FCC SAR

TEST REPORT

of

CM220

Model Name:	CM220
Trade Name:	Haier
Report No.:	SZ09010011S01
FCC ID:	SG70901HC-CM220

prepared for

Qingdao Haier Telecom Co., Ltd.
No.1,Haier Road,Hi-tech Zone,Qingdao,266101,P.R.China

prepared by

Shenzhen Electronic Product Quality Testing Center
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Contents

General Information

1.1. Notes

The test results of this test report relate exclusively to the information specified in section 3.3. Shenzhen Electronic Product Quality Testing Center 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 Electronic Product Quality Testing Center 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.:	SZ09010011S01
Date of Issue:	Feb 11, 2009
Date of Tests:	Jan 19, 2009 – Jan 19, 2009
Responsible for Accreditation:	Deng dexin
Project Manager:	Li Lei
Deputy Project Manager:	Xuewen Wu

1.3. Conclusion

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory has verified that all tests as listed in the section 4.6 of this report haven been performed successfully with the tested equipment.

Li Lei
Tested by
(Responsible for the Test Report)

Xuewen Wu
Reviewed by
(Verification of the Test Report)

Deng dexin
Approved by
(Responsible Test Lab Manager)

2. Testing Laboratory

2.1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Electronic Product Quality Testing Center
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 Electronic Product Quality Testing Center 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 L1659 (see Annex A)

2.4. List of Test Equipments

No.	Instrument	Type
1	PC	Dell (Pentium IV 2.4GHz, SN:X10-23533)
2	Network Emulator	Rohde&Schwarz (CMU200, SN:105894)
3	Voltmeter	Keithley (2000, SN:1000572)
4	Synthetizer	Rohde&Schwarz (SML_03, SN:101868)
5	Amplifier	Nucl udes (ALB216, SN:10800)
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)
7	Probe	Antennessa (SN:SN_3708_EP80)
8	Phantom	Antennessa (SN:SN_36_08_SAM62)
9	Liquid	Antennessa (Last Calibration:21 08 04)

3. Technical Information

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

3.1. Identification of Applicant

Company Name:	Qingdao Haier Telecom Co., Ltd.
Address:	No.1,Haier Road,Hi-tech Zone,Qingdao,266101,P.R.China
Contact Person:	Xu Jun
Telephone:	+86(532)88936583
Facsimile:	+86(532)88936583
E-mail:	xu_jun@haier.com

3.2. Identification of Manufacturer

Company Name:	Qingdao Haier Telecom Co., Ltd.
Address:	No.1,Haier Road,Hi-tech Zone,Qingdao,266101,P.R.China
Contact Person:	Xu Jun
Telephone:	+86(532)88936583
Facsimile:	+86(532)88936583
E-mail:	xu_jun@haier.com

3.3. Equipment Under Test (EUT)

Brand Name:	Haier
Type Name:	CM220
Marking Name:	CM220
Hardware Version:	P0
Software Version:	CM220NOUM-090110
Frequency Bands:	CDMA 1900MHz (channel 25:1851.25MHz, channel 600:1880.00MHz, Channel 1175:1908.75MHz)
Modulation Mode:	CDMA
Antenna type:	Build inside

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	ESN	Hardware Version	Software Version
1#	00000000	P0	CM220NOUM-090110
2#	00000000	P0	CM220NOUM-090110

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)	=	3.80V
	Low Voltage (LV)	=	3.60V
	High Voltage (HV)	=	4.20V
Test frequency:	CDMA 1900MHz		
Operation mode:	Call established		
Power Level:	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 25, 600 and 1175 respectively in the case of CDMA 1900MHz, 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

I. INFORMATIONS ON THE TESTING

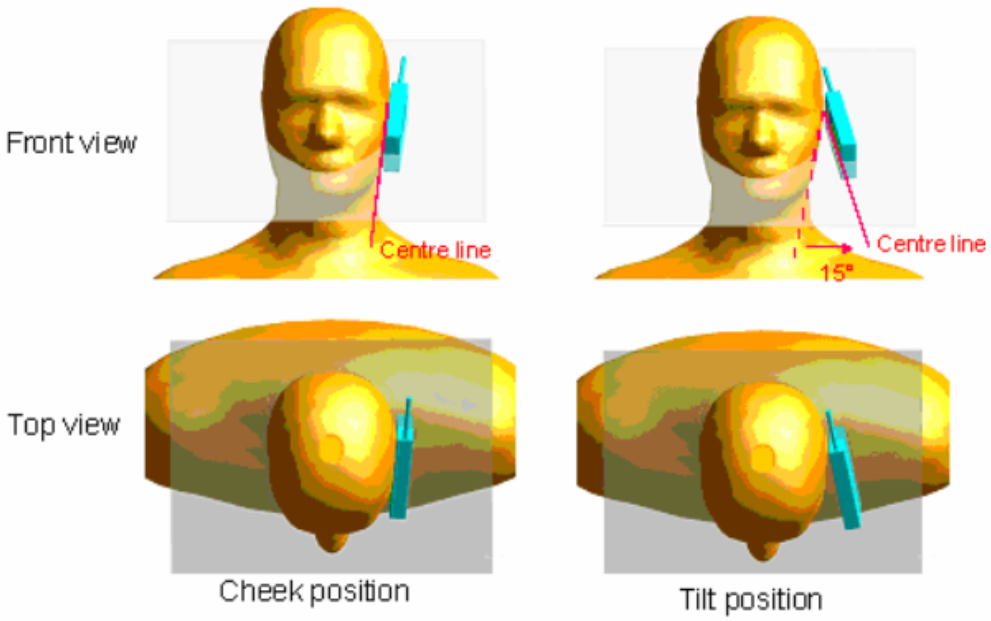
I.1. Normative reference

IEEE 1528: Recommended Practice for determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. Institute of Electrical and Electronics Engineers, INC., 2003.

I.3. Positions and test conditions of the mobile phone under test

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:

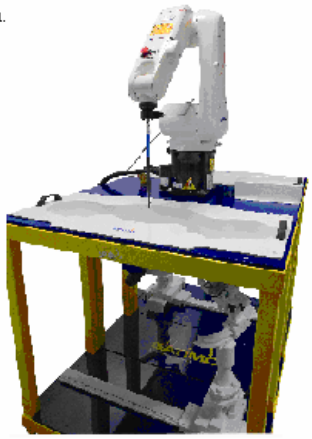
The mobile phone is well place in the "cheek" position as described above. Then the mobile phone is moved outward away from the mouth by an angle of 15 degrees or until contact with the ear lost.

4.3.2. 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.



COMOSAR bench

The mobile phone 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 10 g mass.

II.1. 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 2 mm +/- 0,2 mm. It enables the dosimetric evaluation of left and right hand 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.

II.2. 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 : 2.5 mm
- 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 : <0.50 dB
- Calibration range : 835 to 2500 MHz for head & body simulating liquid
- Angle between probe axis (evaluation axis) and suface normal line : less than 30°

II.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 16 mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors can not directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8 * 4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

II.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 minimise 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 1 mm 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.

4.3.3. Uncertainty Assessment

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

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	7.0	N	1	1	1	7.00	7.00	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1-Cp)^{1/2}$	$(1-Cp)^{1/2}$	1.02	1.02	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$\sqrt{Cp}$	$\sqrt{Cp}$	1.63	1.63	∞
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	
Output power Variation - SAR drift measurement	6.6.2	4.76	R	$\sqrt{3}$	1	1	2.75	2.75	∞
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	0.57	R	$\sqrt{3}$	0.64	0.43	0.21	0.14	∞

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	3.66	R	$\sqrt{3}$	0.6	0.49	1.27	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				11.28	10.78	
Expanded Uncertainty (95% Confidence interval)			k				21.99	21.03	

4.3.4. 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	Target value (1g)	250 mW input power	Test value (1g)
1800MHz	38.1 W/Kg	9.48 W/Kg(body)	37.92 W/Kg(body)

Note:Please refer to check the system performance data, the first 65-68 page.

4.3.5. 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.

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 1: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.0~23.8°C, humidity: 54~60%.			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	1900 MHz	54	1.45
Validation value (Jan 19)	1900 MHZ	53.883521	1.486632

4.3.6. Simulant liquids

Simulant liquids that are used for testing at frequencies of 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 1900MHz	
Tissue Type	Head	Body
Water	55.36	40.4
Salt(NaCl)	0.35	0.5
Sugar	30.45	58.0
HEC	0.0	1.0
Bactericide	0.0	0.1
Triton	0.0	0.0
DGBE	13.84	0.0
Acticide SPX	0.0	0.0
Dielectric Constant	41.00	54.0
Conductivity (S/m)	1.38	1.45

4.4. MEASUREMENT PROCEDURES

4.4.1. Procedures Used To Establish Test Signal

The device was placed into a simulated call using a base station in a screen room. Such test signals offer a consistent means for testing SAR and recommended for evaluating SAR. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5% occurred, the tests were repeated.

4.4.2 SAR Measurement Conditions for CDMA2000 1x

These procedures were followed according to FCC "SAR Measurement Procedures for 3G Devices", October 2007 (Revised).

4.4.2.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "SAR Measurement Procedures for 3G Devices", October 2007 (Revised).
Maximum output power is verified on the High, Middle and Low channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A. For Rev. A, maximum output power for both Subtype 0/1 and Subtype 2 Physical Layer configurations should be measured. The device operating configurations under TAP/ETAP should be documented in the test report; including power control, code channel and RF channel output power levels. The measurement results should be tabulated in the SAR report with any measurement difficulties and equipment limitations clearly identified.

4.4.2.2 SAR Measurement

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev. 0 and Rev. A devices. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. AT power control should be in “All Bits Up” conditions for TAP/ETAP.

Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for that RF channels in Rev. 0.17 Head SAR is required for Ev-Do devices that support operations next to the ear; for

example, with VOIP, using Subtype 2 Physical Layer configurations according to the required handsetconfigurations.

4.4.2.3 1x RTT Support

For Ev-Do devices that also support 1x RTT voice and/or data operations, SAR is not required for 1x RTT when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, the 'Body SAR Measurements' procedures in the 'CDMA 2000 1x Handsets' section should be applied.

4.4.2.4 Output Power Verification 1x RTT

Maximum output power is verified on the High, Middle, and Low channels according to procedures in Section 4.4.5.2 of 3 GPP2 C.S0011/TIA-98-E. Results for at least steps 3,4 and 10 of the power measurement procedures should be tabulated in the SAR report. Steps 3 and 4 should be measured using SO55 with power control bits in "All Up" condition. TDSO/SO32 may be used instead of SO55 for step 4.Step 10 should be measured using TDSO/SO32 with power control bits in the "Bits Hold"

1xRTT Power Measurements

Channel	Radio Configuration aud conducted Power (dBm)				
	RC1	RC2	RC3	RC4	RC5
Low	25.01	24.85	25.11	25.00	25.08
Mid	25.54	25.34	25.87	25.85	25.80
High	25.43	25.25	25.66	25.51	25.65
SO	SO2	SO9	SO55	SO55	SO55

Power Control was set in 'All Bits Up" for all measurements.

4.5. Items used in the Test Results List

Terms in the column "Verdict" for the test results list of the section 4.6:

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

4.6. Test Results List

Summary of Measurement Results (CDMA 1900MHz Band)
SAR Values (CDMA1900MHz 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)
Validation Plane with Body device position on Low Channel in CDMA mode（Horizontal-Up）	0.566	25.08
Validation Plane with Body device position on Middle Channel in CDMA mode（Horizontal-Up）	0.307	25.80
Validation Plane with Body device position on High Channel in CDMA mode（Horizontal-Up）	0.505	25.65
Validation Plane with Body device position on Low Channel in CDMA mode（Horizontal-Down）	0.672	25.08
Validation Plane with Body device position on Middle Channel in CDMA mode（Horizontal-Down）	0.437	25.80
Validation Plane with Body device position on High Channel in CDMA mode（Horizontal-Down）	**0.712**	**25.65**
Validation Plane with Body device position on Low Channel in CDMA mode（Vertical-Front）	0.146	25.08
Validation Plane with Body device position on Middle Channel in CDMA mode（Vertical-Front）	0.138	25.80
Validation Plane with Body device position on High Channel in CDMA mode（Vertical-Front）	0.148	25.65
Validation Plane with Body device position on Low Channel in CDMA mode（Vertical-Back）	0.390	25.08
Validation Plane with Body device position on Middle Channel in CDMA mode（Vertical-Back）	0.296	25.80
Validation Plane with Body device position on High Channel in CDMA mode（Vertical-Back）	0.343	25.65
Validation Plane with Body device position on High Channel in CDMA mode（with earphone）	**0.728**	**25.65**

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 5mm (taking into account of the IEEE 1528 and the place of the antenna)。

2. The separation distance is determined corroding to FCC KDB 447498 D01 Section 2(b)(ii)(1) states, the SAR value of 5mm distance is less than 50% of initial touching position.

Annex A Accreditation Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L1659)

China National Accreditation Service for Conformity Assessment has accredited

Shenzhen Electronic Product Quality Testing Center

(CQCS Testing Co. Ltd.)

Electronic Testing Building Wenguang Road, Shahe West, Xili Town, Nanshan District, Shenzhen, Guangdong, China

to ISO/IEC 17025:1999 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 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: 2007-01-17

Date of Expiry: 2009-10-08

Date of Initial Accreditation: 1999-08-03

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).

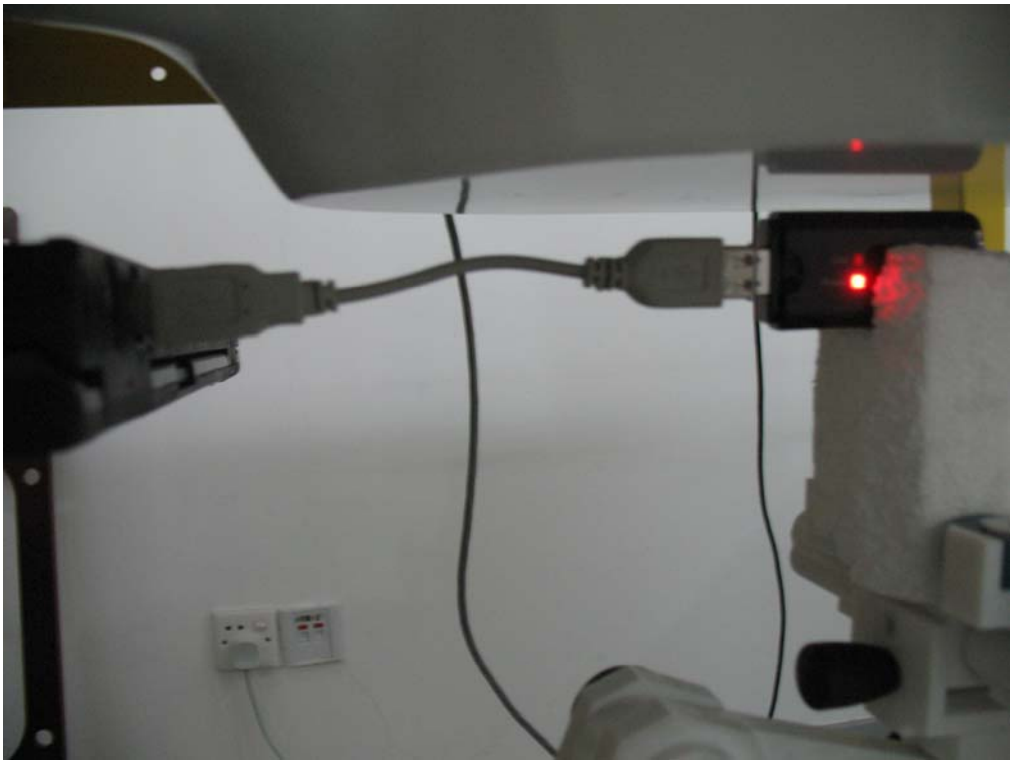
Annex B Photographs of the EUT

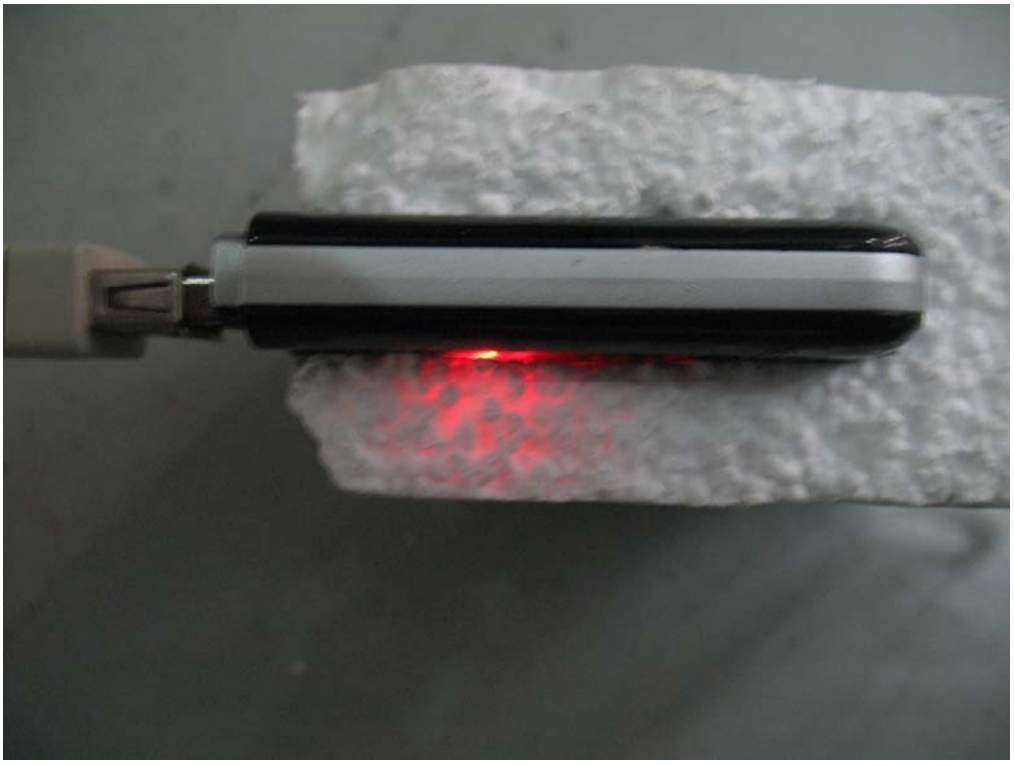
1 EUT Horizontal-Up(PC:IBM T42)

2 EUT Horizontal-Down

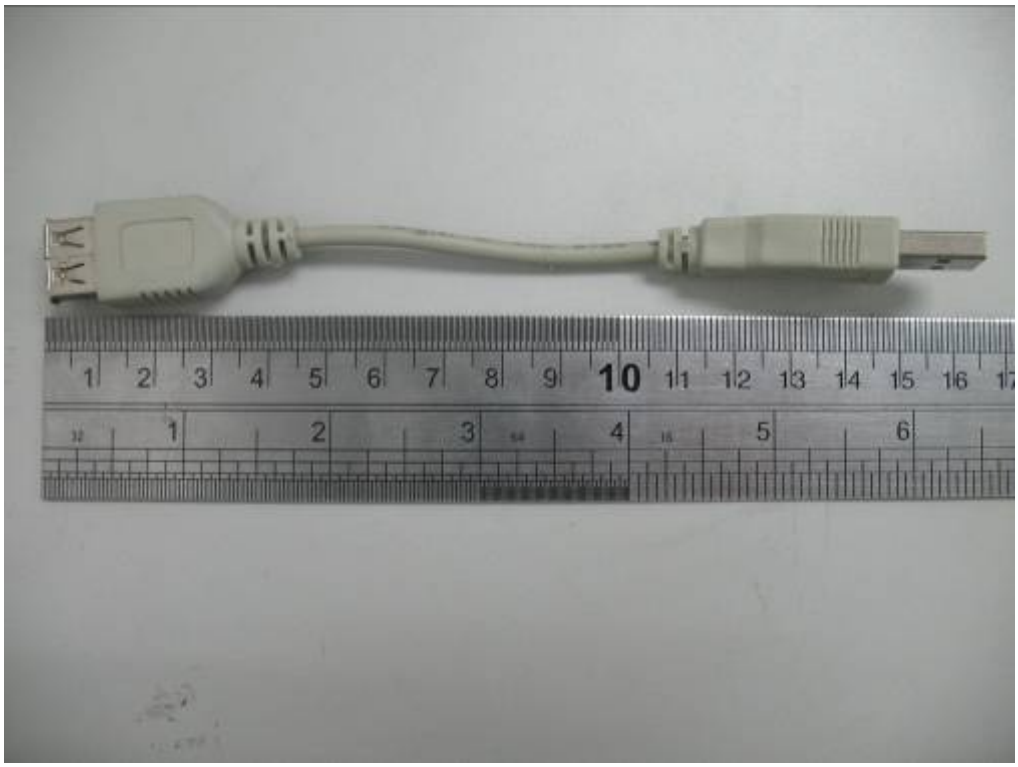
3 EUT Vertical-Front(PC:IBM T20)

4 EUT Vertical-Back





5 Data line



Annex C Graph Test Results

	BAND	PARAMETERS
TYPE	CDMA1900	Measurement 1: Validation Plane with Body device position on Low Channel in CDMA mode （**Horizontal-Up**） Measurement 2: Validation Plane with Body device position on Middle Channel in CDMA mode （**Horizontal-Up**） Measurement 3: Validation Plane with Body device position on High Channel in CDMA mode （**Horizontal-Up**） Measurement 4: Validation Plane with Body device position on Low Channel in CDMA mode （**Horizontal-Down**） Measurement 5: Validation Plane with Body device position on Middle Channel in CDMA mode （**Horizontal-Down**） Measurement 6: Validation Plane with Body device position on High Channel in CDMA mode （**Horizontal-Down**） Measurement 7: Validation Plane with Body device position on Low Channel in CDMA mode （**Vertical-Front**） Measurement 8: Validation Plane with Body device position on Middle Channel in CDMA mode （**Vertical-Front**） Measurement 9: Validation Plane with Body device position on High Channel in CDMA mode （**Vertical-Front**） Measurement 10: Validation Plane with Body device position on Low Channel in CDMA mode （**Vertical-Back**） Measurement 11: Validation Plane with Body device position on Middle Channel in CDMA mode （**Vertical-Back**） Measurement 12: Validation Plane with Body device position on High Channel in CDMA mode （**Vertical-Back**）

		Measurement 6: Validation Plane with Body device position on High Channel in CDMA mode （**Horizontal-Down with earphone**）

MEASUREMENT 1

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 30 seconds

A. Experimental conditions.

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

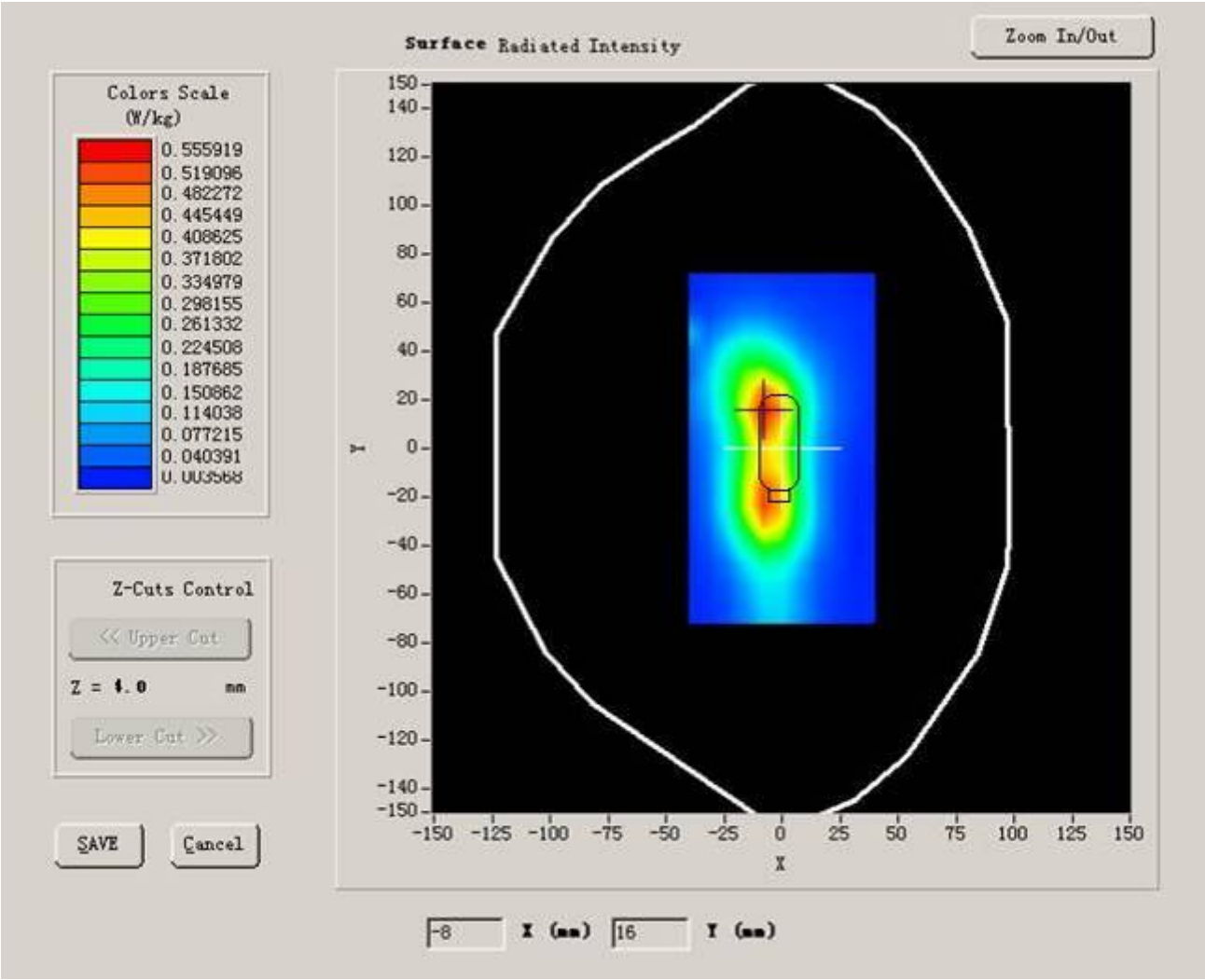
B. SAR Measurement Results

Lower Band SAR (Channel 25):

Frequency (MHz)	1851.250000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.523949
Variation (%)	2.220000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

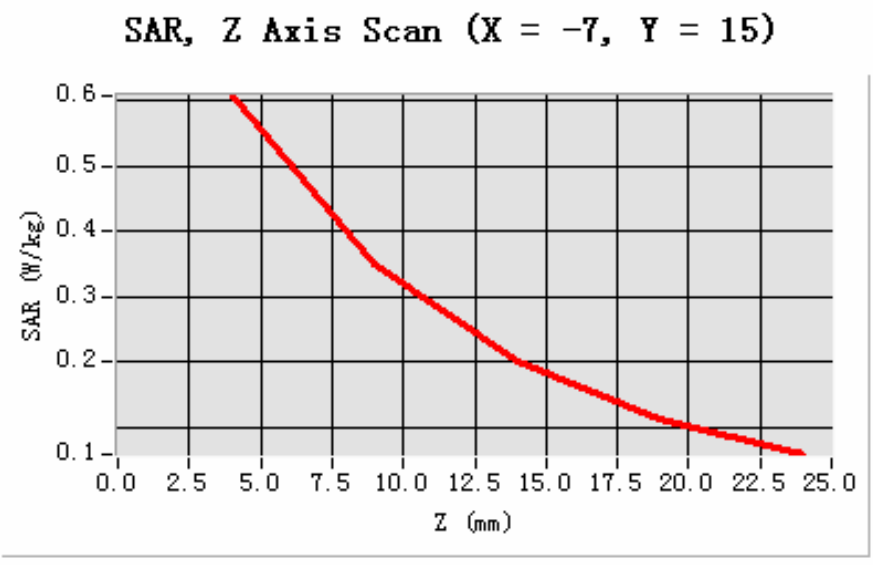


Maximum location: X=-7.00, Y=15.00

SAR 10g (W/Kg)	0.307350
SAR 1g (W/Kg)	0.566046

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6082	0.3513	0.1992	0.1122



MEASUREMENT 2

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 30 seconds

A. Experimental conditions.

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

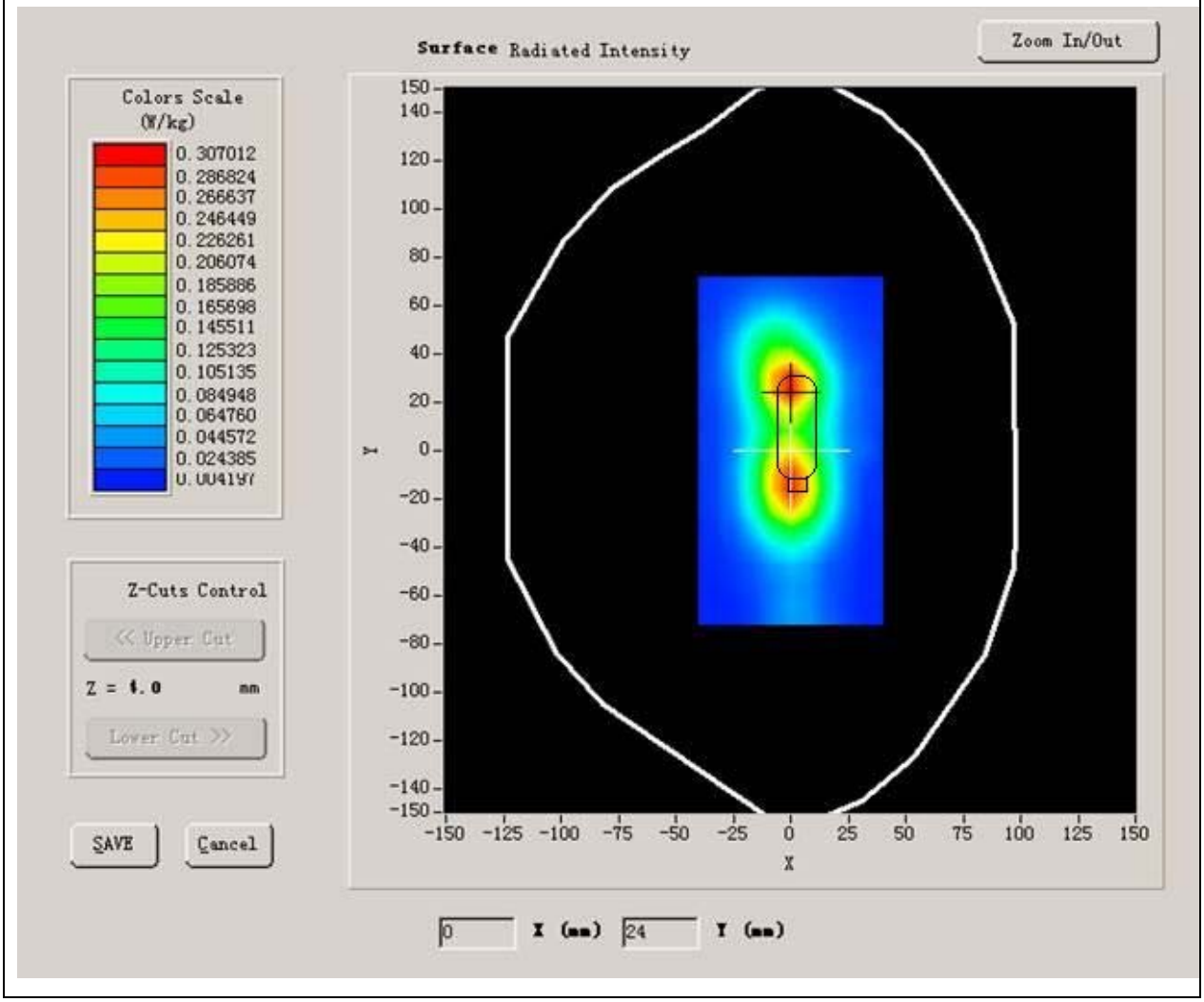
B. SAR Measurement Results

Middle Band SAR (Channel 600):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	51.90300
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.547616
Variation (%)	-0.710000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

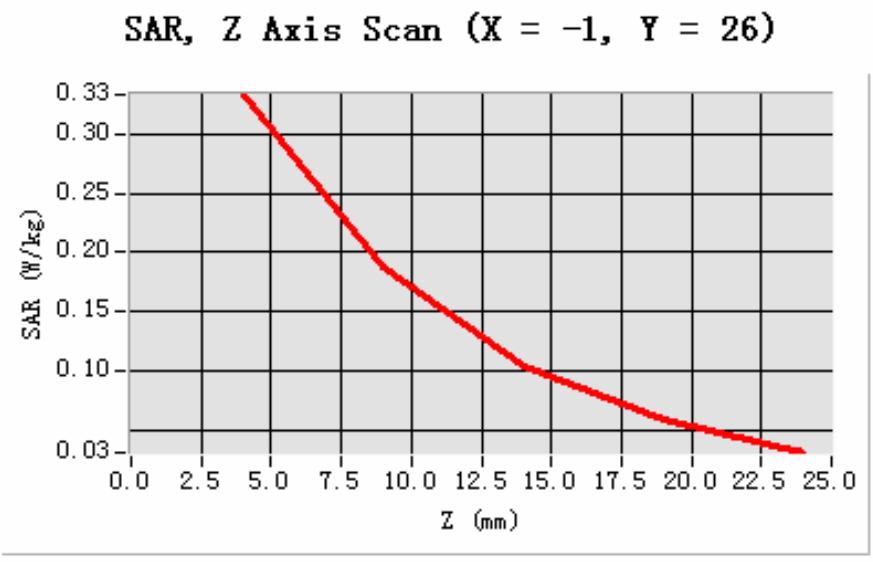


Maximum location: X=-1.00, Y=26.00

SAR 10g (W/Kg)	0.161605
SAR 1g (W/Kg)	0.307680

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3337	0.1876	0.1042	0.0583



MEASUREMENT 3

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 30 seconds

A. Experimental conditions.

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

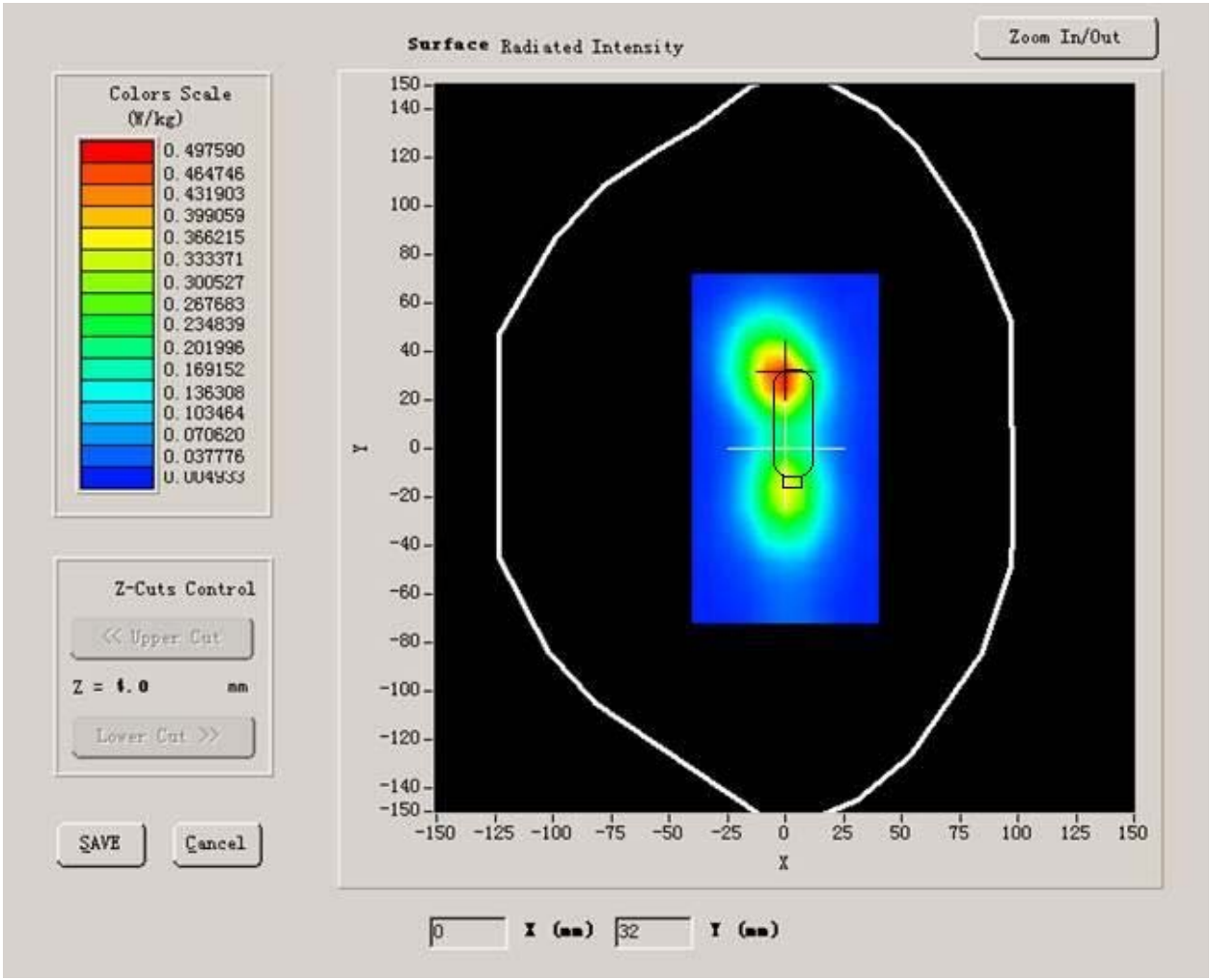
B. SAR Measurement Results

Higher Band SAR (Channel 1175):

Frequency (MHz)	1908.750000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	-1.590000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80

SURFACE SAR

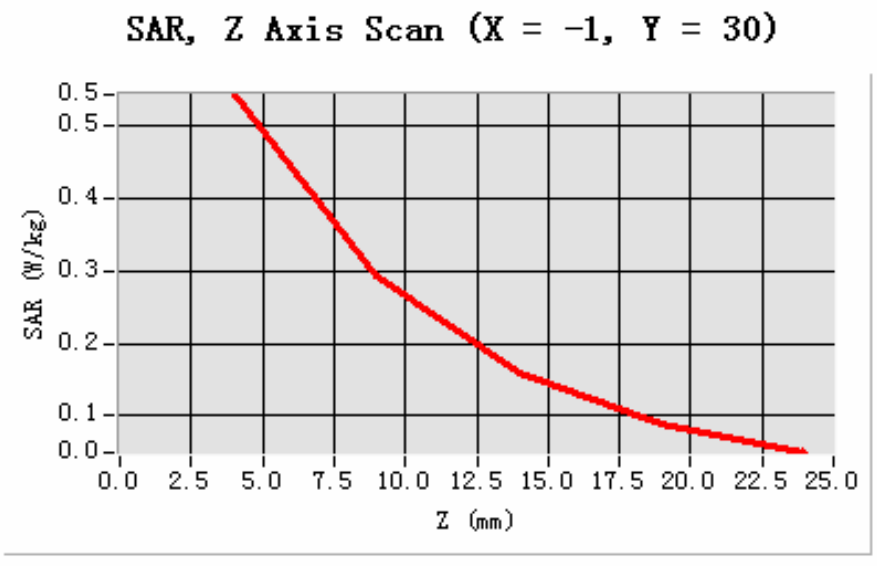


Maximum location: X=-1.00, Y=30.00

SAR 10g (W/Kg)	0.259395
SAR 1g (W/Kg)	0.505984

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.5435	0.2945	0.1595	0.0900



MEASUREMENT 4

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 41 seconds

A. Experimental conditions.

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

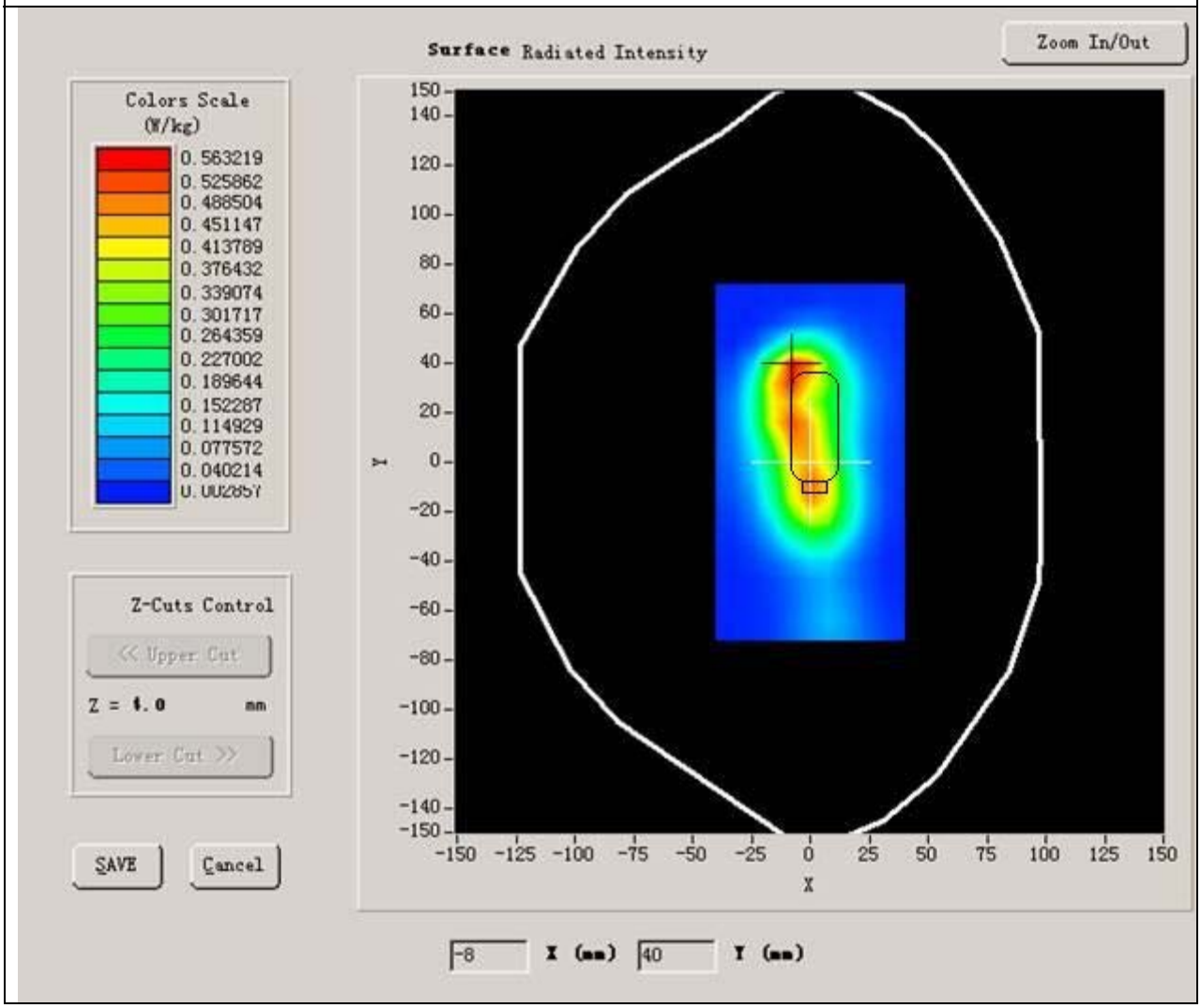
B. SAR Measurement Results

Lower Band SAR (Channel 25):

Frequency (MHz)	1851.250000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.523949
Variation (%)	2.050000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

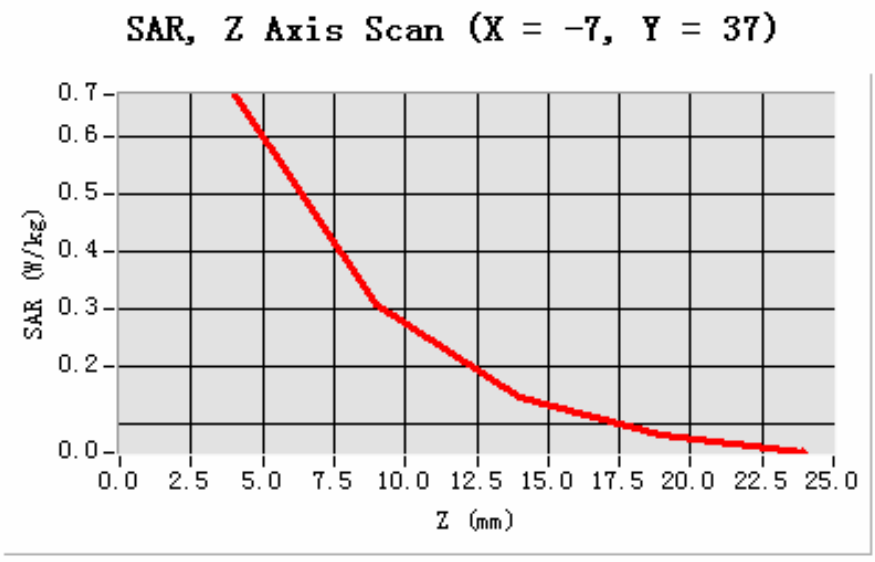


Maximum location: X=-7.00, Y=37.00

SAR 10g (W/Kg)	0.323742
SAR 1g (W/Kg)	0.672524

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6743	0.3085	0.1440	0.0787



MEASUREMENT 5

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 30 seconds

A. Experimental conditions.

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

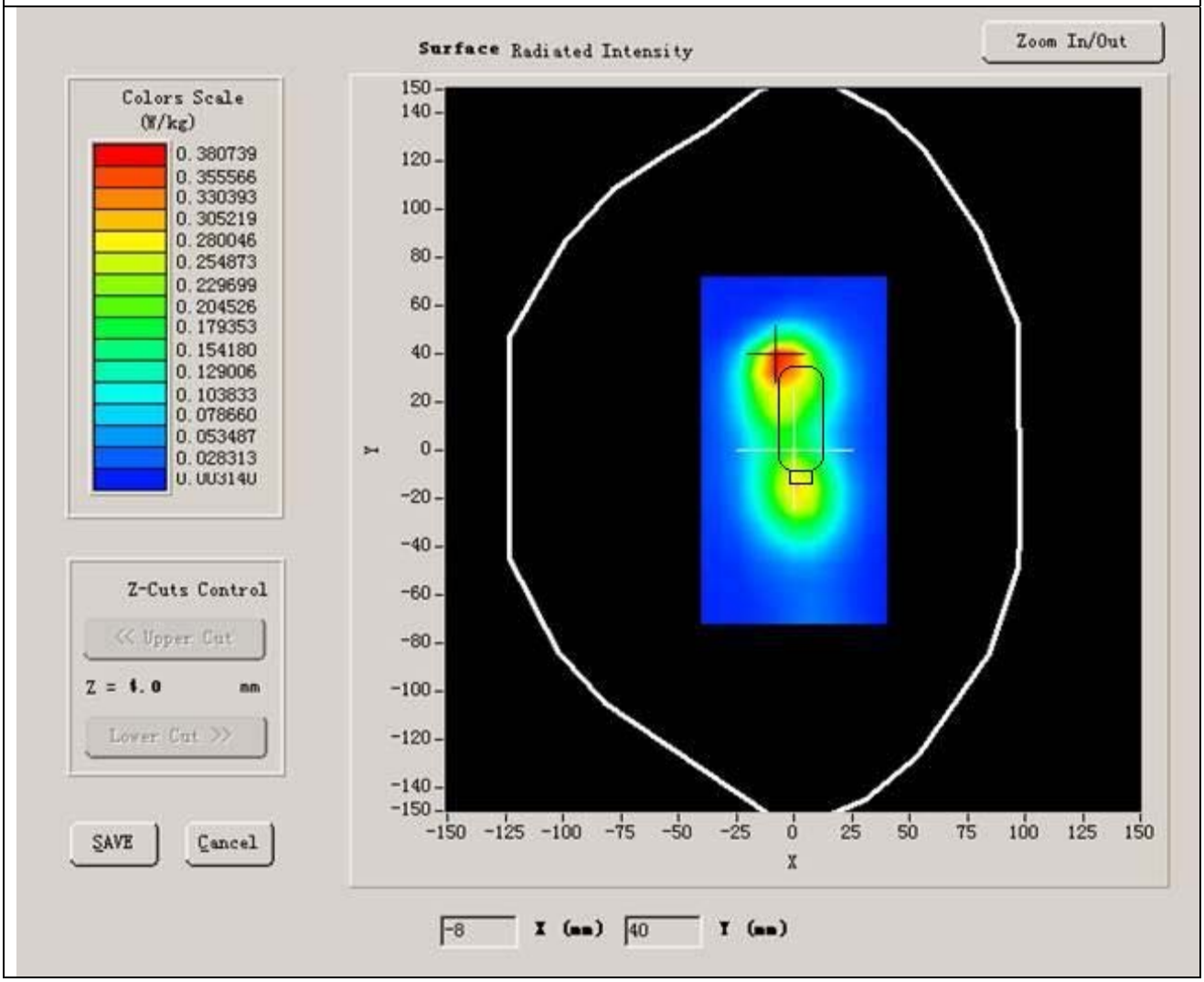
B. SAR Measurement Results

Middle Band SAR (Channel 600):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.547616
Variation (%)	0.960000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

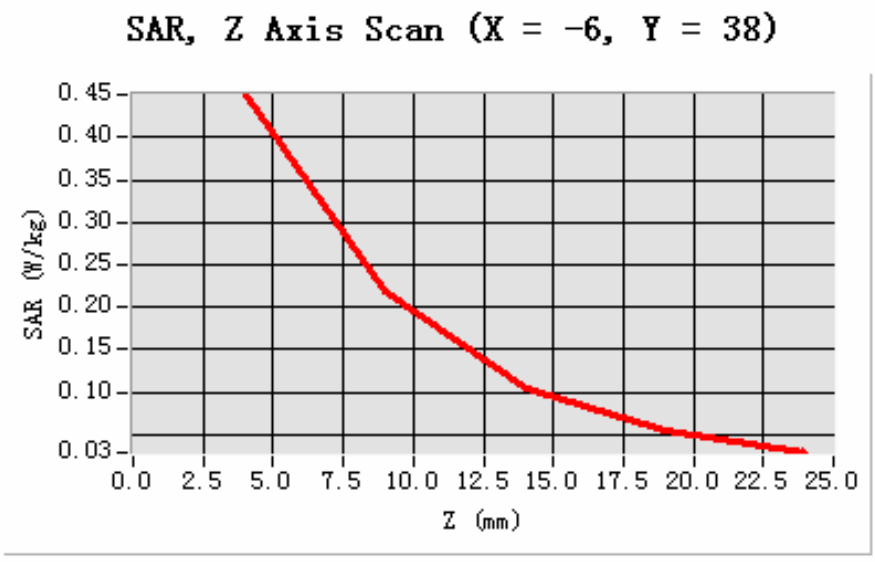


Maximum location: X=-6.00, Y=38.00

SAR 10g (W/Kg)	0.207662
SAR 1g (W/Kg)	0.437676

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.4504	0.2182	0.1052	0.0548



MEASUREMENT 6

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 31 seconds

A. Experimental conditions.

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

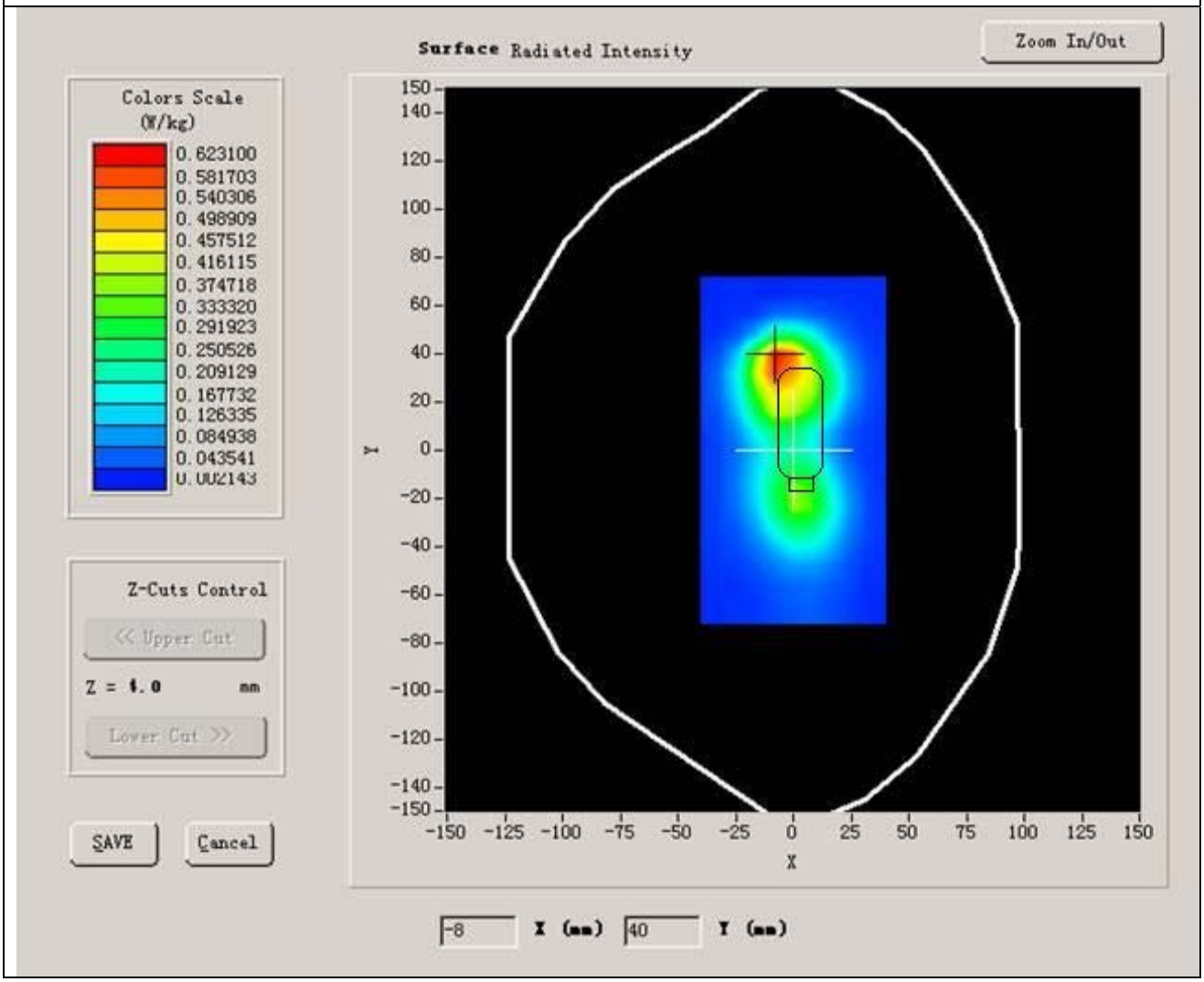
B. SAR Measurement Results

Higher Band SAR (Channel 1175):

Frequency (MHz)	1908.750000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	-0.970000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

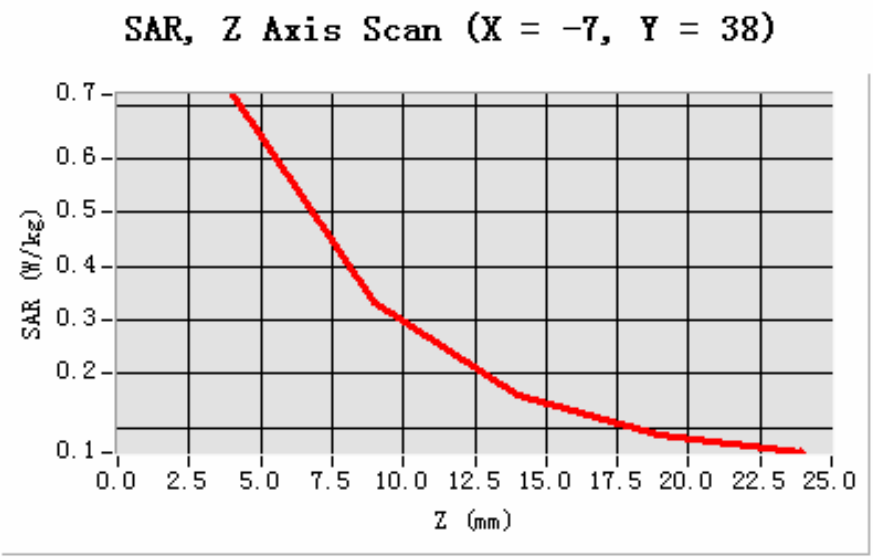


Maximum location: X=-7.00, Y=38.00

SAR 10g (W/Kg)	0.339237
SAR 1g (W/Kg)	0.712809

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.7198	0.3347	0.1587	0.0871



MEASUREMENT 7

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 31 seconds

A. Experimental conditions.

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

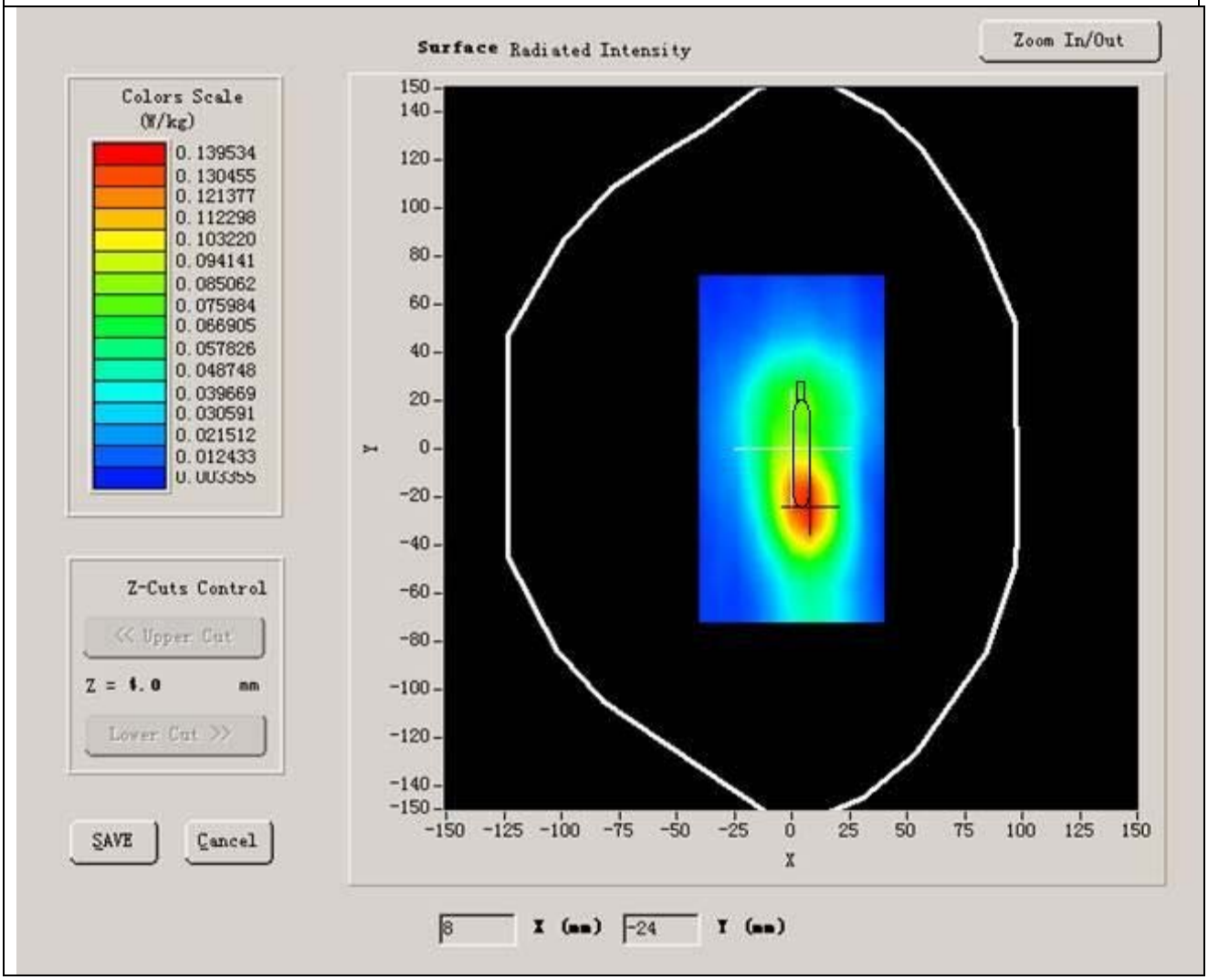
B. SAR Measurement Results

Lower Band SAR (Channel 25):

Frequency (MHz)	1851.250000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.523949
Variation (%)	0.640000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor：	40.136,34.843,38.721

SURFACE SAR

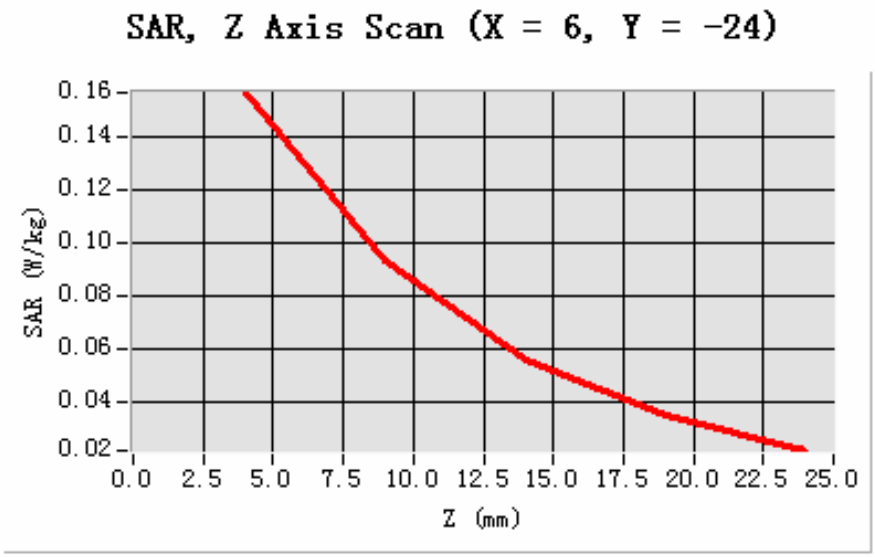


Maximum location: X=6.00, Y=-24.00

SAR 10g (W/Kg)	0.082661
SAR 1g (W/Kg)	0.146088

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1570	0.0933	0.0561	0.0351



MEASUREMENT 8

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 31 seconds

A. Experimental conditions.

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

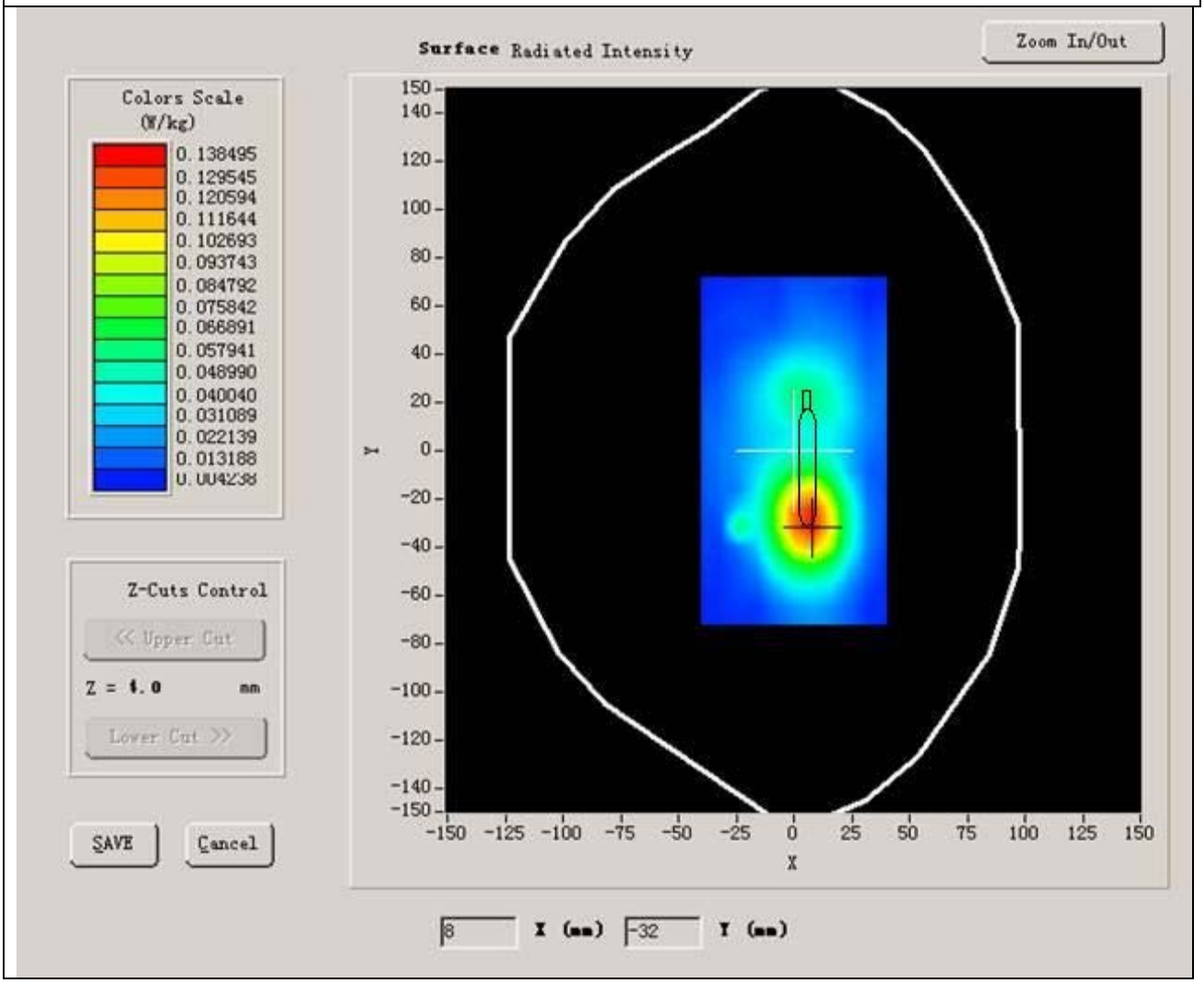
B. SAR Measurement Results

Middle Band SAR (Channel 600):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.547616
Variation (%)	0.100000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

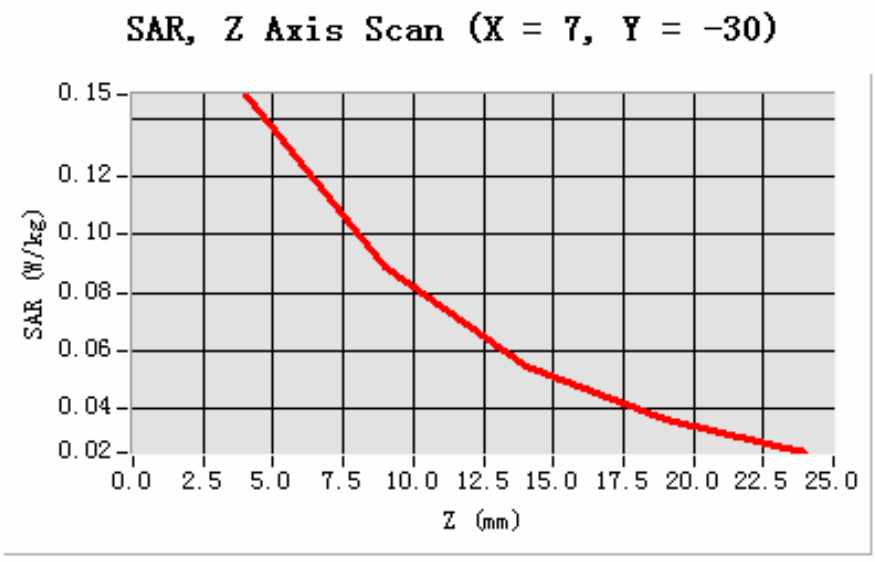


Maximum location: X=7.00, Y=-30.00

SAR 10g (W/Kg)	0.078422
SAR 1g (W/Kg)	0.138347

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1484	0.0886	0.0547	0.0362



MEASUREMENT 9

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 29 seconds

A. Experimental conditions.

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

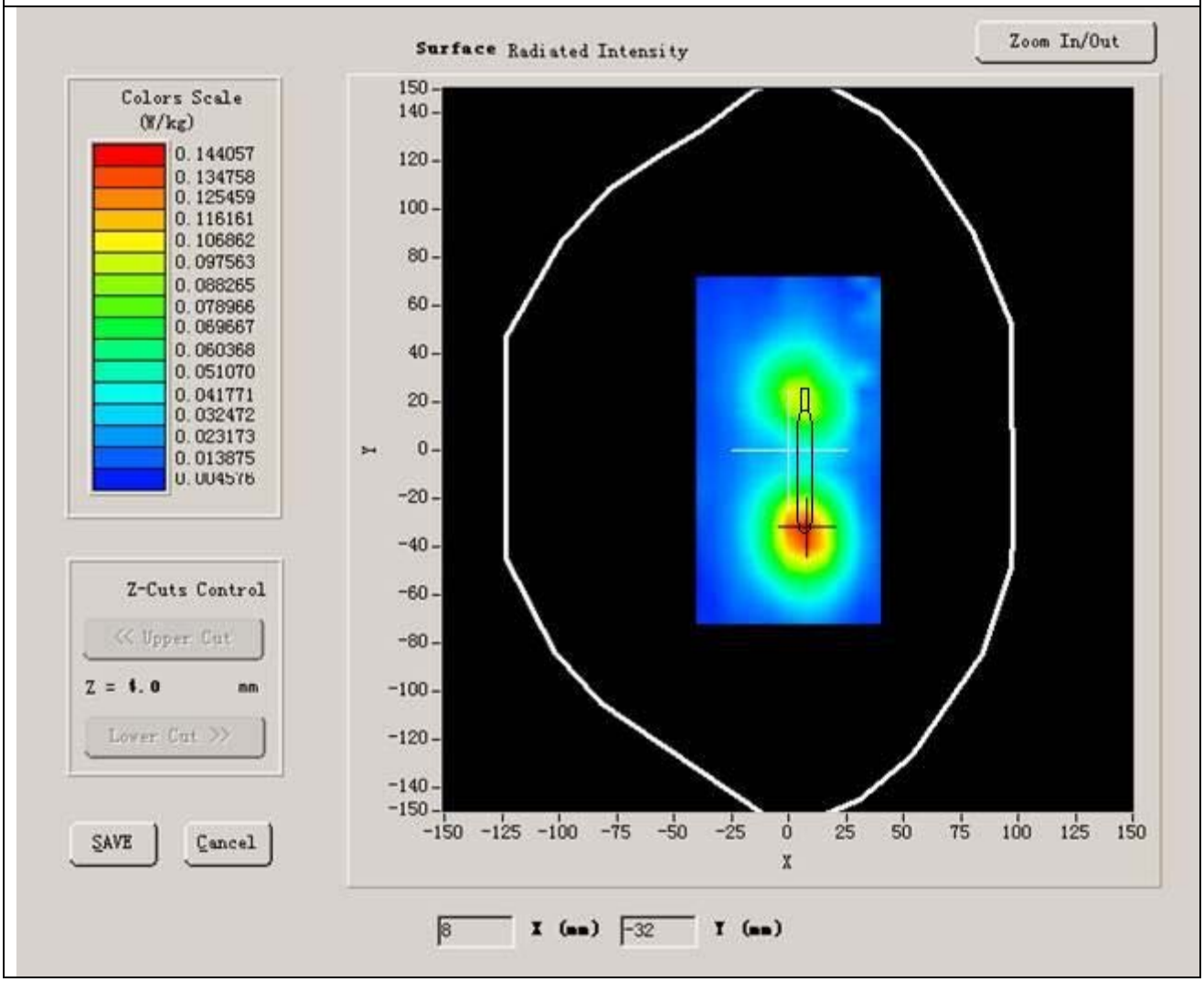
B. SAR Measurement Results

Higher Band SAR (Channel 1175):

Frequency (MHz)	1908.750000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	-4.070000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

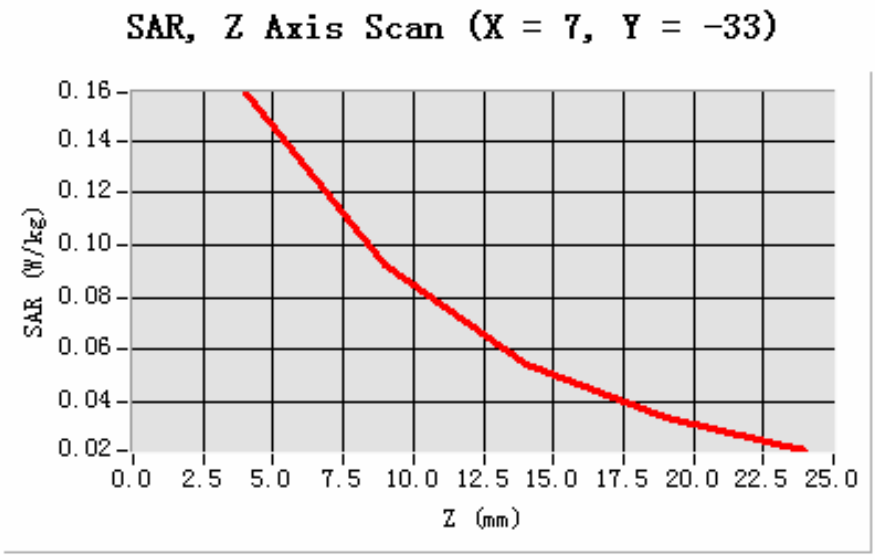


Maximum location: X=7.00, Y=-33.00

SAR 10g (W/Kg)	0.080898
SAR 1g (W/Kg)	0.148081

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1585	0.0922	0.0545	0.0339



MEASUREMENT 10

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 29 seconds

A. Experimental conditions.

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

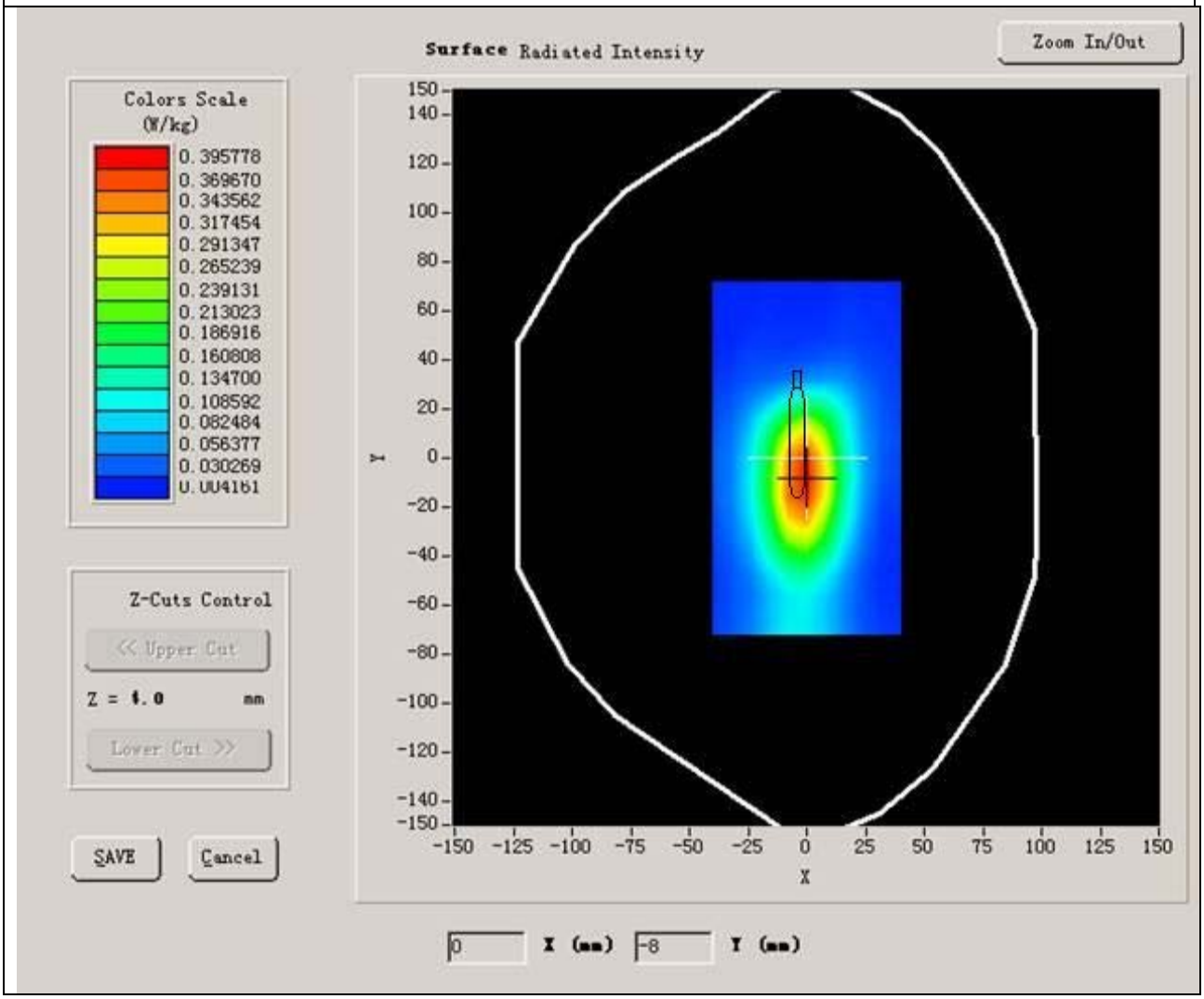
B. SAR Measurement Results

Lower Band SAR (Channel 25):

Frequency (MHz)	1851.250000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	0.720000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

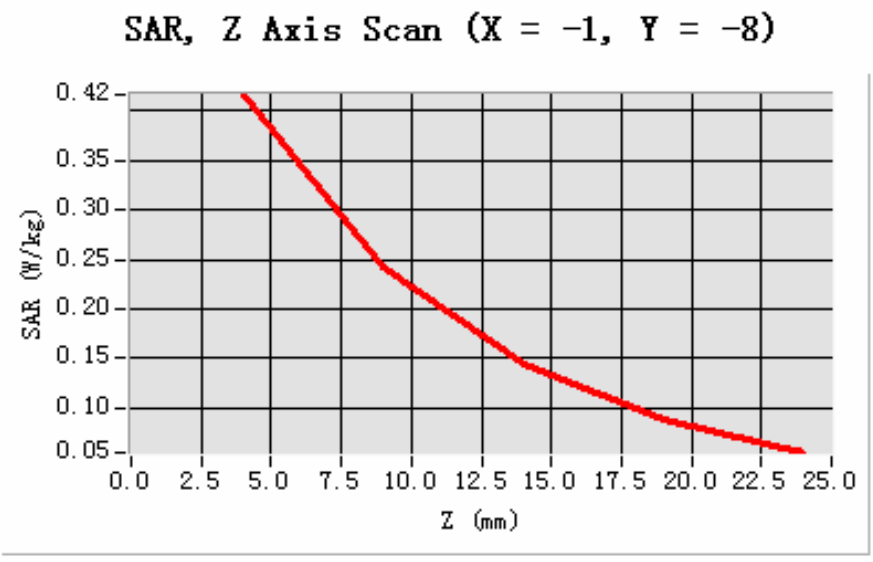


Maximum location: X=-1.00, Y=-8.00

SAR 10g (W/Kg)	0.222676
SAR 1g (W/Kg)	0.390256

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.4162	0.2432	0.1440	0.0892



MEASUREMENT 11

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 29 seconds

A. Experimental conditions.

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

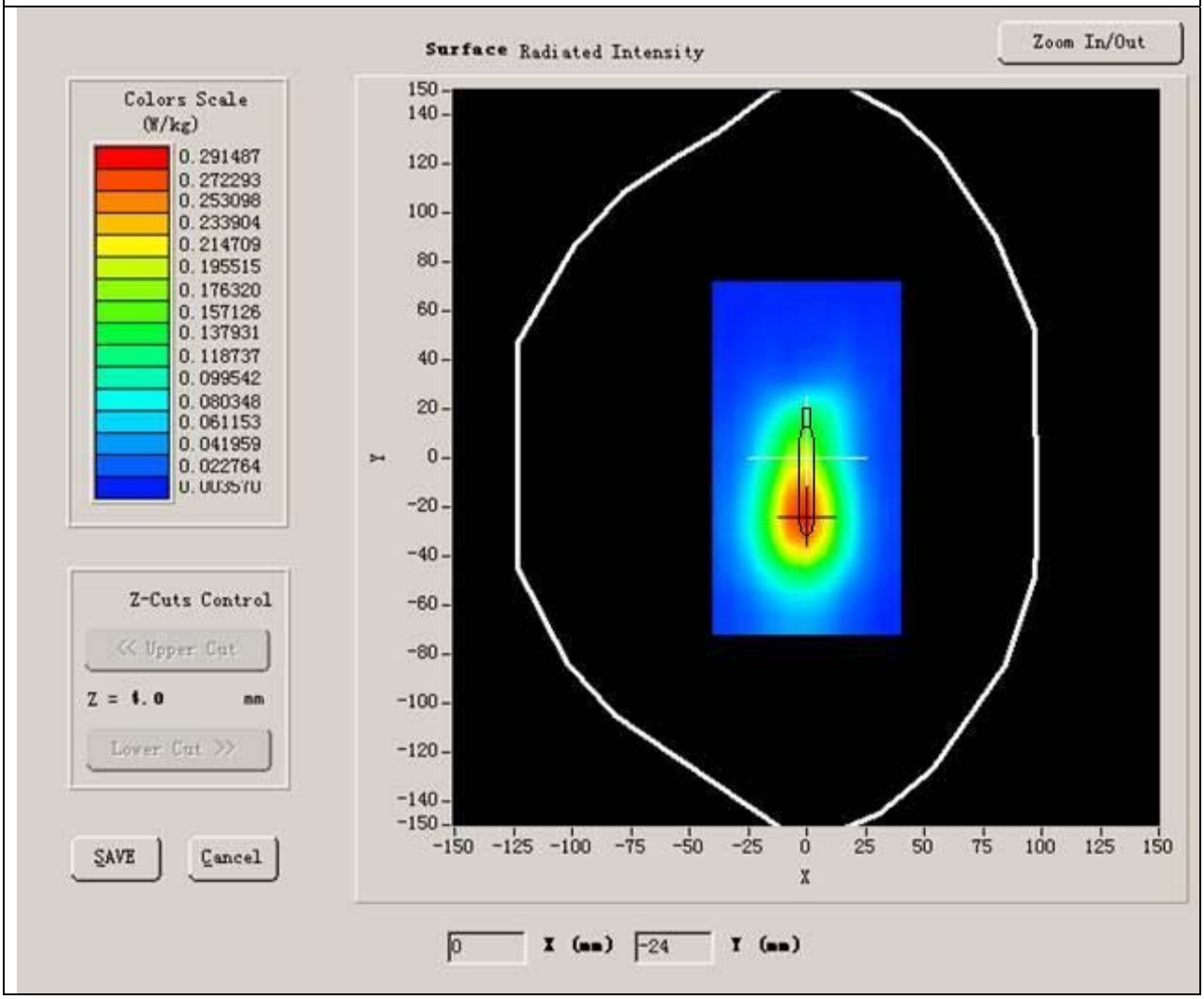
B. SAR Measurement Results

Middle Band SAR (Channel 600):

Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	1.340000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

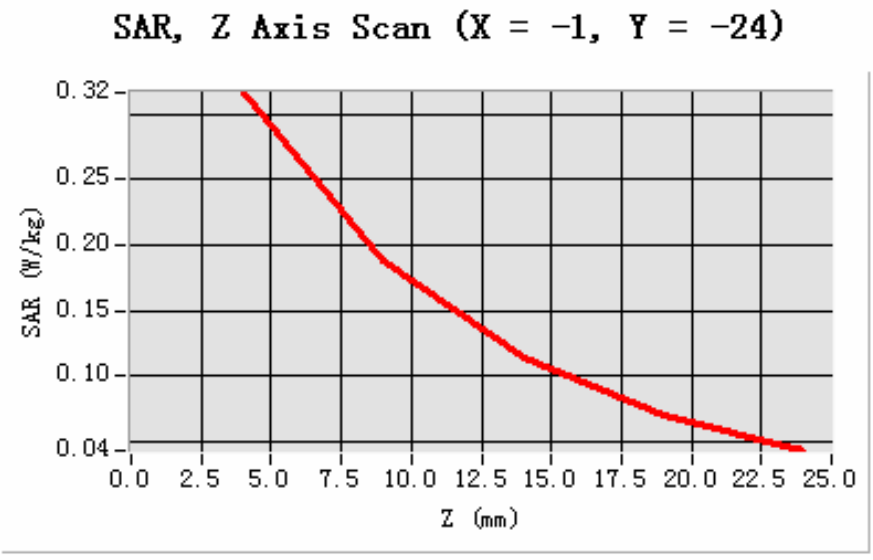


Maximum location: X=-1.00, Y=-24.00

SAR 10g (W/Kg)	0.169320
SAR 1g (W/Kg)	0.296336

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3164	0.1889	0.1138	0.0708



MEASUREMENT 12

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 29 seconds

A. Experimental conditions.

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

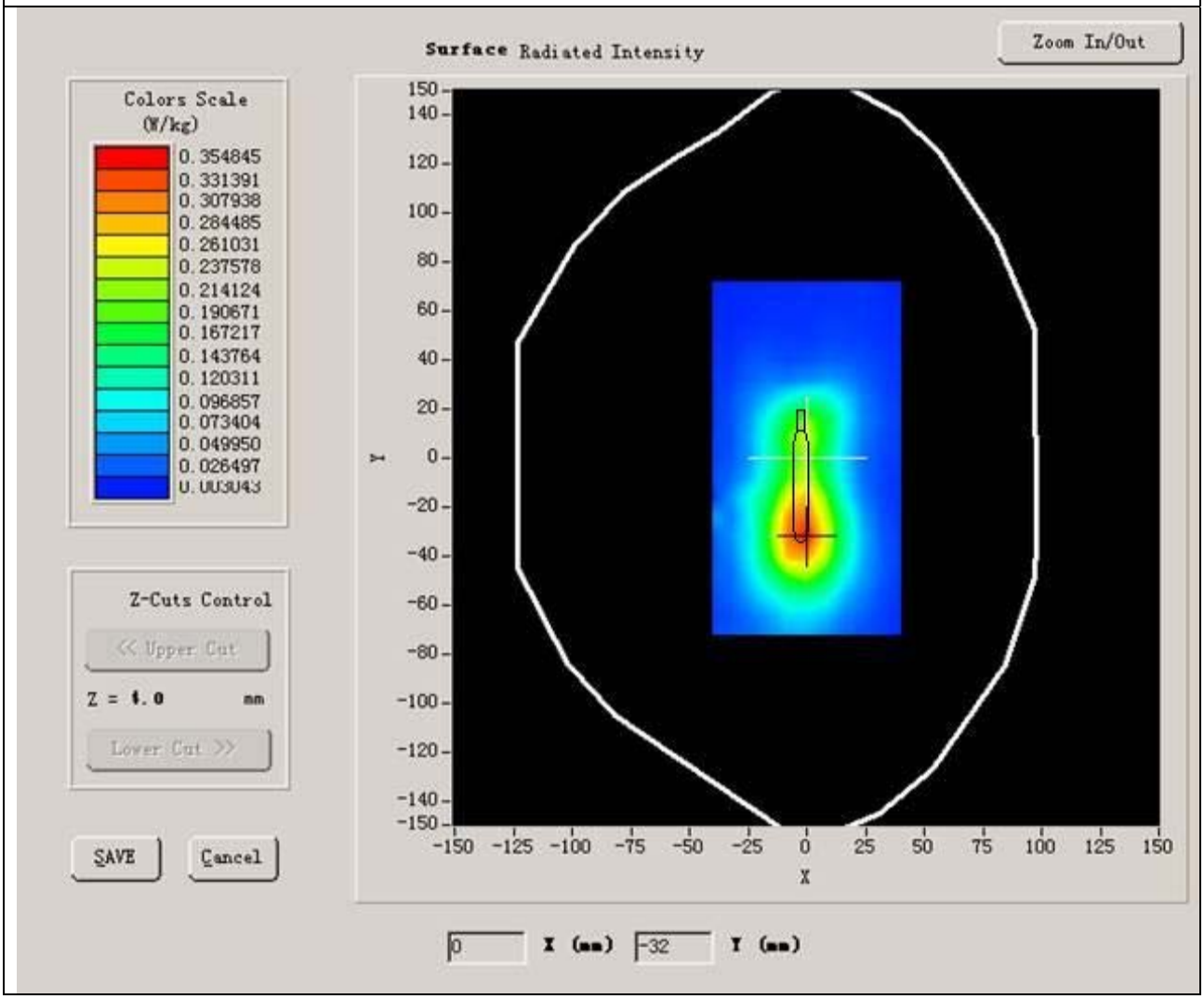
B. SAR Measurement Results

Higher Band SAR (Channel 1175):

Frequency (MHz)	1908.750000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	-1.760000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

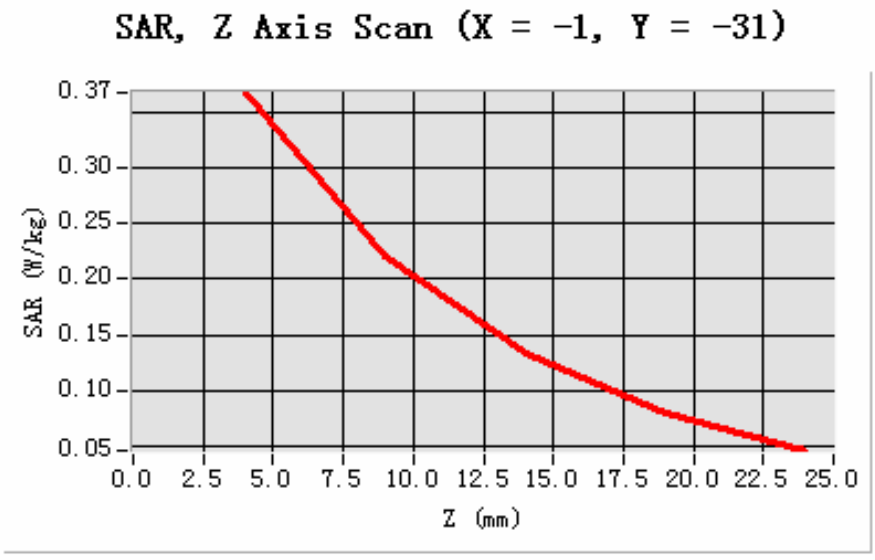


Maximum location: X=-1.00, Y=-31.00

SAR 10g (W/Kg)	0.194743
SAR 1g (W/Kg)	0.343584

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3679	0.2214	0.1326	0.0800



MEASUREMENT 13（with earphone）

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

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

Date of measurement: 19/1/2009

Measurement duration: 5 minutes 31 seconds

A. Experimental conditions.

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

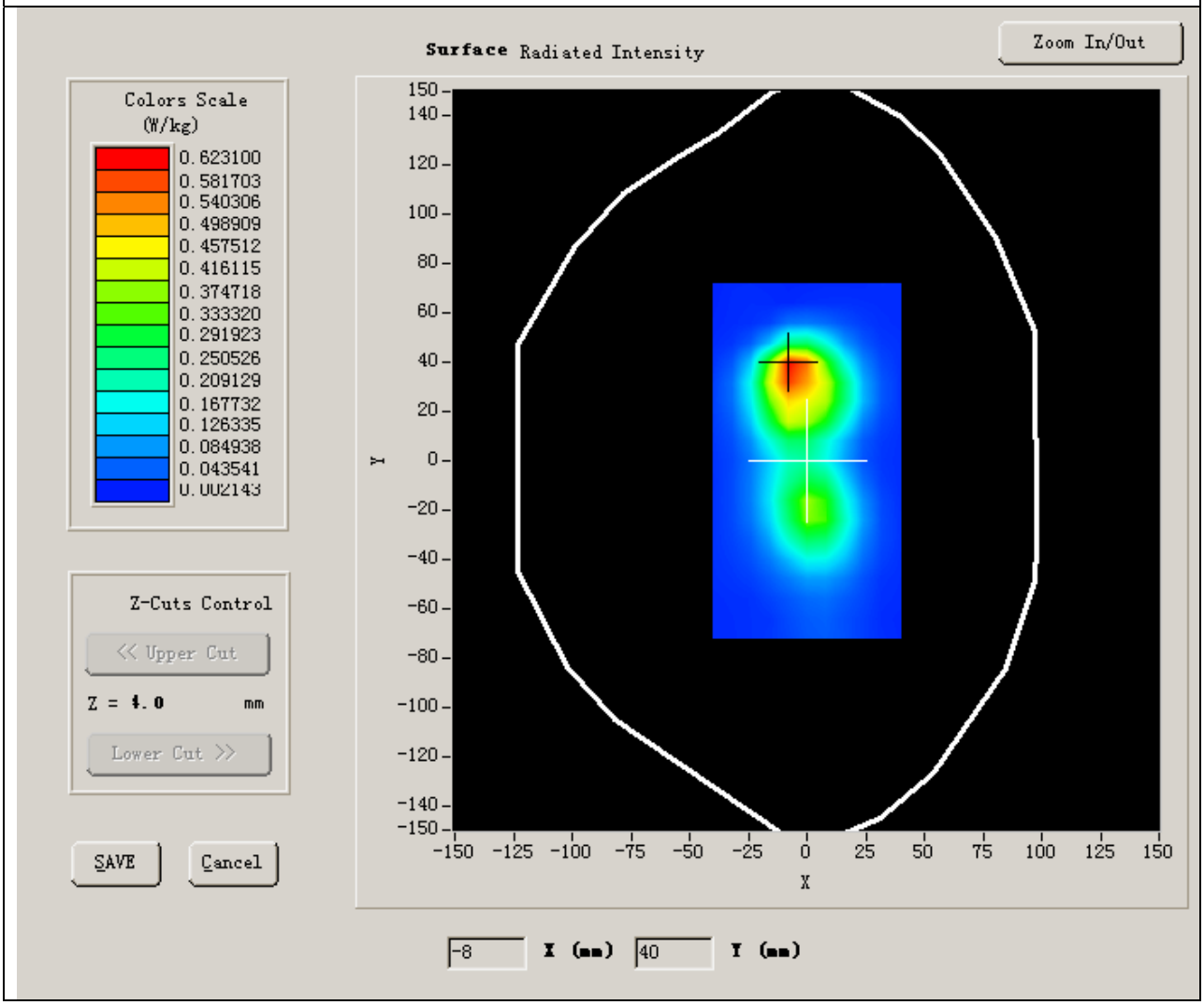
B. SAR Measurement Results

Higher Band SAR (Channel 1175):

Frequency (MHz)	1908.750000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	14.817600

Conductivity (S/m)	1.486632
Variation (%)	-0.970000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Probe Serial Number:	SN_3708_EP80
Crest factor:	40.136,34.843,38.721

SURFACE SAR

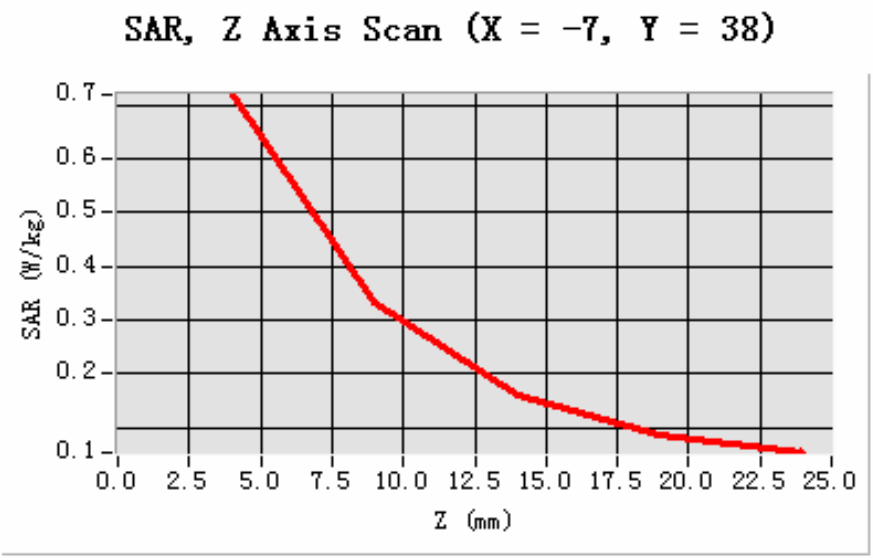


Maximum location: X=-7.00, Y=38.00

SAR 10g (W/Kg)	0.346662
SAR 1g (W/Kg)	0.728484

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.7198	0.3347	0.1587	0.0871



System Performance Check Data(Body)

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

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

Date of measurement:19/1/2009

Measurement duration: 5 minutes 27 seconds

A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Body
Band	CDMA 1900MHz
Signal	CDMA

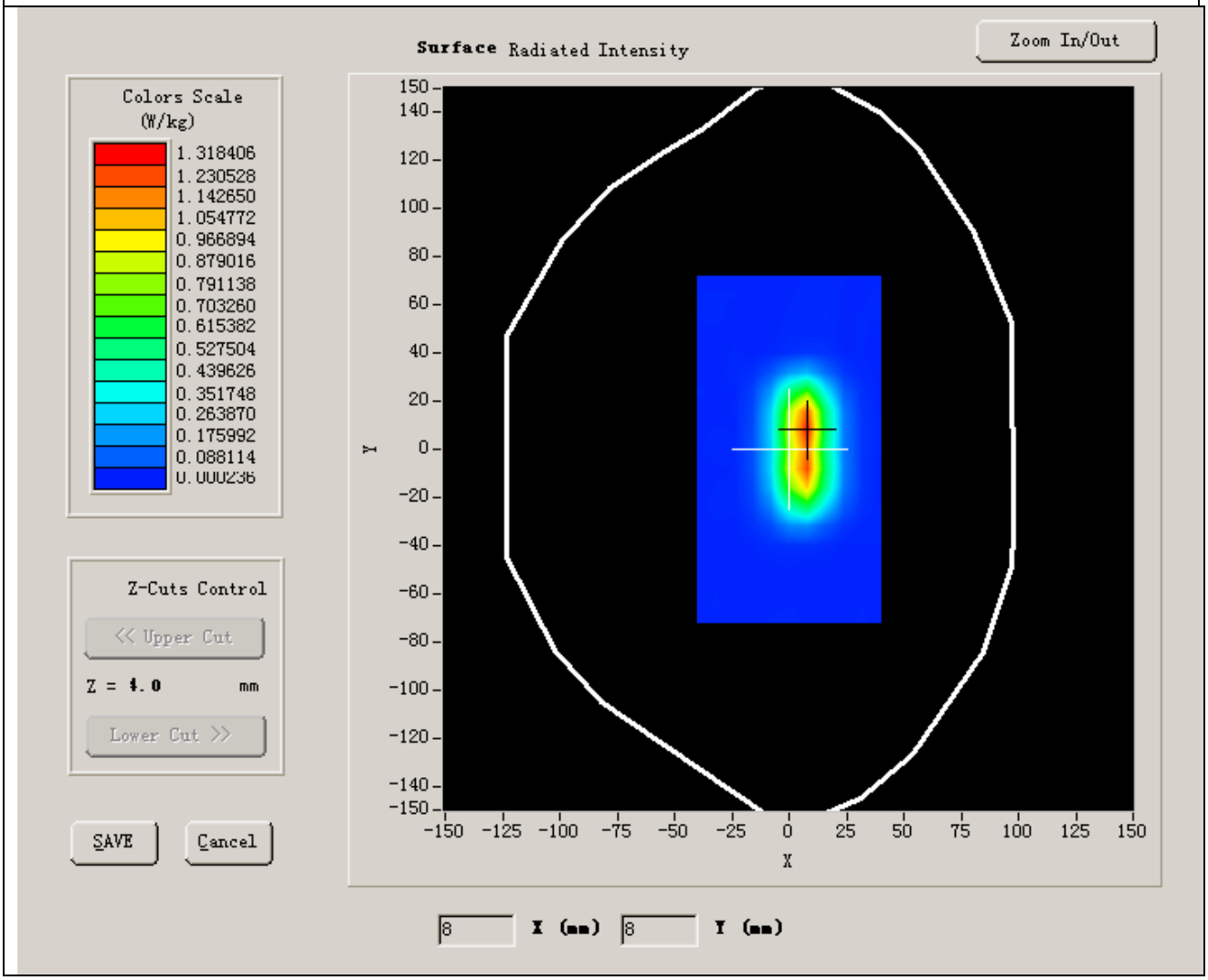
B. SAR Measurement Results

Band SAR:

Frequency (MHz)	1800.000000
Relative permittivity (real part)	53.883521
Relative permittivity (imaginary part)	15.070000

Conductivity (S/m)	1.486632
Variation (%)	-0.140000
Ambient Temperature:	22.9°C
Liquid Temperature:	22.9°C
Crest factor：	40.136,34.843,38.721

SURFACE SAR



Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	5.255842
SAR 1g (W/Kg)	9.485561

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