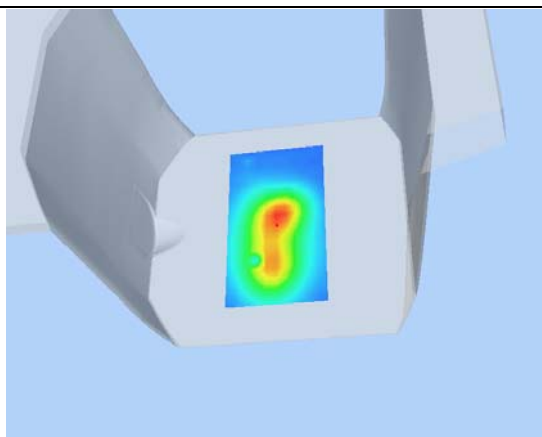
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9938	0.5021	0.2516	0.1279	0.0689	0.0345

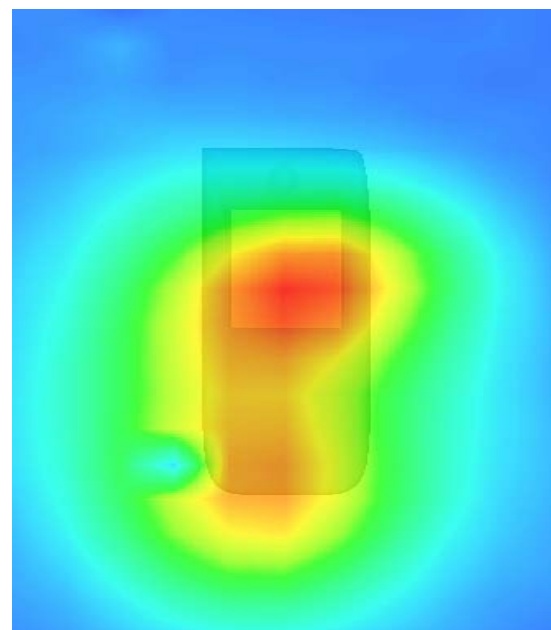
SAR, Z Axis Scan (X = 1, Y = 7)



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: 29/10/2011

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

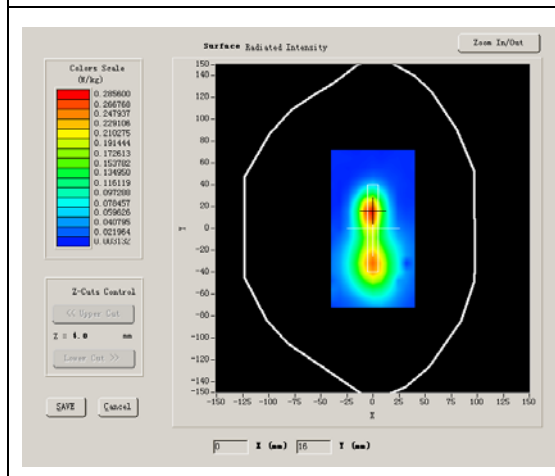
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

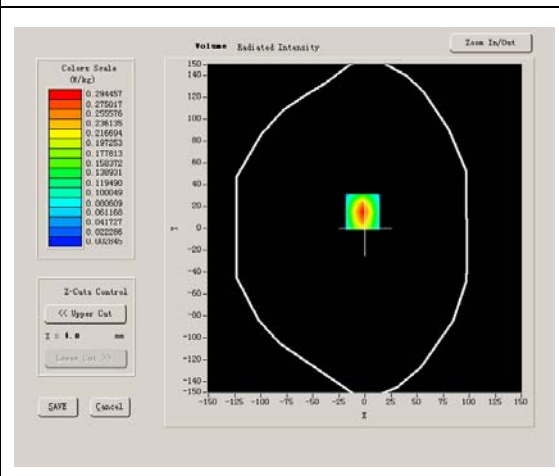
Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	0.860000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

SURFACE SAR



VOLUME SAR



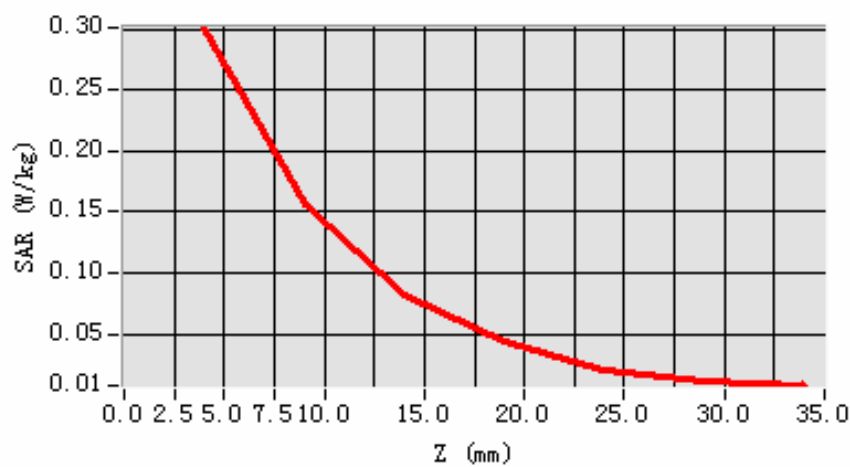
Maximum location: X=-2.00, Y=15.00

SAR 10g (W/Kg)	0.137398
SAR 1g (W/Kg)	0.276342

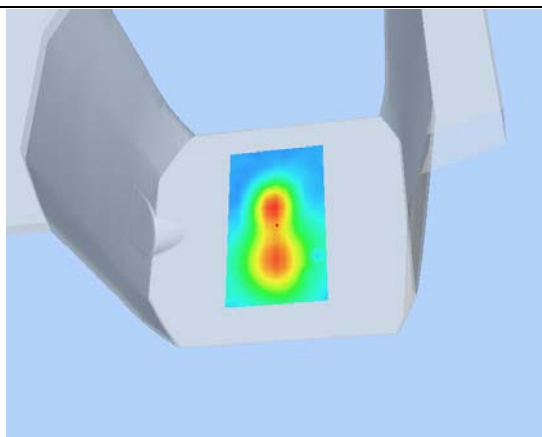
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3013	0.1559	0.0810	0.0439	0.0193	0.0119

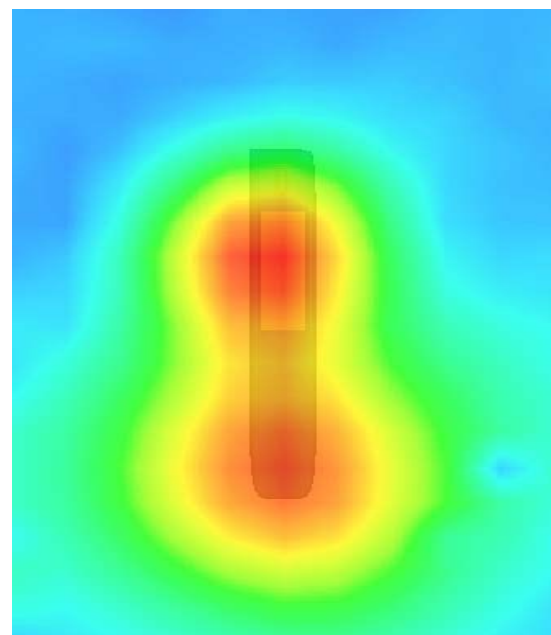
SAR, Z Axis Scan (X = -2, Y = 15)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

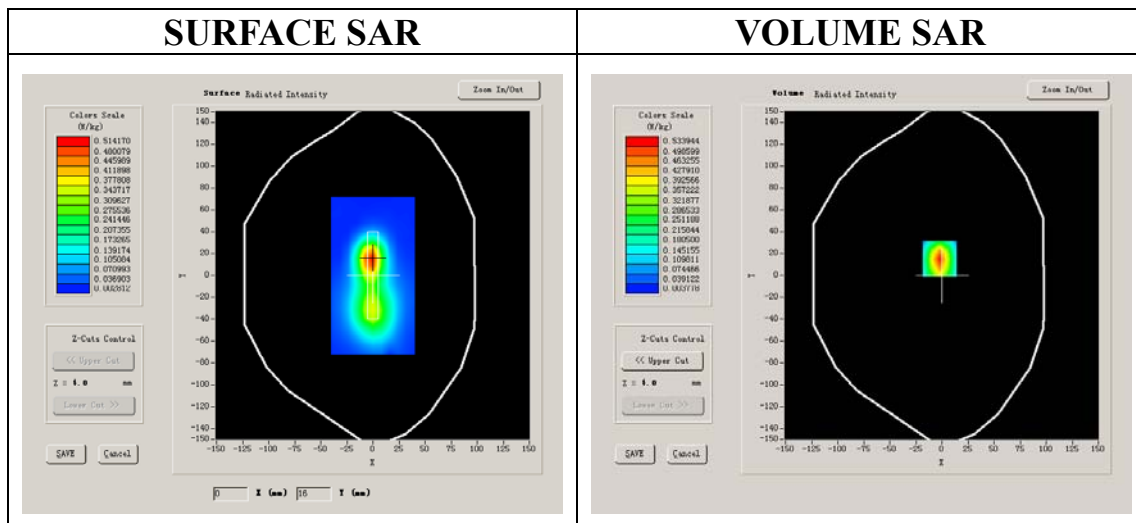
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	-0.460000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2



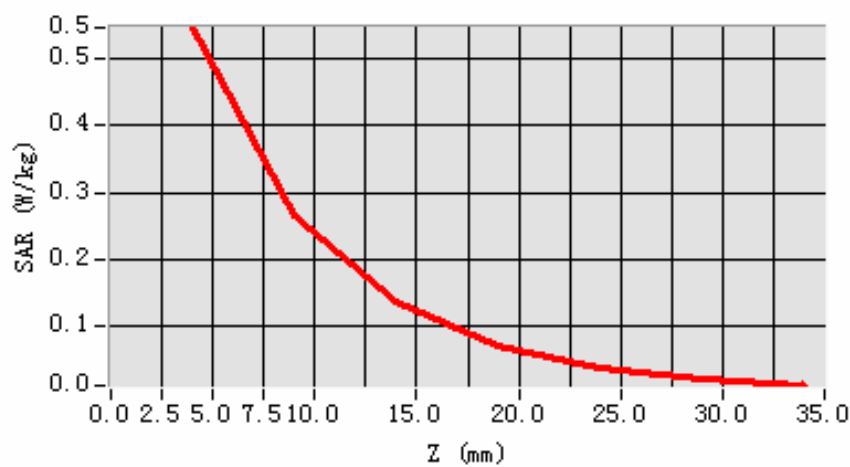
Maximum location: X=-2.00, Y=15.00

SAR 10g (W/Kg)	0.237570
SAR 1g (W/Kg)	0.496793

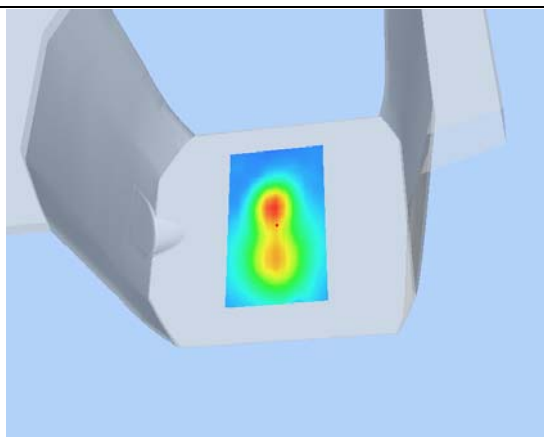
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5464	0.2651	0.1370	0.0719	0.0364	0.0197

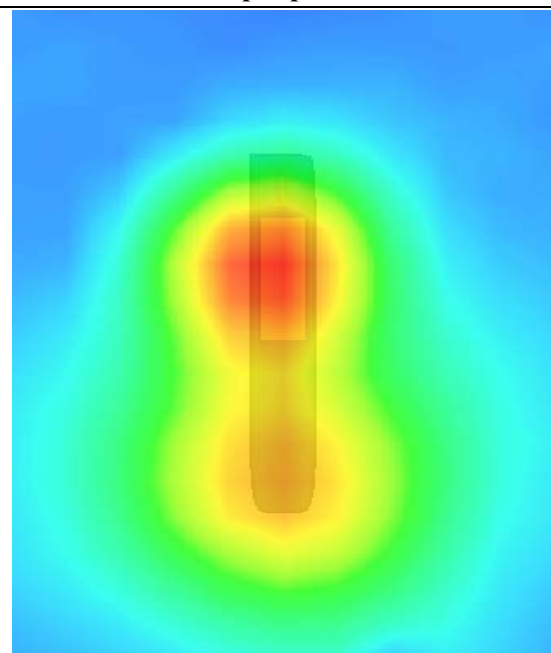
SAR, Z Axis Scan (X = -2, Y = 15)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

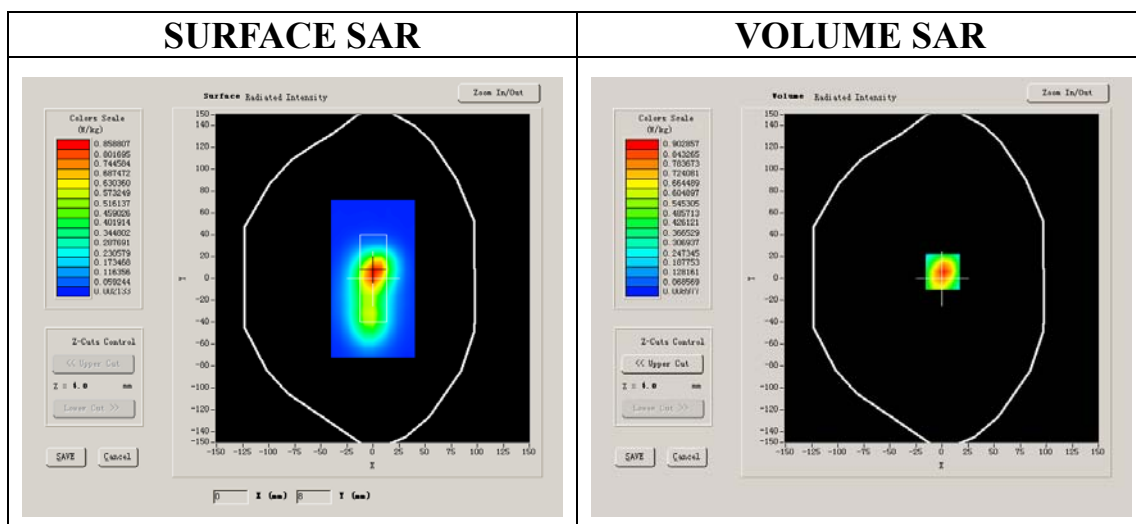
A. Experimental conditions.

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

B. SAR Measurement Results

Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.492827
Power drift (%)	1.440000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2



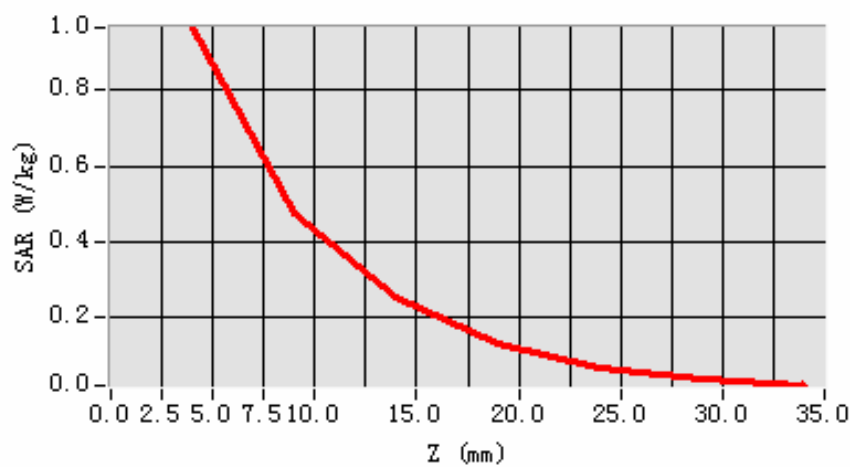
Maximum location: X=1.00, Y=6.00

SAR 10g (W/Kg)	0.457675
SAR 1g (W/Kg)	0.904479

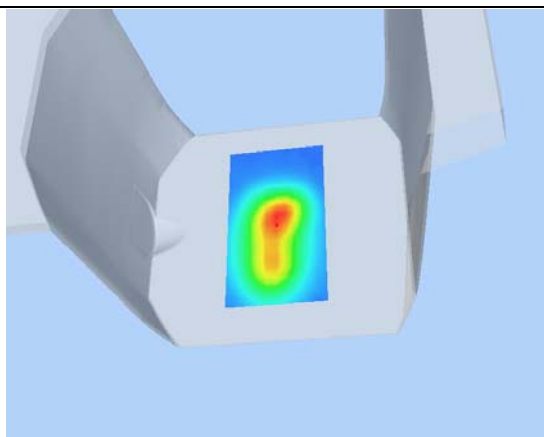
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9655	0.4752	0.2508	0.1292	0.0678	0.0354

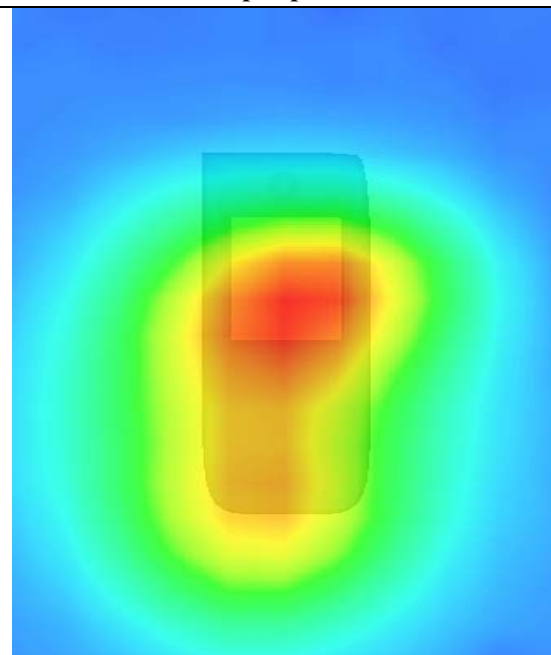
SAR, Z Axis Scan (X = 1, Y = 6)



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: 29/10/2011

Measurement duration: 9 minutes 13 seconds

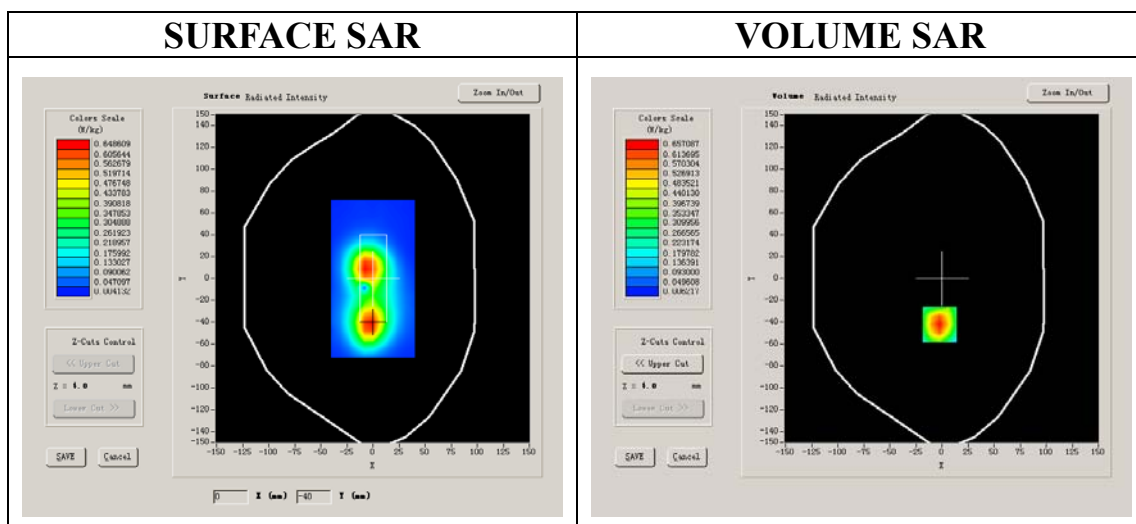
A. Experimental conditions.

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)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power drift (%)	0.790000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2



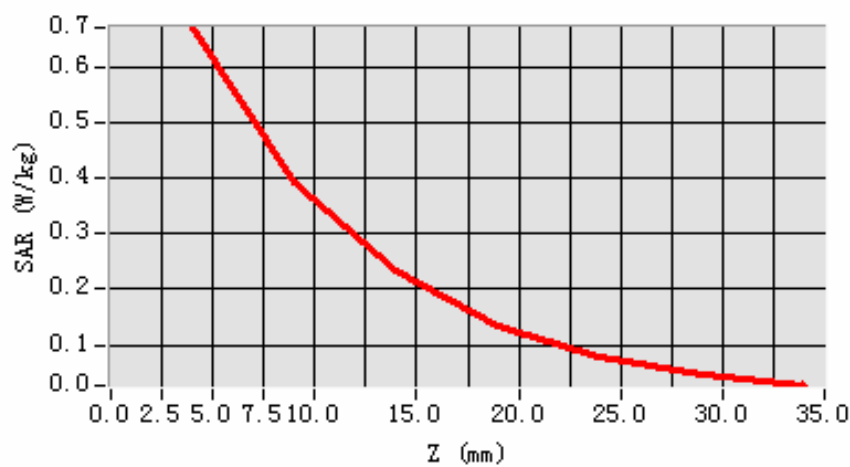
Maximum location: X=-2.00, Y=-42.00

SAR 10g (W/Kg)	0.343166
SAR 1g (W/Kg)	0.628150

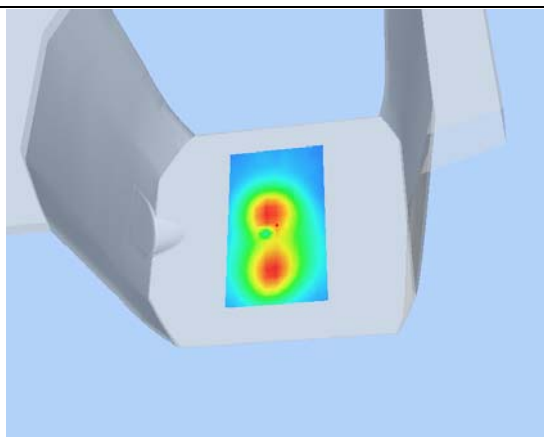
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6724	0.3951	0.2327	0.1353	0.0791	0.0474

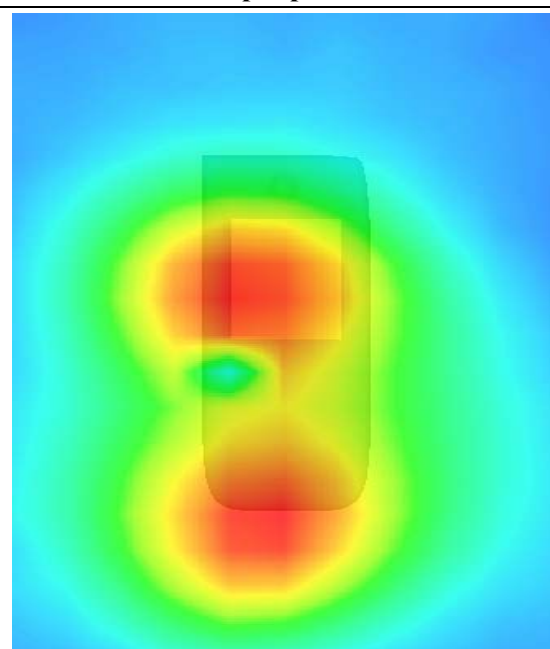
SAR, Z Axis Scan (X = -2, Y = -42)



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: 29/10/2011

Measurement duration: 9 minutes 7 seconds

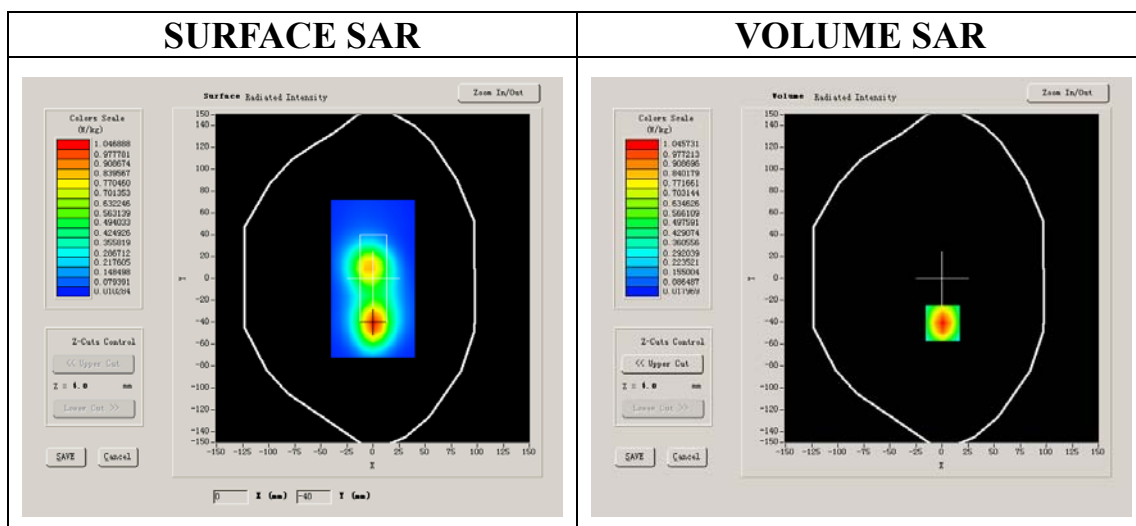
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 9262):

Frequency (MHz)	1852.000000
Relative permittivity (real part)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-1.590000
Ambient Temperature:	22.7°C
Liquid Temperature:	22.2°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



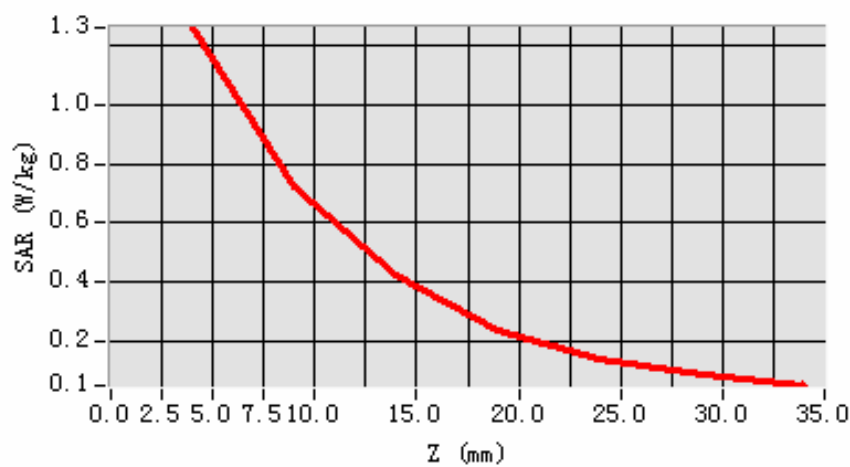
Maximum location: X=1.00, Y=-41.00

SAR 10g (W/Kg)	0.573452
SAR 1g (W/Kg)	1.042153

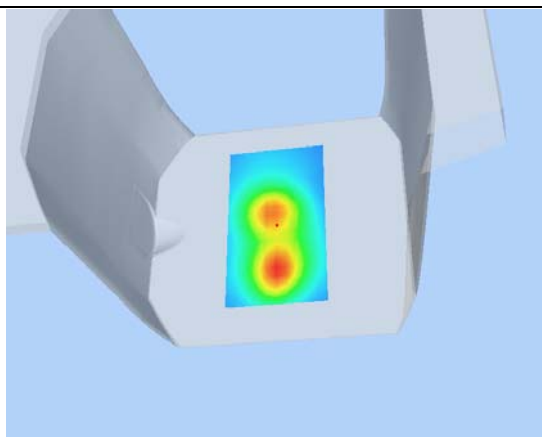
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.2607	0.7256	0.4214	0.2401	0.1390	0.0843

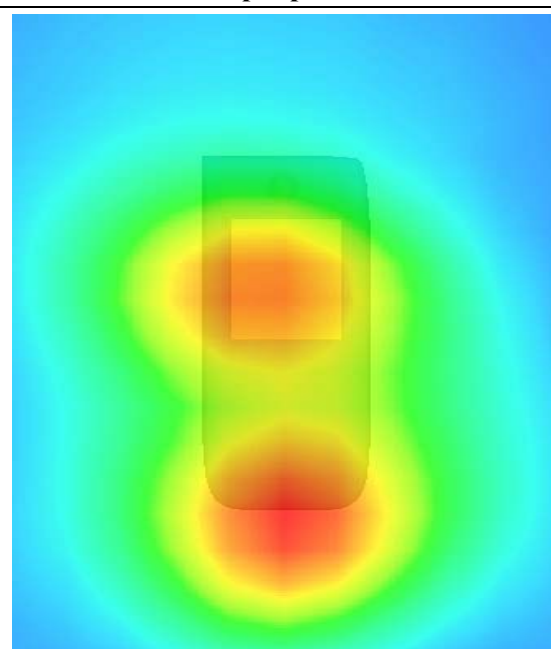
SAR, Z Axis Scan (X = 1, Y = -41)



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: 29/10/2011

Measurement duration: 9 minutes 4 seconds

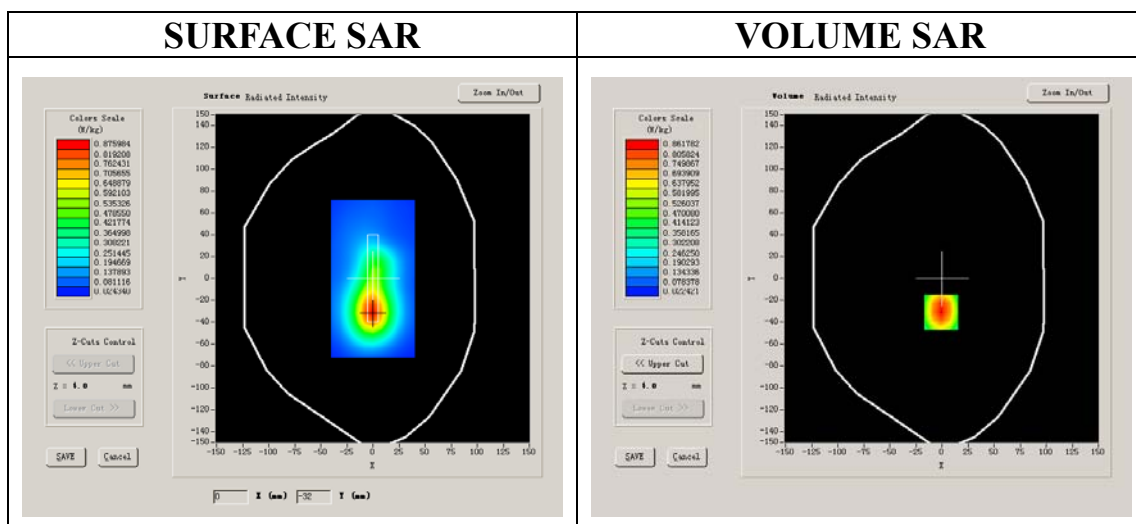
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 9262):

Frequency (MHz)	1852.000000
Relative permittivity (real part)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-1.650000
Ambient Temperature:	22.7°C
Liquid Temperature:	22.2°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



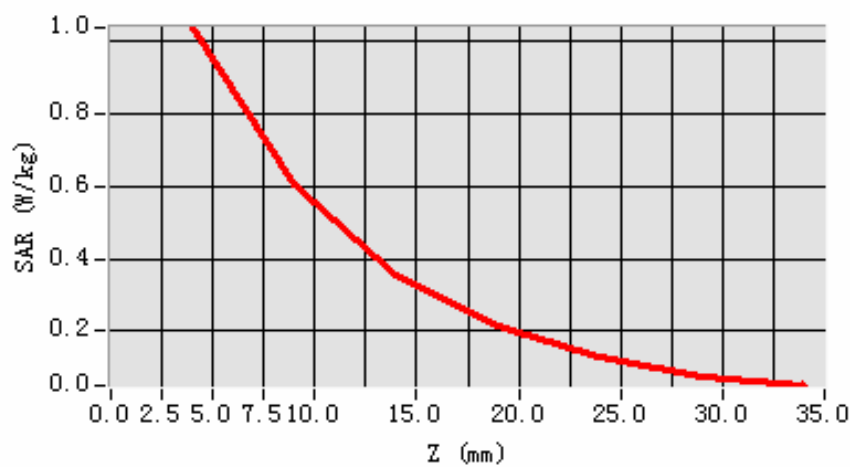
Maximum location: X=-1.00, Y=-31.00

SAR 10g (W/Kg)	0.452647
SAR 1g (W/Kg)	0.811437

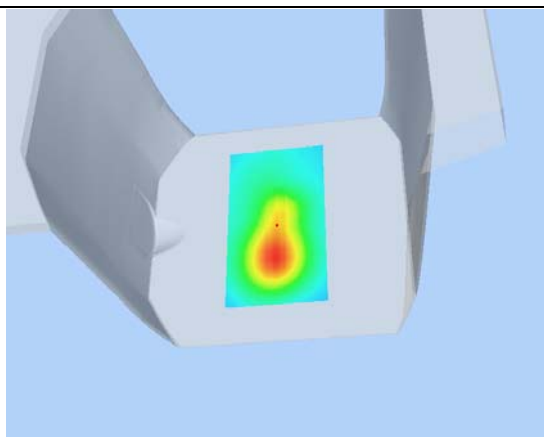
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0389	0.6034	0.3573	0.2131	0.1271	0.0765

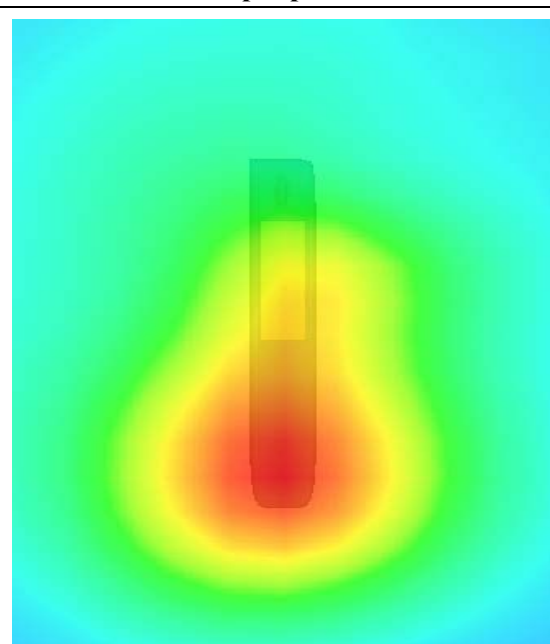
SAR, Z Axis Scan (X = -1, Y = -31)



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: 29/10/2011

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

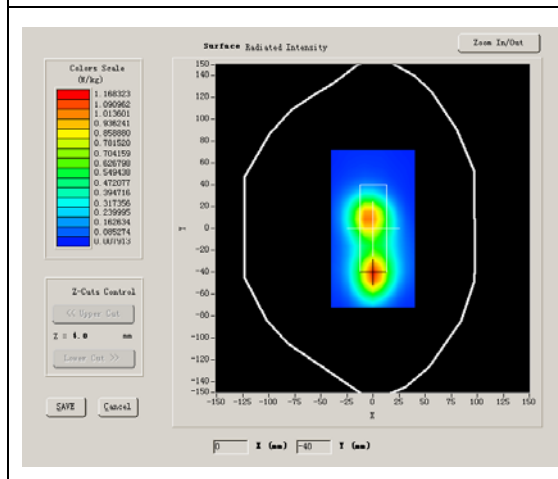
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	WCDMA1900
Channels	Middle
Signal	CDMA

B. SAR Measurement Results

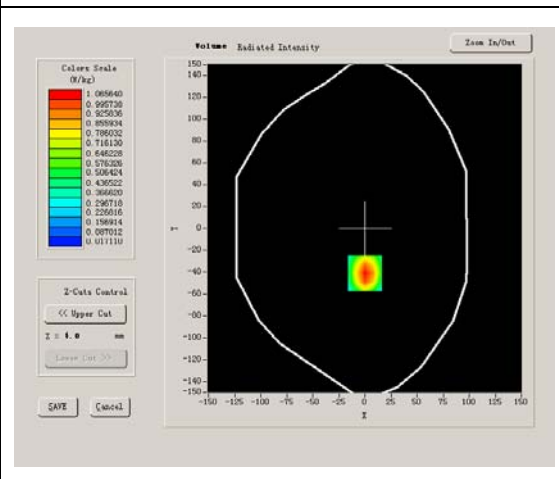
Middle Band SAR (Channel 9400):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-7.610000
Ambient Temperature:	22.7°C
Liquid Temperature:	22.2°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

SURFACE SAR



VOLUME SAR



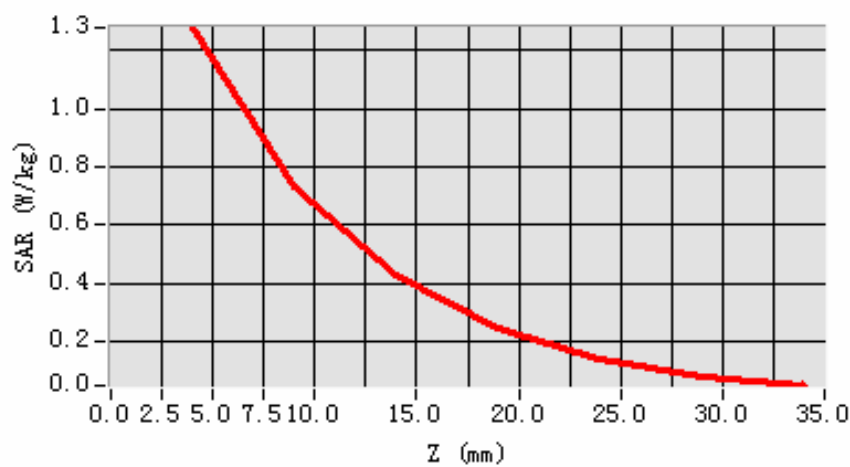
Maximum location: X=0.00, Y=-41.00

SAR 10g (W/Kg)	0.523644
SAR 1g (W/Kg)	1.095325

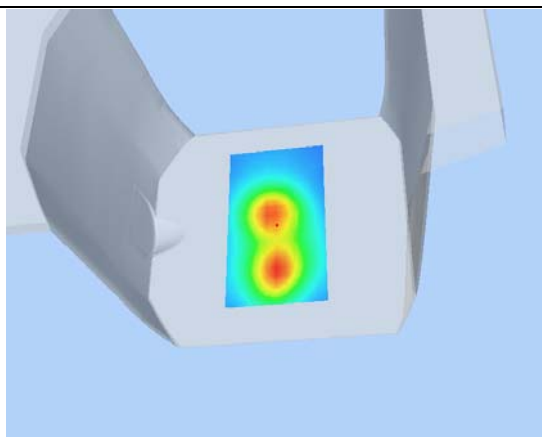
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.2789	0.7291	0.4240	0.2420	0.1367	0.0797

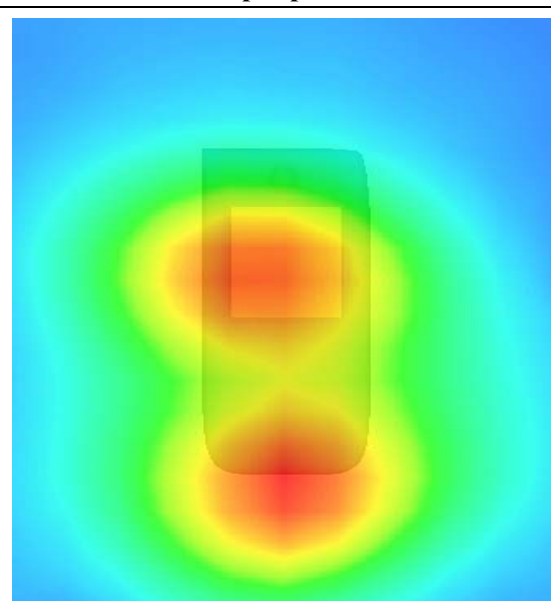
SAR, Z Axis Scan (X = 0, Y = -41)



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: 29/10/2011

Measurement duration: 9 minutes 9 seconds

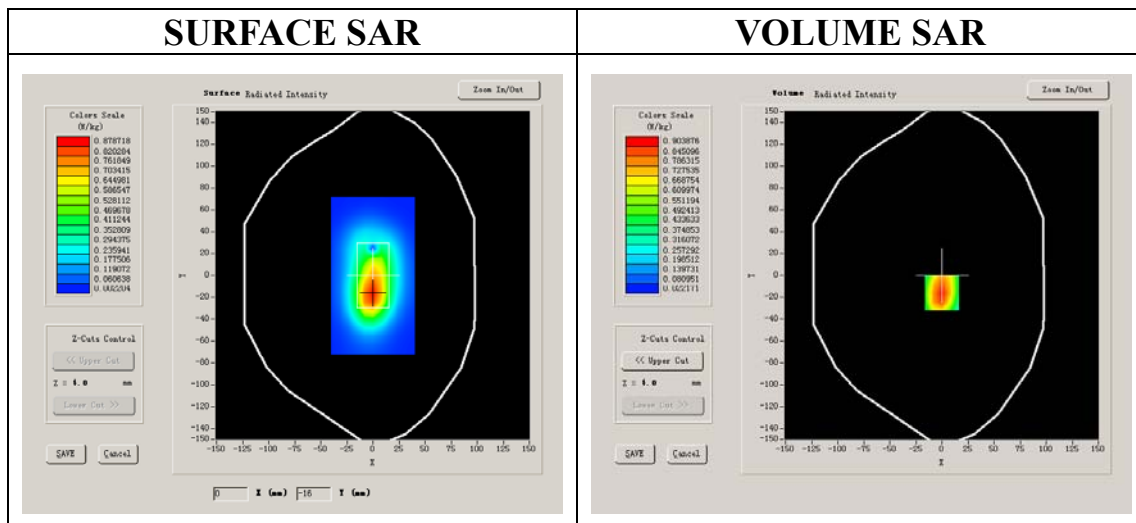
A. Experimental conditions.

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)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	0.170000
Ambient Temperature:	22.7°C
Liquid Temperature:	22.2°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



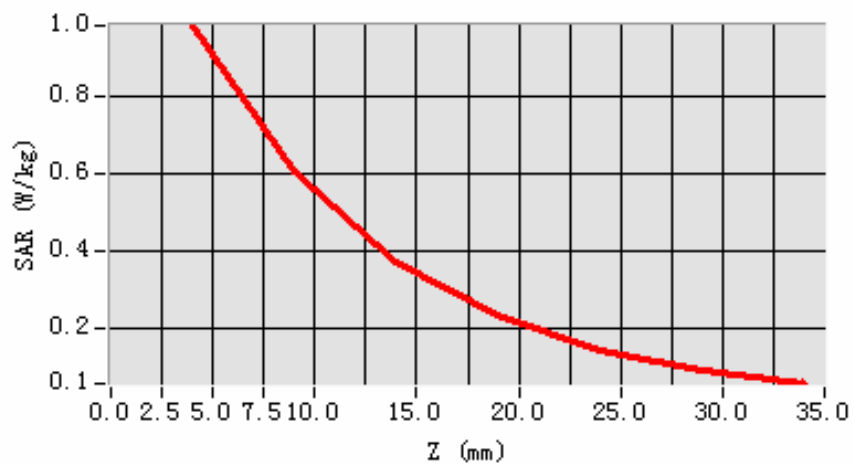
Maximum location: X=0.00, Y=-16.00

SAR 10g (W/Kg)	0.413542
SAR 1g (W/Kg)	0.845123

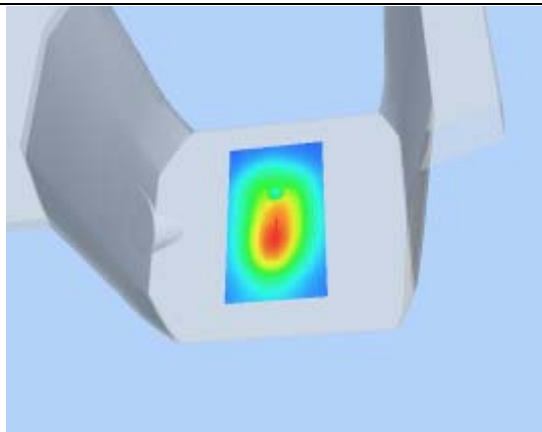
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9842	0.6073	0.3732	0.2309	0.1422	0.0915

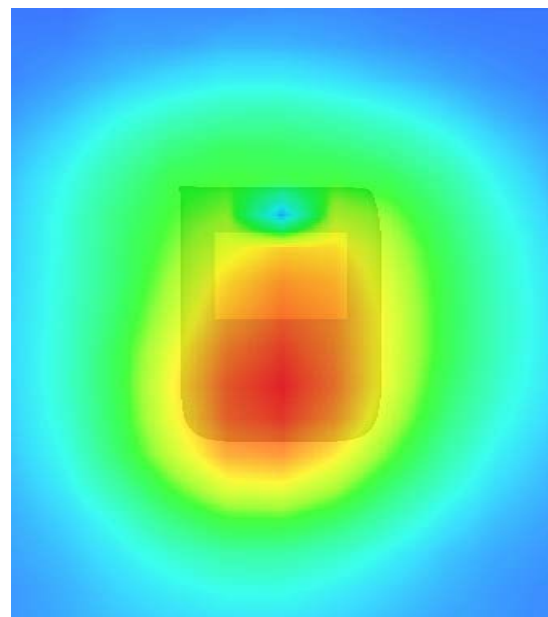
SAR, Z Axis Scan (X = 0, Y = -16)



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: 29/10/2011

Measurement duration: 9 minutes 4 seconds

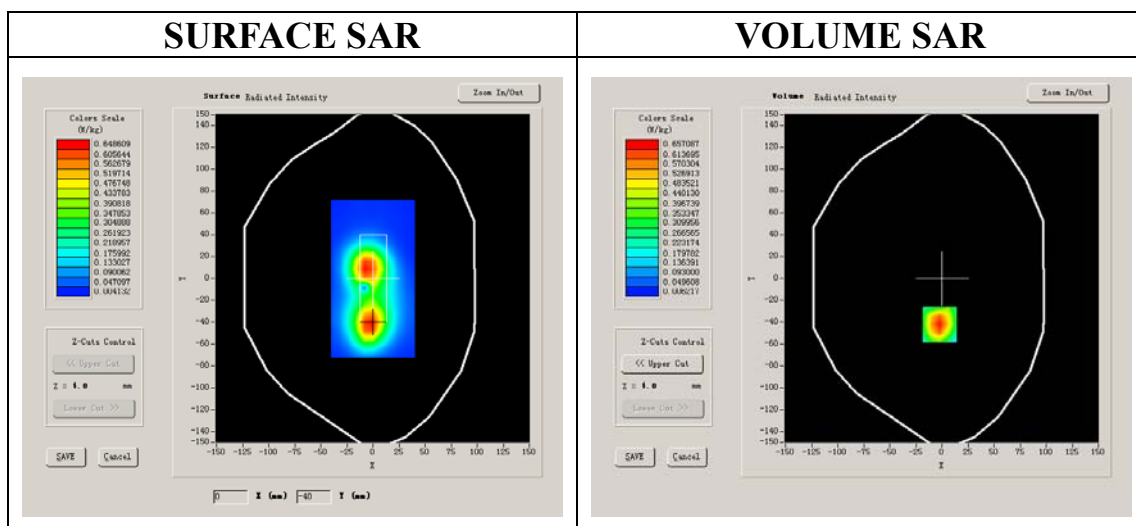
A. Experimental conditions.

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)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-4.000000
Ambient Temperature:	22.7°C
Liquid Temperature:	22.2°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



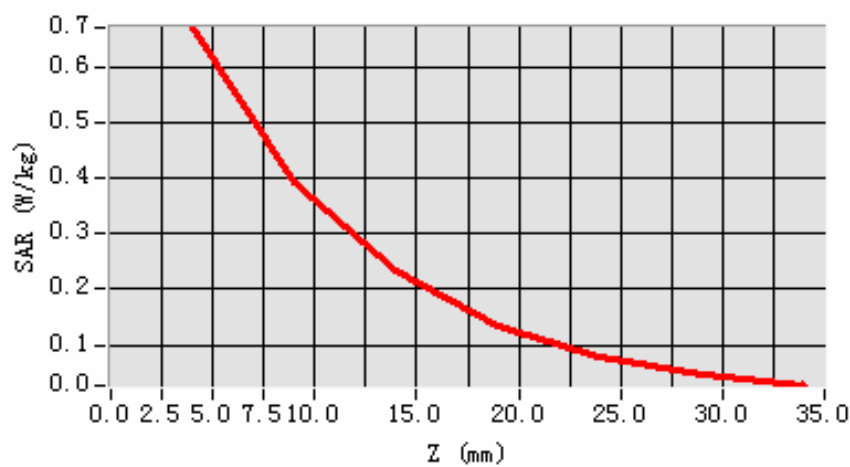
Maximum location: X=-2.00, Y=-42.00

SAR 10g (W/Kg)	0.316452
SAR 1g (W/Kg)	0.573136

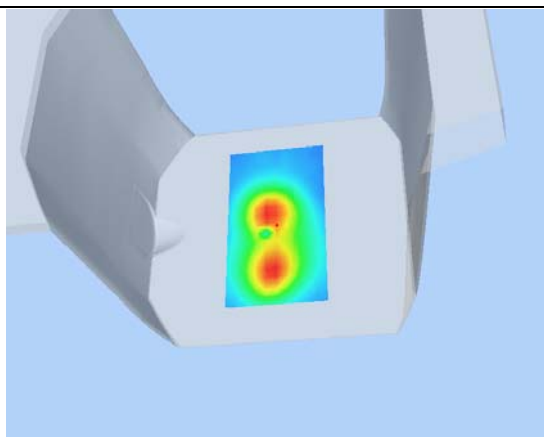
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6724	0.3951	0.2327	0.1353	0.0791	0.0474

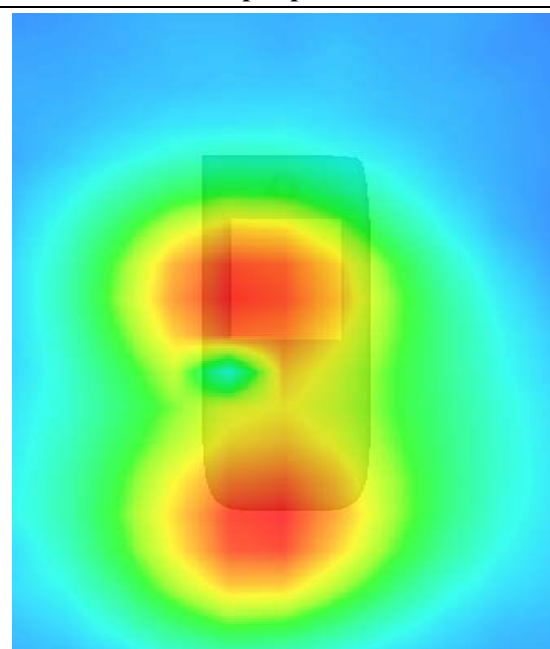
SAR, Z Axis Scan (X = -2, Y = -42)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

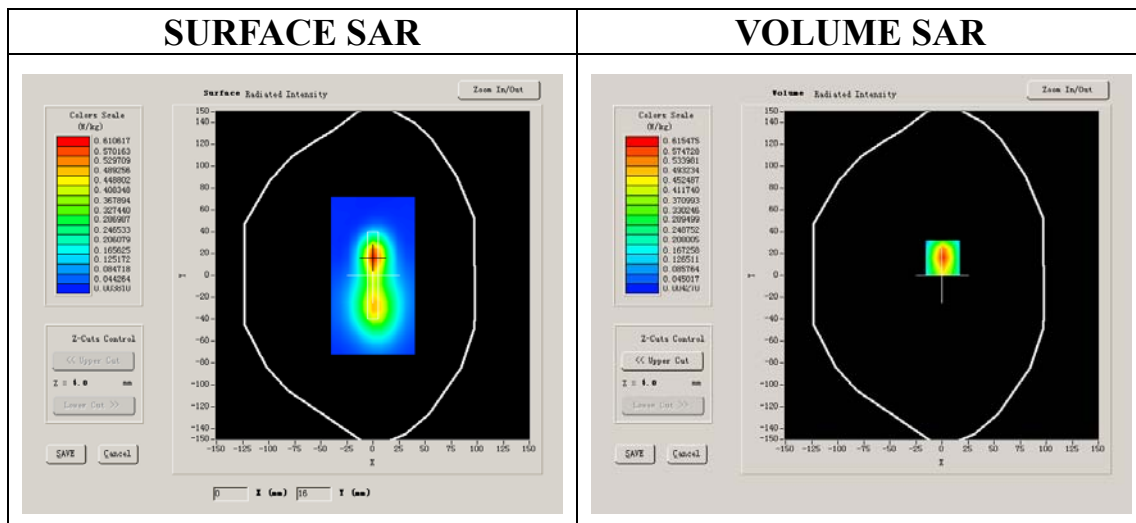
A. Experimental conditions.

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)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-0.180000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



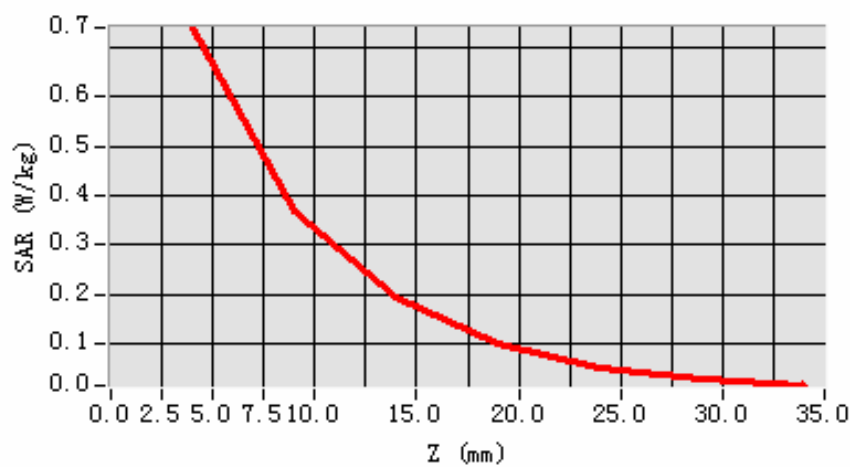
Maximum location: X=1.00, Y=16.00

SAR 10g (W/Kg)	0.263476
SAR 1g (W/Kg)	0.489345

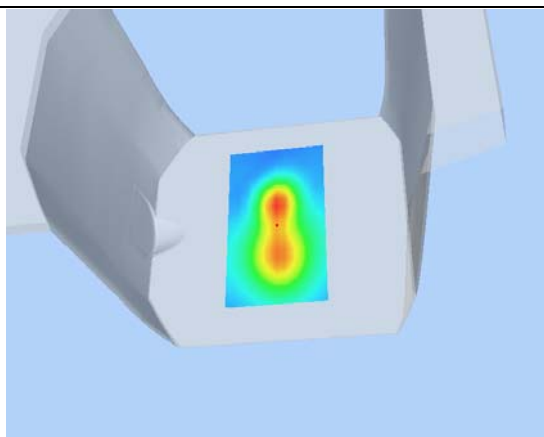
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7386	0.3695	0.1928	0.1001	0.0545	0.0317

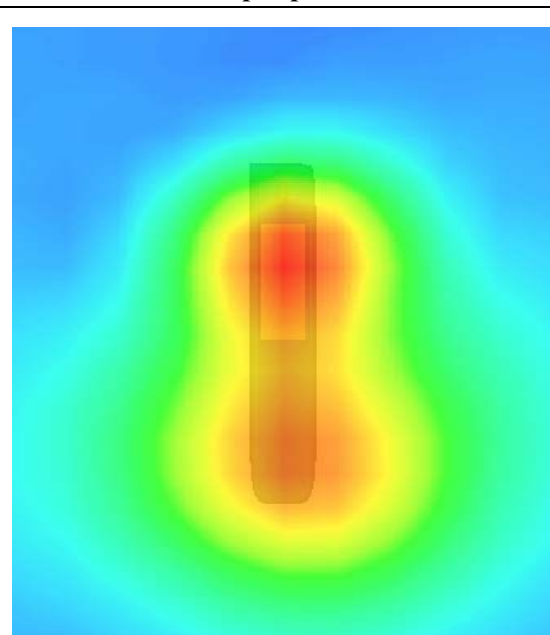
SAR, Z Axis Scan (X = 1, Y = 16)



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: 29/10/2011

Measurement duration: 9 minutes 9 seconds

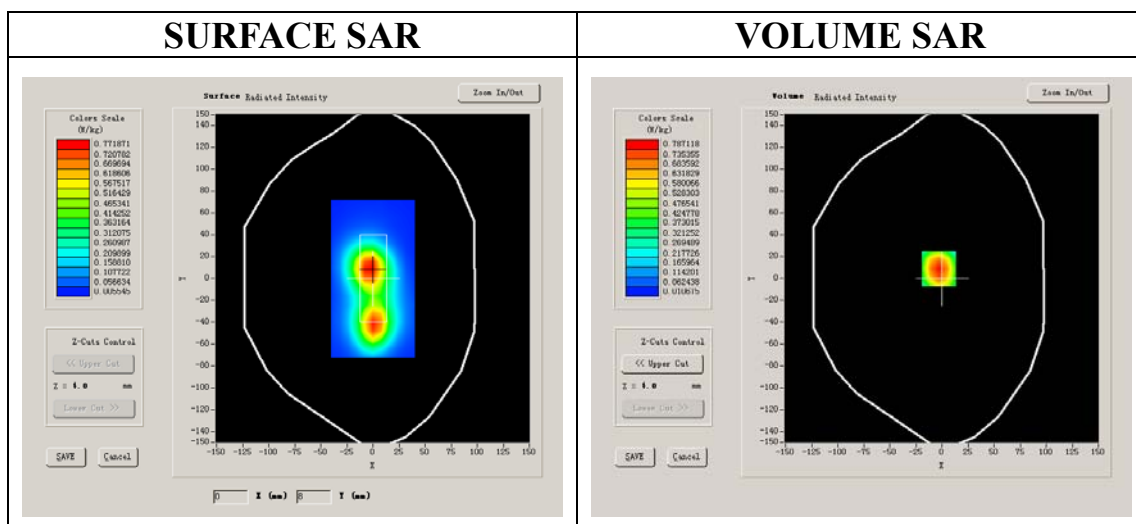
A. Experimental conditions.

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)	1907.000000
Relative permittivity (real part)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-0.880000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



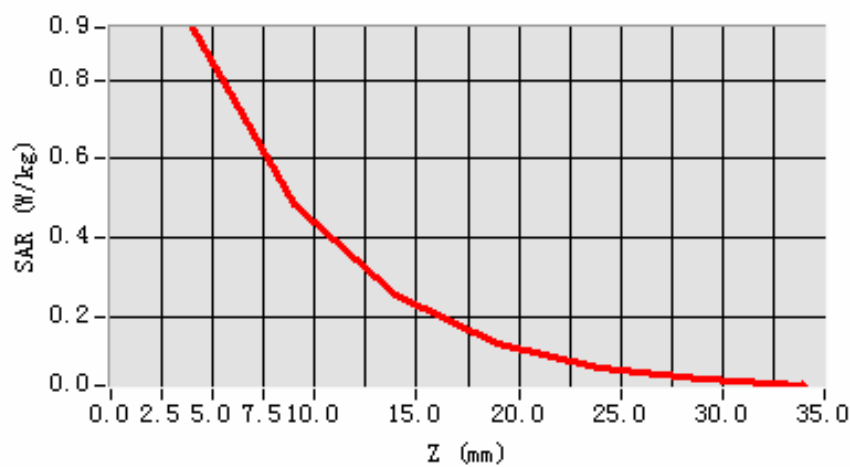
Maximum location: X=-3.00, Y=9.00

SAR 10g (W/Kg)	0.384562
SAR 1g (W/Kg)	0.784125

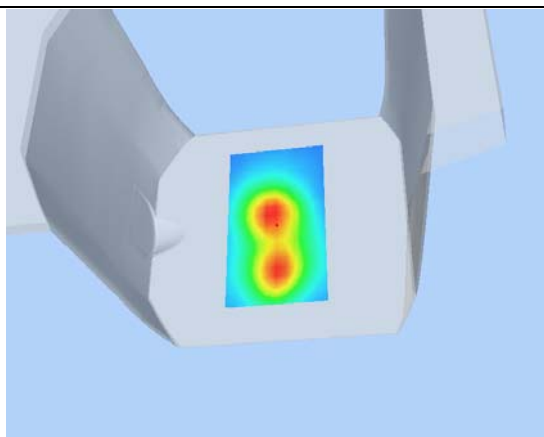
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9340	0.4853	0.2531	0.1329	0.0681	0.0397

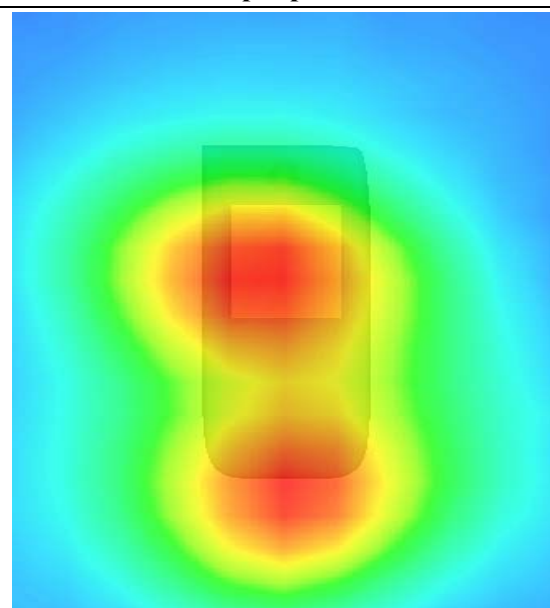
SAR, Z Axis Scan (X = -3, Y = 9)



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: 29/10/2011

Measurement duration: 9 minutes 8 seconds

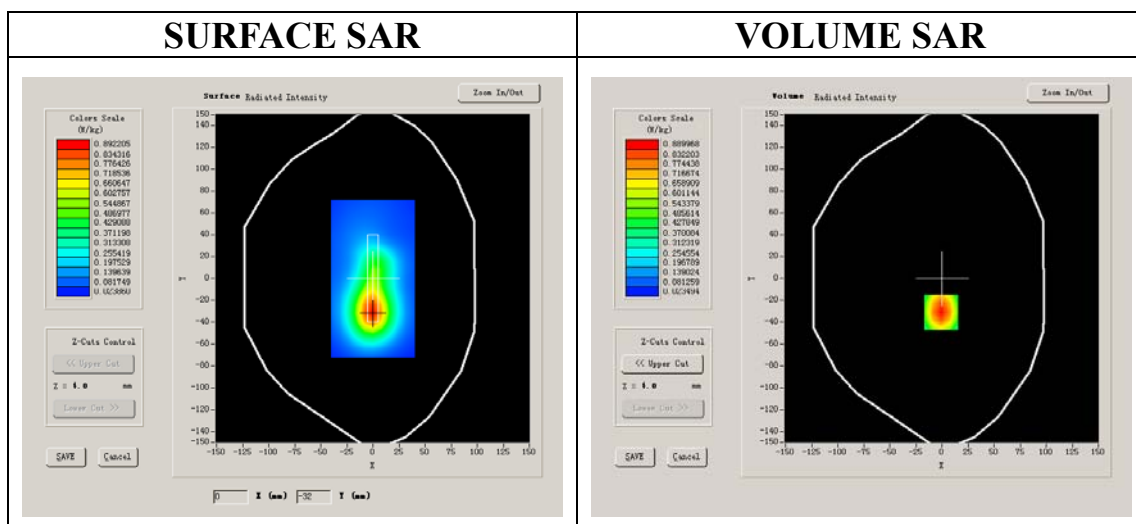
A. Experimental conditions.

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)	1907.000000
Relative permittivity (real part)	52.663472
Relative permittivity	15.877050
Conductivity (S/m)	1.542600
Power drift (%)	-0.590000
Ambient Temperature:	22.5°C
Liquid Temperature:	22.3°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



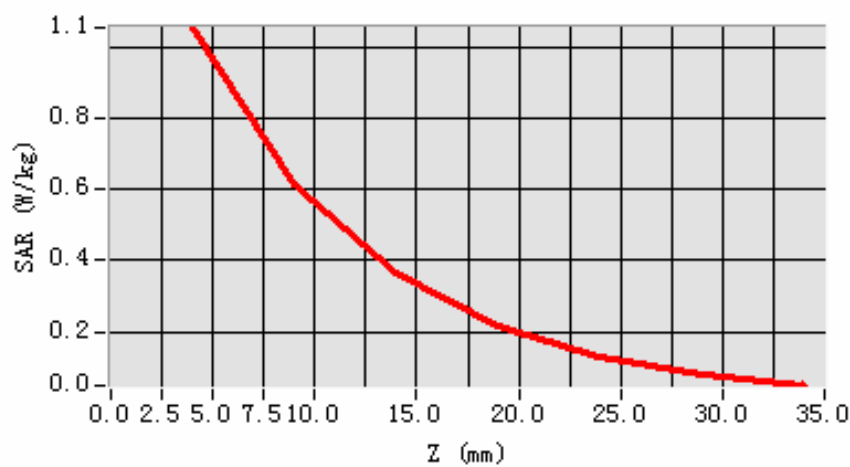
Maximum location: X=-1.00, Y=-31.00

SAR 10g (W/Kg)	0.384574
SAR 1g (W/Kg)	0.750345

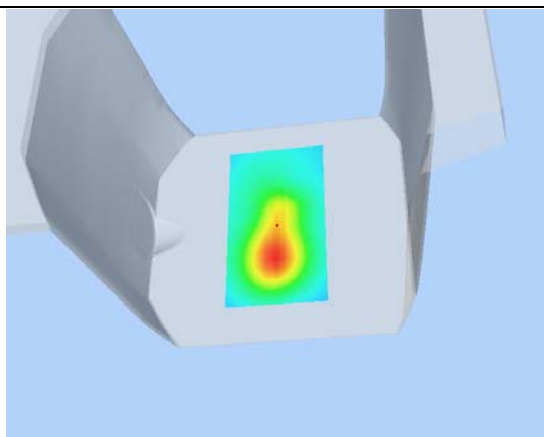
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0561	0.6144	0.3665	0.2174	0.1309	0.0774

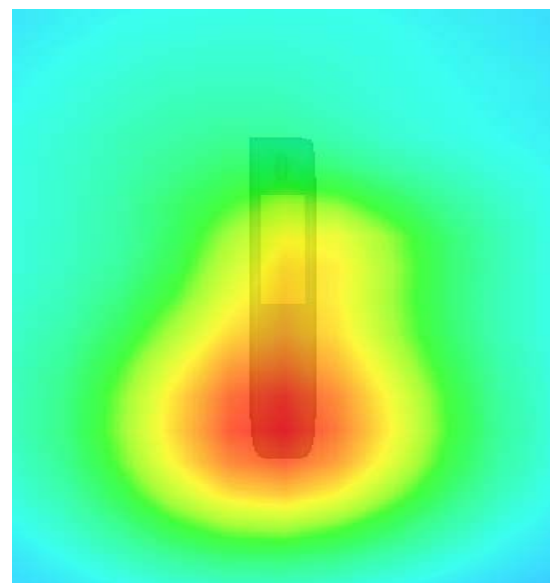
SAR, Z Axis Scan (X = -1, Y = -31)



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: 29/10/2011

Measurement duration: 13 minutes 27 seconds

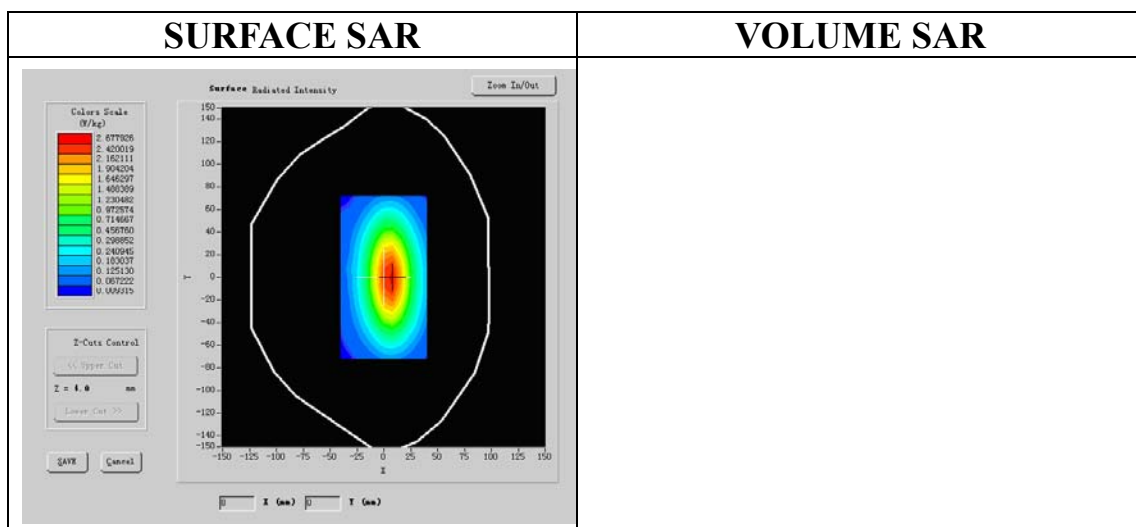
A. Experimental conditions.

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

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	1.009033
Power Drift (%)	-0.050000
Ambient Temperature:	23.2°C
Liquid Temperature:	22.9°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:1



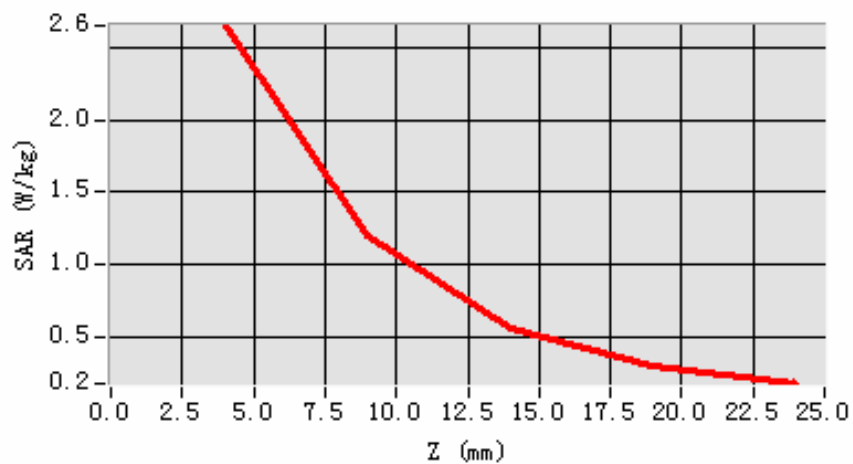
Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	1.586834
SAR 1g (W/Kg)	2.512484

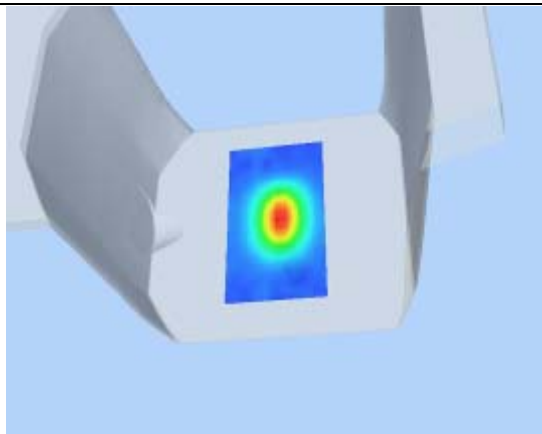
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	2.6486	1.2069	0.5583	0.3002

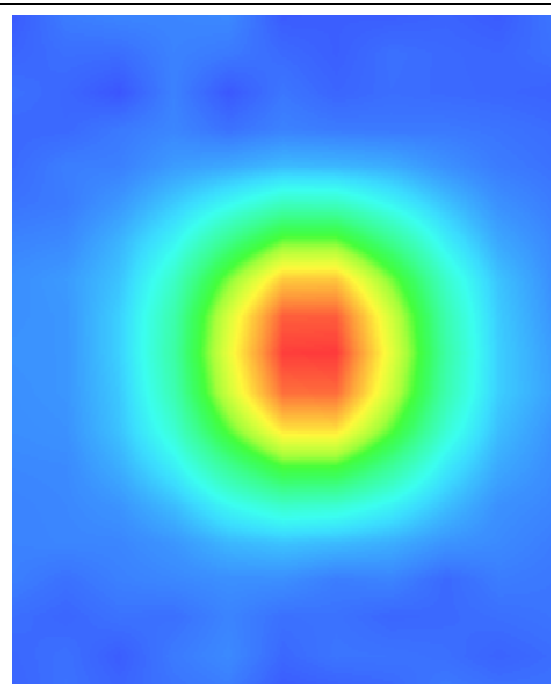
SAR, Z Axis Scan (X = 5, Y = 1)



3D sceen 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: 29/10/2011

Measurement duration: 13 minutes 27 seconds

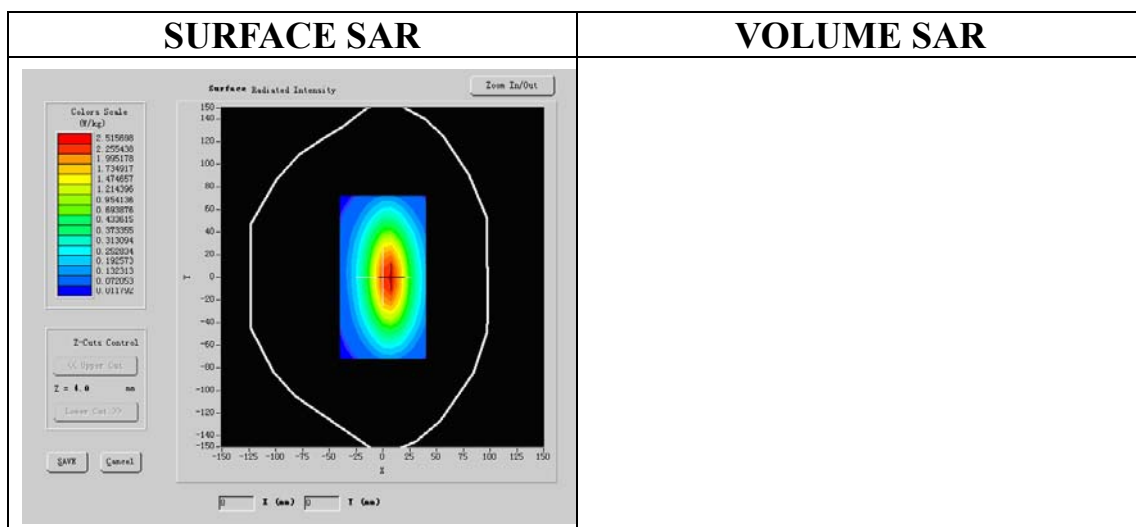
A. Experimental conditions.

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

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1800.000000
Relative permittivity (real part)	52.540001
Relative permittivity	14.070000
Conductivity (S/m)	1.469533
Power Drift (%)	-0.140000
Ambient Temperature:	23.2°C
Liquid Temperature:	22.6°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1



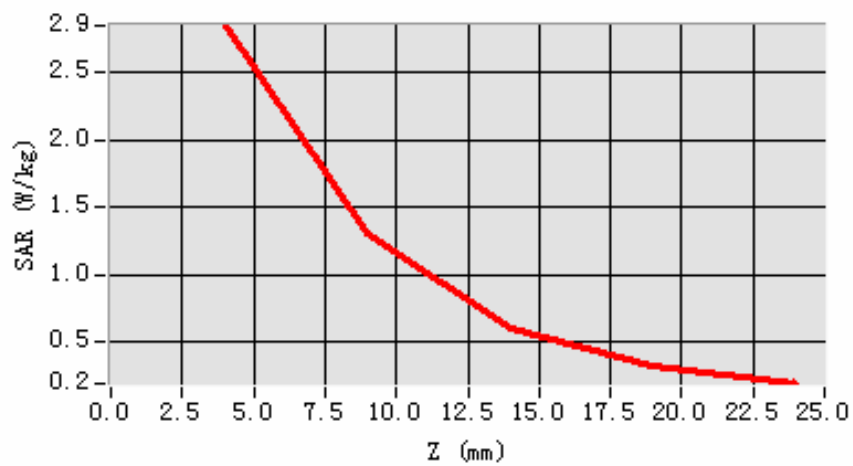
Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	4.910003
SAR 1g (W/Kg)	8.455521

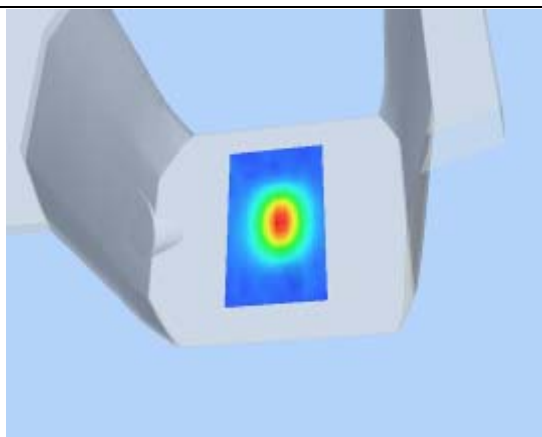
Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	2.8536	1.3061	0.6041	0.3211

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



3D scene shot



Hot spot position

