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SAR Compliace Test Report

APPLICANT NAME & ADDRESS :
CYBERBANK CORP.
3,4,5F., Mirae Bldg., 545-7 Dogok-dong,
Kangnam-gu, Seoul, Korea 135-857

DATA & LOCATION OF TESTING
Dates of testing : 2005 02/19 ~ 03/04
Test Site : ESTECH Co., Ltd. Korea

Test Device :

Models : CP-X315

FCC ID : PGVCP-X315

TYPE : CDMA 800MHz PDA Phone

Test report no :	ESTSAR0503-001	Number of page :	25
Contact person :	Chun-seok Kang	Responsible test Engineer :	M.J.Song
Testing has been Carried out in Accordance with :	IEEE P1528-200X Draft 6.4 Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Body Due to Wireless Communications Device : Experimental Techniques		
Applicant Type :	Certification		
FCC CLASSIFICATION :	Licensed Non-Broadcast Transmitter Held to Ear (TNE)		
FCC Rule Part(s)	§2.1093; FCC/OET Bulletin 65 Supplement C (July 2001)		
Test results :	The Tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced recept in full, without written approval of the laboratory.		

Date and Signatures : 2005-3-4
Report Prepared By : Engineer/ M.J.Song
(Signature)
Manager Engineer/ Jay Kim
(Signature)

Table of Contents

1. SUMMARY FOR TEST REPORT

FCC ID	PGVCP-X315
Date of test	2005/02/19 ~ 2005/03/04
Responsible test engineer	Jay Kim
Measurement performed by	M.J.Song
EUT Type	CDMA 800MHz PDA Phone
Tx Frequency	824.70 ~ 848.31 MHz (CDMA)
Rx Frequency	869.70 ~ 893.31 MHz (CDMA)
Max. RF Output Power	CDMA (24.70 dBm)

Maximum Results Found During SAR Evaluation

1.1 Head Configuration

Max. SAR Measurement

FREQUENCY		Modulation	Conducted Power(dBm)		Device test position	Antenna position	SAR (W/kg)
MHz	Ch		dBm	Battery			
848.31	777	CDMA	24.7	Standard	Left Cheek Touch	-	0.933

1.2 Body Worn Configuration

Max. SAR Measurement

FREQUENCY		Modulation	Conducted Power(dBm)		Separation test position	Antenna position	SAR (W/kg)
MHz	Ch		dBm	Battery			
835.89	363	CDMA	24.7	Standard	Touch [w/o Holster] Slide IN	-	0.929

1.3 Measurement Uncertainty

Combine Standard Uncertainty	± 10.81 (k=1)
Extended Standard Uncertainty	± 21.62 (k=2, 95% CONFIDENCE LEVEL)

2. INTRODUCATION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential azards of RF emissions due to FCC-regulated portable device.[1]

The safety limits used for the environmental evaluation measurements arethe criteria published by the based on American National Standards Institute (ANSI) For localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for safety Levels with Respect to Human Exposure to Radio Frequency Electronic Fields, 3 kHz to 300 GHz. (c) 1992 by the institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.[2] The measurement procedure described in IEEE/ANSIC95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave[3] is used for guidance in measuring SAR due to the RF radiationexposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields," NCRP Report No. 86 (c) NCRP, 1986, Bethesda, MD20814.[6] SAR is ameasure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). it is also defined as the rate of rf energy absorption per unit mass at a point in an absorbing body (see Fig. 3.1.).

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho\, dv}\right)$$

Figure 2.1 SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \sigma E^2 / \rho$$

Where:

σ = conductivity of the tissue-simulant material (S/m)

E = mass density of the tissue-simulant material (kg/㎥)

ρ = Total RMS electric field strength (V/m)

3. DESCRIPTION OF THE DEVICE UNDER TEST

The FCC rules for evaluating portable devices for RF exposure compliance are contained in 47 CFR §2.1093. For purposes of RF exposure evaluation, a portable device is defined as a transmitting device designed to be used with any part of its radiating structure in direct contact with the user's body or within 20 centimeters of the body of a user or bystanders under normal operating conditions. This category of devices would include hand-held cellular and PCS telephones that incorporate the radiating antenna into the hand-piece and wireless transmitters that are carried next to the body. Portable sevices are evaluated with respect to SAR limits for RF exposure. The applicable SAR limit for portable transmitters used by consumers is 1.6 watts/kg, which is averaged over any one gram of tissue defined as a tissue volume in the shape of a cube.

2.1 Antenna Description

Type	Helical
Location	the right top of the device
Radiator Material	P–Carbonate

2.2 Device Description

	FCC ID	FCC ID : PGVCP–X315
	Serial numbers	HKR34DL003487
	Exposure environment	Uncontrolled exposure
	Device category	Portable device
	Mode(s) of Operation	CDMA
	Modulation Mode(s)	CDMA
	Duty Cycle	1
	Transmitting FreQuency Range(s)	824.70 ~ 848.31 MHz (CDMA)

2.3 Battery Options

There is only one battery option available for tested device,

4. TEST CONDITIONS

4.1 Ambient Conditions

Ambient Temperature (˚C)	22
Tissue simulating liquid temperature (˚C)	22
Humidity (%)	41

4.2 RF Characteristics of The Test Site

Tests were performed in a fully enclosed RF Shielded environment

4.3 Test Signal, Frequencies, And Output Power

The handset was placed into simulated call mode (800MHz CDMA modes) using manufacturers test codes.

In all operation bands the measurements were performed on lowest, middle and highest channels.

The phone was set to maximum power level during the all tests and at the beginning of the each test the battery was fully charged.

DASY4 system measures power drift during SAR testing by comparing e-field in the same location at the beginning and at the end of measurement. These records were used to monitor stability of power output.

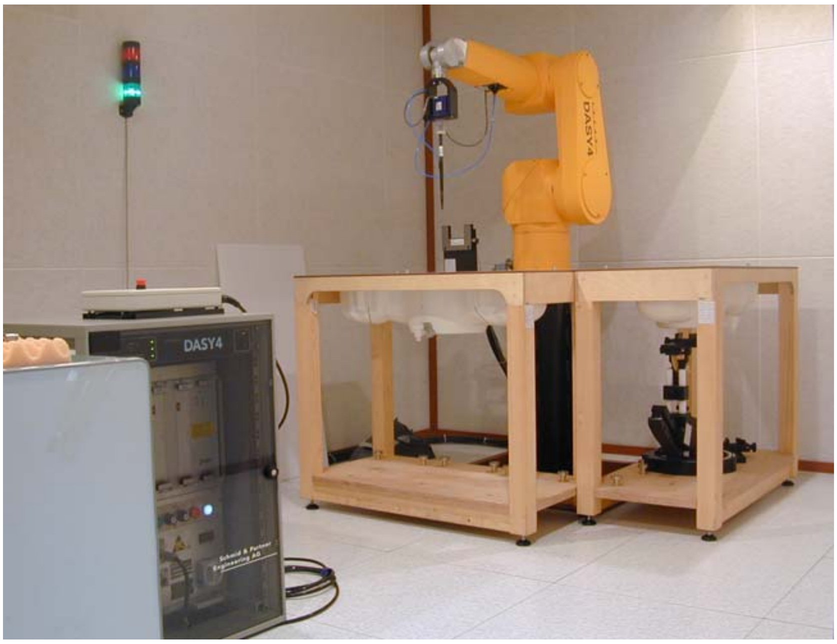

Fig. 4.1 SAR Measurement System

5. DESCRIPTION OF THE TEST EQUIPMENT

An SAR measurement system usually consists of a small diameter isotropic electric field probe, a multiple axis probe positioning system, a test device holder, one or more phantom models, the field probe instrumentation, a computer and other electronic equipment for controlling the probe and making the measurements. Other supporting equipment, such as a network analyzer, power meters and RF signal generators, are also required to measure the dielectric parameters of the simulated tissue media and to verify the measurement accuracy of the SAR system.

5.1 Test System Specifications

Test Equipment	Model	Serial Number	Cal. date
DAE	DAE3	551	2004-04-11
E-Field Probe	ET3DV6	1748	2005-01-21
Dipole validation kit	D835V2	471	2005-01-18
Network analyzer	8753ES	NONE	2004-10-12
Signal generator	E4421B	GB40052295	2004-10-12
RF Power meter	EPM-442A	GB37170412	2004-10-12
Power Sensor	8481A	3318A90368	2004-10-14
Dielectric Probe	85070D	US01440154	-

5.2 SAR Measurement Setup

Measurement are performed using the DASY4 dosimetric assessment system. The DASY4 is made by Schmid & Partner Engineering AG(SPEAG) in Zurich, Switzerland and consists of high precision robotics system (Staubli), robot controller, Pentium IV computer, near-field probe, probe alignment sensor, and the SAM twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field(EMF) (see Fig. 5.1) A cell controller system contains the power supply, robot controller, teach pendant(Joystick), and a remote control used to drive the robot motors. The pc consists of the Intel Pentium IV 2.4 GHz computer with Windows2000 system and SAR measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot data acquisition electronic (DAE) circuit that performs the signal amplification, signal multiplexing,
AD-conversion, offset measurements, mechanical surface detection, collision detection, etc.

5. DESCRIPTION OF THE TEST EQUIPMENT(continued)

Is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

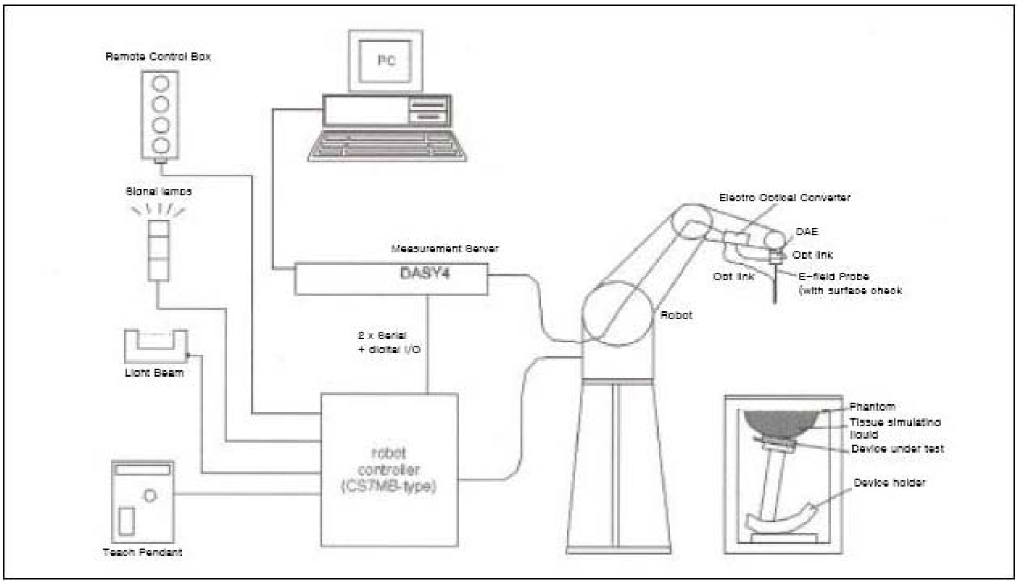

Fig. 5.1 SAR Measurement System Setup

The DAE3 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gainswitching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in [7].

5.3 DASY4 E-Field Probe System

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration [7] (see Fig.5.2) and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box in the robot arm and provides an automatic detection transmitter, the other half to a synchronized receiver.

5. DESCRIPTION OF THE TEST EQUIPMENT(continued)

As the probe approach the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches coupling is zero. The distance of the coupling maximum to the surface is probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting (see Table. 5.2). The approach is stopped at reaching the maximum.

<table>
<tr><td rowspan="7">
Isotropic E-Field Probe</td><td colspan="2">Isotropic E-Field Probe for Dosimetric Measurements</td></tr>
<tr><td>Construction</td><td>Symmetrical design with triangular core
Interleafed sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol)</td></tr>
<tr><td>Calibration</td><td>In air from 10 MHz to 3 GHz
In brain and muscle simulating tissue at frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy ± 8%)
Calibration for other liquids and frequencies upon request</td></tr>
<tr><td>Frequency</td><td>10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)</td></tr>
<tr><td>Directivity</td><td>± 0.2 dB in brain tissue (rotation around probe axis)
± 0.3 dB in brain tissue (rotation normal to probe axis)</td></tr>
<tr><td>Dynamic Range</td><td>5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB</td></tr>
<tr><td>Dimensions</td><td>Overall length: 330 mm
Tip length: 20 mm
Body diameter: 12 mm
Tip diameter: 3.9 mm
Distance from probe tip to dipole centers: 2.7 mm</td></tr>
</table>

Fig. 5.2 Probe Specifications

5. DESCRIPTION OF THE TEST EQUIPMENT(continued)

5.4 Phantom & Equivalent Tissues

SAM Phantom

The SAM Twin Phantom V4.0 is constructed of the fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users [11][12]. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Head & Muscle simulation Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydroxethlcellullose(HEC) gelling agent and saline solution (see Table 5.1). Preservation with a bactericide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been specified in P1528 are derived from the issue dielectric parameters computed from the 4-Cole-Cole equations The mixture characterizations used for the brain and muscle tissue simulation liquids are according to the data by C. Gabriel and G. Hartagrove [13]. (see Fig. 5.3)

Frequency	Head		Body	
(MHz)	εr	σ (S/m)	εr	σ (S/m)
150	52.3	0.76	61.9	0.8
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.9	55.2	0.97
900	41.5	0.97	55	1.05
915	41.5	0.98	55	1.06
1450	40.5	1.2	54	1.3
1610	40.3	1.29	53.8	1.4
1800-2000	40	1.4	53.3	1.52
2450	39.2	1.8	52.7	1.95
3000	38.5	2.4	52	2.73
5800	35.3	5.27	48.2	6

Fig.5.3 Head and body tissue parameters by the IEEE SCC-34/SC-2 in P1528

5. DESCRIPTION OF THE TEST EQUIPMENT(continued)

835MHz			1900MHz		
	Head	Body		Head	Body
Sugar	47.31%	34.31%	DGBE(diethyene Glycol butyl Ether)	44.91%	29.96%
Deionized water	51.07%	65.45%	Deionized water	54.88%	69.91%
Salt	1.15%	0.62%	Salt	0.21%	0.13%
HEC (hydroxyethyl cellulose)	0.24%				
Preventol	0.24%	0.10%			
ε	41.0±5%	55.2±5%	ε	40.0±5%	53.3±5%
σ	0.89±10%	0.97±10%	σ	1.45±10%	1.52±10%

Fig. 5.4 Composition of the Tissue Equivalent Matter

Device Holder for Transmitters

In combination with the SAM Twin Phantom V4.0, the Mounting Device enables the rotation of the accurately, and repeatably be positioned according to the FCC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note : A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produce infinite number of configurations [12]. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

6. DESCRIPTION OF THE TEST PROCEDURE

6.1 Definition of Reference Point

EAR Reference point

The point "M" is the reference point for the center of the mouth, "ERP" is the ear reference point. The ERP are 15mm posterior to the entrance to the ear canal(EEC) along the B–M line (Back–Mouth), as shown is figure 6.1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N–F (Neck–Front) is perpendicular to the reference plane and passing through the ERP is called the Reference Pivoting Line (see Figure 6.1) B–M is perpendicular to the N–F line. Both N–F and B–M lines are marked on the external phantom shell to facilitate handset positioning [5].

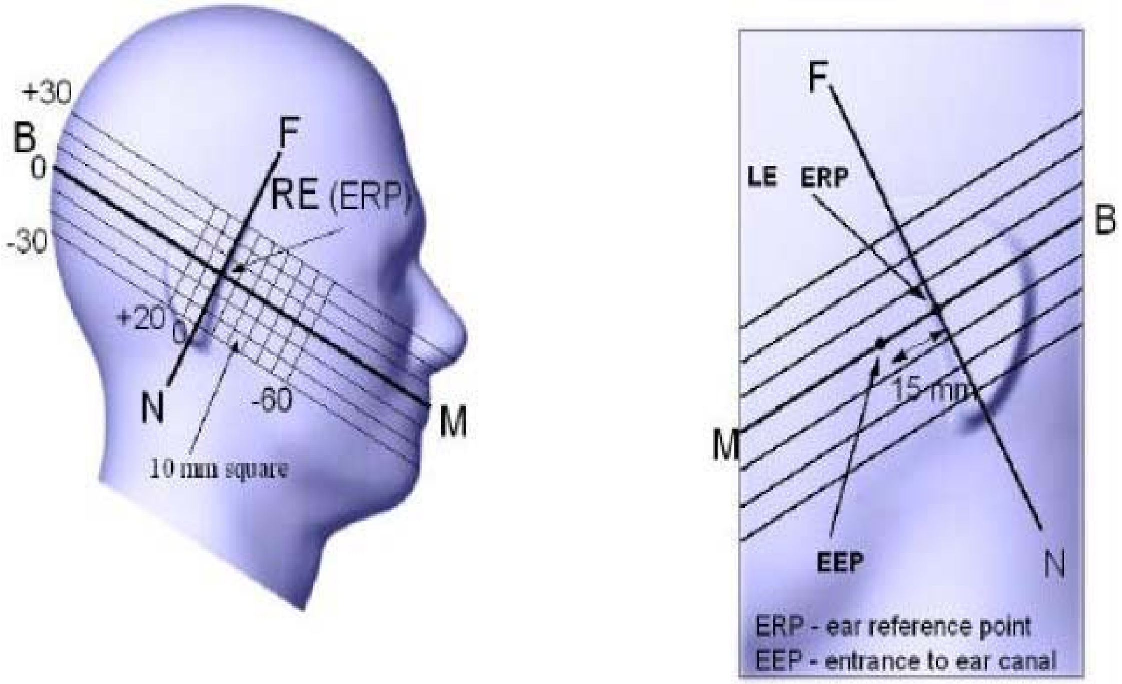

Figure 6.1 Close–up side view of ERP

Handset Reference Points

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (see Fig. 6.2). The "test device reference point" was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at it's top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

6. DESCRIPTION OF THE TEST PROCEDURE(continued)

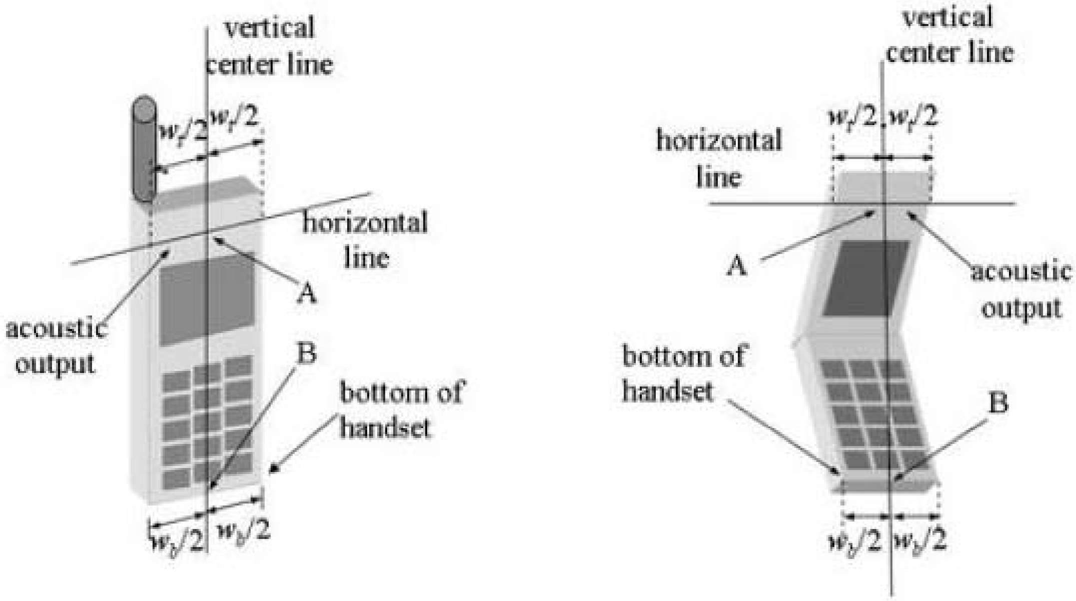

Figure 6.2 Handset Vertical Center & Horizontal Line Reference Points

6.2 Test Configuration Positions
Positioning for Cheek/Touch

1) Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece, open the cover . (If the phone can also be used with the cover closed ,both configurations must be tested.)
2) Define two imaginary lines on the handset: the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset: the midpoint of the width wt of the handset at the level of the acoustic output (point A on Figures 6.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 6.2). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not ecessarily parallel to the front face of the handset (see Figure 6.2), especially for clamshell handsets, handsets with lip pieces, and other irregularly-shaped handsets.
3) Position the handset close to the surface of the phantom touch that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6.3), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

6. DESCRIPTION OF THE TEST PROCEDURE(continued)

4) Translate the handset towards the phantom along the line passing through RE and LE until the handset touches the ear.
5) While maintaining the handset in this plane, rotate it around the LE–RE line until the vertical centerline is in the plane normal to MB–NF including the line MB (called the reference plane).
6) Rotate the phone around the vertical centerline until the phone (horizontal line) is symmetrical with respect to the line NF.
7) While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, rotate the handset about the line NF until any point on the handset is in contact with a phantom point

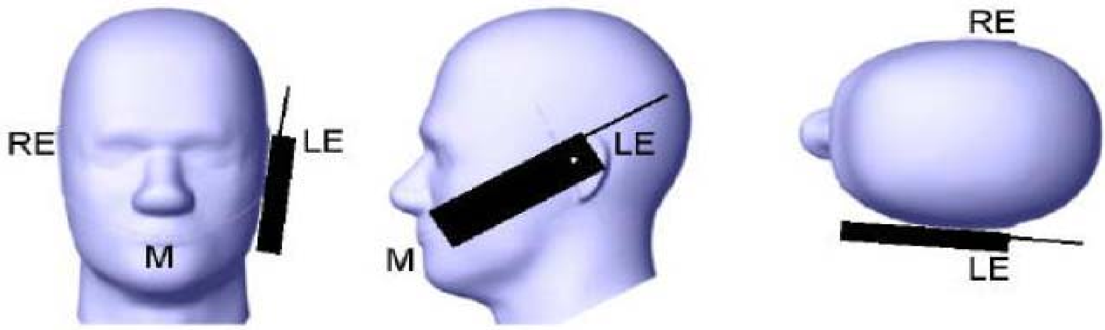

Figure 6.3 “Cheek” or “Touch” Position.

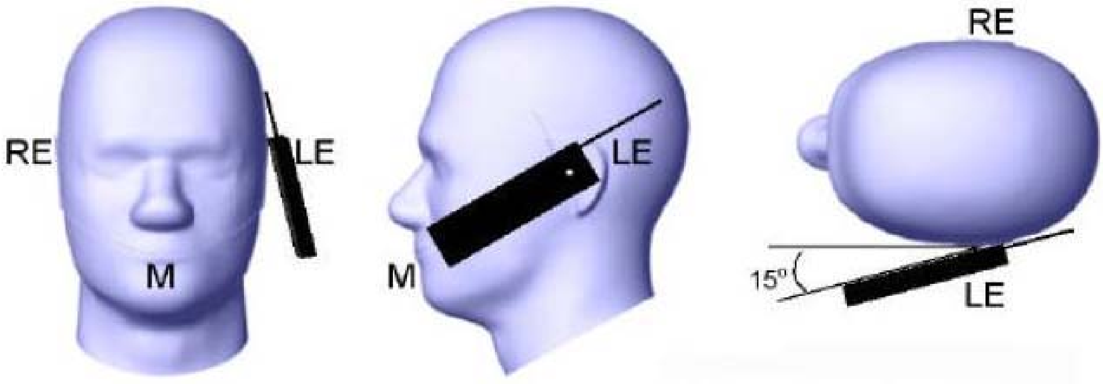

Figure 6.4 “Tilted” Position.

6. DESCRIPTION OF THE TEST PROCEDURE(continued)

Positioning for Ear / 15˚ Tilted

1) Repeat steps 1 to 7 of 6.2(Positioning for Cheek/Touch) to place the device in the "cheek position."
2) While maintaining the orientation of the phone retract the phone parallel to the reference plane far enough to enable a rotation of the phone by 15 degree.
3) Rotate the phone around the horizontal line by 15 degree.
4) While maintaining the orientation of the phone, move the phone parallel to the reference plane until any part of the phone touches the head. (In this position, point A will be located on the line RE–LE). The tilted position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna, the angle of the phone shall be reduced. The tilted position is obtained if any part of the phone is in contact of the ear as well as a second part of the phone is contact with the head.

Body Holder / Belt Clip Configurations

Body–worn operation configurations are tested with the belt–clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body–worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are supplied with the device, the device is tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (i.e. the same metallic belt–clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body–worn accessories may not always be supplied of available as options for some devices intended to be authorized for body–worn use. In this case, a test configuration where a separation distance between the back of the device and the flat phantom is used. All test position spacings are documented. Transmitters that are designed to operate in front of a person's face, as in push–to–talk configurations, are tested for SAR compliance is tested with the accessory(ies), including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration. In all case SAR measurements are performed to investigate the worst case positioning. Worst–case positioning is then documented and used to perform Body SAR testing.

In order for users to be aware of the body–worn operation requirements for meeting RF exposure compliance, operation instructing instructions and cautions statements are included in the user's manual.

6. DESCRIPTION OF THE TEST PROCEDURE(continued)

6.3 Scan Procedures

First coarse scans are used for quick determination of the field distribution. Nest cube scan, 7x7x7 points; spacing between each point 5x5x5 mm, is performed around the highest E-field value to determine the averaged SAR-distribution over 1g.

6.4 SAR Averaging Methods

The maximum SAR value is averaged over its volume using interpolation and extrapolation.
The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a Knot" ?condition [W.Gander, Computerma-thematik, p. 141-150](x, y and z ?directions) [Numerical Recipes in C, Second Edition, p 123].
The extrapolation is based on least square algorithm [W.Gander, Computermathematik, p. 168-180]. Through the points in the first 30 mm in all z-axis, polynomials of order four are calculated₩. This polynomial is then used to evaluate the points between the surface and the probe tip. The points calculated from the surface, have a distance of 1mm from one another.

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7. MEASUREMENT UNCERTAINTY

According to CENELEC [17], typical worst-case uncertainty of field measurements is 5 dB.
For well-defined modulation characteristics the uncertainty can be reduced to 3 dB.

ERROR Description	Uncertainty value ±%	Probability Distribution	Divisor	ci 1 1g	Standard unc. (1g)	vi or Veff
MEASUREMENT SYSTEM						
Probe Calibration	± 11 %	normal	1	1	± 11 %	∞
Axial Isotropy	± 4.7	rectangular	√3	$(1-cp)^{1/2}$	± 1.9%	∞
Hemispherical Isotropy	± 9.6	rectangular	√3	$(cp)^{1/2}$	± 3.9%	∞
Boundary Effects	± 1.0	rectangular	√3	1	± 0.6%	∞
Linearity	± 4.7	rectangular	√3	1	± 2.7%	∞
System Detection Limits	± 1.0	rectangular	√3	1	± 0.6%	∞
Readout Electronics	± 1.0	normal	1		± 1.0%	
Response time	± 0.8	rectangular	√3	1	± 0.5%	∞
Integration time	± 2.6	rectangular	√3	1	± 1.5%	∞
RF Amnient Conditions	± 3.0	rectangular	√3	1	± 1.7%	∞
Probe Positioner Mechanical Tolerance	± 0.4	rectangular	√3	1	± 0.2%	∞
Probe Positioning with respect to Phantom Shell	± 2.9	rectangular	√3	1	± 1.7%	∞
Extrapolation, Interpolation and Integration Algorithms for Max. SAR Evaluation	± 1.0	rectangular	√3	1	± 0.6%	∞
Test Sample Related						
Test Sample Positioning	± 2.9	normal	1	1	± 2.9%	145
Device Holder Uncertainty	± 3.6	normal	1	1	± 3.6%	5
Output Power Validation - SAR drift measurement	± 5.0	rectangular	√3	1	± 2.9%	∞
Phantom and Tissue Parameters						
Phantom Uncertainty (shape and thickness tolerances)	± 4.0	rectangular	√3	1	± 2.3%	∞
Liquid conductivity Target - tolerance	± 5.0	rectangular	√3	0.64	± 1.8%	∞
Liquid Conductivity - measurement uncertainty	± 2.5	normal	1	0.64	± 1.6%	∞
Liquid permittivity Target - tolerance	± 5.0	rectangular	√3	0.6	± 1.7%	∞
Liquid Permittivity - measurement uncertainty	± 2.5	normal	1	0.6	± 1.5%	∞
Combined Standard Uncertainty					±10.81 %	330
Coverage Factor for 95%				K = 2		
Expanded Standard Uncertainty					± 21.62 %	

8. SYSTEM VERIFICATION

Tissue Verification

Table 8.1 Simulated Tissue Verification [5]

MEASURED TISSUE PARAMETERS										
Liquid Temperature (°C)			22		Liquid Depth(mm)		150			
Date	2005-02-21		2005-02-21				/ /			
Tissue	835MHz Brain		835MHz Muscle							
	Target	Measured	Target	Measured						
Dielectric Constant: ε	41.5	40.5	55.2	53.09						
Conductivity: σ	0.9	0.882	0.97	0.946						
Deviation (%)	ε : -2.41% σ : -0.02%		ε : -3.82% σ : -2.47 %							

Test System Validation

Prior to assessment, the system is verified to the ±10% of the specifications at 835MHz (Graphic Plots Attached)

Table 8.2 System Validation [5]

SYSTEM DIPOLE VALIDATION TARGET & MEASURED						
Tissue	System Validation Kit:	Forward Power (mW)	Targeted SAR1g (mW/g)	Measured SAR1g (mW/g)	Deviation (%)	Test Date
835MHz Brain	D835V2(S/N :471)	250	2.26	2.38	5.31%	2005-02-21

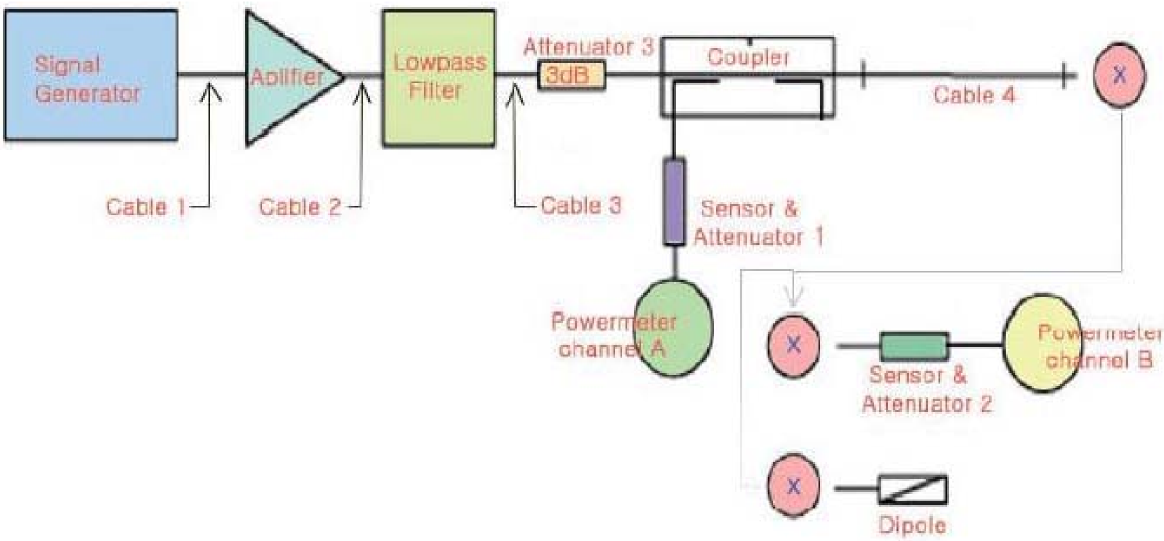

Figure 12.1 Dipole Validation Test Setup

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 22.0
Relative HUMIDITY (%) : 43
Mixture Type : 835MHz Brain
Dielectric Constant : 40.6
Conductivity: 0.884

Measurement Results (CDMA Head SAR-Touch-Slide IN)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Left Head SAR – Touch – Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.70	24.67	Standard	Cheek Touch	–	0.812
835.89	363	CDMA	24.70	24.76	Standard	Cheek Touch	–	0.840
848.31	777	CDMA	24.70	24.71	Standard	Cheek Touch	–	0.933

MEASUREMENT RESULTS (CDMA Right Head SAR – Touch – Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.70	24.71	Standard	Cheek Touch	–	0.748
835.89	363	CDMA	24.70	24.79	Standard	Cheek Touch	–	0.706
848.31	777	CDMA	24.70	24.76	Standard	Cheek Touch	–	0.880

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Head

Engineer M.J.Song (Signature)

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 22.0
Relative HUMIDITY (%) : 43
Mixture Type : 835MHz Brain
Dielectric Constant : 40.6
Conductivity: 0.884

Measurement Results (CDMA Head SAR-Touch-Slide OUT)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Left Head SAR – Touch – Slide OUT)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.72	Standard	Cheek Touch	–	0.417

MEASUREMENT RESULTS (CDMA Right Head SAR – Touch – Slide OUT)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.70	Standard	Cheek Touch	–	0.325

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Head

Engineer M.J.Song (Signature)

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 22.0
Relative HUMIDITY (%) : 41
Mixture Type : 835MHz Brain
Dielectric Constant : 40.6
Conductivity: 0.884

Measurement Results (CDMA Head SAR-Tilt-Slide IN)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Left Head SAR – Tlit – Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.79	Standard	Tilt	–	0.815

MEASUREMENT RESULTS (CDMA Right Head SAR – Tilt –Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.74	Standard	Tilt	–	0.807

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Head

Engineer M.J.Song (Signature)

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 22.0
Relative HUMIDITY (%) : 43
Mixture Type : 835MHz Brain
Dielectric Constant : 40.6
Conductivity: 0.884

Measurement Results (CDMA Head SAR-Tilt-Slide OUT)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Left Head SAR – Tlit – Slide OUT)

Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.74	Standard	Tilt	–	0.292

MEASUREMENT RESULTS (CDMA Right Head SAR – Tilt –Slide OUT)

Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.81	Standard	Tilt	–	0.268

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Head

Engineer M.J.Song (Signature)

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 21
Relative HUMIDITY (%) : 44
Mixture Type : 835MHz Body
Dielectric Constant : 53.1
Conductivity: 0.946

Measurement Results (CDMA BODY SAR w/o Holster)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Body SAR Without Holster Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.70	24.75	Standard	Touch[w/o Holster]	–	0.858
835.89	363	CDMA	24.70	24.78	Standard	Touch[w/o Holster]	–	0.929
848.31	777	CDMA	24.70	24.68	Standard	Touch[w/o Holster]	–	0.728

MEASUREMENT RESULTS (CDMA Body SAR Without Holster Slide OUT)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.69	Standard	Touch[w/o Holster]	–	0.524

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Body

Engineer M.J.Song (Signature)

9. RESULTS(continued)

Ambient TEMPERATURE (C) : 21
Relative HUMIDITY (%) : 43
Mixture Type : 835MHz Body
Dielectric Constant : 53.1
Conductivity: 0.946

Measurement Results (CDMA BODY SAR with Holster)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Brain 1.6 W/kg (mW/g) averaged over 1 gram

MEASUREMENT RESULTS (CDMA Body SAR With Holster)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.70	24.78	Standard	2.3 [with Holster]	–	0.503

NOTES:
1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
2. All modes of operation were investigated and the worst-case are reported.
3. Battery Type : Standard
Radiated measurements indicate that the Extended-life battery produces lower ERP and EIRP, therefore the Standard-life battery is used in SAR testing.
4. Power Measured : Conducted
5. SAR Measurement System : SPEAG
6. SAR Configuration : Body

Engineer M.J.Song
(Signature)

10. REFERENCE

[1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation, Aug. 1996.

[2] ANSI/IEEE C95.1 – 1991, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300kHz to 100GHz, New York: IEEE, Aug. 1992

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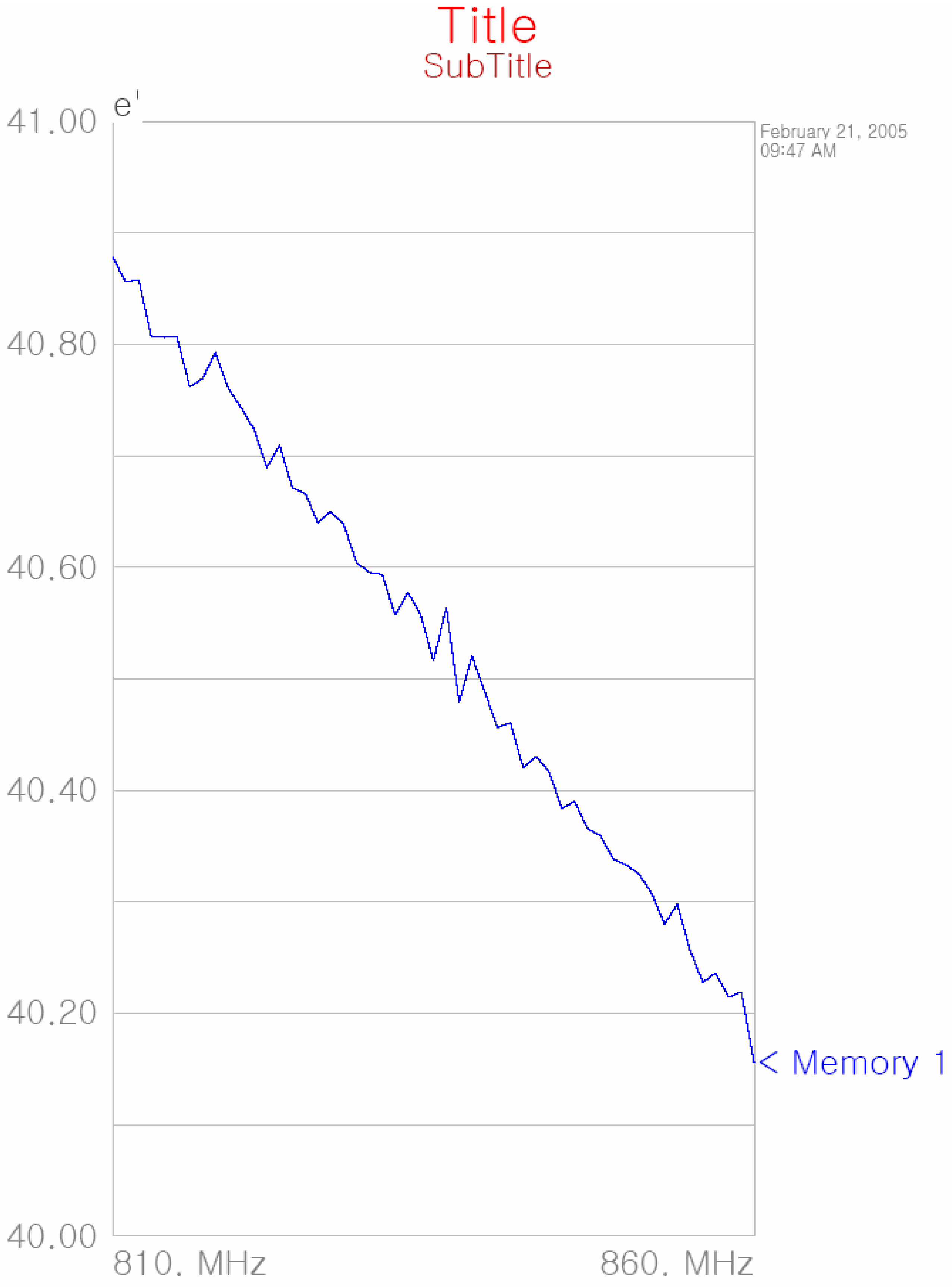
[18] Prof. Dr. Niels Kuster, ETH, Eidgen o ssische Technische Hoschschule Z u rich, Dosimetric Evaluation of the Cellular Phone.

APPENDIX A : Validation Test Data of Tissue

ESTECH Co., Ltd.
Rm.1015, World Venture Center II,
426-5, Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea
TEL: 82-2-867-3201
FAX: 82-2-867-3204

– Head Tissue



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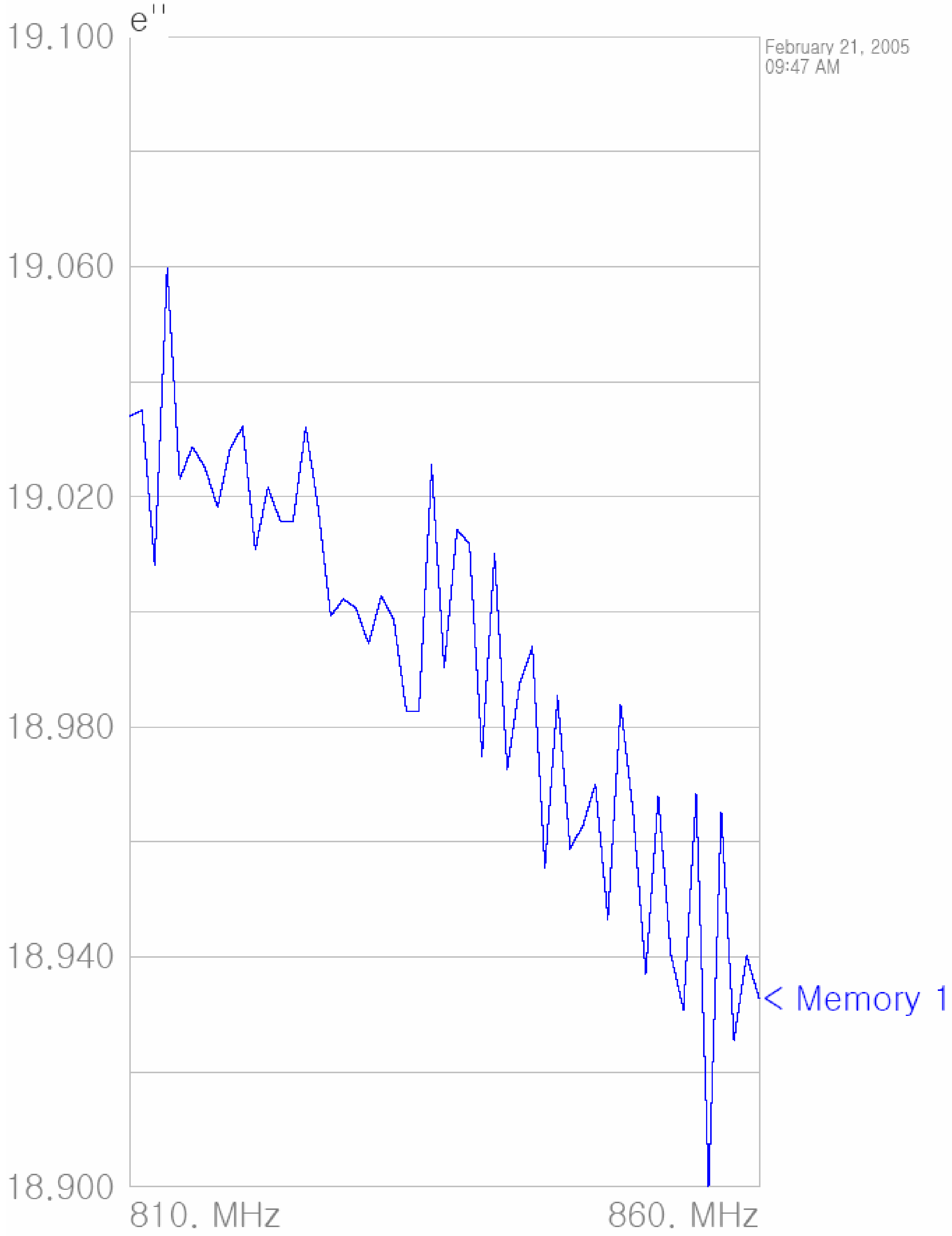
FAX: 82-2-867-3204

Title

SubTitle



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Seoul, 153-803, Korea
TEL: 82-2-867-3201
FAX: 82-2-867-3204

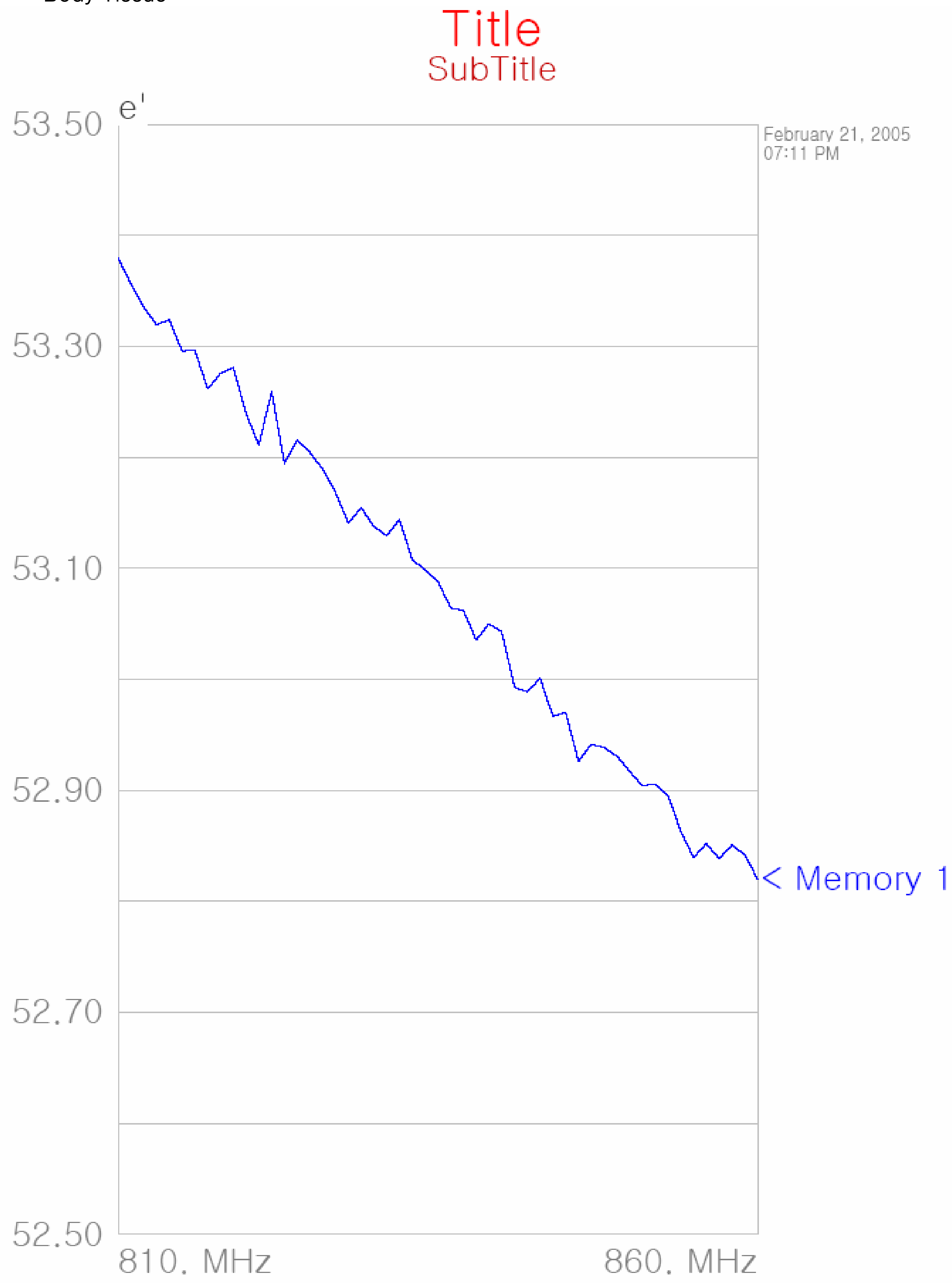
Title

SubTitle

February 21, 2005 09:47 AM

Frequency	e'	e''
810.000000 MHz	40.8784	19.0340
810.973262 MHz	40.8560	19.0350
811.946524 MHz	40.8582	19.0081
812.919785 MHz	40.8066	19.0598
813.893047 MHz	40.8063	19.0230
814.866309 MHz	40.8066	19.0287
815.845418 MHz	40.7619	19.0251
816.824527 MHz	40.7696	19.0182
817.803636 MHz	40.7926	19.0284
818.782745 MHz	40.7607	19.0322
819.761854 MHz	40.7432	19.0108
820.746845 MHz	40.7240	19.0217
821.731836 MHz	40.6896	19.0156
822.716828 MHz	40.7100	19.0158
823.701819 MHz	40.6711	19.0321
824.686810 MHz	40.6665	19.0179
825.677719 MHz	40.6395	18.9993
826.668628 MHz	40.6501	19.0022
827.659537 MHz	40.6384	19.0006
828.650446 MHz	40.6044	18.9945
829.641354 MHz	40.5954	19.0027
830.638216 MHz	40.5936	18.9985
831.635078 MHz	40.5572	18.9826
832.631941 MHz	40.5776	18.9828
833.628803 MHz	40.5573	19.0255
834.625665 MHz	40.5157	18.9902
835.628516 MHz	40.5636	19.0143
836.631367 MHz	40.4788	19.0118
837.634218 MHz	40.5205	18.9748
838.637068 MHz	40.4881	19.0102
839.639919 MHz	40.4565	18.9725
840.648795 MHz	40.4603	18.9876
841.657671 MHz	40.4201	18.9939
842.666547 MHz	40.4300	18.9554
843.675423 MHz	40.4173	18.9854
844.684299 MHz	40.3838	18.9588
845.699236 MHz	40.3899	18.9628
846.714173 MHz	40.3658	18.9700
847.729110 MHz	40.3592	18.9465
848.744047 MHz	40.3384	18.9838
849.758984 MHz	40.3332	18.9651
850.780018 MHz	40.3253	18.9369
851.801053 MHz	40.3081	18.9680
852.822087 MHz	40.2799	18.9403
853.843122 MHz	40.2978	18.9308
854.864157 MHz	40.2569	18.9684
855.891325 MHz	40.2278	18.9001
856.918494 MHz	40.2358	18.9651
857.945663 MHz	40.2146	18.9254
858.972831 MHz	40.2189	18.9402
860.000000 MHz	40.1557	18.9328

– Body Tissue


Title
SubTitle
e'
53.50
53.30
53.10
52.90
52.70
52.50
February 21, 2005
07:11 PM
< Memory 1
810. MHz
860. MHz

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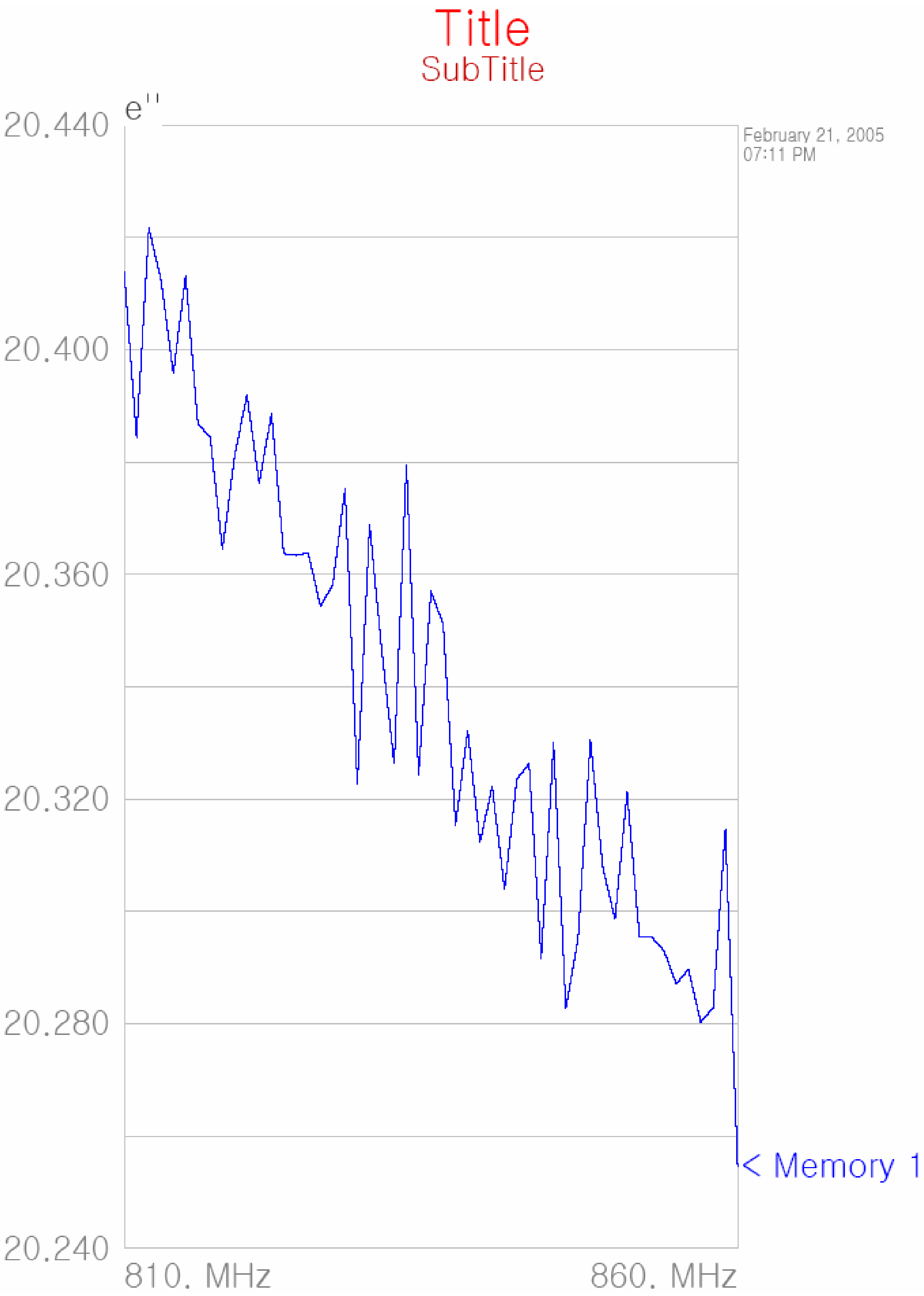

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Title

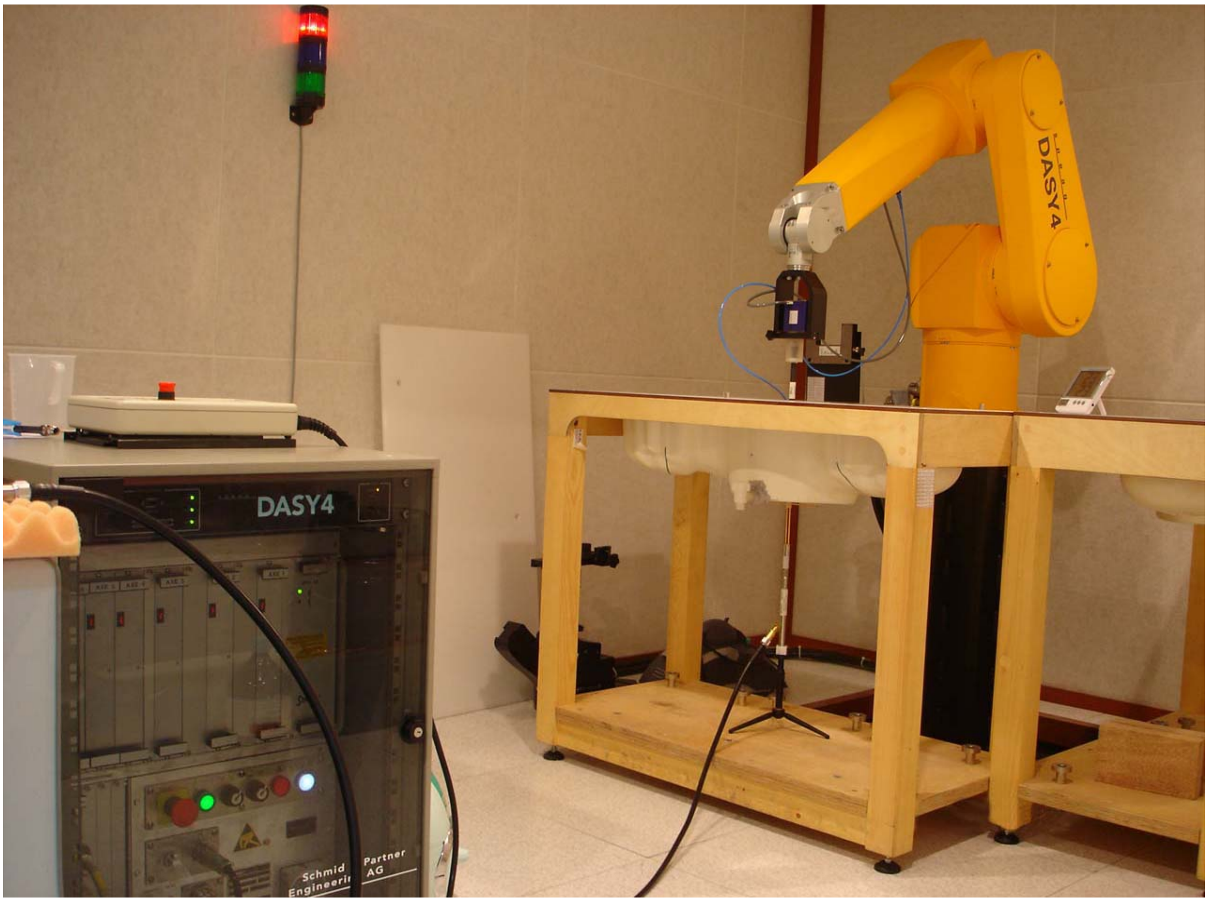
SubTitle

February 21, 2005 07:11 PM

Frequency	e'	e''
810.000000 MHz	53.3792	20.4138
810.973262 MHz	53.3565	20.3844
811.946524 MHz	53.3351	20.4217
812.919785 MHz	53.3195	20.4123
813.893047 MHz	53.3239	20.3958
814.866309 MHz	53.2957	20.4132
815.845418 MHz	53.2966	20.3868
816.824527 MHz	53.2615	20.3844
817.803636 MHz	53.2758	20.3644
818.782745 MHz	53.2810	20.3811
819.761854 MHz	53.2397	20.3920
820.746845 MHz	53.2112	20.3762
821.731836 MHz	53.2593	20.3886
822.716828 MHz	53.1944	20.3637
823.701819 MHz	53.2158	20.3634
824.686810 MHz	53.2043	20.3638
825.677719 MHz	53.1894	20.3543
826.668628 MHz	53.1682	20.3582
827.659537 MHz	53.1408	20.3753
828.650446 MHz	53.1546	20.3226
829.641354 MHz	53.1378	20.3689
830.638216 MHz	53.1294	20.3462
831.635078 MHz	53.1439	20.3263
832.631941 MHz	53.1079	20.3795
833.628803 MHz	53.0987	20.3242
834.625665 MHz	53.0885	20.3570
835.628516 MHz	53.0643	20.3511
836.631367 MHz	53.0622	20.3153
837.634218 MHz	53.0355	20.3322
838.637068 MHz	53.0501	20.3123
839.639919 MHz	53.0428	20.3222
840.648795 MHz	52.9927	20.3040
841.657671 MHz	52.9889	20.3235
842.666547 MHz	53.0009	20.3263
843.675423 MHz	52.9668	20.2916
844.684299 MHz	52.9701	20.3301
845.699236 MHz	52.9260	20.2828
846.714173 MHz	52.9416	20.2952
847.729110 MHz	52.9386	20.3305
848.744047 MHz	52.9307	20.3080
849.758984 MHz	52.9169	20.2986
850.780018 MHz	52.9040	20.3213
851.801053 MHz	52.9057	20.2954
852.822087 MHz	52.8955	20.2954
853.843122 MHz	52.8628	20.2930
854.864157 MHz	52.8396	20.2871
855.891325 MHz	52.8519	20.2897
856.918494 MHz	52.8384	20.2803
857.945663 MHz	52.8507	20.2828
858.972831 MHz	52.8417	20.3146
860.000000 MHz	52.8202	20.2546

APPENDIX B : Validation Test Data

835MHz Dipole Validation



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FAX: 82-2-867-3204

Date/Time: 02/21/05 10:04:30

Test Laboratory: ESTECH

validation 835MHz -0221

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:xxx

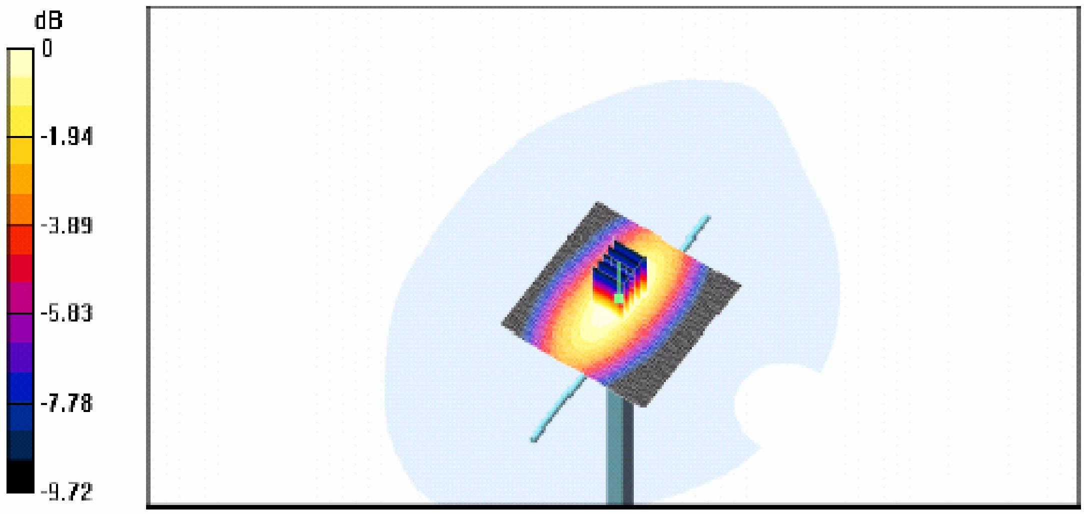
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used: f = 835 MHz; σ = 0.882 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 22℃, Humidity : 42%

Unnamed procedure/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.59 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.38 mW/g
Maximum value of SAR (measured) = 2.57 mW/g



0 dB = 2.57mW/g

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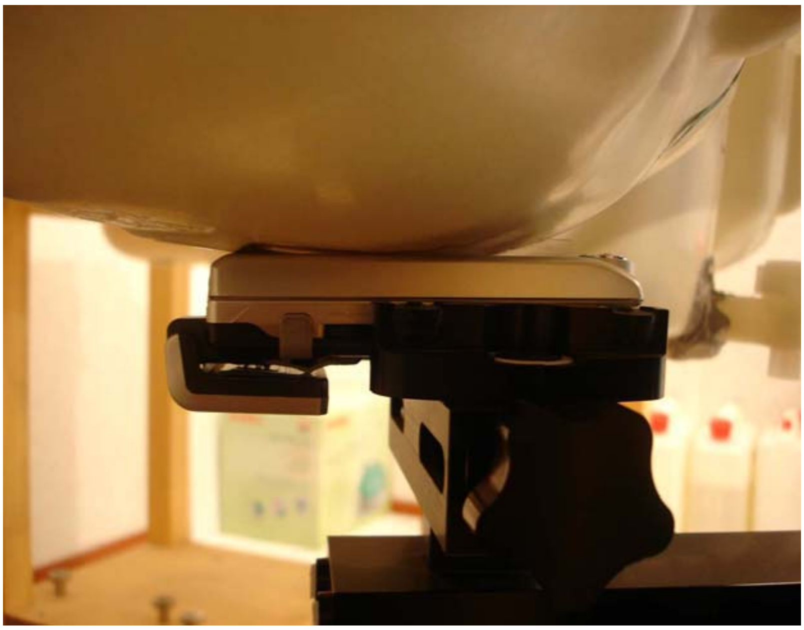
APPENDIX C : SAR Test Setup Photographs

Left Hand –Touch Slide In Position

Right Hand –Touch Slide In Position



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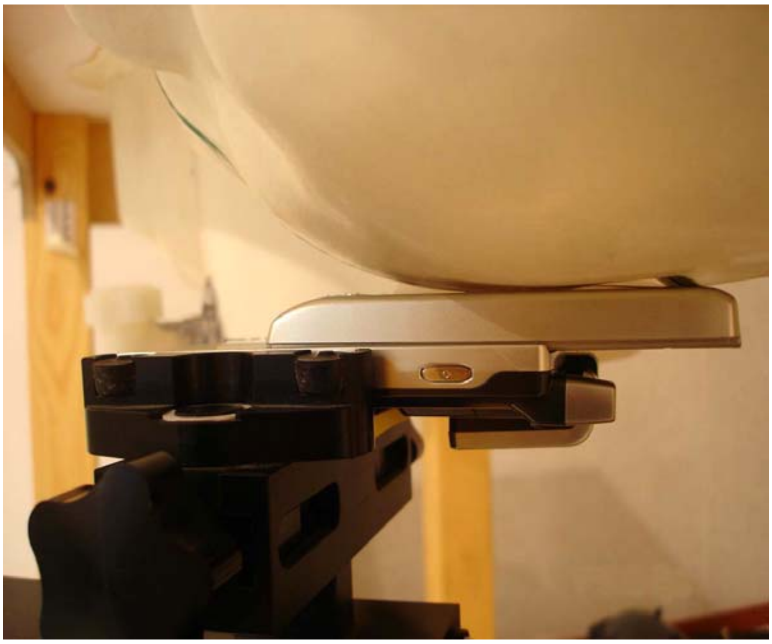
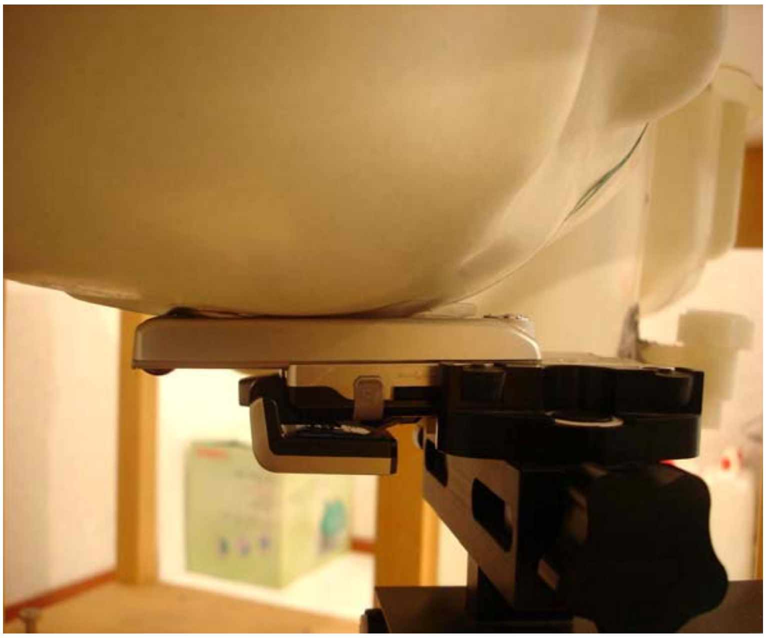
FAX: 82-2-867-3204

APPENDIX C : SAR Test Setup Photographs

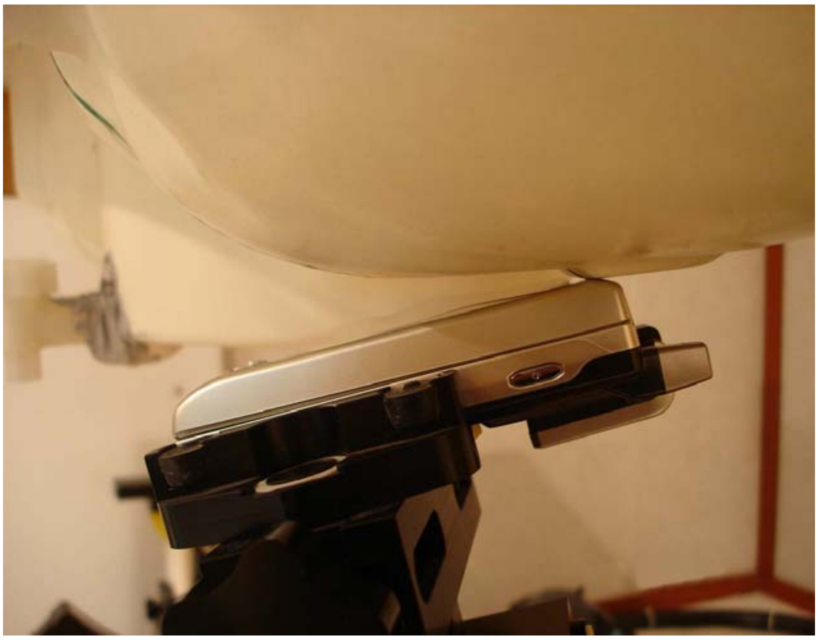
Left Hand –Touch Slide Out Position



Right Hand –Touch Slide Out Position



Left Hand –Tlit Slide In Position



Right Hand –Tilt Slide In Position

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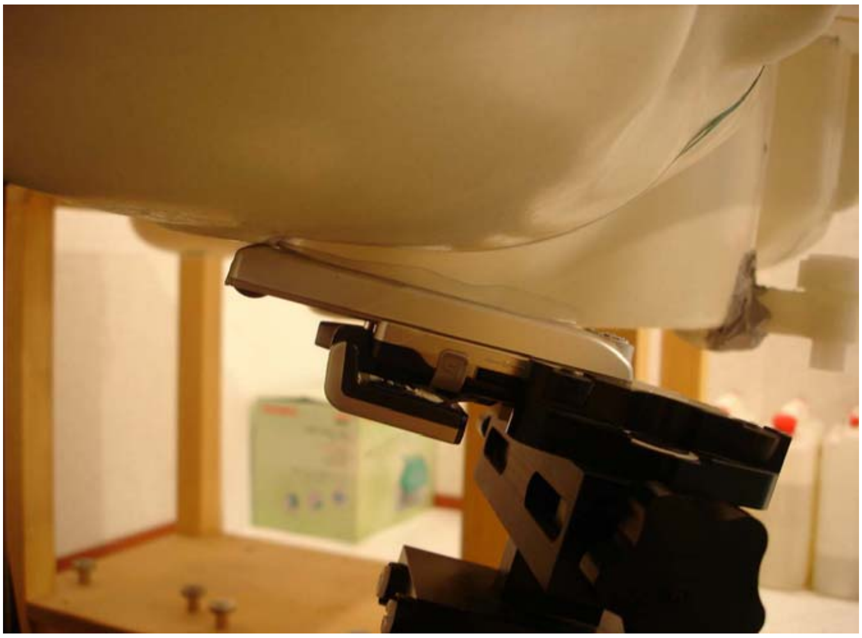
Left Hand –Tlit Slide Out Position

Right Hand –Tilt Slide Out Position



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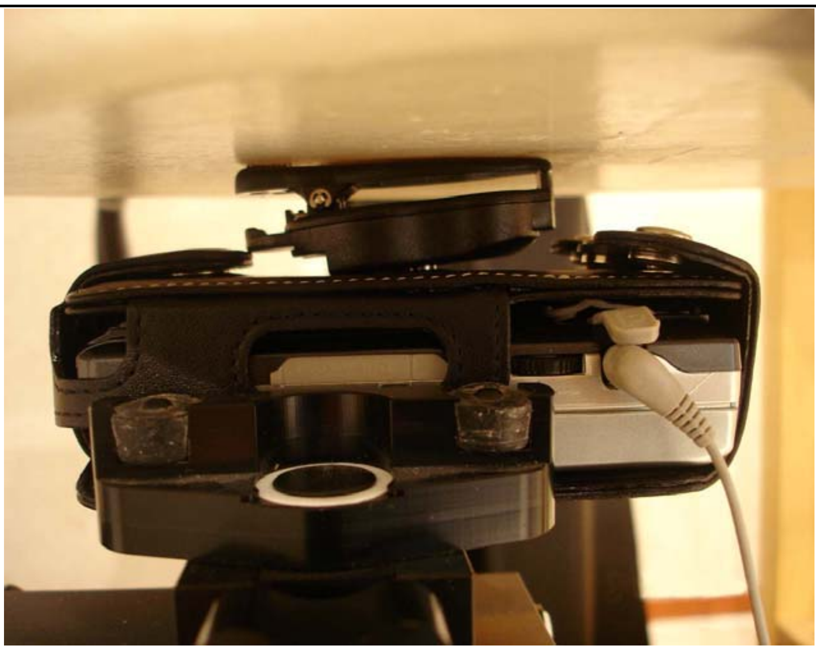
FAX: 82-2-867-3204

Flat – Body Side Configuration (Slide In)

Flat – Body Front Configuration (Slide Out)

Flat – Body Side Configuration (With Holster)



APPENDIX D : SAR Test Data

ESTECH Co., Ltd.
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Date/Time: 02/21/05 15:35:38

Test Laboratory: ESTECH

CH 1013-LEFT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.873 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

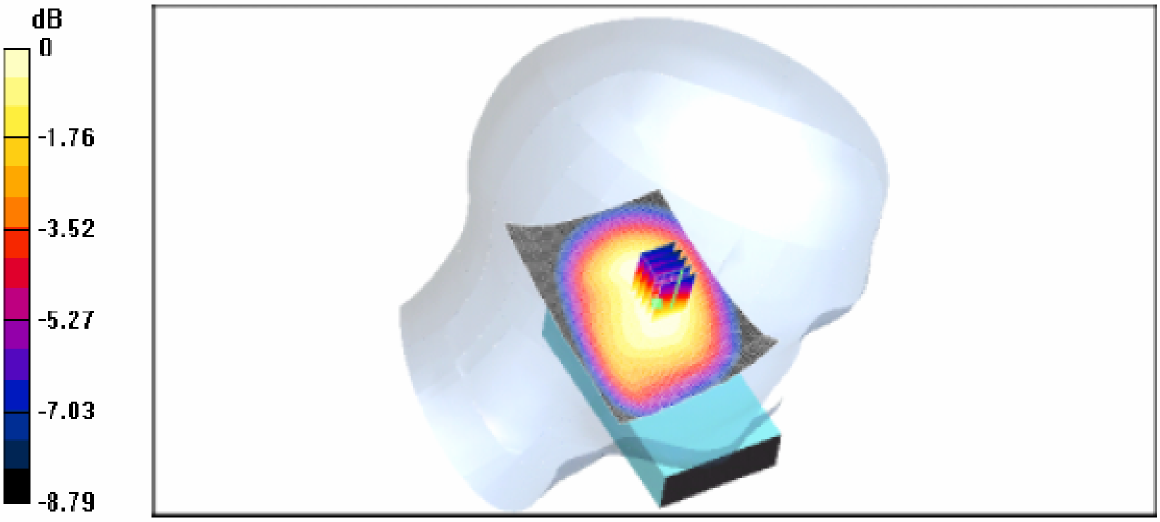
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 22℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 0.874 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = -0.2 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.812 mW/g
Maximum value of SAR (measured) = 0.860 mW/g



0 dB = 0.860mW/g

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426-5, Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea
TEL: 82-2-867-3201
FAX: 82-2-867-3204

Date/Time: 02/21/05 10:43:32

Test Laboratory: ESTECH

CH 363-LEFT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 835.89 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 835.89 MHz; σ = 0.884 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

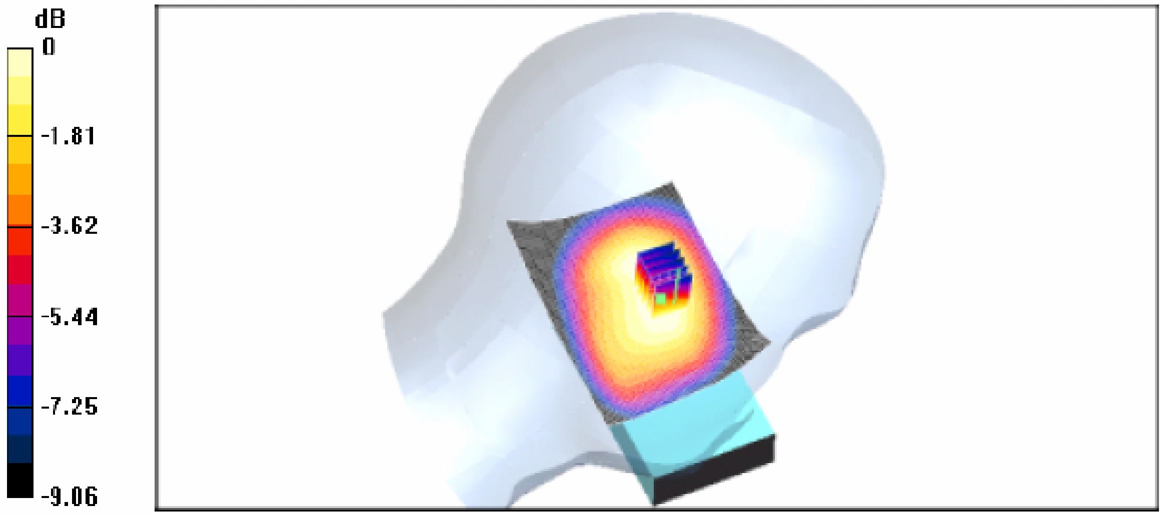
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 22℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 0.919 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = 0.2 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.840 mW/g
Maximum value of SAR (measured) = 0.896 mW/g



0 dB = 0.896mW/g

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FAX: 82-2-867-3204

Date/Time: 02/21/05 17:17:16

Test Laboratory: ESTECH

CH 777-LEFT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.896 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

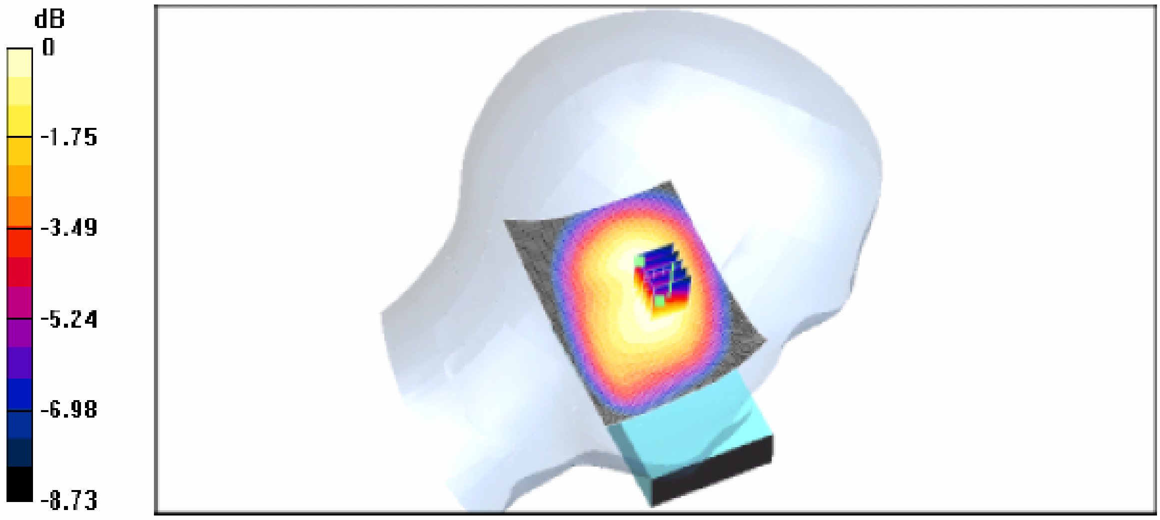
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 21 ℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 1.01 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.1 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.933 mW/g
Maximum value of SAR (measured) = 1 mW/g



0 dB = 1mW/g

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FAX: 82-2-867-3204

Date/Time: 02/21/05 16:12:31

Test Laboratory: ESTECH

CH 1013-RIGHT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.873 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

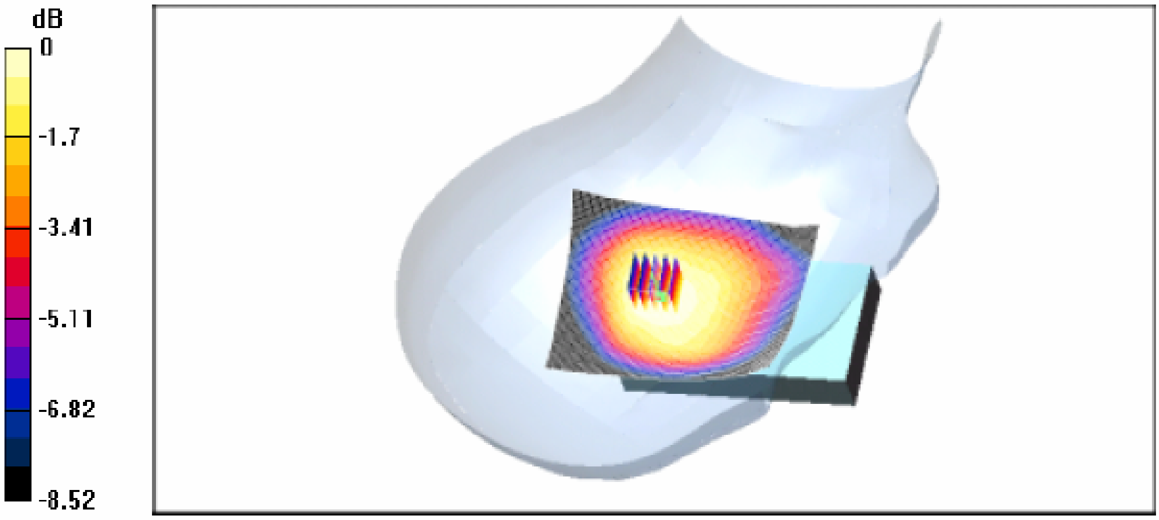
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 22℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 0.784 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.8 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 0.996 W/kg
SAR(1 g) = 0.748 mW/g
Maximum value of SAR (measured) = 0.787 mW/g



0 dB = 0.787mW/g

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FAX: 82-2-867-3204

Date/Time: 02/21/05 11:14:25

Test Laboratory: ESTECH

CH 363-RIGHT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 835.89 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 835.89 MHz; σ = 0.884 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

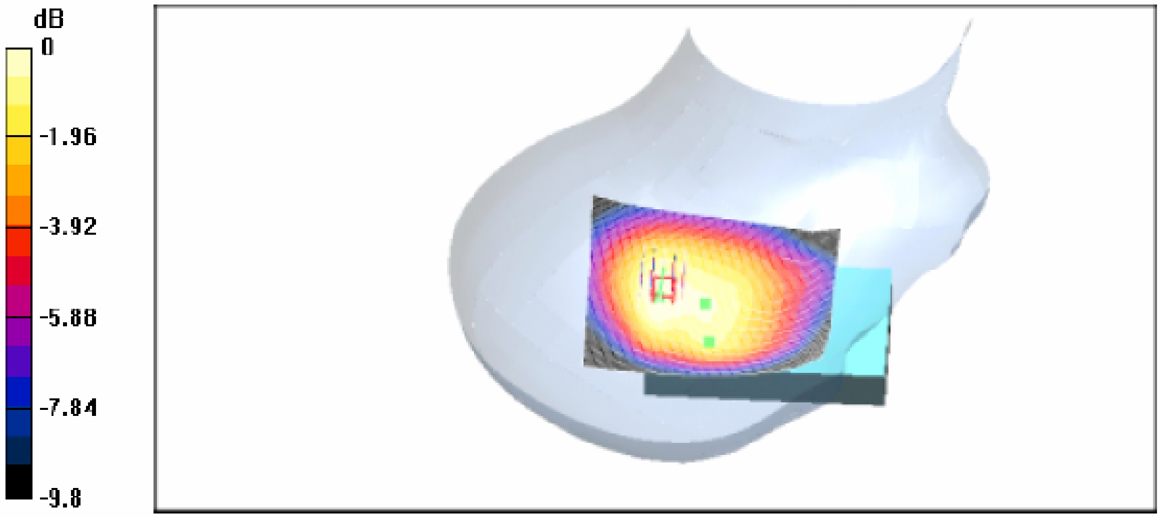
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 22℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 0.760 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.4 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.706 mW/g
Maximum value of SAR (measured) = 0.757 mW/g



0 dB = 0.757mW/g

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Date/Time: 02/21/05 16:39:56

Test Laboratory: ESTECH

CH 777-RIGHT TOUCH-SLIDE IN

DUT: CP-X315; Type: SLIDE; Serial: XXXX

Communication System: CDMA FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: HSL 835MHz Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.896 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

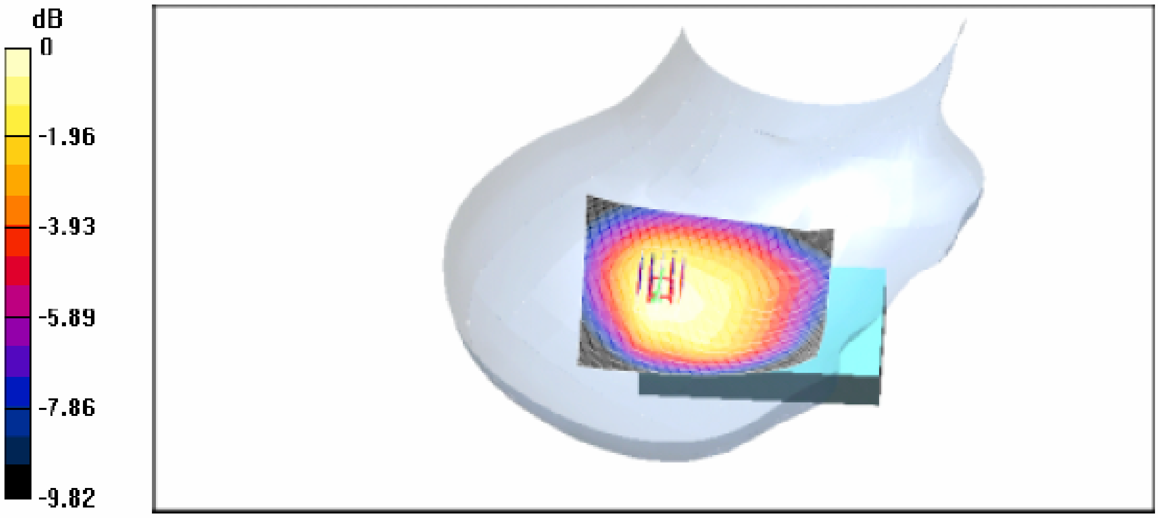
DASY4 Configuration:

- Probe: ET3DV6 - SN1748; ConvF(6.57, 6.57, 6.57); Calibrated: 2005-01-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn551; Calibrated: 2004-04-28
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130
- Temperature : 21℃, Humidity : 43%

Unnamed procedure/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (interpolated) = 0.902 mW/g

Unnamed procedure/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.9 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.880 mW/g
Maximum value of SAR (measured) = 0.941 mW/g



0 dB = 0.941mW/g