Report No.: SZ12090024S01

SAR TEST REPORT

Issued to

Reach Tec(Xiamen) CO., LTD

For

REACH9771

Model Name	:	REACH9771
Trade Name	:	Cincinnati Bell
Brand Name	:	Cincinnati Bell
FCC ID	:	Z5J-REACH9771
Standard	:	FCC Oet65 Supplement C Jun.2001 47CFR 2.1093 ANSI C95.1-1999 IEEE 1528-2003
MAX SAR	:	Head: 0.540W/kg Body: 1.032W/kg
Test date	:	2012-9-17
Issue date	:	2012-9-21

Shenzhen MORLAB Communication Technology Co., Ltd.

Tested by Zhu Zhan	*Approved by* Wu Xuewen	*Review by* Samuel. Peng
Zhu Zhan	Wu Xuewen	Samuel. Peng
Date 2012.9.21	*Date* 2012.09.21	*Date* 2012.9.21

CTIA Authorized Test Lab LAB CODE 29081223-00 IEEE 1725 OTA OFTA 電訊管理局 ilac-MRA TAF Testing Laboratory GCF Official Observer of Global Certification Forum Bluetooth BQTF FCC Reg. No. 741109

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Change History		
Issue	Date	Reason for change
1.0	Sep. 21, 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	Signal Generator	Rohde&Schwarz (SMP_02)	2011-9-24	1year
5	Amplifier	PRANA (Ap32 SV125AZ)	2011-9-24	1year
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)	2011-9-24	1year
7	Directional coupler	Giga-tronics(SN:1829112)	2011-9-24	1year
8	Probe	Satimo (SN:SN_3708_EP80)	2011-9-24	1year
9	DAE	Satimo (SN 35/08 SUPR31)	2011-9-24	1year
10	Dielectric Probe Kit	Agilent (85033E)	2011-9-24	1year
11	Phantom	Satimo (SN:SN_36_08_SAM62)	2011-9-24	1year
12	Liquid	Satimo (Last Calibration: 2012-9-17)	N/A	N.A
13	Dipole 835MHz	Satimo (SN 36/08 DIPC 99)	2011-9-24	1year
14	Dipole 1800MHz	Satimo (SN 36/08 DIPC 101)	2011-9-24	1year
15	Dipole 1900MHz	Satimo (SN 36/08 DIPF 102)	2011-9-24	1year

2. Technical Information

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

2.1. Identification of Applicant

Company Name:	Reach Tec(Xiamen) CO., LTD
Address:	5th Floor, 51#, Wang Hai Road, Software Park II, Xiamen, Fujian Province

2.2. Identification of Manufacturer

Company Name:	Reach Tec(Xiamen) CO., LTD
Address:	5th Floor, 51#, Wang Hai Road, Software Park II, Xiamen, Fujian Province

2.3. Equipment Under Test (EUT)

Model Name:	REACH9771
Trade Name:	Cincinnati Bell
Brand Name:	Cincinnati Bell
Hardware Version:	9771 V3.1
Software Version:	E9771-eng 2.3.5 GRJ90 eng.Root.20120825.052322.test-keys
Frequency Bands:	GSM 850MHz / PCS 1900MHz; WCDMA 1700MHz; Bluetooth; Wifi802.11
Modulation Mode:	GSM/GPRS: GMSK; EDGE:8PSK; WCDMA:CDMA WIFI802.11B: DSSS; WIFI802.11G: OFDM WIFI 802.11N: OFDM BT: GFSK/Π/4-DQPSK/8-DPSK
Multislot Class	GPRS:Class 12; EDGE:Class 12
Antenna type:	Fixed Internal Antenna
Development Stage:	Identical prototype
Battery Model:	54007B
Battery specification:	1200mAh3.7V
3GPP Release:	Release 5

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#	9771 V3.1	E9771-eng 2.3.5 GRJ90 eng.Root.20120825.052322.test-keys

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§2.1O93**	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 648474 D1**	SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas
6	**KDB 2484227**	SAR Measurement Procedures for 802.11 a/b/g Transmitters
7	**KDB 450824 D1**	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:	GSM 850MHz /PCS 1900MHz WCDMA1700MHz 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 802.11B (Maximum output power)

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.
The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 125, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz, or to 1312, 1412 and 1513 respectively in the case of WCDMA 1700, for 1, 6 and 11 respectively in the case of 802.11B . 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 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.

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 head capacity, δ T is the temperature rise and δ t 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

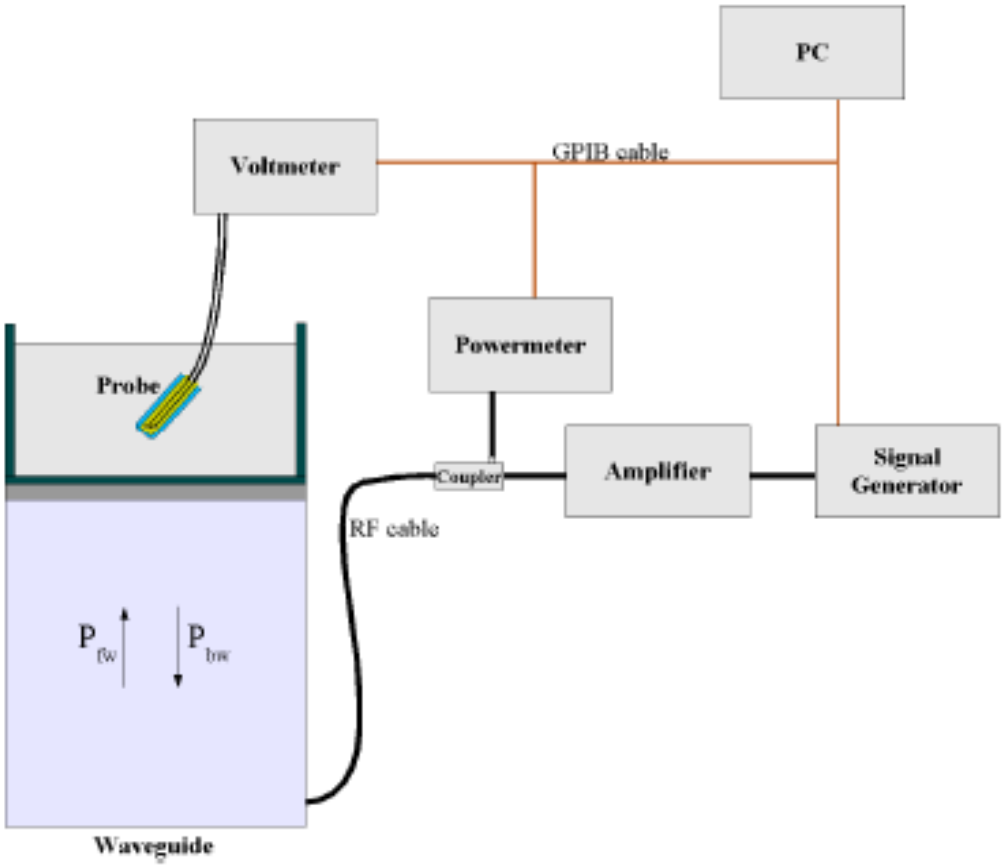
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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 suface normal line:1ess 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.



$$SAR = \frac{4\left(P_{fw} - P_{bw}\right)}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-(2z/\delta)}$$

Where :
Pfw = Forward Power
Pbw = Backward Power
a and b = Waveguide dimensions
ı = 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)/Vlin(N) (N=1,2,3)

The linearised output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

Vlin(N)=V(N)*(1+V(N)/DCP(N)) (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.

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

Where:

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,

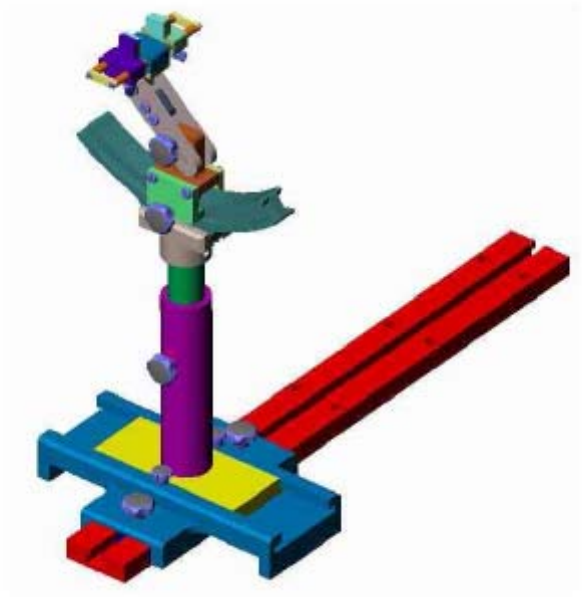
ρ = Tissue density (1.25 g/cm3 for brain tissue)

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 used for testing at frequencies of 835MHz , 1800MHz and 1900MHz, are made mainly of sugar, salt and water solutions may be left in the phantoms. Approximately 20litres are needed for an upright head compared to about 25 litres for a horizontal bath phantom. The liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is or from the flat phantom to the liquid top surface is 15cm.
Following are the recipes for head and body tissue simulating liquid for frequency band 835MHz, 1800MHz and 1900 MHz.

Ingredients (% by weight)	Frequency Band 835MHz		Frequency Band 1800MHz		Frequency Band 1900MHz	
Tissue Type	Head	Body	Head	Body	Head	Body
Water	41.45	52.4	52.64	69.91	54.9	40.4
Salt(NaCl)	1.45	1.4	0.36	0.13	0.18	0.5
Sugar	56.0	45.0	0.0	0.0	0.0	58.0
HEC	1.0	1.0	0.0	0.0	0.0	1.0
Bactericide	0.1	0.1	0.0	0.0	0.0	0.1
Triton	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	47.0	29.96	44.92	0.0
Acticide SPX	0.0	0.0	0.0	0.0	0.0	0.0
Dielectric Constant	42.45	56.1	39.76	52.59	39.9	54.0
Conductivity (S/m)	0.91	0.95	1.45	1.52	1.42	1.52

Recipes for Tissue Simulating Liquid

Table 1: Dielectric Performance of Head 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 ±5% window**	41.5 39.425 to 43.575	0.90 0.855 to 0.945
	Reference result per probe calibration ±5% window	41.5 39.425 to 43.575	0.90 0.855 to 0.945
	Validation value (Sep. 17)	41.675999	0.894409
1800 MHz	**Reference result per OET65 ±5% window**	40 38 to 42	1.40 1.33 to 1.47
	Reference result per probe calibration ±5% window	42 39.9 to 44.1	1.40 1.33 to 1.47
	Validation value (Sep. 17)	40.169997	1.449217

1900 MHz	**Reference result per OET65 ±5% window**	40 38 to 42	1.40 1.33 to 1.47
	Reference result per probe calibration ±5% window	42 39.9 to 44.1	1.40 1.33 to 1.47
	Validation value (Sep. 17)	40.509998	1.436111

Table 2: 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 ±5% window**	55.2 52.44 to 57.96	0.97 0.9215 to 1.0185
	Reference result per probe calibration ±5% window	56.1 53.295 to 58.905	0.95 0.905 to 0.998
	Validation value (Sep. 17)	55.709999	0.9809033
1800 MHz	**Reference result per OET65 ±5% window**	53.3 50.635 to 55.965	1.52 1.444 to 1.596
	Reference result per probe calibration ±5% window	54 51.3 to 56.7	1.45 1.378 to 1.523
	Validation value (Sep. 17)	52.419854	1.502654
1900 MHz	**Reference result per OET65 ±5% window**	53.3 50.635 to 55.965	1.52 1.444 to 1.596
	Reference result per probe calibration ±5% window	54 51.3 to 56.7	1.45 1.378 to 1.523
	Validation value (Sep. 17)	52.548876	1.513978

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.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.

3.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 ≤ 5% while satisfying the required ±5% tolerances in target dielectric parameters. "(KDB 450824 D01)

6. Uncertainty Assessment

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

6.1. UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
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 Algoritms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Test sample Related									
Test sample positioning	E.4.2.1	0.03	N	1	1	1	0.03	0.03	N-1
Device Holder Uncertainty	E.4.1.1	5.00	N	1	1	1	5.00	5.00	N-1
Output power Power drift - SAR drift measurement	6.6.2	4.04	R	$\sqrt{3}$	1	1	2.33	2.33	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞

Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	∞
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	∞
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				11.55	10.67	
Expanded Uncertainty (95% Confidence interval)			K=2				23.11	21.33	

6.2. UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	4.76	N	1	1	1	4.76	4.76	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.01	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.62	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	∞

Input power and SAR drift measurement	8,6.6.2	4.04	R	$\sqrt{3}$	1	1	2.33	2.33	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	∞
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	$\sqrt{3}$	0.64	0.43	1.85	1.24	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	∞
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	$\sqrt{3}$	0.6	0.49	3.46	2.83	M
Combined Standard Uncertainty			RSS				8.83	8.37	
Expanded Uncertainty (95% Confidence interval)			K=2				17.66	16.73	

7. SAR Measurement Evaluation

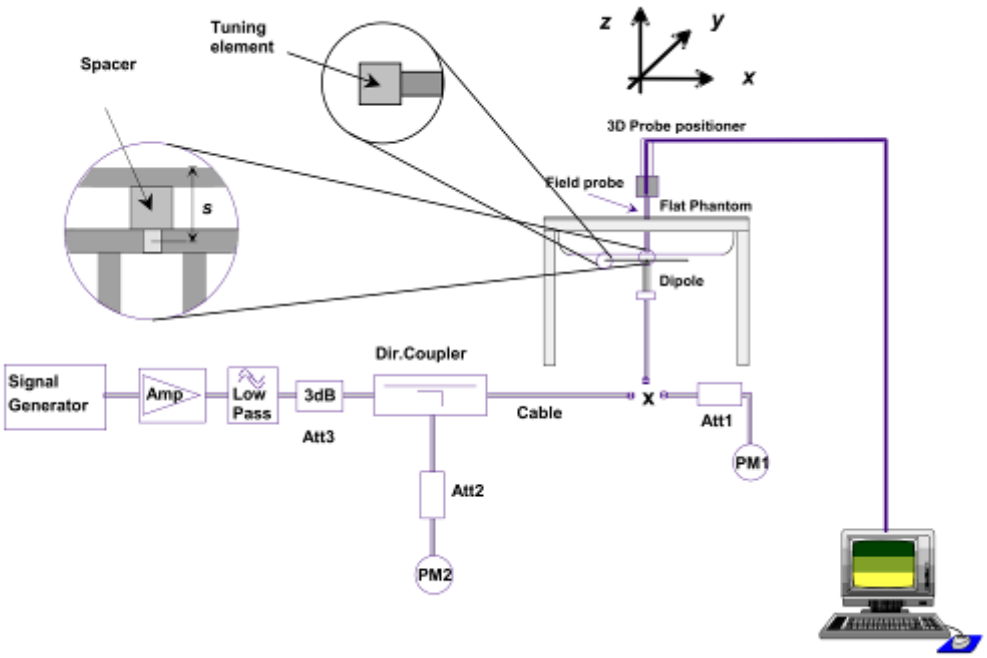
7.1. System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835 MHz, 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	Rohde&Schwarz (SMP_02)
Directional coupler	Giga-tronics(SN:1829112)
Amplifier	PRANA (Ap32 SV125AZ)
Reference dipole	835MHz:SN 36/08 DIPC 99 1800MHz:SN 36/08 DIPF 101 1900MHz:SN 36/08 DIPF 102

System Verification Setup Block Diagram



7.2. Validation Results

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

Frequency	835MHz(Head)	835MHz(Body)	1800MHz(Head)	1800MHz(Body)
Target value（1g）	9.714 W/Kg	9.714 W/Kg	39.32 W/Kg	39.32 W/Kg
250 mW input power	2.478 W/Kg	2.386 W/Kg	9.556 W/Kg	9.340 W/Kg
Test value（1g）	9.912 W/Kg	9.544W/Kg	38.224 W/Kg	37.360 W/Kg

Frequency	1900MHz(Head)	1900MHz(Body)
Target value（1g）	39.89 W/Kg	39.89 W/Kg
250 mW input power	9.455 W/Kg	9.740 W/Kg
Test value（1g）	37.820 W/Kg	38.960 W/Kg

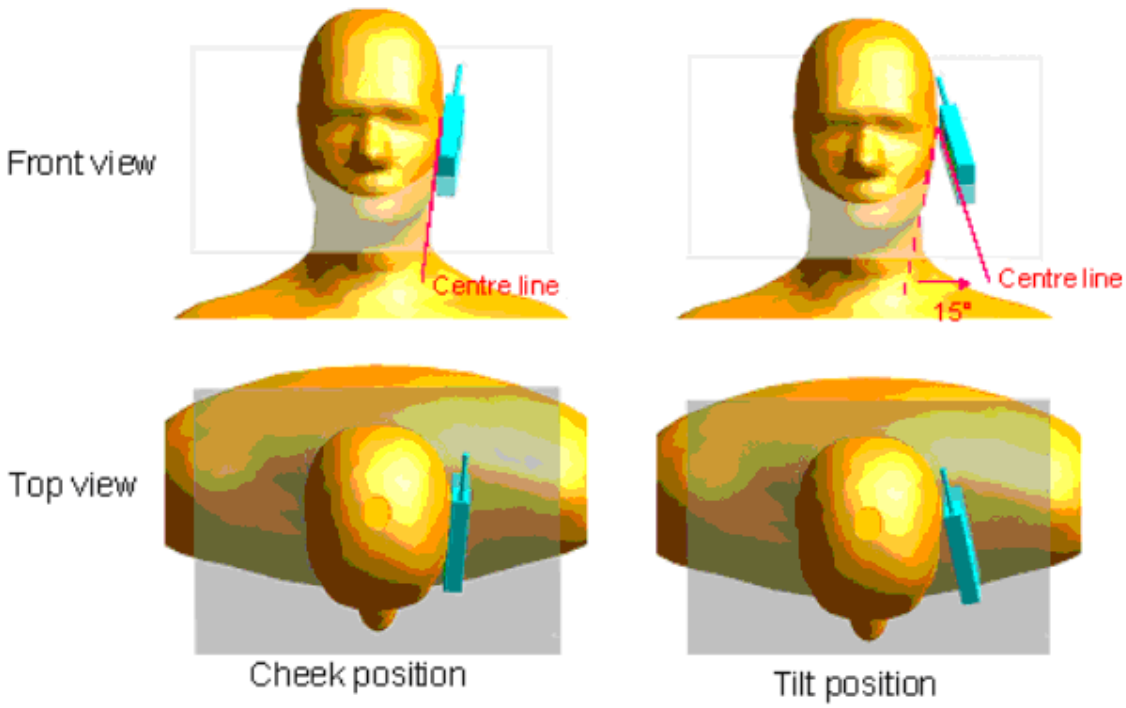
Note: System checks the specific test data please see page 113~124

8. Operational Conditions During Test

8.1. Informations on the testing

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

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



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

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

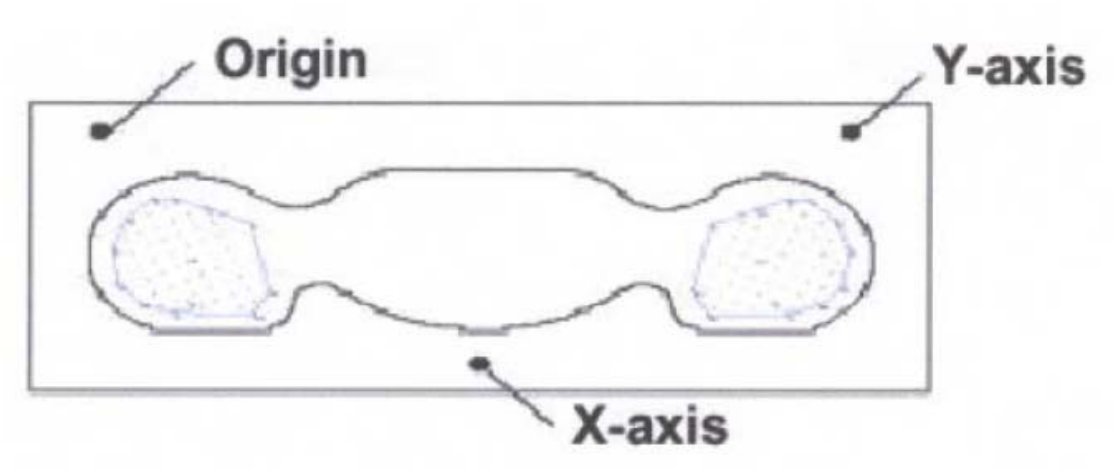
Remark: Please refer to Appendix B for the test setup photos.

8.2. Body-worn Configurations

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

The depth of the body tissue was 15.1cm. The distance between the back of the device and the bottom of the flat phantom is 1.5cm(taking into account of the IEEE 1528 and the place of the antenna)

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



SAR Measurement Points in Area Scan

8.3. Measurement procedure

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors can not directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

8.4. Description of interpolation/extrapolation scheme

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

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

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

9. Measurement Of Conducted Peak output power

1. WCDMA Conducted peak output power

Item	band	WCDMA 1700		
	ARFCN	1312	1412	1513
	subtest	dBm		
5.2(WCDMA)	non	21.66	21.45	21.61
HSDPA	1	21.62	21.39	21.55
	2	21.61	21.41	21.53
	3	21.13	20.91	21.06
	4	21.11	20.87	21.09

2. GSM Conducted peak output power

Band	Channel	Frequency (MHz)	Output Power (dBm)
GSM 850	128	824.2	31.72
	190	836.6	31.52
	251	848.8	31.39
PCS 1900	512	1850.2	28.07
	661	1880.0	28.11
	810	1909.8	28.11

3. GPRS Mode Conducted peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	31.33	29.30	28.45	27.30
	190	836.6	31.53	29.44	28.30	27.41
	251	848.8	31.74	29.61	28.24	27.21
PCS 1900	512	1850.2	28.08	27.05	26.06	25.01
	661	1880.0	27.58	26.00	25.03	24.70
	810	1909.8	27.10	26.63	25.55	24.40

GPRS Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	22.33	23.28	24.19	24.29
	190	836.6	22.53	23.42	24.04	24.40
	251	848.8	22.74	23.59	23.98	24.20
PCS 1900	512	1850.2	19.08	21.03	21.80	22.00
	661	1880.0	18.58	19.98	20.77	21.69
	810	1909.8	18.10	20.61	21.29	21.39

4. EDGE Mode Conducted peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	32.24	28.98	27.25	26.44
	190	836.6	32.44	29.22	27.41	26.30
	251	848.8	32.66	29.28	27.34	26.76
PCS 1900	512	1850.2	28.50	26.83	25.25	24.72
	661	1880.0	27.69	26.74	25.32	24.67
	810	1909.8	27.18	26.90	25.37	24.54

EDGE Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	23.24	22.96	22.99	23.43
	190	836.6	23.44	23.20	23.15	23.29
	251	848.8	23.66	23.26	23.08	23.75
PCS 1900	512	1850.2	19.50	20.81	20.99	21.71
	661	1880.0	18.69	20.72	21.06	21.66
	810	1909.8	18.18	20.88	21.11	21.53

5. Wifi peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11B (DSSS)	802.11G (OFDM)
WiFi	1	2412	8.95	6.38
	6	2437	8.69	5.11
	11	2462	7.58	3.73

6. Bluetooth peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)
			GFSK
BT	0	2402	-4.882
	38	2441	-4.419
	79	2480	-4.278

10. Wireless Hot Spot SAR Evaluation

The are three transmitters build in EUT, As followed:

This Portable Devices with Wireless Router function. And the SAR evaluation procedures accord with KDB 941225 D06 Hot Spot SAR v01.

1. SAR must be tested for all surfaces and edges (side) with a transmitting antenna with in 2.5 cm from that surface or edge, at a test separation distance of 10 mm, in the wireless modes that support wireless routing.
2. Edge Configurations:

3. WCDMA&GSM antenna is located at Edge A, based on the distance between Main Antenna and Edge A&B&C&D, according to KDB941225 D06, the SAR measurement of Edge A&B&C of WCDMA & GSM are required, Edge D is not required.

4. Wifi antenna is located at Edge D, based on the distance between WiFi antenna and Edge A&B&C&D, according to KDB941225 D06, the SAR measurement of Edge B&D are required, but Edge A&C are not required. (refer to Multiple Transmitters Evaluation wifi standalone SAR is not required)

11. 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
Right Side Of Head		Cheek/Touch	Internal	0.483	/	/
		Ear/Tilt	Internal	0.302	/	/
Left Side Of Head		Cheek/Touch	Internal	0.454	/	/
		Ear/Tilt	Internal	0.273	/	/
Body (10mm Separation)	GSM	Back upward	Internal	0.213	/	/
		Face Upward	Internal	0.167	/	/
	GPRS	Back upward	Internal	0.959	1.032	0.948
		Face Upward	Internal	/	0.732	/
		EDGE A	Internal	/	0.428	/
		EDGE B	Internal	/	0.655	/
		EDGE C	Internal	/	0.642	/
	EDGE	Back upward	Internal	0.876	0.860	0.902

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
Right Side Of Head		Cheek/Touch	Internal	/	0.540	/
		Ear/Tilt	Internal	/	0.103	/
Left Side Of Head		Cheek/Touch	Internal	/	0.504	/
		Ear/Tilt	Internal	/	0.085	/
Body (10mm Separation)	GSM	Back upward	Internal	/	0.213	/
		Face Upward	Internal	/	0.167	/
	GPRS	Back upward	Internal	0.494	/	/
		Face Upward	Internal	0.252	/	/
		EDGE A	Internal	0.512	/	/
		EDGE B	Internal	0.365	/	/
		EDGE C	Internal	0.315	/	/
	EDGE	Back upward	Internal	0.537	/	/

Note:

1.The SAR test shall be performed at the high, middle and low frequency channels of each operating mode, when the SAR of highest power channel of each configurations is less than 0.8 W/kg, refer to KDB 648474, testing for the other channels is not required.

2. The main antenna to Edge D is greater than 2.5cm, so the Edge D configuration is not required.

Summary of Measurement Results (WCDMA 1700MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%.					
Phantom Configurations	Device Test Positions	Antenna Positions	SAR(W/Kg), 1g Peak		
			Device Test channel		
			Channel 1312	Channel 1412	Channel 1513
Right Side Of Head	Cheek/Touch	Internal	0.326	/	/
	Ear/Tilt	Internal	0.211	/	/
Left Side Of Head	Cheek/Touch	Internal	0.293	/	/
	Ear/Tilt	Internal	0.199	/	/
Body (10mm Separation)	Back upward	Internal	0.557	/	/
	Face Upward	Internal	0.268	/	/
	EDGE A	Internal	0.286	/	/
	EDGE B	Internal	0.433	/	/
	EDGE C	Internal	0.394	/	/

Note:

1. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode, when the SAR of highest power channel of each configurations is less than 0.8 W/kg, refer to KDB 648474, testing for the other channels is not required.

2. Maximum SAR for 12.2kbps RMC is 0.557 W/Kg≤ 75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSUPA active is less than 1/4 dB higher than that measured without HSUPA/HSDPA using 12.2kbps RMC (refer to Page 24 of the report), according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.

3. The main antenna to Edge D is greater than 2.5cm, so the Edge D configuration is not required.

12. Multiple Transmitters Evaluation

The are three transmitters build in EUT, As followed:

Stand-alone SAR

The output power of Wifi transmitter is 8mW < Pref((Pref= 12mW)) , and the distance between WiFi antenna and GSM&WCDMA antenna is 7.3cm > 5cm, stand-alone SAR evaluation is not required for Wifi.

The BT Max. Peak output power is 0.4mW ≤ Pref (Pref= 12mW),and the distance between BT antenna and main antenna is 7.3cm > 5 cm standalone SAR evaluation is not required for Bluetooth antenna.

Simultaneous SAR

The BT and Wifi can't simultaneous transmitting.

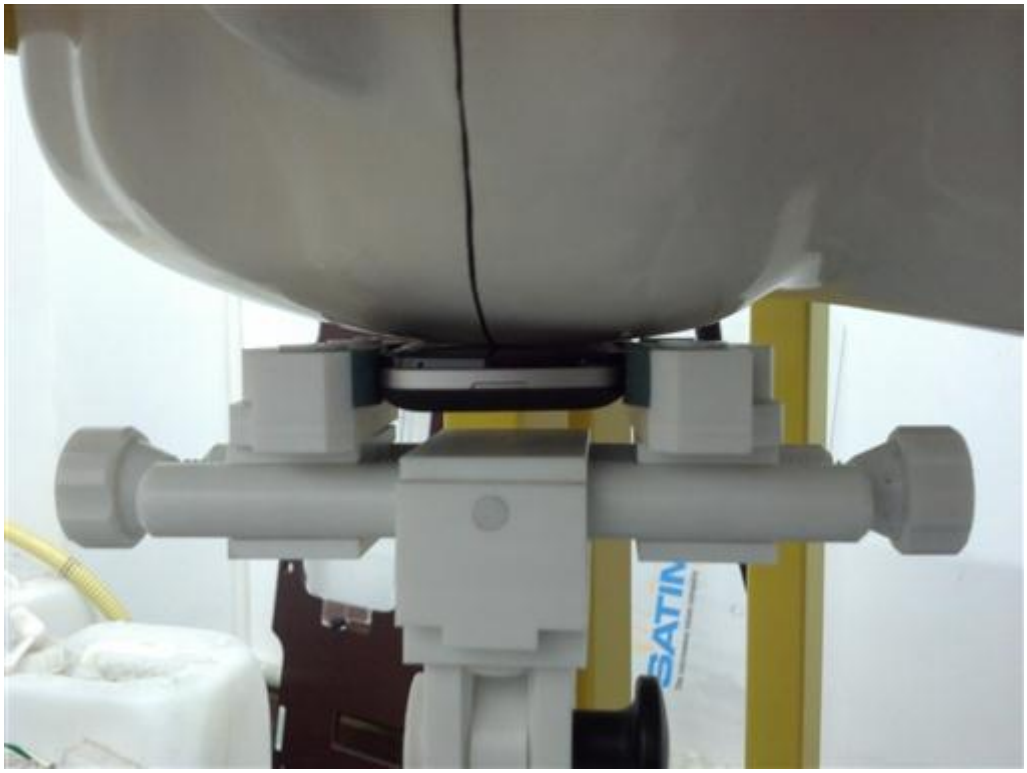
Test Position	GSM&WCDMA SAR_{Max} (W/Kg)	Bluetooth SAR(W/Kg)	WiFi SAR(W/Kg)	∑1-g SAR_{Max}(W/Kg)	
				BT&Main Ant	WiFi&Main Ant
Head SAR	0.540	0	0	0.540	0.540
Body SAR	1.032	0	0	1.032	1.032

Simultaneous Transmission SAR evaluation is not required for BT and GSM, because the sum of 1g SAR_{Max} is 1.032W/Kg < 1.6W/Kg for Wifi and GSM&WCDMA.

Simultaneous Transmission SAR evaluation is not required for WiFi and GSM, because the sum of 1g SAR_{Max} is 1.032W/Kg < 1.6W/Kg for BT and GSM&WCDMA

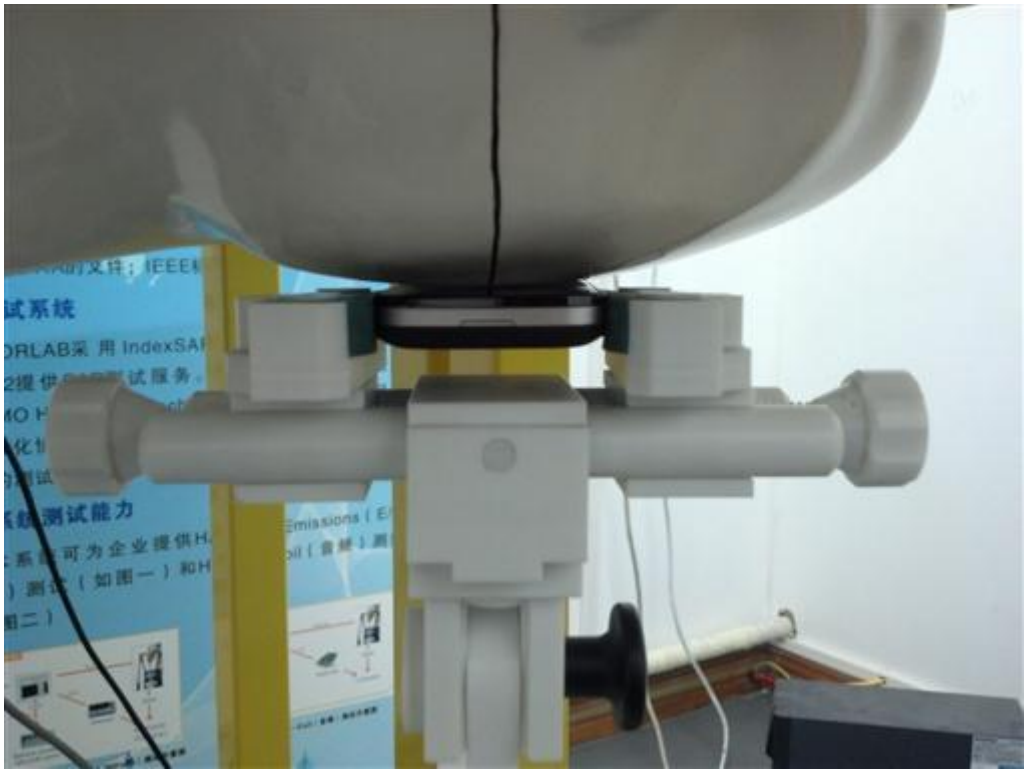
Annex A EUT Setup Photos

1 EUT Right Head Touch Cheek Position

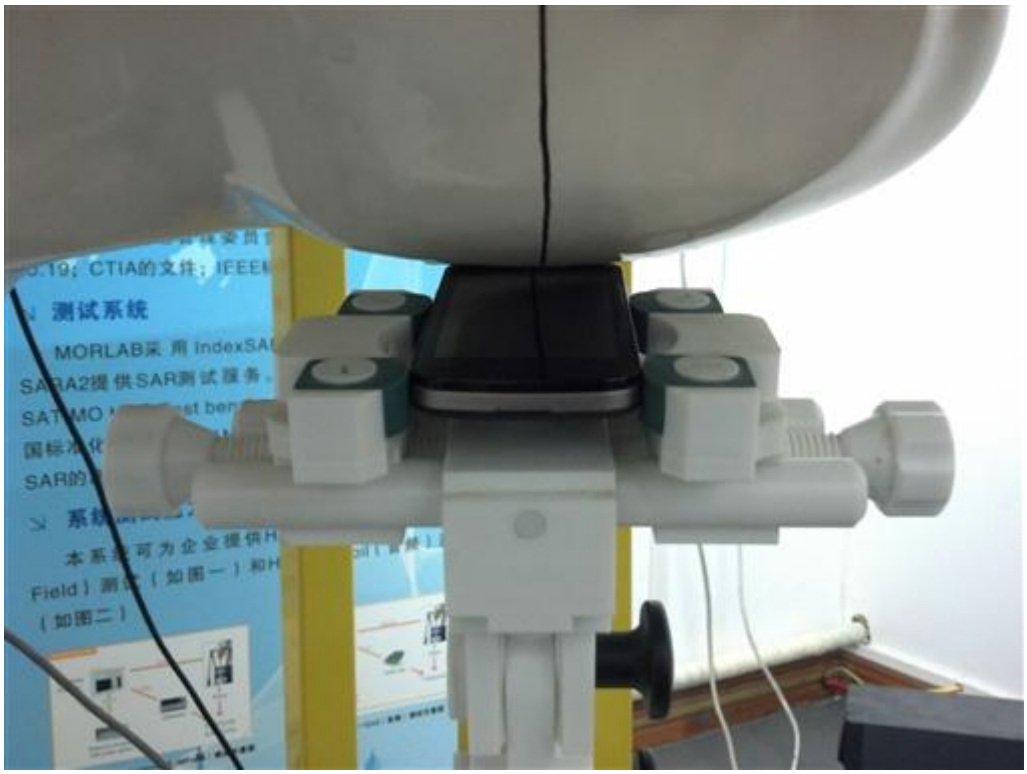


2 EUT Right Head Tilt15 Position

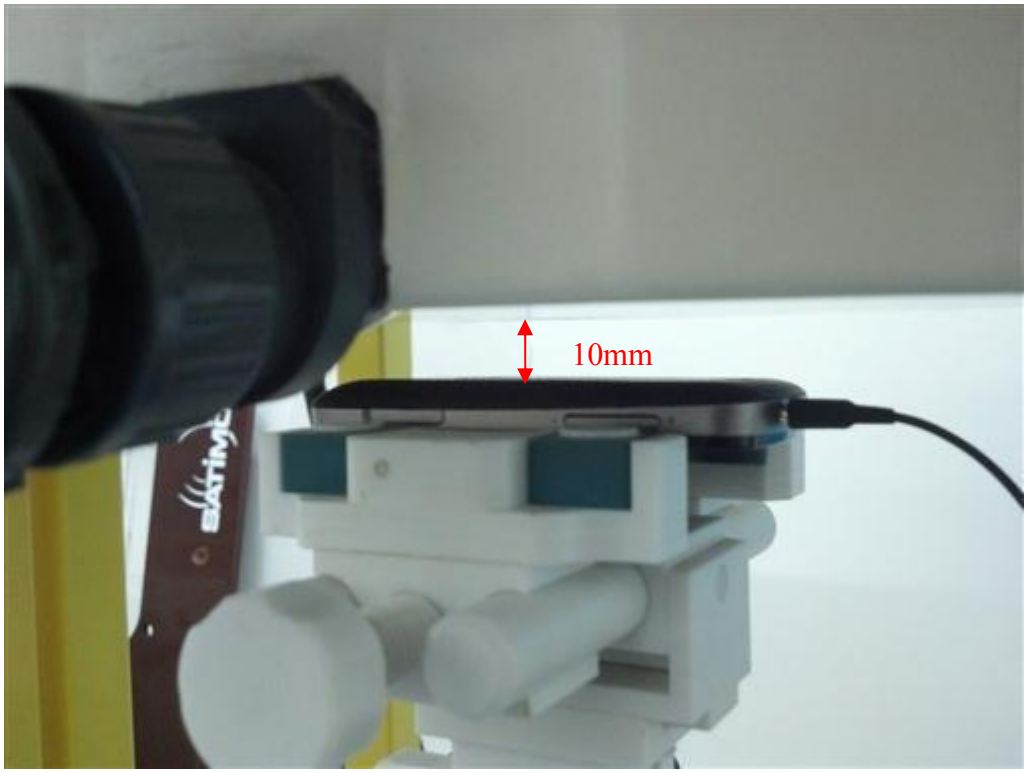
3 EUT Left Head Touch Cheek Position



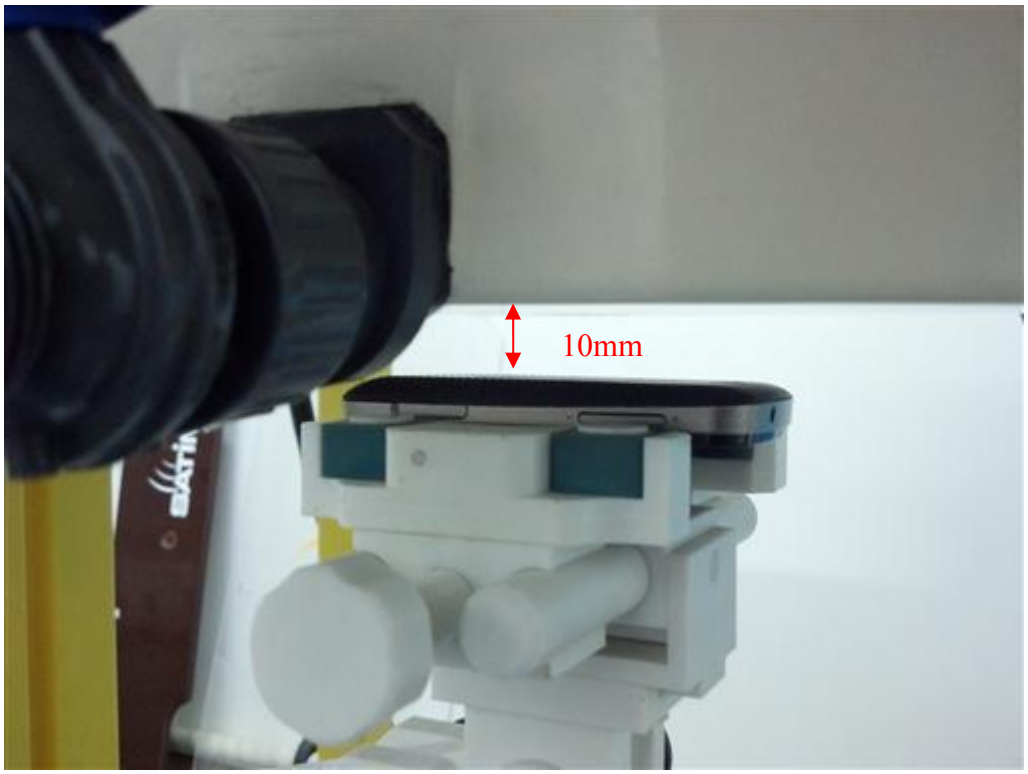
4 EUT Left Head Tilt15 Position



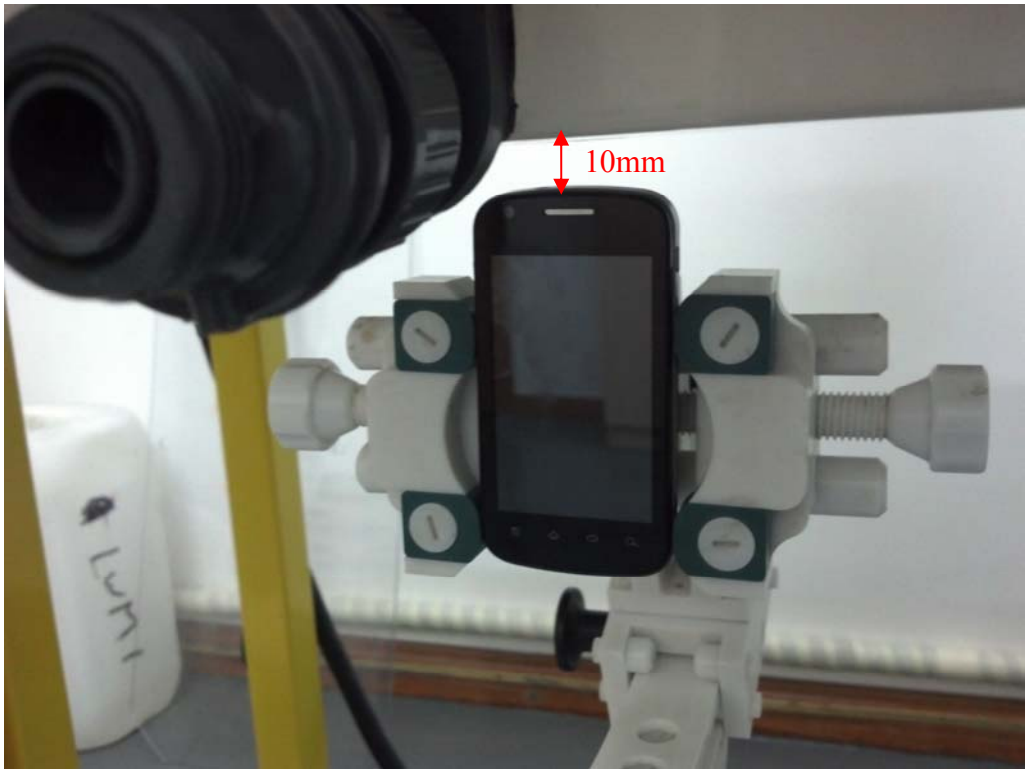
5 Side Position with earphone



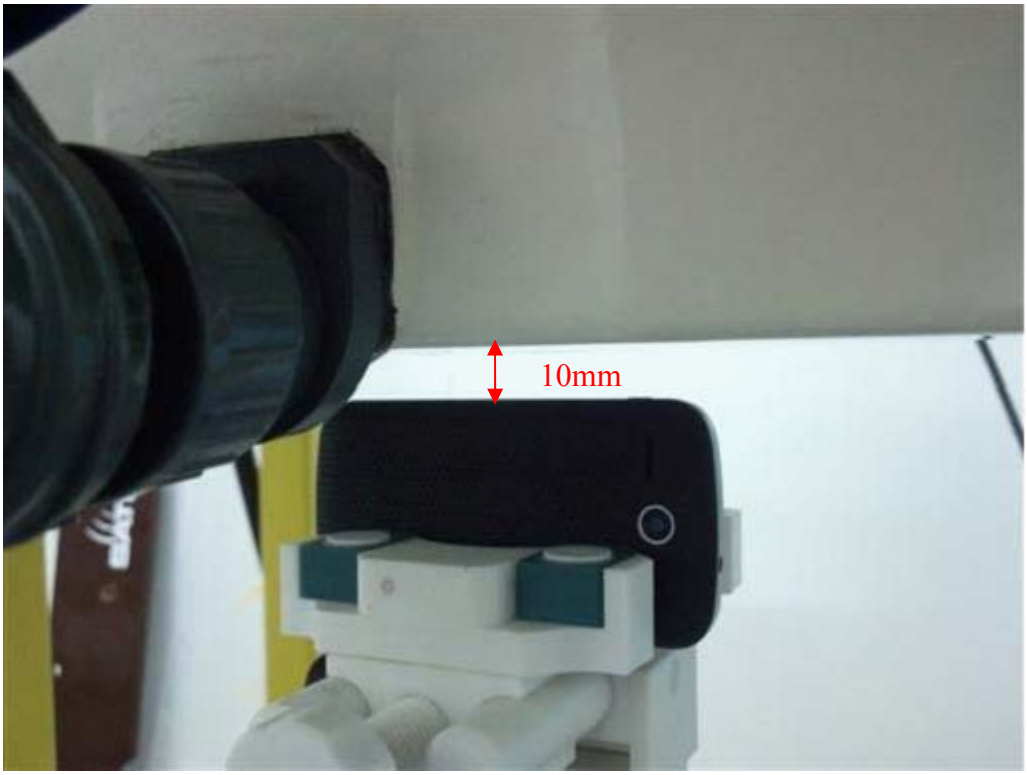
6 Side Position



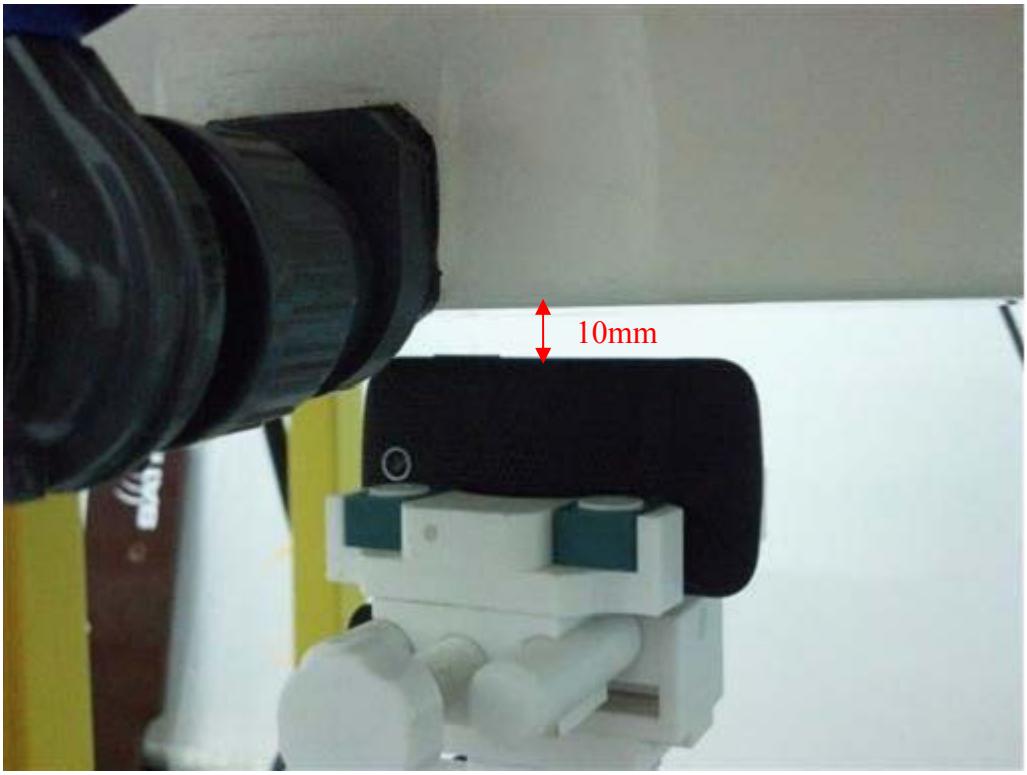
7 Edge A



8 Edge B



9 Edge C



10 Edge D

Liquid Level Photo

Annex B Graph Test Results

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

	Measurement 21: Flat Plane with Body device position on Middle Channel in GSM mode Measurement 22: Flat Plane with Body device position on Middle Channel in GSM mode Measurement 23: Flat Plane with Body device position on Low Channel in GPRS mode Measurement 24: Flat Plane with Body device position on Low Channel in GPRS mode Measurement 25: Flat Plane with Body device position on Low Channel in GPRS mode Measurement 26: Flat Plane with Body device position on Low Channel in GPRS mode Measurement 27: Flat Plane with Body device position on Low Channel in GPRS mode Measurement 28: Flat Plane with Body device position on Low Channel in EDGE mode
WCDMA 1700	Measurement 29: Right Head with Cheek device position on Middle Channel in WCDMA mode Measurement 30: Right Head with Tilt device position on Middle Channel in WCDMA mode Measurement 31: Left Head with Cheek device position on Middle Channel in WCDMA mode Measurement 32: Left Head with Tilt device position on Middle Channel in WCDMA mode Measurement 33: Flat Plane with Body device position on Middle Channel in WCDMA mode Measurement 34: Flat Plane with Body device position on Middle Channel in WCDMA mode Measurement 35: Flat Plane with Body device position on Middle Channel in WCDMA mode Measurement 36: Flat Plane with Body device position on Middle Channel in WCDMA mode Measurement 37: Flat Plane with Body device position on Middle Channel in WCDMA 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: 17/9/2012
Measurement duration: 7 minutes 49 seconds

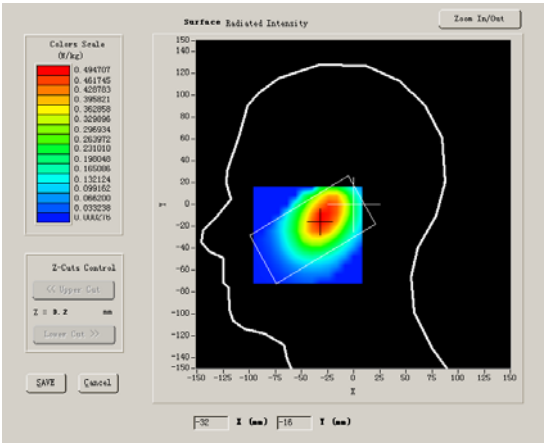
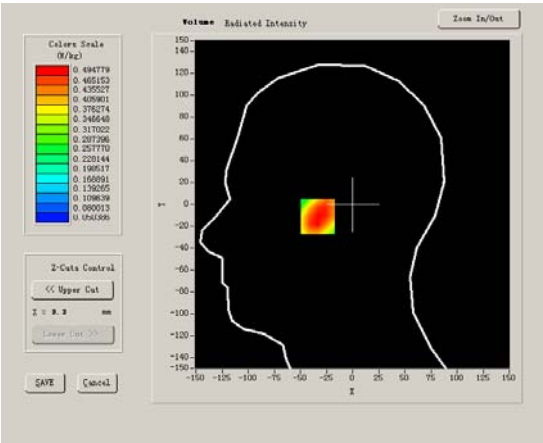
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	41.675999
Relative permittivity	15.070000
Conductivity (S/m)	0.894409
Power drift(%)	-1.210000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.479,25.214,27.19
Crest factor:	1:8

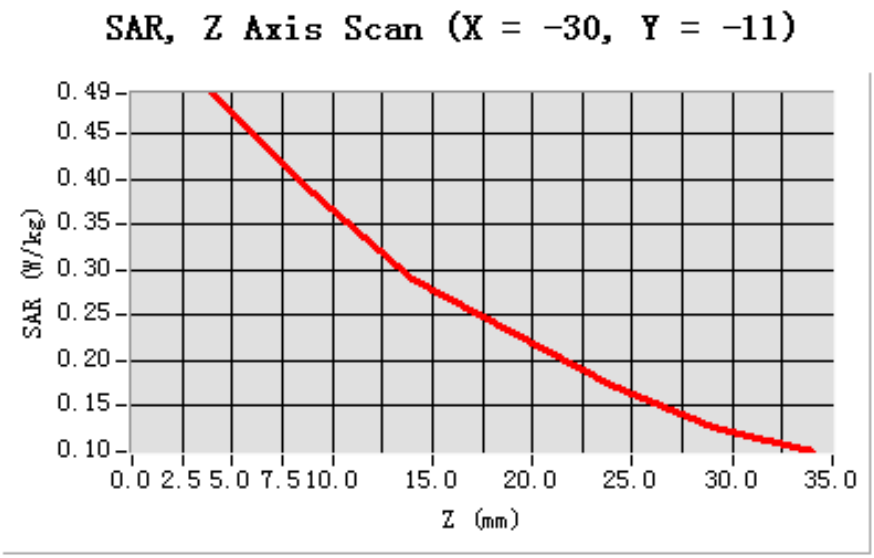
SURFACE SAR	VOLUME SAR
	

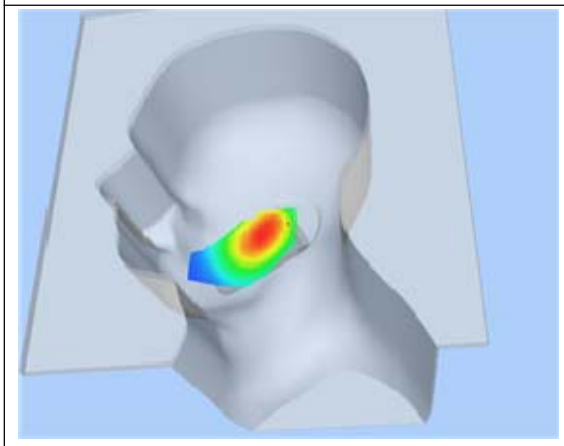
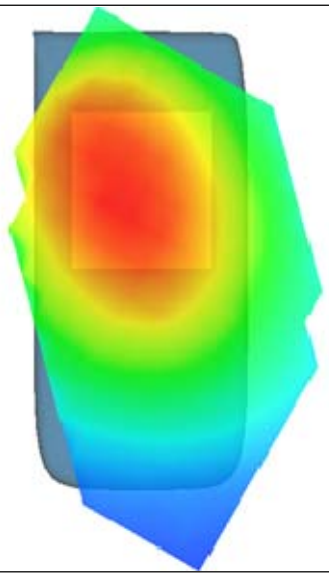
Maximum location: X=-30.00, Y=-11.00

SAR 10g (W/Kg)	0.345123
SAR 1g (W/Kg)	0.483343

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4947	0.3848	0.2908	0.2317	0.1727	0.1277



3D sceen shot	Hot spot position
	

MEASUREMENT 2

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 7 minutes 33 seconds

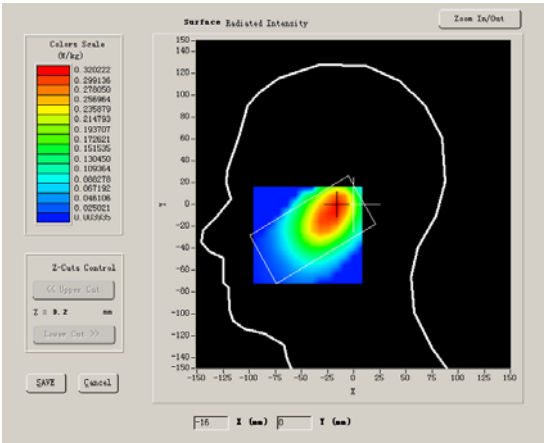
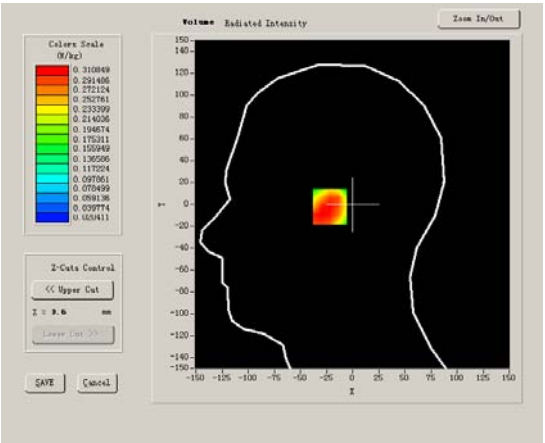
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	41.675999
Relative permittivity	19.120001
Conductivity (S/m)	0.894409
Power drift(%)	-1.510000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.479,25.214,27.19
Crest factor:	1:8

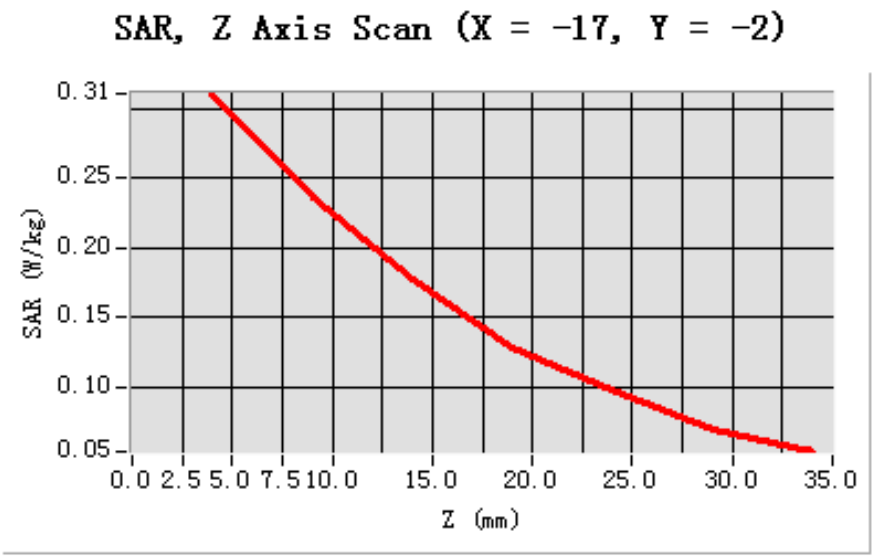
SURFACE SAR	VOLUME SAR
	

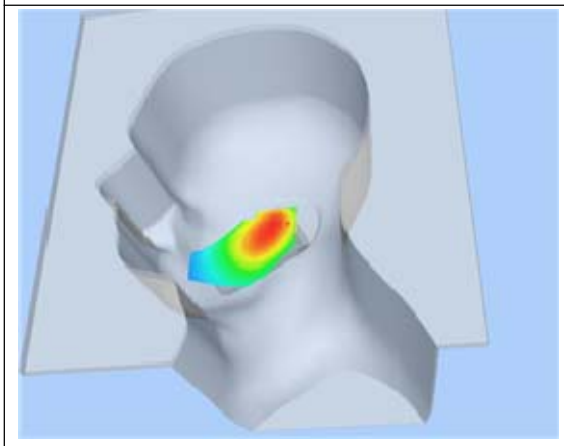
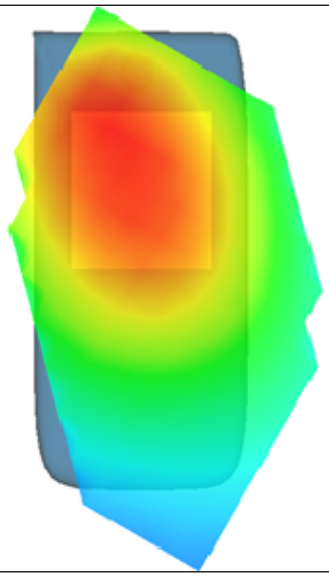
Maximum location: X=-17.00, Y=-2.00

SAR 10g (W/Kg)	0.217564
SAR 1g (W/Kg)	0.301770

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3108	0.2358	0.1778	0.1278	0.0979	0.0697



3D sceen 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: 17/9/2012
Measurement duration: 7 minutes 47 seconds

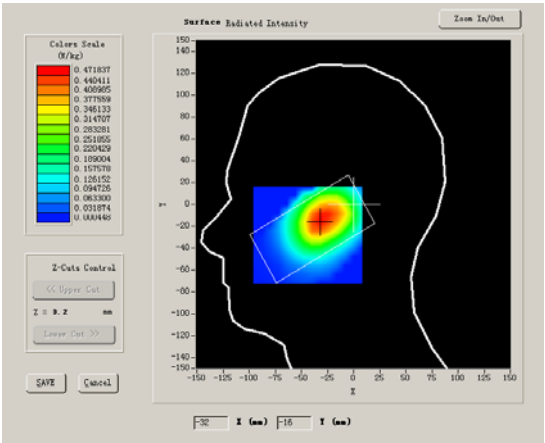
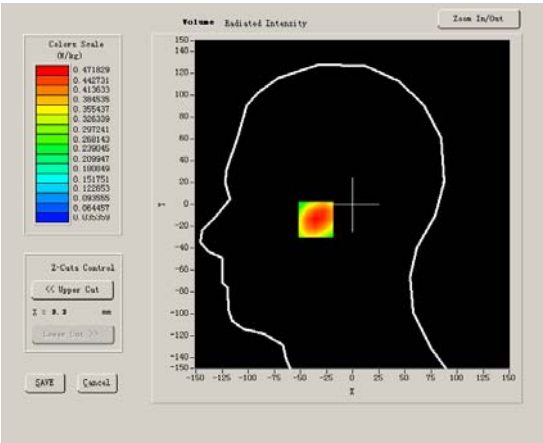
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	41.675999
Relative permittivity	19.120001
Conductivity (S/m)	0.894409
Power drift(%)	-2.130000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.479,25.214,27.19
Crest factor:	1:8

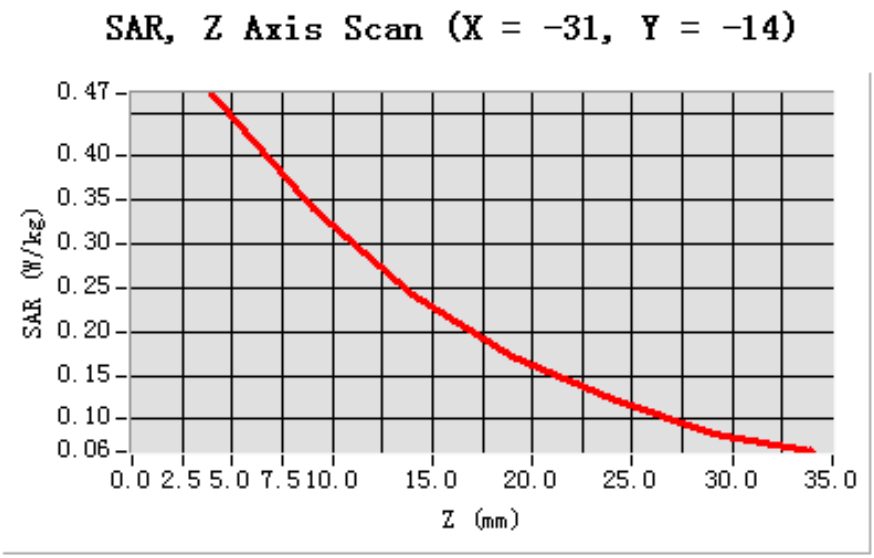
SURFACE SAR	VOLUME SAR
	

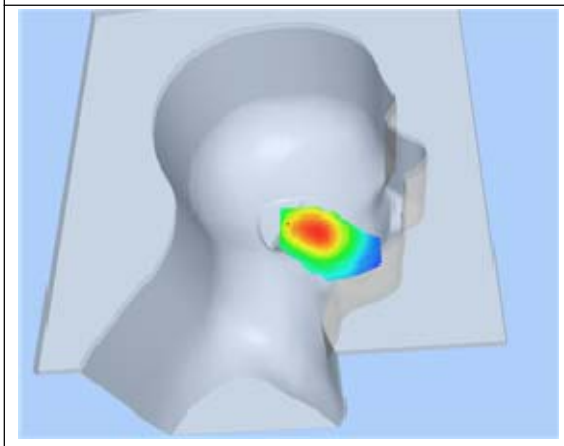
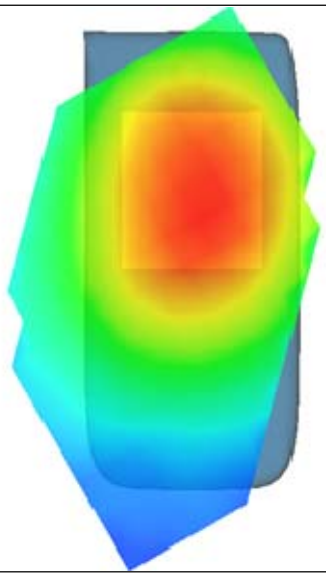
Maximum location: X=-31.00, Y=-14.00

SAR 10g (W/Kg)	0.304664
SAR 1g (W/Kg)	0.453583

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4718	0.3396	0.2433	0.1727	0.1247	0.0848



3D sceen 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: 17/9/2012
Measurement duration: 7 minutes 33 seconds

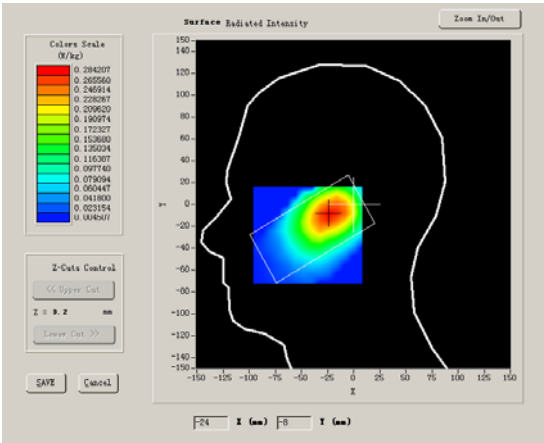
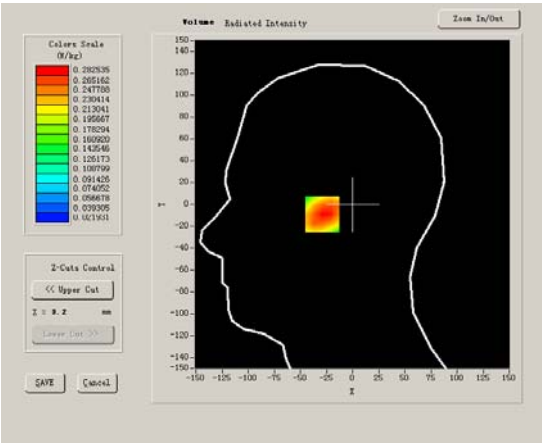
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	41.675999
Relative permittivity	19.120001
Conductivity (S/m)	0.894409
Power drift(%)	-1.480000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.479,25.214,27.19
Crest factor:	1:8

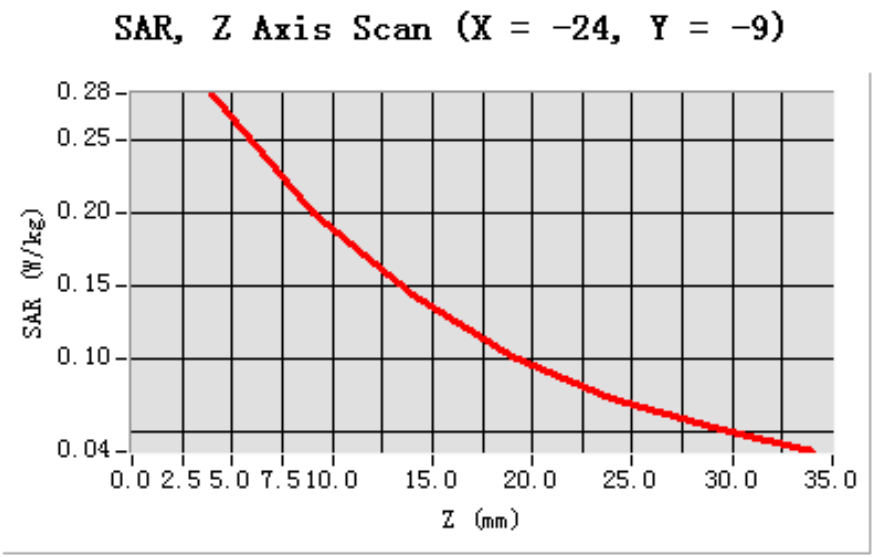
SURFACE SAR	VOLUME SAR
	

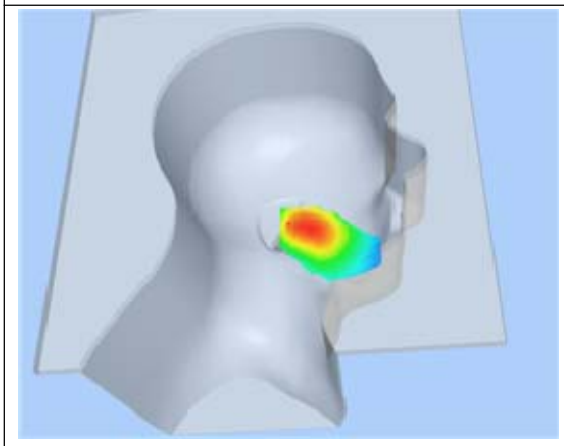
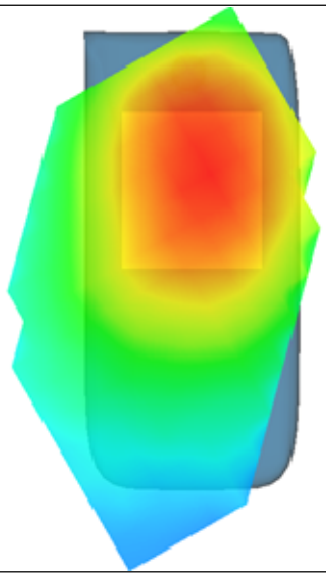
Maximum location: X=-24.00, Y=-9.00

SAR 10g (W/Kg)	0.183854
SAR 1g (W/Kg)	0.272714

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2825	0.2008	0.1442	0.1012	0.0722	0.0518



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 11 seconds

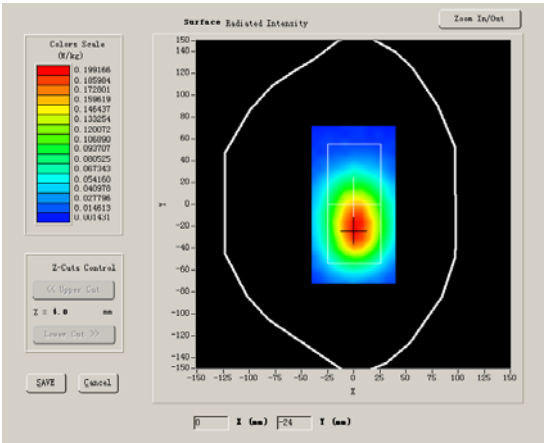
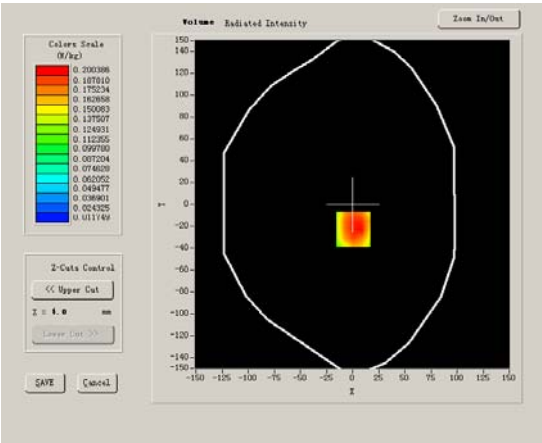
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GSM

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.310000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:8

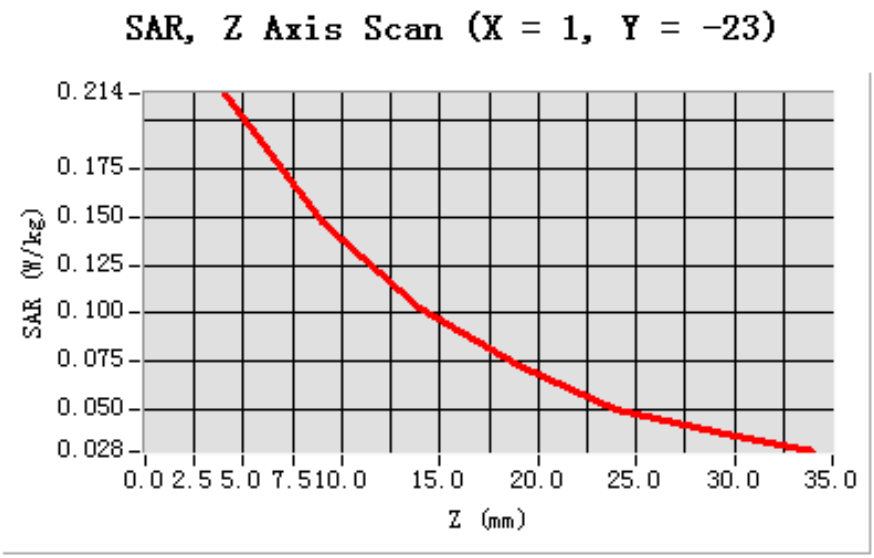
SURFACE SAR	VOLUME SAR
	

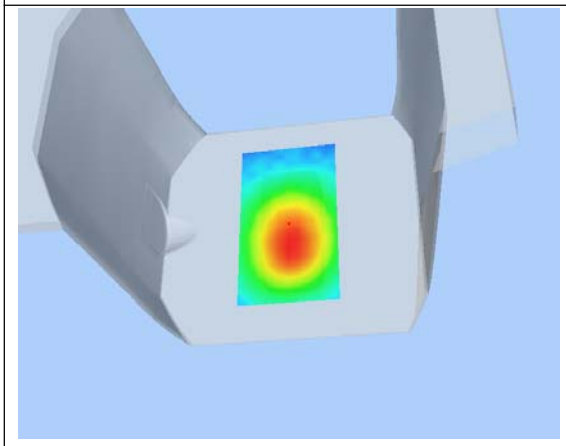
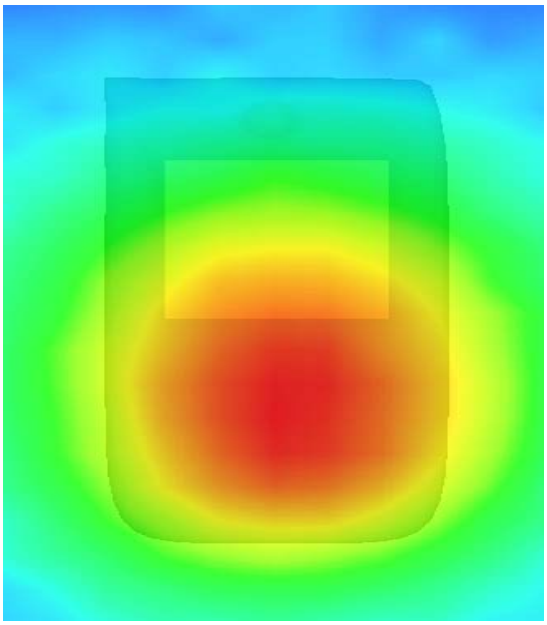
Maximum location: X=1.00, Y=-23.00

SAR 10g (W/Kg)	0.140841
SAR 1g (W/Kg)	0.213095

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2143	0.1479	0.1031	0.0733	0.0502	0.0385



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

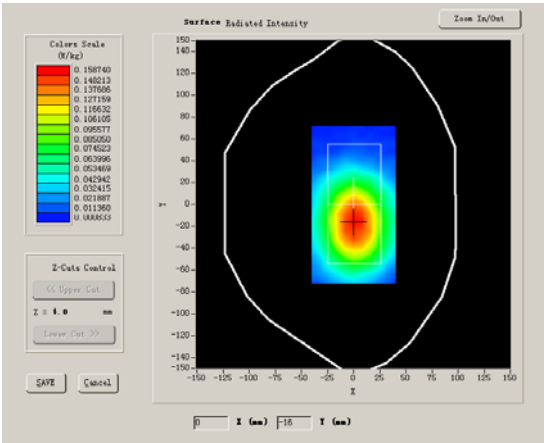
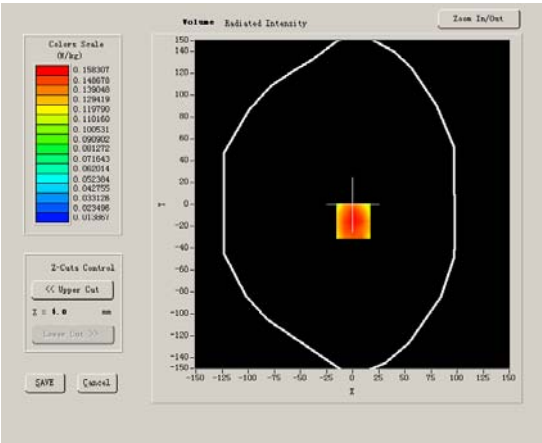
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GSM

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-0.790000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:8

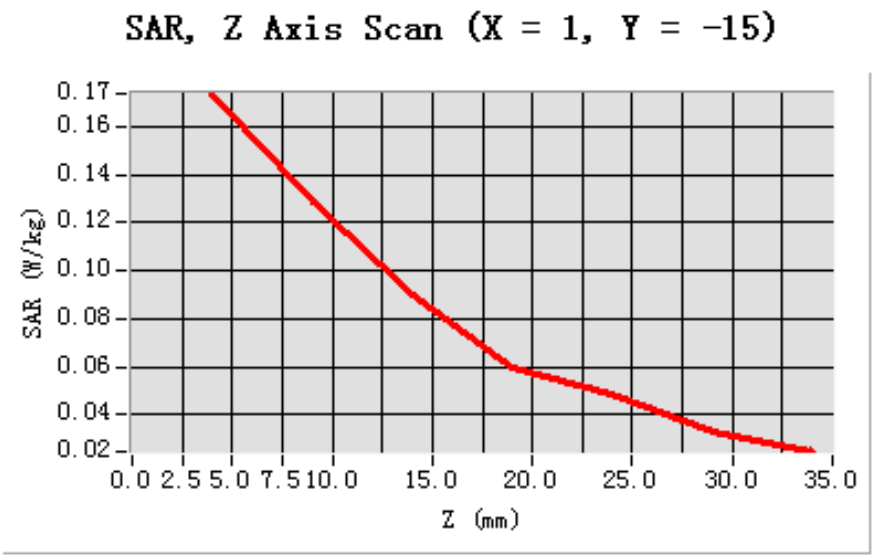
SURFACE SAR	VOLUME SAR
	

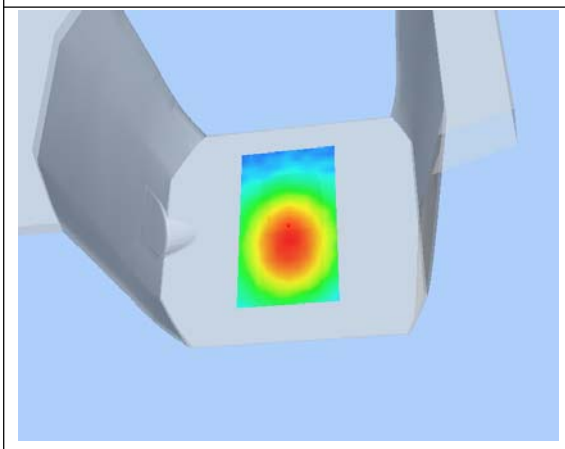
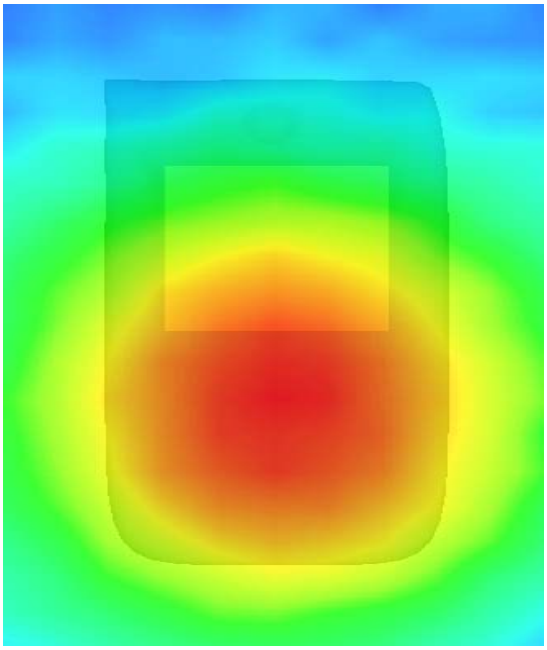
Maximum location: X=1.00, Y=-15.00

SAR 10g (W/Kg)	0.114262
SAR 1g (W/Kg)	0.166680

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.1738	0.1285	0.0902	0.0594	0.0487	0.0332



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 11 seconds

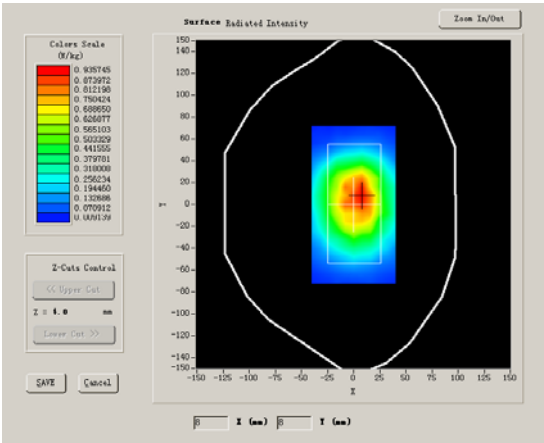
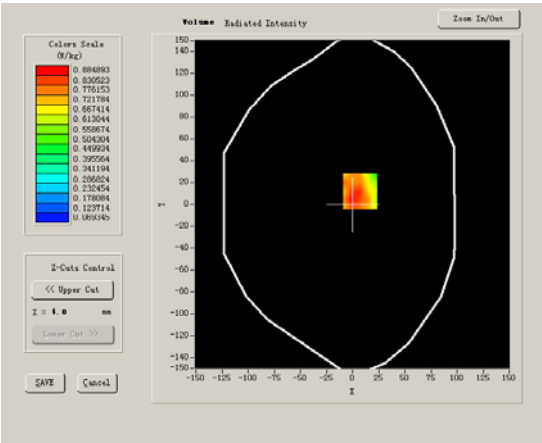
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.120000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

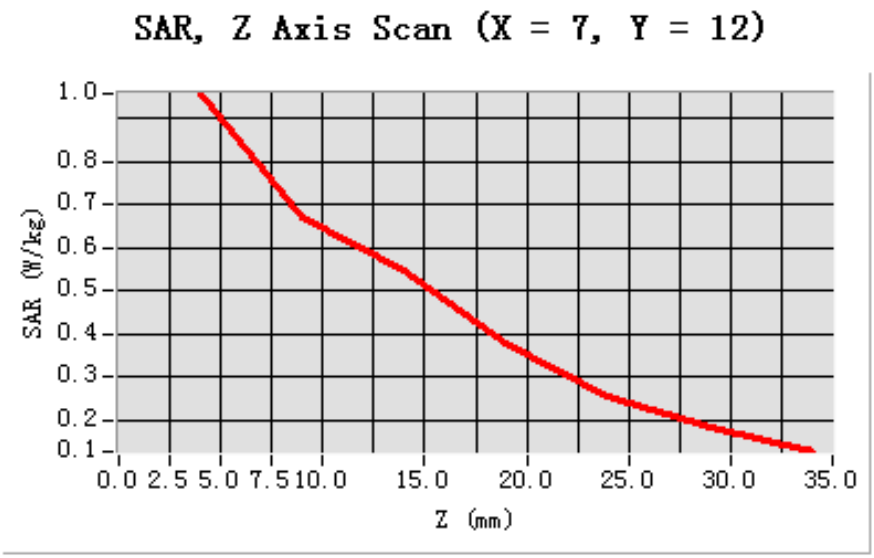
SURFACE SAR	VOLUME SAR
	

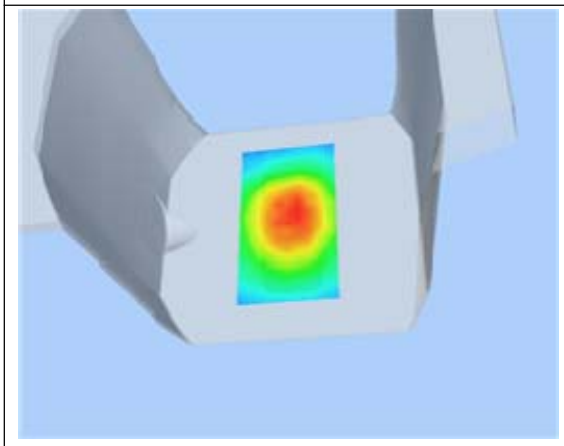
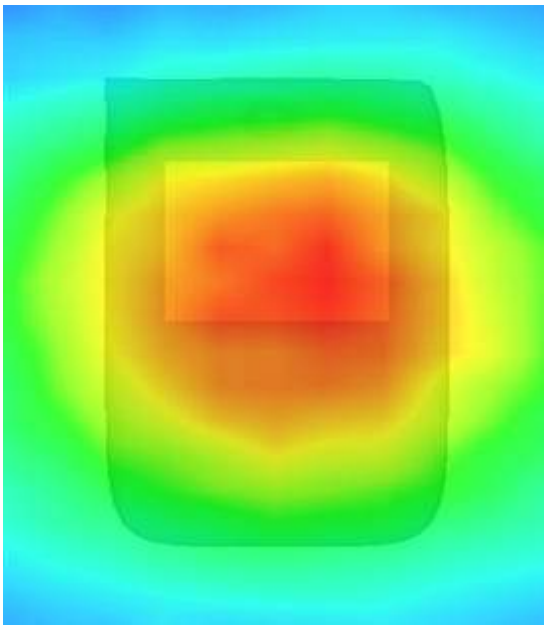
Maximum location: X=7.00, Y=12.00

SAR 10g (W/Kg)	0.665055
SAR 1g (W/Kg)	0.958886

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9569	0.6708	0.5466	0.3753	0.2555	0.1840



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

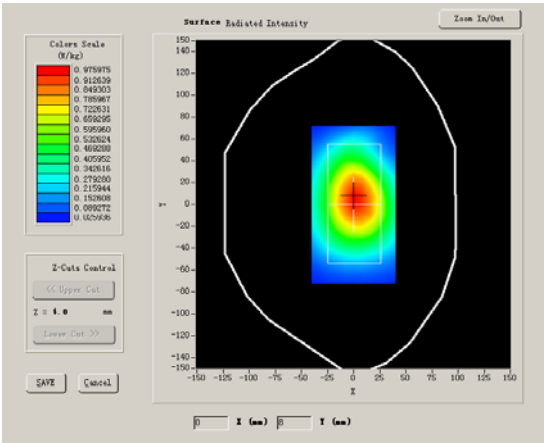
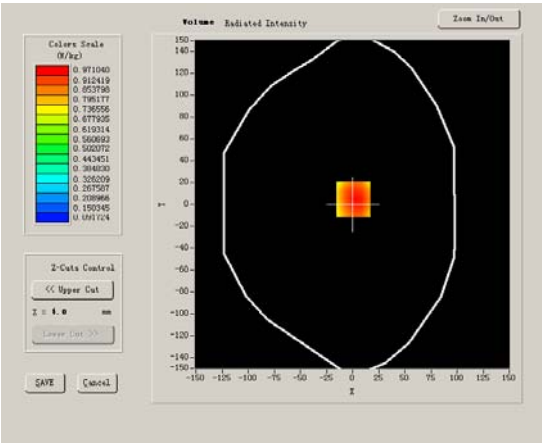
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-0.680000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

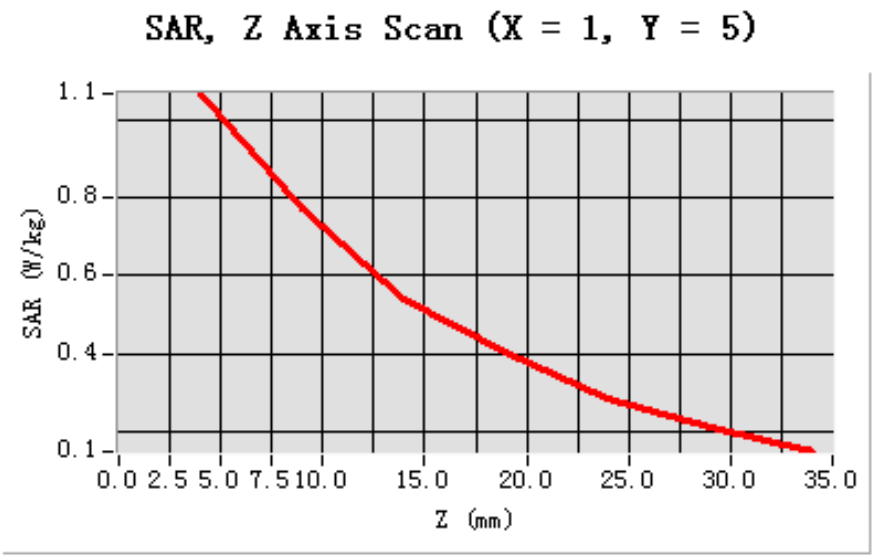
SURFACE SAR	VOLUME SAR
	

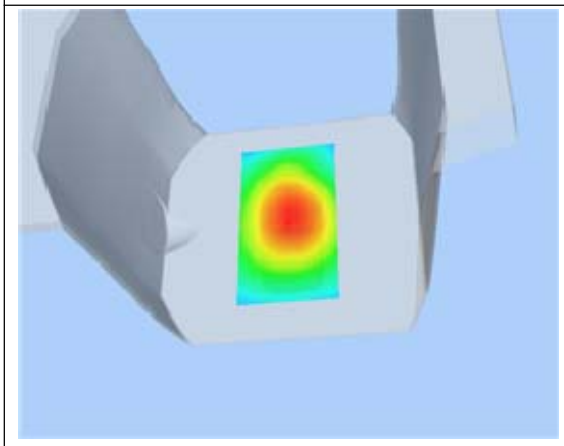
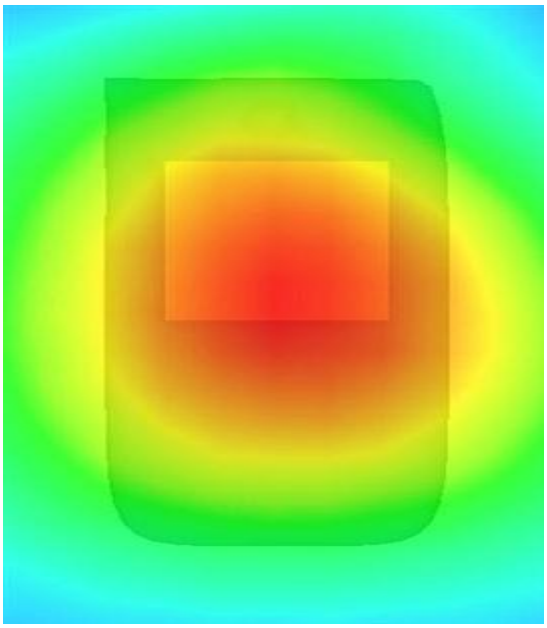
Maximum location: X=1.00, Y=5.00

SAR 10g (W/Kg)	0.713281
SAR 1g (W/Kg)	1.032266

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0660	0.7703	0.5414	0.4012	0.2863	0.2103



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 11 seconds

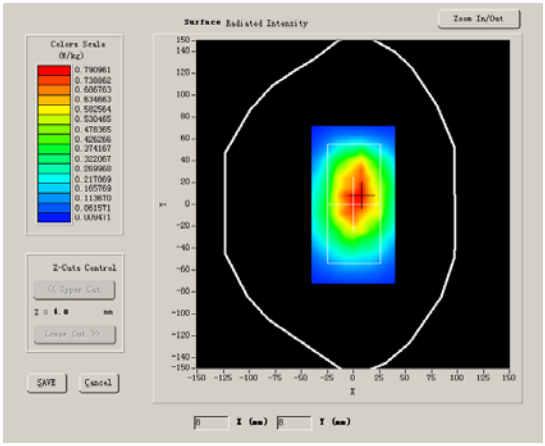
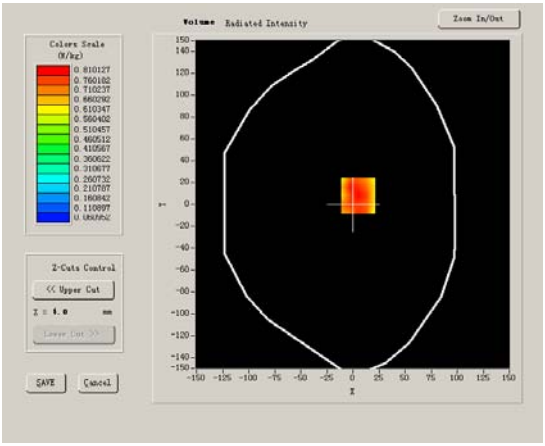
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-0.810000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

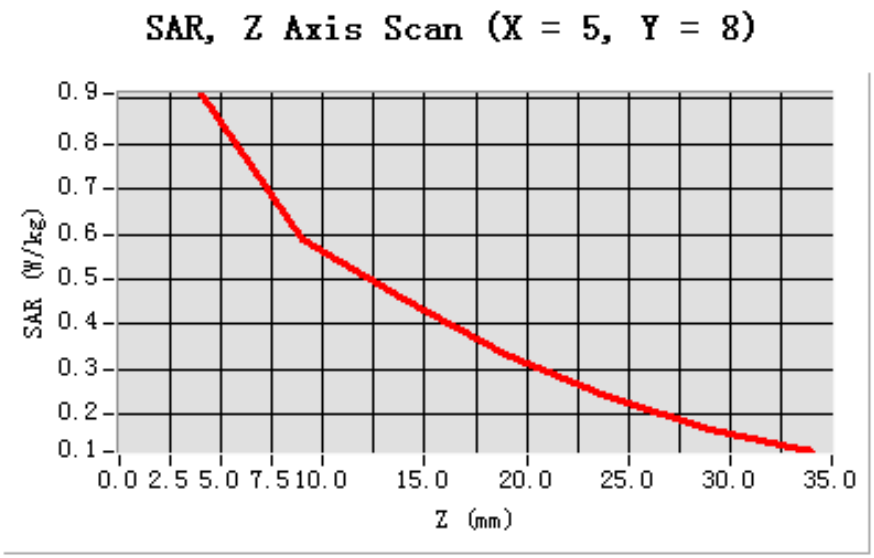
SURFACE SAR	VOLUME SAR
	

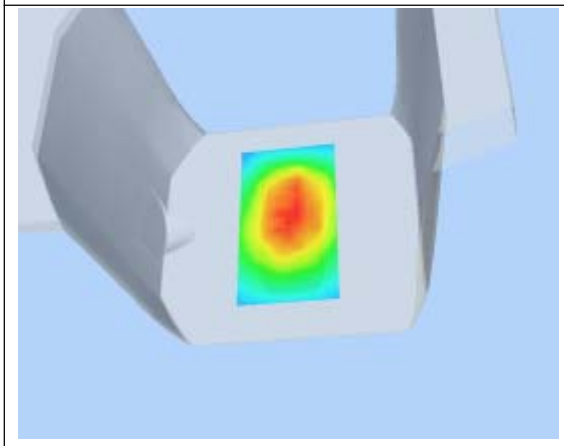
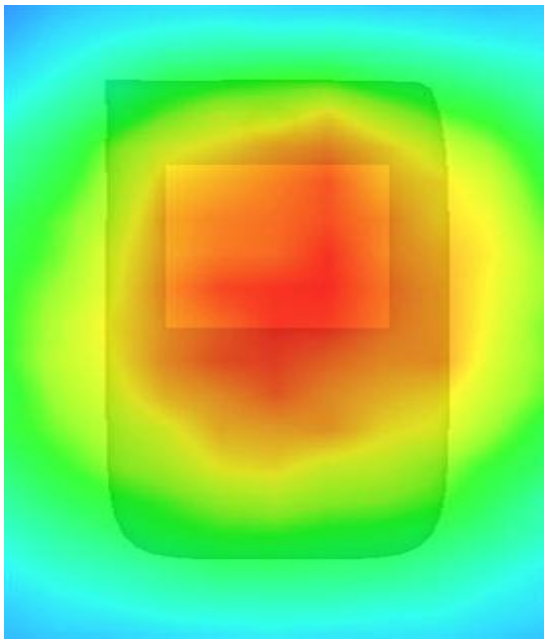
Maximum location: X=5.00, Y=8.00

SAR 10g (W/Kg)	0.653036
SAR 1g (W/Kg)	0.947655

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9611	0.5905	0.4577	0.3353	0.2402	0.1683



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

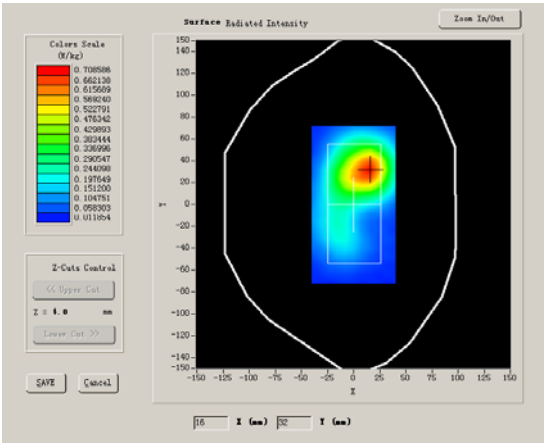
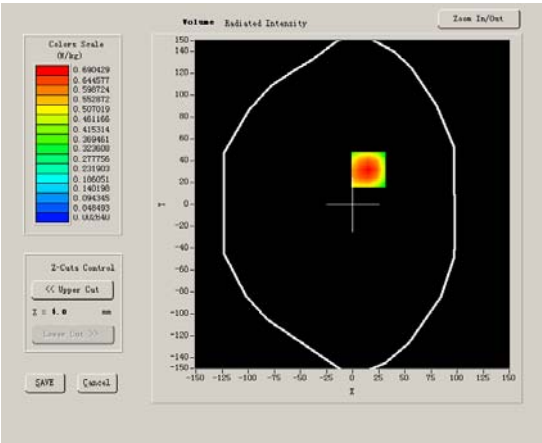
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-0.470000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

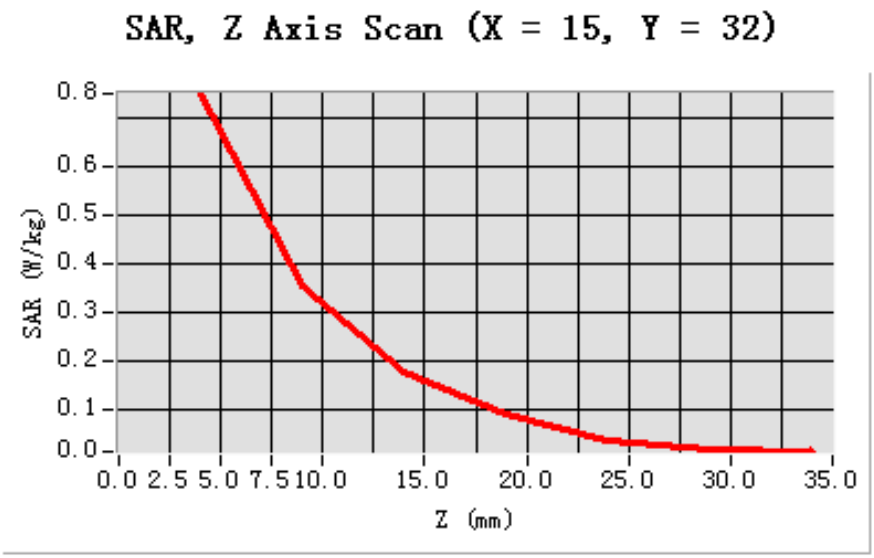
SURFACE SAR	VOLUME SAR
	

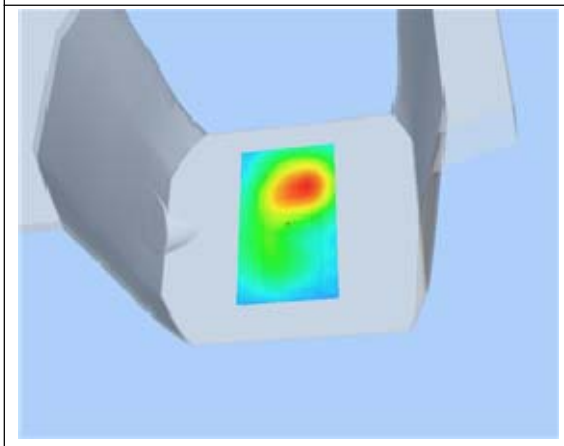
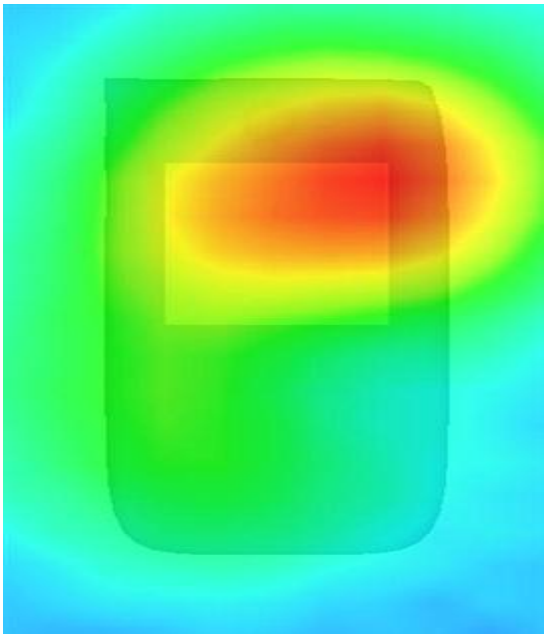
Maximum location: X=15.00, Y=32.00

SAR 10g (W/Kg)	0.384944
SAR 1g (W/Kg)	0.731889

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7708	0.3557	0.1741	0.0884	0.0366	0.0157



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

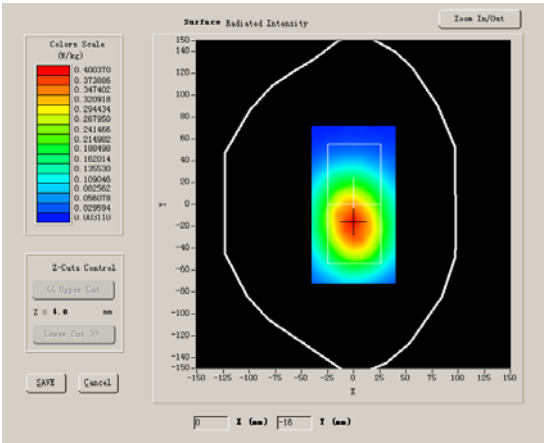
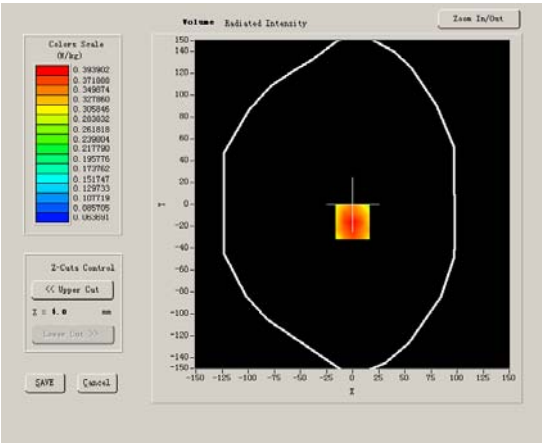
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.210000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

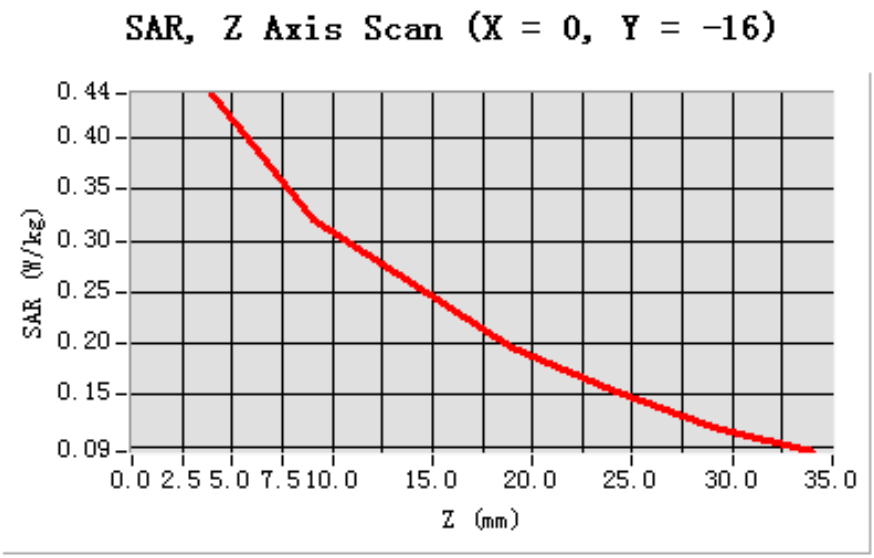
SURFACE SAR	VOLUME SAR
	

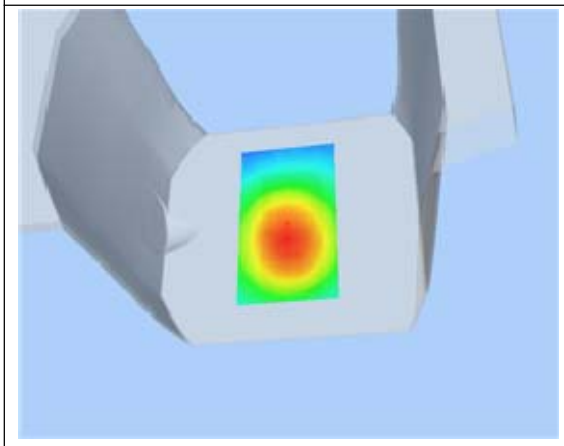
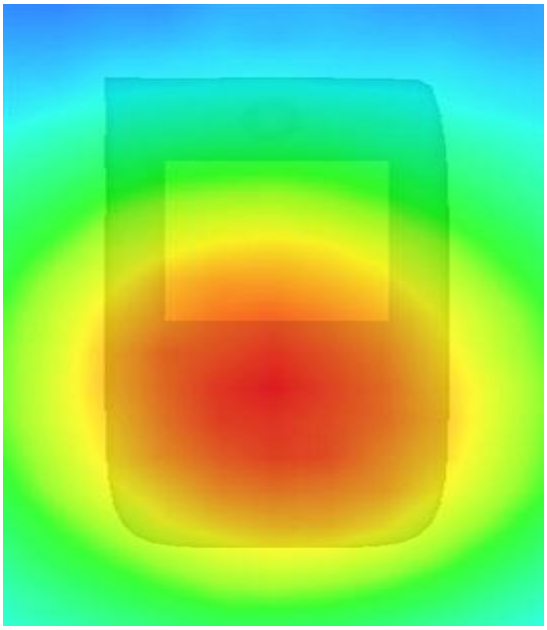
Maximum location: X=0.00, Y=-16.00

SAR 10g (W/Kg)	0.307607
SAR 1g (W/Kg)	0.427739

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4430	0.3207	0.2577	0.1958	0.1555	0.1185



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

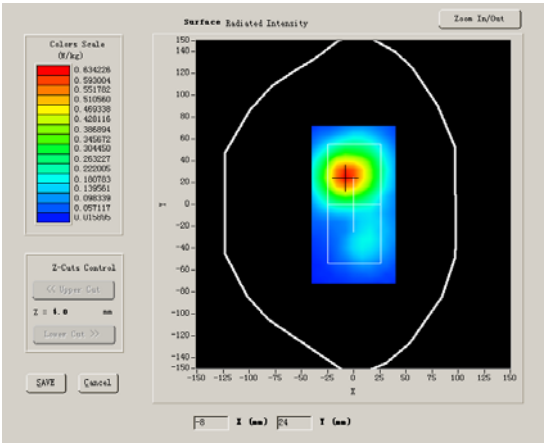
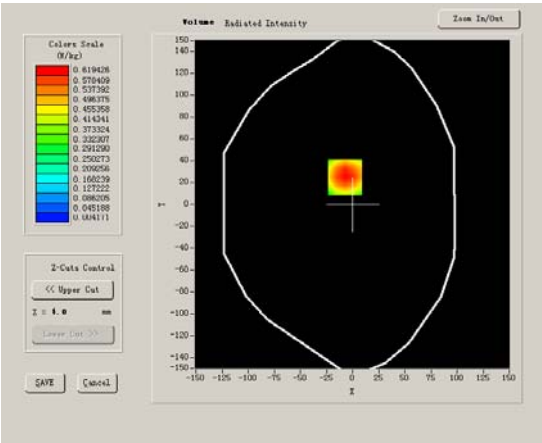
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.500000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

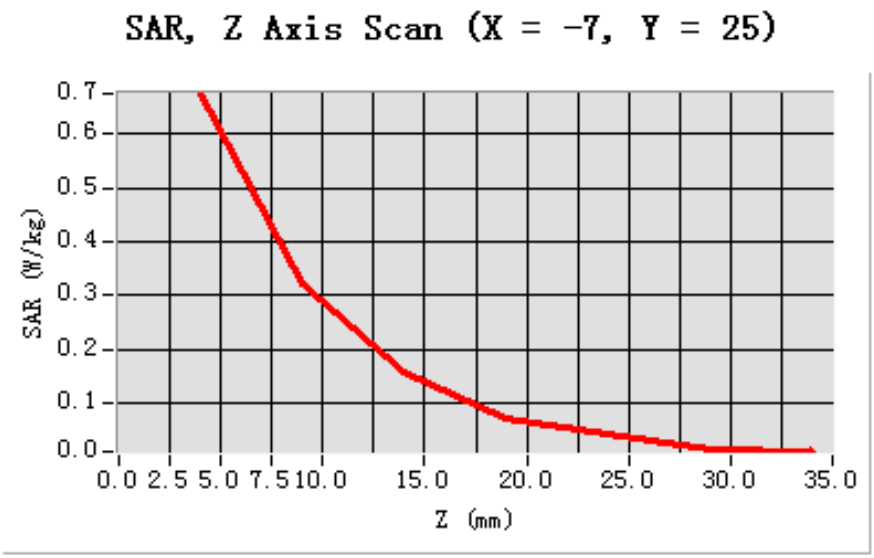
SURFACE SAR	VOLUME SAR
	

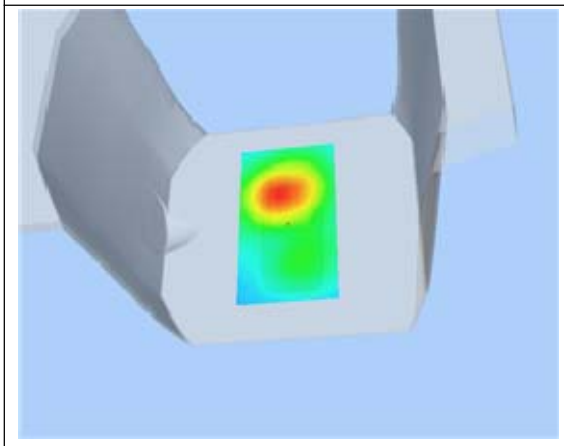
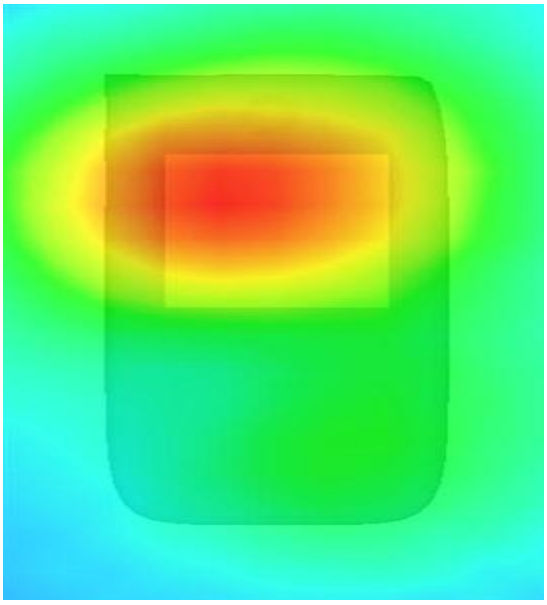
Maximum location: X=-7.00, Y=25.00

SAR 10g (W/Kg)	0.346978
SAR 1g (W/Kg)	0.655110

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6745	0.3219	0.1598	0.0735	0.0433	0.0158



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

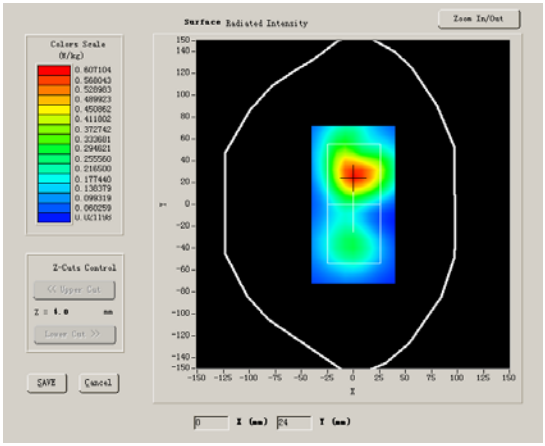
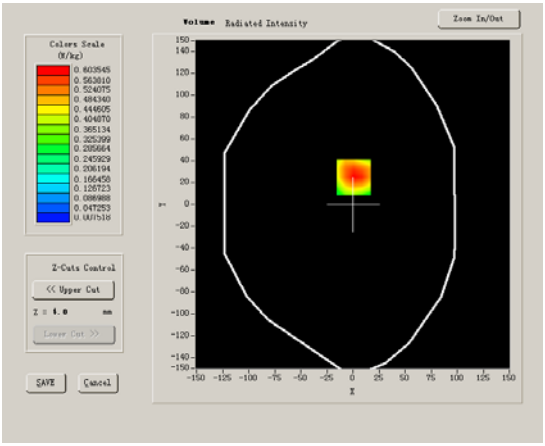
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-2.170000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

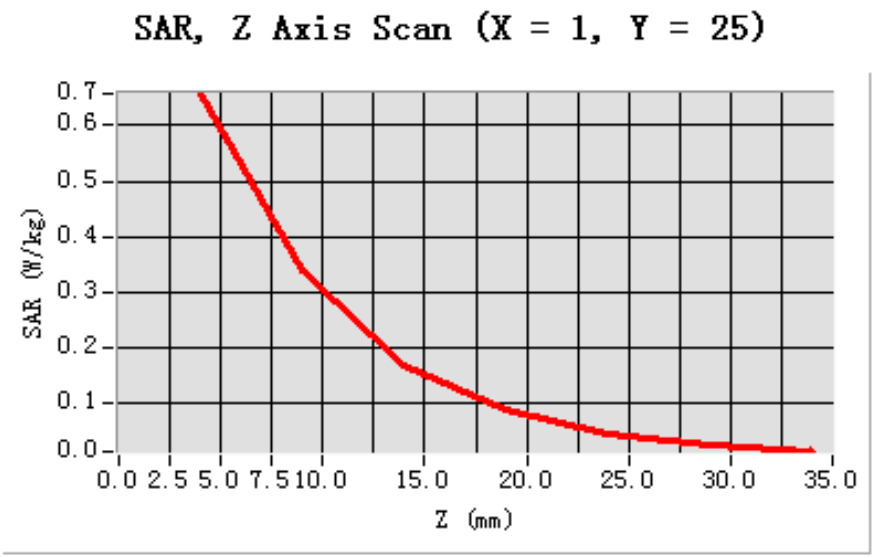
SURFACE SAR	VOLUME SAR
	

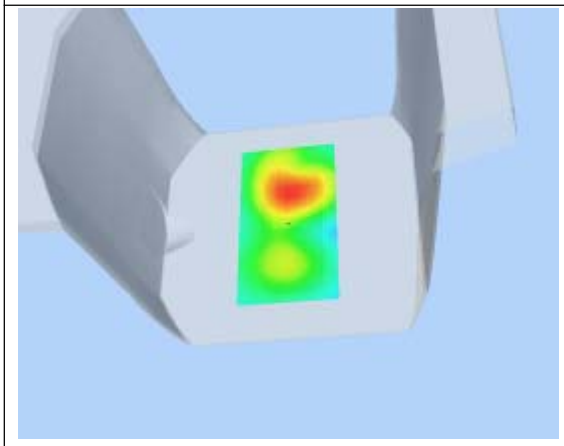
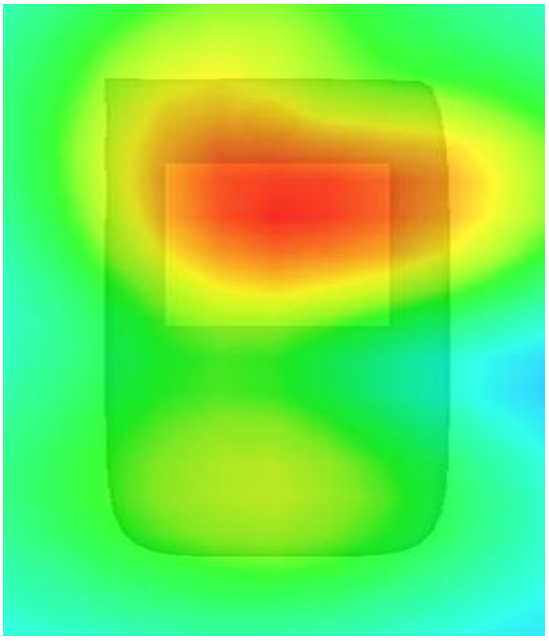
Maximum location: X=1.00, Y=25.00

SAR 10g (W/Kg)	0.413305
SAR 1g (W/Kg)	0.641356

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6572	0.3376	0.1691	0.0881	0.0440	0.0245



3D sceen shot	Hot spot position
	

MEASUREMENT 14

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 10 seconds

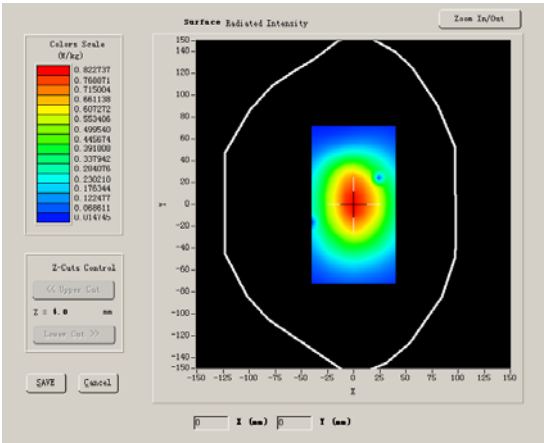
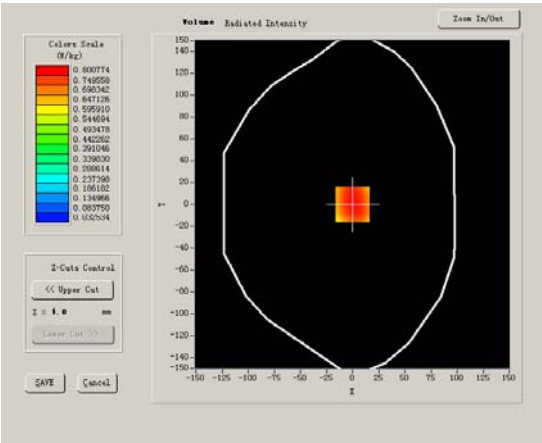
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	EDGE

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.350000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

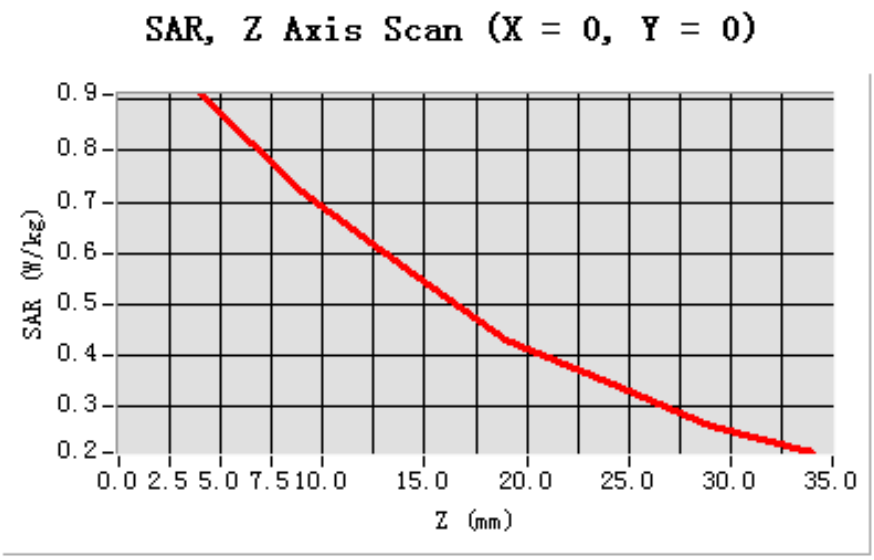
SURFACE SAR	VOLUME SAR
	

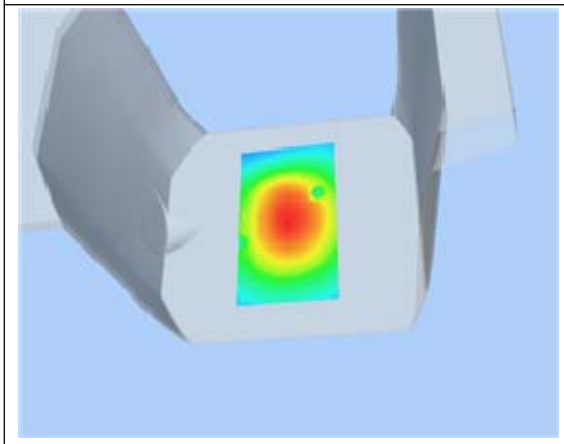
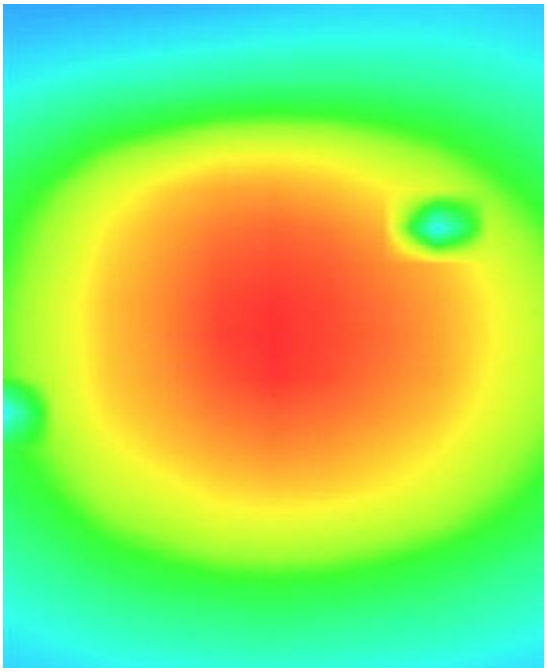
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	0.662764
SAR 1g (W/Kg)	0.875513

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9092	0.7185	0.5748	0.4302	0.3502	0.2625



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

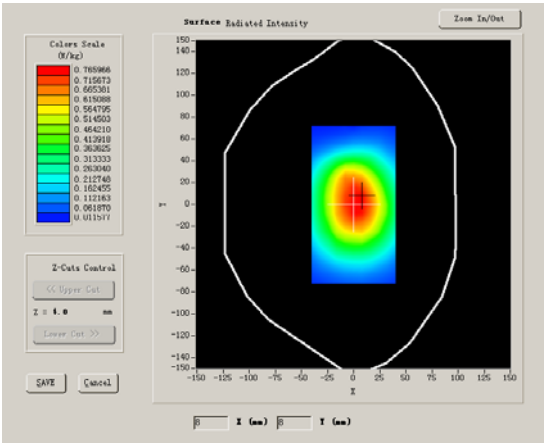
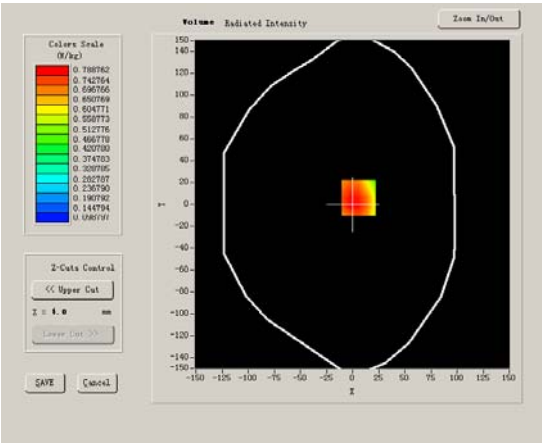
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	EDGE

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.600000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-0.810000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

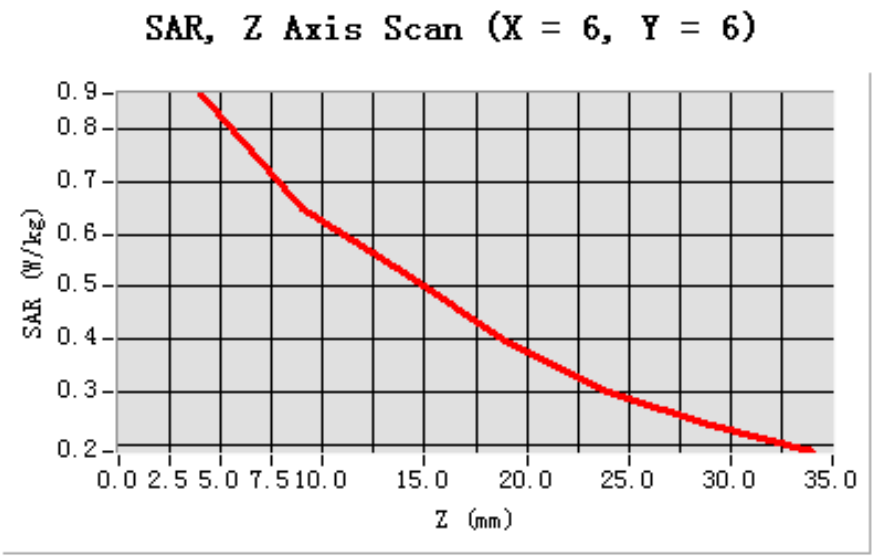
SURFACE SAR	VOLUME SAR
	

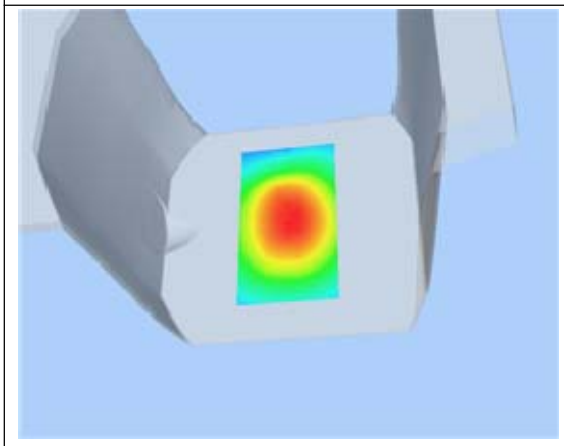
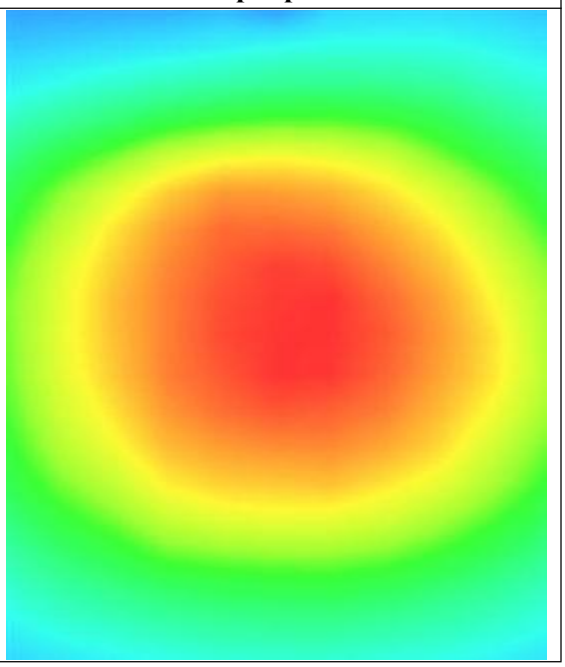
Maximum location: X=6.00, Y=6.00

SAR 10g (W/Kg)	0.640481
SAR 1g (W/Kg)	0.860450

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8676	0.6507	0.5253	0.3970	0.3014	0.2368



3D sceen 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: 17/9/2012
Measurement duration: 9 minutes 10 seconds

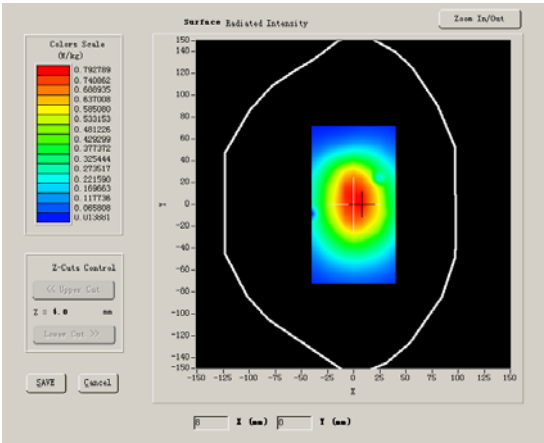
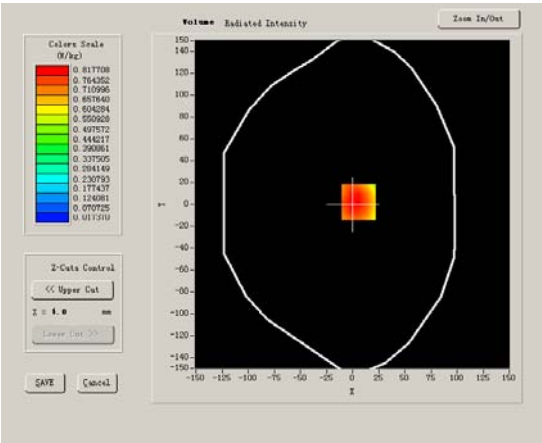
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM850
Channels	High
Signal	EDGE

B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.800000
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999
Conductivity (S/m)	0.9809033
Power drift(%)	-1.300000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	28.559,25.681,27.588
Crest factor:	1:2

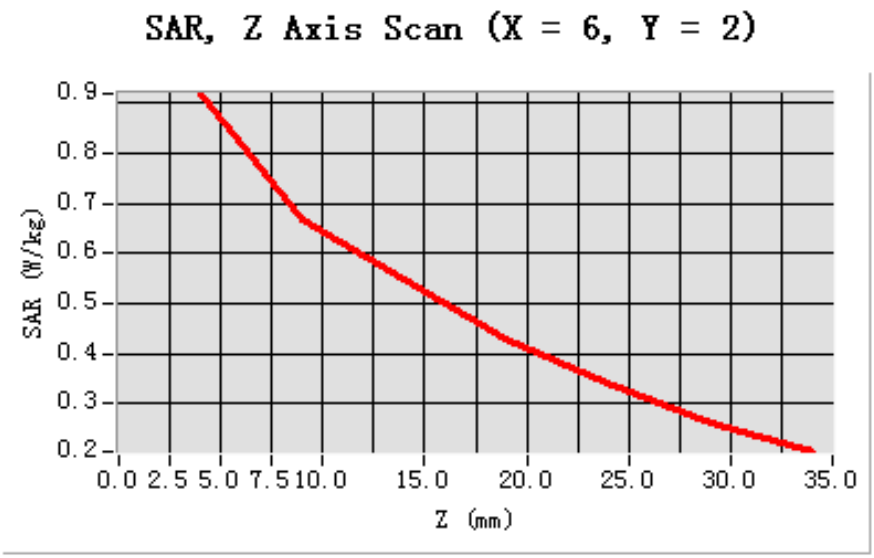
SURFACE SAR	VOLUME SAR
	

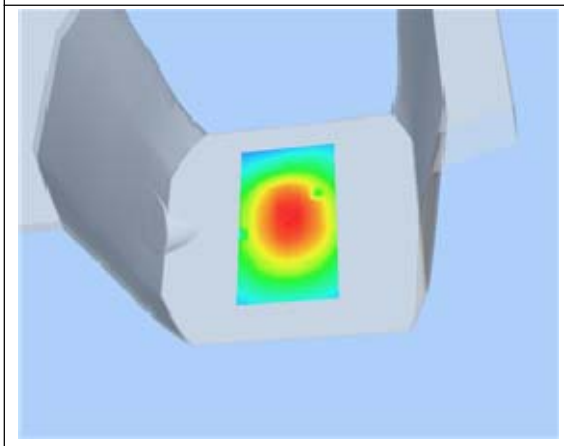
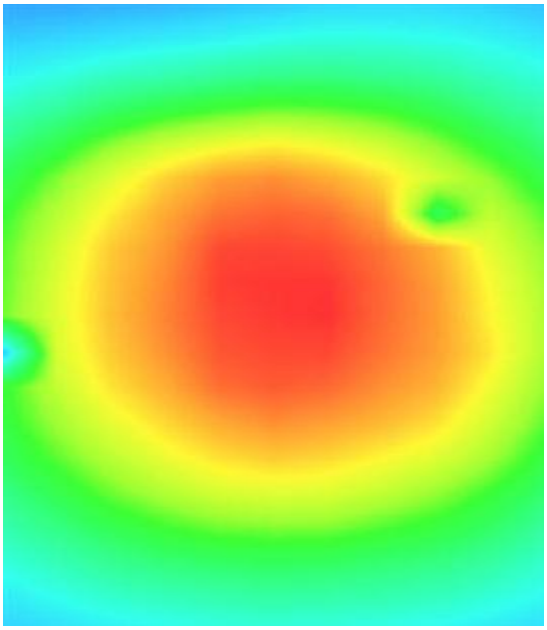
Maximum location: X=6.00, Y=2.00

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



3D sceen 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: 17/9/2012
Measurement duration: 8 minutes 33 seconds

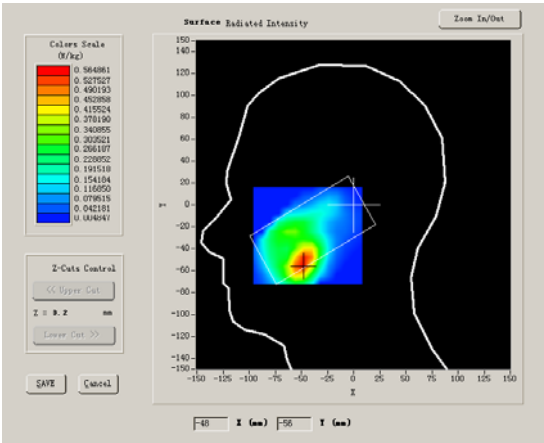
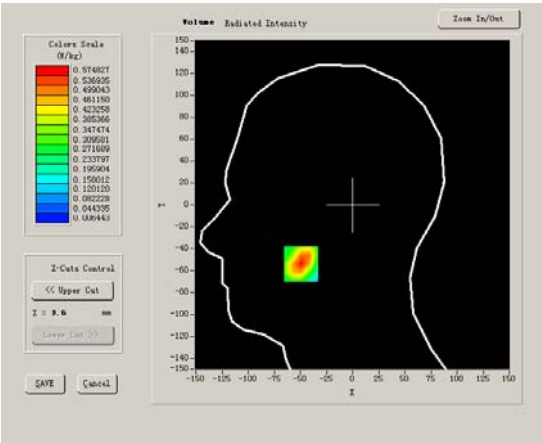
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.509998
Relative permittivity	15.070000
Conductivity (S/m)	1.436111
Power drift(%)	-1.160000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

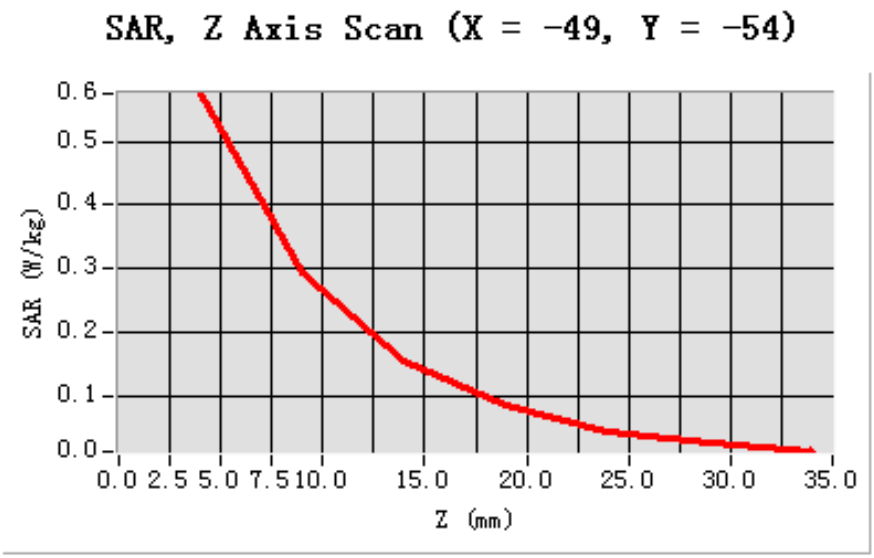
SURFACE SAR	VOLUME SAR
	

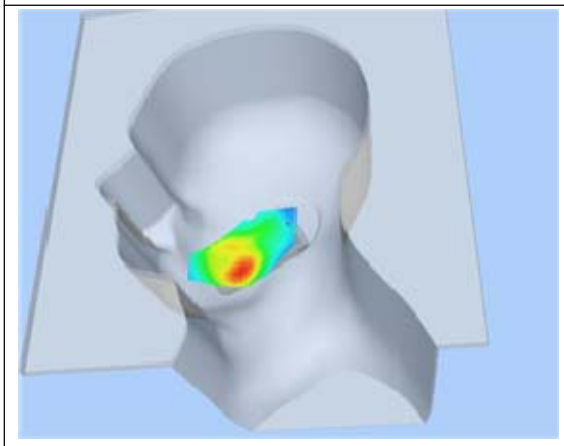
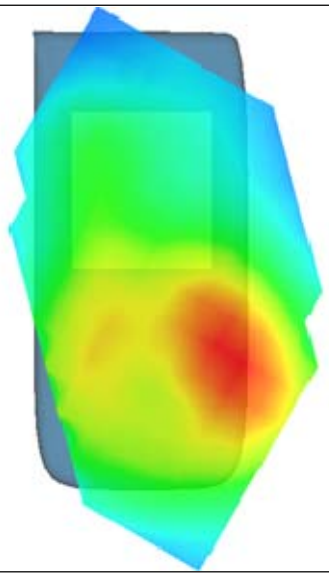
Maximum location: X=-49.00, Y=-54.00

SAR 10g (W/Kg)	0.278995
SAR 1g (W/Kg)	0.540260

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5748	0.2927	0.1562	0.0864	0.0451	0.0268



3D sceen 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: 17/9/2012
Measurement duration: 8 minutes 33 seconds

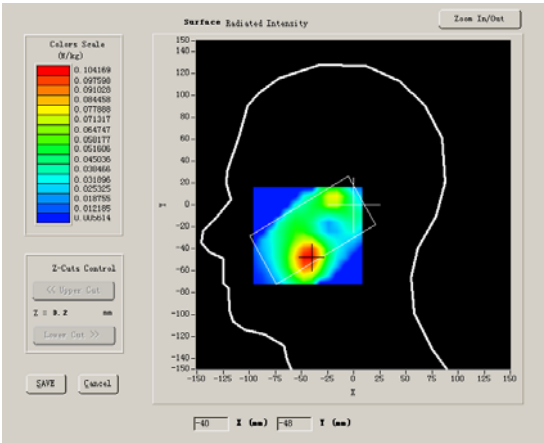
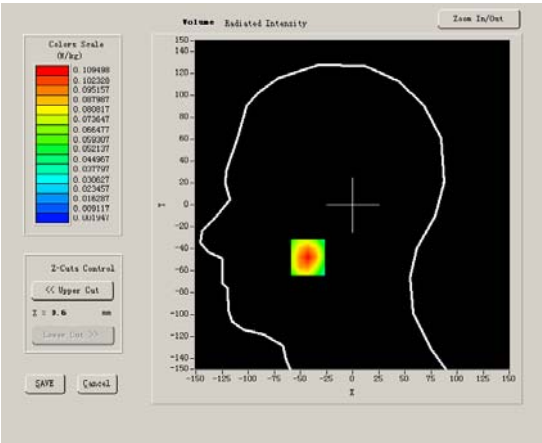
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.509998
Relative permittivity	15.070000
Conductivity (S/m)	1.436111
Power drift(%)	-2.170000
Ambient Temperature:	22.8°C
Liquid Temperature:	22.6°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

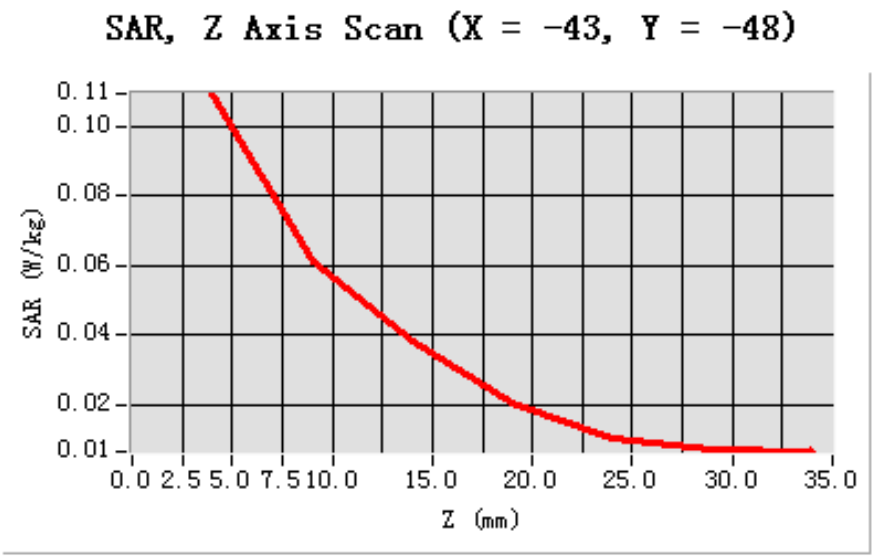
SURFACE SAR	VOLUME SAR
	

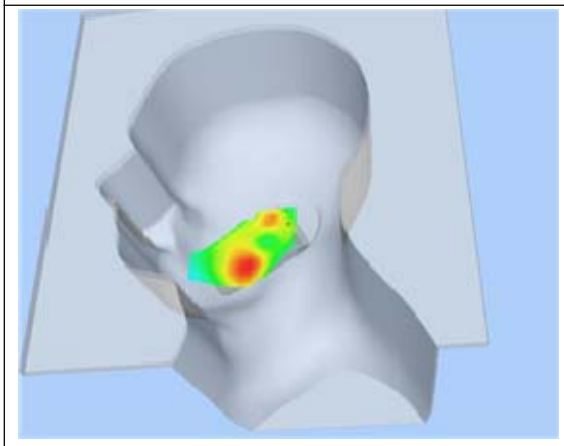
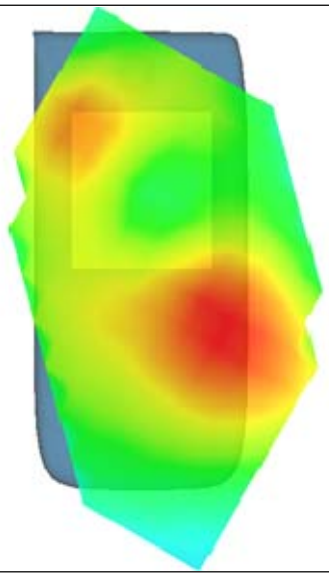
Maximum location: X=-43.00, Y=-48.00

SAR 10g (W/Kg)	0.057219
SAR 1g (W/Kg)	0.102535

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.1095	0.0613	0.0381	0.0205	0.0104	0.0068



3D sceen 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: 17/9/2012
Measurement duration: 7 minutes 57 seconds

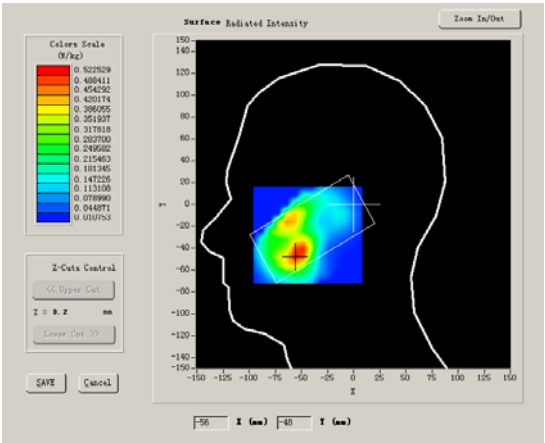
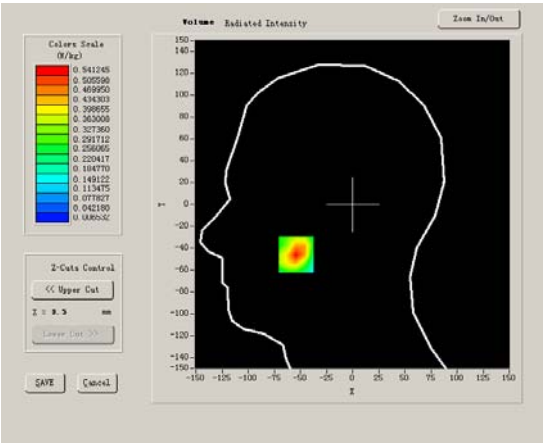
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.509998
Relative permittivity	15.070000
Conductivity (S/m)	1.436111
Power drift(%)	-0.310000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

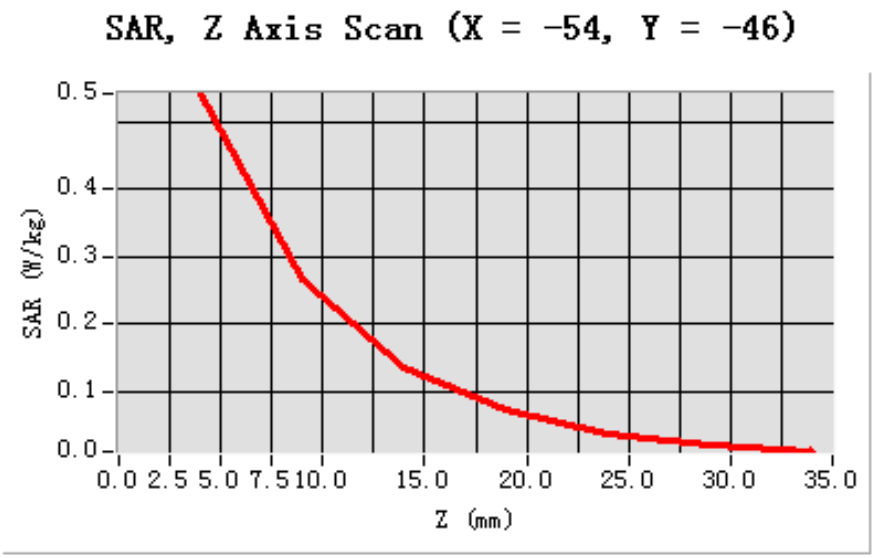
SURFACE SAR	VOLUME SAR
	

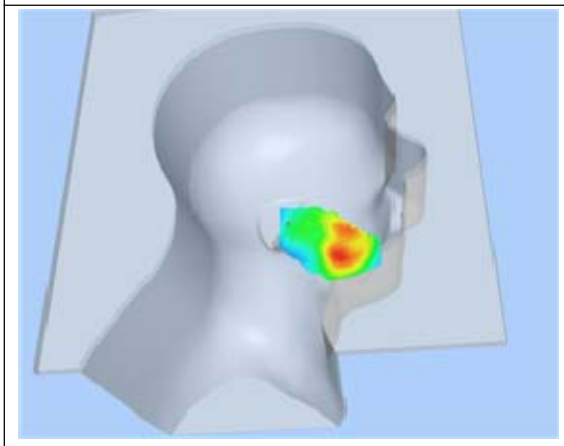
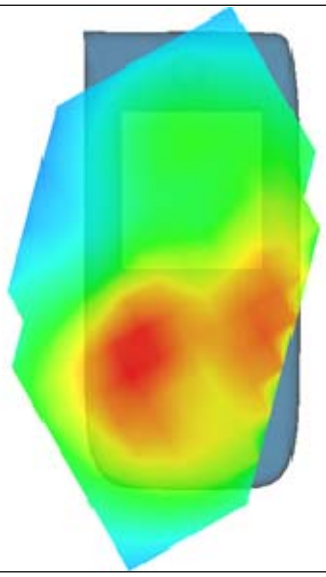
Maximum location: X=-54.00, Y=-46.00

SAR 10g (W/Kg)	0.253992
SAR 1g (W/Kg)	0.503776

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5412	0.2667	0.1352	0.0715	0.0374	0.0203



3D sceen 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: 17/9/2012
Measurement duration: 7 minutes 18 seconds

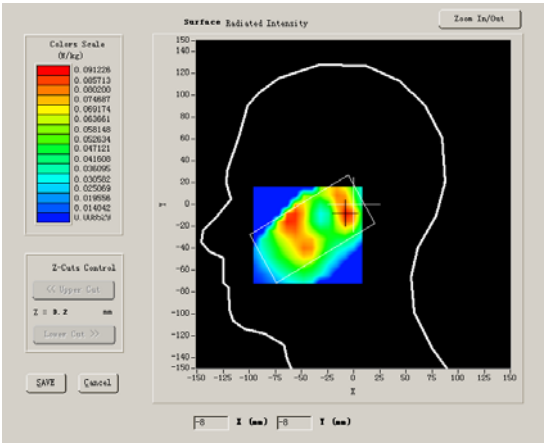
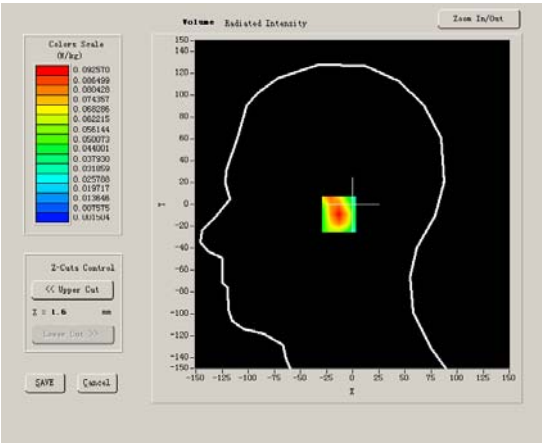
A. Experimental conditions.

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

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.509998
Relative permittivity	15.070000
Conductivity (S/m)	1.436111
Power drift(%)	-0.620000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:8

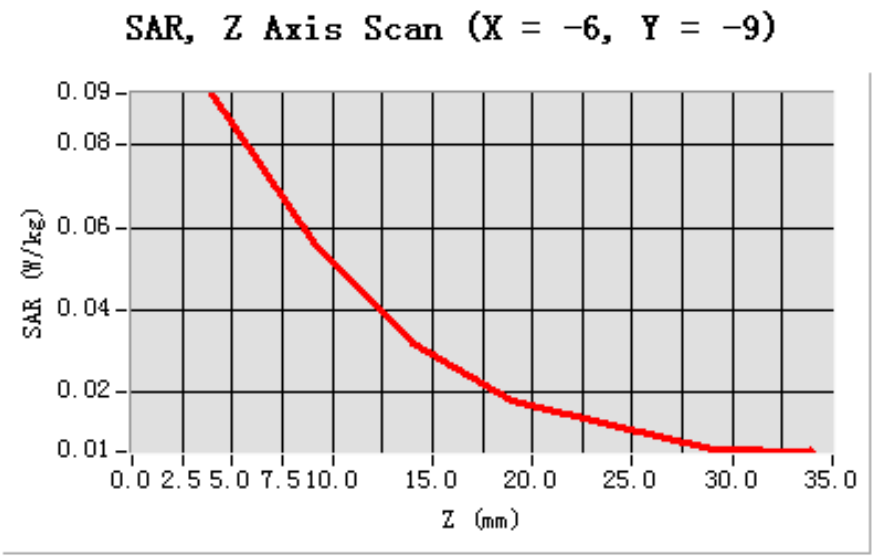
SURFACE SAR	VOLUME SAR
	

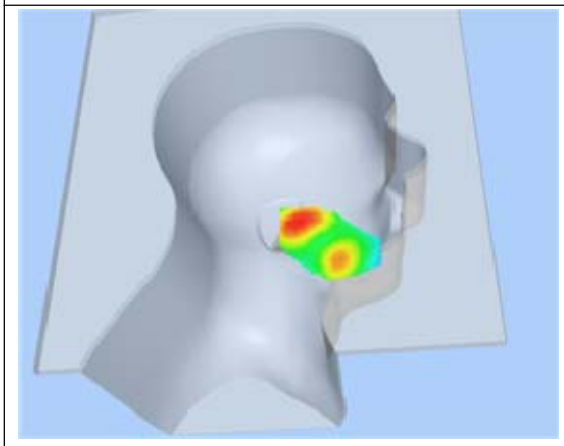
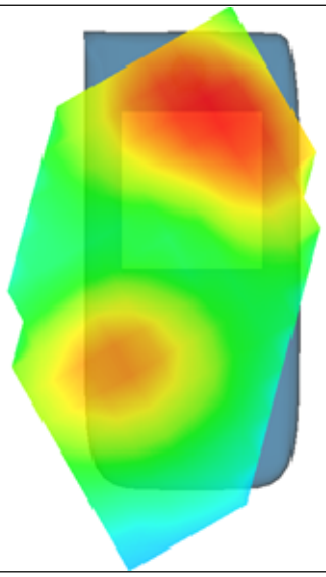
Maximum location: X=-6.00, Y=-9.00

SAR 10g (W/Kg)	0.047884
SAR 1g (W/Kg)	0.084693

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.0926	0.0565	0.0317	0.0180	0.0118	0.0063



3D sceen shot	Hot spot position
	

MEASUREMENT 21

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

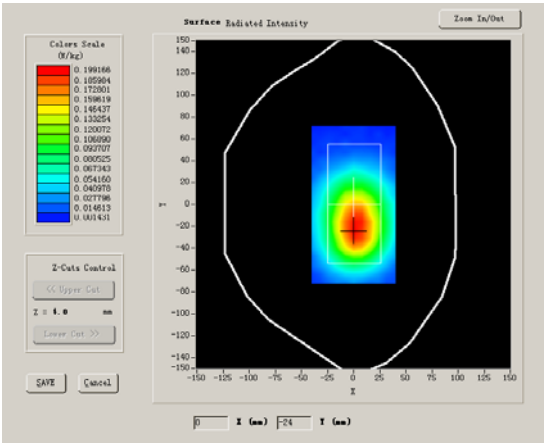
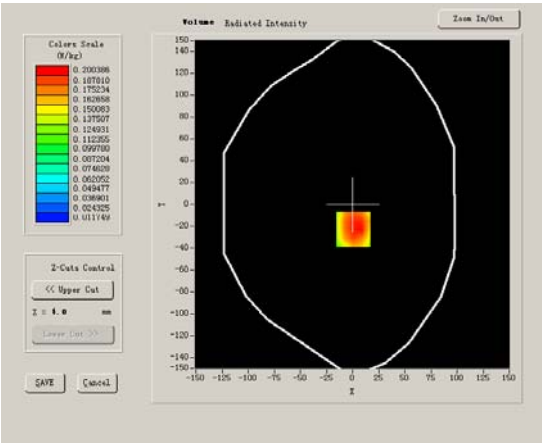
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-0.480000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:8

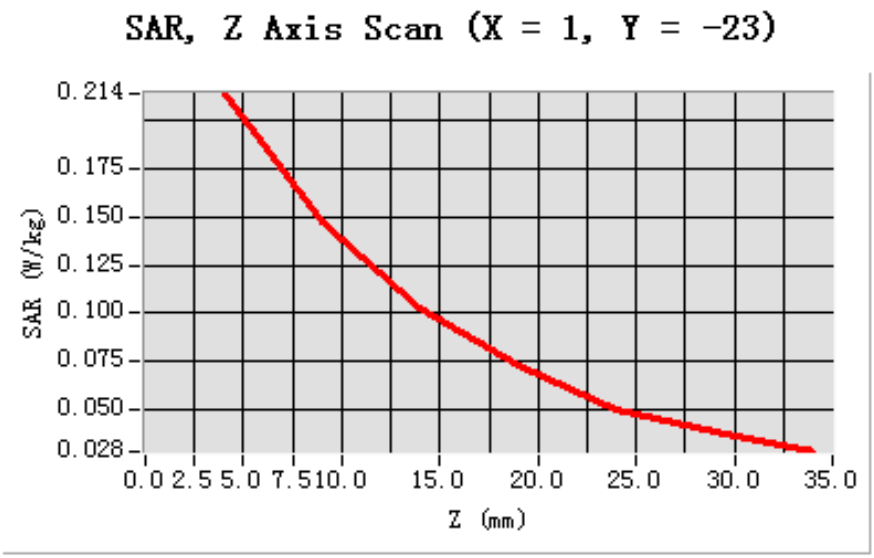
SURFACE SAR	VOLUME SAR
	

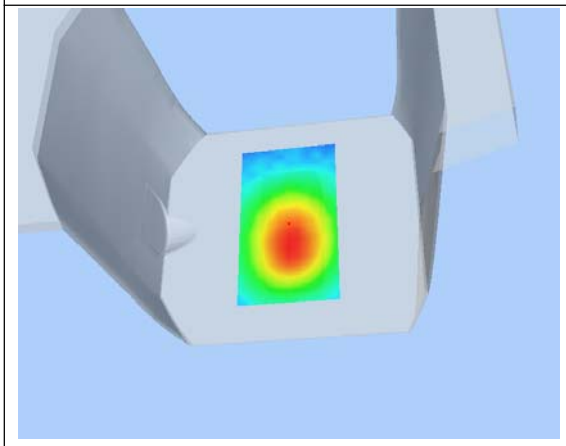
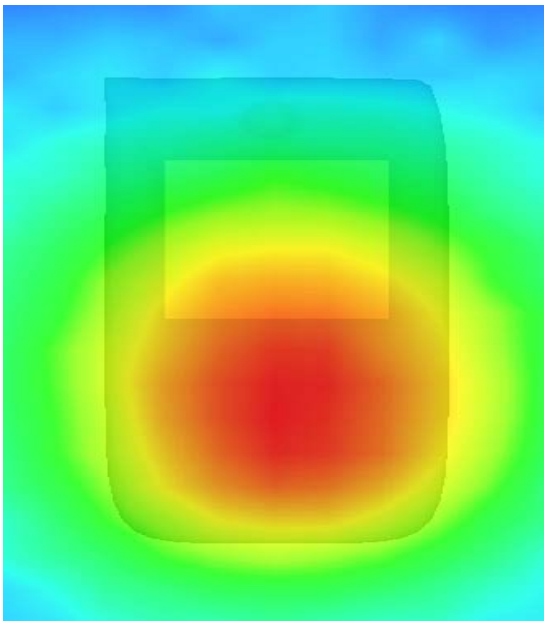
Maximum location: X=1.00, Y=-23.00

SAR 10g (W/Kg)	0.140841
SAR 1g (W/Kg)	0.213095

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2143	0.1479	0.1031	0.0733	0.0502	0.0385



3D sceen shot	Hot spot position
	

MEASUREMENT 22

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

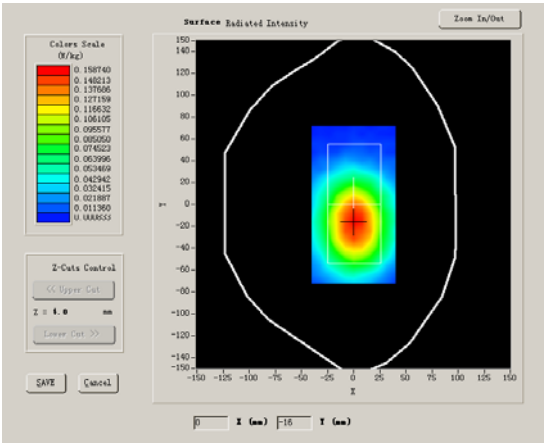
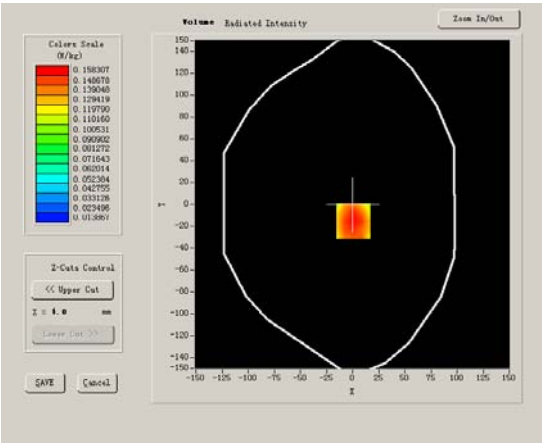
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-0.240000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:8

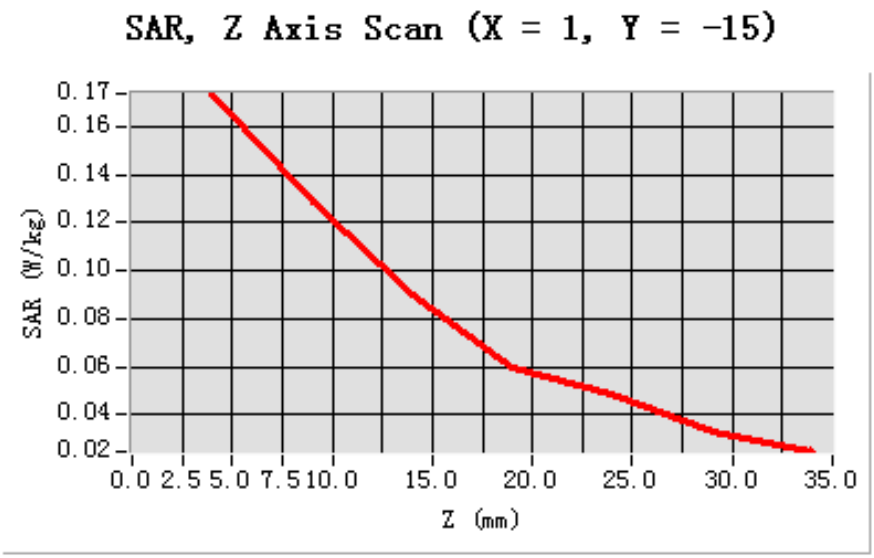
SURFACE SAR	VOLUME SAR
	

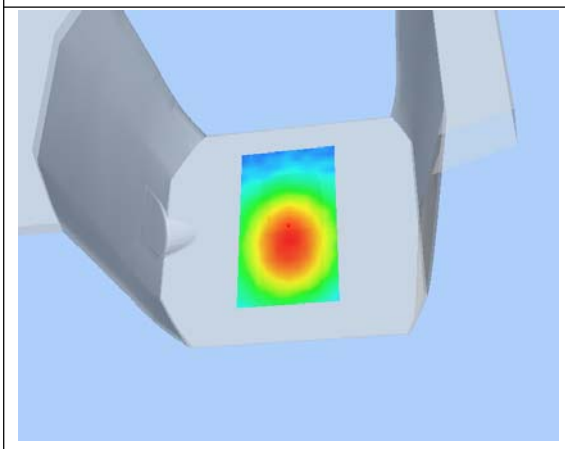
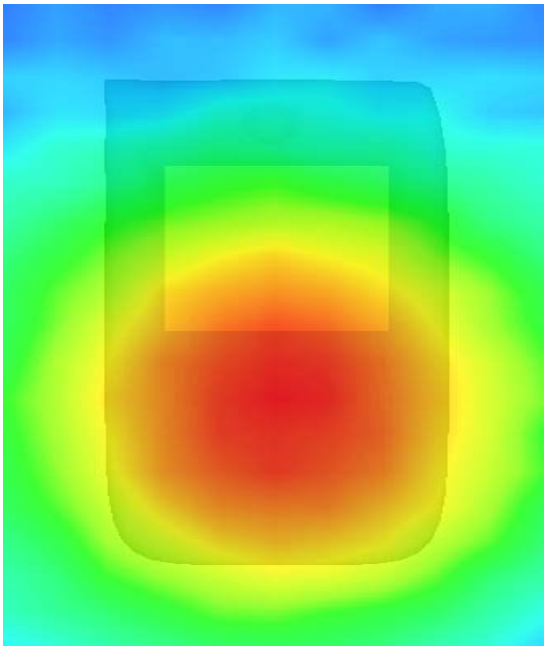
Maximum location: X=1.00, Y=-15.00

SAR 10g (W/Kg)	0.114262
SAR 1g (W/Kg)	0.166680

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.1738	0.1285	0.0902	0.0594	0.0487	0.0332



3D sceen shot	Hot spot position
	

MEASUREMENT 23

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

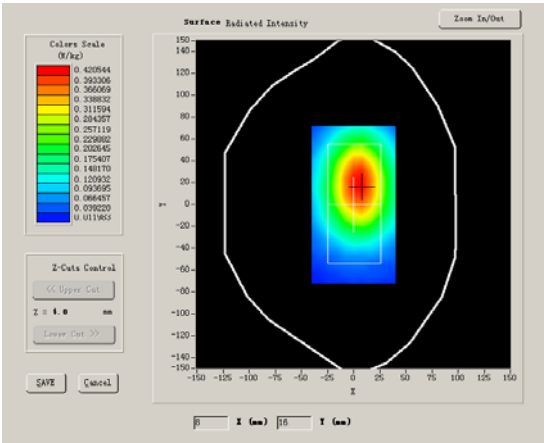
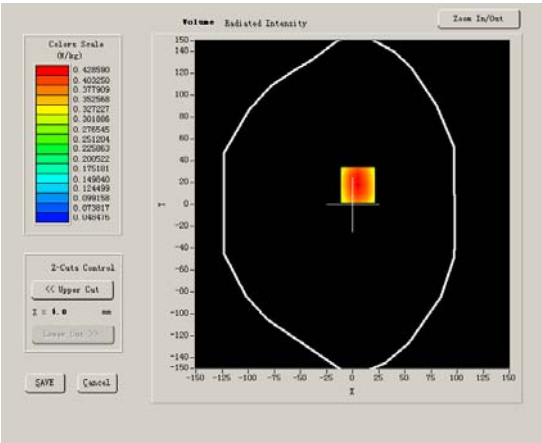
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-1.500000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

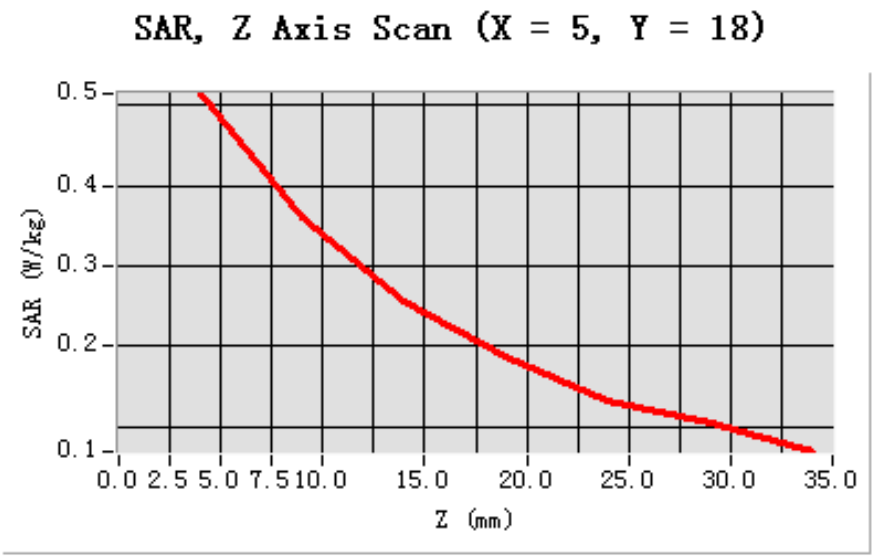
SURFACE SAR	VOLUME SAR
	

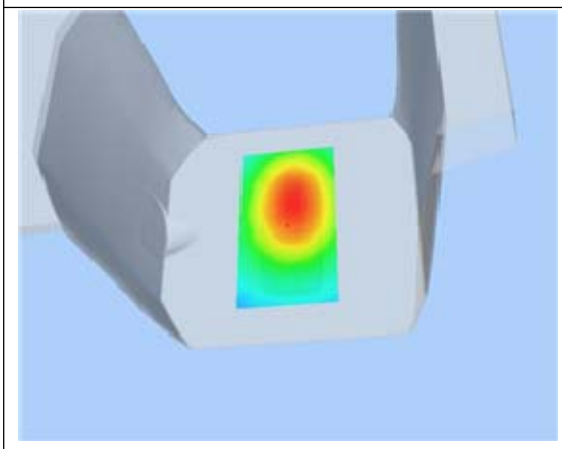
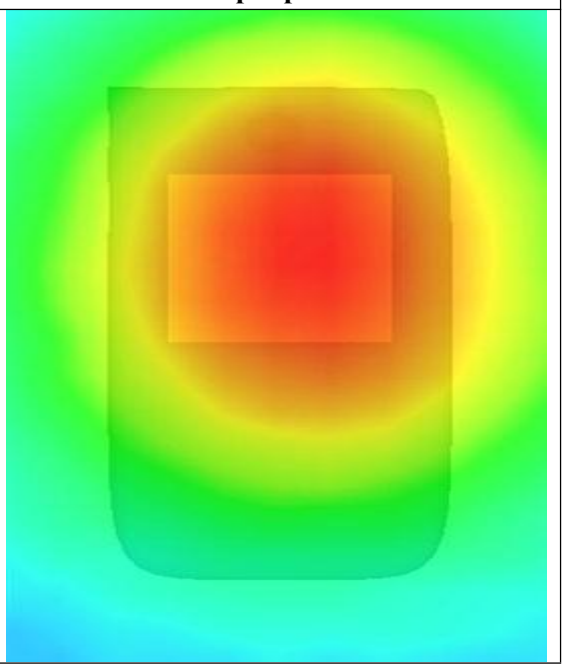
Maximum location: X=5.00, Y=18.00

SAR 10g (W/Kg)	0.337181
SAR 1g (W/Kg)	0.493518

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5143	0.3596	0.2563	0.1865	0.1311	0.1044



3D sceen shot	Hot spot position
	

MEASUREMENT 24

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

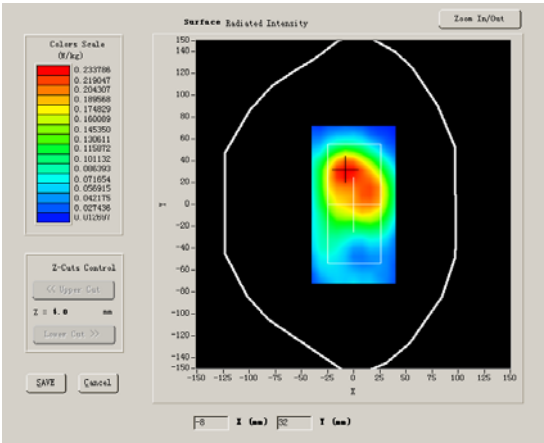
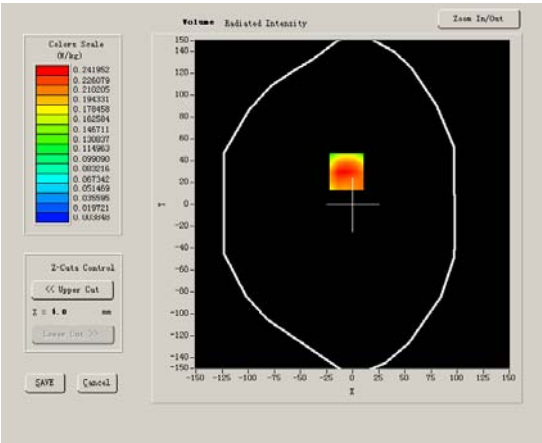
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-0.930000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

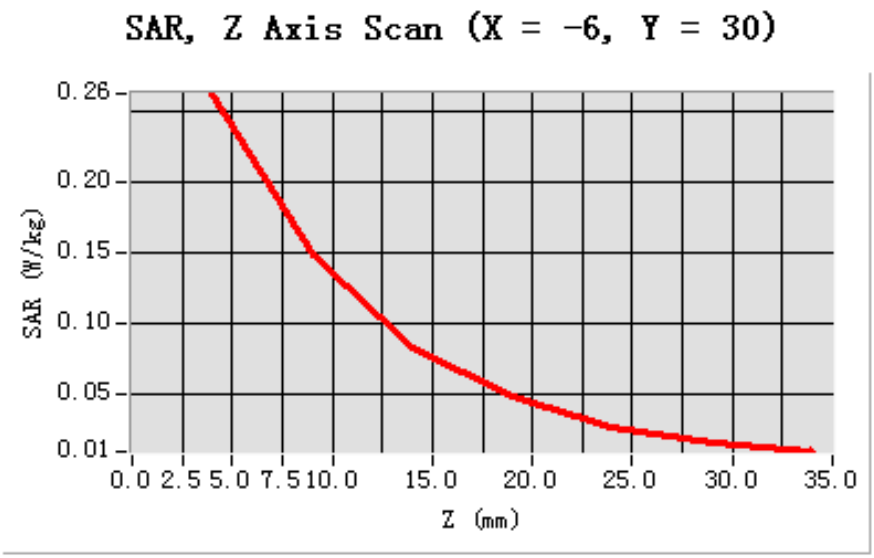
SURFACE SAR	VOLUME SAR
	

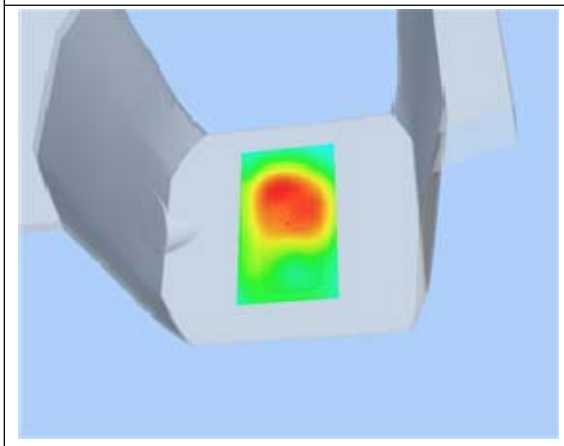
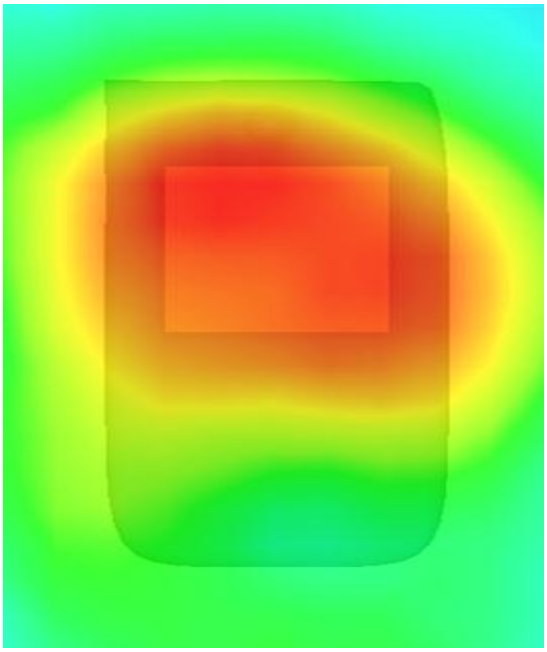
Maximum location: X=-6.00, Y=30.00

SAR 10g (W/Kg)	0.143713
SAR 1g (W/Kg)	0.252108

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2620	0.1478	0.0833	0.0490	0.0276	0.0164



3D sceen shot	Hot spot position
	

MEASUREMENT 25

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

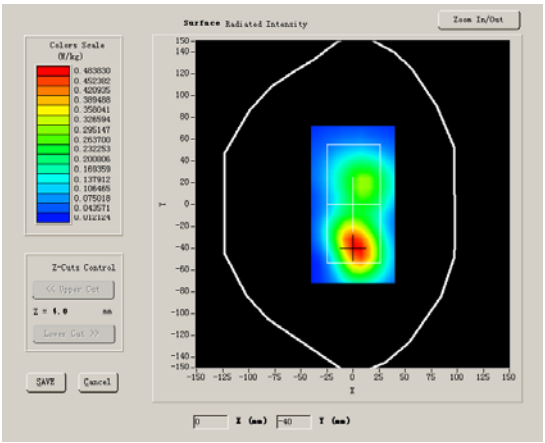
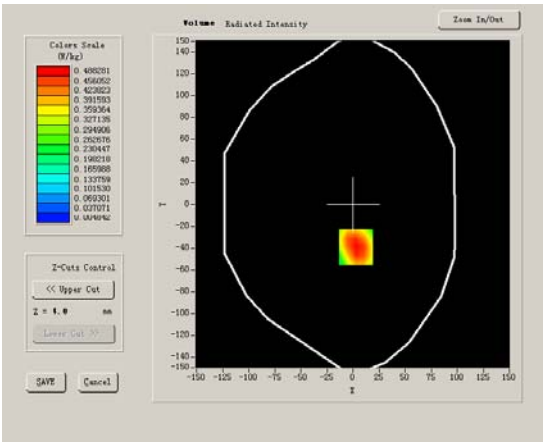
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-0.810000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

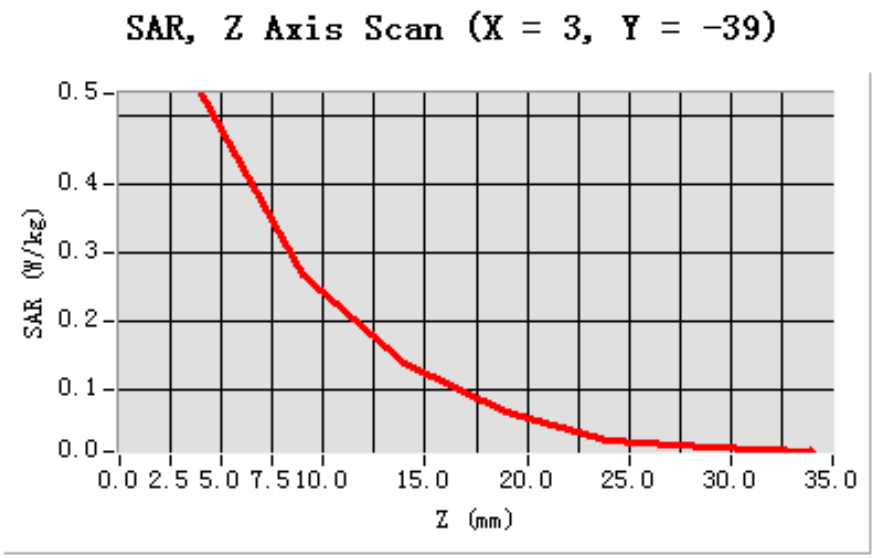
SURFACE SAR	VOLUME SAR
	

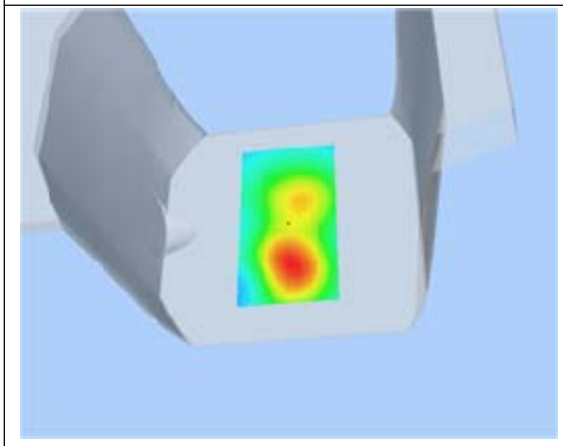
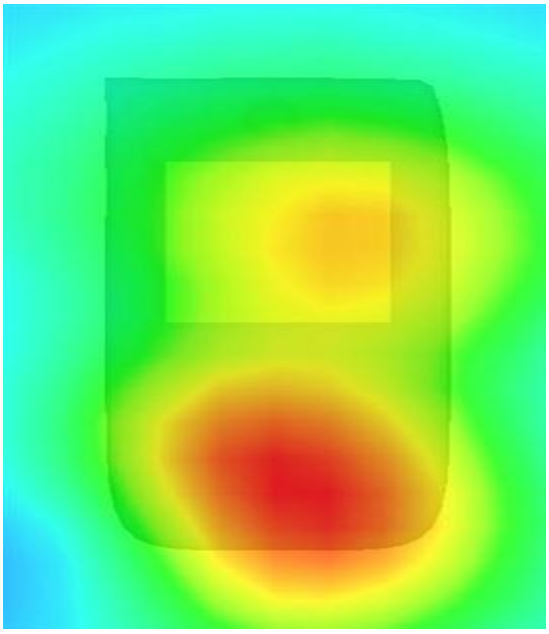
Maximum location: X=3.00, Y=-39.00

SAR 10g (W/Kg)	0.278277
SAR 1g (W/Kg)	0.512319

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5317	0.2680	0.1383	0.0680	0.0281	0.0180



3D sceen shot	Hot spot position
	

MEASUREMENT 26

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

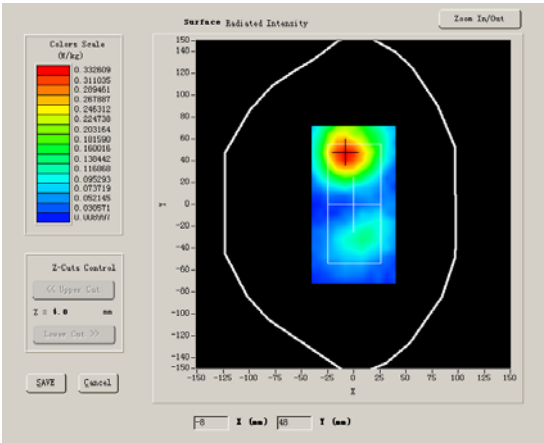
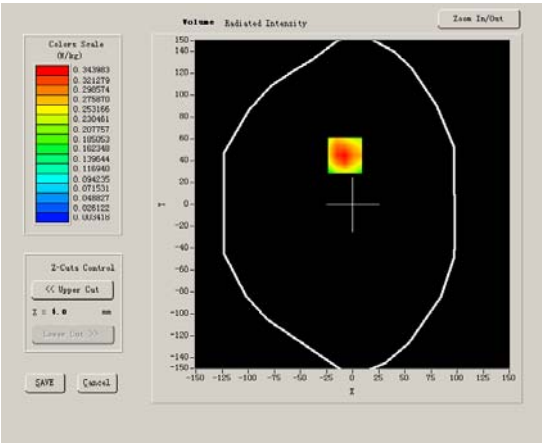
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
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:	1:2

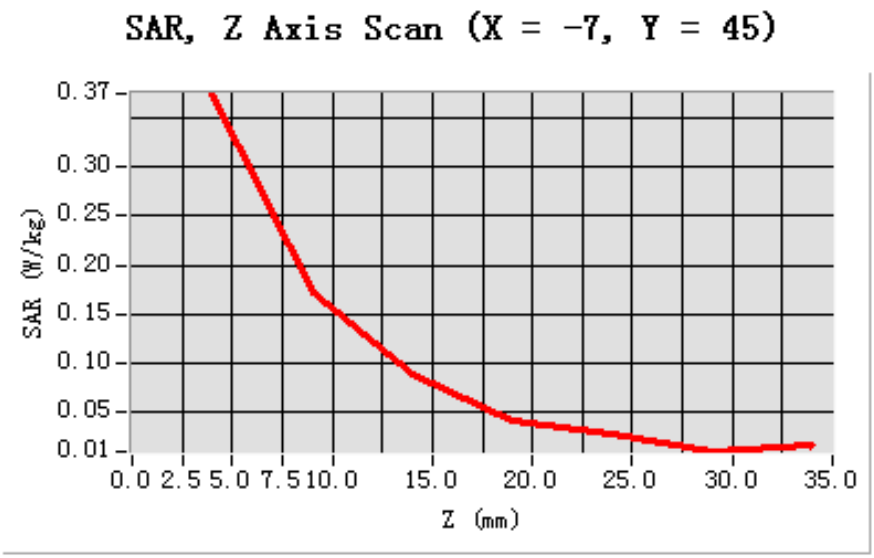
SURFACE SAR	VOLUME SAR
	

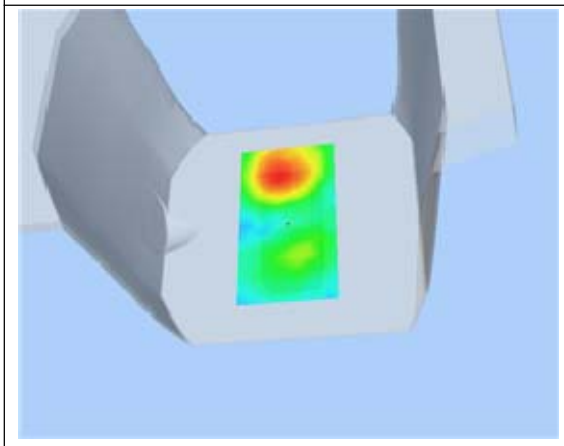
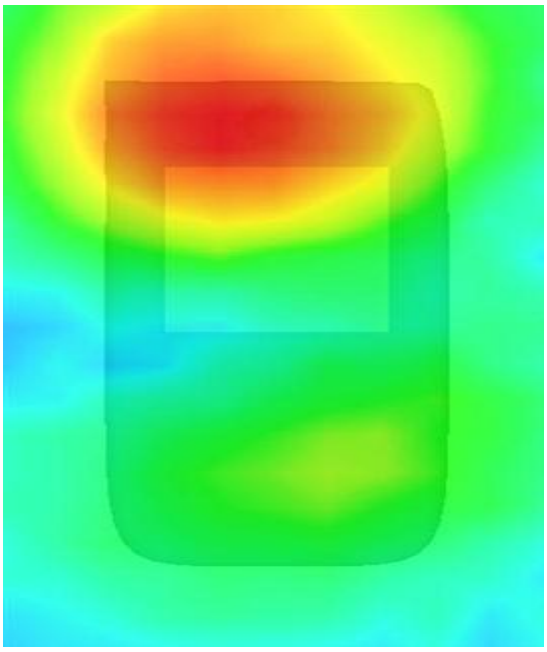
Maximum location: X=-7.00, Y=45.00

SAR 10g (W/Kg)	0.189549
SAR 1g (W/Kg)	0.364914

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3746	0.1709	0.0887	0.0415	0.0278	0.0100



3D sceen shot	Hot spot position
	

MEASUREMENT 27

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

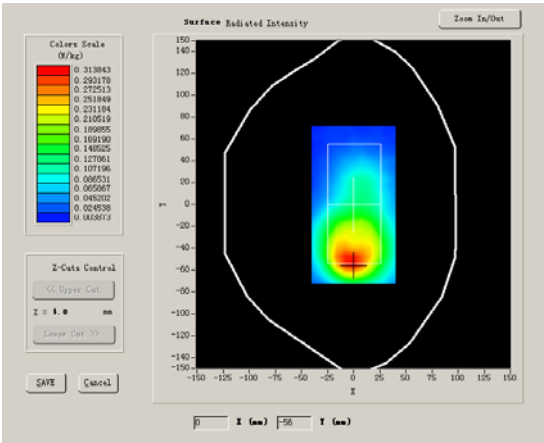
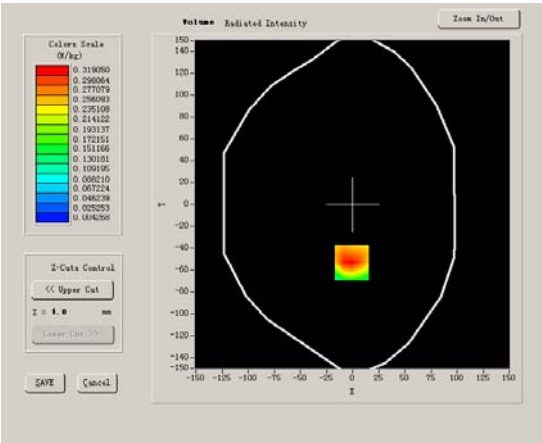
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-1.250000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

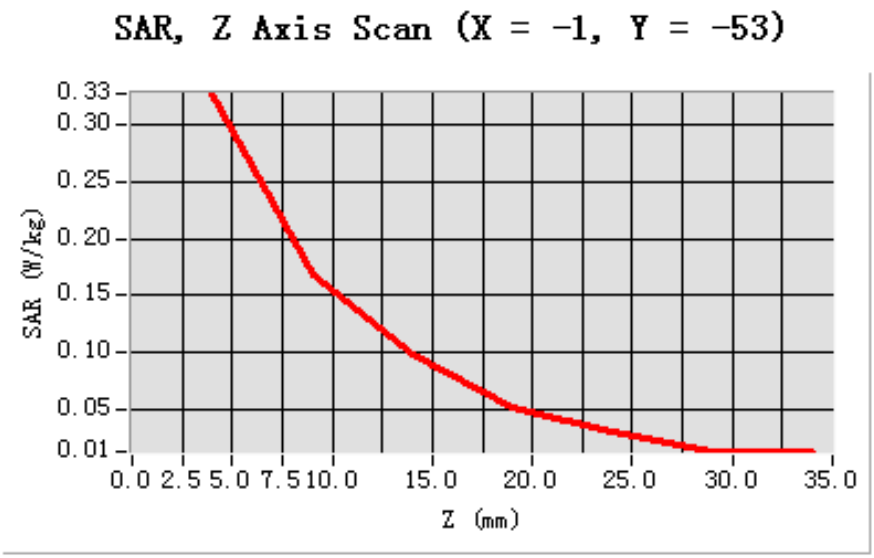
SURFACE SAR	VOLUME SAR
	

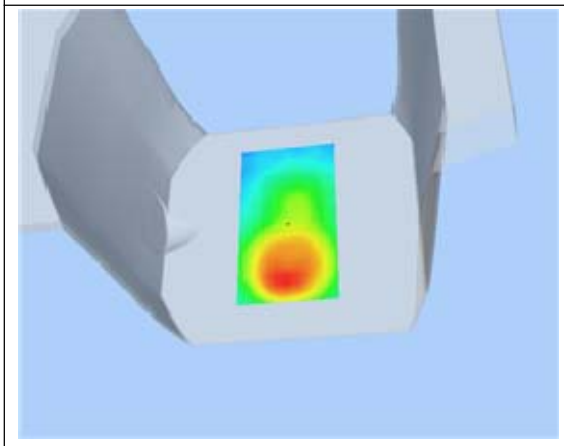
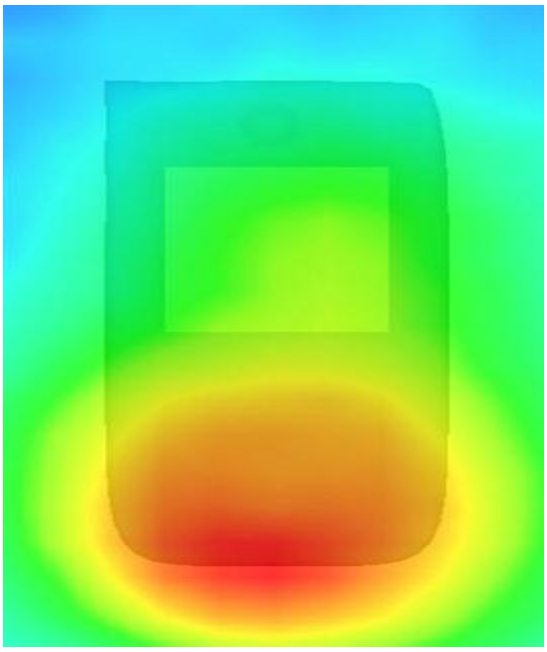
Maximum location: X=-1.00, Y=-53.00

SAR 10g (W/Kg)	0.170754
SAR 1g (W/Kg)	0.314514

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3265	0.1690	0.0991	0.0523	0.0319	0.0144



3D sceen shot	Hot spot position
	

MEASUREMENT 28

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

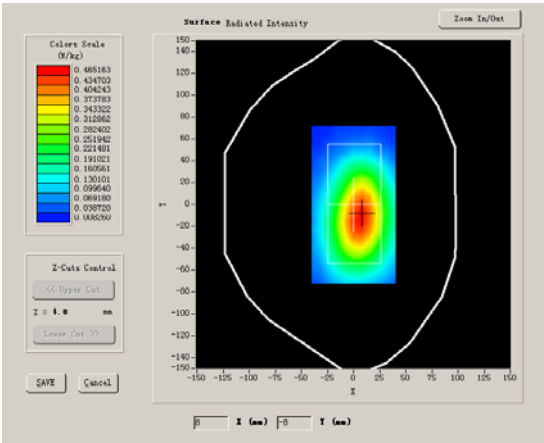
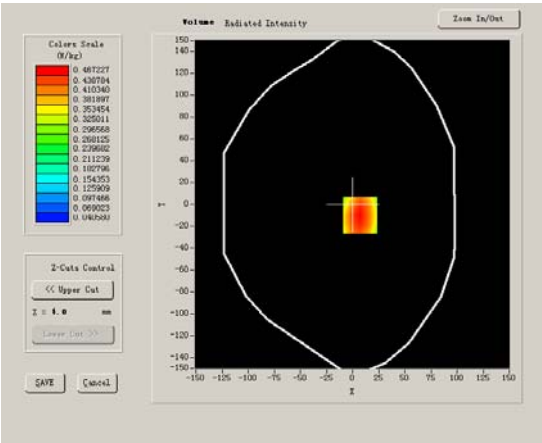
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	EDGE

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.200000
Relative permittivity (real part)	52.548876
Relative permittivity	14.070000
Conductivity (S/m)	1.513978
Power drift(%)	-0.500000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:2

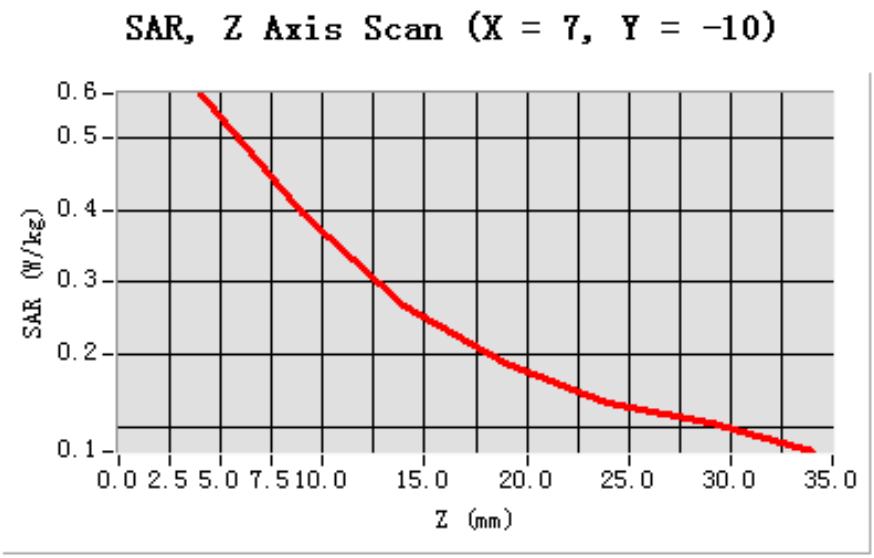
SURFACE SAR	VOLUME SAR
	

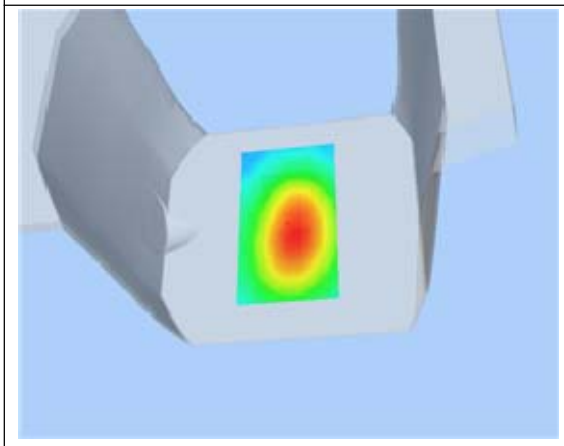
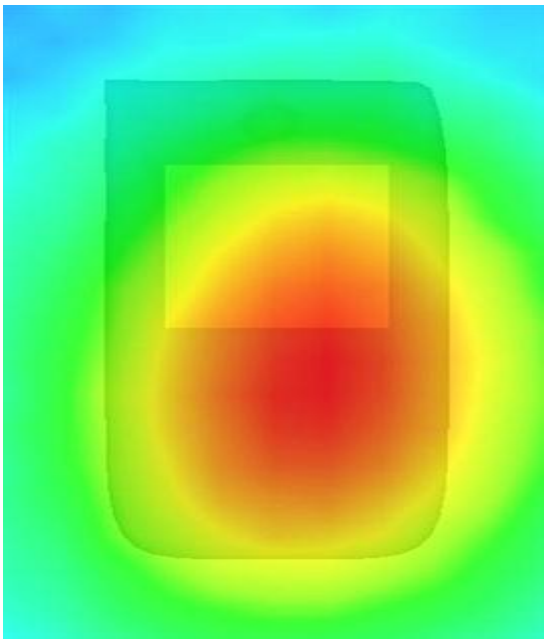
Maximum location: X=7.00, Y=-10.00

SAR 10g (W/Kg)	0.360302
SAR 1g (W/Kg)	0.537271

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5607	0.3945	0.2684	0.1865	0.1334	0.1043



3D sceen shot	Hot spot position
	

MEASUREMENT 29

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 8 minutes 4 seconds

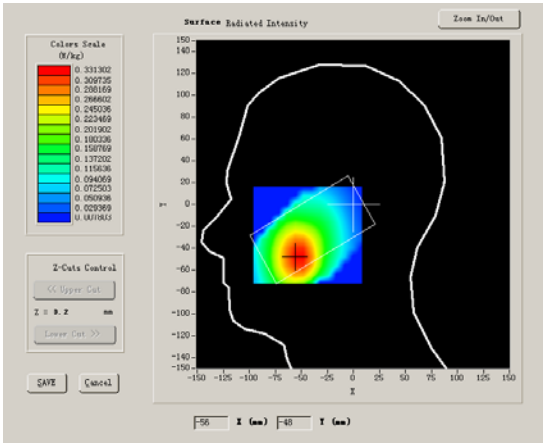
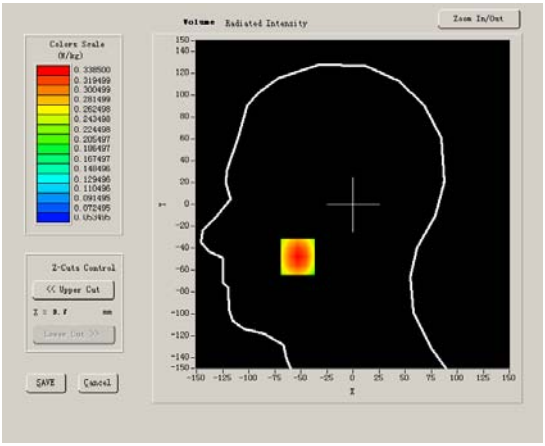
A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WCDMA
Channels	Low
Signal	CDMA

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	40.169997
Relative permittivity	13.170000
Conductivity (S/m)	1.449217
Power drift (%)	0.980000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

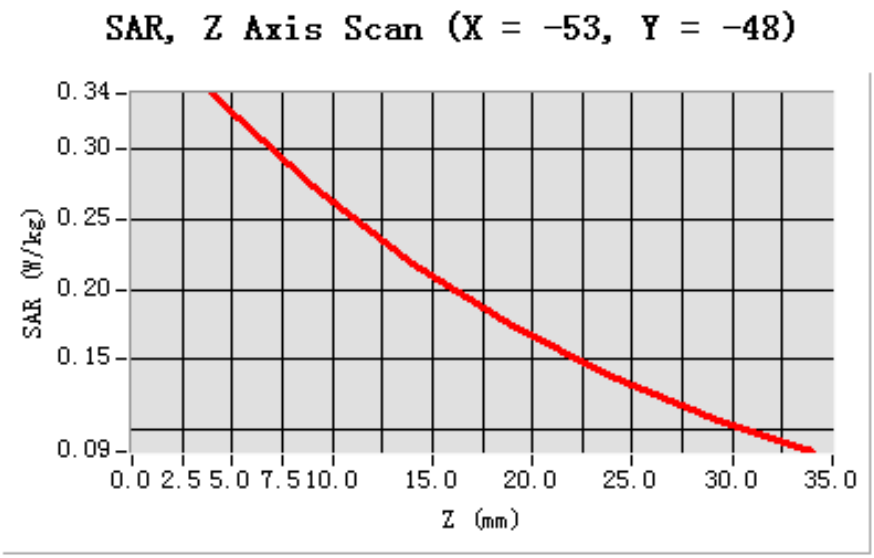
SURFACE SAR	VOLUME SAR
	

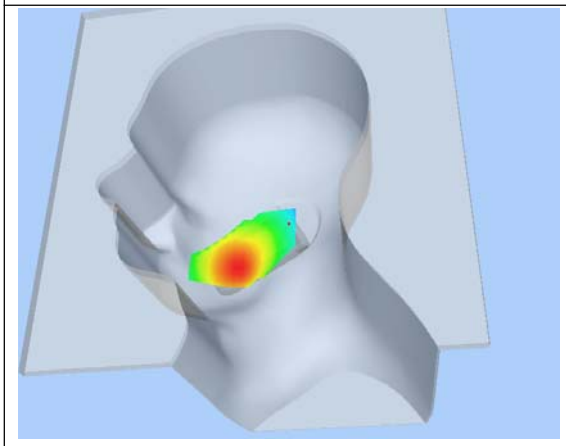
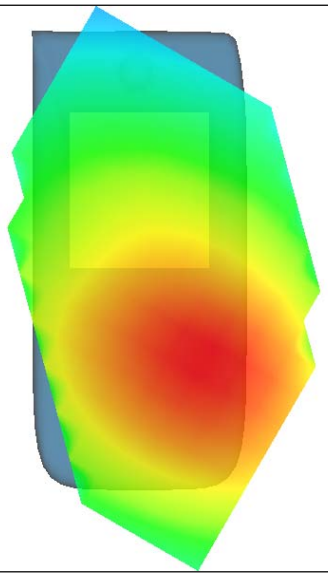
Maximum location: X=-53.00, Y=-48.00

SAR 10g (W/Kg)	0.246122
SAR 1g (W/Kg)	0.326265

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3385	0.2723	0.2185	0.1747	0.1379	0.1080



3D sceen shot	Hot spot position
	

MEASUREMENT 30

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 7 minutes 29 seconds

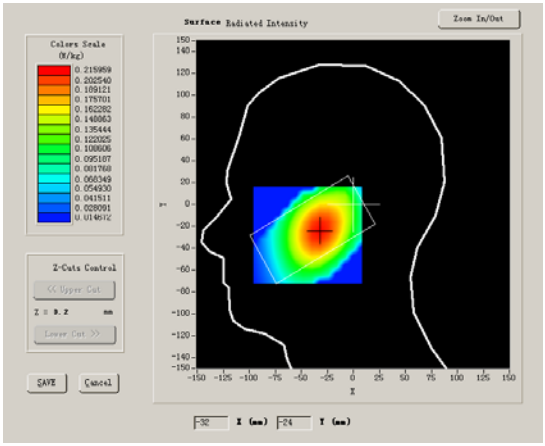
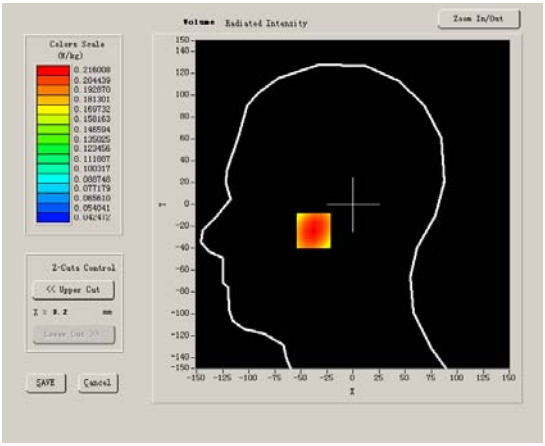
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	40.169997
Relative permittivity	13.170000
Conductivity (S/m)	1.449217
Power drift (%)	1.220000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

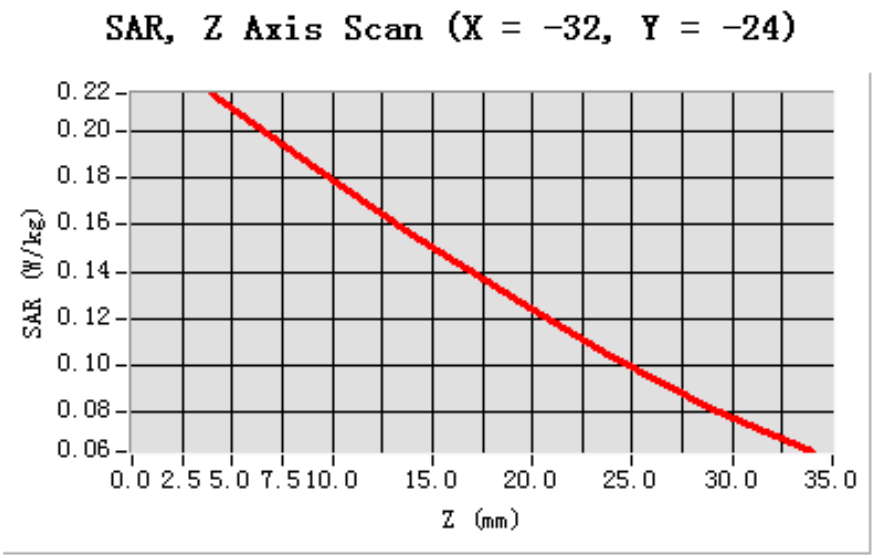
SURFACE SAR	VOLUME SAR
	

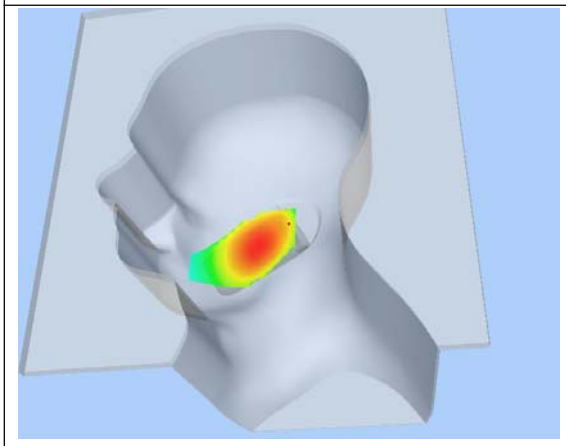
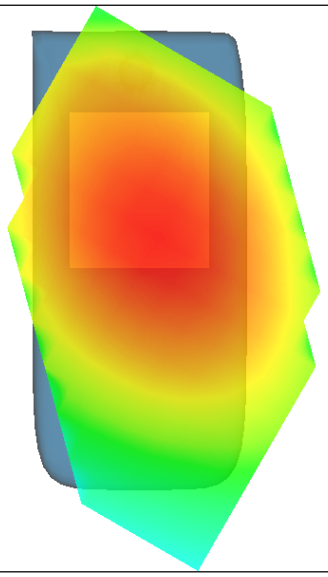
Maximum location: X=-32.00, Y=-24.00

SAR 10g (W/Kg)	0.169770
SAR 1g (W/Kg)	0.210730

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2160	0.1849	0.1557	0.1292	0.1039	0.0811



3D sceen shot	Hot spot position
	

MEASUREMENT 31

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 8 minutes 34 seconds

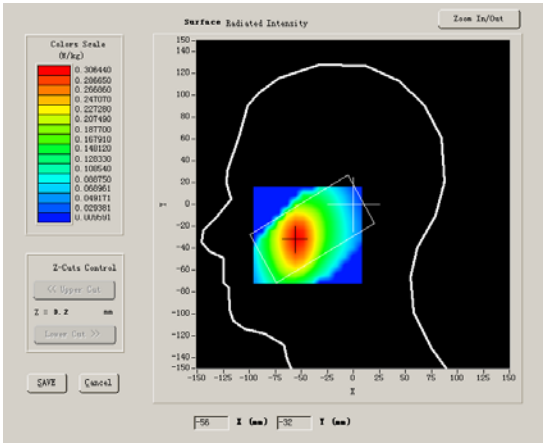
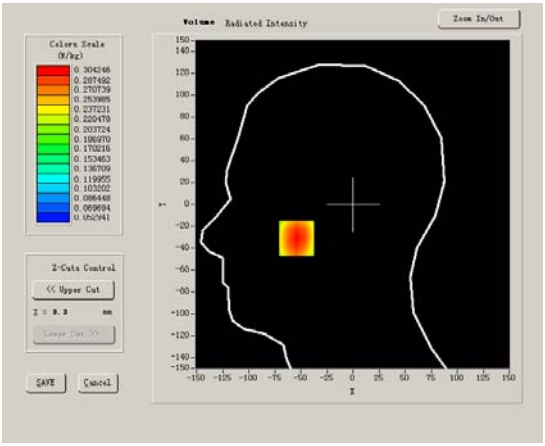
A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	WCDMA
Channels	Low
Signal	CDMA

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	40.169997
Relative permittivity	13.170000
Conductivity (S/m)	1.449217
Power drift (%)	1.170000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

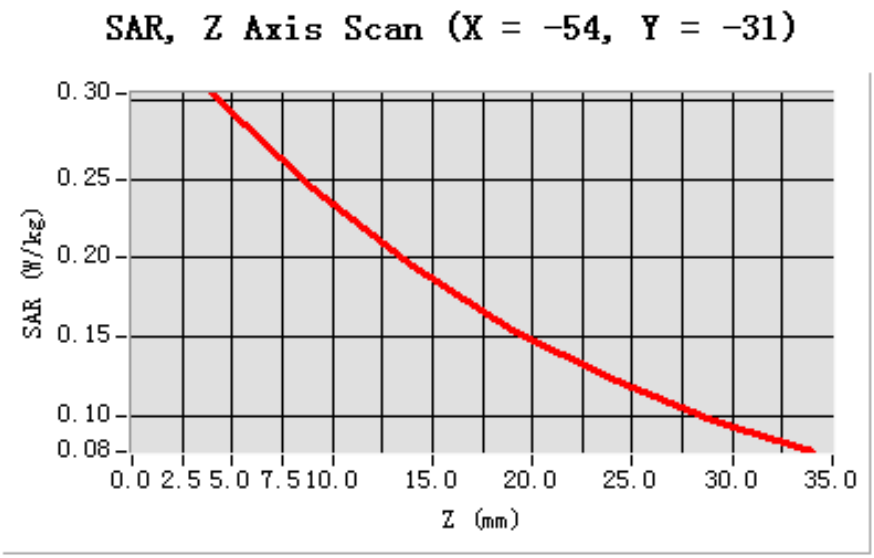
SURFACE SAR	VOLUME SAR
	

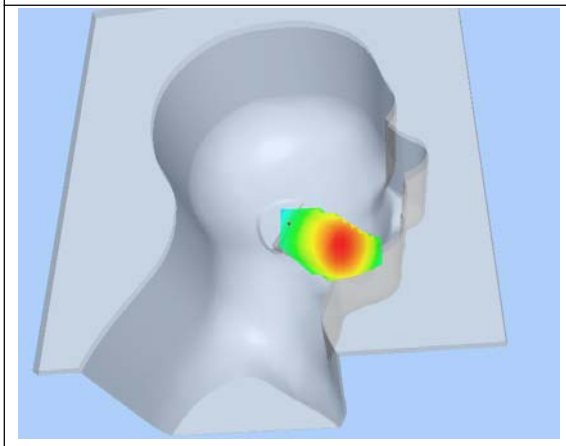
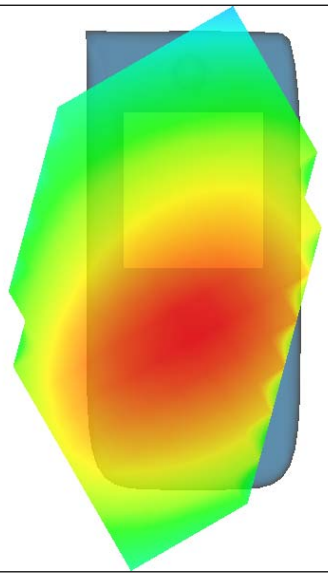
Maximum location: X=-54.00, Y=-31.00

SAR 10g (W/Kg)	0.221901
SAR 1g (W/Kg)	0.293111

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3042	0.2442	0.1945	0.1540	0.1227	0.0971



3D sceen shot	Hot spot position
	

MEASUREMENT 32

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 7 minutes 24 seconds

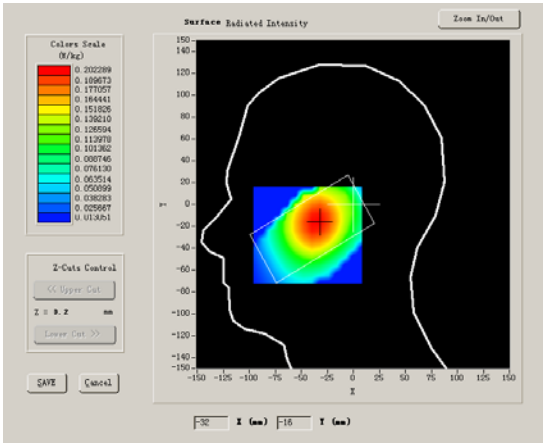
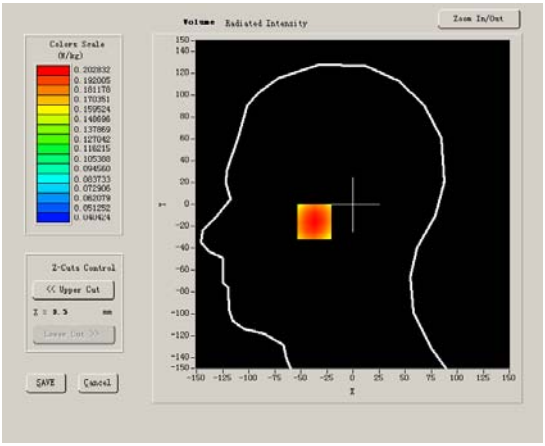
A. Experimental conditions.

Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Tilt
Band	WCDMA
Channels	Low
Signal	CDMA

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	40.169997
Relative permittivity	13.170000
Conductivity (S/m)	1.449217
Power drift (%)	-2.200000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

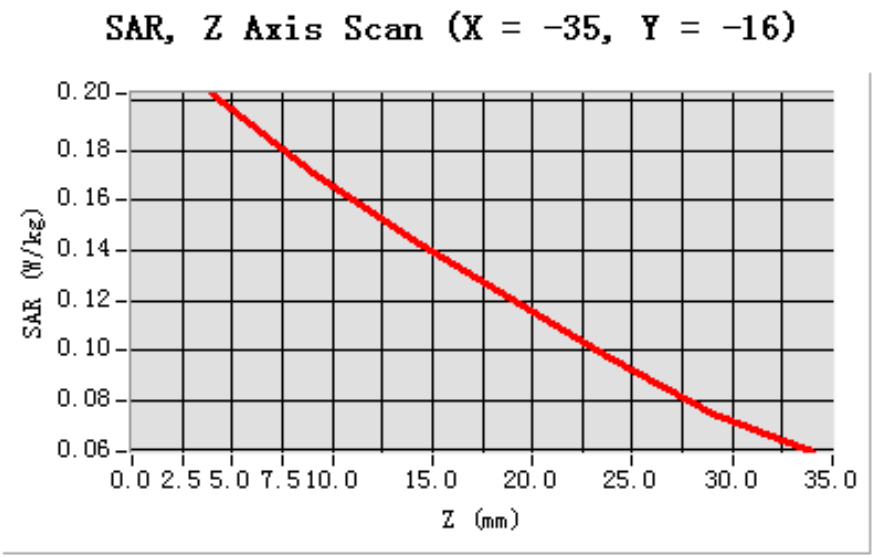
SURFACE SAR	VOLUME SAR
	

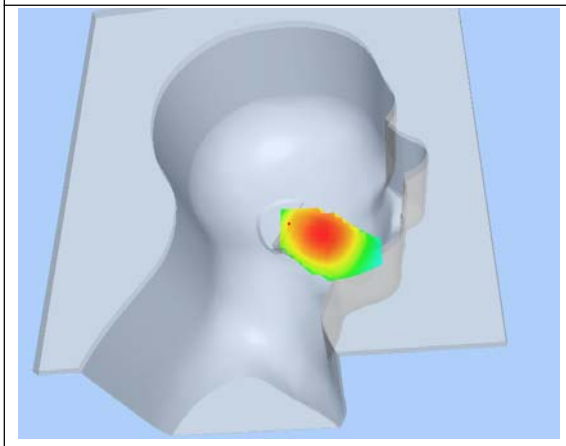
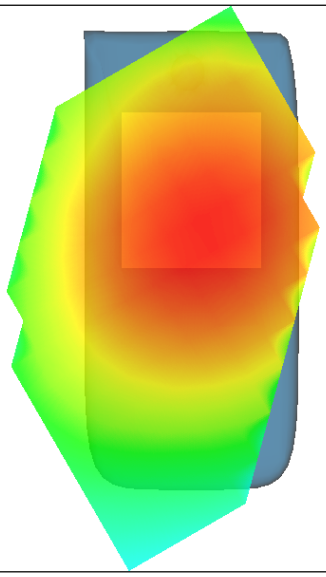
Maximum location: X=-35.00, Y=-16.00

SAR 10g (W/Kg)	0.158598
SAR 1g (W/Kg)	0.197897

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2028	0.1713	0.1448	0.1203	0.0968	0.0747



3D sceen shot	Hot spot position
	

MEASUREMENT 33

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

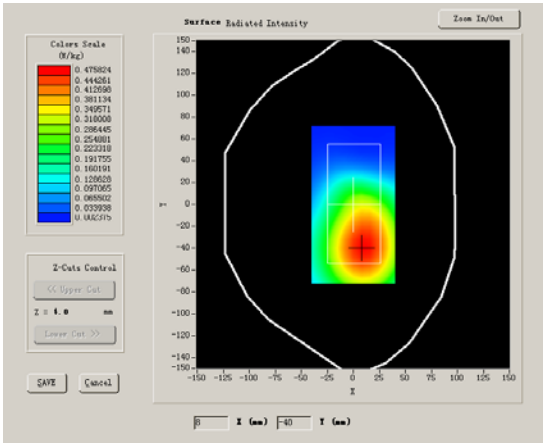
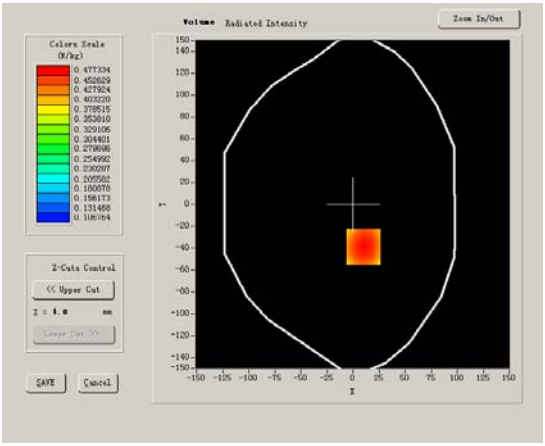
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	52.419854
Relative permittivity	15.877050
Conductivity (S/m)	1.502654
Power drift (%)	-0.860000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.982,37.514,41.835
Crest factor:	1:1

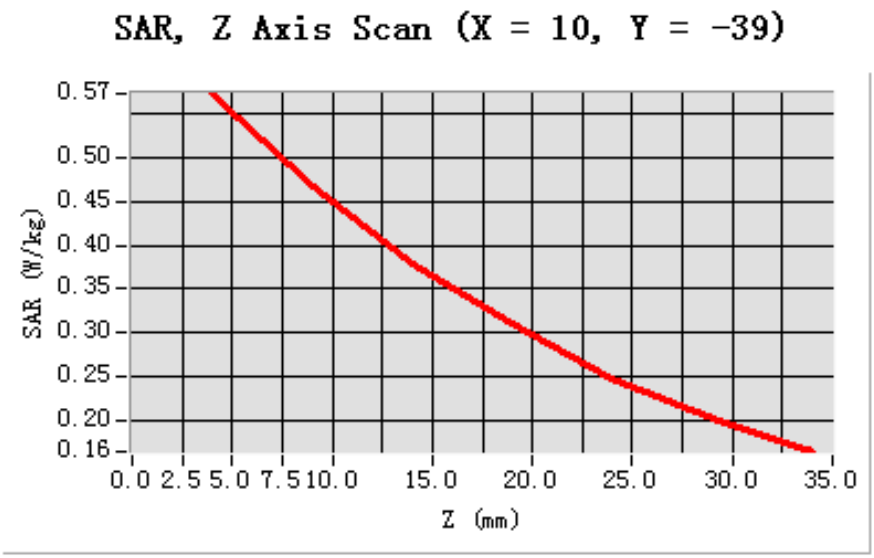
SURFACE SAR	VOLUME SAR
	

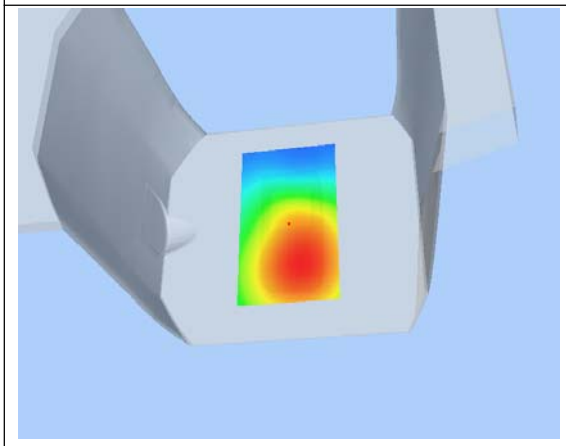
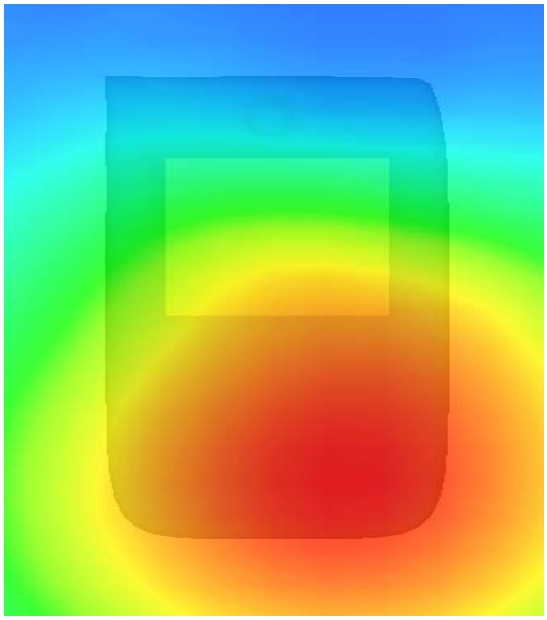
Maximum location: X=10.00, Y=-39.00

SAR 10g (W/Kg)	0.436164
SAR 1g (W/Kg)	0.556792

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5728	0.4672	0.3791	0.3100	0.2491	0.2031



3D sceen shot	Hot spot position
	

MEASUREMENT 34

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

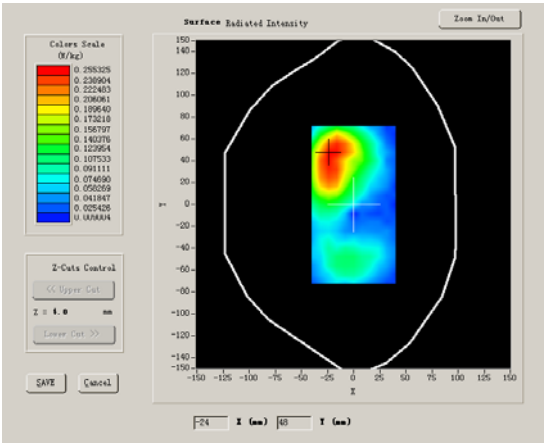
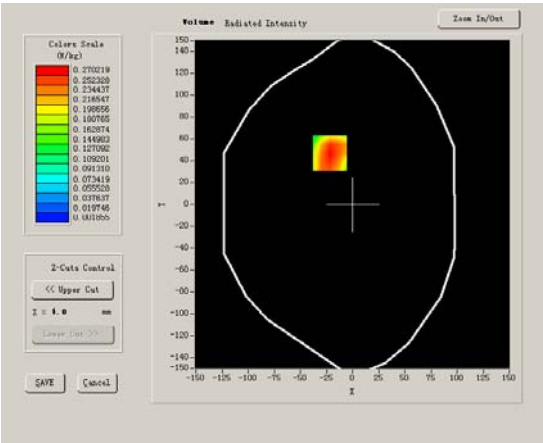
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	52.419854
Relative permittivity	15.877050
Conductivity (S/m)	1.502654
Power drift (%)	-0.330000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.982,37.514,41.835
Crest factor:	1:1

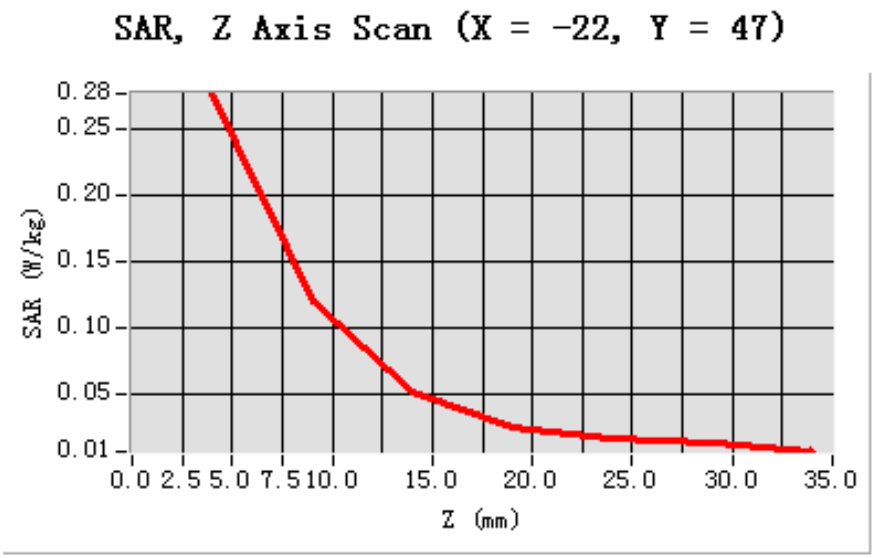
SURFACE SAR	VOLUME SAR
	

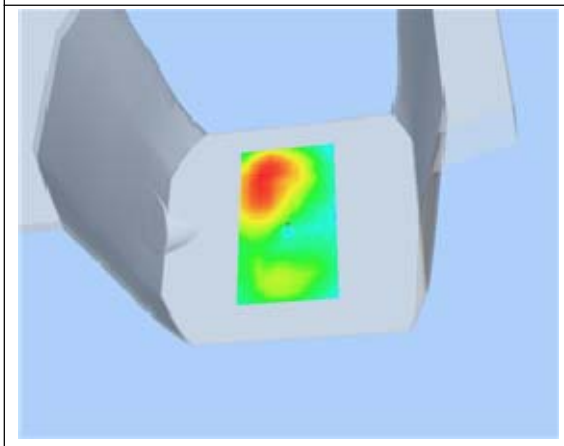
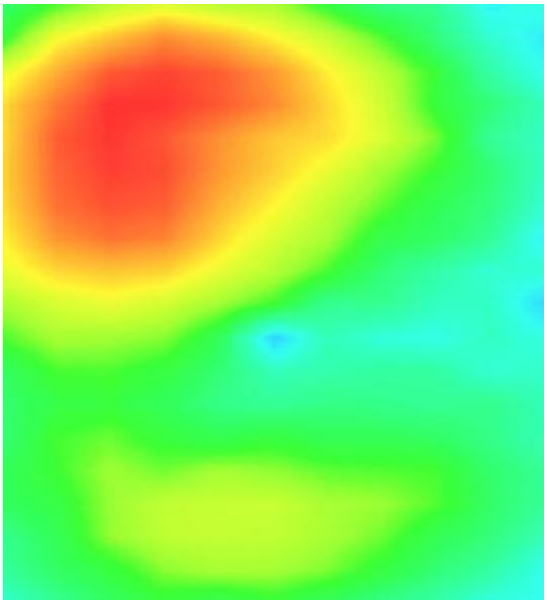
Maximum location: X=-22.00, Y=47.00

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



3D sceen shot	Hot spot position
	

MEASUREMENT 35

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 8 seconds

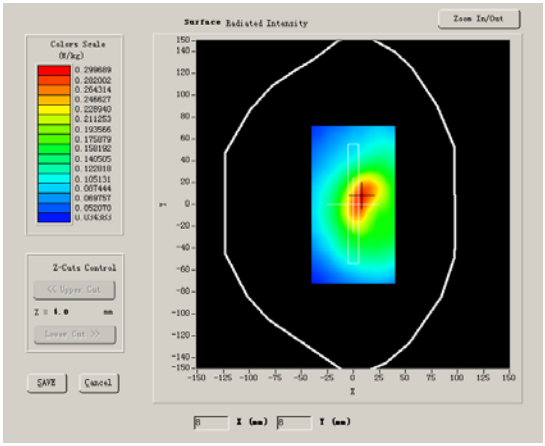
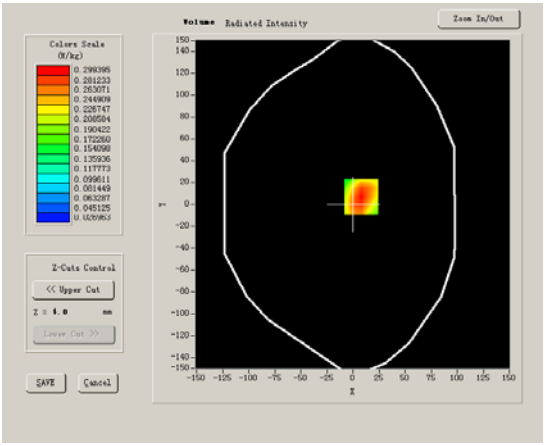
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	52.419854
Relative permittivity	15.877050
Conductivity (S/m)	1.502654
Power drift (%)	-0.620000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.982,37.514,41.835
Crest factor:	1:1

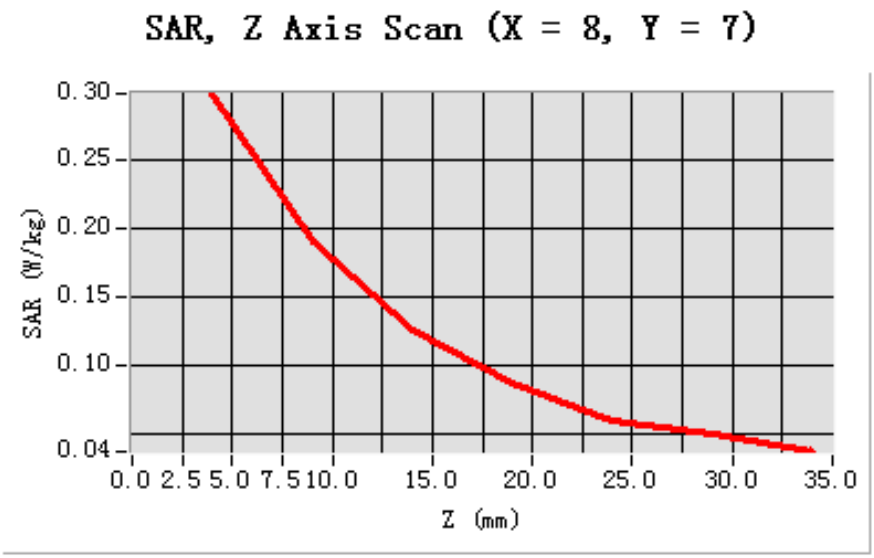
SURFACE SAR	VOLUME SAR
	

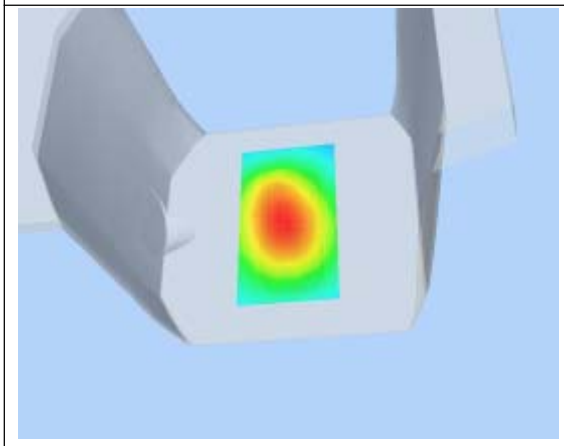
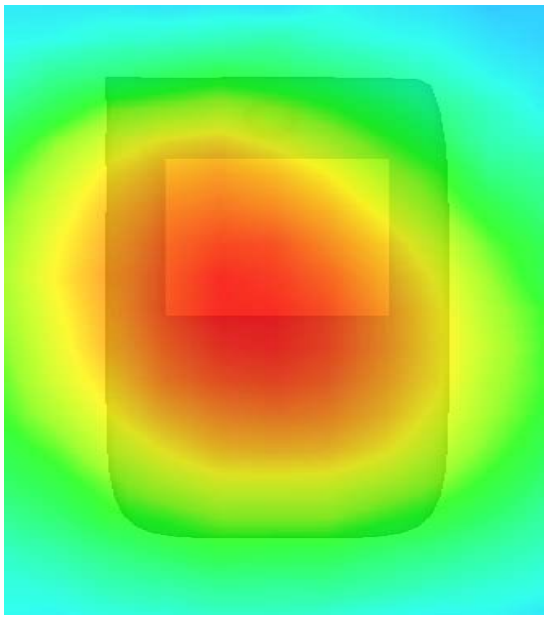
Maximum location: X=8.00, Y=7.00

SAR 10g (W/Kg)	0.185646
SAR 1g (W/Kg)	0.286416

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.2994	0.1902	0.1258	0.0876	0.0590	0.0498



3D sceen shot	Hot spot position
	

MEASUREMENT 36

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

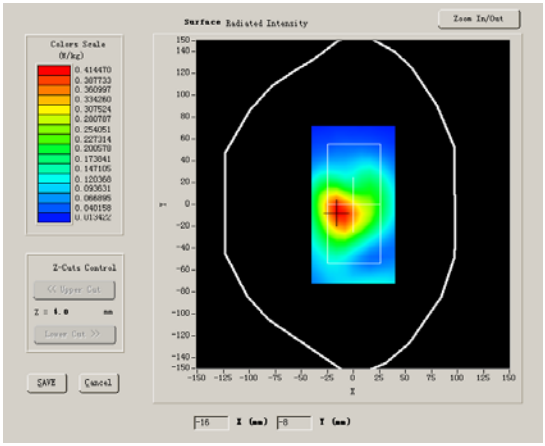
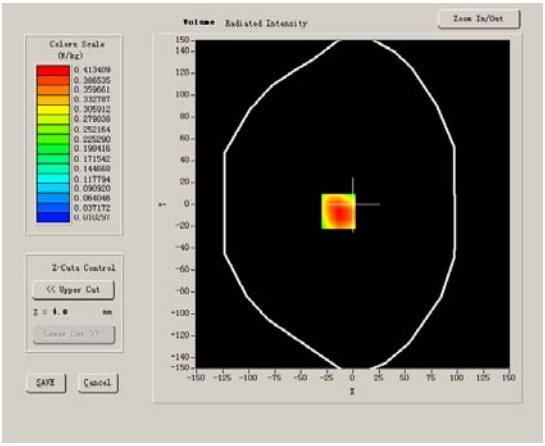
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	52.419854
Relative permittivity	15.877050
Conductivity (S/m)	1.502654
Power drift (%)	-2.420000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.982,37.514,41.835
Crest factor:	1:1

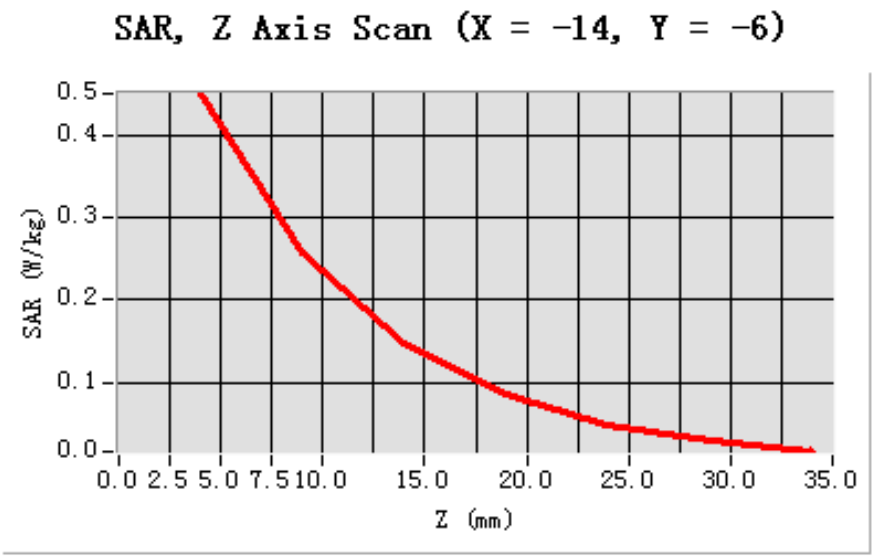
SURFACE SAR	VOLUME SAR
	

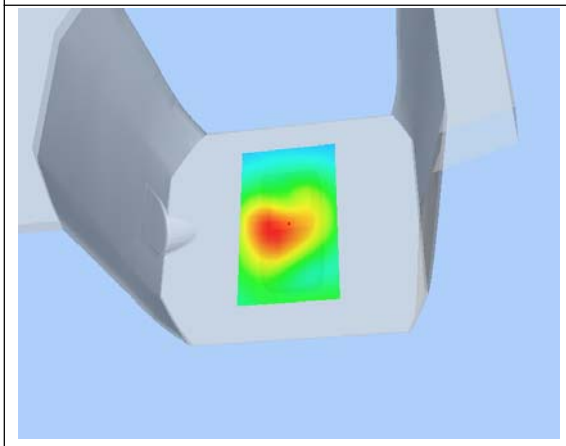
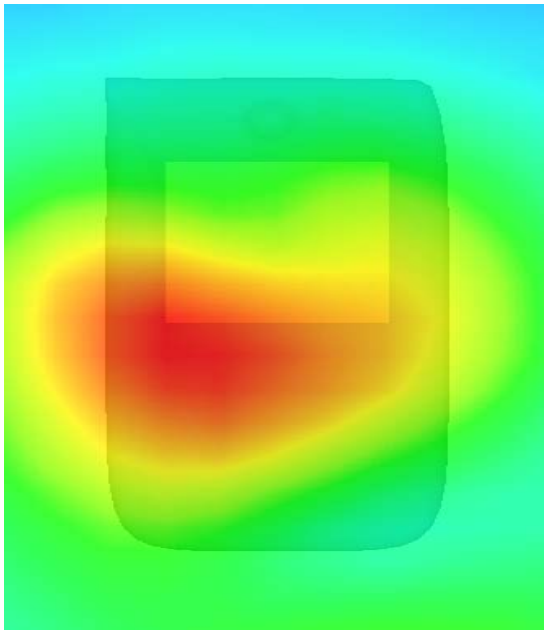
Maximum location: X=-14.00, Y=-6.00

SAR 10g (W/Kg)	0.254347
SAR 1g (W/Kg)	0.433479

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4502	0.2578	0.1474	0.0858	0.0493	0.0295



3D sceen shot	Hot spot position
	

MEASUREMENT 37

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 9 minutes 9 seconds

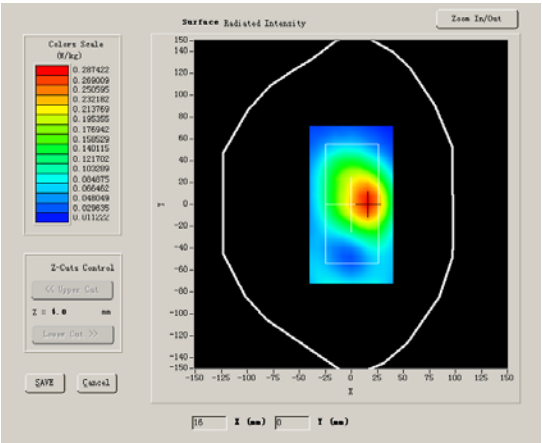
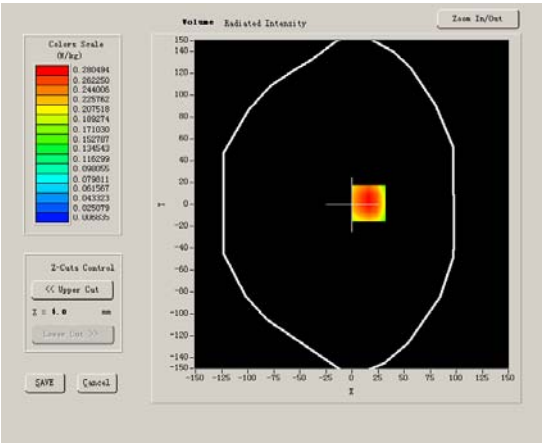
A. Experimental conditions.

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

B. SAR Measurement Results

Lower Band SAR (Channel 1312):

Frequency (MHz)	1712.400000
Relative permittivity (real part)	52.419854
Relative permittivity	15.877050
Conductivity (S/m)	1.502654
Power drift (%)	-1.410000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.7°C
ConvF:	42.982,37.514,41.835
Crest factor:	1:1

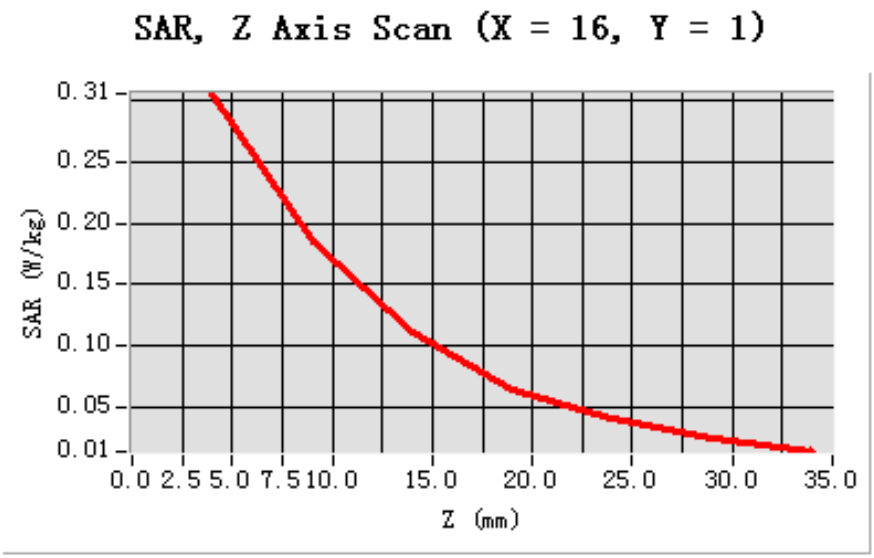
SURFACE SAR	VOLUME SAR
	

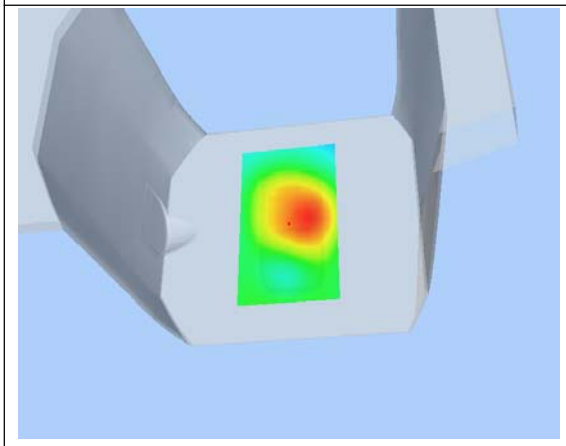
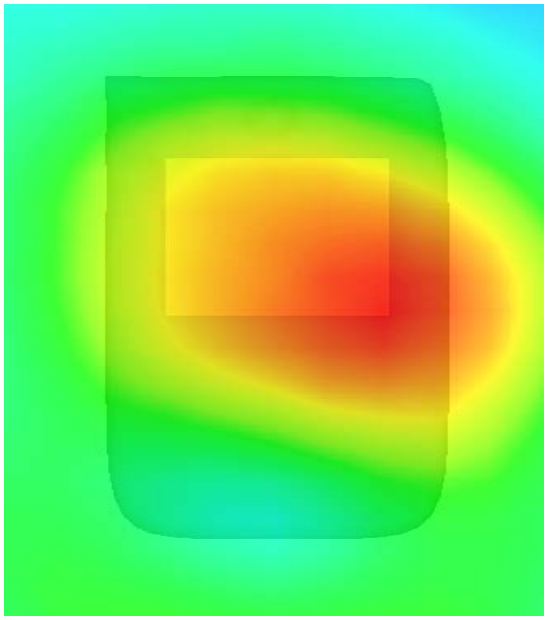
Maximum location: X=16.00, Y=1.00

SAR 10g (W/Kg)	0.176005
SAR 1g (W/Kg)	0.294389

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3054	0.1847	0.1109	0.0647	0.0404	0.0252



3D sceen shot	Hot spot position
	

System Performance Check Data(Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 27 seconds

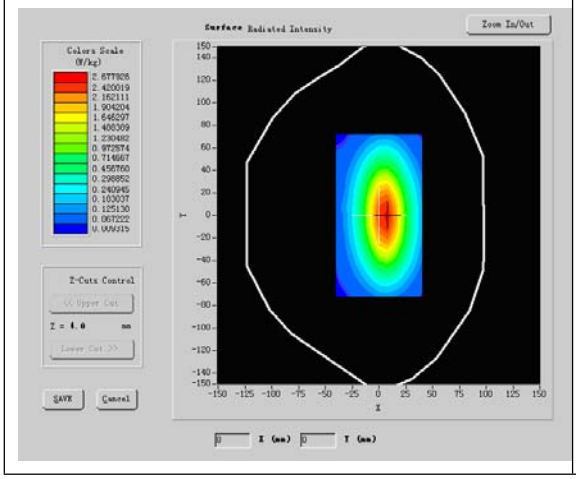
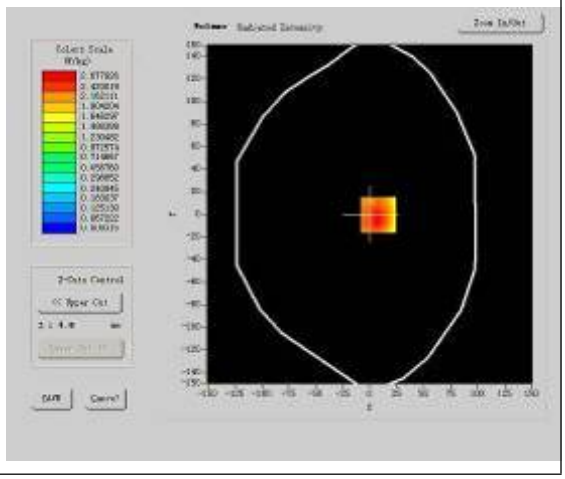
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.675999
Relative permittivity	15.070000
Conductivity (S/m)	0.894409
Power drift (%)	-0.050000
Ambient Temperature:	22.4°C
Liquid Temperature:	21.5°C
ConvF:	28.479,25.214,27.196
Crest factor:	1:1

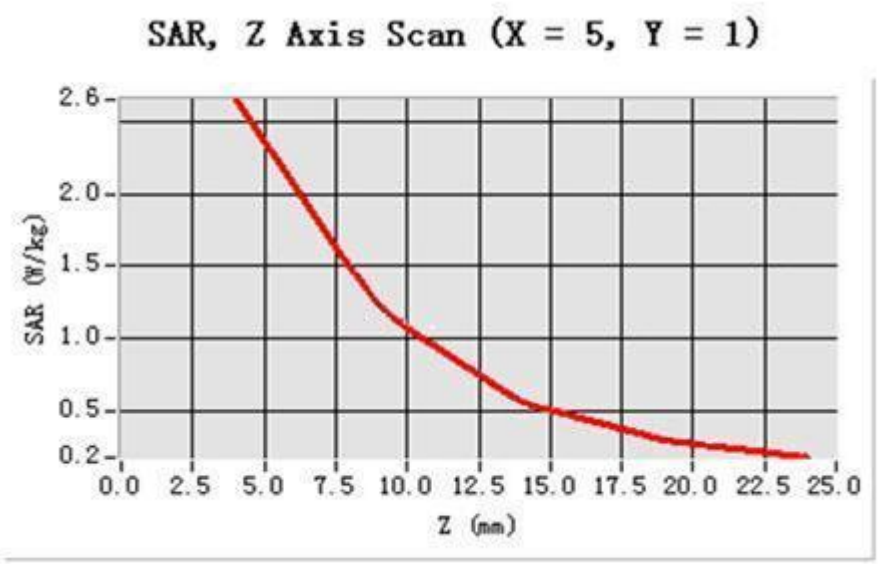
SURFACE SAR	VOLUME SAR
	

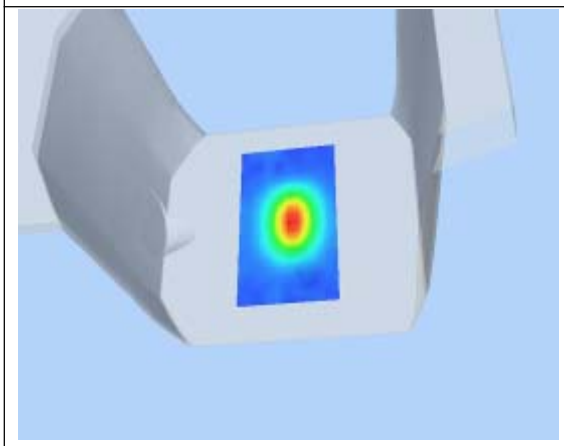
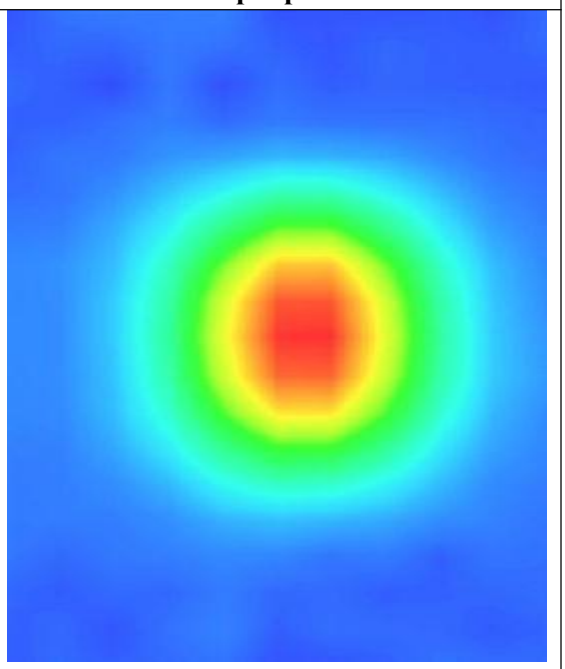
Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	1.685732
SAR 1g (W/Kg)	2.478462

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	2.4754	1.2251	0.5257	0.2114



3D sceen shot	Hot spot position
	

System Performance Check Data(Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 27 seconds

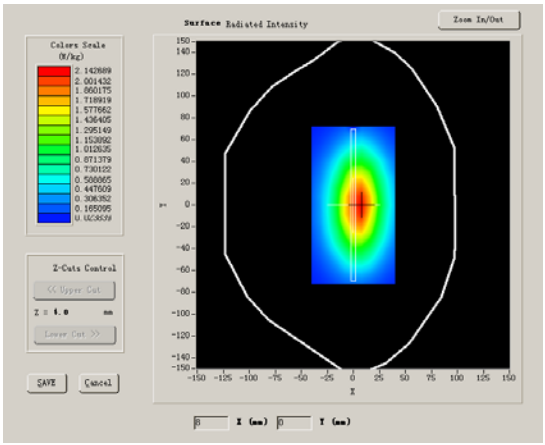
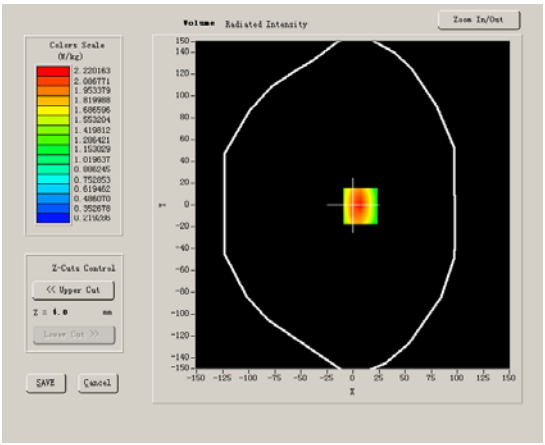
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat 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)	0.9809033
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

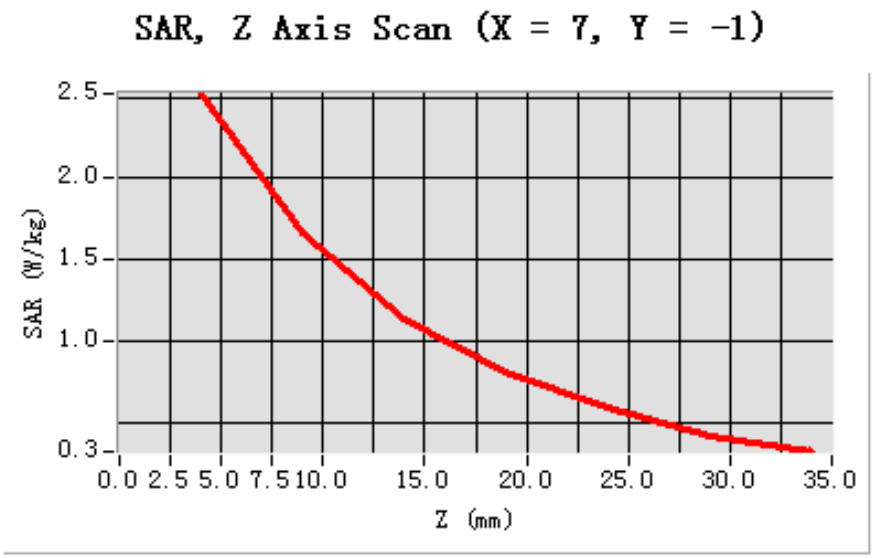
SURFACE SAR	VOLUME SAR
	

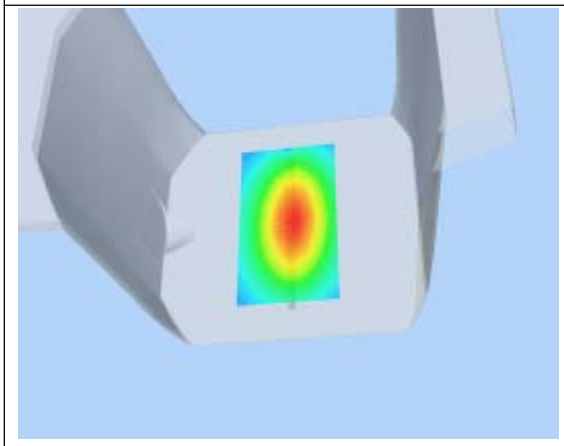
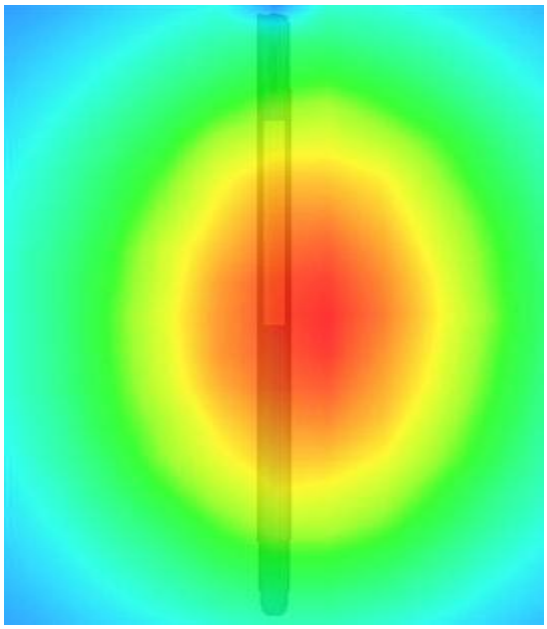
Maximum location: X=7.00, Y=-1.00

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



3D sceen shot	Hot spot position
	

System Performance Check Data(Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 27 seconds

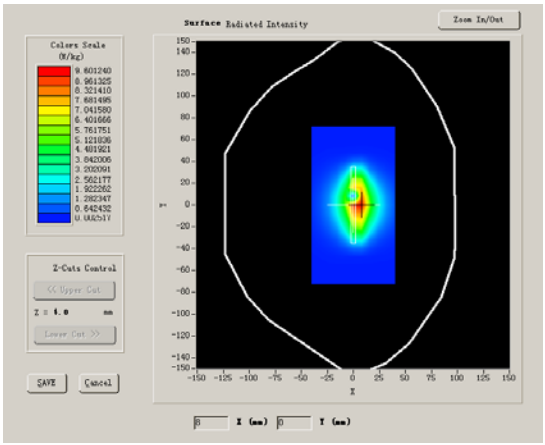
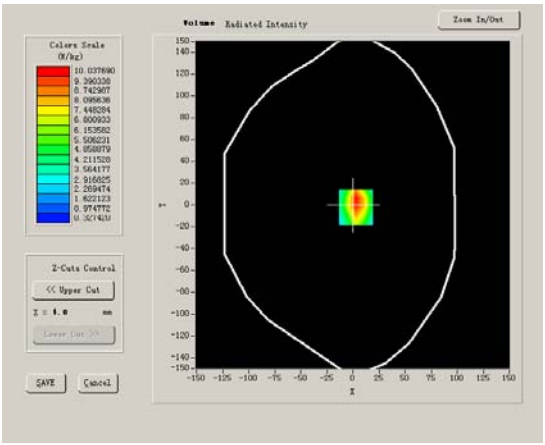
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1800MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1800.000000
Relative permittivity (real part)	40.169997
Relative permittivity	15.070000
Conductivity (S/m)	1.449217
Power drift (%)	-0.820000
Ambient Temperature:	22.3°C
Liquid Temperature:	22.6°C
ConvF:	42.533,36.791,41.019
Crest factor:	1:1

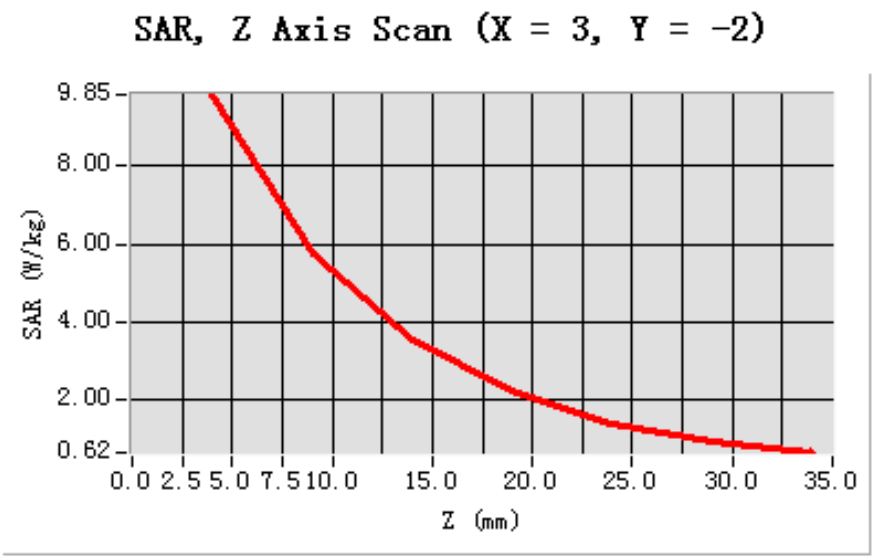
SURFACE SAR	VOLUME SAR
	

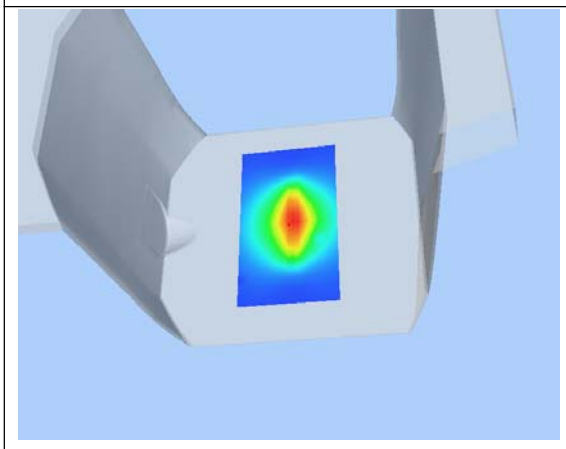
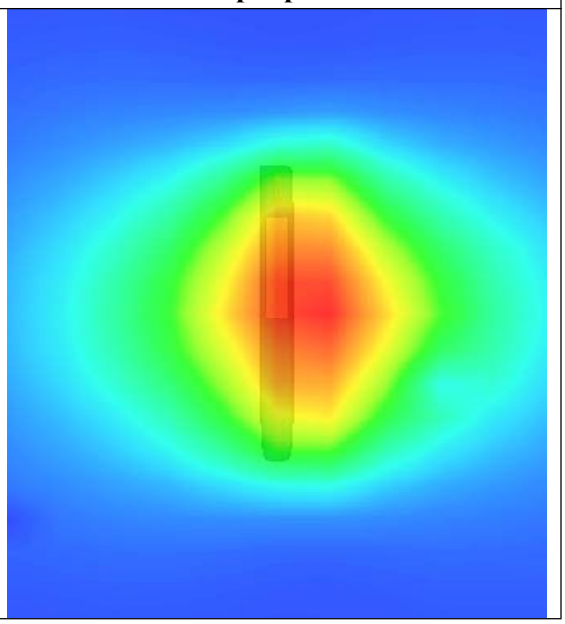
Maximum location: X=3.00, Y=-2.00

SAR 10g (W/Kg)	5.233842
SAR 1g (W/Kg)	9.556460

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	9.8504	5.7592	3.5340	2.1937	1.3905	0.9106



3D sceen shot	Hot spot position
	

System Performance Check Data(Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 26 seconds

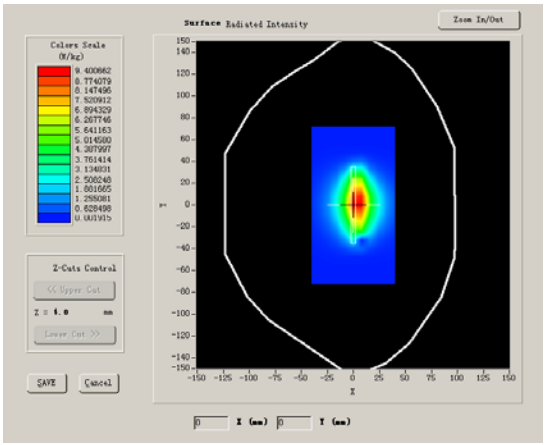
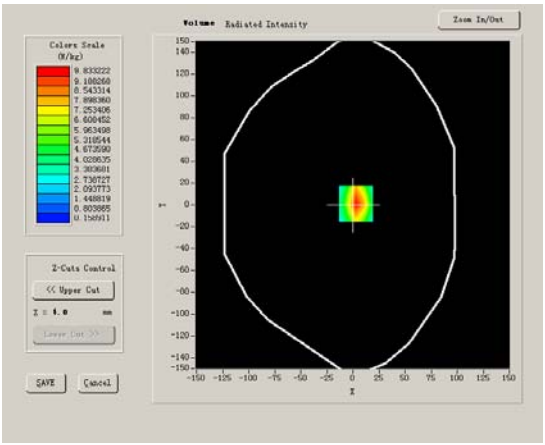
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1800MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1800.000000
Relative permittivity (real part)	52.419854
Relative permittivity	14.070000
Conductivity (S/m)	1.502654
Power drift (%)	-0.710000
Ambient Temperature:	22.3°C
Liquid Temperature:	22.6°C
ConvF:	40.625,34.773,38.535
Crest factor:	1:1

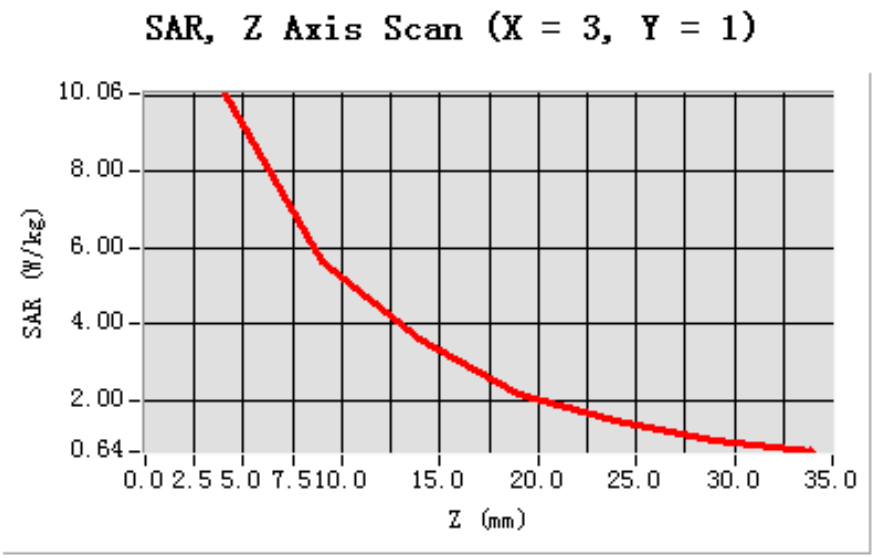
SURFACE SAR	VOLUME SAR
	

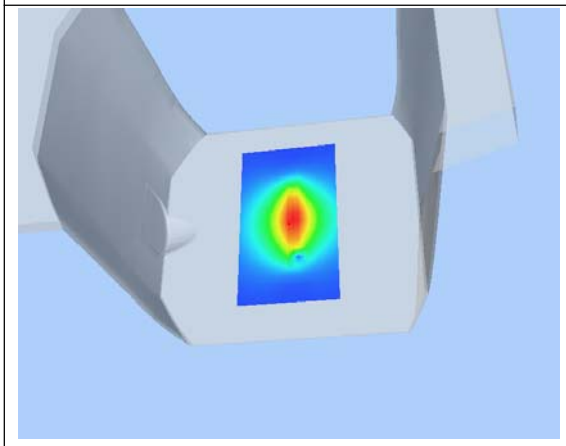
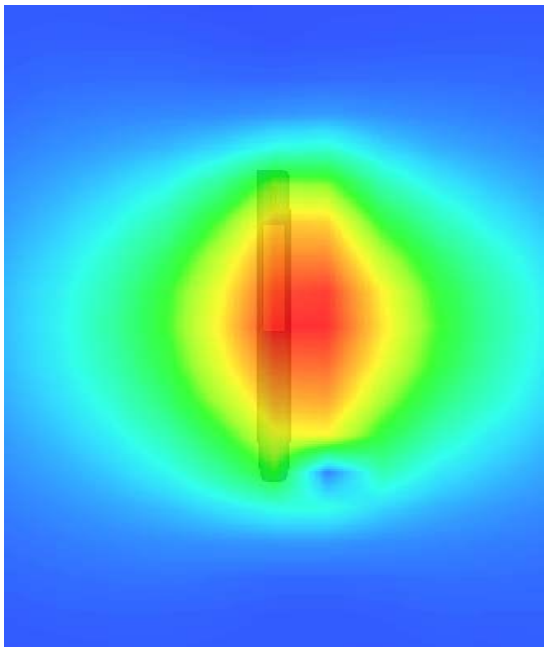
Maximum location: X=3.00, Y=1.00

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

Z Axis Scan

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



3D sceen shot	Hot spot position
	

System Performance Check Data(Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 27 seconds

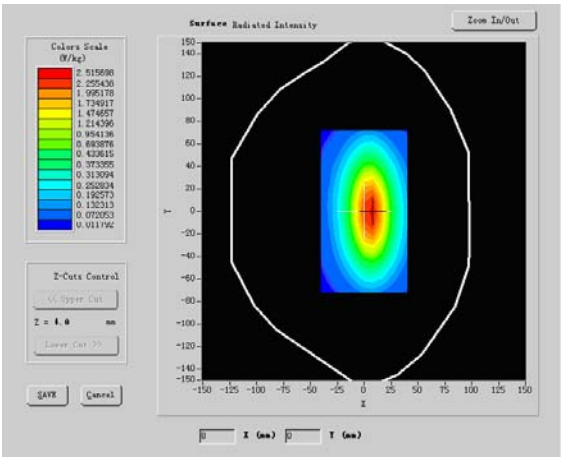
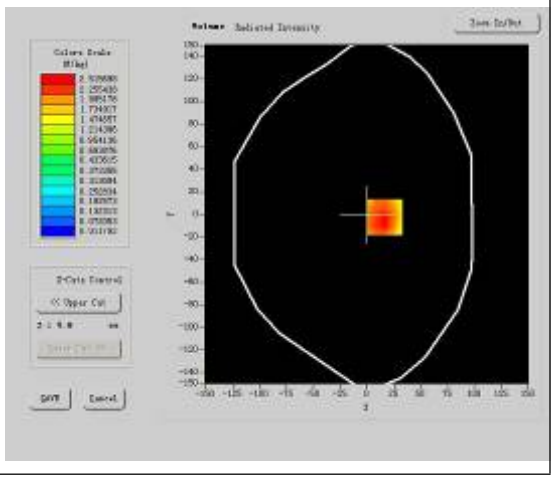
A. Experimental conditions.

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)	40.509998
Relative permittivity	15.070000
Conductivity (S/m)	1.436111
Power drift (%)	-0.140000
Ambient Temperature:	22.3°C
Liquid Temperature:	22.6°C
ConvF:	40.136,34.843,38.721
Crest factor:	1:1

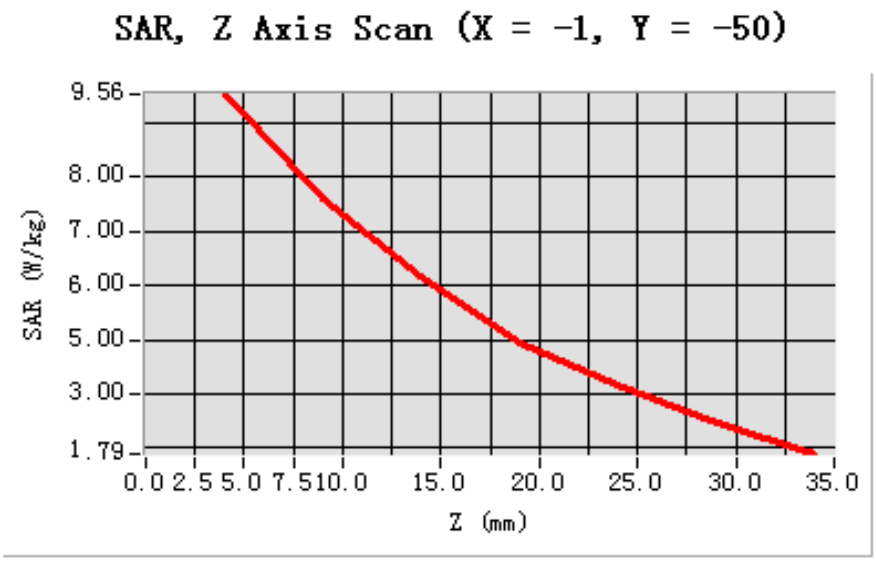
SURFACE SAR	VOLUME SAR
	

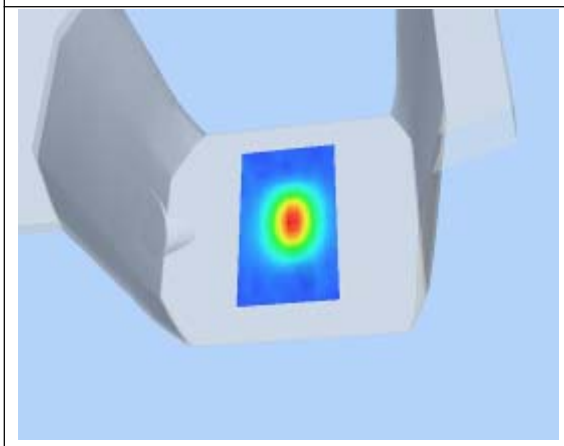
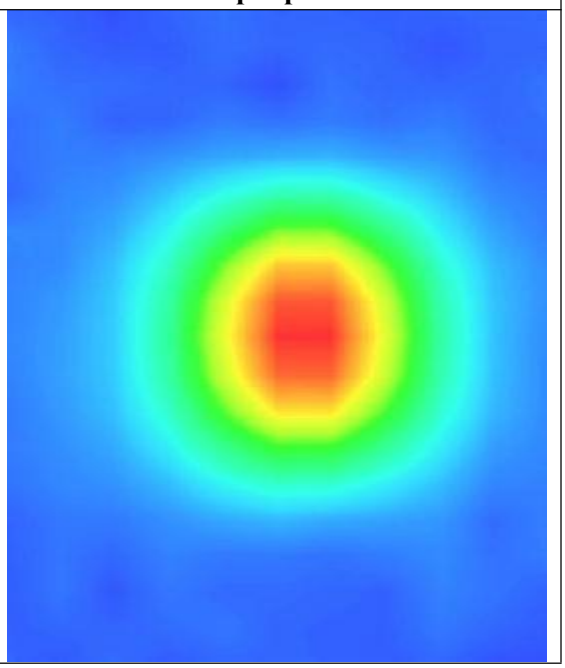
Maximum location: X=-1.00, Y=-50.00

SAR 10g (W/Kg)	4.884149
SAR 1g (W/Kg)	9.454628

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	9.4148	7.3955	6.3646	4.3955



3D sceen shot	Hot spot position
	

System Performance Check Data(Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 17/9/2012
Measurement duration: 13 minutes 26 seconds

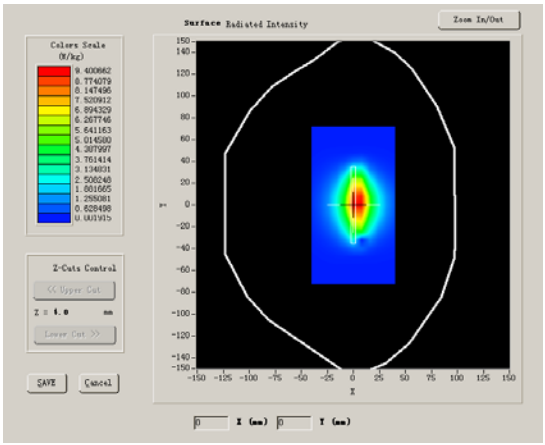
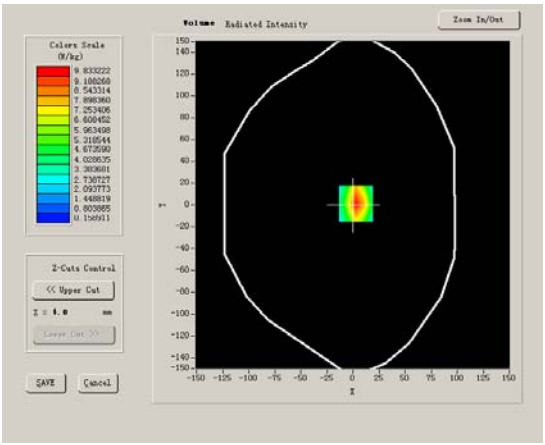
A. Experimental conditions.

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

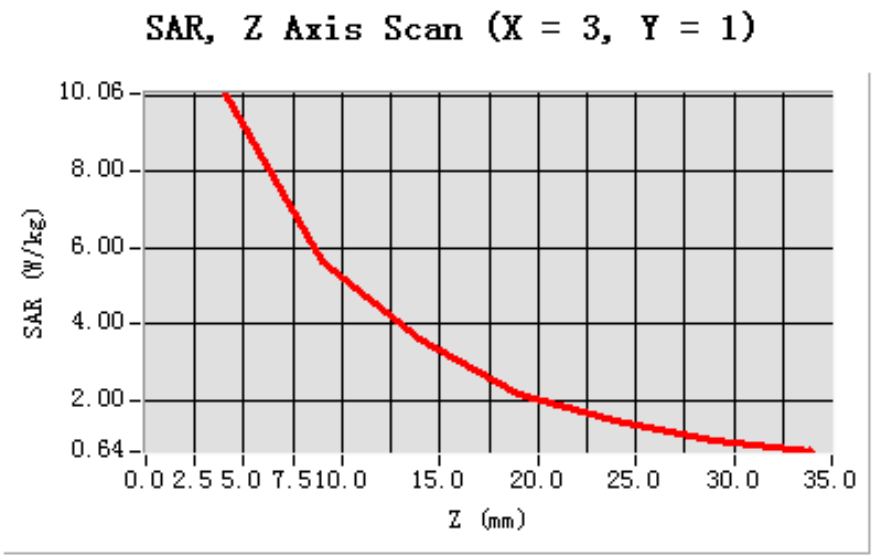
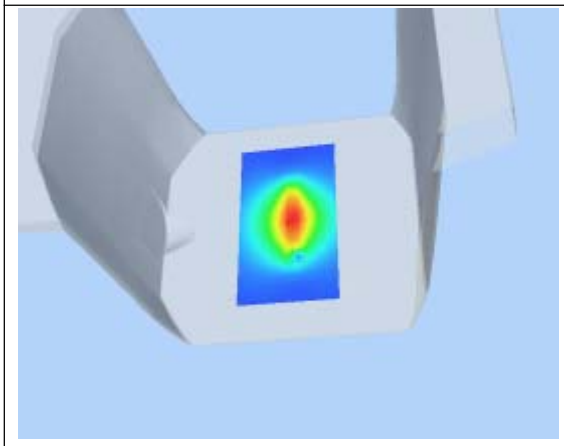
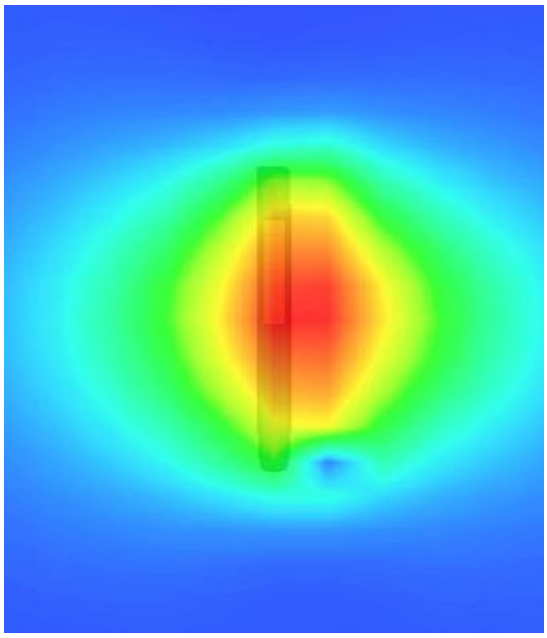
SURFACE SAR	VOLUME SAR
	

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



3D sceen shot	Hot spot position