



SPECIFIC ABSORPTION RATE (SAR)

TEST REPORT

of

CDMA 1X DIGITAL MOBILE PHONE

Model Name: OT-208C
Brand Name: ALCATEL
Report No.: SH11010004S01
FCC ID: R5C208C

prepared for

Huizhou TCL Mobile Communication Co.,Ltd

NO.23 Zone, ZhongKai High-Technology Development Zone



**Shenzhen Electronic Product Quality Testing Center
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



NOTE: This test report can be duplicated completely for the legal use with the approval of the applicant, it shall not be reproduced except in full, without the written approval of Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. Any objections should be raised to us within thirty workdays since the date of issue.



GENERAL SUMMARY

Product Name	CDMA 1X DIGITAL MOBILE PHONE	Model	OT-208C
Brand Name	ALCATEL	Carrier	Ji Jianjun
Quantity of EUT	One	Manufacturer	Huizhou TCL Mobile Communication Co.,Ltd
Standard(s)	<p>OET 65(Edition 97-01), Supplement C (Edition 01-01): Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.</p> <p>ANSI C95.1-1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz.</p> <p>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.</p> <p>KDB 941225 D01 v02:SAR Measurement Procedures for 3G Devices CDMA 2000/EV-Do WCDMA/HSDPA/HSPA</p>		
Conclusion	<p>Localized Specific Absorption Rate (SAR) of this portable wireless equipment has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.</p> <p>General Judgment: Pass</p>		
Comment	<p>TX Freq. Band: 824.70MHz–848.31MHz(CDMA Cellular)</p> <p>RX Freq. Band: 869.70MHz–893.37MHz(CDMA Cellular)</p> <p>Antenna Character : build inside</p> <p>The test result only responds to the measured sample.</p>		

Tested by: Shi Feng Date: 2011. 1. 17
Checked by: Zhang Sun Date: 2011. 1. 17
Approved by: Wei Pei Date: 2011. 1. 17



TABLE OF CONTENT

1	GENERAL CONDITIONS.....	4
2	ADMINISTRATIVE DATA.....	5
2.1	IDENTIFICATION OF THE RESPONSIBLE TESTING LABORATORY	5
2.2	IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION(S)	5
2.3	ORGANIZATION ITEM	5
2.4	IDENTIFICATION OF APPLICANT.....	5
3	EQUIPMENT UNDER TEST (EUT).....	6
4	OPERATIONAL CONDITIONS DURING TEST	7
4.1	SCHEMATIC TEST CONFIGURATION	7
4.2	SAR MEASUREMENT SYSTEM	7
4.2.1	<i>Robot system specification</i>	8
4.2.2	<i>Probe Specification</i>	8
	ISOTROPIC E-FIELD PROBE SPECIFICATION.....	10
	BOUNDARY DETECTION UNIT AND PROBE MOUNTING DEVICE	10
	DAQ-PAQ (ANALOG TO DIGITAL ELECTRONICS).....	11
4.2.3	<i>Phantoms, Device Holder and Simulant Liquid</i>	12
	ALSAS UNIVERSAL WORKSTATION.....	13
	UNIVERSAL DEVICE POSITIONER.....	13
4.2.4	<i>SAR measurement procedure</i>	14
4.2.5	<i>Validation Test Using Flat Phantom</i>	15
	VALIDATION Dipoles	16
	<i>Validation Result</i>	16
4.2.6	<i>Measurement Procedure</i>	17
4.2.7	<i>Description of Interpolation/Extrapolation Scheme</i>	18
5	CHARACTERISTICS OF THE TEST	18
5.1.1	<i>Applicable Limit Regulations</i>	18
5.1.2	<i>Applicable Measurement Standards</i>	19
6	LABORATORY ENVIRONMENT	19
7	TEST RESULTS	20
7.1	EXPLAIN	20
7.2	DIELECTRIC PERFORMANCE.....	20
7.3	SUMMARY OF MEASUREMENT RESULTS	20
7.4	CONCLUSION	21
8	MEASUREMENT UNCERTAINTIES.....	22
9	MAIN TEST INSTRUMENTS.....	24
	ANNEX A- ACCREDITATION CERTIFICATE.....	25



ANNEX B- TEST LAYOUT	27
ANNEX C- SAMPLE PHOTOGRAPHS.....	32
ANNEX D- GRAPH TEST RESULTS.....	33

1 GENERAL CONDITIONS

This report only refers to the item that has undergone the test. This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities.

This document is only valid if complete; no partial reproduction can be made without written approval of Shenzhen Morlab Communications Technology Co., Ltd.

This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of Shenzhen Morlab Communications Technology Co., Ltd. and the Accreditation Bodies, if it applies.



2 Administrative Date

2.1 Identification of the Responsible Testing Laboratory

Company Name: Shenzhen Morlab Communications Technology Co.,Ltd.
Department: Testing Department
Address: 3Fl, Electronic Testing Building, ShaHe Road, NanShan District, Shenzhen, P. R. China
Telephone: +86 755 86130268
Fax: +86 755 86130218
Responsible Test Lab Managers: Mr. Shu Luan

2.2 Identification of the Responsible Testing Location(s)

Company Name: Shenzhen Electronic Product Quality Testing Center Morlab Laboratory
Address: 3Fl, Electronic Testing Building, ShaHe Road, NanShan District, Shenzhen, P. R. China

2.3 Organization Item

Morlab Report No.: SH11010004S01
Morlab Project Leader: Mr. Zhang Jun
Morlab Responsible for Accreditation scope: Mrs. Wei Bei
Start of Testing: 2011-1-17
End of Testing: 2011-1-17

2.4 Identification of Applicant

Company Name: Huizhou TCL Mobile Communication Co.,Ltd
Address: NO.23 Zone, ZhongKai High-Technology Development Zone
Contact person: Ji Jianjun
Telephone: 0755-33035352
Fax: 0755-33313007

2.5 Identification of Manufacture

Company Name: Huizhou TCL Mobile Communication Co.,Ltd
Address: NO.23 Zone, ZhongKai High-Technology Development Zone

Notes: This data is based on the information offered by the applicant.



3 Equipment Under Test (EUT)

3.1. Identification of the Equipment under Test

Product Name:	CDMA 1X DIGITAL MOBILE PHONE	
Brand name:	ALCATEL	
Model No:	OT-208C	
FCC ID:	R5C208C	
General description:	Test frequency	CDMA Cellular
	Accessories	Battery,Charger,
	Battery Model	CAB21EC000C1
	Battery specification	3.7V 650mAh
	Charger Model	WEU350mA5V00-00
	Charger specification	Ac 220V 150mA Max3.2W 47-63Hz
	Charger Manufacture	BYD COMPANY LIMITED
	Antenna type	CDMA 1x:Integrated
	Modulation mode	QPSK

3.2. Identification of all used Test Sample of the Equipment under Test

EUT Code	Serial Number	Hardware Version	Software Version	IMEI
#1	N.A.	SATURN_V1.1	SATURN_BASE_V1.0	\

NOTE:

1. The EUT is production unit. The EUT consists of Hand Telephone Set and normal options: Charger, Lithium Battery as listed above.
2. Please refer to Appendix C for the photographs of the EUT. For a more detailed features description of the EUT, please refer to its User's Manual.
3. Testing for General Population/Uncontrolled limits.

4 OPERATIONAL CONDITIONS DURING TEST

4.1 Schematic Test Configuration

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 TCH is allocated to 1013, 384 and 777 respectively in the case of CDMA Cellular. 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.

4.2 SAR Measurement System

ALSAS-10-U is fully compliant with the technical and scientific requirements of IEEE 1528, IEC 62209, CENELEC, ARIB, ACA, and the Federal Communications Commission. The system comprises of a six axes articulated robot which utilizes a dedicated controller. ALSAS-10U uses the latest methodologies and FDTD order to provide a platform which is repeatable with minimum uncertainty.

Applications Predefined measurement procedures compliant with the guidelines of CENELEC, IEEE, IEC, FCC, etc are utilized during the assessment for the device. Automatic detection for all SAR maxima are embedded within the core architecture for the system, ensuring that peak locations used for centering the zoom scan are within a 1mm resolution and a 0.05mm repeatable position. System operation range currently is available up to 6 GHz in simulated tissue.



4.2.1 Robot system specification

ALSAS-10U utilizes a six articulated robot, which is controlled using a Pentium based real-time movement controller. The movement kinematics engine utilizes proprietary (Thermo CRS) interpolation and extrapolation algorithms, which allow full freedom of movement for each of the six joints within the working envelop. Utilization of joint 6 allows for full probe rotation with a tolerance better than 0.05mm around the central axis.



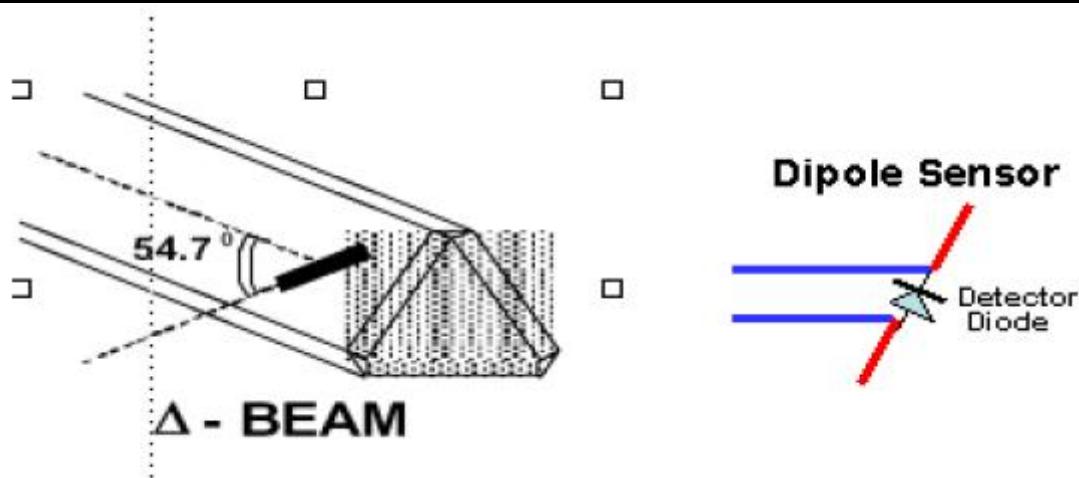
Robot/Controller Manufacturer	Thermo CRS
Number of Axis	Six independently controlled axis
Positioning Repeatability	0.05mm
Controller Type	Single phase Pentium based C500C
Robot Reach	710mm
Communication	RS232 and LAN compatible

4.2.2 Probe Specification

The isotropic E-Field probe has been fully calibrated and assessed for isotropic, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change. A number of methods is used for calibrating probes, and these are outlined in the table below:

Calibration Frequency	Air Calibration	Tissue Calibration
850MHZ	TEM Cell	Temperature
1900MHZ	TEM Cell	Temperature

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



SAR is assessed with a calibrated probe which moves at a default height of 5mm from the center of the diode, which is mounted to the sensor, to the phantom surface (in the Z Axis). The 5mm offset height has been selected so as to minimize any resultant boundary effect due to the probe being in close proximity to the phantom surface.

The following algorithm is an example of the function used by the system for linearization of the output from the probe when measuring complex modulation schemes.

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$



Isotropic E-Field Probe Specification

Calibration in Air	Frequency Dependent Below 2GHz Calibration in air performed in a TEM Cell Above 2GHz Calibration in air performed in waveguide
Sensitivity	0.70 μ V/(V/m) ² to 0.85 μ V/(V/m) ²
Dynamic Range	0.0005 W/kg to 100W/kg
Isotropic Response	Better than 0.2dB
Diode Compression point (DCP)	Calibration for Specific Frequency
Probe Tip Radius	< 5mm
Sensor Offset	1.56 (+/- 0.02mm)
Probe Length	290mm
Video Bandwidth	@ 500 Hz: 1dB @1.02 KHz: 3dB
Boundary Effect	Less than 2% for distance greater than 2.4mm
Spatial Resolution	Diameter less than 5mm Compliant with Standards

Boundary detection Unit and Probe Mounting Device

ALSAS-10U incorporates a boundary detection unit with a sensitivity of 0.05mm for detecting all types of surfaces. The robust design allows for detecting during probe tilt (probe normalize) exercises, and utilizes a second stage emergency stop. The signal electronics are directly into the robot controller for high accuracy surface detection in lateral and axial detection modes (X, Y, &Z). The probe is mounted directly onto the Boundary Detection unit for accurate tooling and displacement calculations controlled by the robot kinematics. The probe is connected to an isolated probe interconnect where the output stage of the probe is fed directly into the amplifier stage of the Daq-Paq.

Daq-Paq (Analog to Digital Electronics)

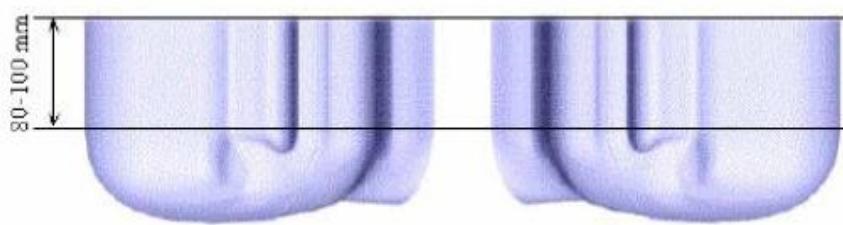
ALSAS-10U incorporates a fully calibrated Daq-Paq (analog to digital conversion system) which has a 4 channel input stage, sent via a 2 stage auto-set amplifier module. The input signal is amplified accordingly so as to offer a dynamic range from 5μ V to 800mV. Integration of the fields measured is carried out at board level utilizing a Co-Processor which then sends the measured fields down into the main computational module in digitized form via a RS232 communications port. Probe linearity and duty cycle compensation is carried out within the main Daq-Paq module.

ADC	12 Bit
Amplifier Range	20mV to 200mV and 150mV to 800mV
Field Integration	Local Co-Processor utilizing proprietary integration algorithms
Number of Input Channels	4 in total 3 dedicated and 1 spare
Communication	Packet data via RS232

4.2.3 Phantoms, Device Holder and Simulant Liquid

4.2.3.1 Sam Phantom

The SAM phantoms developed using the IEEE SAM CAD file. They are fully compliant with the requirements for both IEEE 1528 and FCC Supplement C. Both the left and right SAM phantoms are interchangeable, transparent and include the IEEE 1528 grid with visible NF and MB lines.



APREL Laboratories Universal Phantom

The Universal Phantom is used on the ALSAS-10U as a system validation phantom. The Universal Phantom has been fully validated both experimentally from 800MHz to 6GHz and numerically using XFDTD numerical software. The shell thickness is 2mm overall, with a 4mm spacer located at the NF/MB intersection providing an overall thickness of 6mm in line with the requirements of IEEE-1528.

The design allows for fast and accurate measurements, of handsets, by allowing the conservative SAR to be evaluated at on frequency for both left and right head experiments in one measurement.



Device and Dipole Holder

ALSAS Universal Workstation

ALSAS Universal workstation allows for repeatability and fast adaptability. It allows users to do calibration, testing and measurement using different types of phantoms with one set up, which significantly speeds up the measurement process.

Universal Device Positioner

The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales which form the design used to indicate positioning for any given test scenario in all major axes. A 15° tilt movements for head SAR analysis. Overall uncertainty for measurements has been reduced due to the design of the Universal device positioner, which allows positioning of a device in as near to a free-space scenario as possible, and by providing the means for complete repeatability.



4.2.3.2 Tissue Simulating Liquids

There is no simulating liquids that can cover all frequency bands. Therefore, our system is using different liquids for the measured band as explained bellows.

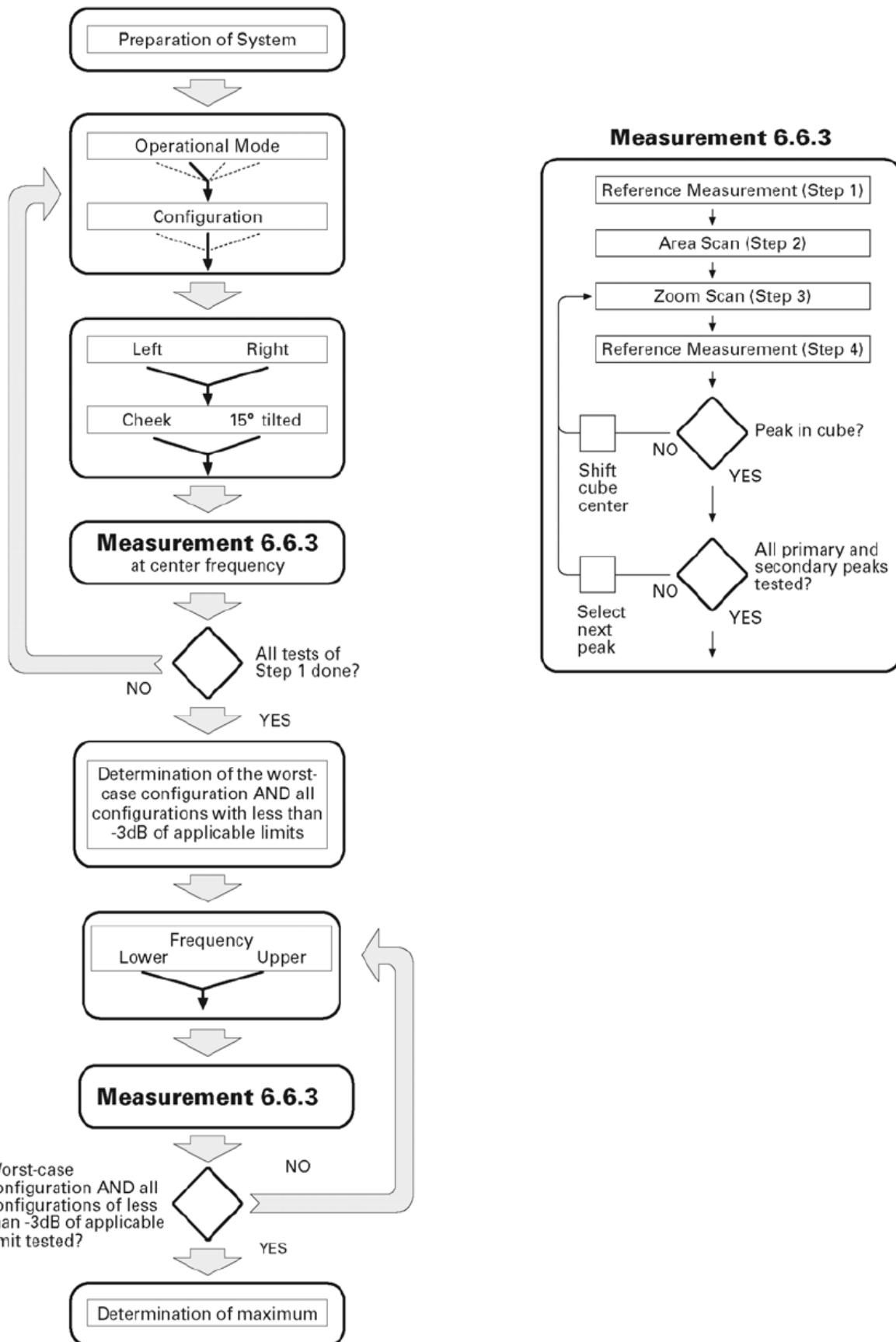
The parameters of the simulating solution strongly influence the SAR values. The different normalization organizations have defined adapted solutions for the each mobile system.

GSM liquid: is made of Sugar, de-ionized water and NaCl, reconstituting the electric properties of human tissues at 850MHz.

Several measurement systems are available for measuring the dielectric parameters.

Antennessa has developed its own software, based on a coaxial probe. This method allows measurement of liquid permittivity between 300 MHz and 6GHz.

4.2.4 SAR measurement procedure



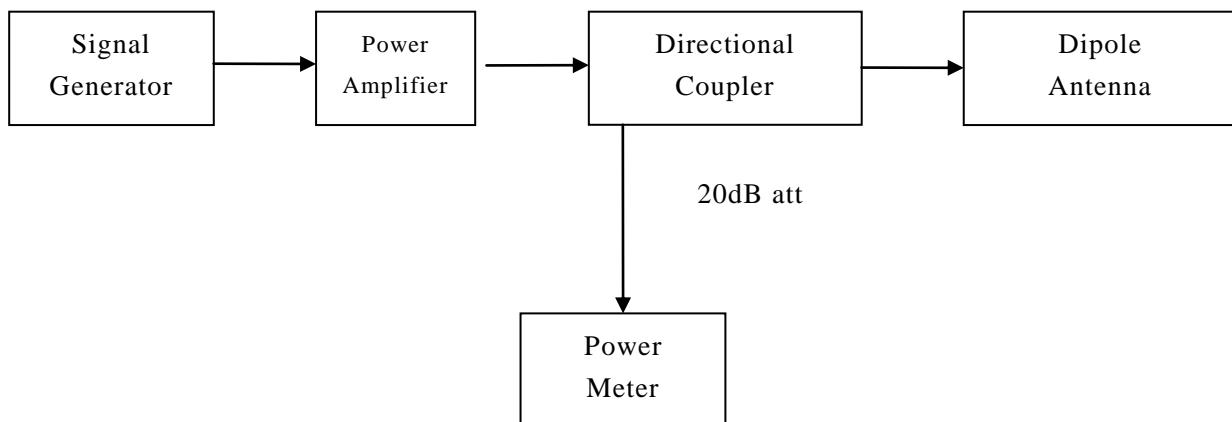
Channel	Left				Right			
	Cheek		Tilt		Cheek		Tilt	
	Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended
Mode 1:								
High			S2(-1.4dB)	S2(-0.4dB)			S2(-2.2dB)	S2(-1.4dB)
Middle	S1(-4dB)	S1(-4dB)	S1(-1.5dB)	S1(-0.5dB)	S1(-5dB)	S1(-5dB)	S1(-2.5dB)	S1(-1.5dB)
Low			S2(-1.3dB)	S2(-0.7dB)			S2(-2.7dB)	S2(-0.6dB)
Mode 2:								
High			S2(-2.7dB)	S2(-1.1dB)				
Middle	S1(-5dB)	S1(-5dB)	S1(-2.5dB)	S1(-1dB)	S1(-6dB)	S1(-6dB)	S1(-5dB)	S1(-5dB)
Low			S2(-2.2dB)	S2(-0.8dB)				

After an area scan has been done at a fixed distance of 8mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEE P1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.

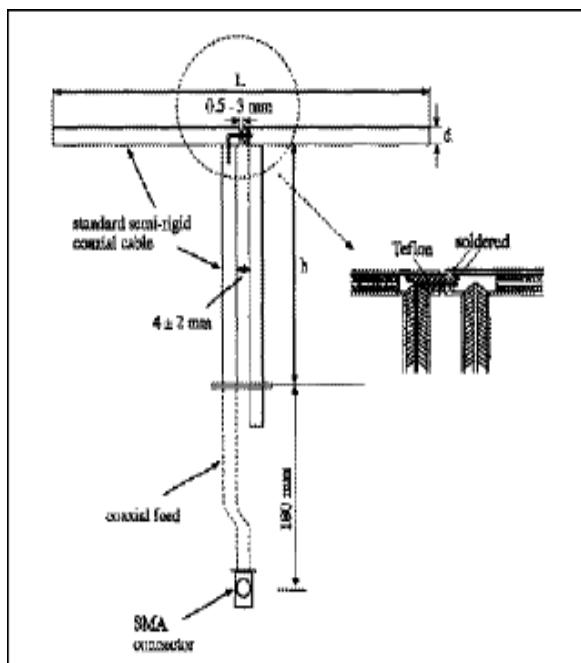
4.2.5 Validation Test Using Flat Phantom

The following procedure, recommended for performing validation tests using flat phantom is based on the procedures described in the IEEE standard P1528. Setup according to the setup diagram below:



4.2.5.1 Setting up the Box Phantom for Validation Testing

Validation Dipoles



The dipoles used are based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. The table below provides details for the mechanical and electrical specifications for the dipoles.

Frequency	L(mm)	h(mm)	d(mm)
850MHZ	161	89.8	3.6

Validation Result

System Performance Check at 835MHz

Validation Kit: ASL-D-835-S-2

Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(°C)
835MHz Head	Target result	9.590	6.003	N/A
	Value(1W) 2011-1-17	10.008	6.42	20.7
	Value(0.25W) 2011-1-17	2.502	2.605	20.7
835MHz Body	Target result	9.981	6.006	N/A

	Value(1W) 2011-1-17	9.868	6.052	20.7
	Value(0.25W) 2011-1-17	2.467	1.513	20.7

Note: Validation SAR values are normalized to 1W forward power

4.2.6 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 phone and the base station simulator is established via air interface.

Measurement of the local E-field distribution is done with a grid of 8 to 16mm*8 to 16mm and a constant distance to the inner surface of the phantom. Since the sensors cannot 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 interpolating scheme. Around this point, a cube of 30*30*30mm or 32*32*32mm is assessed by measuring 5 or 8*5 or 8*4 or 5mm. With these data, the peak spatial-average SAR value can be calculated.

Field scans:

ALSAS-10U can provide multiple scan types including Measurements along lines (X, Y, Z), multiple planes, curved surfaces (normalize probe to surface), volumes in free space or restricted volumes (phantoms). Cube measurements with surface extrapolation and spatial SAR evaluation for 1g and/or 10g. Time measurements (source power drift). Probe rotation measurements (isotropy) and many others in line with the requirements of any given standard or procedure.

Area Scans:

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 10mm² step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

A maximum area scan size is set at 280mm x 200mm which can be changed to a smaller size dependent on the field distribution of the device under test. The area scan size is documented within the SAR report which is delivered by the SAR system software. Where the system identifies multiple SAR peaks (which are within 2dB of each peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the ALSAS-10U software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1 000 kg/m³ is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm. When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the centre of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface. The centre of the cube and the tangential angle associated defines each face of the cube so that all transitional points follow this tangential angle. The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 5x5x9 (8mmx8mmx4mm Fx <3GHz) and 9x9x17 (4mmx4mmx2mm Fx>3GHz) providing a volume of 32mm in the X & Y axis, and 32mm in the Z axis. All points remain tangential to the surface by utilizing the normalize (probe tilt) feature so as to reduce measurement uncertainty.

4.2.7 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 used to determinate this highest local SAR values. The extrapolation is base 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 (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8mm. to obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1gram requires a very fine resolution in the three-dimensional scanned data array.

5 CHARACTERISTICS OF THE TEST

5.1.1 Applicable Limit Regulations

ANSI C95.1-1999: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.1.2 Applicable Measurement Standards

IEEE 1528-2003: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

KDB 941225 D01 v02: SAR Measurement Procedures for 3G Devices

CDMA 2000/EV-Do WCDMA/HSDPA/HSPA

It specifies the measurement method for demonstration of compliance with the SAR limits for such equipments.

6 LABORATORY ENVIRONMENT

Table: The Ambient Conditions during SAR Test

Temperature	Min. =15 °C, Max. =30 °C
Relative humidity	Min. =30%, Max. =70%
Ground system resistance	<0.5Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

7 TEST RESULTS

7.1 Explain

The EUT has been tested under the operating conditions.

7.2 Dielectric Performance

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 (Jan 17)	835 MHZ	41.423007	0.891011

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 (Jan 17)	835 MHz	55.358010	0.974233

7.3 Summary of Measurement Results

Conducted Power(dBm)

Test Model	Test Status	Channel	Frequency(M Hz)	Conducted Power(dBm)
CDMA 2000 1xRTT	RC1+SO55	1013	824.70	23.56
		384	836.52	23.67
		777	848.31	23.86
	RC3+SO55	1013	824.70	23.41
		384	836.52	23.54
		777	848.31	23.77
	RC3+SO32	1013	824.70	23.47
		384	836.52	23.61
		777	848.31	23.81

According to KDB 941225, the head SAR is measured in RC3 with SO55. Head SAR for RC1 is not required because the maximum power is less than 1/4 dB higher than RC3. The body SAR is measured in RC3 with SO32. Body SAR for RC1 is not required because the maximum power is less than 1/4 dB higher than RC3.

SAR Values, Measured against the head.

Temperature: 21.0~23.5 °C, Relative Humidity: 60~65%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Configuration	Measurement Result (W/kg)	
	1 g Average(W/kg)	Power Drift(%)
Left head,cheek,Low channel	0.659	-3.338
Left head,cheek,Middle channel	0.962	-3.659
Left head,cheek,High channel	1.078	0.949
Left head,Tilt,Low channel	0.317	-2.772
Left head,Tilt,Middle channel	0.785	-3.774
Left head,Tilt,High channel	0.866	-2.741
Right head,cheek,Low channel	0.729	-2.336
Right head,cheek,Middle channel	0.915	-4.572
Right head,cheek,High channel	1.274	-2.104
Right head,Tilt,Low channel	0.510	3.856
Right head,Tilt,Middle channel	0.755	-3.880
Right head,Tilt,High channel	0.915	-2.204

SAR Values, Measured against the body.

Temperature: 21.0~23.5 °C, Relative Humidity: 60~65%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Configuration	Measurement Result (W/kg)	
	1 g Average (W/kg)	Power Drift(%)
Body,Towards Phantom, Middle channel	0.481	-1.201
Body,Towards Ground,Low channel	0.443	-2.624
Body,Towards Ground,Middle channel	0.677	-4.462
Body,Towards Ground,High channel	1.073	-1.466
Body,Towards Ground,High channel (earphone)	1.050	-3.142

7.4 Conclusion

Peak Spatial-Average Specific Absorption Rate (SAR) of this portable wireless device has been measured in all configurations requested by the relevant standards cited in Clause 5.2 of this report. SAR values are below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

8 Measurement Uncertainties

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

UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

Source of Uncertainty	Tolerance Value	Probability Distribution	Divisor	ci1 (1-g)	ci1 (10-g)	Standard Uncertainty (1-g) %	Standard Uncertainty (10-g) %
Measurement System							
Probe Calibration	3.5	normal	1	1	1	3.5	3.5
Axial Isotropy	3.7	rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.5	1.5
Hemispherical Isotropy	10.9	rectangular	$\sqrt{3}$	\sqrt{cp}	\sqrt{cp}	4.4	4.4
Boundary Effect	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	rectangular	$\sqrt{3}$	1	1	2.7	2.7
Detection Limit	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Readout Electronics	1.0	normal	1	1	1	1.0	1.0
Response Time	0.8	rectangular	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	1.7	rectangular	$\sqrt{3}$	1	1	1.0	1.0
RF Ambient Condition	3.0	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner Mech.	0.4	rectangular	$\sqrt{3}$	1	1	0.2	0.2
Restriction							
Probe Positioning with respect to Phantom Shell	2.9	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Extrapolation	3.7	rectangular	$\sqrt{3}$	1	1	2.1	2.1



and Integration							
Test Sample Positioning	4.0	normal	1	1	1	4.0	4.0
Device Holder Uncertainty	2.0	normal	1	1	1	2.0	2.0
Drift of Output Power	0.6	rectangular	$\sqrt{3}$	1	1	0.3	0.3
Phantom and Setup							
Phantom Uncertainty(s hape & thickness tolerance)	3.4	rectangular	$\sqrt{3}$	1	1	2.0	2.0
Liquid Conductivity (target)	5.0	rectangular	$\sqrt{3}$	0.7	0.5	2.0	1.4
Liquid Conductivity (meas.)	0.0	normal	1	0.7	0.5	0.0	0.0
Liquid Permittivity(t arget)	5.0	rectangular	$\sqrt{3}$	0.6	0.5	1.7	1.4
Liquid Permittivity(meas.)	2.4	normal	1	0.6	0.5	1.4	1.2
Combined Uncertainty		RSS				9.3	9.2
Combined Uncertainty (coverage factor=2)		Normal(k=2)				18.7	18.3



9 MAIN TEST INSTRUMENTS

Instrument	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Due
Universal Work Station	Aprel	ALS-UWS	100-00154	Jun.2011	1 year
Data Acquisition Package	Aprel	ALS-DAQ-PAQ-3	110-00215	Jun.2011	1 year
Probe Mounting Device and Boundary Detection Sensor System	Aprel	ALS-PMDPS-3	120-00265	Jun.2011	1 year
Miniature E-Field Probe	Aprel	E-020	273-B	Dec.2010	3 year
Left ear SAM Phantom	Aprel	ALS-P-SAM-L	130-00312	N/A	N/A
Right ear SAM Phantom	Aprel	ALS-P-SAM-R	140-00362	N/A	N/A
Universal SAM Phantom	Aprel	ALS-P-SU-1	150-00410	N/A	N/A
Reference Validation Dipole 835MHz	Aprel	ALS-D-835-S-2	180-00565	18 th February 2011	3 year
Dielectric Probe Kit	Aprel	ALS-PR-DIEL	260-00955	N/A	N/A
Device Holder 2.0	Aprel	ALS-H-E-SET-2	170-00506	N/A	N/A
SAR software	Aprel	ALS-SAR-AL-10	Ver.2.3.6	N/A	N/A
CRS C500C Controller	Thermo	ALS-C500	RCF0504291	N/A	N/A
CRS F3 Robot	Aprel	ALS-F3-SW	N/A	N/A	N/A
Power Amplifier	Mini-Circuit	SN0974	040306	N/A	N/A
Directional Coupler	Agilent	778D-012	N/A	N/A	N/A
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	104845	Jan.2011	1 year
Vector Network	Anritsu	MS4623B	N/A	Nov.2010	1 year
Signal Generator	Agilent	E8257D	N/A	Jan.2011	1 year
Power Meter	Rohde&Schwarz	NRP	N/A	Jan.2011	1 year



Report No: SH11010004S01

ANNEX A- Accreditation Certificate

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

CDMA 1X DIGITAL MOBILE PHONE

REPORT NO: SH11010004S01

Type Name: OT-208C

Hardware Version: SATURN_V1.1

Software Version: SATURN_BASE_V1.0

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

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 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: 2009-09-29

Date of Expiry: 2012-09-28

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).



Report No: SH11010004S01

ANNEX B- Test Layout

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

CDMA 1X DIGITAL MOBILE PHONE

REPORT NO: SH11010004S01

Type Name: OT-208C

Hardware Version: SATURN_V1.1

Software Version: SATURN_BASE_V1.0

Test Layout

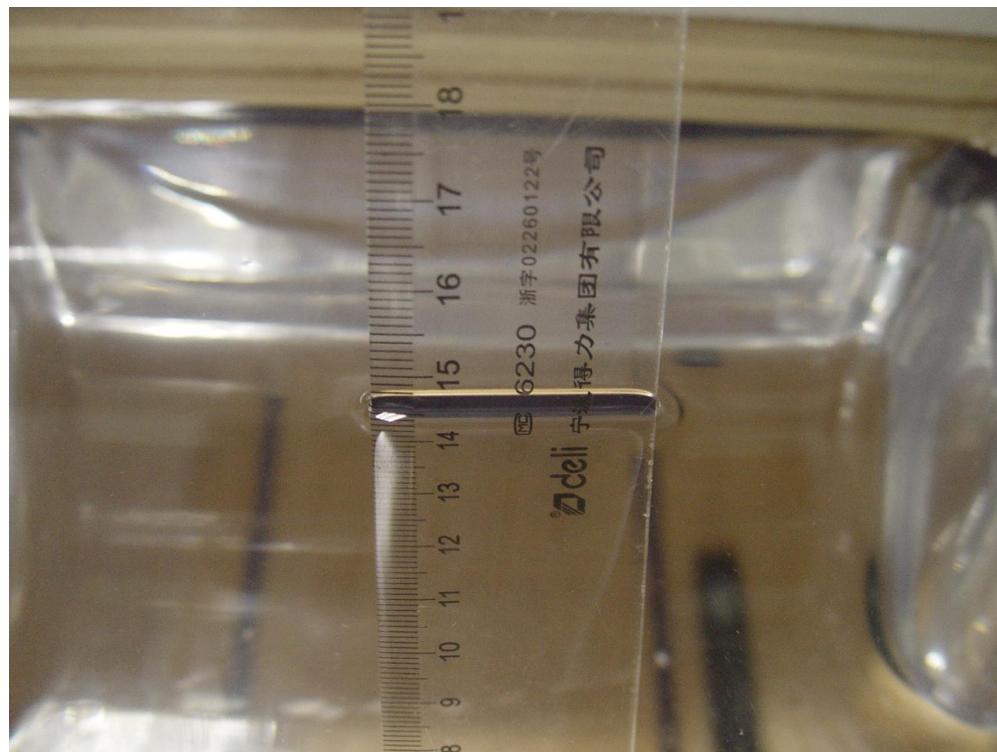


Figure B.1 Depth of Simulating Liquid in SAM Head Phantom

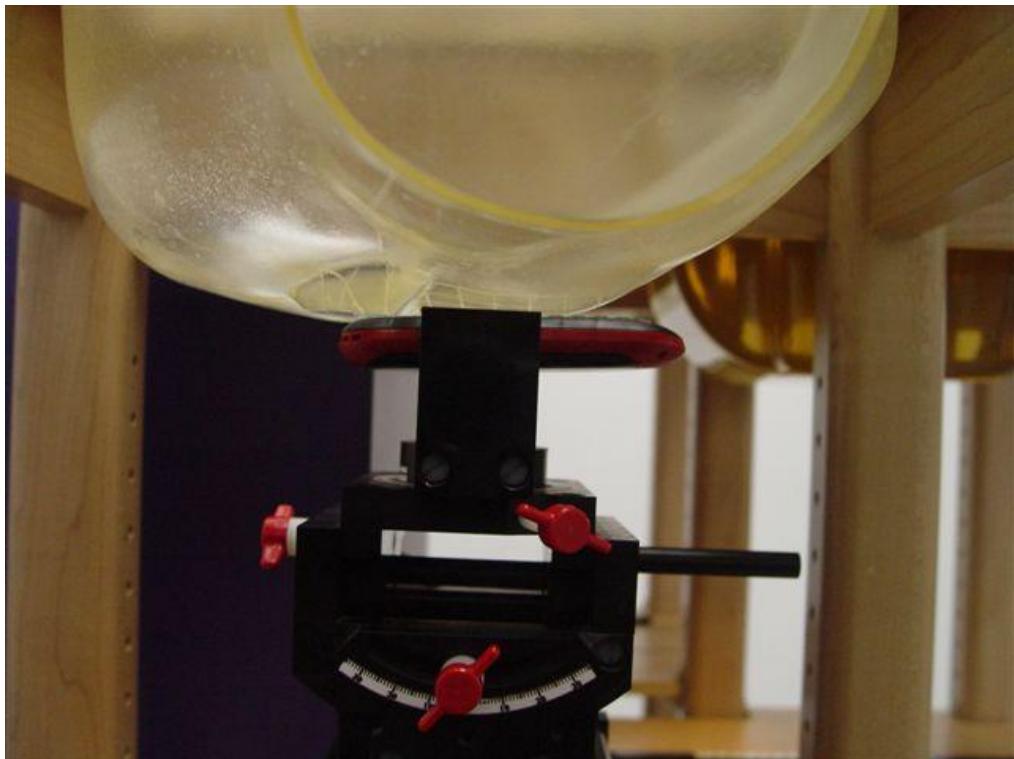


Figure B.2 EUT Left Cheek Position

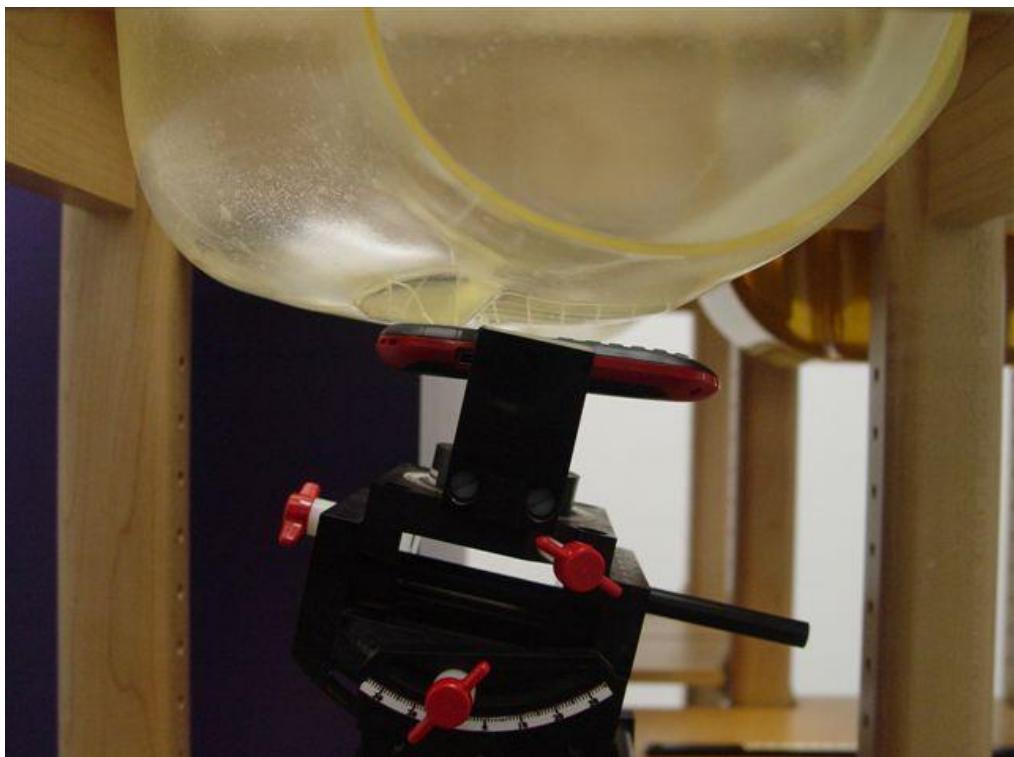


Figure B.3 EUT Left Tilt Position



Figure B.4 EUT Right Cheek Position



Figure B.5 EUT Right Tilt Position

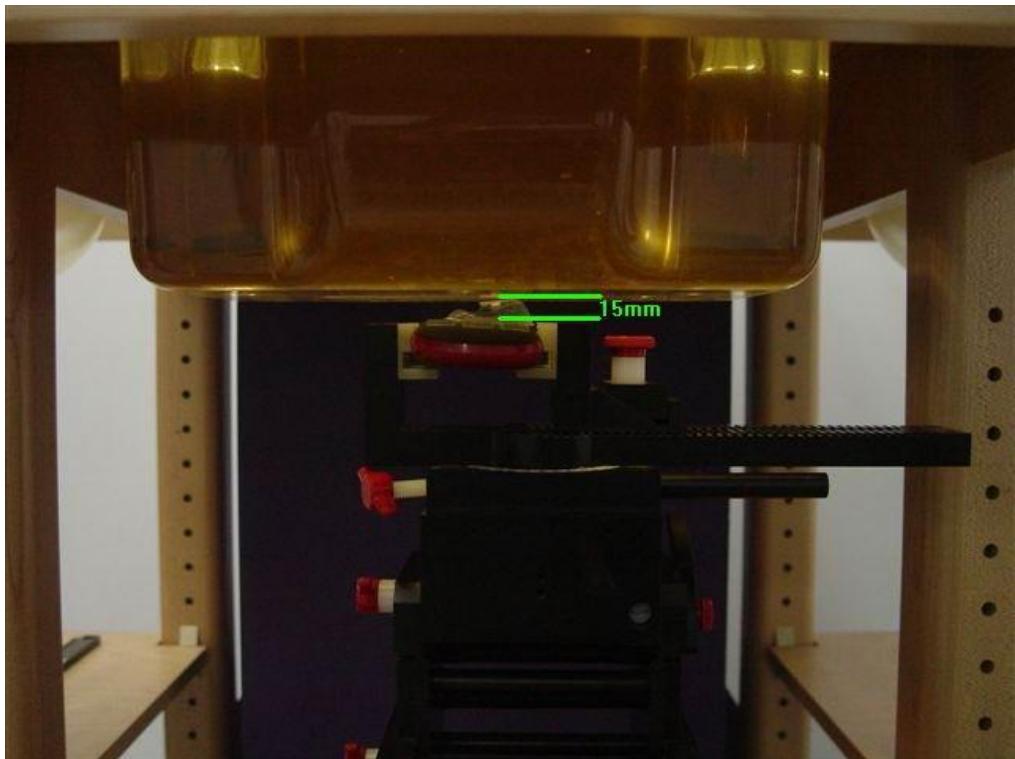


Figure B.6 EUT Body Towards Phantom

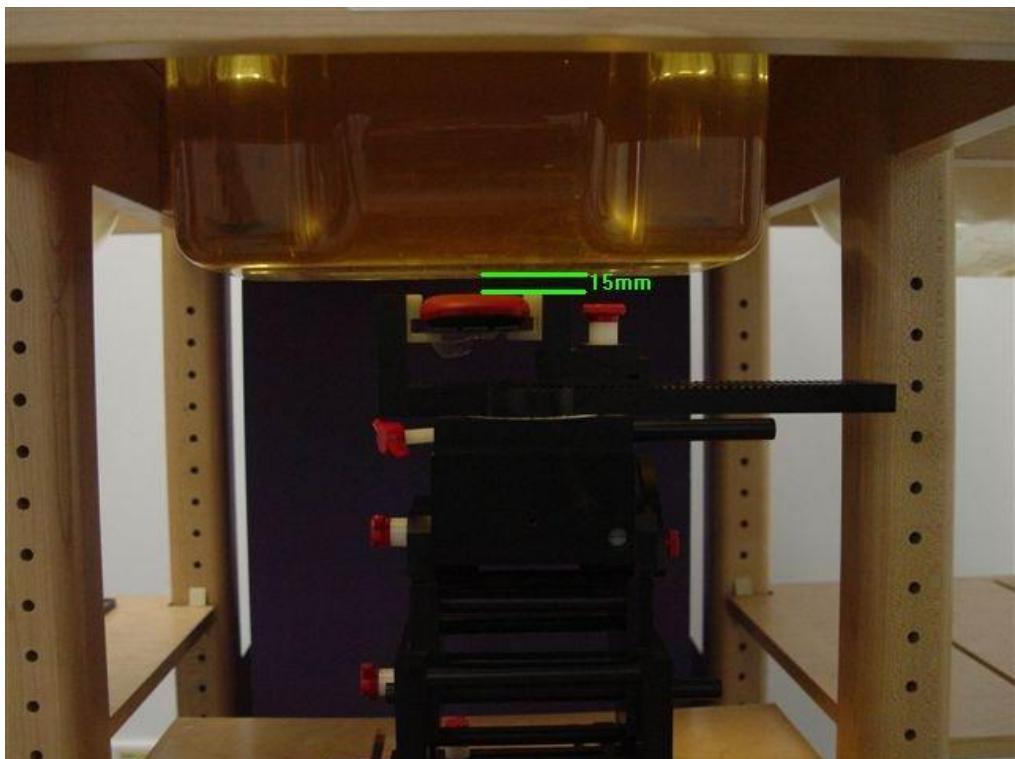


Figure B.6 EUT Body Towards Ground



Figure B.6 EUT Body Towards Ground with earphone



Report No: SH11010004S01

ANNEX C- Sample Photographs

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

CDMA 1X DIGITAL MOBILE PHONE

REPORT NO: SH11010004S01

Type Name: OT-208C

Hardware Version: SATURN_V1.1

Software Version: SATURN_BASE_V1.0

Sample Photographs



Photograph of the Equipment under Test



Report No: SH11010004S01

ANNEX D- Graph Test Results

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

CDMA 1X DIGITAL MOBILE PHONE

REPORT NO: SH11010004S01

Type Name: OT-208C

Hardware Version: SATURN_V1.1

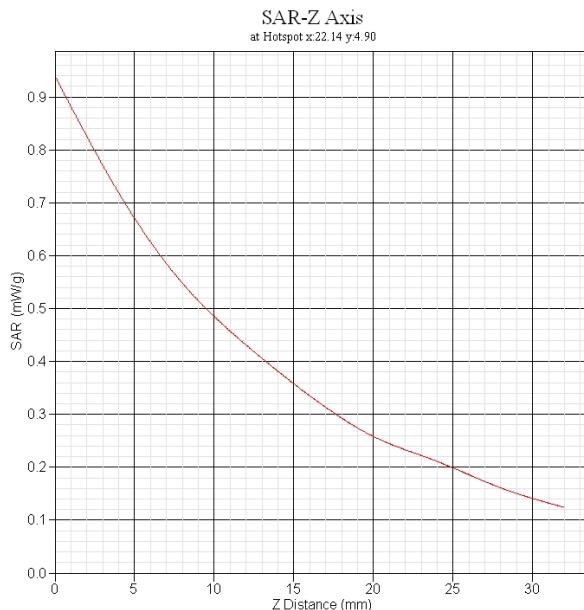
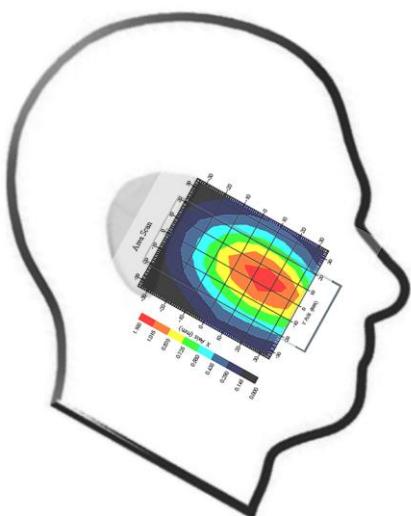
Software Version: SATURN_BASE_V1.0

Graph Test Results



CDMA Cellular Left head Cheek Low (1013)

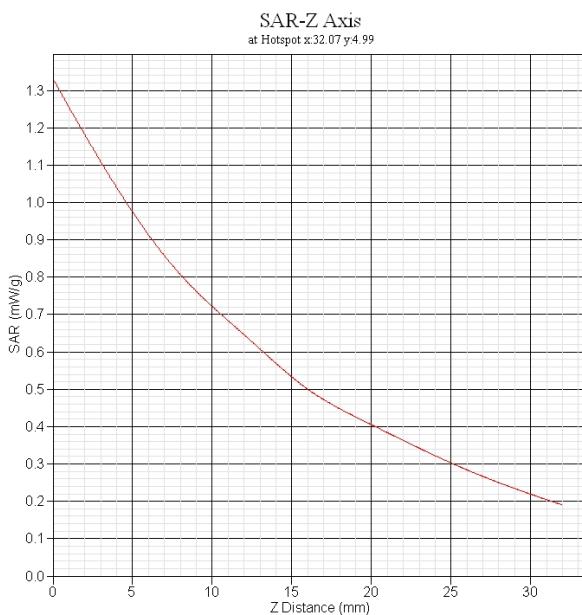
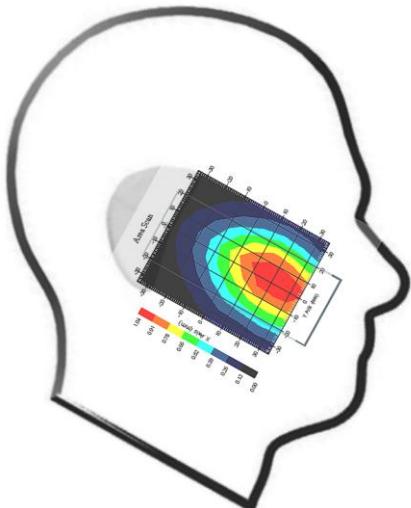
Frequency (MHz)	824.700012
Relative permittivity (real part)	41.530100
Relative permittivity (imaginary part)	19.664151
Conductivity (S/m)	0.880011
Variation (%)	-3.338000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.433
SAR 1g (W/Kg)	0.659

CDMA Cellular Left head Cheek Middle (384)

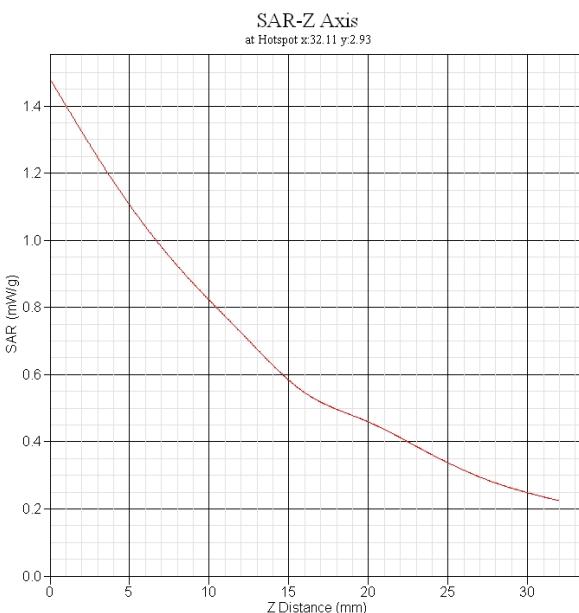
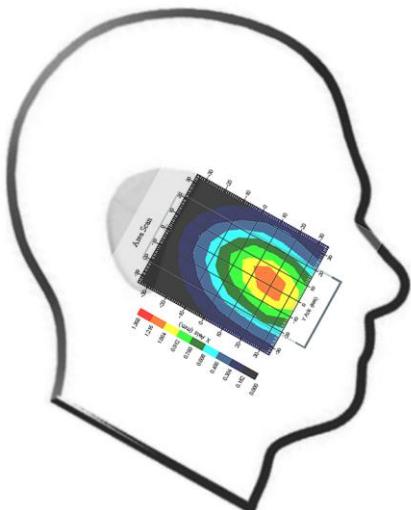
Frequency (MHz)	836.520016
Relative permittivity (real part)	41.423007
Relative permittivity (imaginary part)	17.885950
Conductivity (S/m)	0.891011
Variation (%)	-3.659000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.658
SAR 1g (W/Kg)	0.962

CDMA Cellular Left head Cheek High (777)

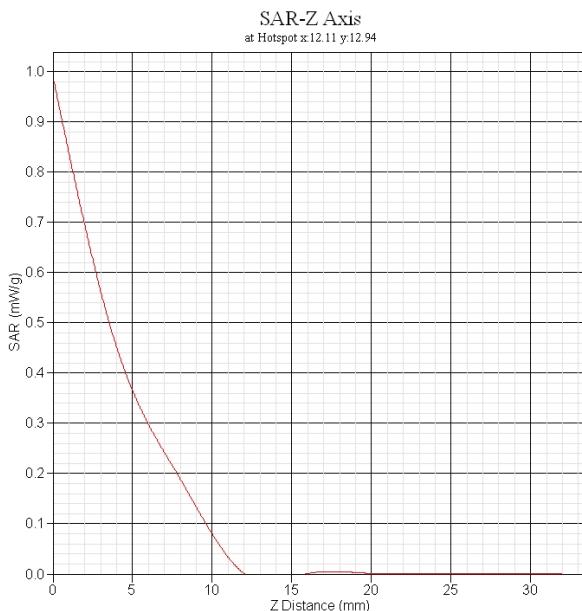
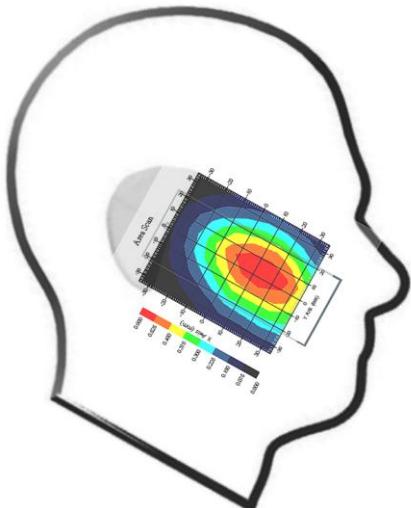
Frequency (MHz)	848.310088
Relative permitivity (real part)	41.432001
Relative permitivity (imaginary part)	18.977301
Conductivity (S/m)	0.901021
Variation (%)	-0.949000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.866
SAR 1g (W/Kg)	1.075

CDMA Cellular Left head Tilt Low (1013)

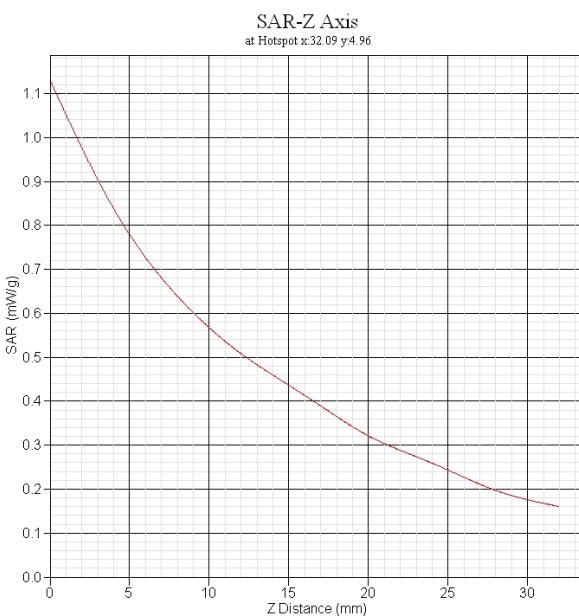
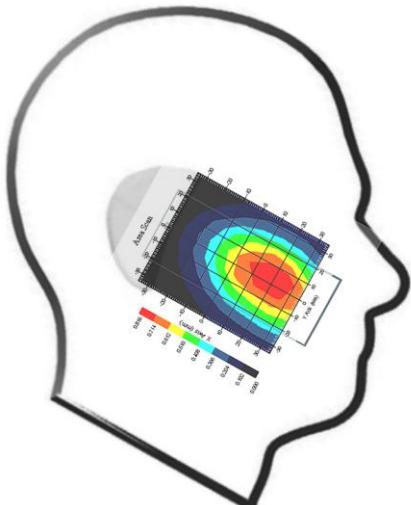
Frequency (MHz)	824.700012
Relative permittivity (real part)	41.530100
Relative permittivity (imaginary part)	15.32658
Conductivity (S/m)	0.880011
Variation (%)	-2.772000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.135
SAR 1g (W/Kg)	0.317

CDMA Cellular Left head Tilt Middle (384)

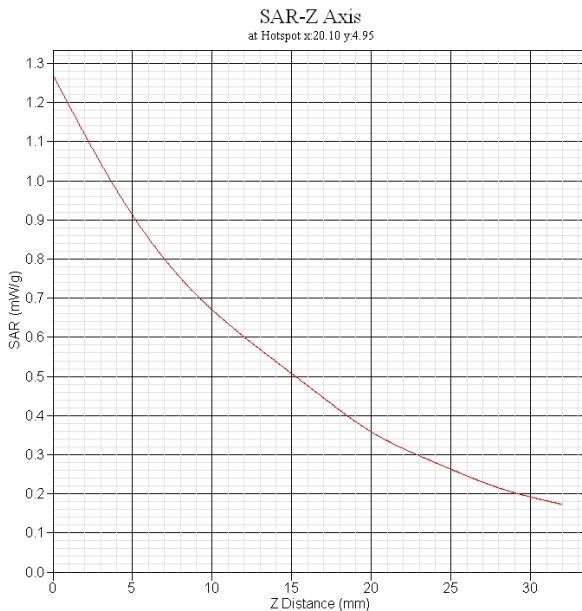
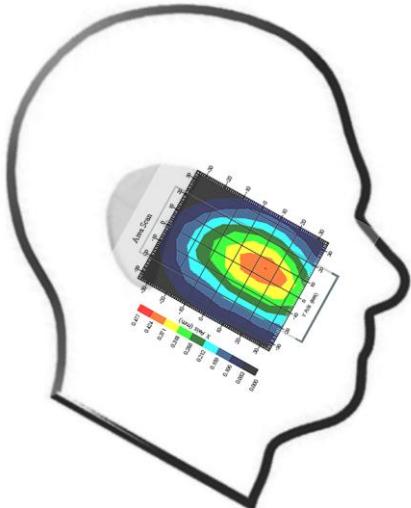
Frequency (MHz)	836.520016
Relative permittivity (real part)	41.423007
Relative permittivity (imaginary part)	19.215148
Conductivity (S/m)	0.891011
Variation (%)	-3.774000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.532
SAR 1g (W/Kg)	0.785

CDMA Cellular Left head Tilt High (777)

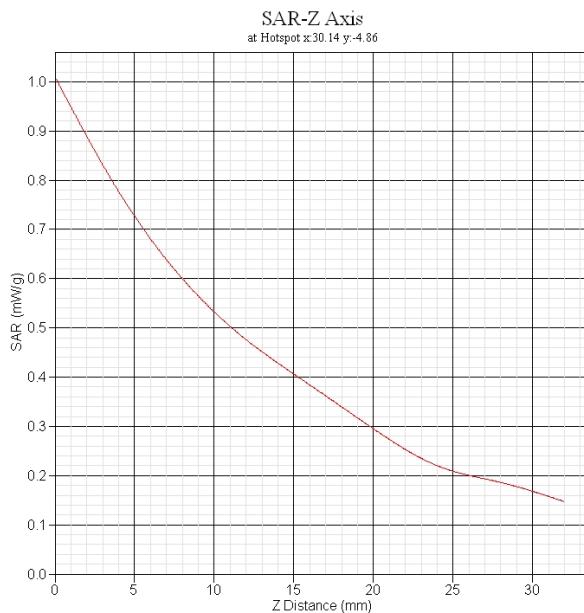
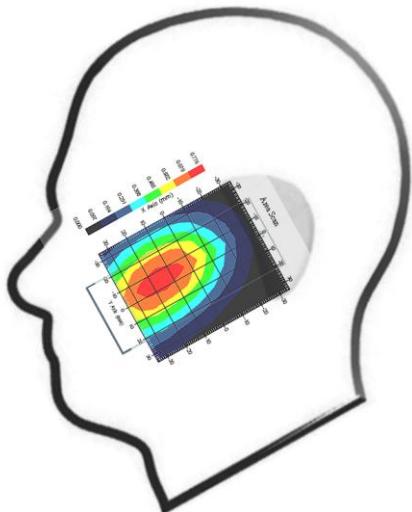
Frequency (MHz)	848.310088
Relative permittivity (real part)	41.432001
Relative permittivity (imaginary part)	16.755421
Conductivity (S/m)	0.901021
Variation (%)	-2.741000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.567
SAR 1g (W/Kg)	0.866

CDMA Cellular Right head Cheek Low (1013)

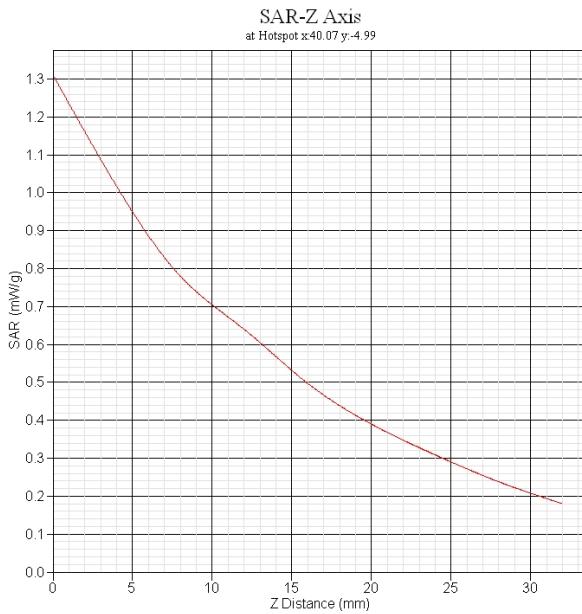
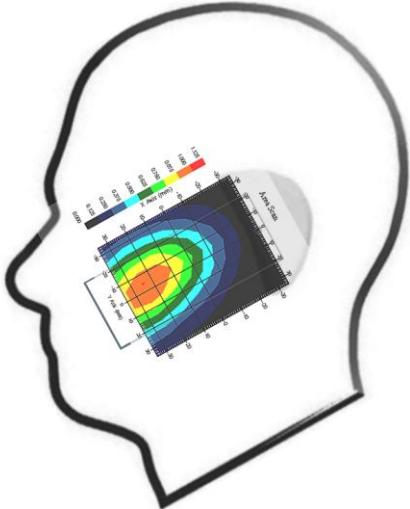
Frequency (MHz)	824.700012
Relative permittivity (real part)	41.530100
Relative permittivity (imaginary part)	17.648151
Conductivity (S/m)	0.880011
Variation (%)	-2.336000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.498
SAR 1g (W/Kg)	0.729

CDMA Cellular Right head Cheek Middle (384)

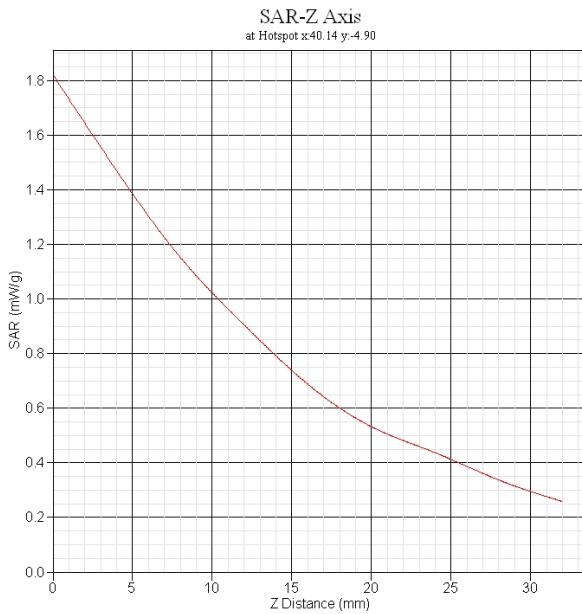
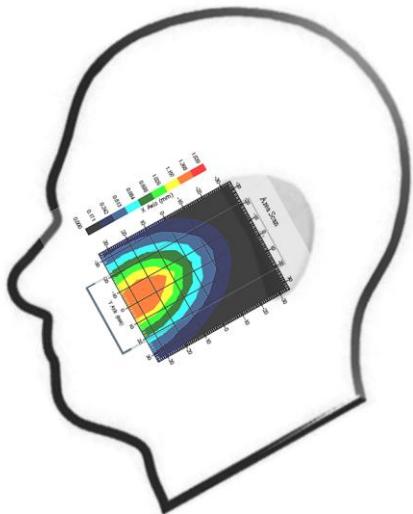
Frequency (MHz)	836.520016
Relative permittivity (real part)	41.423007
Relative permittivity (imaginary part)	18.005245
Conductivity (S/m)	0.891011
Variation (%)	-4.572000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.600
SAR 1g (W/Kg)	0.915

CDMA Cellular Right head Cheek High (777)

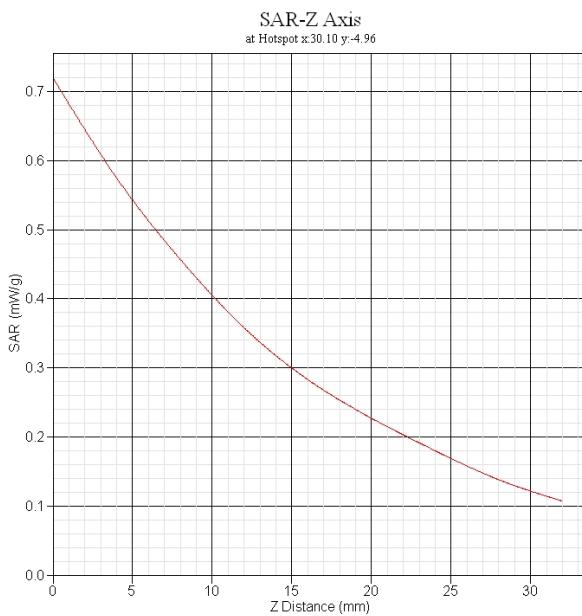
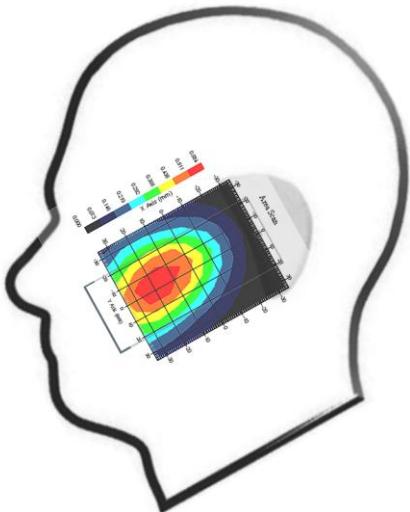
Frequency (MHz)	848.310088
Relative permittivity (real part)	41.432001
Relative permittivity (imaginary part)	16.452101
Conductivity (S/m)	0.901021
Variation (%)	-2.104000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.831
SAR 1g (W/Kg)	1.274

CDMA Cellular Right head Tilt Low (1013)

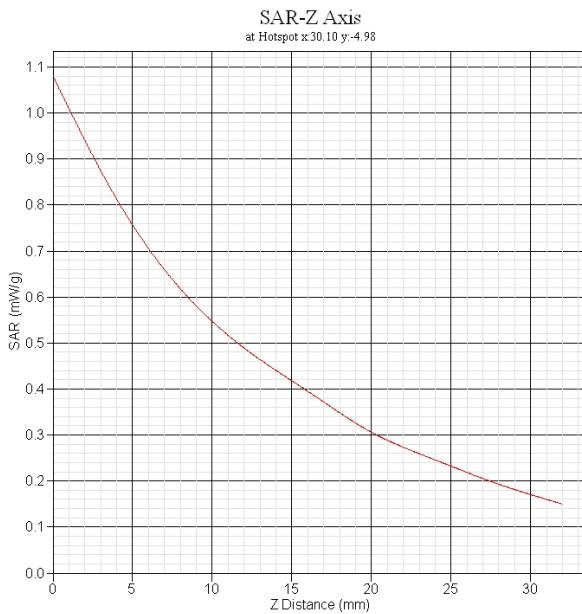
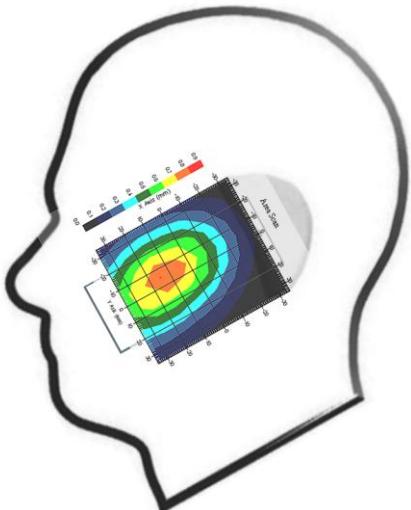
Frequency (MHz)	824.700012
Relative permittivity (real part)	41.530100
Relative permittivity (imaginary part)	17.127577
Conductivity (S/m)	0.880011
Variation (%)	3.856000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.343
SAR 1g (W/Kg)	0.510

CDMA Cellular Right head Tilt Middle (384)

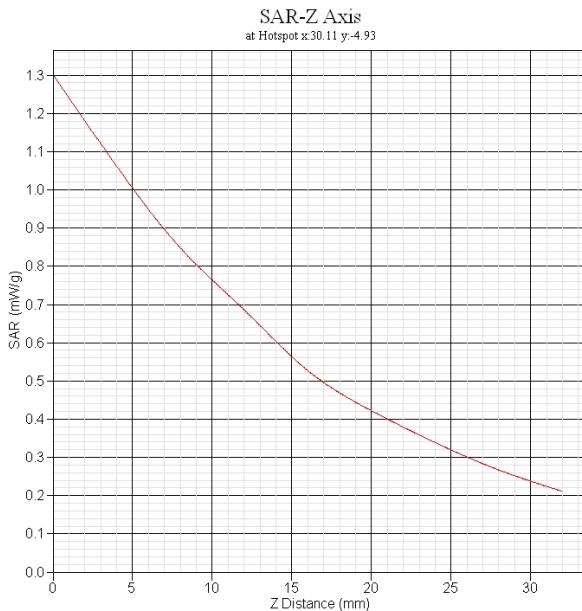
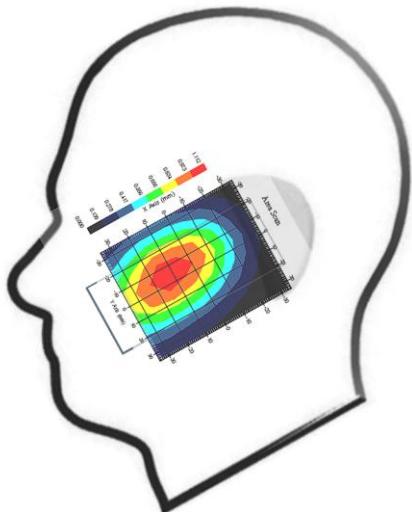
Frequency (MHz)	836.520016
Relative permittivity (real part)	41.423007
Relative permittivity (imaginary part)	18.574554
Conductivity (S/m)	0.891011
Variation (%)	-3.880000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.510
SAR 1g (W/Kg)	0.755

CDMA Cellular Right head Tilt High (777)

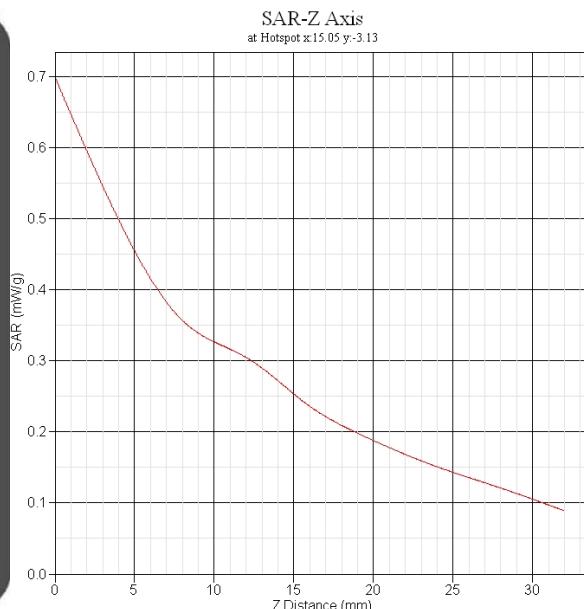
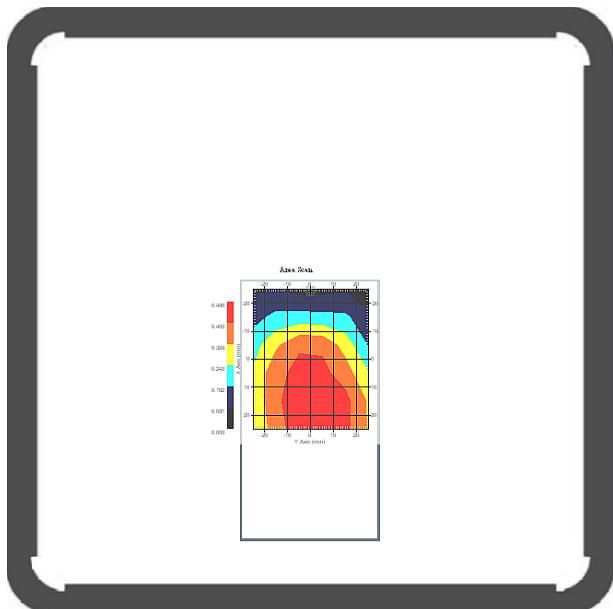
Frequency (MHz)	848.310088
Relative permittivity (real part)	41.432001
Relative permittivity (imaginary part)	19.754301
Conductivity (S/m)	0.901021
Variation (%)	-2.204000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.606
SAR 1g (W/Kg)	0.915

CDMA Cellular body Towards Phantom Middle (384)

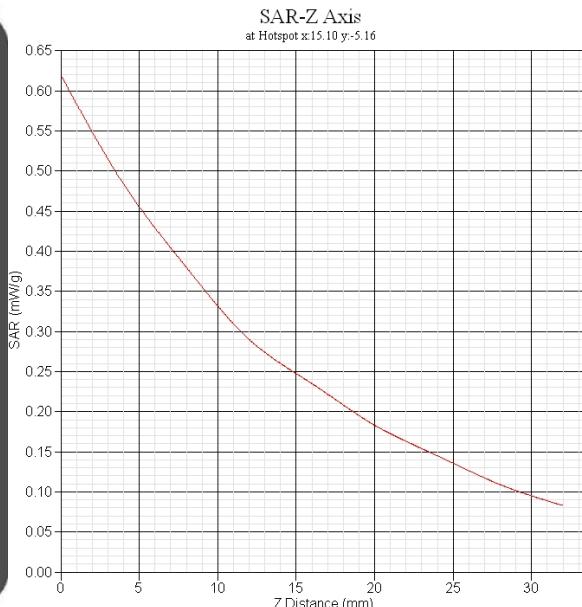
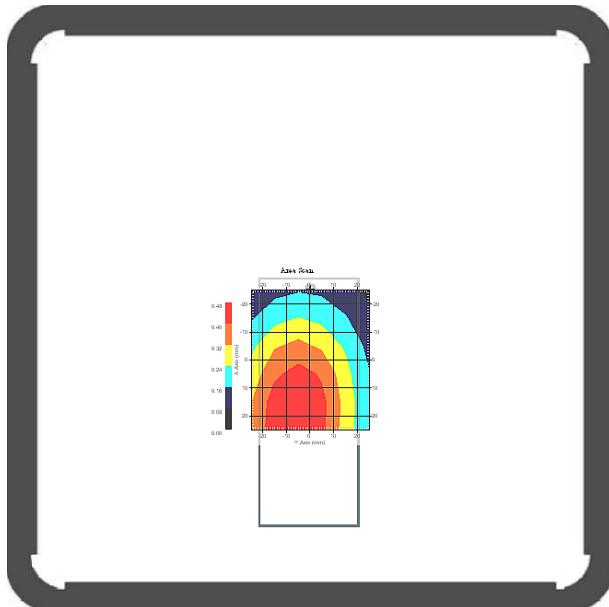
Frequency (MHz)	836.521210
Relative permittivity (real part)	55.358010
Relative permittivity (imaginary part)	20.451099
Conductivity (S/m)	0.974233
Variation (%)	-1.201000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.327
SAR 1g (W/Kg)	0.481

CDMA Cellular body Towards Ground Low (1013)

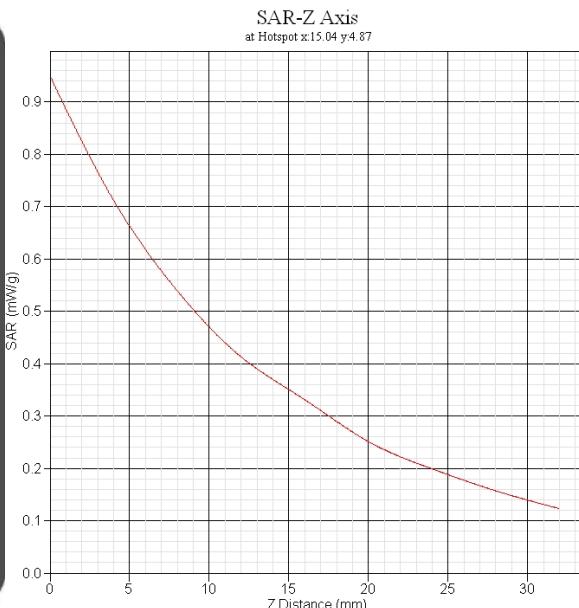
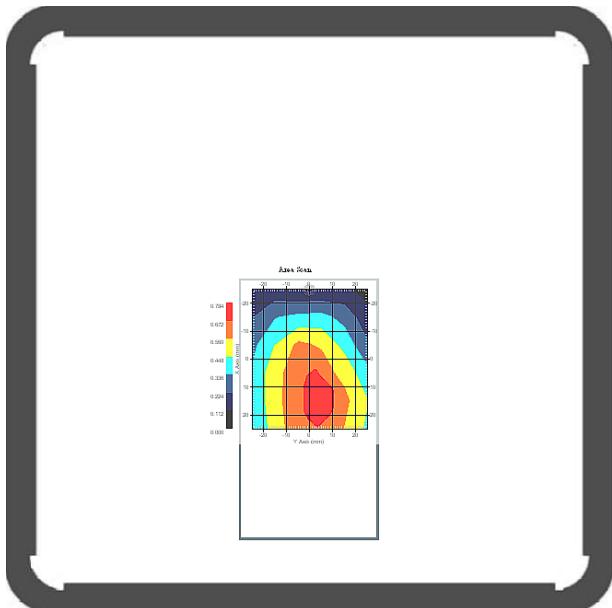
Frequency (MHz)	824.701101
Relative permittivity (real part)	55.403200
Relative permittivity (imaginary part)	19.524110
Conductivity (S/m)	0.969450
Variation (%)	-2.624000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.297
SAR 1g (W/Kg)	0.443

CDMA Cellular body Towards Ground Middle (384)

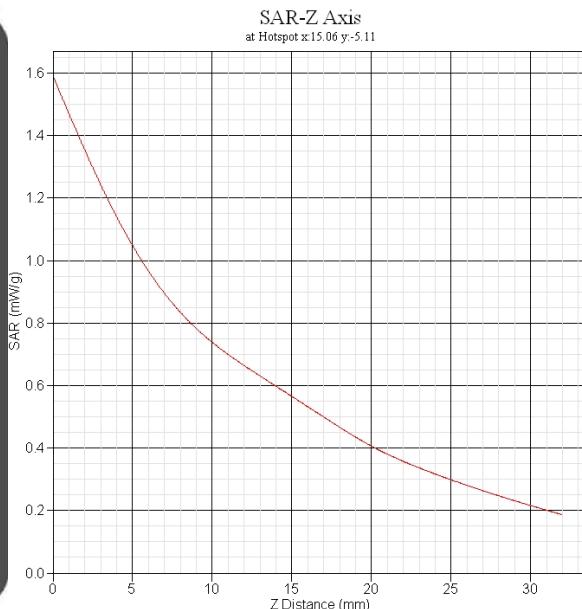
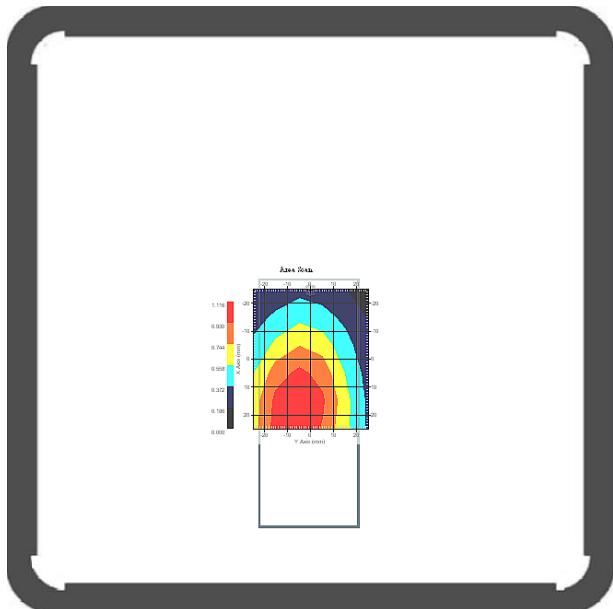
Frequency (MHz)	836.521210
Relative permittivity (real part)	55.358010
Relative permittivity (imaginary part)	21.001457
Conductivity (S/m)	0.974233
Variation (%)	-4.4620000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.464
SAR 1g (W/Kg)	0.677

CDMA Cellular body Towards Ground High (777)

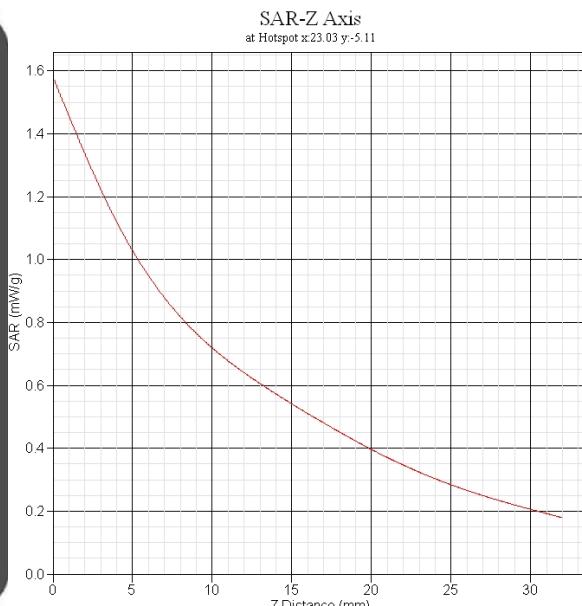
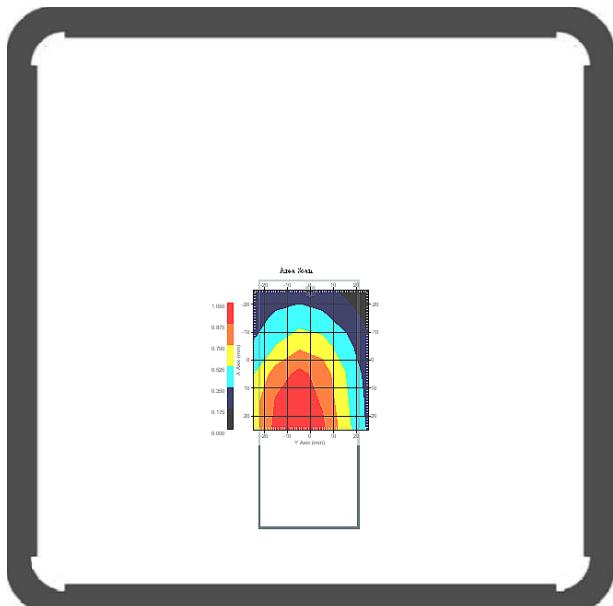
Frequency (MHz)	848.310041
Relative permittivity (real part)	55.304111
Relative permittivity (imaginary part)	18.854574
Conductivity (S/m)	0.980034
Variation (%)	-1.466000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	0.721
SAR 1g (W/Kg)	1.073

CDMA Cellular body Towards Ground High (777) with earphone

Frequency (MHz)	848.310041
Relative permittivity (real part)	55.304111
Relative permittivity (imaginary part)	19.441001
Conductivity (S/m)	0.980034
Variation (%)	-3.142000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17

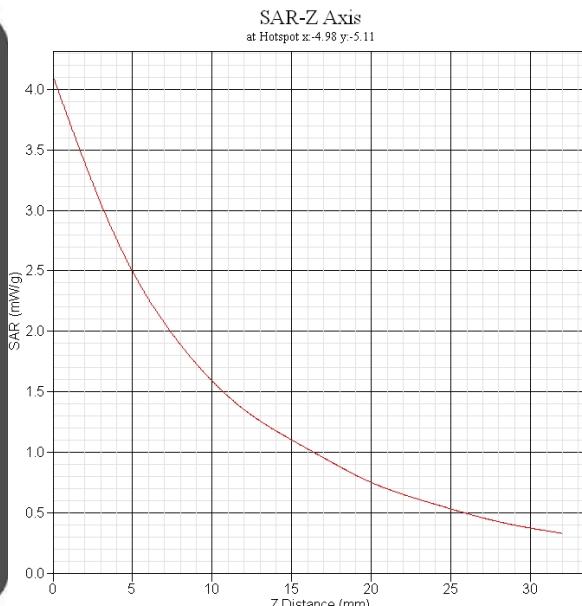
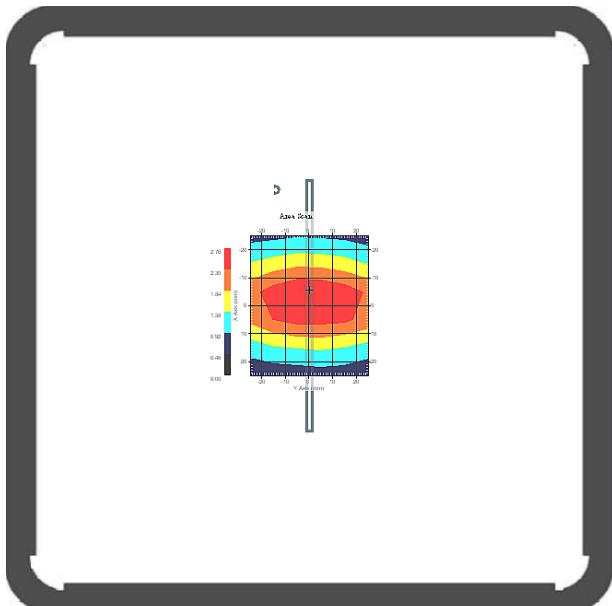


SAR 10g (W/Kg)	0.696
SAR 1g (W/Kg)	1.050

System Performance Check Data

Head 835MHz

Frequency (MHz)	835
Relative permittivity (real part)	41.423007
Relative permittivity (imaginary part)	14.611001
Conductivity (S/m)	0.891011
Variation (%)	-2.041000
Crest factor	1
Conversion Factor	6.2
Temperatures	21.00 °C
Date	2011-01-17

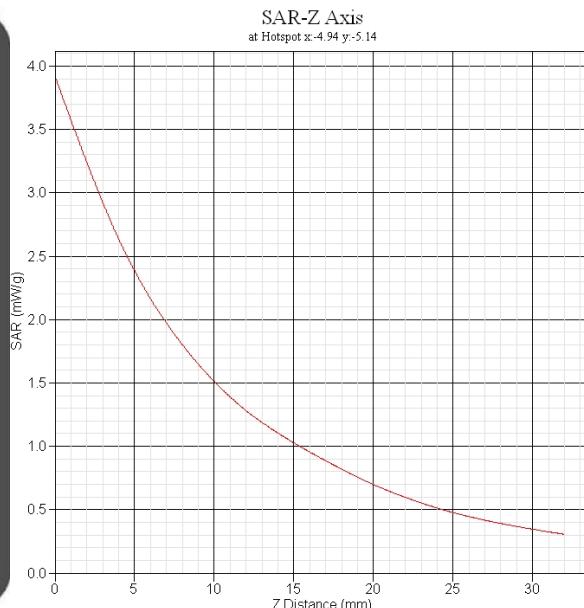
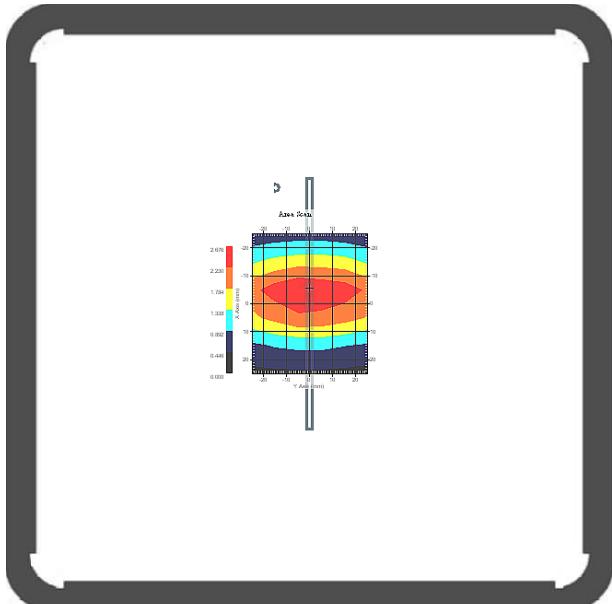


SAR 10g (W/Kg)	1.605
SAR 1g (W/Kg)	2.502

System Performance Check Data

Body 835MHz

Frequency (MHz)	835
Relative permitivity (real part)	55.358010
Relative permitivity (imaginary part)	15.110001
Conductivity (S/m)	0.974233
Variation (%)	-1.020000
Crest factor	1
Conversion Factor	6
Temperatures	21.00 °C
Date	2011-01-17



SAR 10g (W/Kg)	1.513
SAR 1g (W/Kg)	2.467

** END OF REPORT **