FCC SAR

TEST REPORT

of

GSM Mobile Phone

Model Name: C1012B, TTX28, TTX28GT
Trade Name: Telefonica,PCD, Cellon
Report No.: SZ10070146S01
FCC ID.: T38PCD1012B

prepared for

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

pidrepared by

Shenzhen Morlab Communications Technology Co., Ltd.
Morlab Laboratory
3/F, Electronic Testing Building, Shahe Road, Xili,
Nanshan District, Shenzhen, 518055 P. R. China
Tel: +86 755 86130398
Fax: +86 755 86130218

LAB CODE 20081223-00

Contents

General Information

1.1. Notes

The test results of this test report relate exclusively to the information specified in section 3.3. Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the identification. The test report may only be reproduced or published in full. Reproduction or publications of extracts from the test report requires the prior written approval of Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory. The test report shall be invalid without all the signatures of testing the Project Manager, the Deputy Project Manager and the Test Lab Manager. Any objections must be raised to Morlab within 30 days since the date when the report is received. It will not be taken into consideration beyond this limit.

1.2. Organization item

Report No.:	SZ10070146S01
Date of Issue:	Sep10, 2010
Date of Tests:	Sep 2, 2010 –Sep 2, 2010
Responsible for Accreditation:	Shu Luan
Project Manager:	Li Lei
Deputy Project Manager:	Samuel Peng

1.3. Conclusion

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory has verified that all tests as listed in the section 4.11 of this report haven been performed succ essfully with the tested equipment.

Samuel Peng
Tested by
(Responsible for the Test Report)

Li Lei
Reviewed by
(Verification of the Test Report)

Shu Luan
Approved by
(Responsible Test Lab Manager)

2. Testing Laboratory

2.1. 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

2.2. 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

2.3. Accreditation Certificate

Accredited Testing Laboratory:	No. CNAS L3572 (see 0)

2.4. List of Test Equipments

No.	Instrument	Type	Cal. Date	Cal. Due
1	PC	Dell (Pentium IV 2.4GHz, SN:X10-23533)		
2	Network Emulator	Rohde&Schwarz (CMU200, SN:105894)	2009-9-26	1year
3	Voltmeter	Keithley (2000, SN:1000572)	2009-9-24	1year
4	Synthetizer	Rohde&Schwarz (SML_03, SN:101868)	2009-9-24	1year
5	Amplifier	Nucl udes (ALB216, SN:10800)	2009-9-24	1year
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)	2009-9-24	1year
7	Probe	Antennessa (SN:SN_3708_EP80)	2009-9-24	1year
8	Phantom	Antennessa (SN:SN_36_08_SAM62)	2009-9-24	1year
9	Liquid	Antennessa (Last Calibration:21 08 08)	2010-8-21	1year

3. Technical Information

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

3.1. Identification of Applicant

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

3.2. Identification of Manufacturer

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

3.3. Equipment Under Test (EUT)

Brand Name:	Telefonica,PCD, Cellon
Type Name:	Telefonica,PCD, Cellon
Marking Name:	C1012B, TTX28, TTX28GT
Hardware Version:	C1012_MB_P2
Software Version:	C1012_2.1_0x01209_CLARO_NI_NUMONYX
Frequency Bands:	GSM 850MHz (channel 128:824.20MHz,channel 190:836.59MHz, channel 251:848.29MHz) PCS 1900MHz (channel 512:1850.19MHz,channel 661:1880.00MHz, channel 810:1909.80MHz)
Modulation Mode:	GMSK
Antenna type:	Build inside
Development Stage:	Identical prototype
Battery Model:	BTR380
Battery specification:	720mAh 3.7V
Development Stage	Identical prototype
Multislot Class	GPRS: Multislot Class 12: EDGE:(n.a)
GPRS Operation Mode	Class B

3.3.1. Photographs of the EUT

Please see for photographs of the EUT.

3.3.2. Identification of all used EUTs

The EUT Identity consists of numerical and letter characters (see the table below), the first five numerical characters indicates the Type of the EUT defined by Morlab, the next letter character indicates the test sample, and the following two numerical characters indicates the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	C1012_MB_P2	C1012_2.1_0x01209_CLARO_NI_NUMONYX

4. Test Results

4.1. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR § 2. 1093**	Radiofrequency Radiation Exposure Evaluation: Portable Devices
2	**FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)**	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
3	**ANSI C95.1-1999**	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz
4	**IEEE 1528-2003**	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techuiques.

4.2. Test Environment/Conditions

Normal Temperature (NT):	20 ... 25 °C		
Relative Humidity:	30 ... 75 %		
Air Pressure:	980 ... 1020 hPa		
Details of Power Supply:	220V/50Hz AC		
Extreme Temperature:	Low Temperature (LT)	=	-10°C
	High Temperature (HT)	=	55°C
Extreme Voltage of the EUT:	Normal Voltage (NV)	=	3.70V
	Low Voltage (LV)	=	3.60V
	High Voltage (HV)	=	4.20V
Test frequency:	GSM 850MHz		
	PCS 1900MHz		
Operation mode:	Call established		
Power Level:	GSM 850 MHz Maximum output power(level 5)		
	PCS 1900 MHz Maximum output power(level 0)		

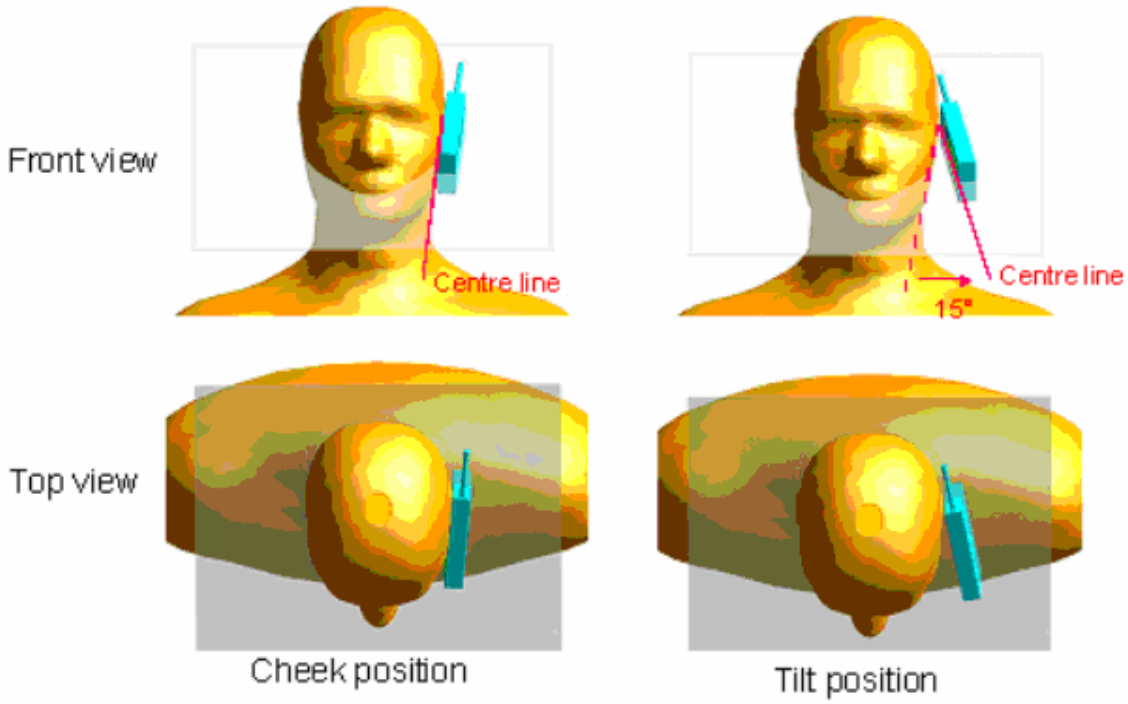
During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.
The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 128, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz, The EUT, The EUT is commanded to operate at maximum transmitting power.
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.
The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 35 dB.

4.3.Operational Conditions During Test

4.3.1. 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.

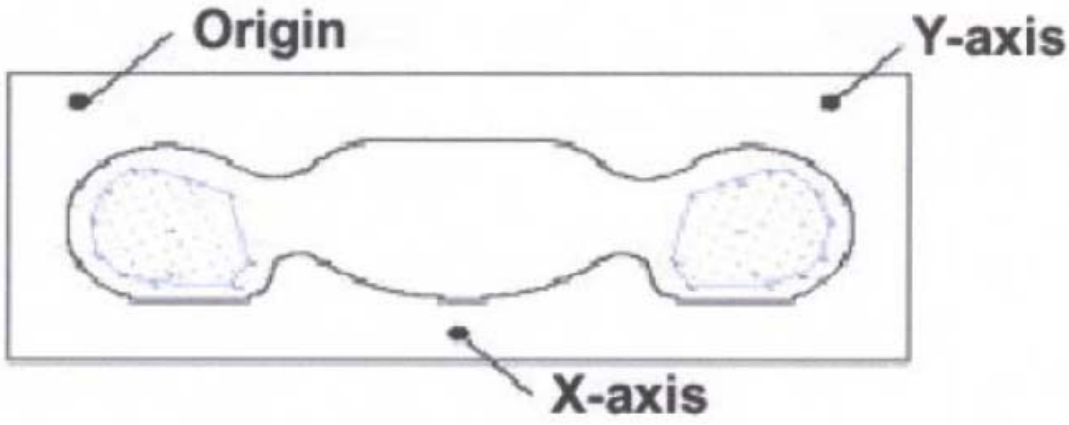
Remark: Please refer to Appendix B for the test setup photos.

4.4. 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

4.5. 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.

4.6. 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.

4.7. SAR 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.

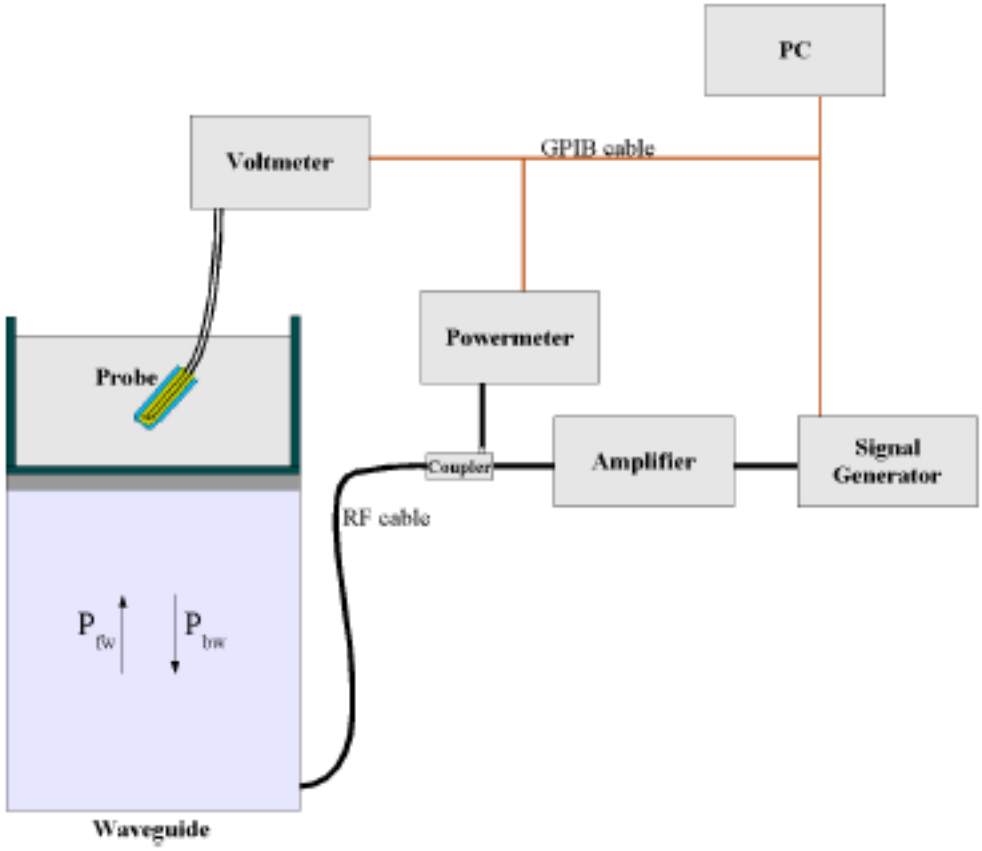
4.8. Probe

For the measurements the Specific Dosimetric E-Field Probe SSE5 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter : 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 50361 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 50361 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.

4.8.1. Uncertainty Assessment

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

UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	V i
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R				1.02	1.02	
Hemispherical Isotropy	E.2.2	4.0	R				1.63	1.63	
Boundary effect	E.2.3	1.0	R		1	1	0.58	0.58	
Linearity	E.2.4	5.0	R		1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R		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		1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R		1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R		1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R		1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R		1	1	0.03	0.03	
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R		1	1	2.89	2.89	
Test sample Related									
Test sample positioning	E.4.2.1	0.03	N	1	1	1	0.03	0.03	N - 1
Device Holder Uncertainty	E.4.1.1	5.00	N	1	1	1	5.00	5.00	
Output power Variation - SAR drift measurement	6.6.2	3.45	R		1	1	1.99	1.99	
Phantom and Tissue Parameters									

Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R		1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	2.12	R		0.64	0.43	0.78	0.53	
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	3.76	R		0.6	0.49	1.30	1.06	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				11.13	10.62	
Expanded Uncertainty (95% Confidence interval)			k				21.70	20.71	

UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	V i
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R				1.02	1.02	
Hemispherical Isotropy	E.2.2	4.0	R				1.63	1.63	
Boundary effect	E.2.3	1.0	R		1	1	0.58	0.58	
Linearity	E.2.4	5.0	R		1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R		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		1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R		1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R		1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R		1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R		1	1	0.03	0.03	
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R		1	1	2.89	2.89	
Dipole									

Dipole axis to liquid Distance	8,E.4.2	1.00	N		1	1	0.58	0.58	N-1
Input power and SAR drift measurement	8,6.6.2	3.45	R		1	1	1.99	1.99	
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R		1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	2.12	R		0.64	0.43	0.78	0.53	
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	3.76	R		0.6	0.49	1.30	1.06	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				9.96	9.39	
Expanded Uncertainty (95% Confidence interval)			k				19.42	18.30	

4.8.2. Equipments and results of validation testing

Equipments :

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

Results:

Frequency	835MHz	1900MHz
Target value（1g）	10.8 W/Kg(body)	39.7 W/Kg
250 mW input power	2.753 W/Kg (head) 2.774 W/Kg (body)	9.888 W/Kg (head) 9.922 W/Kg (body)
Test value（1g）	11.012 W/Kg (head) 11.096 W/Kg (body)	39.552 W/Kg (head) 39.6880 W/Kg (body)

Note:Please refer to check the system performance data, the first 92-100 page. 250 mW input power

4.8.3. Dielectric Performance

The measured 1-gram averaged SAR values of the device against the head and the body are provided in Tables 1 and 2 respectively. The humidity and ambient temperature of test facility were 54% ~60% and 23.0 °C ~23.8°C respectively. The SAM head phantom（SN 0381 SH）were full of the head tissue simulating liquid. 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). A base station simulator was used to control the device during the SAR measurement. The phone was supplied with full-charged battery for each measurement.
For head measurement, the device was tested at the lowest, middle and highest frequencies in the transmit band.

Table 1: Dielectric Performance of Head Tissue Simulating Liquid

Temperature: 23.0~23.8°C, humidity: 54~60%.			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	835 MHZ	41.5	0.90
Validation value (Sep 2)	835 MHZ	40.669998	0.866612
Target value	1900 MHZ	40	1.40
Validation value (Sep 2)	1900 MHZ	39.993999	1.335397

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

Table 2: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.0~23.8°C, humidity: 54~60%.			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	835 MHz	55.0	0.95
Validation value (Sep 2)	835 MHz	54.116001	0.974596
Target value	1900 MHz	53.3	1.52

Validation value (Sep 2)	1900 MHz	51.540001	1.573978

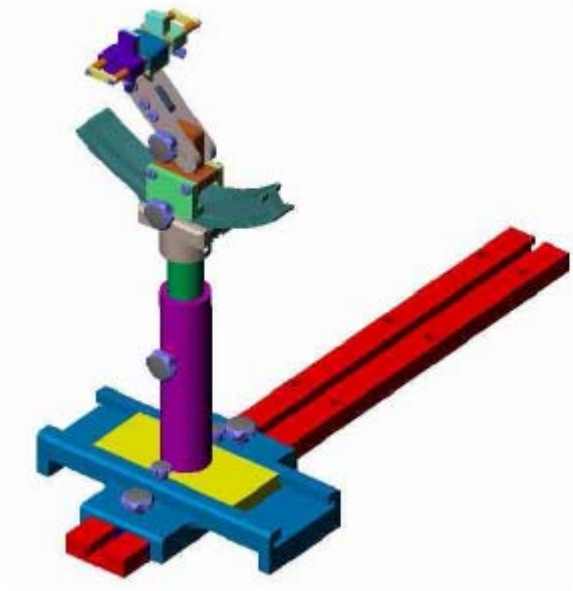
4.8.4. Simulant liquids

Simulant liquids that are used for testing at frequencies of GSM 850MHz and GSM 1900MHz, which are made mainly of sugar, salt and water solutions may be left in the phantoms. Approximately 20litres are needed for an upright head compared to about 20litres for a horizontal bath phantom.

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

4.9. 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

4.10.Items used in the Test Results List

Terms in the column “Verdict” for the test results list of the section 4.11:

Verdict	Description
PASS	EUT passed this test case
FAIL	EUT failed this test case
INC.	EUT did not pass and did not fail this test case, therefore the verdict is inconclusive
Decl.	“Declaration”: Morlab has received documents from the applicant and/or manufacturer which show conformity to the applied standards for this test case.
N/A	Test case not applicable for the EUT, see the column “Note” for detailed

4.11.Test Results List

Conducted RF Output Power Test Result

Band	Channel	Frequency (MHz)	Measured Output Power
			dBm
GSM 850MHz	128	824.2	30.95
	190	836.6	31.31
	251	848.8	31.84
GSM 1900MHz	512	1850.2	28.63
	661	1880.0	29.4
	810	1909.8	29.37
GPRS 850MHz	128	824.2	30.96
	190	836.6	31.3
	251	848.8	31.84
GPRS 1900MHz	512	1850.2	28.96
	661	1880.0	29.36
	810	1909.8	29.38

Summary of Measurement Results (GSM 850MHz Band)
SAR Values (GSM 850MHz Band), Measured against the head.

Temperature: 23.0~23.8°C, humidity: 54~60%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Case	Measurement Result (W/kg)	
	1 g Average (W/kg)	Power level (dBm)
Left head, Touch cheek, Channel Middle	0.659	31.31
Left head, Tilt 15 Degree, Channel Middle	0.383	31.31
Right head, Touch cheek, Channel Middle	0.586	31.31
Right head, Tilt 15 Degree, Channel Middle	0.313	31.31

Summary of Measurement Results (GSM 1900MHz Band)
SAR Values (GSM 1900MHz Band), Measured against the head.

Temperature: 23.0~23.8°C, humidity: 54~60%.	
Limit of SAR (W/kg)	1 g Average
	1.6
Test Case	Measurement Result (W/kg)

	1 g Average (W/kg)	Power level (dBm)
Left head, Touch cheek, Channel Middle	0.759	29.4
Left head, Tilt 15 Degree, Channel Middle	0.674	29.4
Right head, Touch cheek, Channel Middle	0.700	29.4
Right head, Tilt 15 Degree, Channel Middle	0.661	29.4

SAR Values (GSM 850MHz Band), Measured against the body.

Temperature: 23.0~23.8°C, humidity: 54~60%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Case	Measurement Result (W/kg)	
	1 g Average (W/kg)	Power level (dBm)
Side, Low frequency GPRS mode Back towards the phantom	1.093	30.96
Side, Middle frequency GPRS mode Back towards the phantom	0.901	31.3
Side, High frequency GPRS mode Back towards the phantom	0.755	31.84
Side, Low frequency GPRS mode Keyboard towards the phantom	0.990	30.96
Side, Middle frequency GSM mode Back towards the phantom	0.663	31.31
Side, Low frequency GSM mode Back towards the Phantom (with earphone)	0.659	31.31

SAR Values (GSM 1900MHz Band), Measured against the body.

Temperature: 23.0~23.8°C, humidity: 54~60%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Case	Measurement Result (W/kg)	
	1 g Average (W/kg)	Power level (dBm)
Side, Low frequency GPRS mode Back towards the phantom	0.754	28.96
Side, Middle frequency GPRS mode Back towards the phantom	1.441	29.36
Side, High frequency GPRS mode Back towards the phantom	1.507	29.38

Side, High frequency GPRS mode Keyboard towards the phantom	0.604	29.38
Side, Middle frequency GSM mode Back towards the phantom	0.604	29.4
Side, Middle frequency GSM mode Back towards the Phantom (with earphone)	0.598	29.4

Note: 1. 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)

2. 2. when the SAR procedures require multiple channels to be tested and the 1g SAR for the highest output channel is less than 0.8 W/kg and peak SAR is less than 1.0W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.
3. Power Output test data, please refer to EMC test report.

Annex A Accreditation Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L3572)

China National Accreditation Service for Conformity Assessment has accredited

Morlab Laboratory Shenzhen Morlab Communications Technology Co., Ltd.

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

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

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

Date of Issue: 2008-07-01

Date of Expiry: 2011-06-30

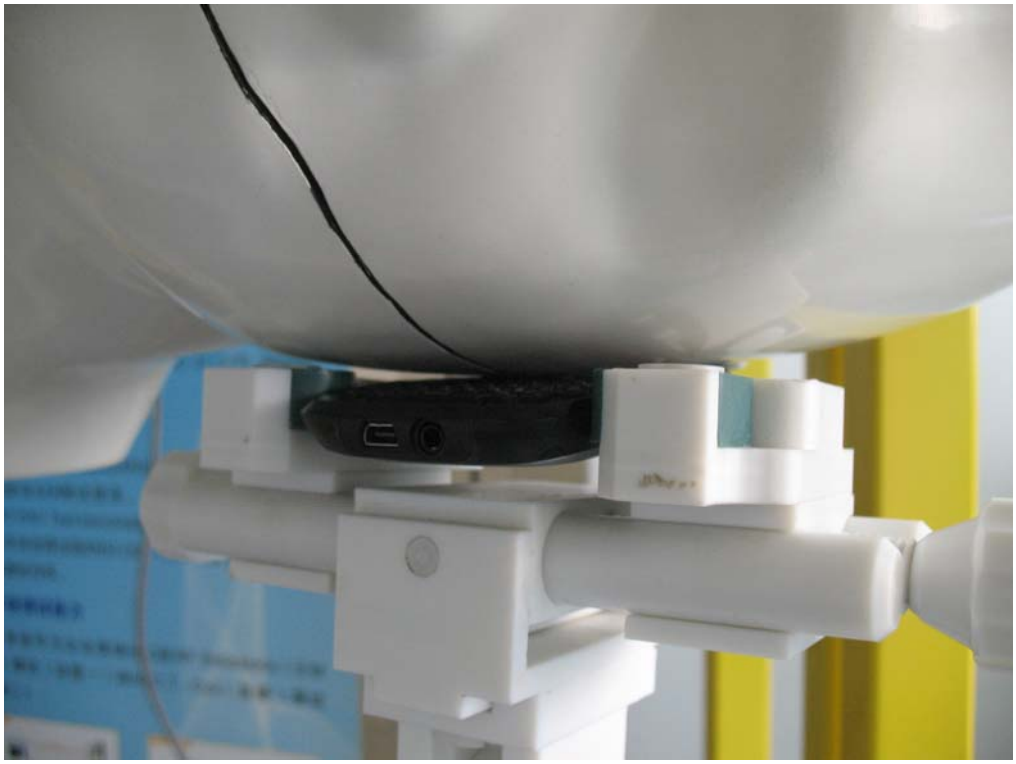
Date of Initial Accreditation: 2008-07-01

Signed on behalf of China National Accreditation Service for Conformity Assessment

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

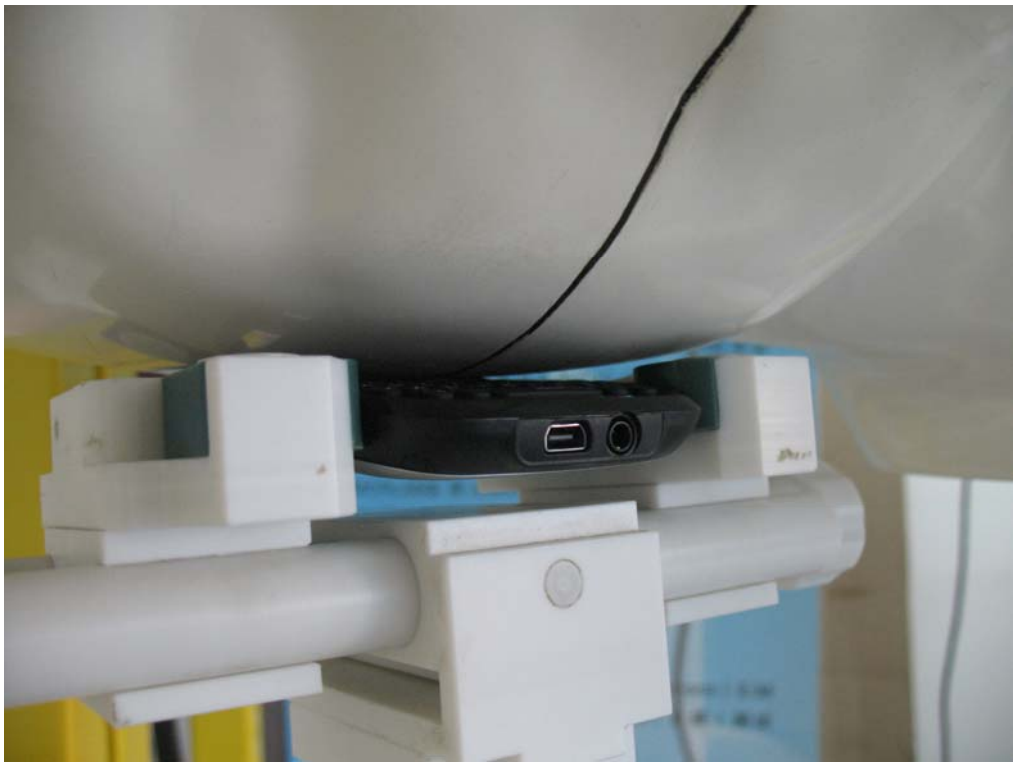
Annex B Photographs of the EUT

1 EUT Left Head Touch Cheek Position



2 EUT Left Head Tilt15 Position

3 EUT Right Head Touch Cheek Position



4 EUT Right Head Tilt15 Position

5 Side Position

6 With Headphone

Annex C Graph Test Results

TYPE	BAND	PARAMETERS
	GSM 8500	Measurement 1: Right Head with Cheek device position on Middle Channel in GSM mode Measurement 2: Right Head with Tilt device position on Middle Channel in GSM mode Measurement 3: Left Head with Cheek device position on Middle Channel in GSM mode Measurement 4: Left Head with Tilt device position on Middle Channel in GSM mode Measurement 5: Validation Plane with Body device position on Low Channel in GPRS mode Measurement 6: Validation Plane with Body device position on Middle Channel in GPRS mode Measurement 7: Validation Plane with Body device position on High Channel in GPRS mode Measurement 8: Validation Plane with Body device position on Low Channel in GPRS mode（back） Measurement 9: Validation Plane with Body device position on Middle Channel in GSM mode Measurement 10: Validation Plane with Body device position on Middle Channel in GSM mode（with earphone）
	GSM 1900	Measurement 11: Right Head with Cheek device position on Middle Channel in GSM mode Measurement 12: Right Head with Tilt device position on Middle Channel in GSM mode Measurement 13: Left Head with Cheek device position on Middle Channel in GSM mode Measurement 14: Left Head with Tilt device position on Middle Channel in GSM mode Measurement 15: Validation Plane with Body device position on Low Channel in GPRS mode Measurement 16: Validation Plane with Body device position on Middle Channel in GPRS mode Measurement 17: Validation Plane with Body device position on High Channel in GPRS mode Measurement 18: Validation Plane with Body device position on Low Channel in GPRS mode（back）

		Measurement 19: Validation Plane with Body device position on Middle Channel in GSM mode Measurement 20: Validation Plane with Body device position on Middle Channel in GSM mode（with earphone）

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: 2/9/2010

Measurement duration: 7 minutes 28 seconds

A. Experimental conditions.

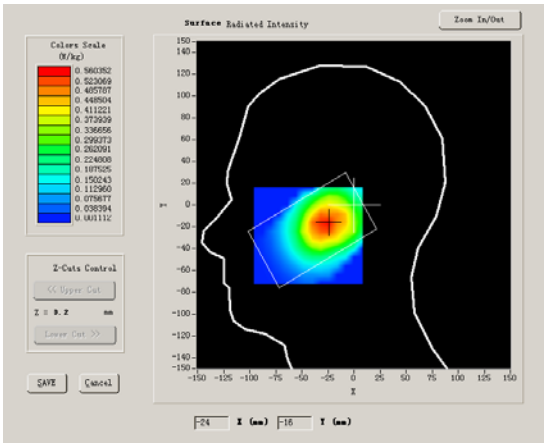
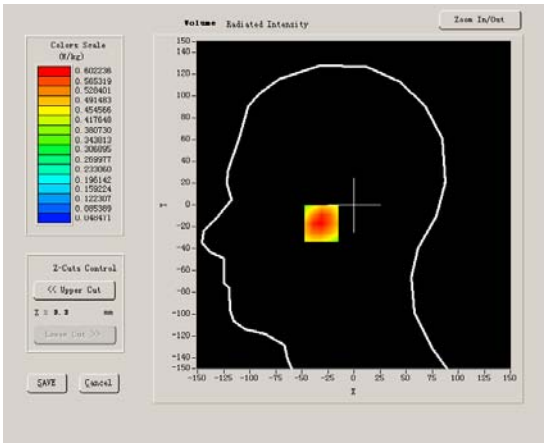
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001

Conductivity (S/m)	0.888655
Variation (%)	1.580000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

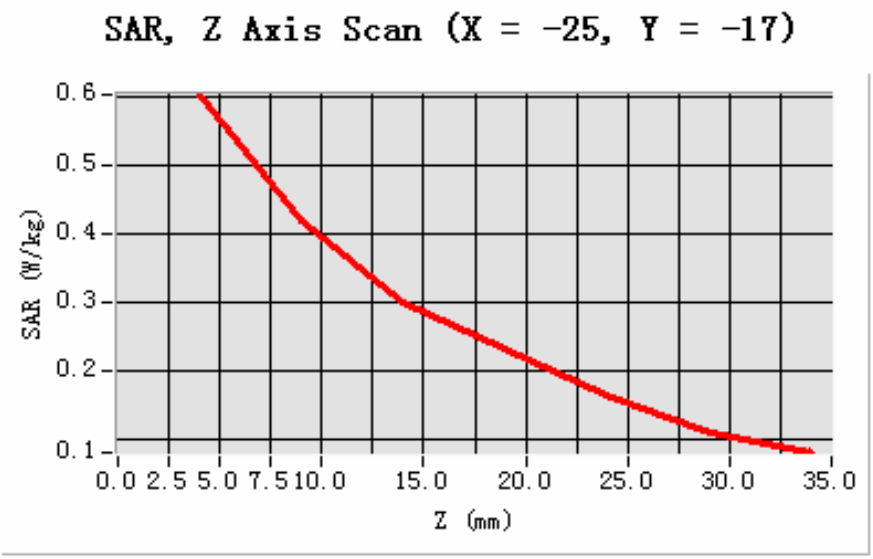
SURFACE SAR	**VOLUME SAR**
	

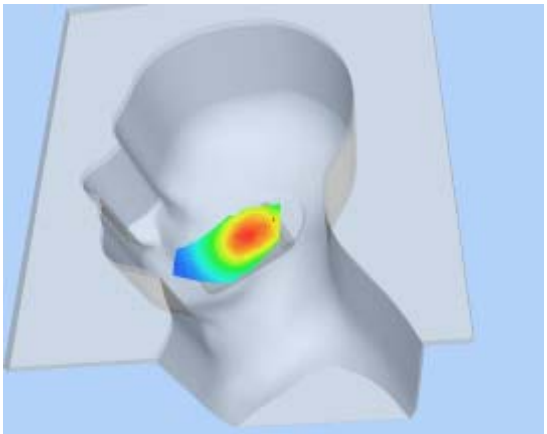
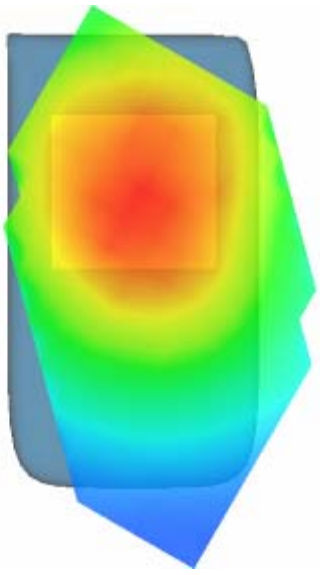
Maximum location: X=-25.00, Y=-17.00

SAR 10g (W/Kg)	0.393569
SAR 1g (W/Kg)	0.585817

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6022	0.4194	0.3011	0.2328	0.1641	0.1122



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: 2/9/2010

Measurement duration: 7 minutes 25 seconds

A. Experimental conditions.

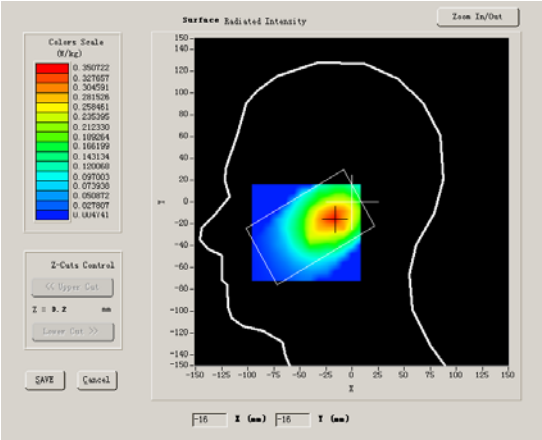
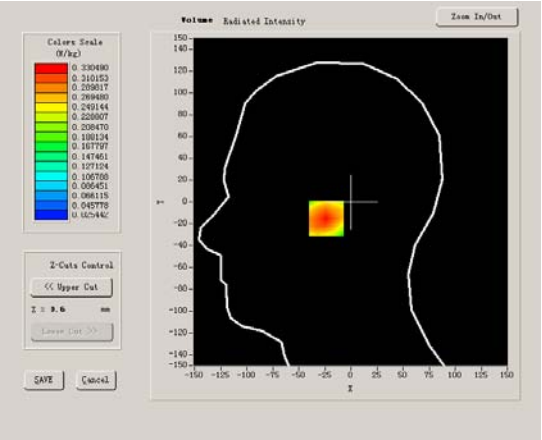
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Tilt
Band	GSM850
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001

Conductivity (S/m)	0.888655
Variation (%)	-3.400000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

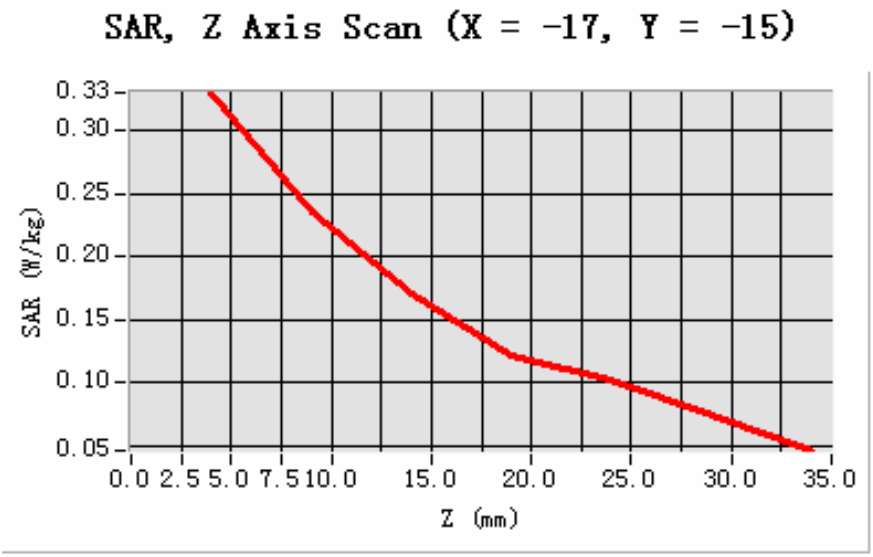
SURFACE SAR	VOLUME SAR
	

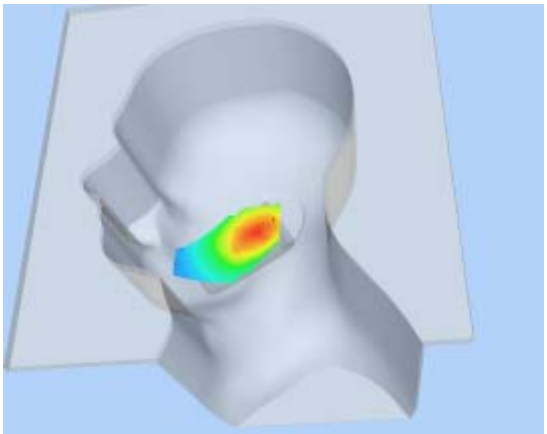
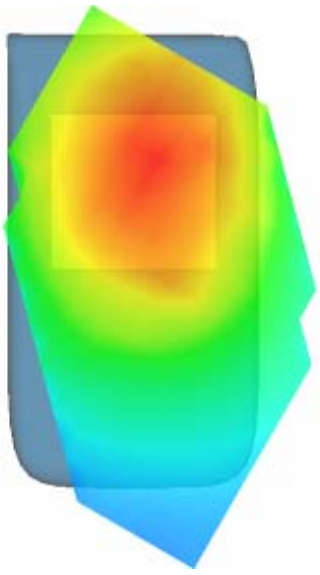
Maximum location: X=-17.00, Y=-15.00

SAR 10g (W/Kg)	0.212969
SAR 1g (W/Kg)	0.313344

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3305	0.2362	0.1714	0.1212	0.1018	0.0746



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: 2/9/2010

Measurement duration: 7 minutes 30 seconds

A. Experimental conditions.

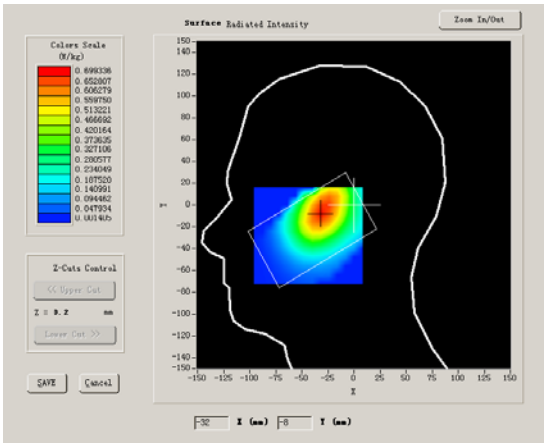
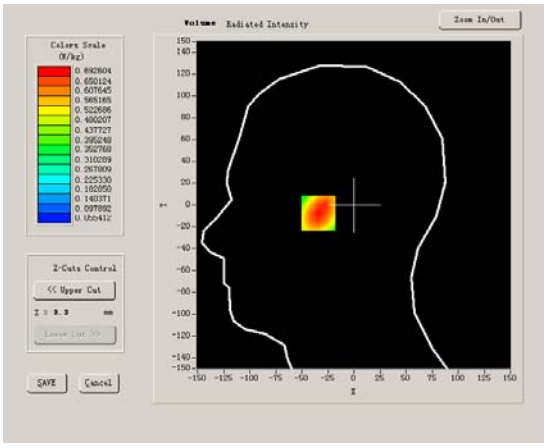
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001

Conductivity (S/m)	0.888655
Variation (%)	-1.060000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

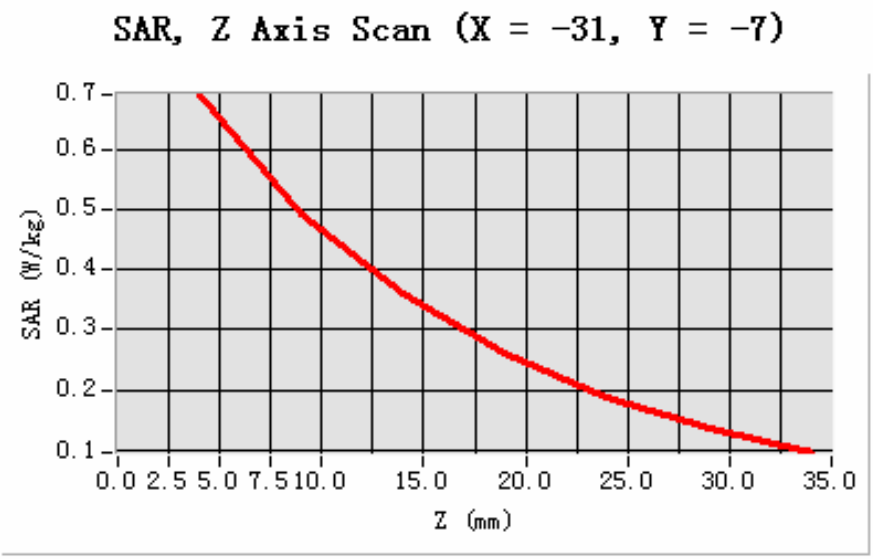
SURFACE SAR	VOLUME SAR
	

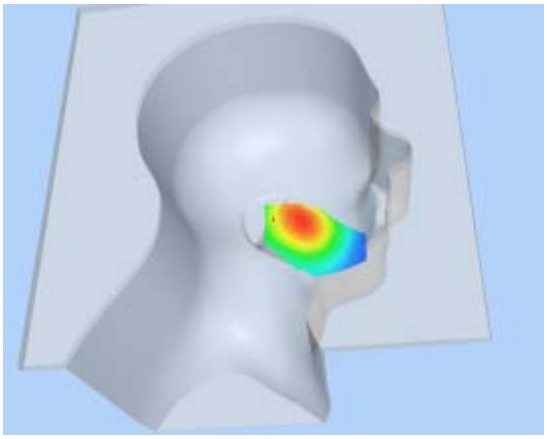
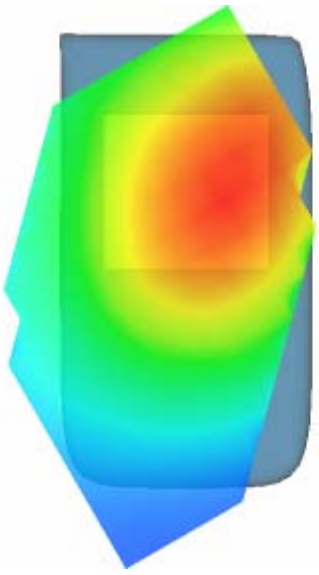
Maximum location: X=-31.00, Y=-7.00

SAR 10g (W/Kg)	0.449252
SAR 1g (W/Kg)	0.659065

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6926	0.4949	0.3618	0.2601	0.1865	0.1345



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: 2/9/2010

Measurement duration: 7 minutes 24 seconds

A. Experimental conditions.

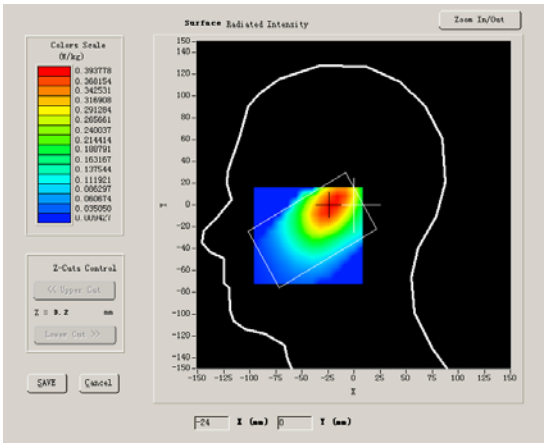
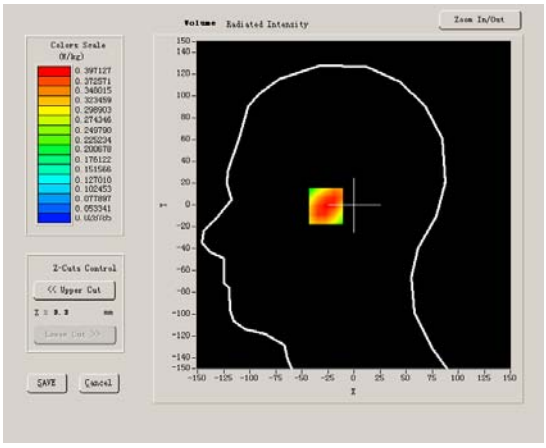
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Tilt
Band	GSM850
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	40.669998
Relative permittivity	19.120001

Conductivity (S/m)	0.888655
Variation (%)	0.290000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

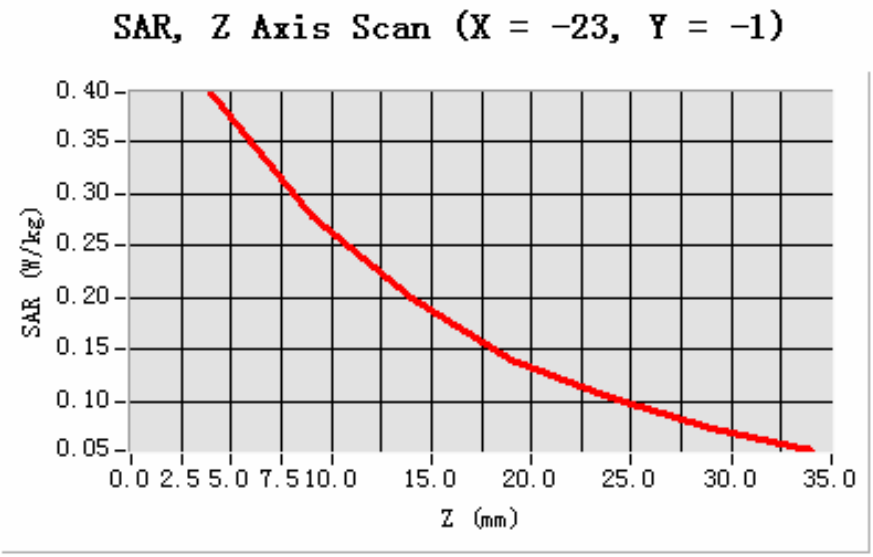
SURFACE SAR	**VOLUME SAR**
	

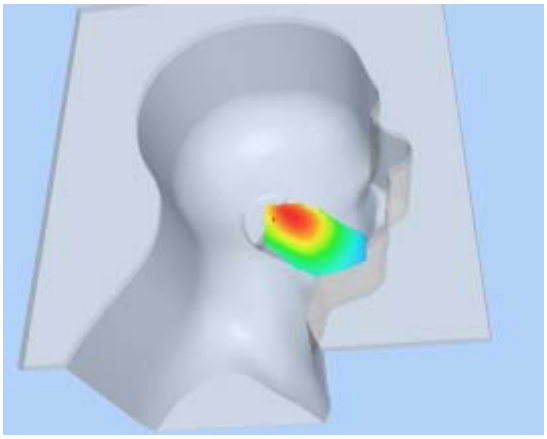
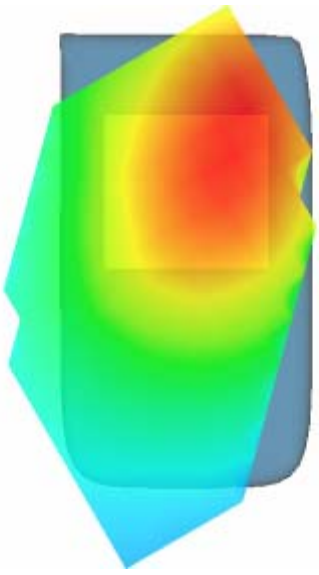
Maximum location: X=-23.00, Y=-1.00

SAR 10g (W/Kg)	0.259469
SAR 1g (W/Kg)	0.383481

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3971	0.2791	0.1997	0.1396	0.1031	0.0734



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: 2/9/2010

Measurement duration: 9 minutes 11 seconds

A. Experimental conditions.

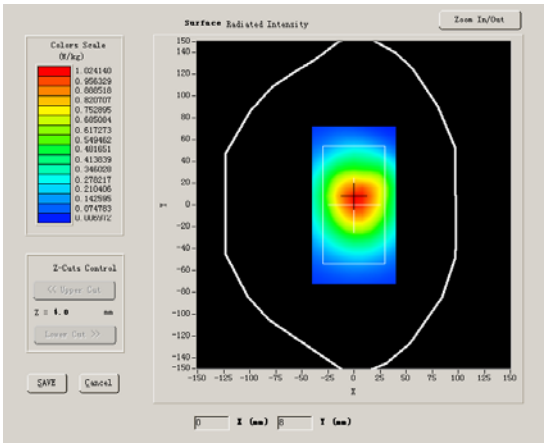
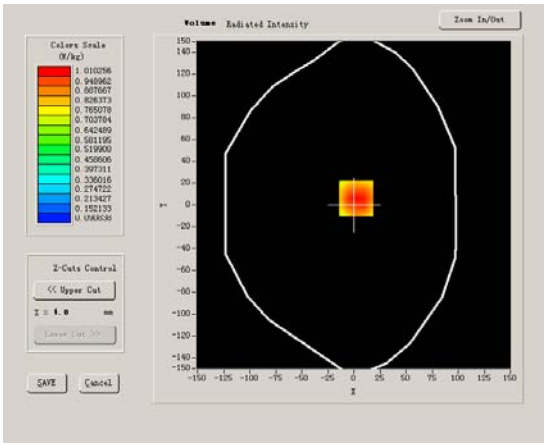
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550

Conductivity (S/m)	0.974596
Variation (%)	-1.570000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:2

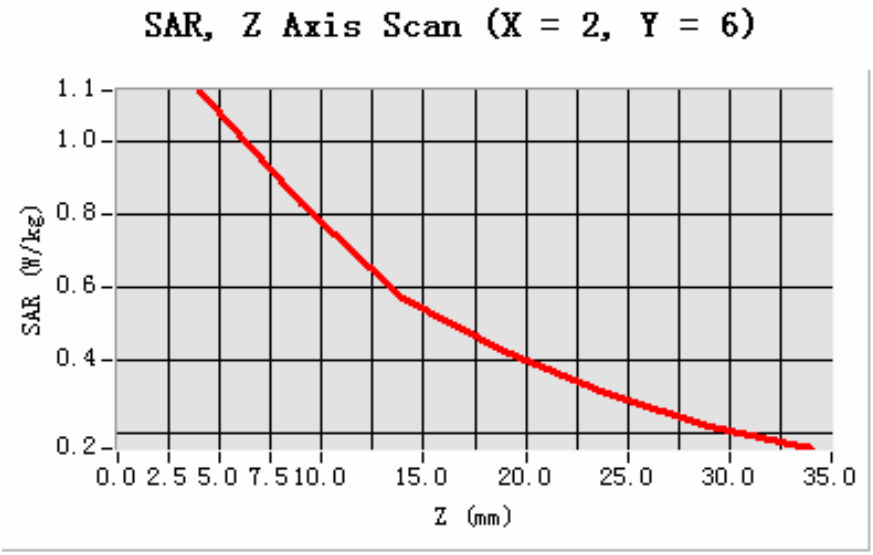
SURFACE SAR	**VOLUME SAR**
	

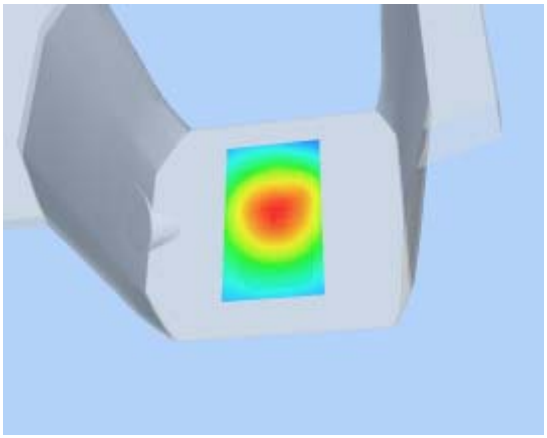
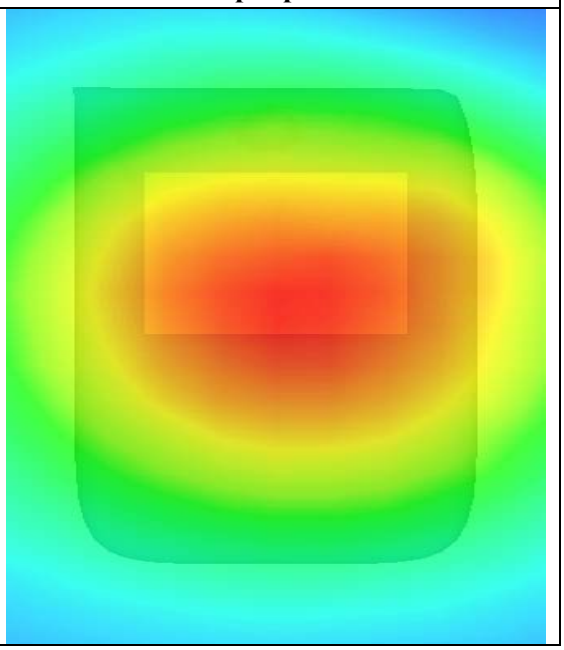
Maximum location: X=2.00, Y=6.00

SAR 10g (W/Kg)	0.751211
SAR 1g (W/Kg)	1.092688

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.1361	0.8291	0.5699	0.4251	0.3058	0.2166



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: 2/9/2010

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

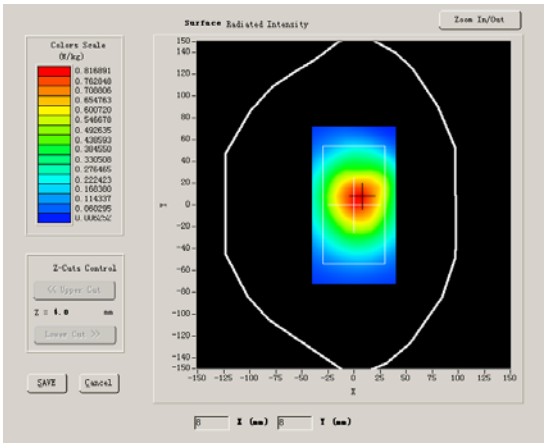
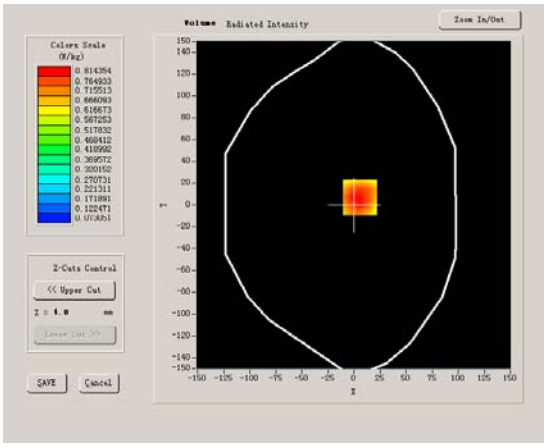
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 190):

Frequency (MHz)	836.599976
Relative permittivity (real part)	55.709999
Relative permittivity	21.709999

Conductivity (S/m)	1.009033
Variation (%)	-0.050000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:2

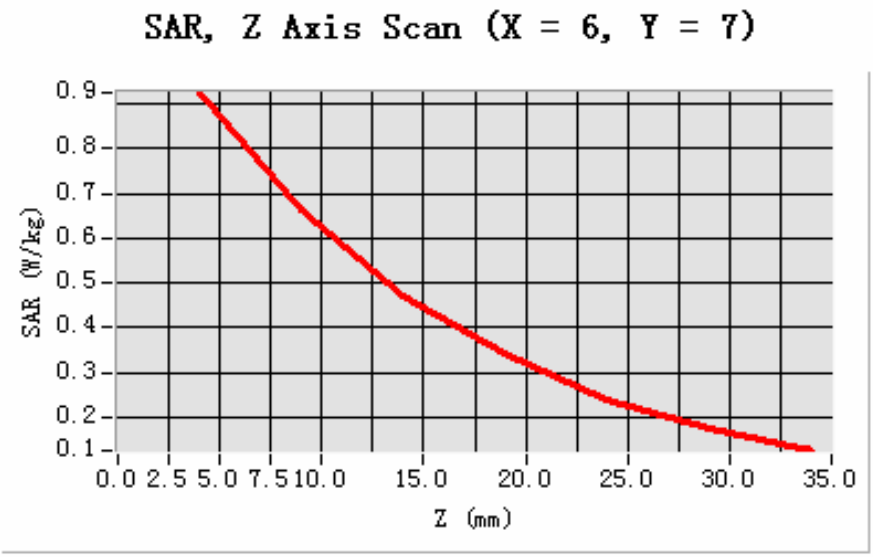
SURFACE SAR	**VOLUME SAR**
	

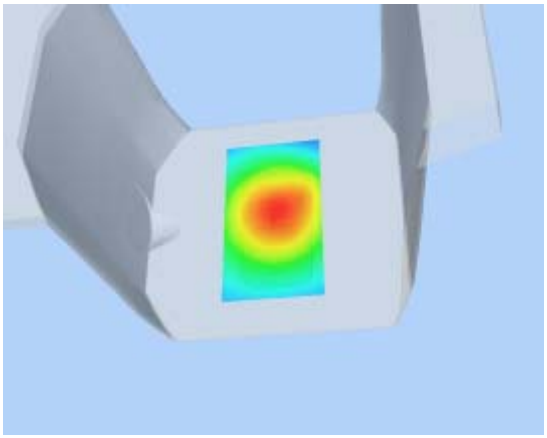
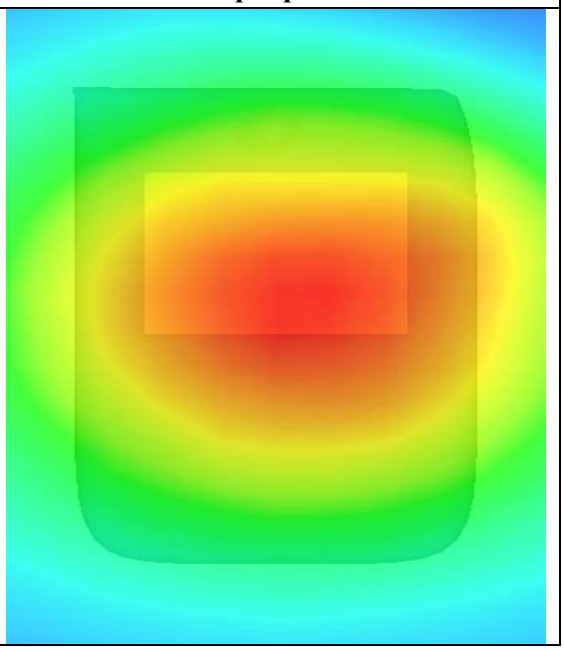
Maximum location: X=6.00, Y=7.00

SAR 10g (W/Kg)	0.618651
SAR 1g (W/Kg)	0.901317

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9247	0.6626	0.4727	0.3433	0.2403	0.1763



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: 2/9/2010

Measurement duration: 9 minutes 9 seconds

A. Experimental conditions.

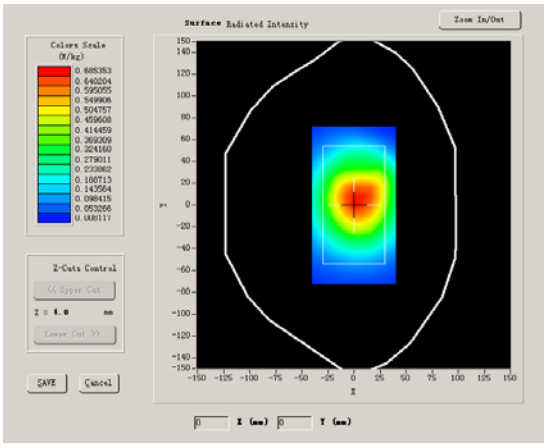
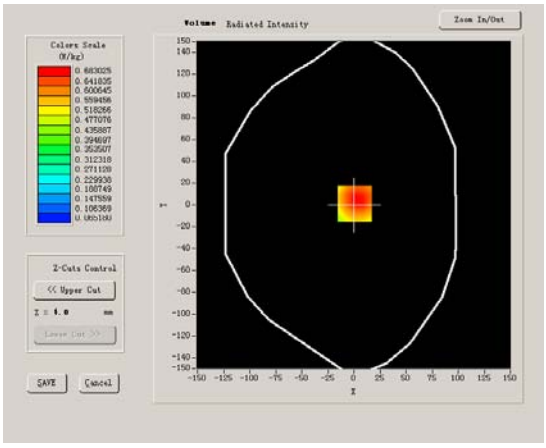
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GPRS

B. SAR Measurement Results

Higher Band SAR (Channel 251):

Frequency (MHz)	848.799988
Relative permittivity (real part)	54.014999
Relative permittivity	21.332850

Conductivity (S/m)	1.005962
Variation (%)	-2.500000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:2

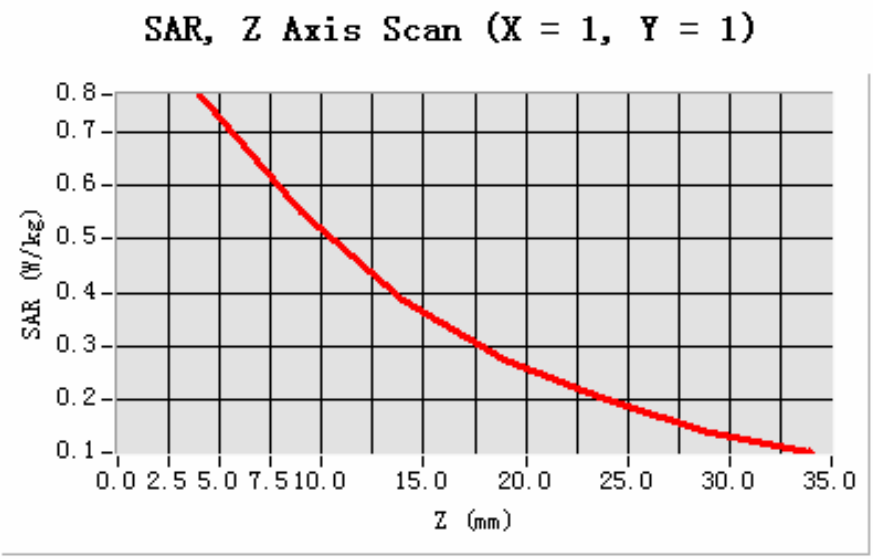
SURFACE SAR	VOLUME SAR
	

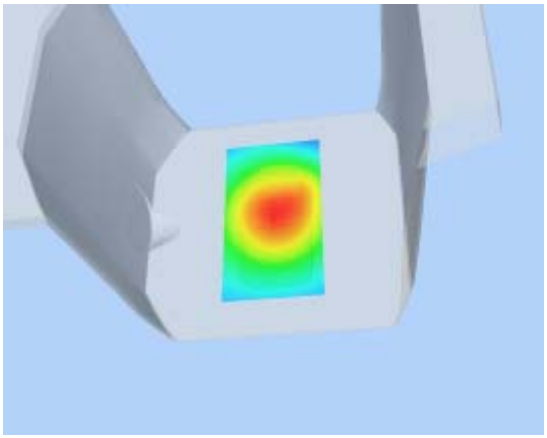
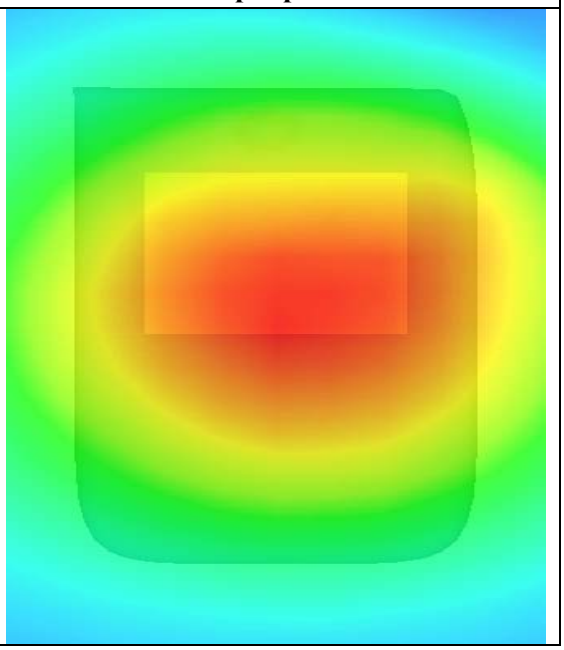
Maximum location: X=1.00, Y=1.00

SAR 10g (W/Kg)	0.512692
SAR 1g (W/Kg)	0.754933

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7682	0.5487	0.3879	0.2748	0.2009	0.1397



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: 2/9/2010

Measurement duration: 9 minutes 6 seconds

A. Experimental conditions.

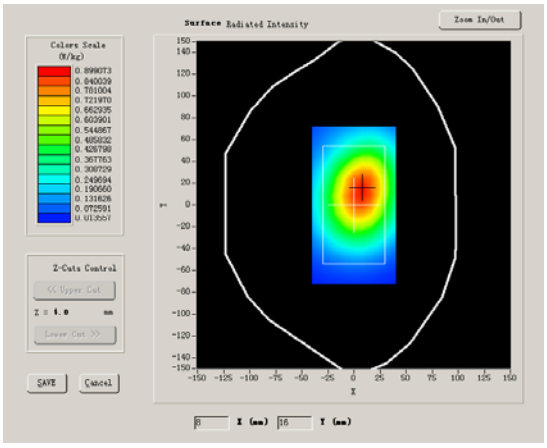
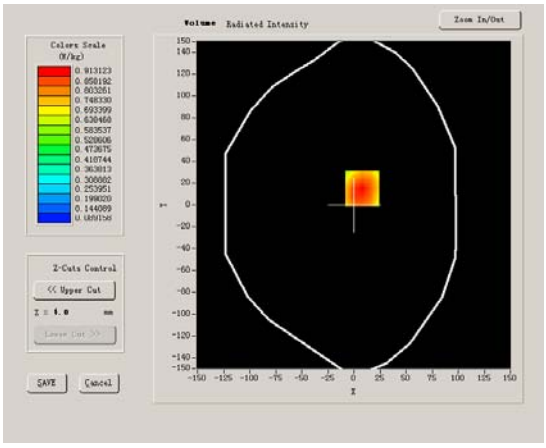
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550

Conductivity (S/m)	0.974596
Variation (%)	0.160000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:2

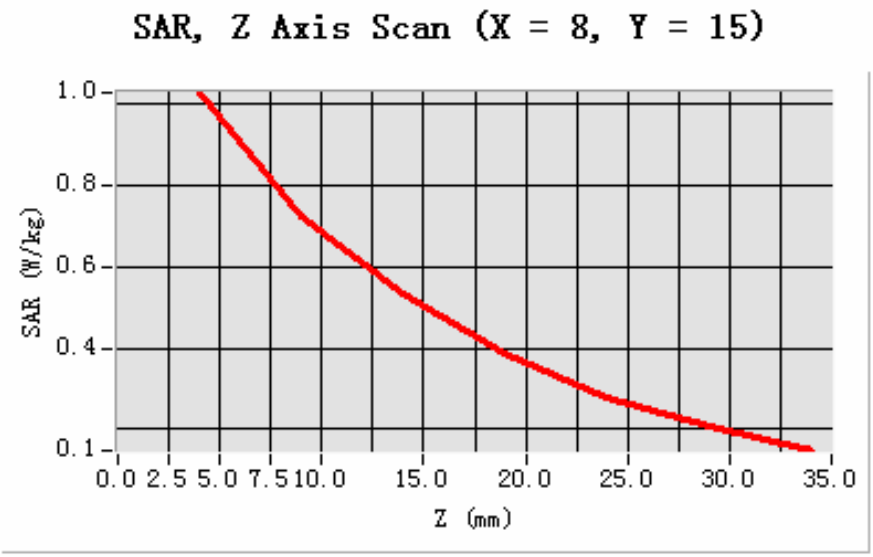
SURFACE SAR	VOLUME SAR
	

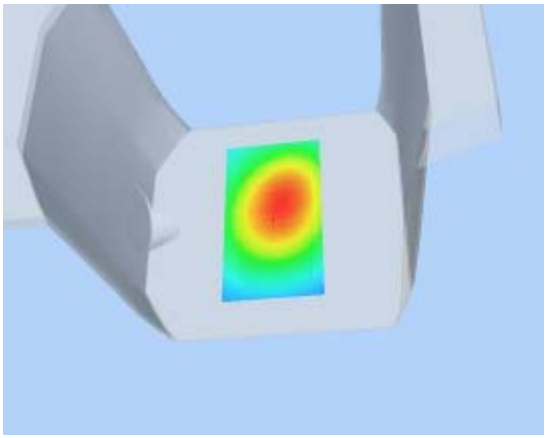
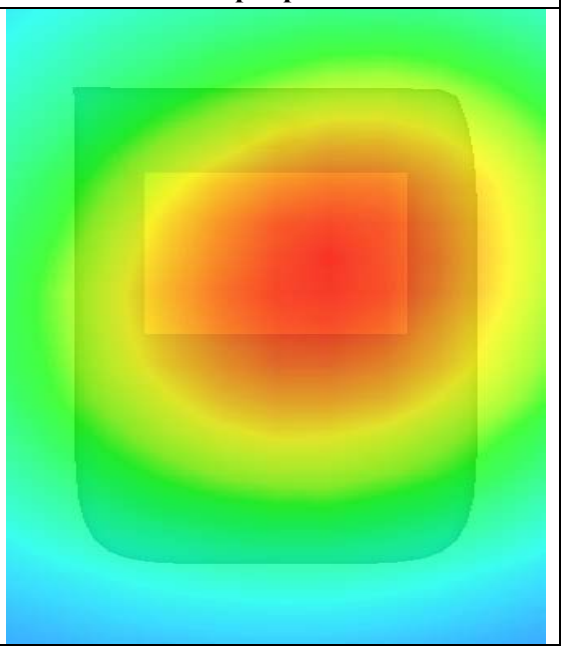
Maximum location: X=8.00, Y=15.00

SAR 10g (W/Kg)	0.684803
SAR 1g (W/Kg)	0.989794

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0269	0.7238	0.5337	0.3881	0.2773	0.2079



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: 3/9/2010

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

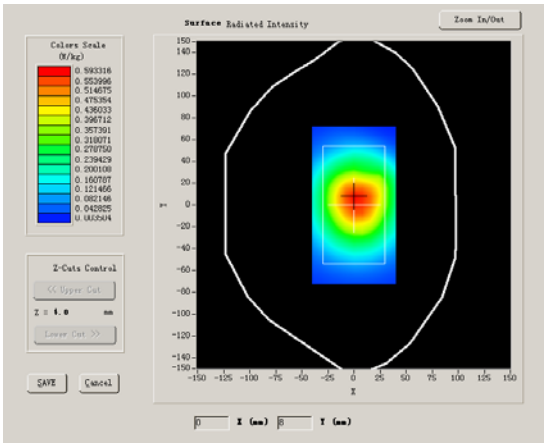
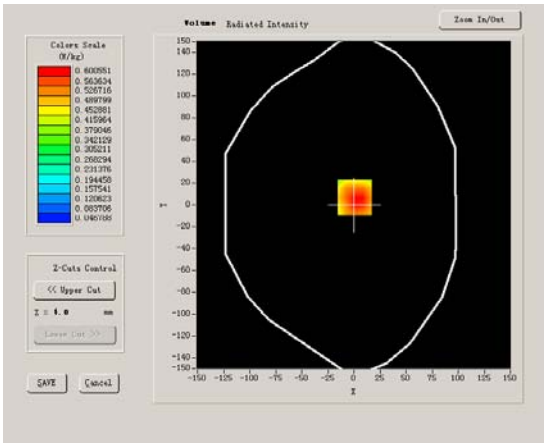
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GSM

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550

Conductivity (S/m)	0.974596
Variation (%)	0.350000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

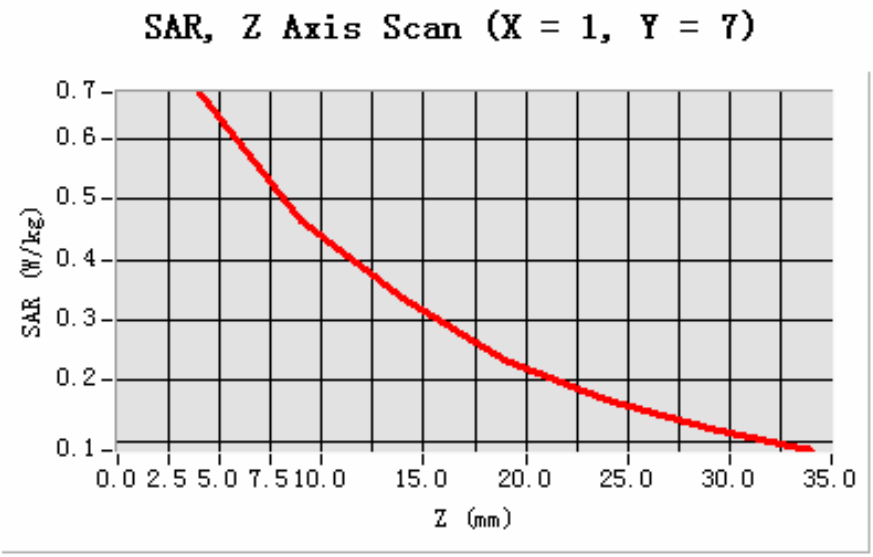
SURFACE SAR	**VOLUME SAR**
	

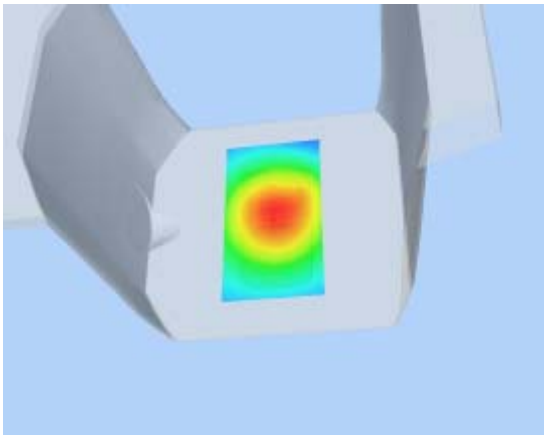
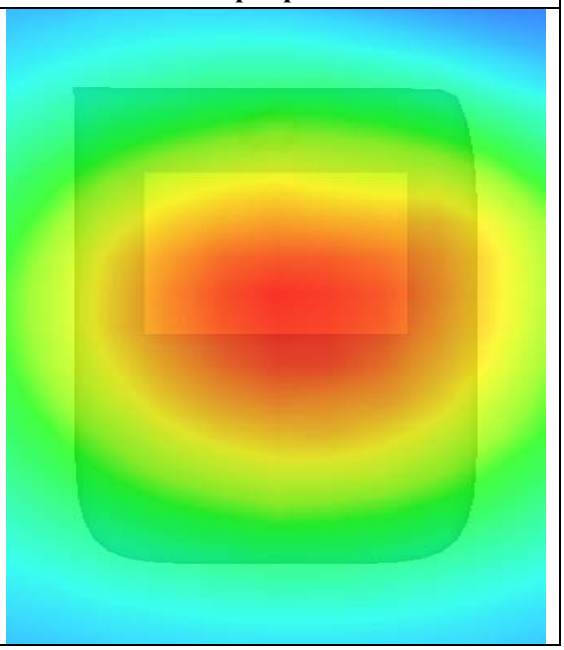
Maximum location: X=1.00, Y=7.00

SAR 10g (W/Kg)	0.444945
SAR 1g (W/Kg)	0.662991

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6754	0.4634	0.3350	0.2338	0.1674	0.1219



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: 3/9/2010

Measurement duration: 9 minutes 10 seconds

A. Experimental conditions.

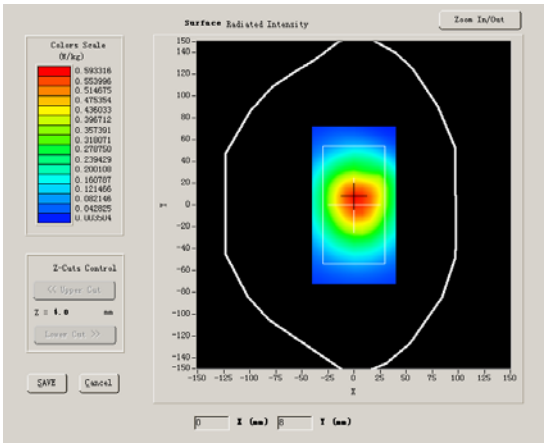
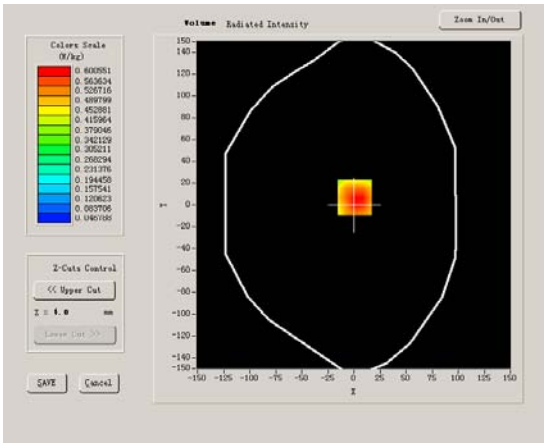
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GSM

B. SAR Measurement Results

Lower Band SAR (Channel 128):

Frequency (MHz)	824.200012
Relative permittivity (real part)	54.116001
Relative permittivity	21.284550

Conductivity (S/m)	0.974596
Variation (%)	0.350000
Ambient Temperature:	22.2°C
Liquid Temperature:	22.1°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:8

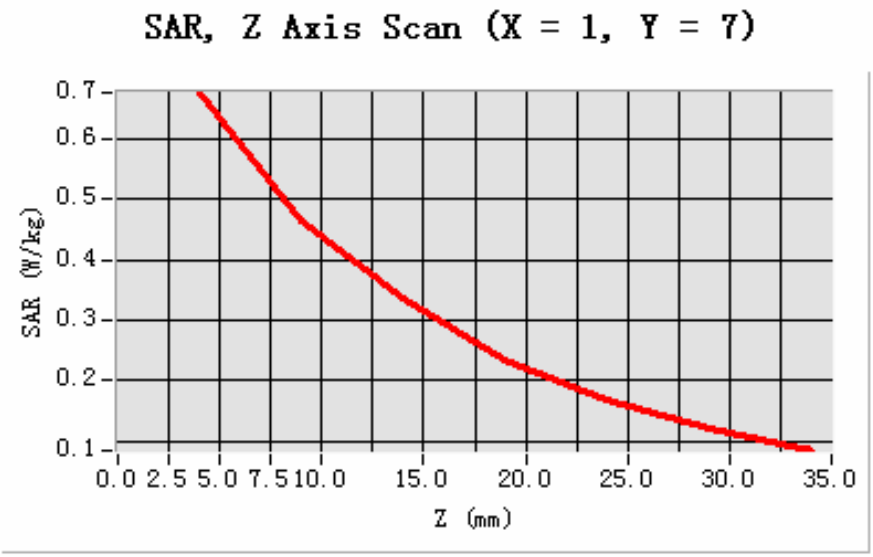
SURFACE SAR	**VOLUME SAR**
	

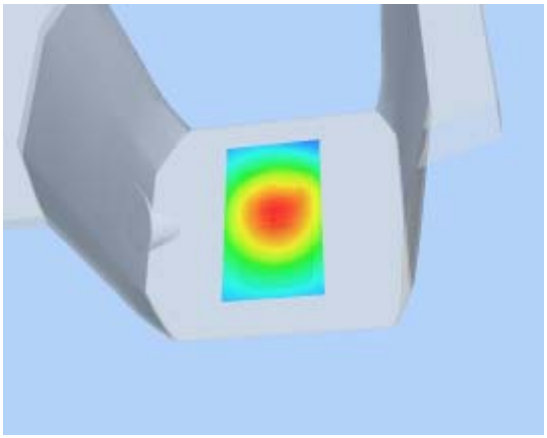
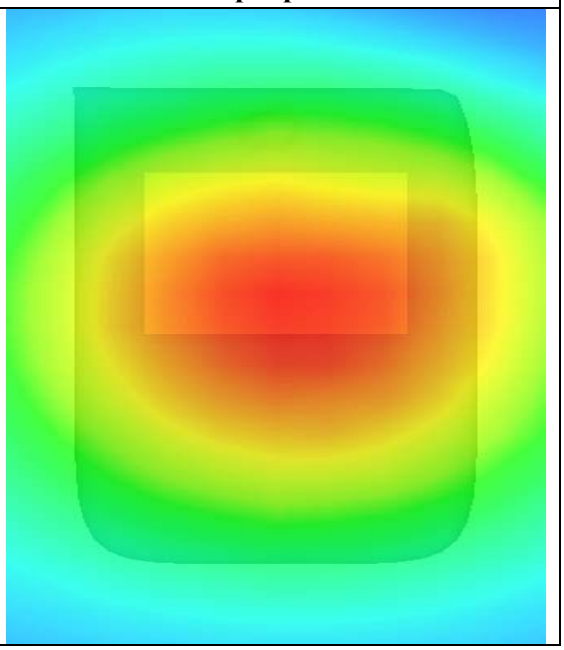
Maximum location: X=1.00, Y=7.00

SAR 10g (W/Kg)	0.431663
SAR 1g (W/Kg)	0.659476

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6754	0.4634	0.3350	0.2338	0.1674	0.1219



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: 8/9/2010

Measurement duration: 7 minutes 26 seconds

A. Experimental conditions.

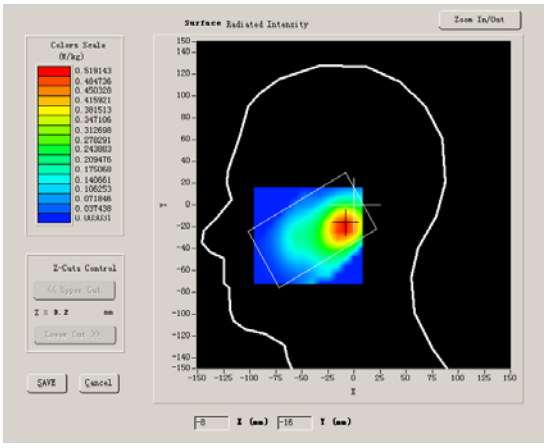
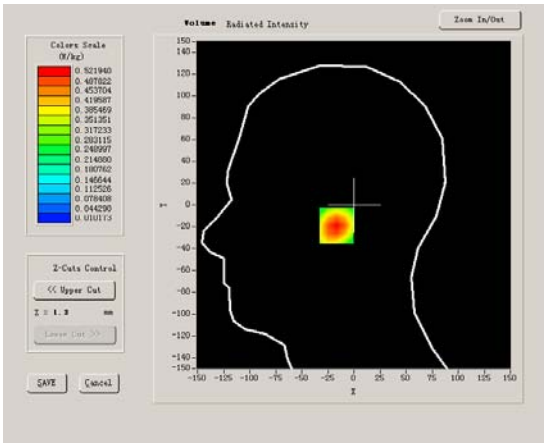
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Lower Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.993999
Relative permittivity	12.991650

Conductivity (S/m)	1.335397
Variation (%)	0.240000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

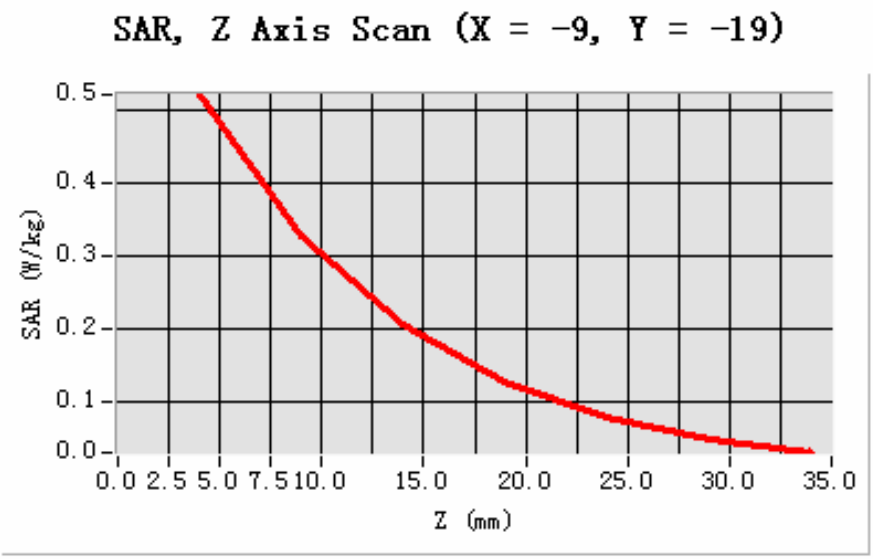
SURFACE SAR	VOLUME SAR
	

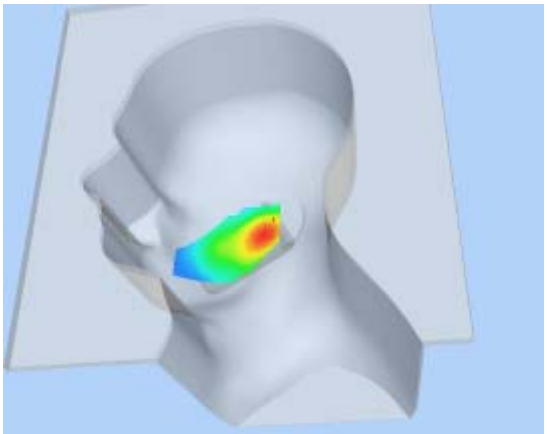
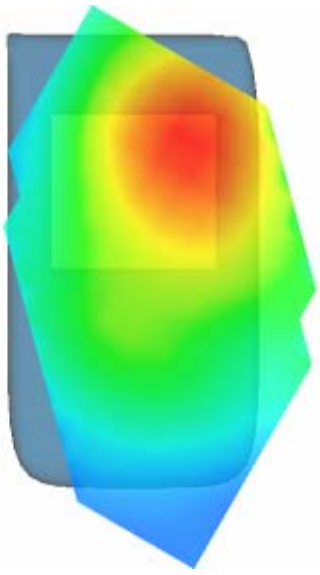
Maximum location: X=-9.00, Y=-19.00

SAR 10g (W/Kg)	0.300421
SAR 1g (W/Kg)	0.699582

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5219	0.3281	0.2069	0.1297	0.0803	0.0503



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: 8/9/2010

Measurement duration: 7 minutes 24 seconds

A. Experimental conditions.

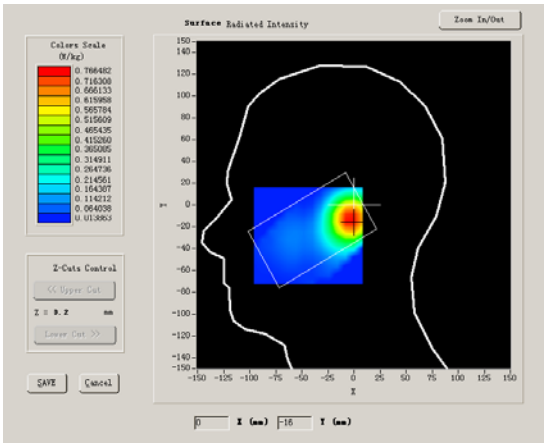
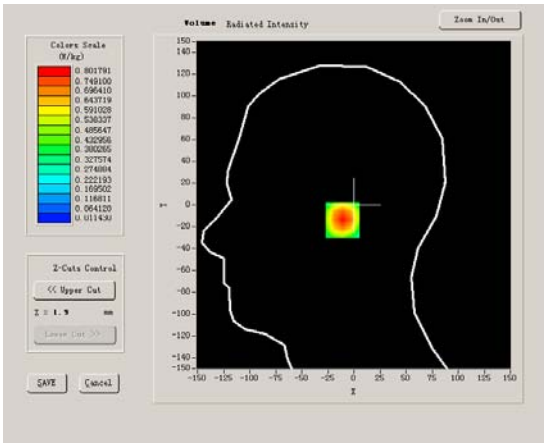
Phantom File	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Tilt
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000

Conductivity (S/m)	1.436111
Variation (%)	-0.370000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

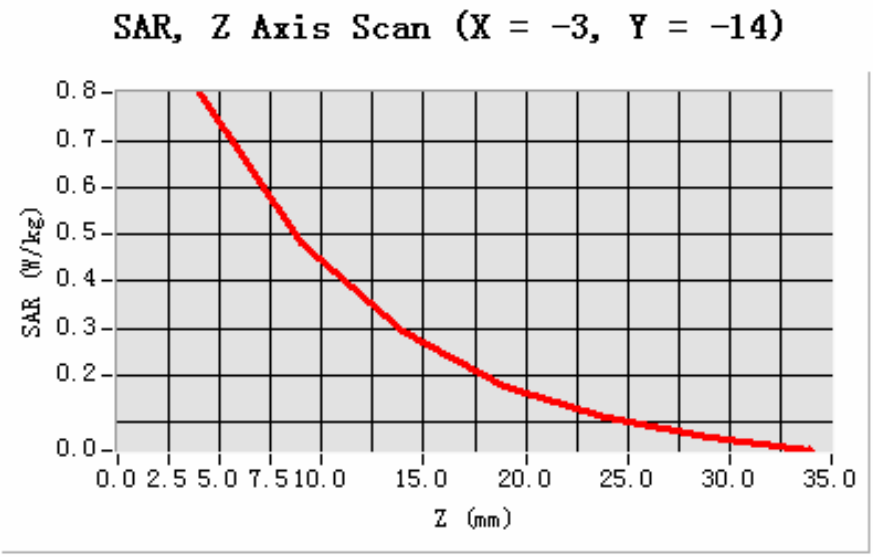
SURFACE SAR	**VOLUME SAR**
	

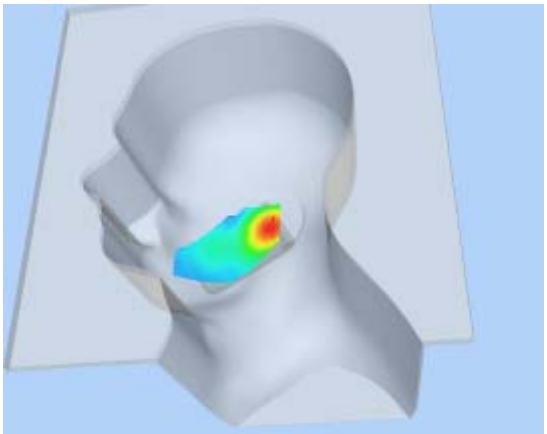
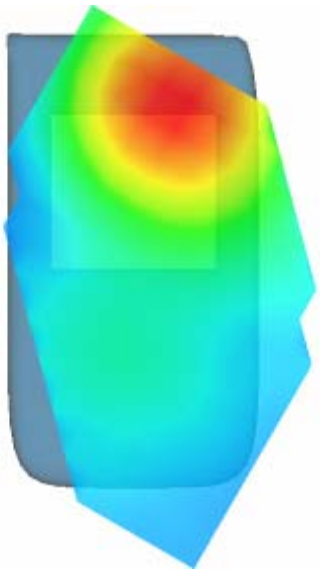
Maximum location: X=-3.00, Y=-14.00

SAR 10g (W/Kg)	0.341686
SAR 1g (W/Kg)	0.660843

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8018	0.4810	0.2963	0.1757	0.1091	0.0671



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: 8/9/2010

Measurement duration: 7 minutes 26 seconds

A. Experimental conditions.

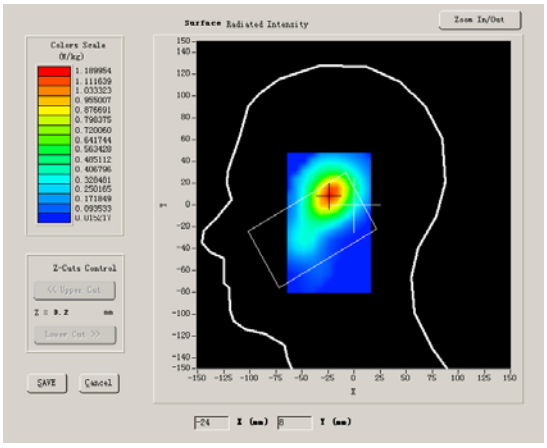
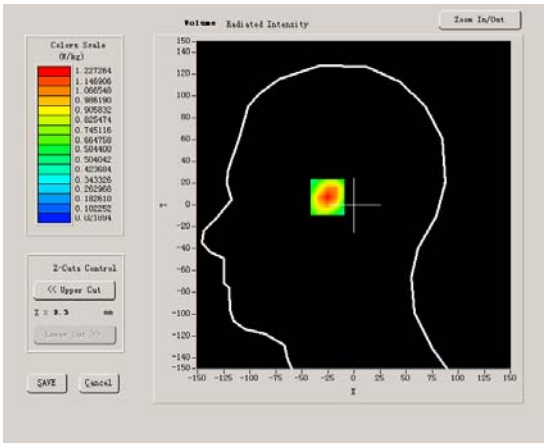
Phantom File	zinf3.txt
Phantom	Left head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000

Conductivity (S/m)	1.436111
Variation (%)	0.280000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

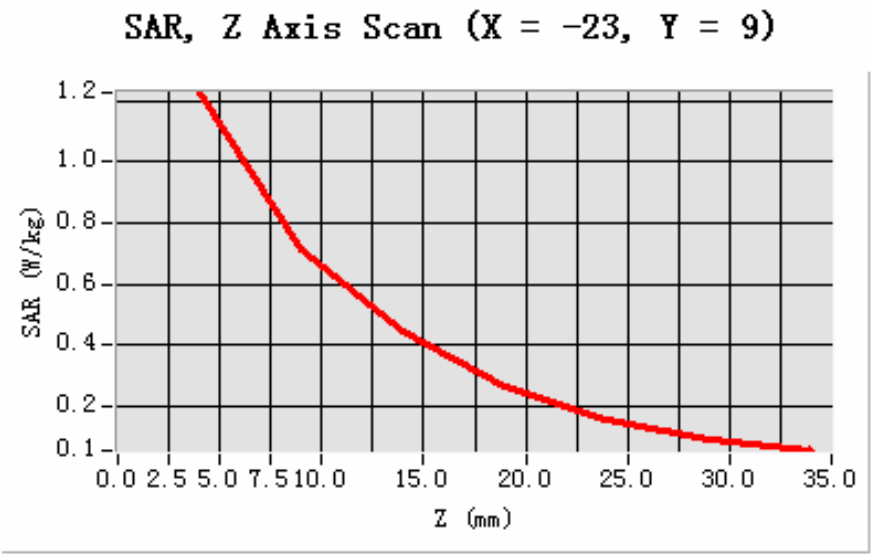
SURFACE SAR	VOLUME SAR
	

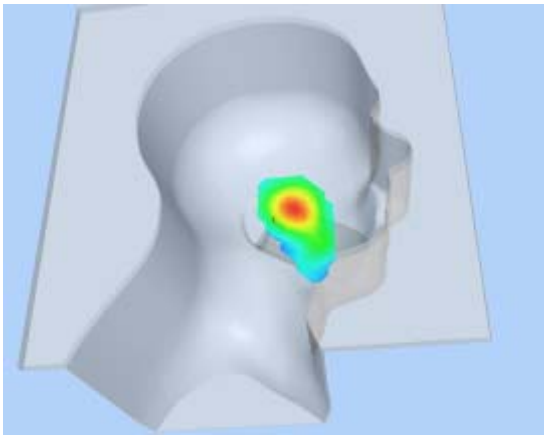
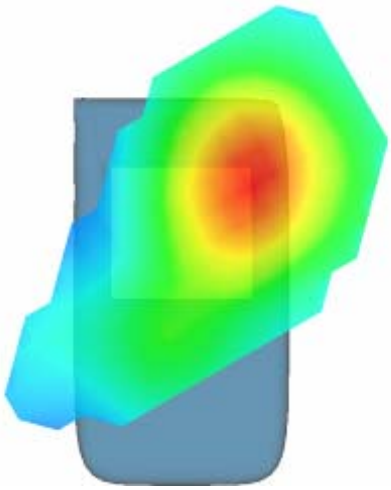
Maximum location: X=-23.00, Y=9.00

SAR 10g (W/Kg)	0.354873
SAR 1g (W/Kg)	0.758629

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.2273	0.7134	0.4467	0.2653	0.1611	0.0945



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: 8/9/2010

Measurement duration: 7 minutes 26 seconds

A. Experimental conditions.

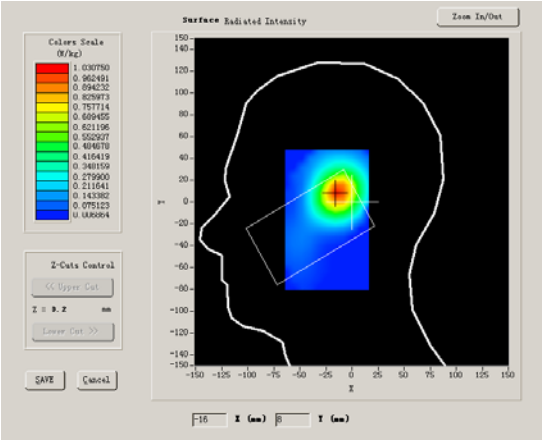
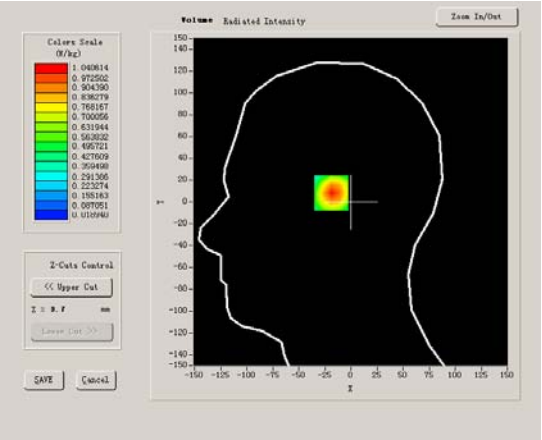
Phantom File	zinf3.txt
Phantom	Left head
Device Position	Tilt
Band	GSM1900
Channels	Middle
Signal	GSM

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.509998
Relative permittivity	13.750000

Conductivity (S/m)	1.436111
Variation (%)	-0.700000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

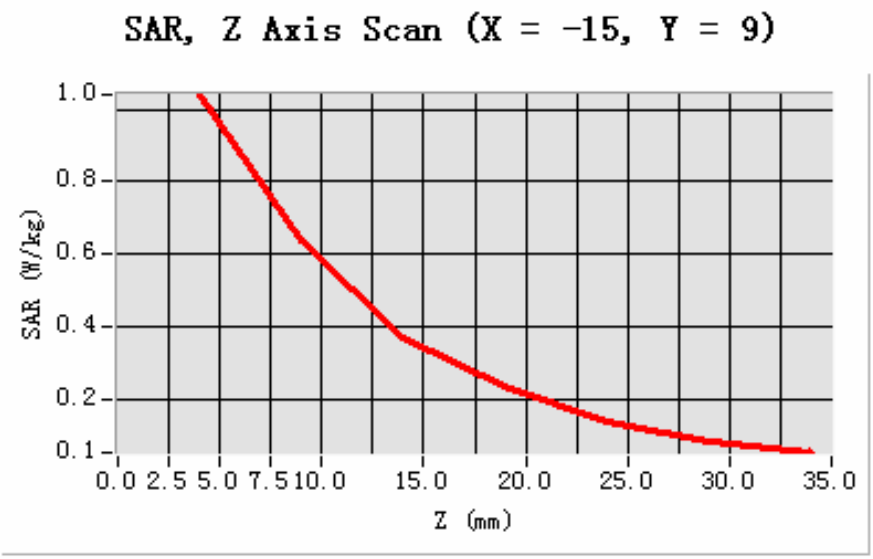
SURFACE SAR	VOLUME SAR
	

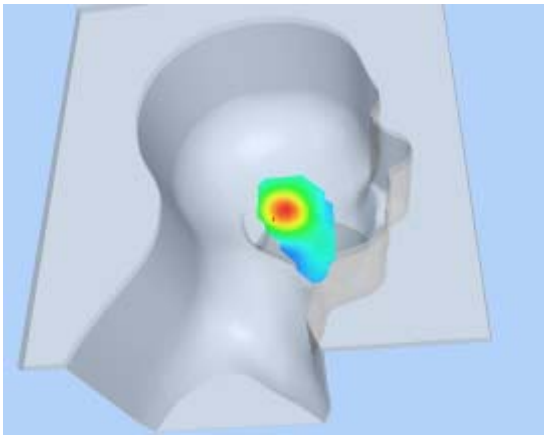
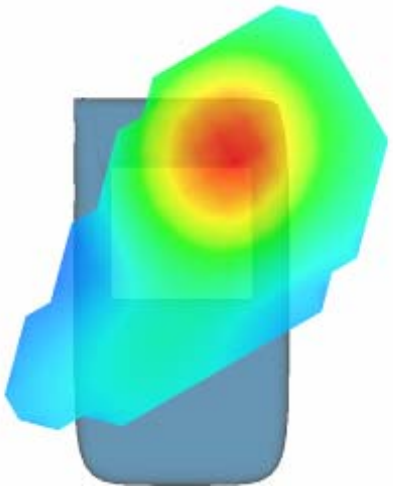
Maximum location: X=-15.00, Y=9.00

SAR 10g (W/Kg)	0.326451
SAR 1g (W/Kg)	0.674273

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0406	0.6395	0.3691	0.2329	0.1366	0.0825



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: 2/9/2010

Measurement duration: 9 minutes 4 seconds

A. Experimental conditions.

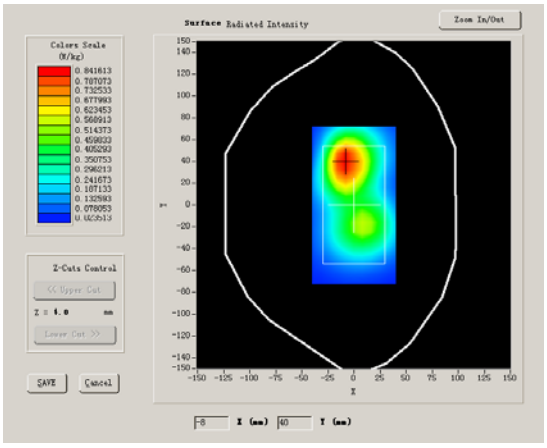
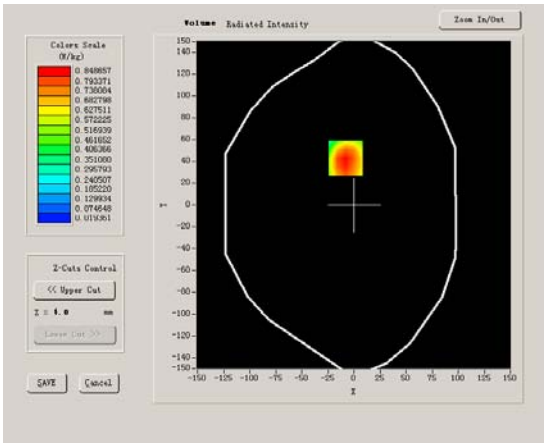
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GPRS

B. SAR Measurement Results

Lower Band SAR (Channel 512):

Frequency (MHz)	1850.199951
Relative permittivity (real part)	51.540001
Relative permittivity	12.000000

Conductivity (S/m)	1.233467
Variation (%)	0.600000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:2

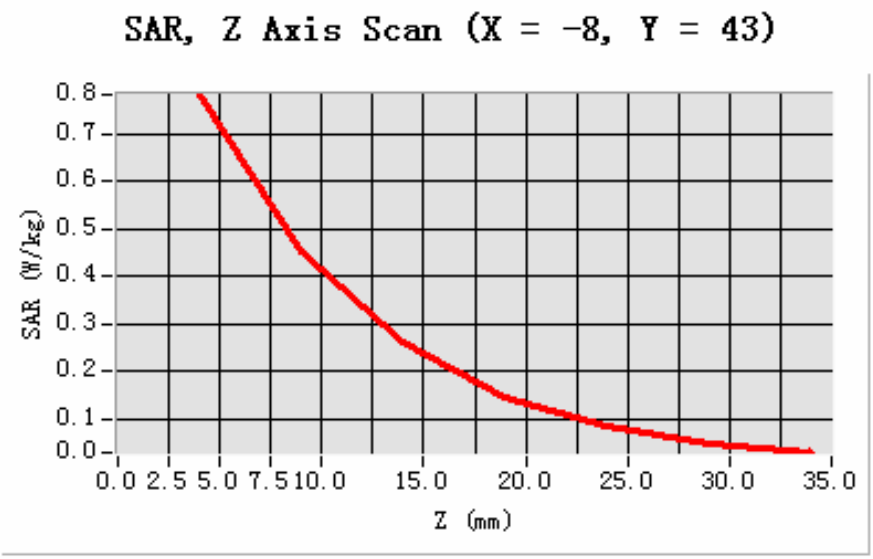
SURFACE SAR	**VOLUME SAR**
	

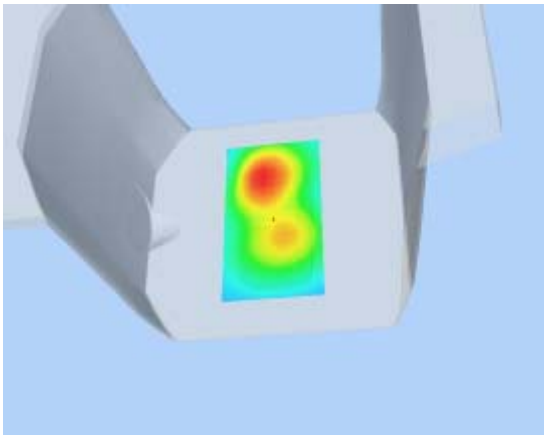
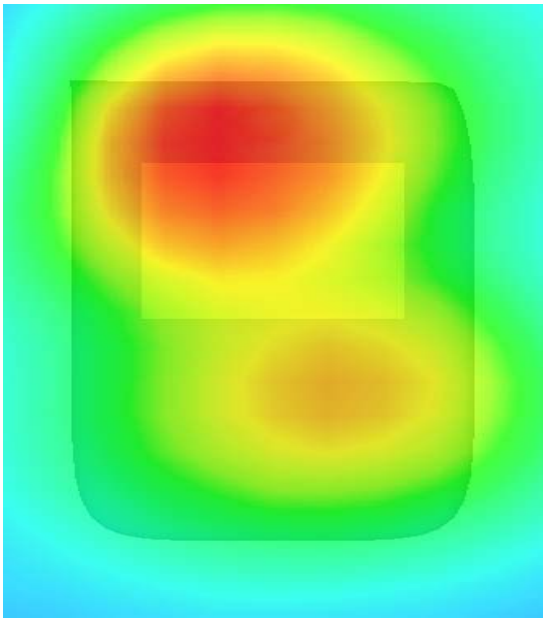
Maximum location: X=-8.00, Y=43.00

SAR 10g (W/Kg)	0.437562
SAR 1g (W/Kg)	0.753883

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7839	0.4511	0.2603	0.1478	0.0852	0.0499



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: 2/9/2010

Measurement duration: 9 minutes 4 seconds

A. Experimental conditions.

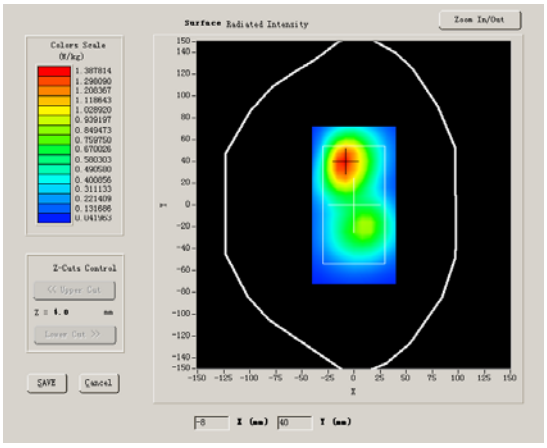
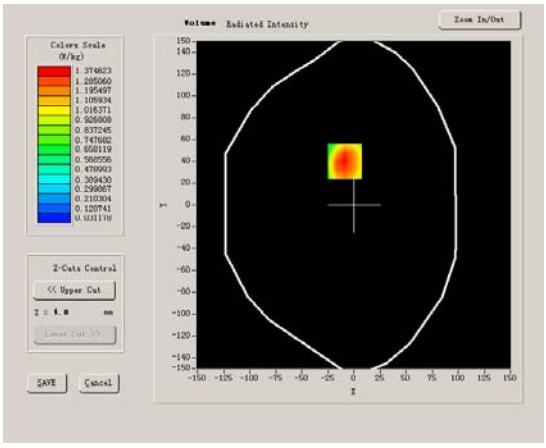
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GPRS

B. SAR Measurement Results

Middle Band SAR (Channel 661):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	51.540001
Relative permittivity	15.070000

Conductivity (S/m)	1.573978
Variation (%)	-0.700000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:2

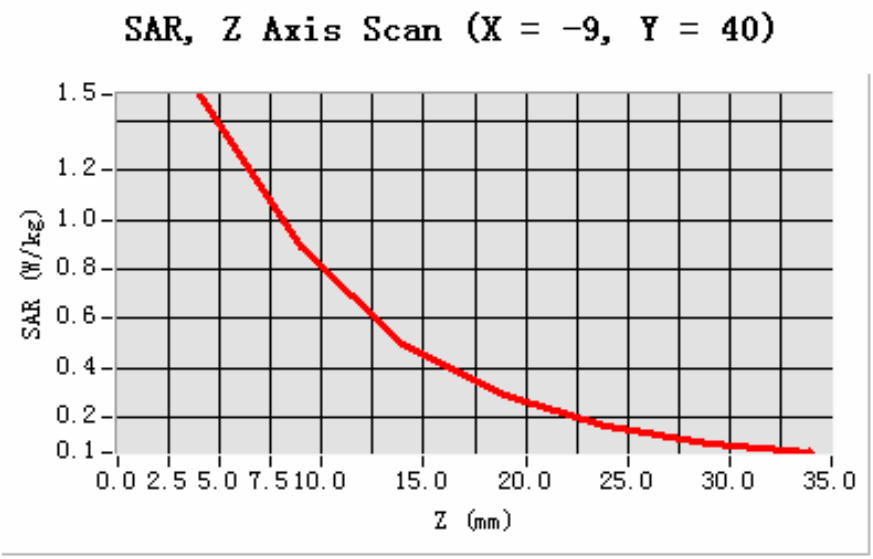
SURFACE SAR	**VOLUME SAR**
	

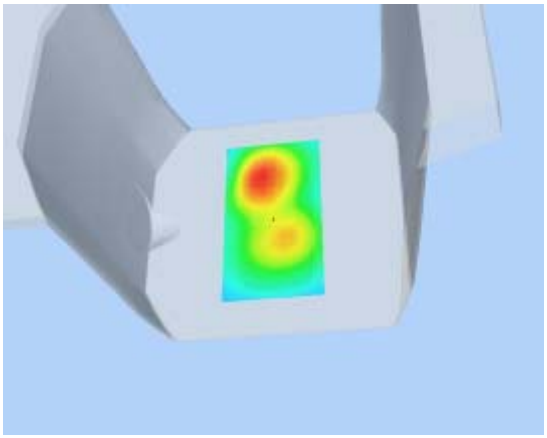
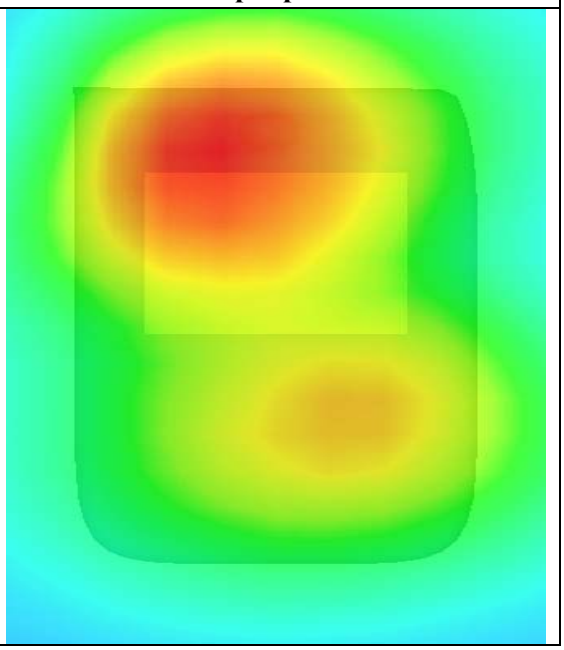
Maximum location: X=-9.00, Y=40.00

SAR 10g (W/Kg)	0.831903
SAR 1g (W/Kg)	1.441455

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.5066	0.8847	0.4984	0.2893	0.1635	0.0967



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: 2/9/2010

Measurement duration: 9 minutes 8 seconds

A. Experimental conditions.

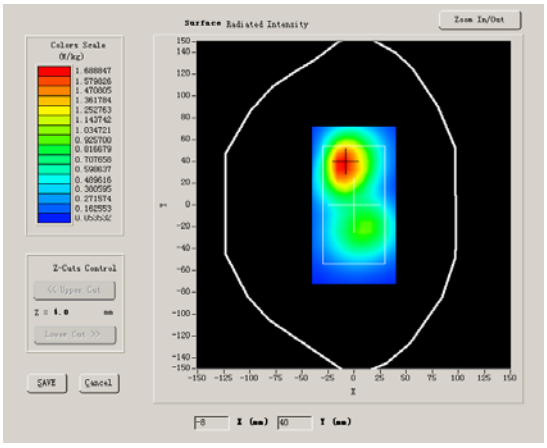
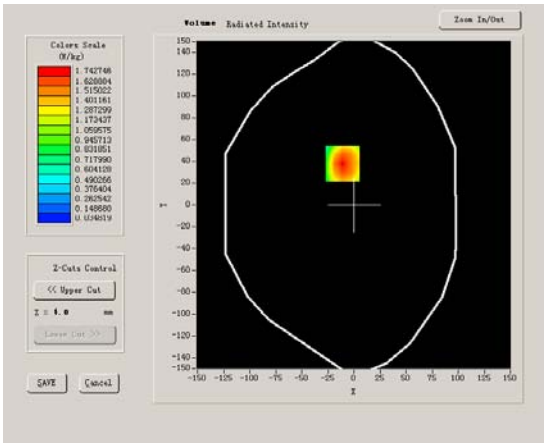
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GPRS

B. SAR Measurement Results

Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	51.540001
Relative permittivity	12.000000

Conductivity (S/m)	1.273200
Variation (%)	0.290000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:2

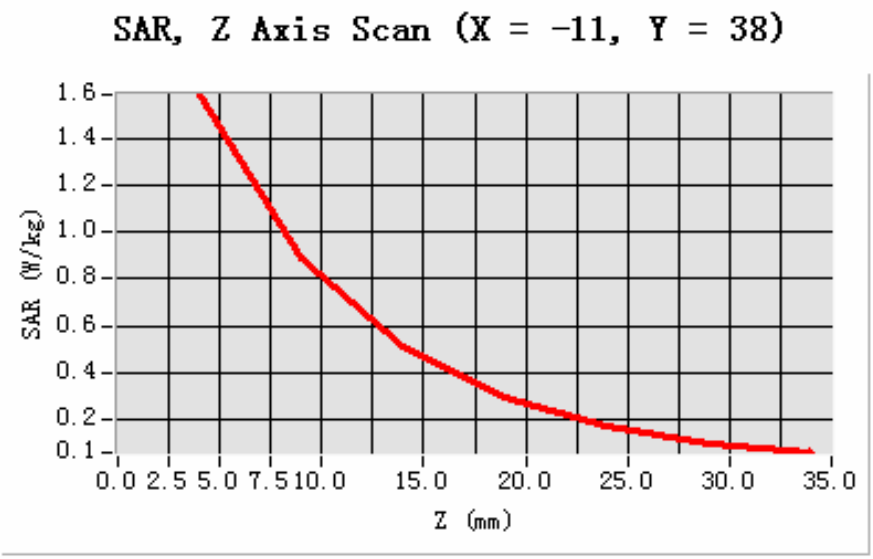
SURFACE SAR	**VOLUME SAR**
	

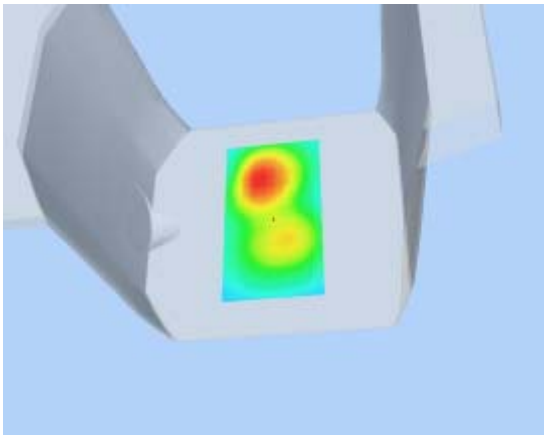
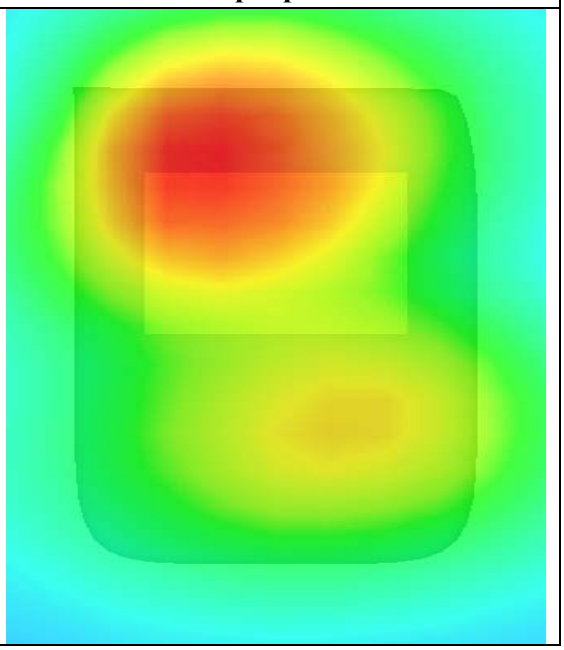
Maximum location: X=-11.00, Y=38.00

SAR 10g (W/Kg)	0.858912
SAR 1g (W/Kg)	1.506854

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.5896	0.8853	0.5118	0.2954	0.1690	0.0976



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: 2/9/2010

Measurement duration: 9 minutes 6 seconds

A. Experimental conditions.

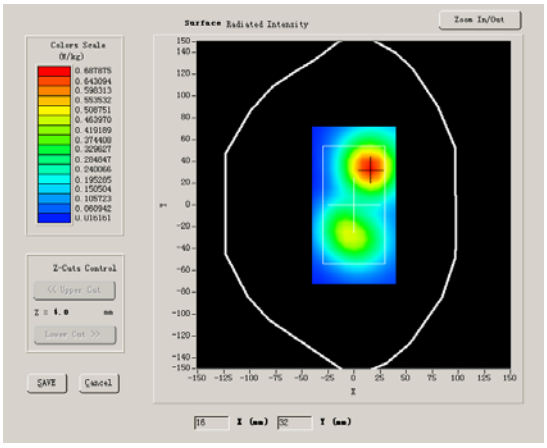
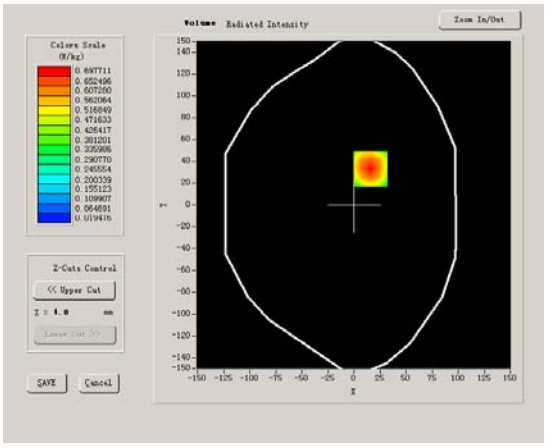
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GPRS

B. SAR Measurement Results

Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	51.540001
Relative permittivity	12.000000

Conductivity (S/m)	1.273200
Variation (%)	1.270000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:2

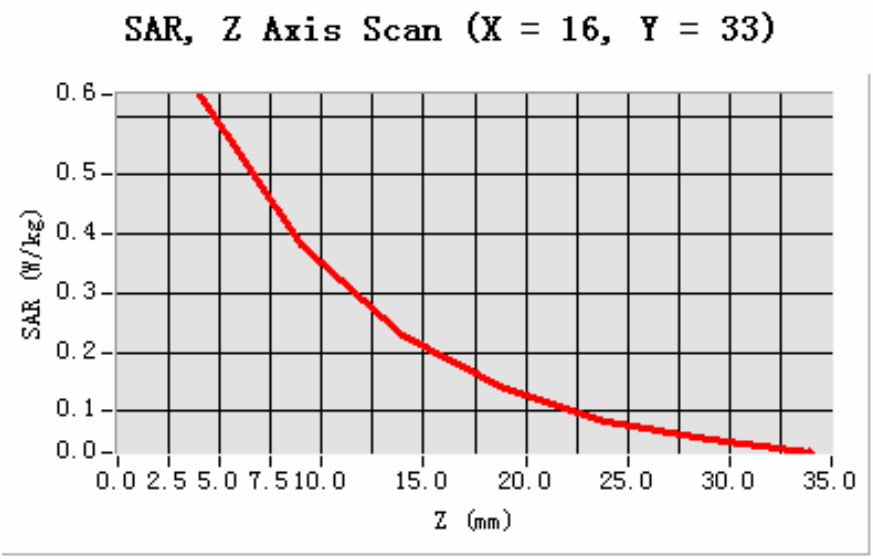
SURFACE SAR	**VOLUME SAR**
	

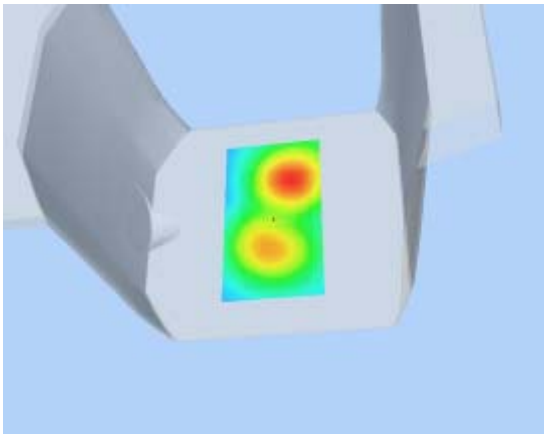
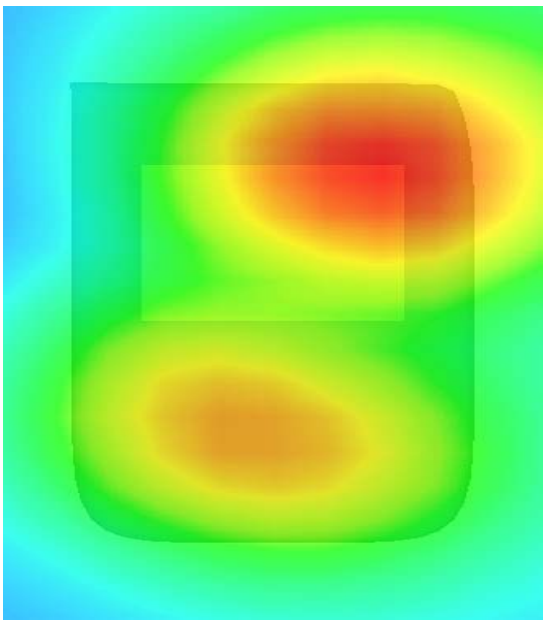
Maximum location: X=16.00, Y=33.00

SAR 10g (W/Kg)	0.356877
SAR 1g (W/Kg)	0.604048

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6364	0.3827	0.2289	0.1392	0.0843	0.0512



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: 2/9/2010

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

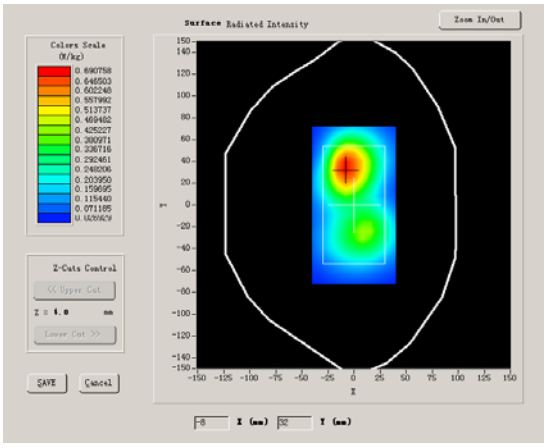
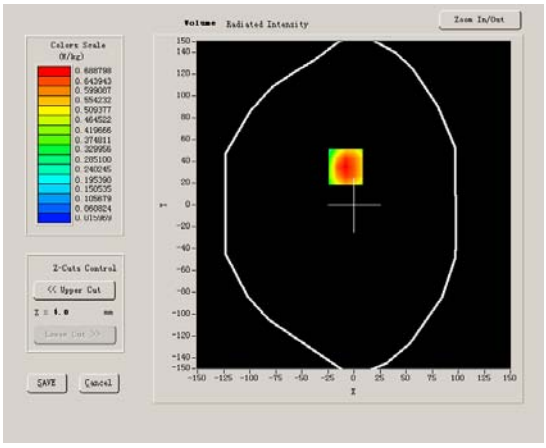
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GSM

B. SAR Measurement Results

Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	51.540001
Relative permittivity	12.000000

Conductivity (S/m)	1.273200
Variation (%)	-1.180000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

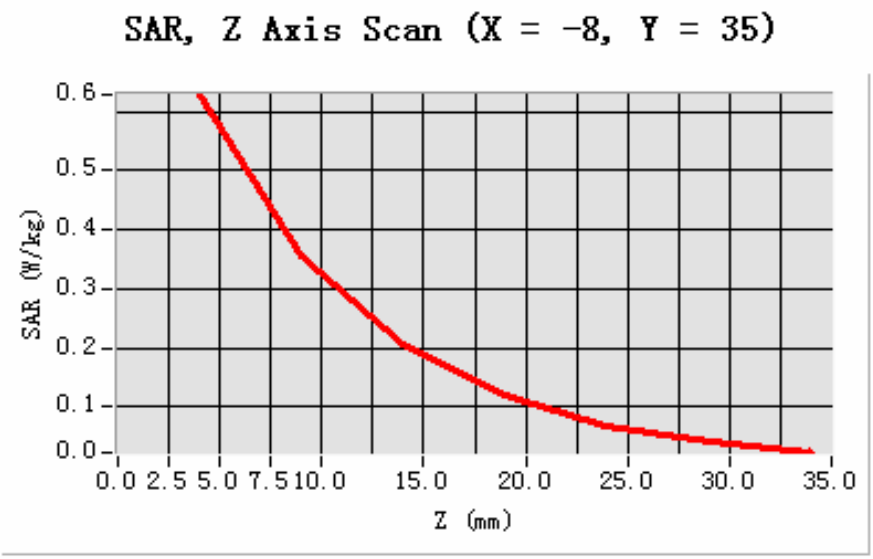
SURFACE SAR	**VOLUME SAR**
	

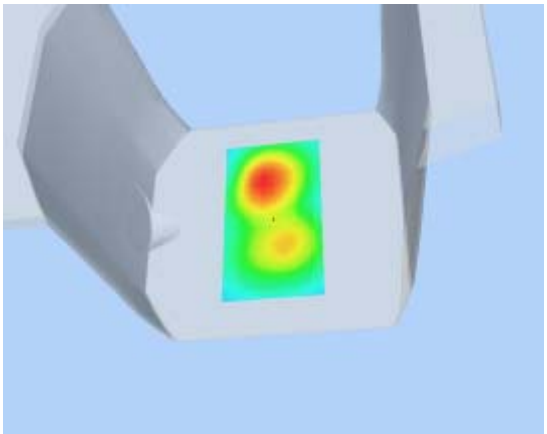
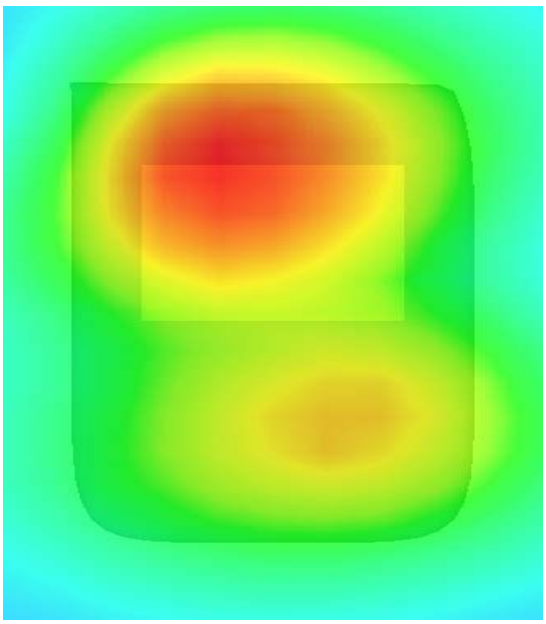
Maximum location: X=-8.00, Y=35.00

SAR 10g (W/Kg)	0.348176
SAR 1g (W/Kg)	0.604417

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6282	0.3537	0.2073	0.1195	0.0685	0.0402



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: 2/9/2010

Measurement duration: 9 minutes 7 seconds

A. Experimental conditions.

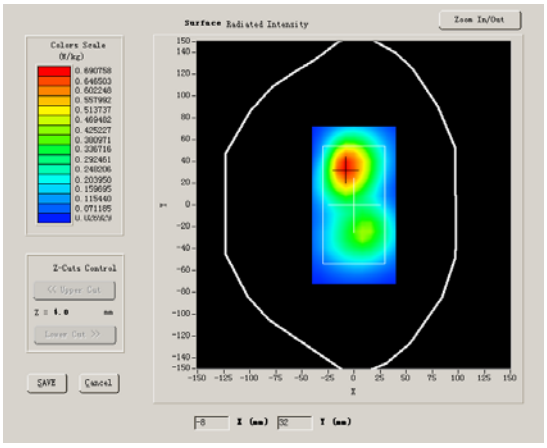
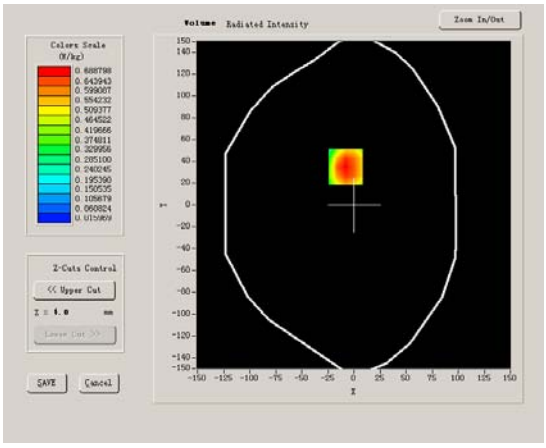
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GSM

B. SAR Measurement Results

Higher Band SAR (Channel 810):

Frequency (MHz)	1909.800049
Relative permittivity (real part)	51.540001
Relative permittivity	12.000000

Conductivity (S/m)	1.273200
Variation (%)	-1.180000
Ambient Temperature:	23.3°C
Liquid Temperature:	23.1°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:8

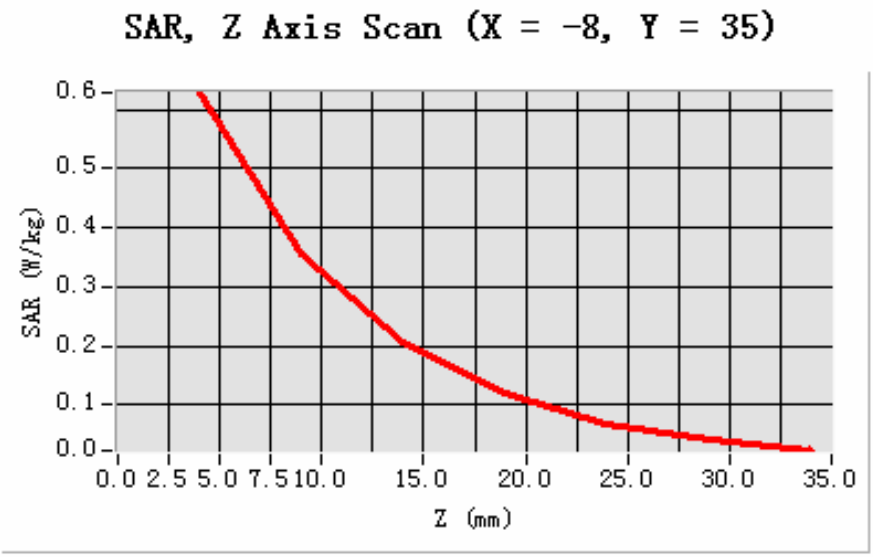
SURFACE SAR	**VOLUME SAR**
	

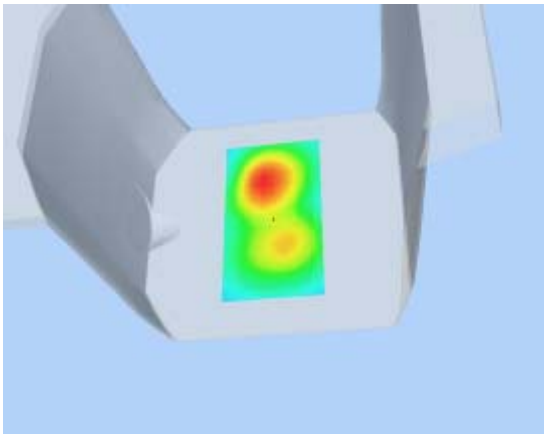
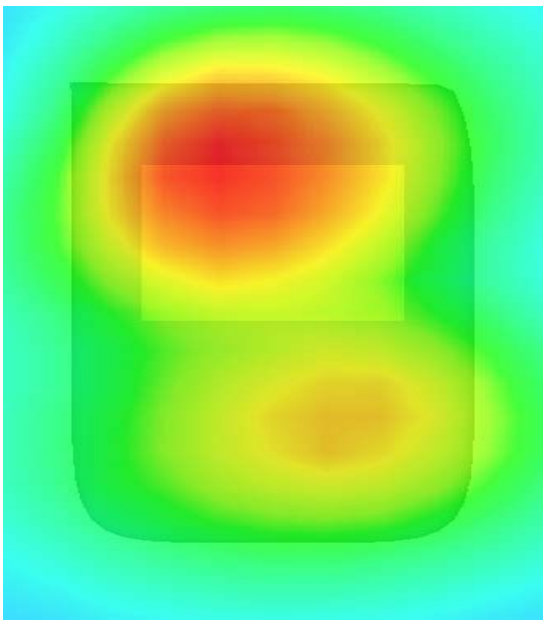
Maximum location: X=-8.00, Y=35.00

SAR 10g (W/Kg)	0.337465
SAR 1g (W/Kg)	0.598499

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6282	0.3537	0.2073	0.1195	0.0685	0.0402



3D sceen shot	Hot spot position
	

System Performance Check Data(835MHz Head)

Type: Phone measurement (Complete)

Date of measurement: 2/9/2010

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

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

A. Experimental conditions.

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

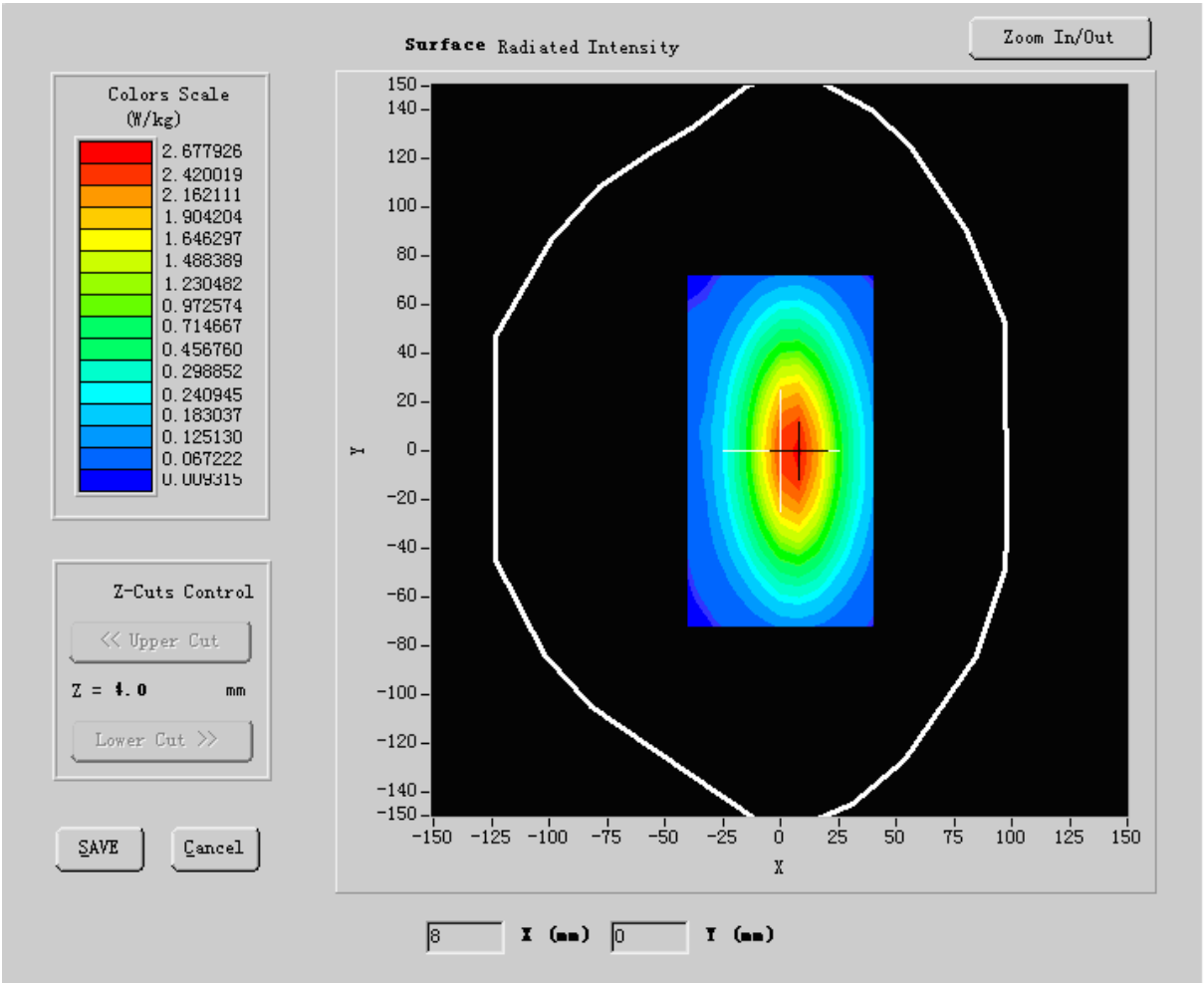
B. SAR Measurement Results

Middle Band SAR:

Frequency (MHz)	835.00000
Relative permittivity (real part)	40.669998
Relative permittivity	18.926250
Conductivity (S/m)	0.866612

SAR drift (%)	-0.050000
Ambient Temperature:	22.6°C
Liquid Temperature:	22.3°C
ConvF:	28.479,25.214,27.196
Crest factor：	1:1

SURFACE SAR

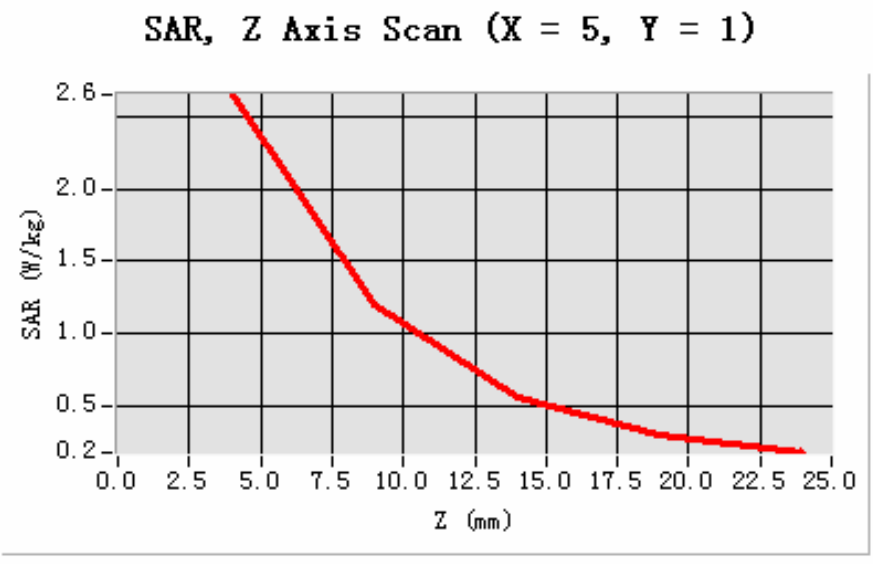


Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	1.946643
SAR 1g (W/Kg)	2.753735

Z Axis Scan

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



System Performance Check Data(835MHz Body)

Type: Phone measurement (Complete)

Date of measurement: 2/9/2010

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

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

A. Experimental conditions.

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

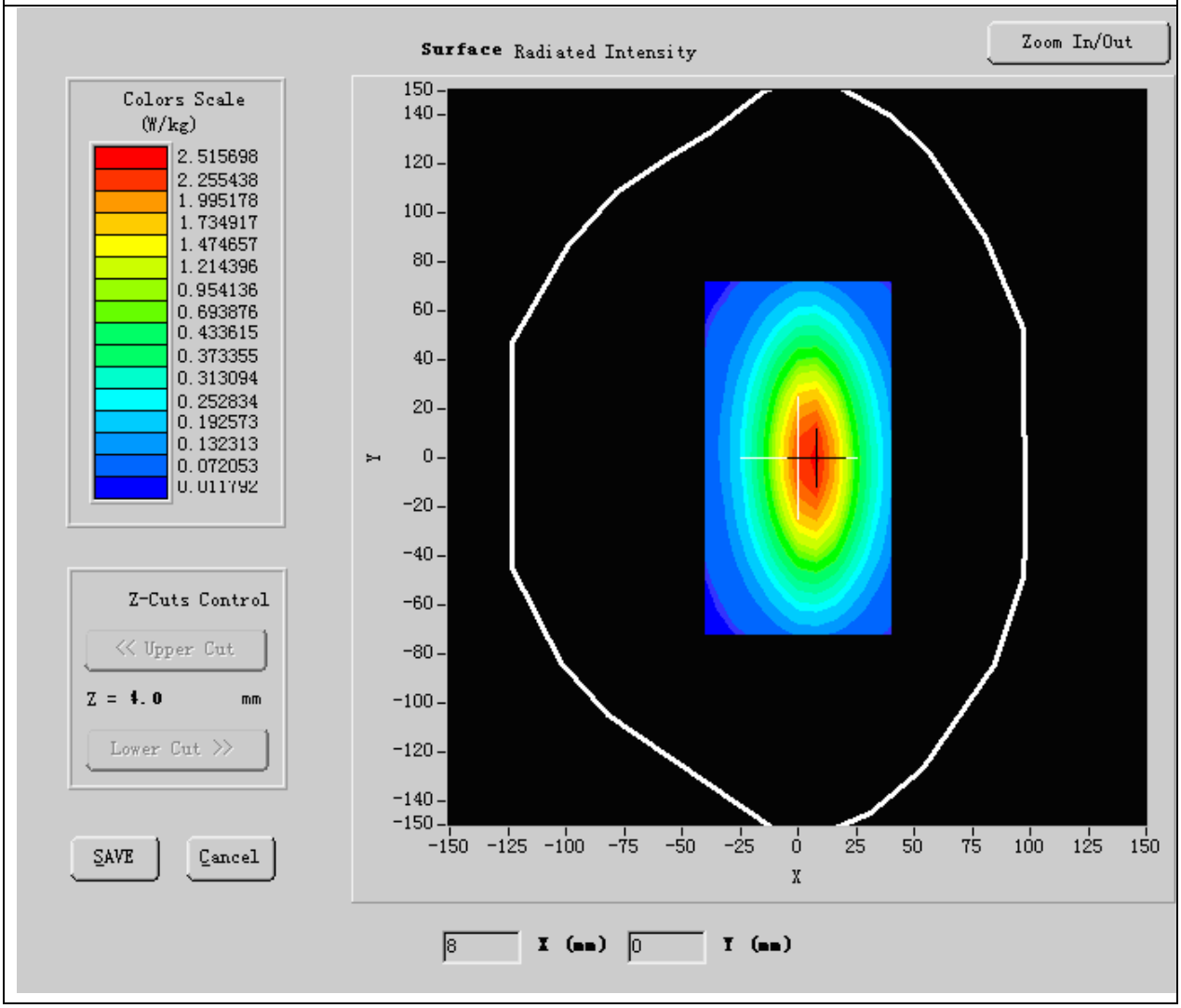
B. SAR Measurement Results

Middle Band SAR:

Frequency (MHz)	835.000000
Relative permittivity (real part)	54.116001
Relative permittivity	15.070000
Conductivity (S/m)	0.974596

SAR drift (%)	-0.140000
Ambient Temperature:	23.5°C
Liquid Temperature:	22.8°C
ConvF:	28.559,25.681,27.588
Crest factor：	1:1

SURFACE SAR

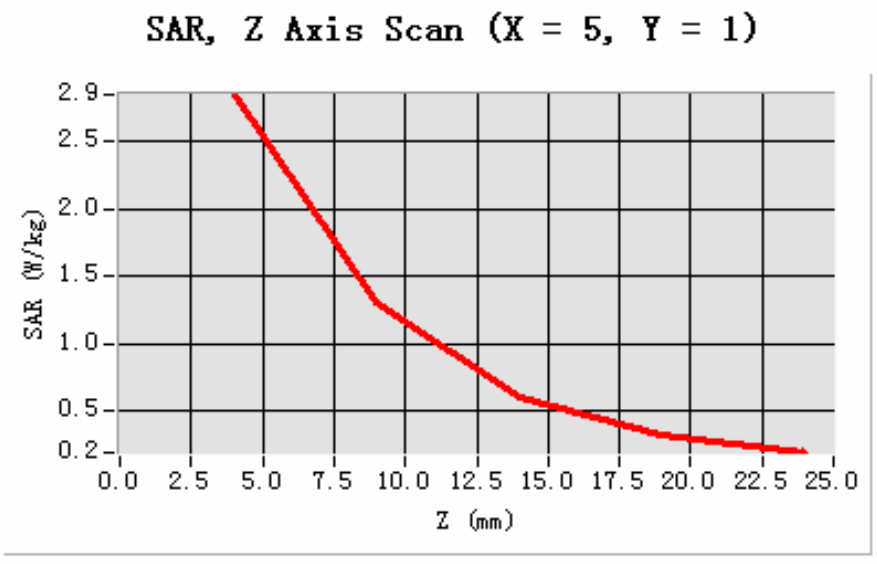


Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	1.71663
SAR 1g (W/Kg)	2.774634

Z Axis Scan

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



System Performance Check Data(1900MHz Head)

Type: Phone measurement (Complete)

Date of measurement: 2/9/2010

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

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

A. Experimental conditions.

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

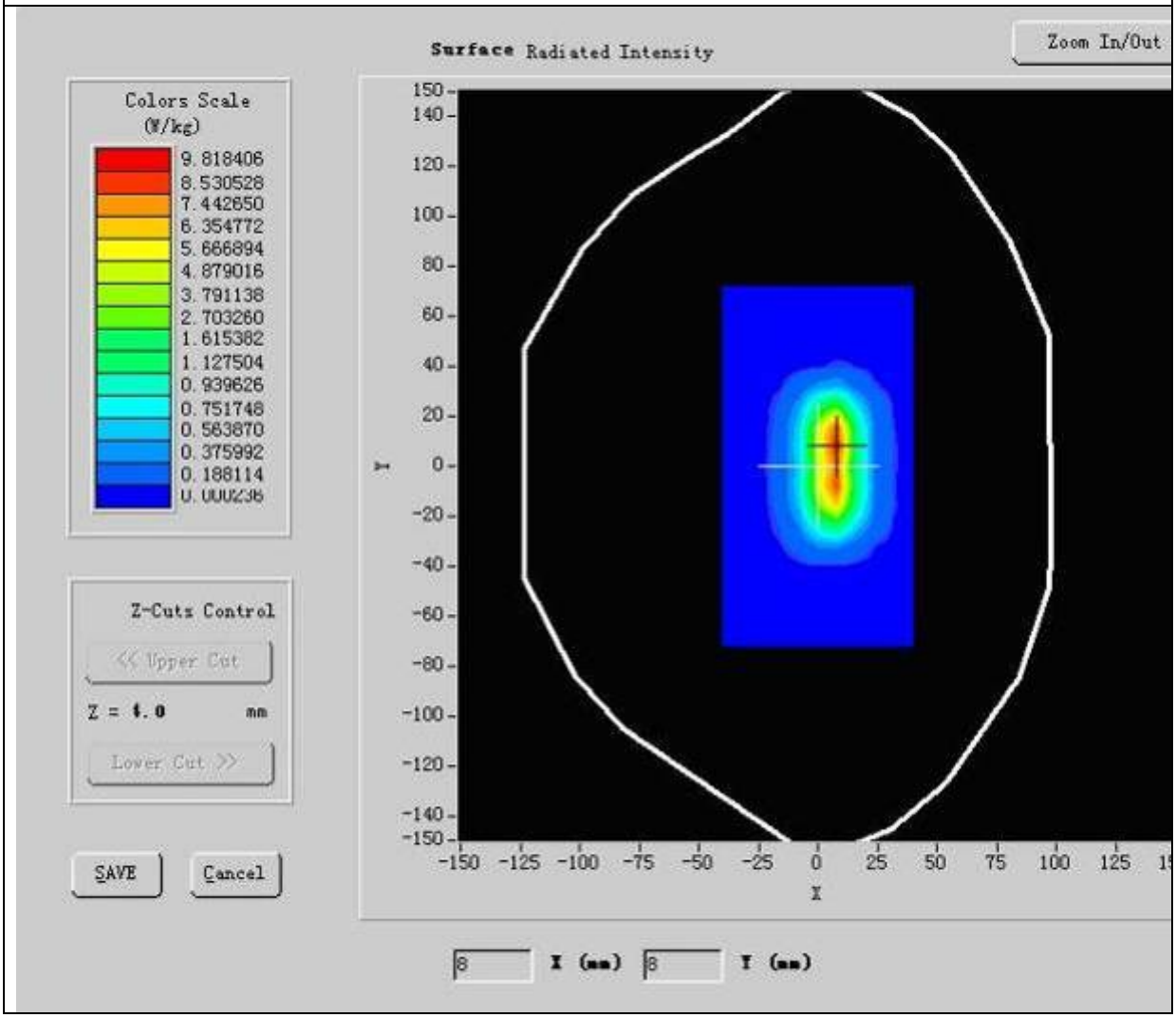
B. SAR Measurement Results

Lower Band SAR:

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.481223
Relative permittivity	12.991650
Conductivity (S/m)	1.395758

SAR drift (%)	0.570000
Ambient Temperature:	23.5°C
Liquid Temperature:	22.8°C
ConvF:	40.136,34.843,38.721
Crest factor：	1:1

SURFACE SAR

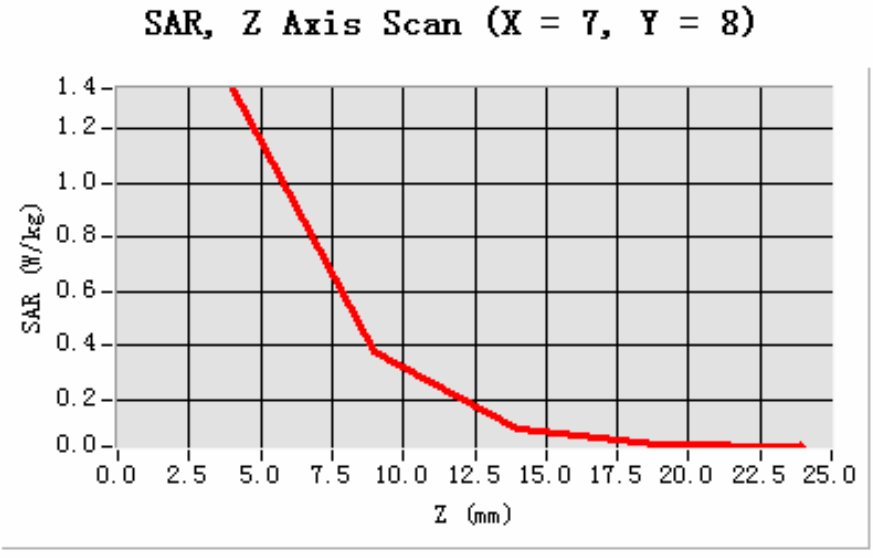


Maximum location: X=7.00, Y=8.00

SAR 10g (W/Kg)	5.978466
SAR 1g (W/Kg)	9.888446

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	1.3503	0.3791	0.0904	0.0338



System Performance Check Data(1900MHz Body)

Type: Phone measurement (Complete)

Date of measurement: 2/9/2010

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

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

A. Experimental conditions.

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

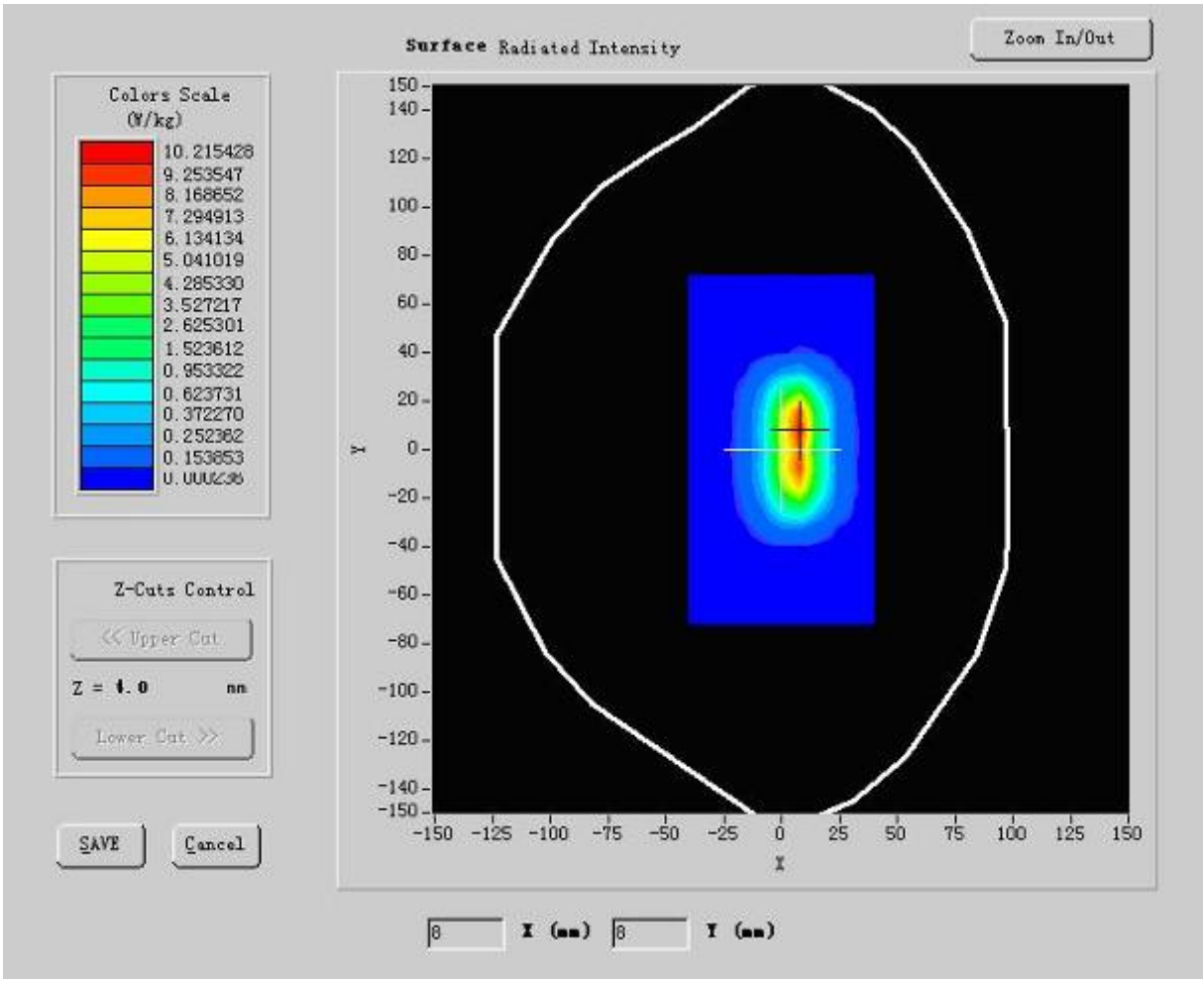
B. SAR Measurement Results

Lower Band SAR:

Frequency (MHz)	1900.000000
Relative permittivity (real part)	51.540001
Relative permittivity (imaginary part)	12.991650

Conductivity (S/m)	1.573978
SAR drift (%)	0.570000
Ambient Temperature:	23.5°C
Liquid Temperature:	22.8°C
ConvF:	40.625,34.773,38.535
Crest factor：	1:1

SURFACE SAR



Maximum location: X=7.00, Y=8.00

SAR 10g (W/Kg)	5.746644
SAR 1g (W/Kg)	9.922524

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	1.3503	0.3791	0.0904	0.0338