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SAR Compliance Test Report

APPLICANT NAME & ADDRESS :

LG Electronics Inc.
459-9, Kasan-dong, Keumchun-ku,
Seoul 153-023, Korea

DATA & LOCATION OF TESTING

Dates of testing : 2006 06/20 ~ 07/22
Test Site : ESTECH Co., Ltd. Korea

Test Device :

Models : MX800
FCC ID : BEJMX800
TYPE : Dual Band CDMA Phone with Bluetooth (Prototype)

Test report no :

ESTSAR0607-004

Number of page :

29

Contact person :

Bong Hyo, Han

Responsible test Engineer :

K.H.Kang

**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)
Licensed Portable Transmitter Held to Ear (PCE)

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 receipt in full, without written approval of the laboratory.

Date and Signatures : 2006/07/22

Report Prepared By : Engineer/ K.H.Kang

(Signature)

Manager Engineer/ Jay Kim

(Signature)

Test report no : ESTSAR0607-004

FCC ID : BEJMX800

Web : www. estech. co. kr

Page 1 of 29



Table of Contents

1. SUMMARY FOR SAR TET REPORT	3
1.1 Head Configuration	3
1.2 Body Worn Configuration	3
1.3 Measurement Uncertainty	3
2. INTRODUCTION	4
3. DESCRIPTION OF THE DEVICE UNDER TEST	5
3.1 Antenna Description	5
3.2 Device Description	5
3.3 Battery Option	5
4. TEST CONDITIONS	6
4.1 Ambient Conditions	6
4.2 RF Characteristics of The Test Site	6
4.3 Test Signal, Frequencies, And Output Power	6
5. DESCRIPTION OF THE TEST EQUIPMENT	7
5.1 Test System Specifications	7
5.2 SAR Measurement Setup	7
5.3 DASY 4 E-Field Probe System	8
5.4 Phantom & Equivalent Tissues	10
6. DESCRIPTION OF THE TEST PROCEDURE	12
6.1 Definition of Reference Point	12
6.2 Test Configuration Positions	13
6.3 Scan Procedures	16
6.4 SAR Averaging Methods	16
7. MEASUREMENT UNCERTAINTY	17
8. SYSTEM VERIFICATION	18
8.1 Tissue Verification	18
8.2 Test System Validation	18
9. RESULTS	19
10. REFERENCES	29
APPENDIX A : Validation Test Data of Tissue	
APPENDIX B : Validation Test Data	
APPENDIX C : SAR Test Data	
APPENDIX D : Calibration Certificates	



1. SUMMARY FOR TEST REPORT

FCC ID	BEJMX800
Date of test	2006/06/20 ~ 2006/07/22
Responsible test engineer	Jay Kim
Measurement performed by	K.H.Kang
EUT Type	Dual Band CDMA Phone with Bluetooth (Prototype)
Tx Frequency	824.70 ~ 848.31 MHz(CDMA), 1851.25 ~ 1908.75(PCS)
Rx Frequency	869.70 ~ 893.31 MHz(CDMA), 1931.25 ~ 1988.75(PCS)
Max. RF Output Power	CDMA (24.2 dBm) PCS (24 dBm)

Maximum Results Found During SAR Evaluation under phone call and bluetooth function enable

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	24.2	Standard	Right Touch	—	0.627
1908.75	1175	CDMA	24	Standard	Left Touch	—	0.982

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			
824.70	1013	CDMA	24.2	Standard	1.5cm [w/o Holster]	—	1.02
1908.75	1175	CDMA	24	Standard	1.5cm [w/o Holster]	—	0.874

1.3 Measurement Uncertainty

Combine Standard Uncertainty	± 11.32 (k=1)
Extended Standard Uncertainty	± 22.64 (k=2, 95% CONFIDENCE LEVEL)



2. INTRODUCTION

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 hazards of RF emissions due to FCC-regulated portable device.[1]

The safety limits used for the environmental evaluation measurements are the 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/ANSI C95.3-1992 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 radiation exposure 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, MD 20814.[6] SAR is a measure 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/m³)

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

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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 devices 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	Internal Antenna
Location	the bottom of the device
Radiator Material	Copper

2.2 Device Description

FCC ID	FCC ID : BEJMX800
Serial numbers	—
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), 1851.25 ~ 1908.75(PCS)
test signal method	☐ Base station simulator ☒ Internal test code

2.3 Battery Options

There is only one battery option available for tested device,



4. TEST CONDITIONS

4.1 Ambient Conditions

Ambient Temperature (°C)	21
Tissue simulating liquid temperature (°C)	21
Humidity (%)	43

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, 1900MHz PCS 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.

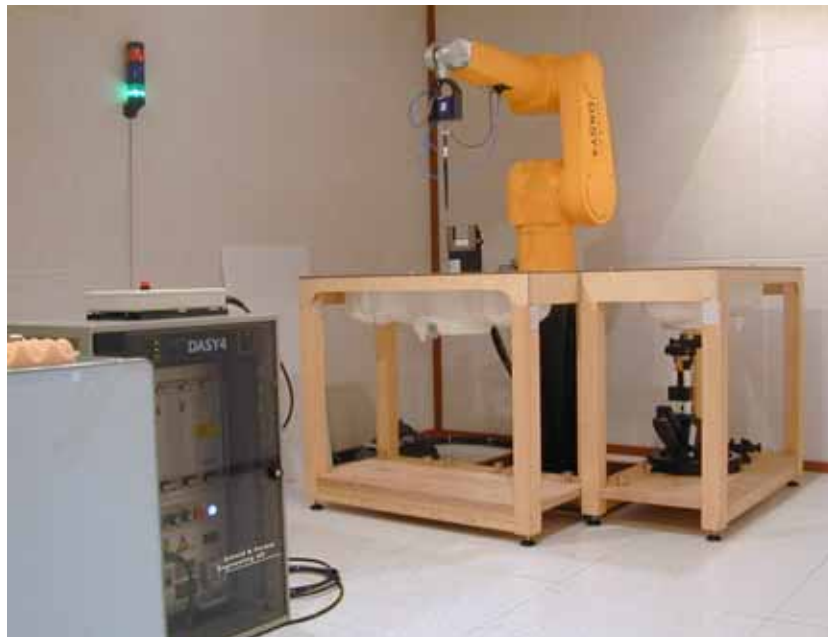


Fig. 4.1 SAR Measurement System



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	DAE4	551	2006-04-27
E-Field Probe	ET3DV6	1750	2006-01-24
Dipole validation kit	D835V2	475	2005-02-24
	D1900V2	5d058	2005-01-27
Network analyzer	8753ES	NONE	2005-10-17
Signal generator	E4432B	GB40050840	2006-03-03
RF Power meter	EPM-442A	GB37170412	2005-10-05
Power Sensor	8481A	3318A90368	2005-10-05
RF Power meter	E4418A	GB38272722	2006-03-03
Power Sensor	8481A	3318A90368	2005-10-05
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.

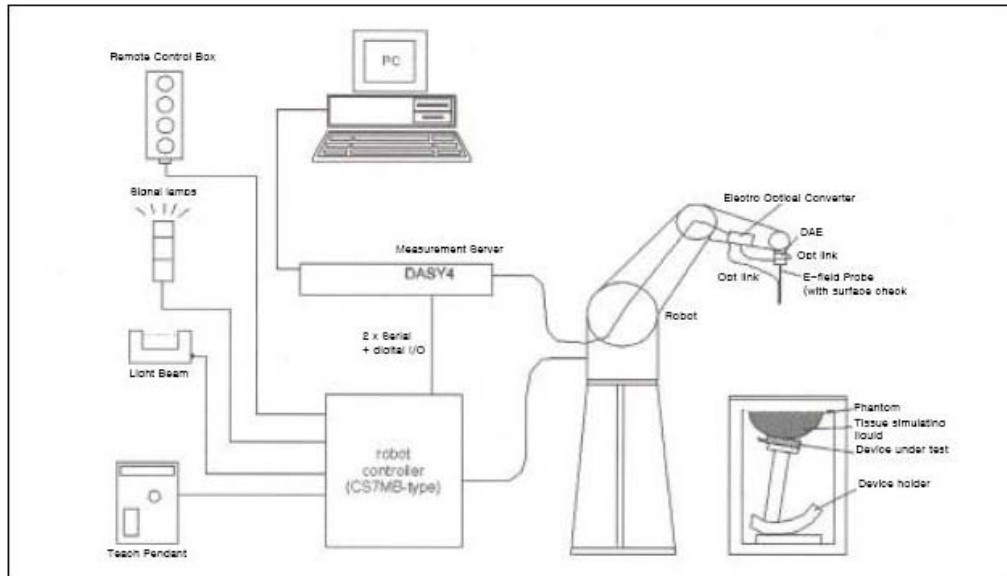


Fig. 5.1 SAR Measurement System Setup

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.

 Isotropic E-Field Probe	Isotropic E-Field Probe for Dosimetric Measurements	
	Construction	Symmetrical design with triangular core Interleafed sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycol)
	Calibration	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 $\pm 8\%$) Calibration for other liquids and frequencies upon request
	Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
	Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.3 dB in brain tissue (rotation normal to probe axis)
	Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
	Dimensions	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

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 hydroxethylcellulose(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)	ϵ_r	σ (S/m)	ϵ_r	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(diethylene 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	$41.0 \pm 5\%$	$55.2 \pm 5\%$	ϵ	$40.0 \pm 5\%$	$53.3 \pm 5\%$
σ	$0.89 \pm 10\%$	$0.97 \pm 10\%$	σ	$1.45 \pm 10\%$	$1.52 \pm 10\%$

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].

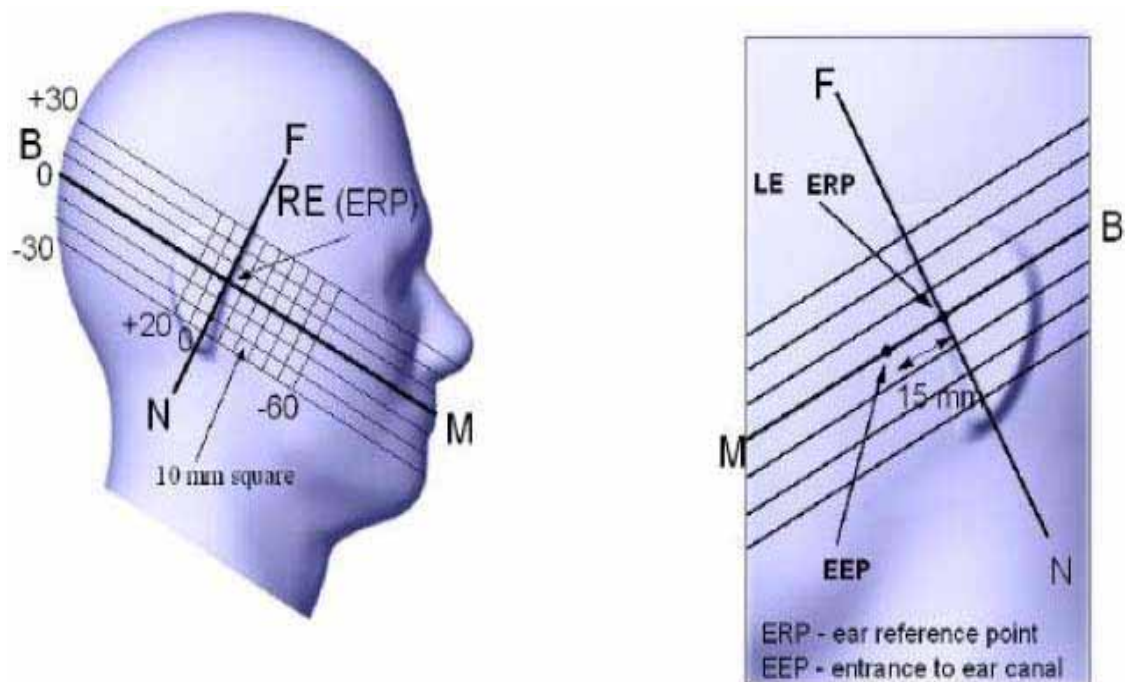


Figure 6.1 Close-up side view of ERP

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 then 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.

6. DESCRIPTION OF THE TEST PROCEDURE(continued)

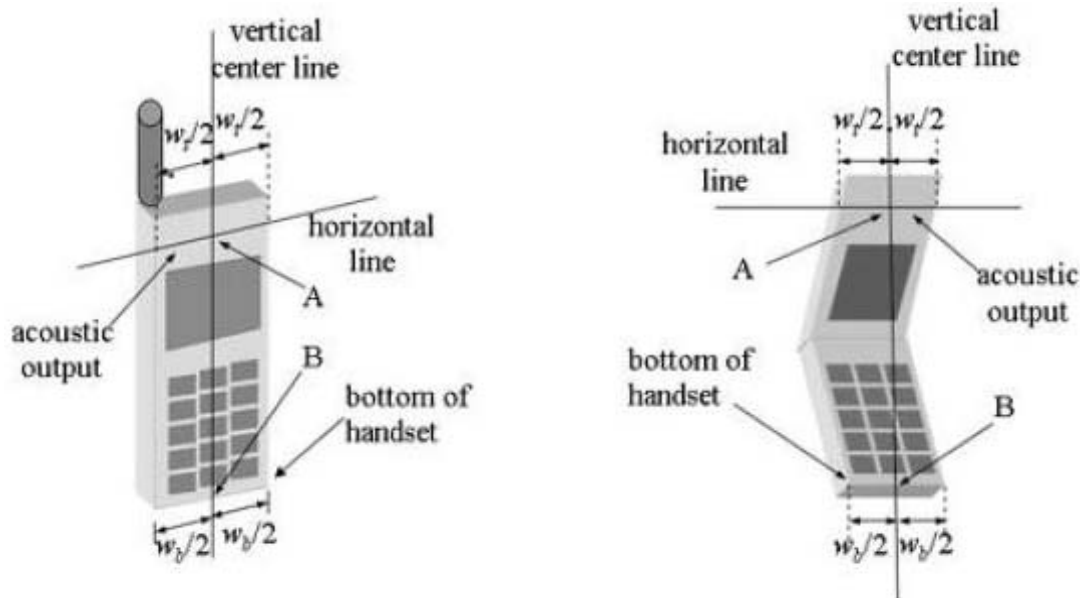


Figure 6.2 Handset Vertical Center & Horizontal Line Reference Points

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 w_t of the handset at the level of the acoustic output (point A on Figures 6.2), and the midpoint of the width w_b 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 necessarily 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

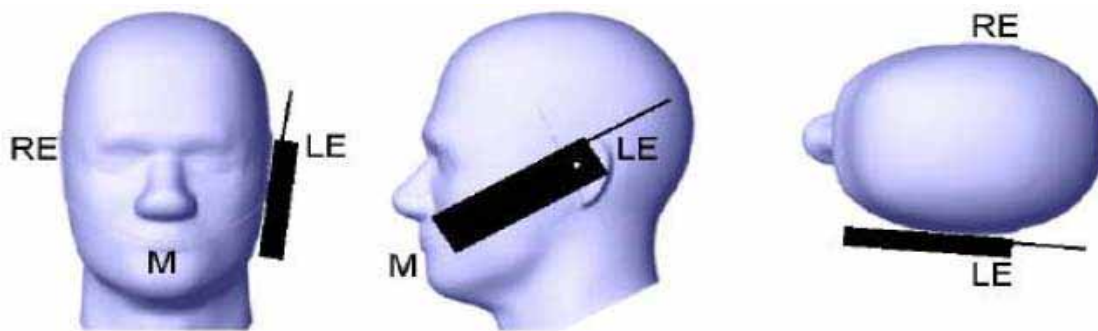


Figure 6.3 "Cheek" or "Touch" Position.

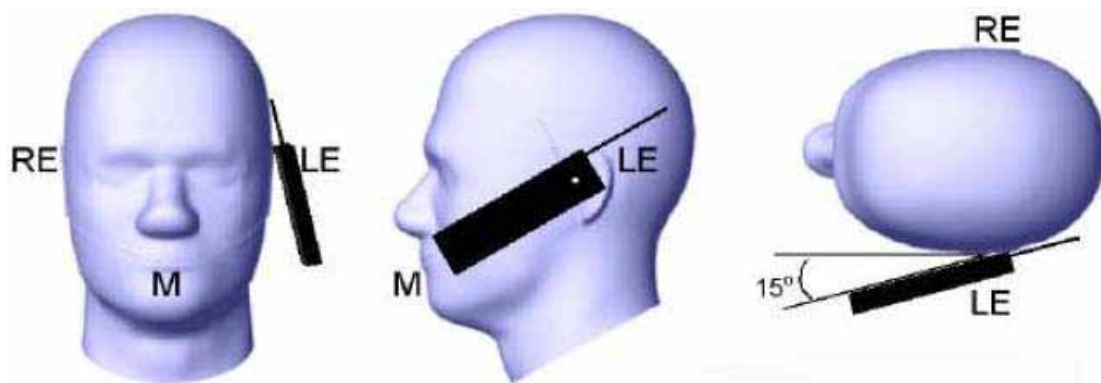


Figure 6.4 "Tilted" Position.



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, Computermathematik, 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.



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	Probability	Divisor	ci 1	Standard unc.	vi or
	value ±%	Distribution		1g	(1g)	Veff
MEASUREMENT SYSTEM						
Probe Calibration	± 11.7 %	normal	1	1	± 4.8 %	∞
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	± 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	± 2.97%	145
Device Holder Uncertainty	± 3.6	normal	0.84	1	± 3.69%	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					±11.32 %	330
Coverage Factor for 95%				K = 2		
Expanded Standard Uncertainty					± 22.64 %	



8. SYSTEM VERIFICATION

Tissue Verification

Table 8.1 Simulated Tissue Verification [5]

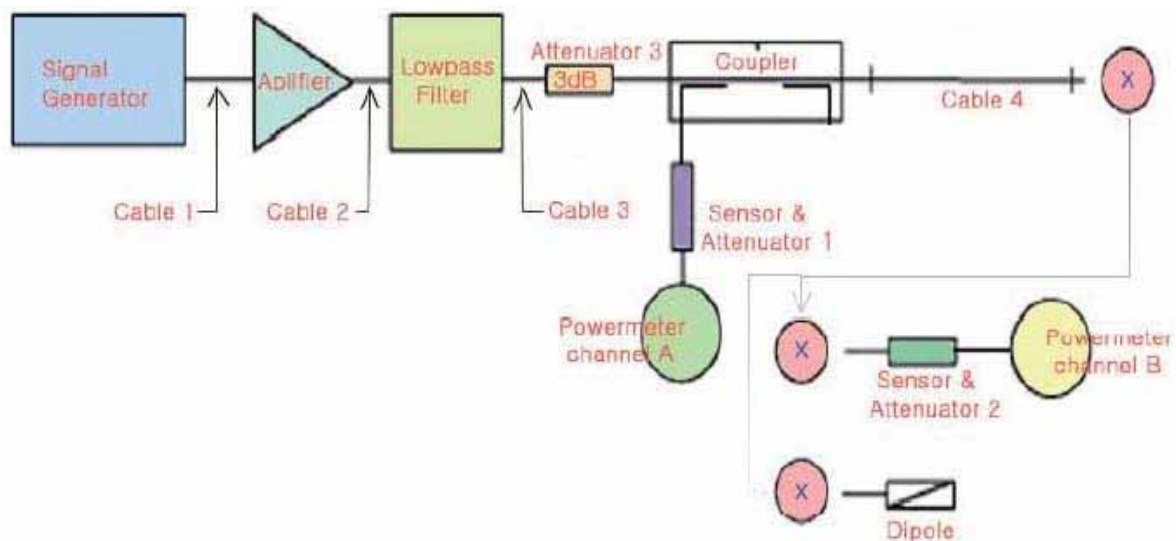
MEASURED TISSUE PARAMETERS										
Liquid Temperature (°C)		21		Liquid Depth(mm)		150				
Date	2006-07-20	2006-07-20		2006-07-21		2006-07-21				
Tissue	835MHz Brain	835MHz Muscle		1900MHz Brain		1900MHz Muscle				
	Target	Measured	Target	Measured	Target	Measured	Target	Measured		
Dielectric Constant: ϵ	41.5	40.2	55.2	53.6	40	38.5	53.3	54.9		
Conductivity: σ	0.9	0.891	0.97	0.956	1.45	1.41	1.52	1.55		
Deviation (%)	ϵ : -3.13%		ϵ : -2.90%		ϵ : -3.75%		ϵ : 3.00%			
	σ : -1.00%		σ : -1.44%		σ : -2.76%		σ : 1.97%			

Test System Validation

- Prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at 835MHz (Graphic Plots Attached)
- The results are nominalized to 1W input power.

Table 8.2 System Validation [5]

SYSTEM DIPOLE VALIDATION TARGET & MEASURED						
Tissue	System Validation Kit:	Forward Power (W)	Targeted SAR1g (mW/g)	Measured SAR1g (mW/g)	Deviation (%)	Test Date
835MHz Brain	D835V2(S/N :475)	1.0	9.5	9.32	1.89%	2006-07-20
1900MHz Brain	D1900V2(S/N :5d058)	1.0	39.2	37.96	3.16%	2006-07-21

**Figure 12.1 Dipole Validation Test Setup**

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FAX: 82-2-867-3204**9. RESULTS(continued)**Ambient TEMPERATURE (C) : **21.0**Relative HUMIDITY (%) : **43**Mixture Type : **835MHz Brain**Dielectric Constant : **40.2**Conductivity: **0.891****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				
835.89	363	CDMA	24.20	24.13	Standard	Cheek Touch	–	0.302

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				
835.89	363	CDMA	24.20	24.17	Standard	Cheek Touch	–	0.364

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**

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Test report no : ESTSAR0607–004

FCC ID : BEJMX800

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Page 19 of 29



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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 21.0

Relative HUMIDITY (%) : 43

Mixture Type : 835MHz Brain

Dielectric Constant : 40.2

Conductivity: 0.891

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 – 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	24.20	24.18	Standard	Tilt	–	0.194

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	24.20	24.21	Standard	Tilt	–	0.204

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

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FCC ID : BEJMX800

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Page 20 of 29

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9. RESULTS(continued)

Ambient TEMPERATURE (C) : **21.0**Relative HUMIDITY (%) : **43**Mixture Type : **835MHz Brain**Dielectric Constant : **40.2**Conductivity: **0.891**

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

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 UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.20	24.10	Standard	Cheek Touch	–	0.512
835.89	363	CDMA	24.20	24.12	Standard	Cheek Touch	–	0.449
848.31	777	CDMA	24.20	24.12	Standard	Cheek Touch	–	0.545

MEASUREMENT RESULTS (CDMA Right Head SAR – Touch – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.20	24.12	Standard	Cheek Touch	–	0.548
835.89	363	CDMA	24.20	24.17	Standard	Cheek Touch	–	0.503
848.31	777	CDMA	24.20	24.23	Standard	Cheek Touch	–	0.612

MEASUREMENT RESULTS (CDMA Right Head SAR – Touch – Slide UP – BT ON)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
848.31	777	CDMA	24.20	24.17	1013	Cheek Touch	–	0.627

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**

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6. SAR Configuration : **Head, Bluetooth function enable**

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FCC ID : BEJMX800

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Page 21 of 29

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FAX: 82-2-867-3204**9. RESULTS(continued)**Ambient TEMPERATURE (C) : **21.0**Relative HUMIDITY (%) : **43**Mixture Type : **835MHz Brain**Dielectric Constant : **40.2**Conductivity: **0.891****Measurement Results (CDMA Head SAR-Tilt-Slide UP)**

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 – Tilt – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.20	24.28	Standard	Tilt	–	0.297

MEASUREMENT RESULTS (CDMA Right Head SAR – Tilt – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
835.89	363	CDMA	24.20	24.14	Standard	Tilt	–	0.313

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**

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FCC ID : BEJMX800

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Page 22 of 29



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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 21

Relative HUMIDITY (%) : 45

Mixture Type : 835MHz Body

Dielectric Constant : 53.6

Conductivity: 0.956

Measurement Results (CDMA BODY SAR without Holster)

ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram		
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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				
835.89	363	CDMA	24.20	24.10	Standard	1.5[w/o Holster]	—	0.650

MEASUREMENT RESULTS (CDMA Body SAR Without Holster–Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.20	24.20	1013	1.5[w/o Holster]	—	1.020
835.89	363	CDMA	24.20	24.26	1013	1.5[w/o Holster]	—	0.990
848.31	777	CDMA	24.20	24.31	1013	1.5[w/o Holster]	—	0.966

MEASUREMENT RESULTS (CDMA Body SAR Without Holster–Slide UP–BT ON)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
824.70	1013	CDMA	24.20	24.05		1.5[w/o Holster]	—	1.020

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
- All modes of operation were investigated and the worst-case are reported.
- 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.
- Power Measured : Conducted
- SAR Measurement System : SPEAG
- SAR Configuration : Body, Bluetooth function enable

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Test report no : ESTSAR0607-004

FCC ID : BEJMX800

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Page 23 of 29

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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 20.0Relative HUMIDITY (%) : 47Mixture Type : 1900MHz BrainDielectric Constant : 38.5Conductivity: 1.41

Measurement Results (PCS 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 (PCS Left Head SAR – Touch – Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1851.25	25	CDMA	24.00	23.96	Standard	Cheek Touch	—	0.519
1880.00	600	CDMA	24.00	23.93	Standard	Cheek Touch	—	0.903
1908.75	1175	CDMA	24.00	24.08	Standard	Cheek Touch	—	0.982

MEASUREMENT RESULTS (PCS Right Head SAR – Touch – Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1851.25	25	CDMA	24.00	23.88	Standard	Cheek Touch	—	0.579
1880.00	600	CDMA	24.00	24.09	Standard	Cheek Touch	—	0.862
1908.75	1175	CDMA	24.00	23.85	Standard	Cheek Touch	—	0.968

MEASUREMENT RESULTS (PCS Left Head SAR – Touch – Slide IN – BT ON)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1908.75	1175	CDMA	24.00	23.94	1013	Cheek Touch	—	0.970

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

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6. SAR Configuration : Head, Bluetooth function enable

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FCC ID : BEJMX800

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Page 24 of 29

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FAX: 82-2-867-3204**9. RESULTS(continued)**Ambient TEMPERATURE (C) : **20.0**Relative HUMIDITY (%) : **47**Mixture Type : **1900MHz Brain**Dielectric Constant : **38.5**Conductivity: **1.41****Measurement Results (PCS 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 (PCS Left Head SAR – Tilt – Slide IN)

Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880	600	CDMA	24.00	23.92	Standard	Tilt	–	0.534

MEASUREMENT RESULTS (PCS Right Head SAR – Tilt – Slide IN)

Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880	600	CDMA	24.00	23.93	Standard	Tilt	–	0.489

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**

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Test report no : ESTSAR0607-004

FCC ID : BEJMX800

Web : www. estech. co. kr

Page 25 of 29



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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 20.0

Relative HUMIDITY (%) : 47

Mixture Type : 1900MHz Brain

Dielectric Constant : 38.5

Conductivity: 1.41

Measurement Results (PCS Head SAR–Touch–Slide UP)

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 (PCS Left Head SAR – Touch – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880.00	600	CDMA	24.00	24.00	Standard	Cheek Touch	–	0.482

MEASUREMENT RESULTS (PCS Right Head SAR – Touch – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880.00	600	CDMA	24.00	23.95	Standard	Cheek Touch	–	0.656

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

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Test report no : ESTSAR0607-004

FCC ID : BEJMX800

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Page 26 of 29



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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 20.0

Relative HUMIDITY (%) : 47

Mixture Type : 1900MHz Brain

Dielectric Constant : 38.5

Conductivity: 1.41

Measurement Results (PCS Head SAR-Tilt-Slide UP)

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 (PCS Left Head SAR – Tilt – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880	600	CDMA	24.00	23.95	Standard	Tilt	–	0.428

MEASUREMENT RESULTS (PCS Right Head SAR – Tilt – Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880	600	CDMA	24.00	24.01	Standard	Tilt	–	0.343

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

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FCC ID : BEJMX800

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Page 27 of 29

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9. RESULTS(continued)

Ambient TEMPERATURE (C) : 21Relative HUMIDITY (%) : 46Mixture Type : 1900MHz BodyDielectric Constant : 54.9Conductivity: 1.55

Measurement Results (PCS BODY SAR without Holster)

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

MEASUREMENT RESULTS (PCS Body SAR Without Holster–Slide IN)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1851.25	25	CDMA	24.00	23.87	Standard	1.5[w/o Holster]	—	0.477
1880.00	600	CDMA	24.00	23.94	Standard	1.5[w/o Holster]	—	0.788
1908.75	1175	CDMA	24.00	23.93	Standard	1.5[w/o Holster]	—	0.808

MEASUREMENT RESULTS (PCS Body SAR Without Holster–Slide UP)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1880.00	600	CDMA	24.00	24.05	1013	1.5[w/o Holster]	—	0.693

MEASUREMENT RESULTS (PCS Body SAR Without Holster–Slide IN–BT ON)								
Frequency		Moudulation	Conducted Power(dBm)		battery	Device Test position	Antenna Position	SAR (W/kg)
MHz	Ch.		Begin	End				
1908.75	1175	CDMA	24.00	23.96		1.5[w/o Holster]	—	0.874

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
- All modes of operation were investigated and the worst-case are reported.
- 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.
- Power Measured : Conducted
- SAR Measurement System : SPEAG
- SAR Configuration : Body, Bluetooth function enable

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Test report no : ESTSAR0607-004

FCC ID : BEJMX800

Web : www. estech. co. kr

Page 28 of 29



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- [17] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10kHz-300GHz, Jan. 1995.
- [18] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hochschule Zürich, Dosimetric Evaluation of the Cellular Phone.



ESTECH Co., Ltd.

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Seoul, 153-803, Korea

TEL: 82-2-867-3201
FAX: 82-2-867-3204

APPENDIX A : Validation Test Data of Tissue



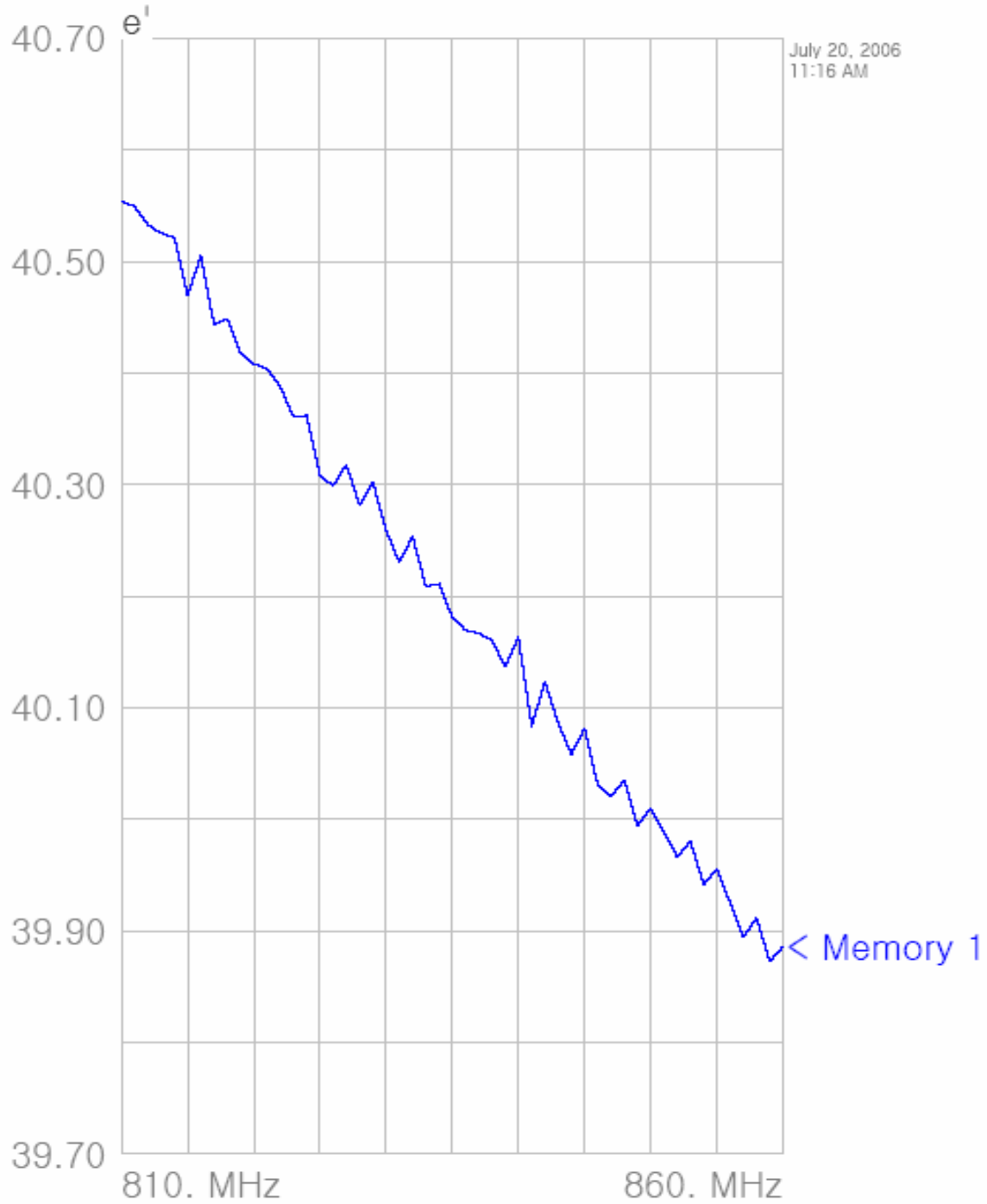
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– Head Tissue(CDMA)

Title
SubTitle



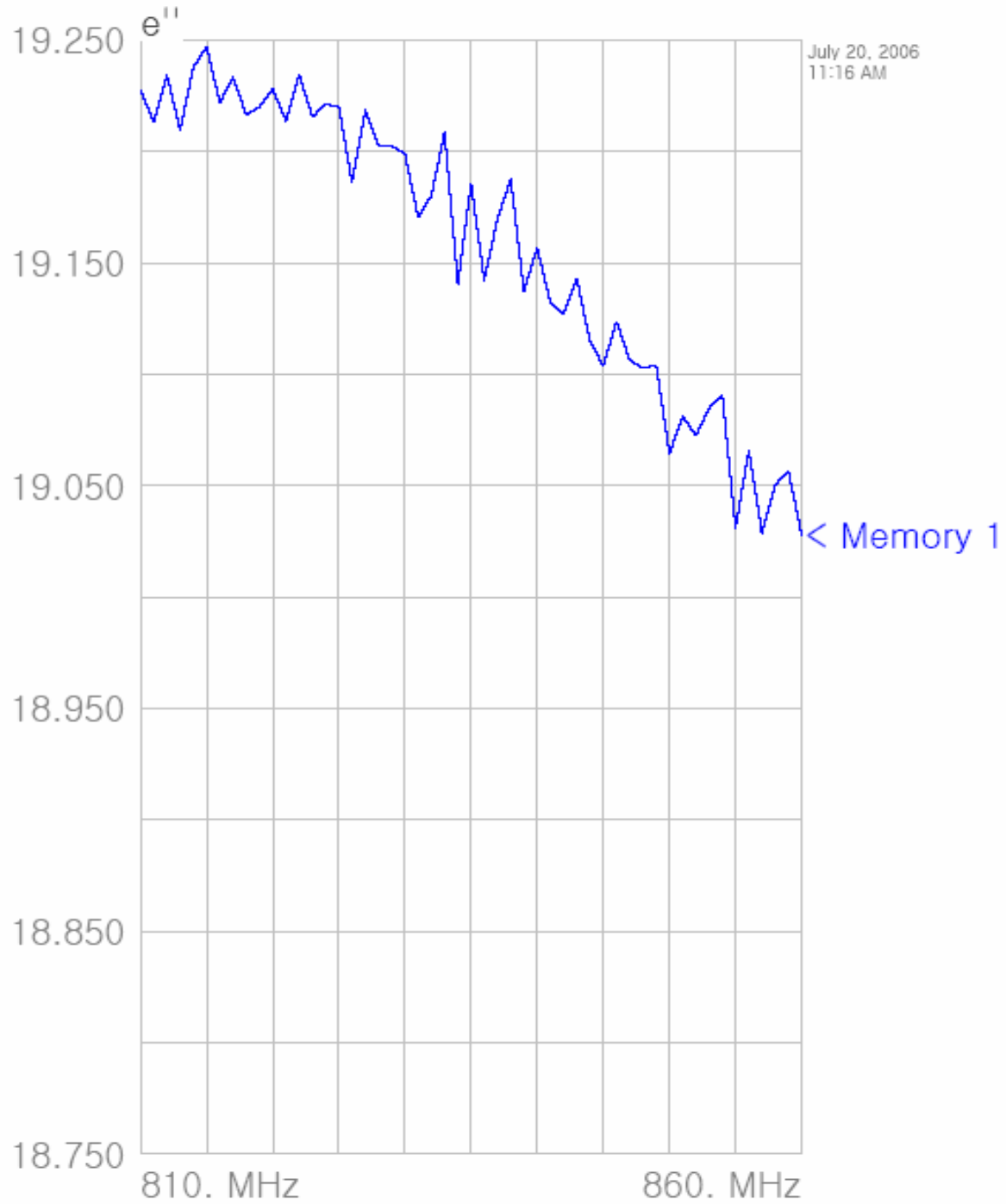


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Title

SubTitle

July 23, 2016 11:15 AM

Frequency	e'	e''
810.000000 MHz	40.5541	19.2275
811.000000 MHz	40.5494	19.2131
812.000000 MHz	40.5327	19.2341
813.000000 MHz	40.5254	19.2097
814.000000 MHz	40.5214	19.2380
815.000000 MHz	40.4696	19.2468
816.000000 MHz	40.5050	19.2218
817.000000 MHz	40.4434	19.2334
818.000000 MHz	40.4489	19.2164
819.000000 MHz	40.4173	19.2199
820.000000 MHz	40.4083	19.2281
821.000000 MHz	40.4039	19.2138
822.000000 MHz	40.3877	19.2345
823.000000 MHz	40.3610	19.2156
824.000000 MHz	40.3620	19.2211
825.000000 MHz	40.3084	19.2201
826.000000 MHz	40.2990	19.1861
827.000000 MHz	40.3179	19.2185
828.000000 MHz	40.2816	19.2024
829.000000 MHz	40.3024	19.2025
830.000000 MHz	40.2591	19.1989
831.000000 MHz	40.2302	19.1704
832.000000 MHz	40.2537	19.1803
833.000000 MHz	40.2087	19.2087
834.000000 MHz	40.2111	19.1405
835.000000 MHz	40.1813	19.1857
836.000000 MHz	40.1695	19.1423
837.000000 MHz	40.1665	19.1699
838.000000 MHz	40.1608	19.1876
839.000000 MHz	40.1367	19.1373
840.000000 MHz	40.1629	19.1568
841.000000 MHz	40.0834	19.1321
842.000000 MHz	40.1237	19.1269
843.000000 MHz	40.0865	19.1428
844.000000 MHz	40.0583	19.1147
845.000000 MHz	40.0814	19.1038
846.000000 MHz	40.0300	19.1236
847.000000 MHz	40.0203	19.1062
848.000000 MHz	40.0351	19.1027
849.000000 MHz	39.9944	19.1041
850.000000 MHz	40.0097	19.0644
851.000000 MHz	39.9888	19.0811
852.000000 MHz	39.9662	19.0725
853.000000 MHz	39.9802	19.0847
854.000000 MHz	39.9412	19.0909
855.000000 MHz	39.9559	19.0310
856.000000 MHz	39.9249	19.0658
857.000000 MHz	39.8947	19.0287
858.000000 MHz	39.9114	19.0503
859.000000 MHz	39.8727	19.0566
860.000000 MHz	39.8858	19.0280



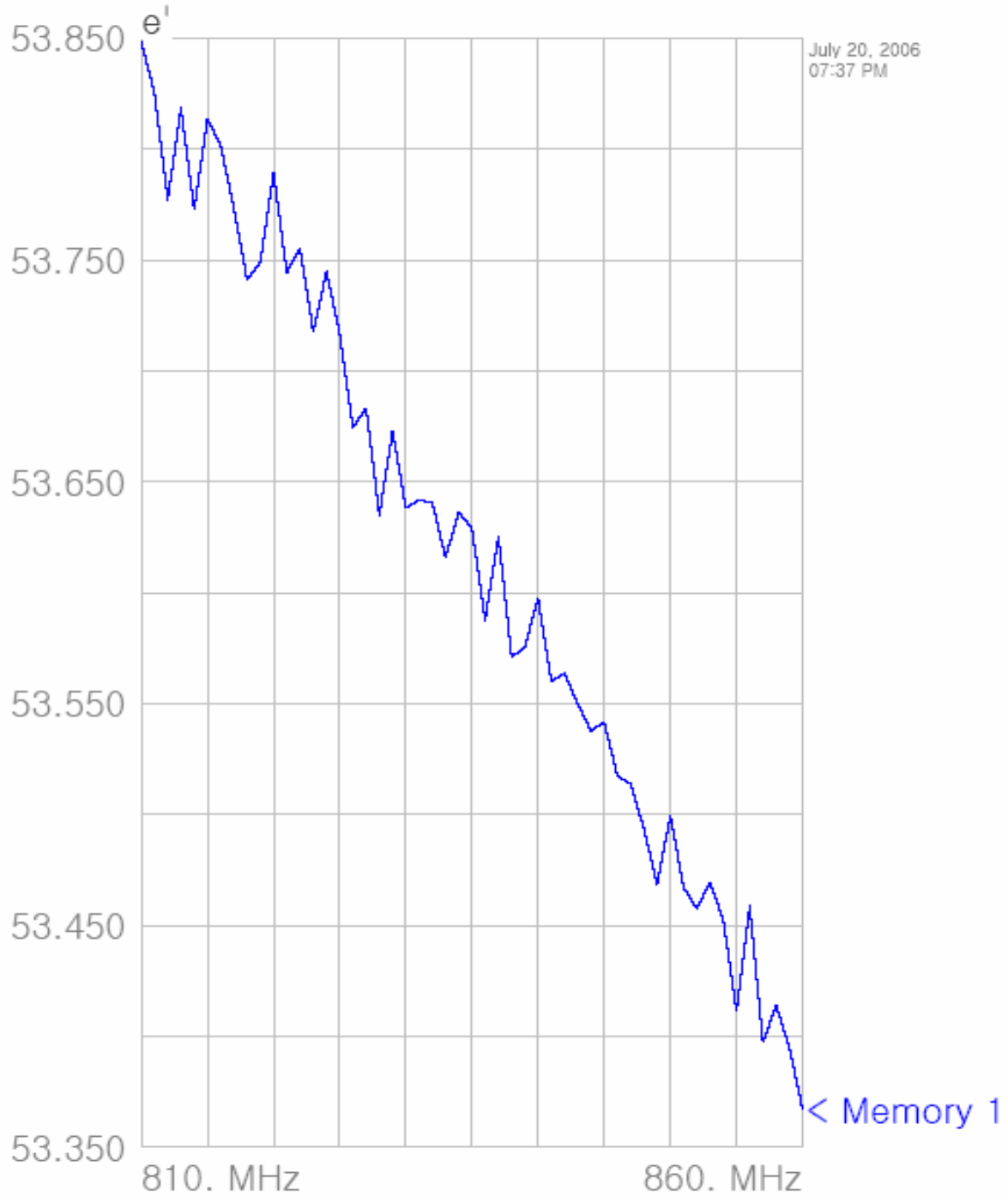
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– Body Tissue(CDMA)

Title
SubTitle





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Title

SubTitle



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Title**SubTitle**

July 23, 2016 07:27 PM

Frequency	e'	e''
810.000000 MHz	53.8484	20.4725
811.000000 MHz	53.8252	20.4429
812.000000 MHz	53.7771	20.5007
813.000000 MHz	53.8185	20.5265
814.000000 MHz	53.7727	20.5274
815.000000 MHz	53.8135	20.5198
816.000000 MHz	53.8018	20.5532
817.000000 MHz	53.7733	20.5703
818.000000 MHz	53.7412	20.5775
819.000000 MHz	53.7488	20.5705
820.000000 MHz	53.7895	20.5628
821.000000 MHz	53.7443	20.5636
822.000000 MHz	53.7554	20.5664
823.000000 MHz	53.7175	20.5869
824.000000 MHz	53.7448	20.5727
825.000000 MHz	53.7167	20.5896
826.000000 MHz	53.6746	20.5672
827.000000 MHz	53.6832	20.5930
828.000000 MHz	53.6350	20.5840
829.000000 MHz	53.6730	20.5991
830.000000 MHz	53.6382	20.5963
831.000000 MHz	53.6417	20.5467
832.000000 MHz	53.6407	20.5758
833.000000 MHz	53.6159	20.5695
834.000000 MHz	53.6361	20.5359
835.000000 MHz	53.6291	20.5781
836.000000 MHz	53.5876	20.5560
837.000000 MHz	53.6255	20.5707
838.000000 MHz	53.5710	20.5425
839.000000 MHz	53.5755	20.5256
840.000000 MHz	53.5976	20.5570
841.000000 MHz	53.5600	20.5446
842.000000 MHz	53.5636	20.4953
843.000000 MHz	53.5499	20.5179
844.000000 MHz	53.5378	20.4854
845.000000 MHz	53.5416	20.4961
846.000000 MHz	53.5174	20.4898
847.000000 MHz	53.5137	20.4652
848.000000 MHz	53.4937	20.4846
849.000000 MHz	53.4687	20.4463
850.000000 MHz	53.4995	20.4415
851.000000 MHz	53.4671	20.4709
852.000000 MHz	53.4577	20.4161
853.000000 MHz	53.4694	20.4183
854.000000 MHz	53.4527	20.4311
855.000000 MHz	53.4114	20.3775
856.000000 MHz	53.4587	20.3881
857.000000 MHz	53.3973	20.3961
858.000000 MHz	53.4139	20.3534
859.000000 MHz	53.3951	20.3885
860.000000 MHz	53.3670	20.3411



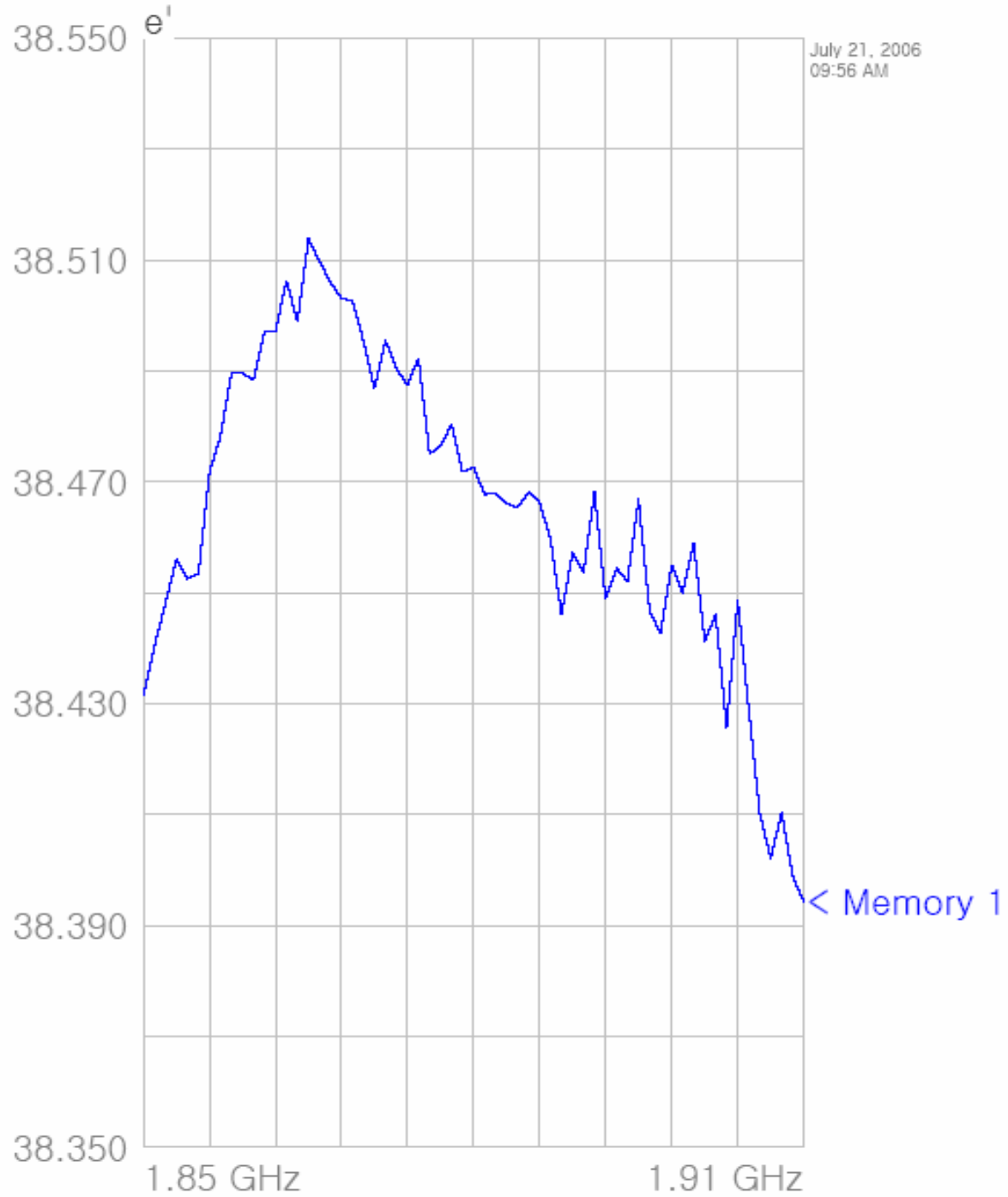
ESTECH Co., Ltd.

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426-5, Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea

TEL: 82-2-867-3201
FAX: 82-2-867-3204

– Head Tissue(PCS)

Title
SubTitle



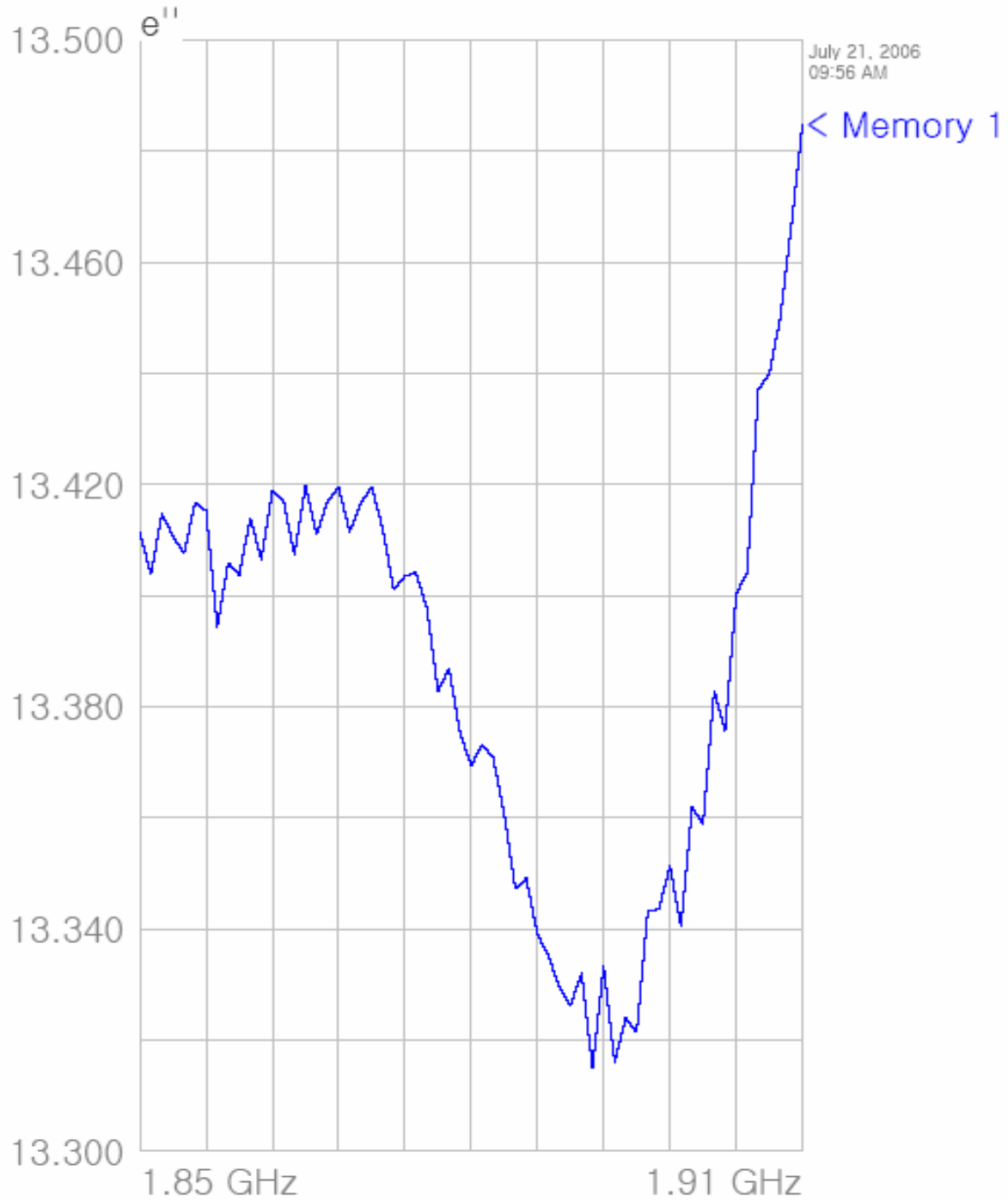


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Title
SubTitle



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Title**SubTitle**

July 21, 2016 10:55 AM

Frequency	e'	e''
1.85000000 GHz	38.4316	13.4113
1.85100000 GHz	38.4403	13.4038
1.85200000 GHz	38.4481	13.4147
1.85300000 GHz	38.4560	13.4107
1.85400000 GHz	38.4525	13.4076
1.85500000 GHz	38.4534	13.4167
1.85600000 GHz	38.4717	13.4153
1.85700000 GHz	38.4782	13.3943
1.85800000 GHz	38.4896	13.4059
1.85900000 GHz	38.4896	13.4037
1.86000000 GHz	38.4883	13.4140
1.86100000 GHz	38.4970	13.4065
1.86200000 GHz	38.4971	13.4190
1.86300000 GHz	38.5063	13.4171
1.86400000 GHz	38.4989	13.4074
1.86500000 GHz	38.5138	13.4198
1.86600000 GHz	38.5098	13.4110
1.86700000 GHz	38.5060	13.4170
1.86800000 GHz	38.5031	13.4195
1.86900000 GHz	38.5027	13.4115
1.87000000 GHz	38.4954	13.4166
1.87100000 GHz	38.4869	13.4196
1.87200000 GHz	38.4955	13.4120
1.87300000 GHz	38.4904	13.4010
1.87400000 GHz	38.4875	13.4035
1.87500000 GHz	38.4923	13.4042
1.87600000 GHz	38.4751	13.3977
1.87700000 GHz	38.4764	13.3828
1.87800000 GHz	38.4804	13.3869
1.87900000 GHz	38.4718	13.3752
1.88000000 GHz	38.4727	13.3694
1.88100000 GHz	38.4677	13.3731
1.88200000 GHz	38.4679	13.3708
1.88300000 GHz	38.4662	13.3607
1.88400000 GHz	38.4653	13.3472
1.88500000 GHz	38.4681	13.3491
1.88600000 GHz	38.4664	13.3391
1.88700000 GHz	38.4596	13.3351
1.88800000 GHz	38.4460	13.3295
1.88900000 GHz	38.4573	13.3262
1.89000000 GHz	38.4537	13.3320
1.89100000 GHz	38.4682	13.3149
1.89200000 GHz	38.4489	13.3334
1.89300000 GHz	38.4544	13.3160
1.89400000 GHz	38.4521	13.3239
1.89500000 GHz	38.4669	13.3214
1.89600000 GHz	38.4468	13.3433
1.89700000 GHz	38.4427	13.3435
1.89800000 GHz	38.4550	13.3513
1.89900000 GHz	38.4499	13.3404
1.90000000 GHz	38.4590	13.3619
1.90100000 GHz	38.4412	13.3589
1.90200000 GHz	38.4461	13.3829
1.90300000 GHz	38.4257	13.3757
1.90400000 GHz	38.4486	13.4003
1.90500000 GHz	38.4292	13.4042
1.90600000 GHz	38.4103	13.4371
1.90700000 GHz	38.4021	13.4399
1.90800000 GHz	38.4103	13.4501
1.90900000 GHz	38.3989	13.4667
1.91000000 GHz	38.3943	13.4848



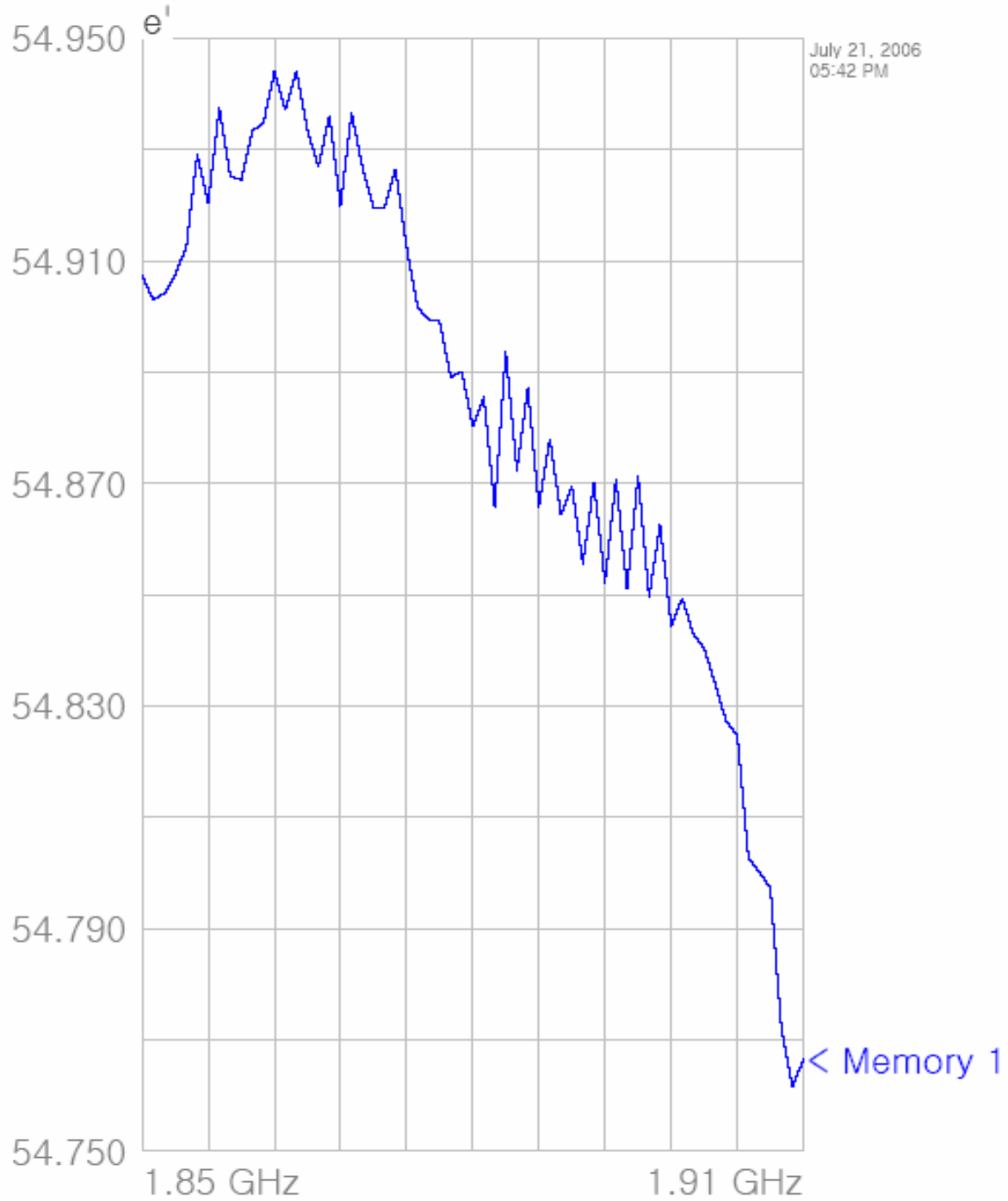
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– Body Tissue(PCS)

Title
SubTitle





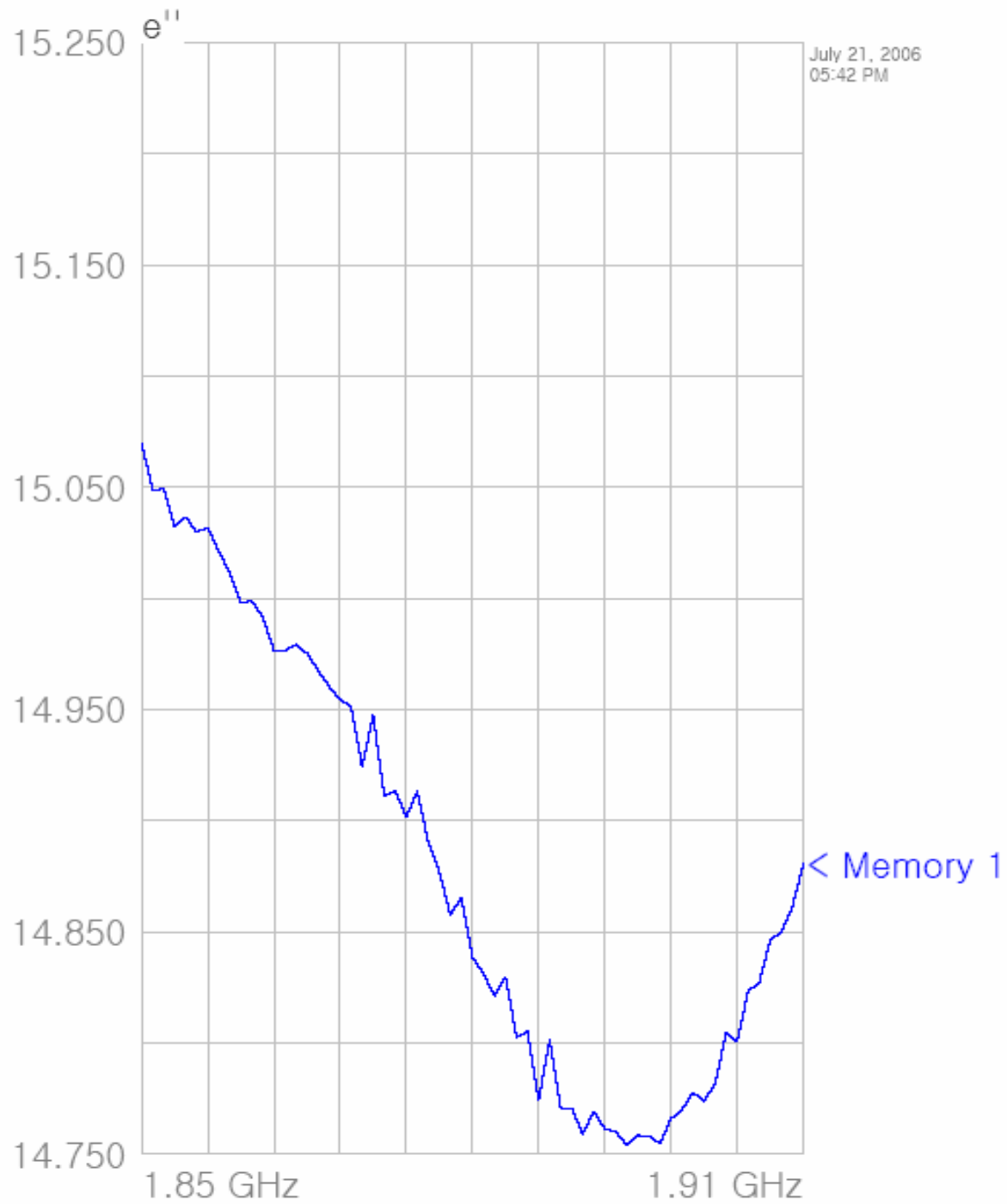
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Title

SubTitle



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Title**SubTitle**

July 21, 2006 05:42 PM

Frequency	e'	e''
1.85000000 GHz	54.9073	15.0699
1.85100000 GHz	54.9031	15.0487
1.85200000 GHz	54.9041	15.0492
1.85300000 GHz	54.9076	15.0321
1.85400000 GHz	54.9124	15.0366
1.85500000 GHz	54.9292	15.0298
1.85600000 GHz	54.9204	15.0319
1.85700000 GHz	54.9374	15.0212
1.85800000 GHz	54.9251	15.0114
1.85900000 GHz	54.9246	14.9981
1.86000000 GHz	54.9334	14.9988
1.86100000 GHz	54.9347	14.9914
1.86200000 GHz	54.9440	14.9765
1.86300000 GHz	54.9372	14.9766
1.86400000 GHz	54.9440	14.9791
1.86500000 GHz	54.9335	14.9753
1.86600000 GHz	54.9270	14.9676
1.86700000 GHz	54.9361	14.9604
1.86800000 GHz	54.9199	14.9544
1.86900000 GHz	54.9366	14.9513
1.87000000 GHz	54.9268	14.9242
1.87100000 GHz	54.9195	14.9475
1.87200000 GHz	54.9196	14.9110
1.87300000 GHz	54.9265	14.9134
1.87400000 GHz	54.9125	14.9017
1.87500000 GHz	54.9016	14.9132
1.87600000 GHz	54.8995	14.8902
1.87700000 GHz	54.8991	14.8769
1.87800000 GHz	54.8891	14.8576
1.87900000 GHz	54.8901	14.8655
1.88000000 GHz	54.8803	14.8385
1.88100000 GHz	54.8856	14.8311
1.88200000 GHz	54.8657	14.8212
1.88300000 GHz	54.8937	14.8299
1.88400000 GHz	54.8724	14.8026
1.88500000 GHz	54.8871	14.8051
1.88600000 GHz	54.8658	14.7740
1.88700000 GHz	54.8780	14.8014
1.88800000 GHz	54.8644	14.7705
1.88900000 GHz	54.8695	14.7708
1.89000000 GHz	54.8556	14.7591
1.89100000 GHz	54.8701	14.7692
1.89200000 GHz	54.8522	14.7614
1.89300000 GHz	54.8708	14.7600
1.89400000 GHz	54.8510	14.7540
1.89500000 GHz	54.8714	14.7584
1.89600000 GHz	54.8496	14.7581
1.89700000 GHz	54.8625	14.7547
1.89800000 GHz	54.8444	14.7660
1.89900000 GHz	54.8494	14.7700
1.90000000 GHz	54.8429	14.7777
1.90100000 GHz	54.8404	14.7739
1.90200000 GHz	54.8339	14.7816
1.90300000 GHz	54.8272	14.8045
1.90400000 GHz	54.8247	14.8007
1.90500000 GHz	54.8027	14.8234
1.90600000 GHz	54.8001	14.8272
1.90700000 GHz	54.7973	14.8464
1.90800000 GHz	54.7719	14.8498
1.90900000 GHz	54.7616	14.8611
1.91000000 GHz	54.7665	14.8804



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APPENDIX B : Validation Test Data

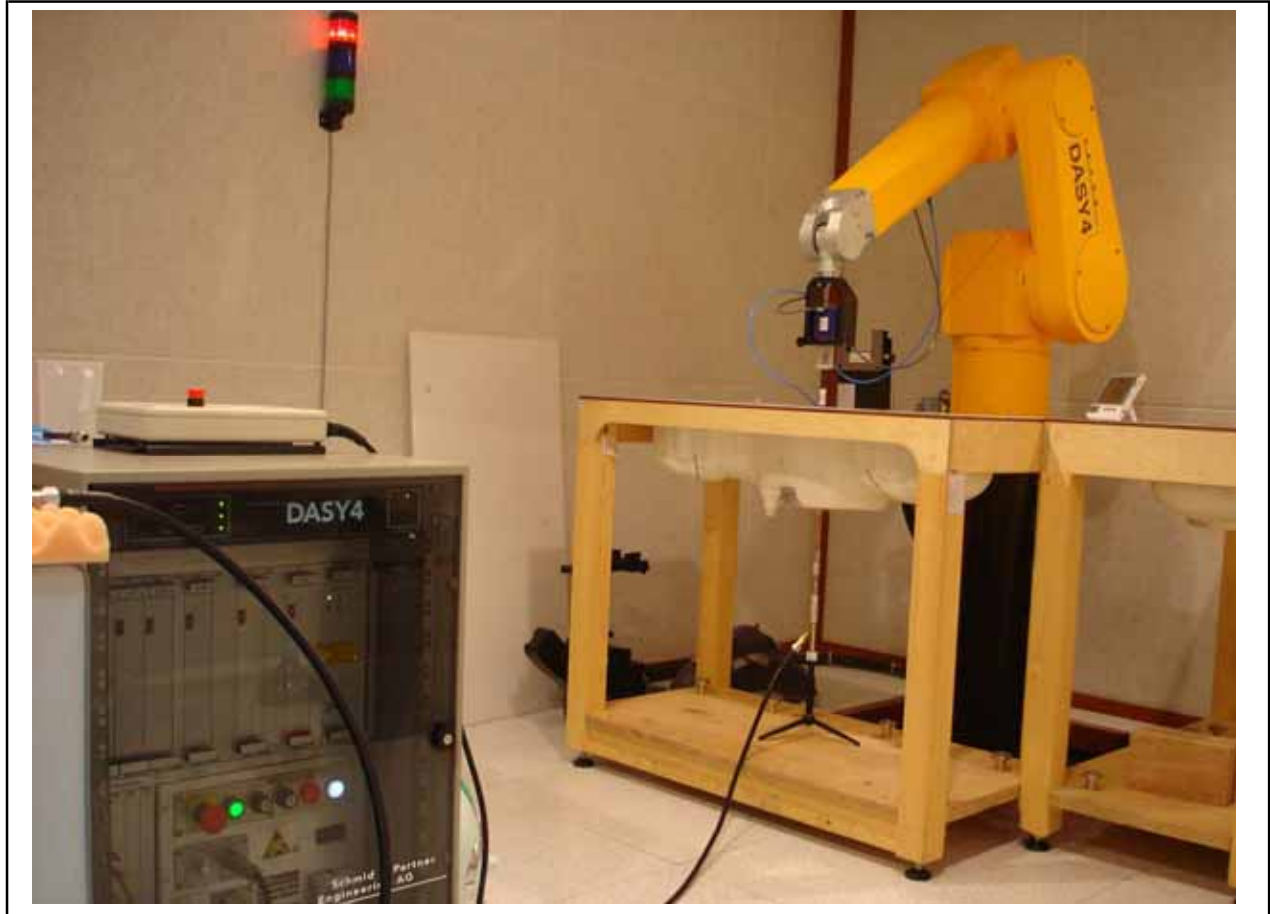


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Dipole Validation



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FAX: 82-2-867-3204

(CDMA)

Date/Time: 2006-07-20 12:34:41

Test Laboratory: ESTECH

VALIDATION 0720

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

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.891$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.53 mW/g

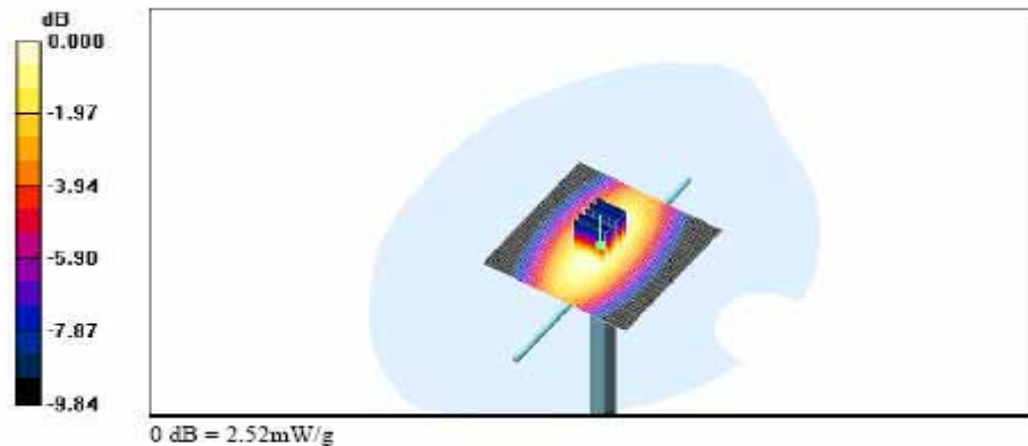
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.9 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 3.46 W/kg

SAR(1 g) = 2.33 mW/g

Maximum value of SAR (measured) = 2.52 mW/g



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(PCS)

Date/Time: 2006-07-21 10:22:17

Test Laboratory: ESTECH

VALIDATION 0721

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:xxx

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 47%

Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.4 mW/g

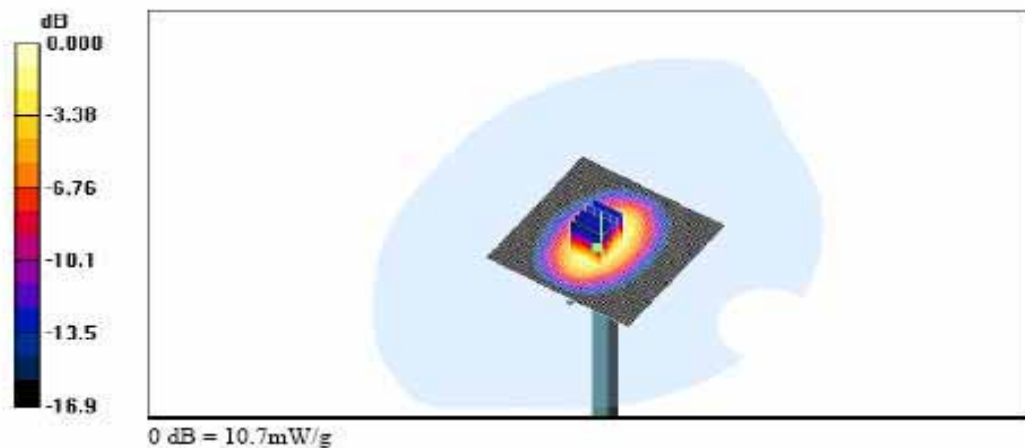
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.6 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 9.49 mW/g

Maximum value of SAR (measured) = 10.7 mW/g





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APPENDIX C : SAR Test Data

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

(CDMA)

Date/Time: 2006-07-20 13:33:12

Test Laboratory: ESTECH

CH363 LEFT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_t = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 44%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.325 mW/g

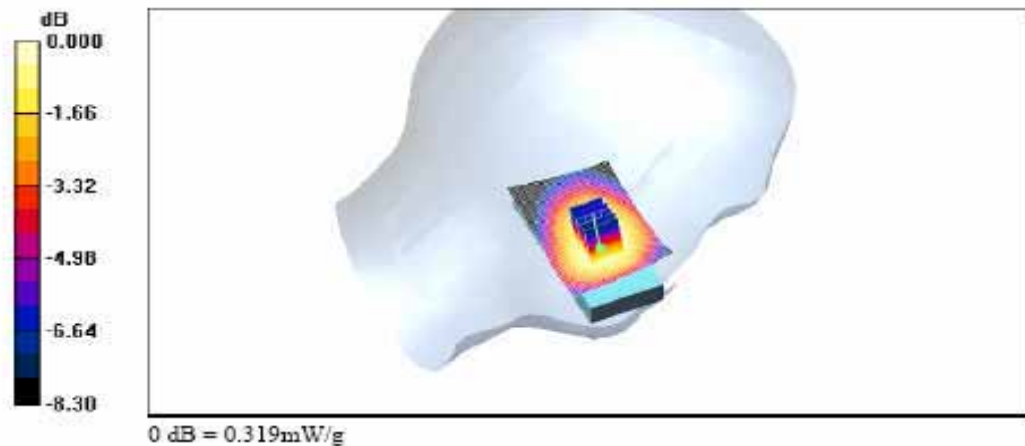
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.12 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.393 W/kg

SAR(1 g) = 0.302 mW/g

Maximum value of SAR (measured) = 0.319 mW/g



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TEL: 82-2-867-3201
FAX: 82-2-867-3204

Date/Time: 2006-07-20 14:06:36

Test Laboratory: ESTECH

CH363 RIGHT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (41x61x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.394 mW/g

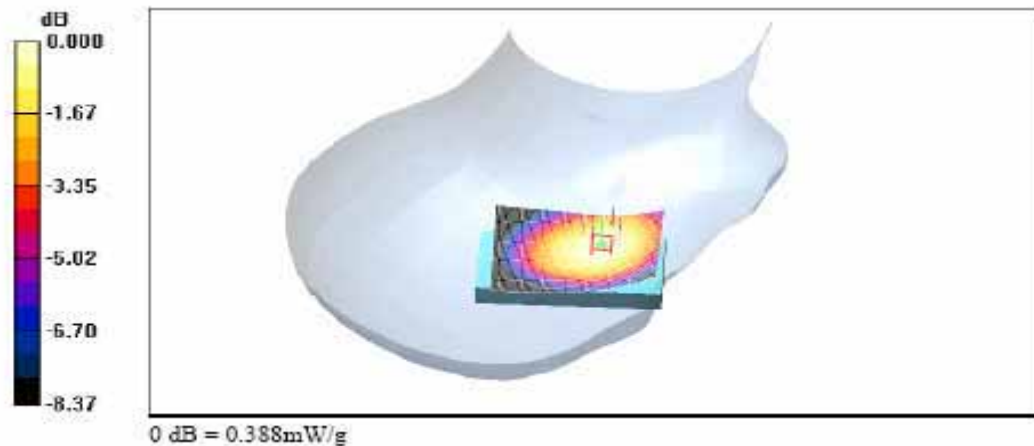
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.80 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.460 W/kg

SAR(1 g) = 0.364 mW/g

Maximum value of SAR (measured) = 0.388 mW/g



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CH363 LEFT TILT SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 41%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.206 mW/g

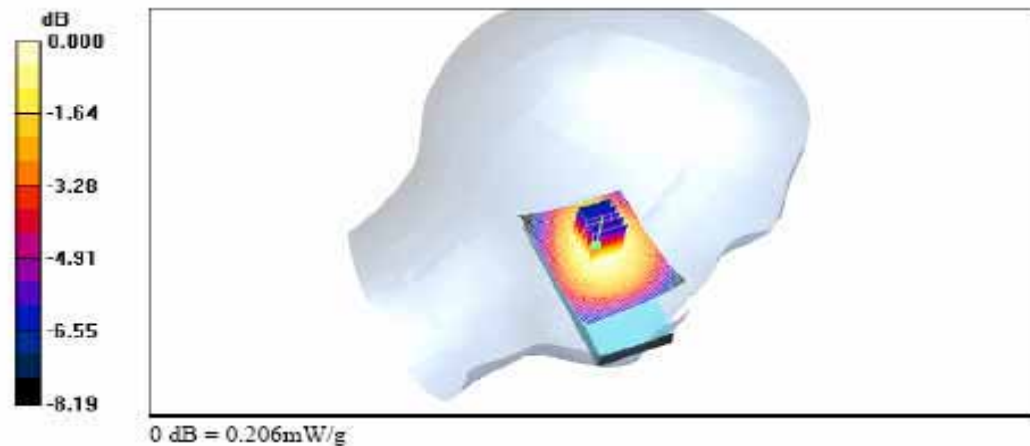
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.0 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.252 W/kg

SAR(1 g) = 0.194 mW/g

Maximum value of SAR (measured) = 0.206 mW/g



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Date/Time: 2006-07-20 14:17:22

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CH363 RIGHT TILT SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

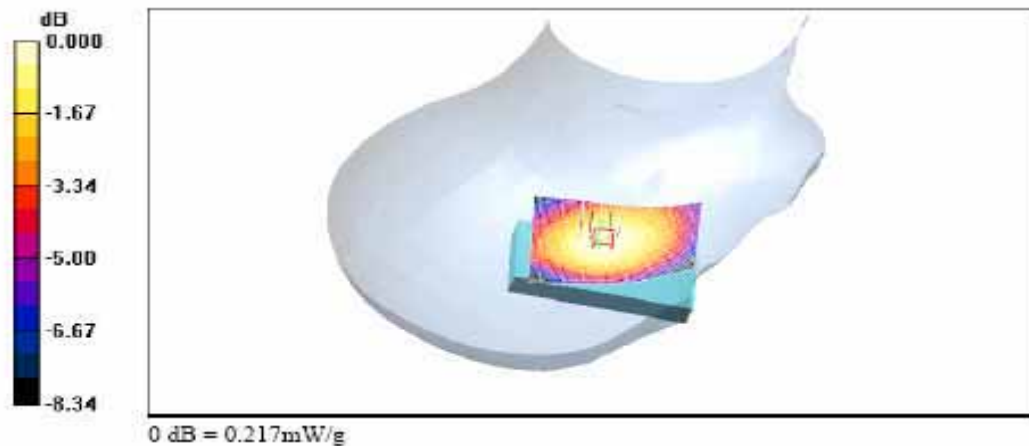
Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 42%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.215 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.204 mW/g
Maximum value of SAR (measured) = 0.217 mW/g



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Test Laboratory: ESTECH

CH1013 LEFT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 825$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.543 mW/g

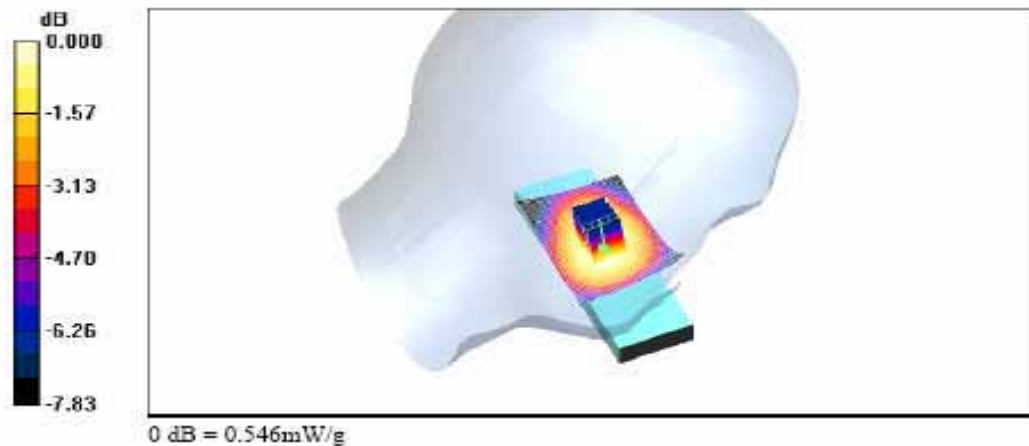
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 0.671 W/kg

SAR(1 g) = 0.512 mW/g

Maximum value of SAR (measured) = 0.546 mW/g



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CH363 LEFT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 42%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.462 mW/g

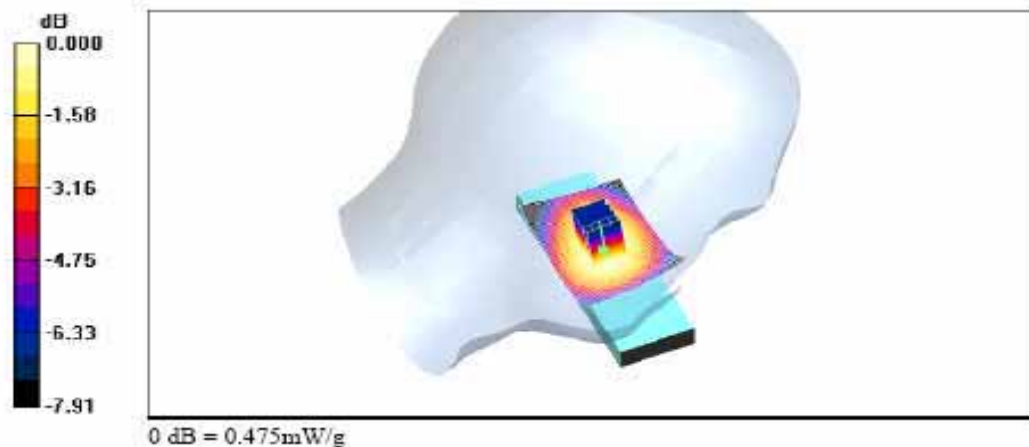
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.7 V/m; Power Drift = -0.075 dB

Peak SAR (extrapolated) = 0.589 W/kg

SAR(1 g) = 0.449 mW/g

Maximum value of SAR (measured) = 0.475 mW/g



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CH777 LEFT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31 \text{ MHz}$; $\sigma = 0.902 \text{ mho/m}$; $\epsilon_r = 40$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.571 mW/g

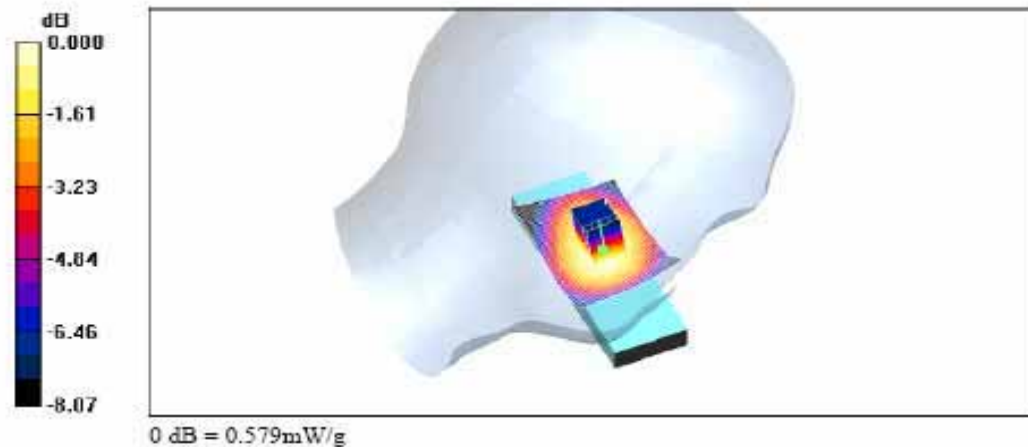
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.7 V/m; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 0.725 W/kg

SAR(1 g) = 0.545 mW/g

Maximum value of SAR (measured) = 0.579 mW/g



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CH1013 RIGHT TOUCH SLIDE UP

DUT: MX800; **Type:** SLIDE TYPE; **Serial:** NONE

Communication System: CDMA FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 825$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.594 mW/g

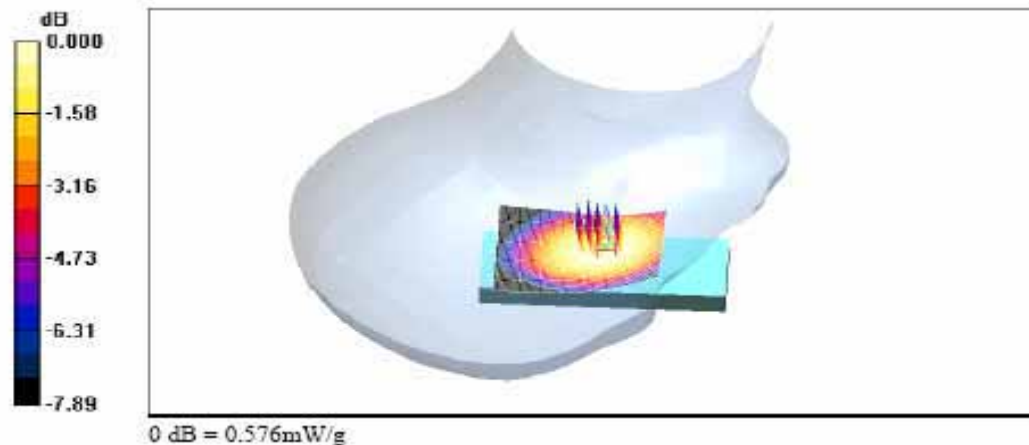
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.2 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.694 W/kg

SAR(1 g) = 0.548 mW/g

Maximum value of SAR (measured) = 0.576 mW/g



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CH363 RIGHT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 41%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.528 mW/g

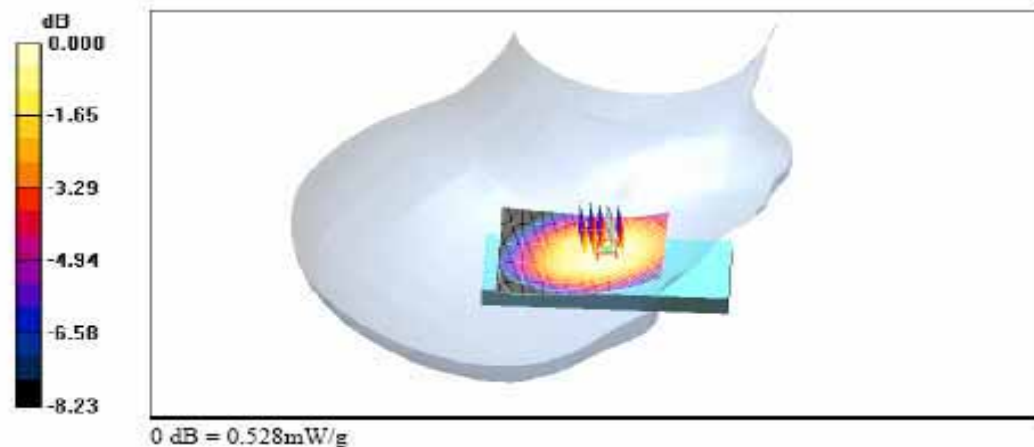
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.3 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.651 W/kg

SAR(1 g) = 0.503 mW/g

Maximum value of SAR (measured) = 0.528 mW/g



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CH777 RIGHT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.902$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 42%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.661 mW/g

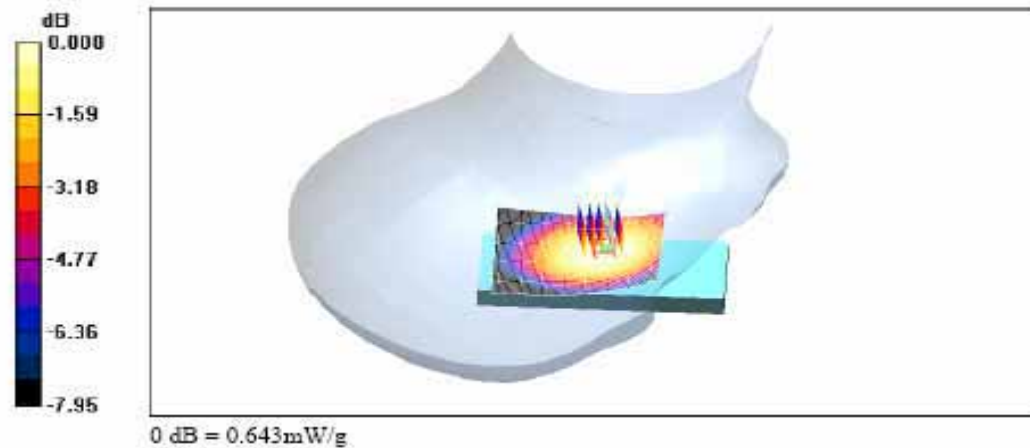
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.5 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.612 mW/g

Maximum value of SAR (measured) = 0.643 mW/g



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CH363 LEFT TILT SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.308 mW/g

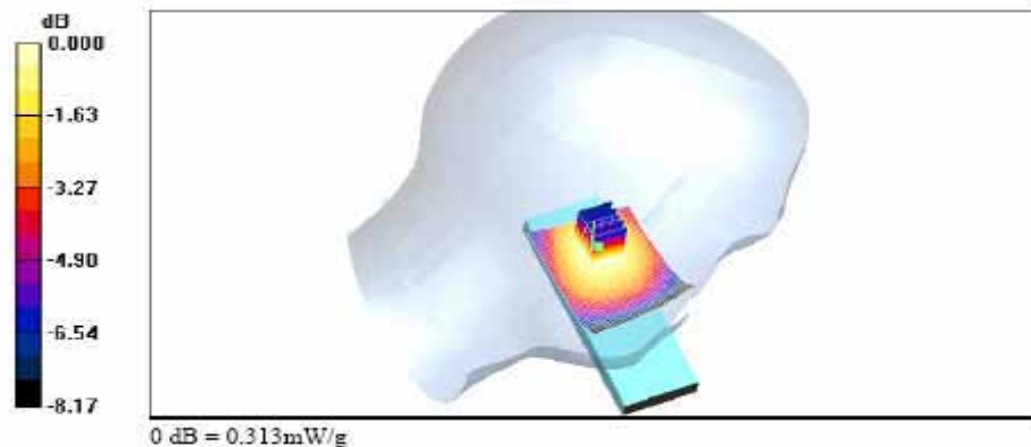
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.2 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 0.393 W/kg

SAR(1 g) = 0.297 mW/g

Maximum value of SAR (measured) = 0.313 mW/g



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CH363 RIGHT TILT SLIDE UP

DUT: MX800; **Type:** SLIDE TYPE; **Serial:** NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.331 mW/g

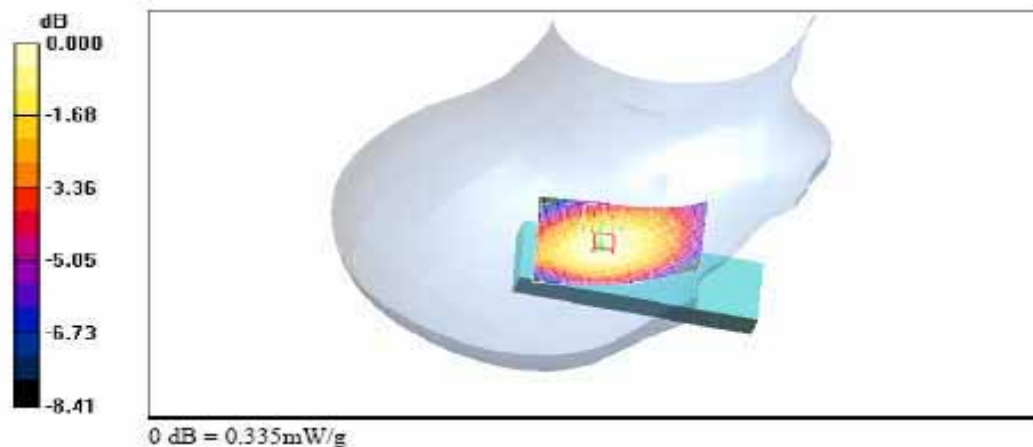
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.7 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 0.413 W/kg

SAR(1 g) = 0.313 mW/g

Maximum value of SAR (measured) = 0.335 mW/g



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CH777 RIGHT TOUCH SLIDE UP-BT

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.902$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.676 mW/g

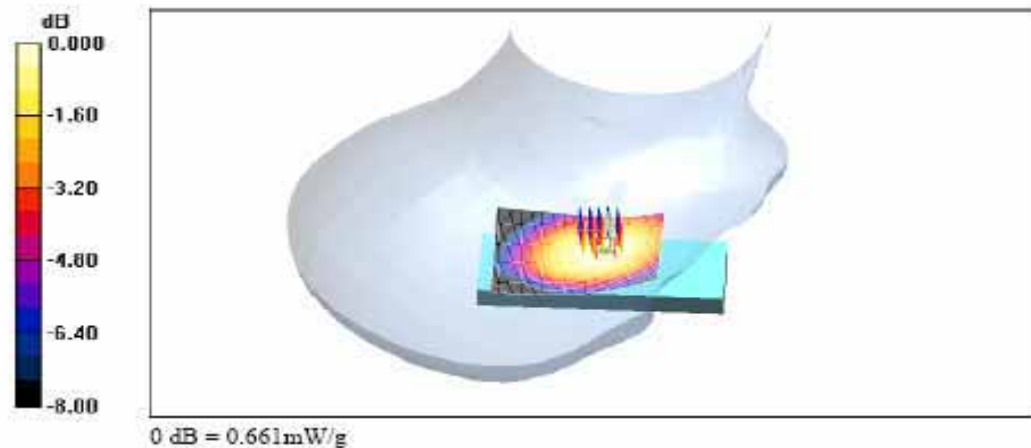
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.6 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.815 W/kg

SAR(1 g) = 0.627 mW/g

Maximum value of SAR (measured) = 0.661 mW/g



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CH777 RIGHT TOUCH SLIDE UP-BT-ZSCAN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 848.31 MHz; Duty Cycle: 1:1

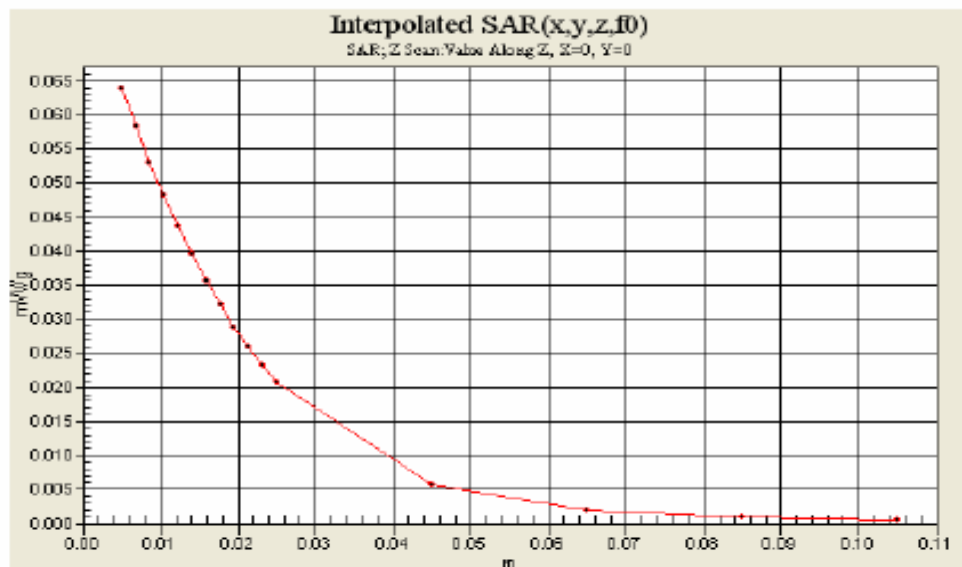
Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.902$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.57, 6.57, 6.57); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%



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Date/Time: 2006-07-20 19:54:20

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CH363 BODY SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.956$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 45%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.774 mW/g

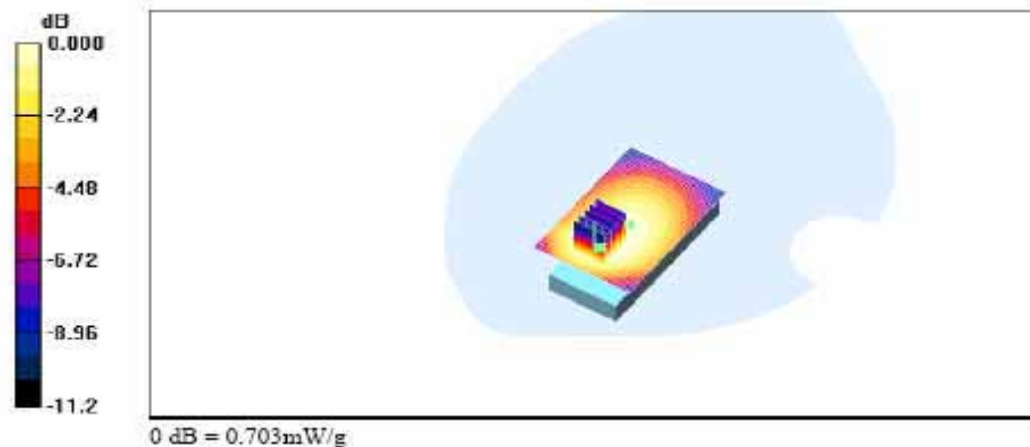
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.0 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 0.983 W/kg

SAR(1 g) = 0.650 mW/g

Maximum value of SAR (measured) = 0.703 mW/g



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CH1013 BODY SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 825$ MHz; $\sigma = 0.945$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 45%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

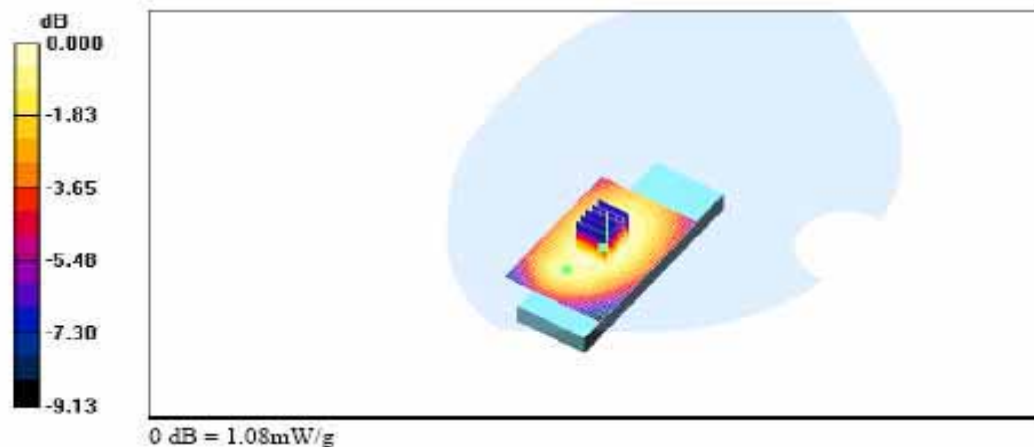
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.0 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 1.02 mW/g

Maximum value of SAR (measured) = 1.08 mW/g



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Test Laboratory: ESTECH

CH363 BODY SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 835.89 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836$ MHz; $\sigma = 0.956$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.03 mW/g

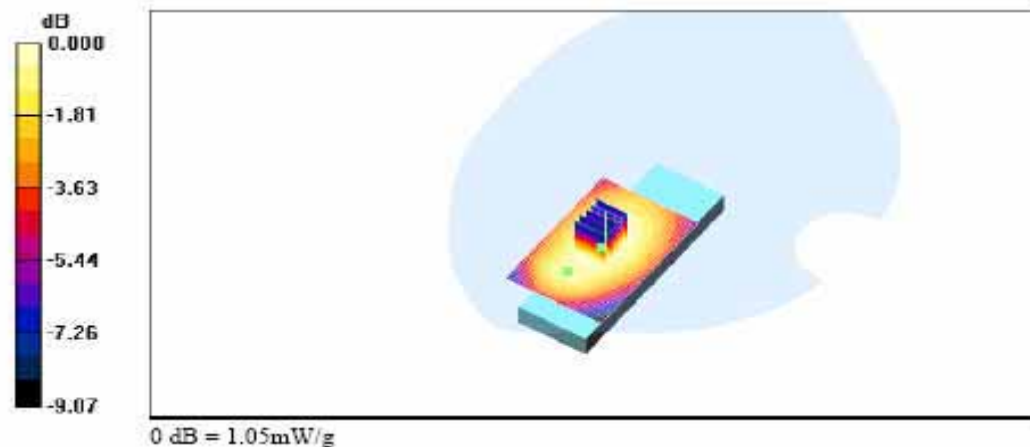
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.3 V/m; Power Drift = 0.064 dB

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.990 mW/g

Maximum value of SAR (measured) = 1.05 mW/g



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CH777 BODY SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.966$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$

kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 43%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.999 mW/g

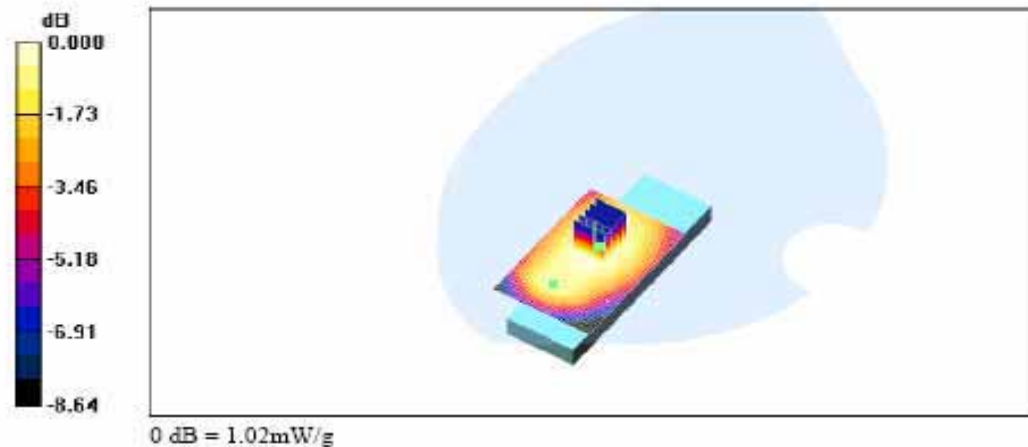
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.5 V/m; Power Drift = 0.110 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.966 mW/g

Maximum value of SAR (measured) = 1.02 mW/g



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Test Laboratory: ESTECH

CHI013 BODY SLIDE UP-BT

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 825$ MHz; $\sigma = 0.945$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

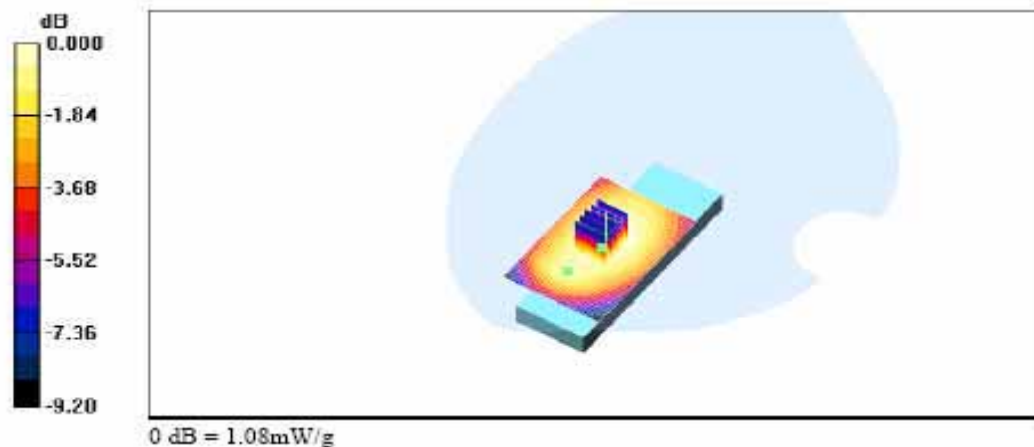
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.8 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 1.02 mW/g

Maximum value of SAR (measured) = 1.08 mW/g



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CH1013 BODY SLIDE UP-ZSCAN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: CDMA FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1

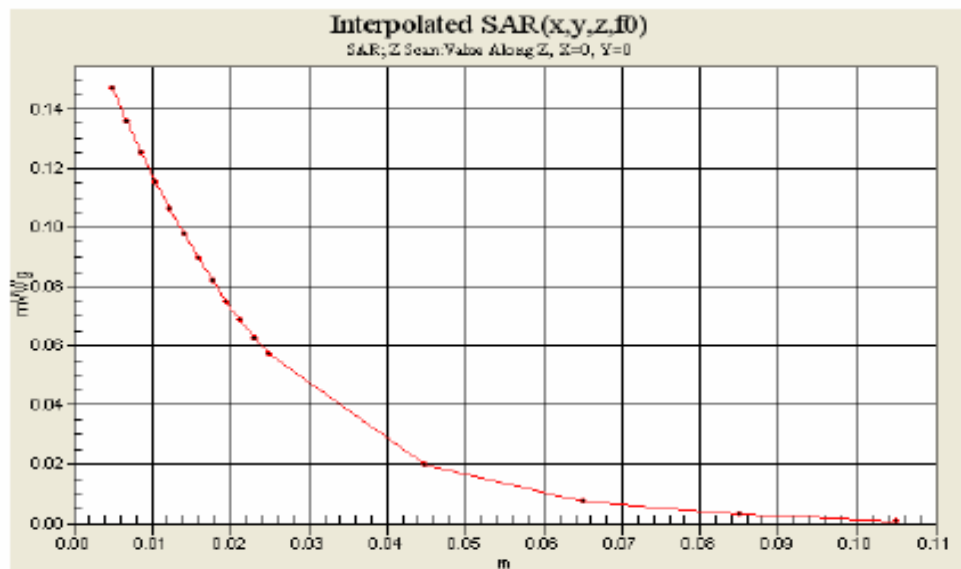
Medium parameters used: $f = 825$ MHz; $\sigma = 0.945$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(6.17, 6.17, 6.17); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM 835MHz; Type: SAM 835MHz; Serial: TP-1262
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 45%



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(PCS)

Date/Time: 2006-07-21 14:38:36

Test Laboratory: ESTECH

CH25 LEFT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$

kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.579 mW/g

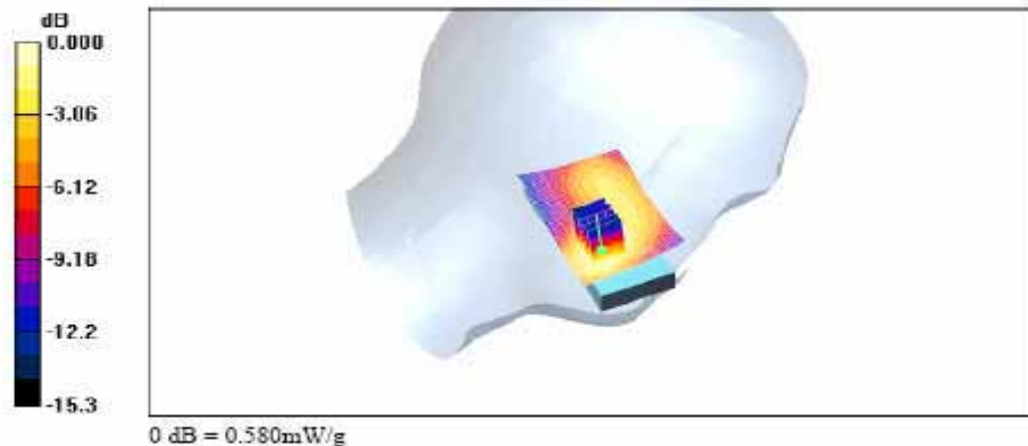
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.53 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 0.761 W/kg

SAR(1 g) = 0.519 mW/g

Maximum value of SAR (measured) = 0.580 mW/g



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Date/Time: 2006-07-21 11:42:42

Test Laboratory: ESTECH

CH600 LEFT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.995 mW/g

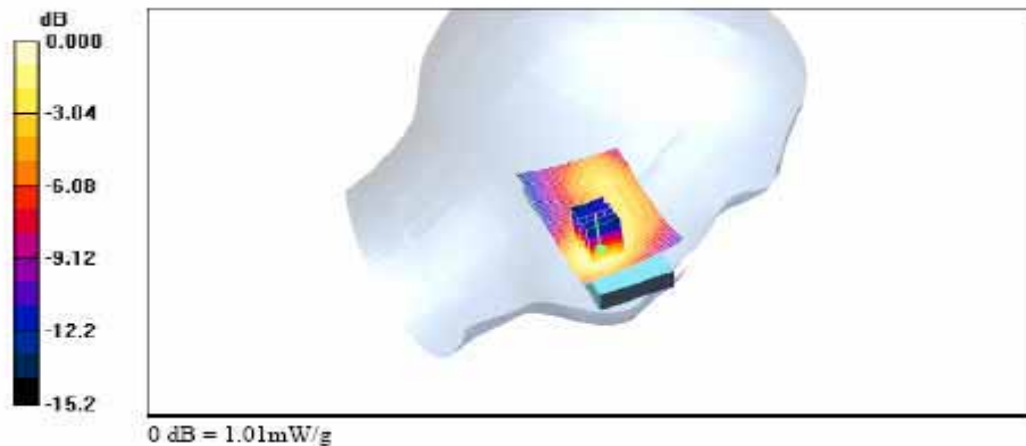
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.9 V/m; Power Drift = -0.074 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.903 mW/g

Maximum value of SAR (measured) = 1.01 mW/g



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Date/Time: 2006-07-21 16:07:03

Test Laboratory: ESTECH

CH1175 LEFT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.09 mW/g

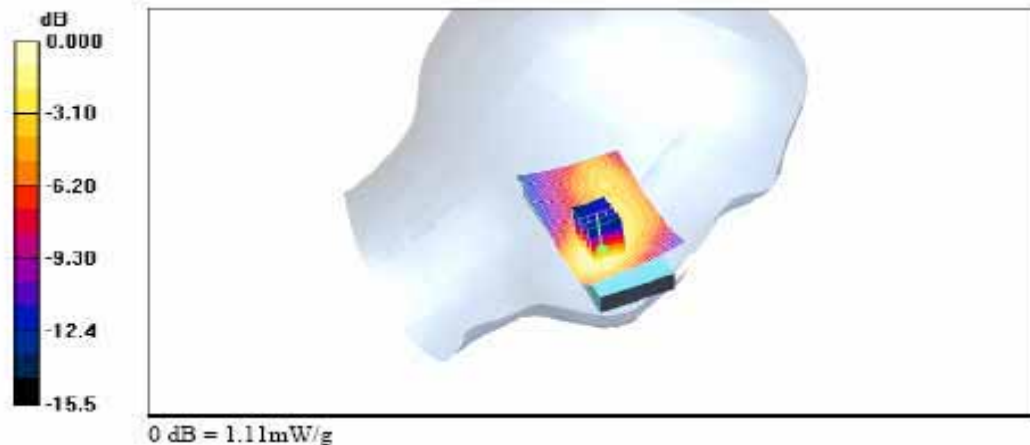
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.982 mW/g

Maximum value of SAR (measured) = 1.11 mW/g



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Test Laboratory: ESTECH

CH25 RIGHT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$

kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.645 mW/g

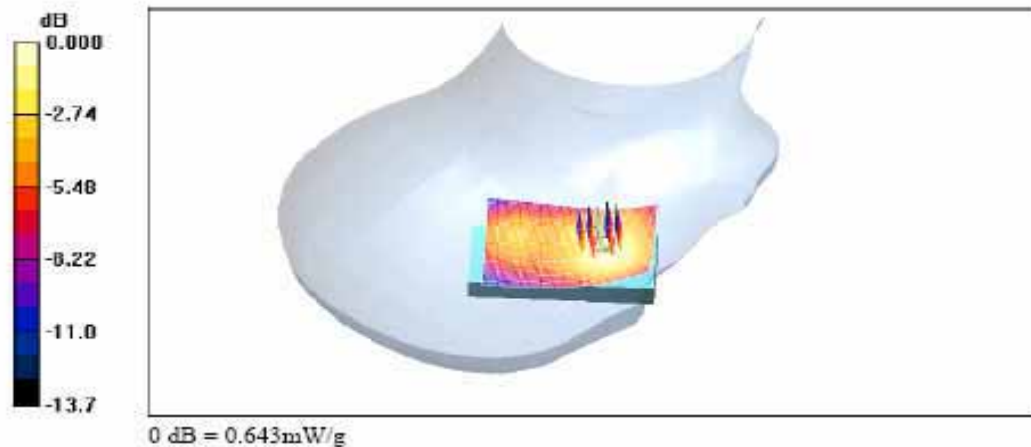
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.122 dB

Peak SAR (extrapolated) = 0.812 W/kg

SAR(1 g) = 0.579 mW/g

Maximum value of SAR (measured) = 0.643 mW/g



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Date/Time: 2006-07-21 12:06:29

Test Laboratory: ESTECH

CH600 RIGHT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.896 mW/g

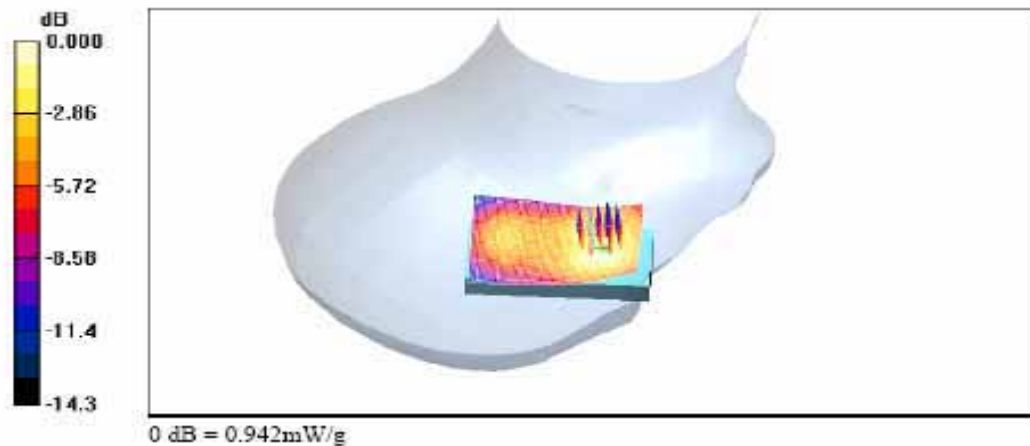
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.8 V/m; Power Drift = 0.089 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.862 mW/g

Maximum value of SAR (measured) = 0.942 mW/g



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Date/Time: 2006-07-21 15:54:54

Test Laboratory: ESTECH

CHI175 RIGHT TOUCH SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.08 mW/g

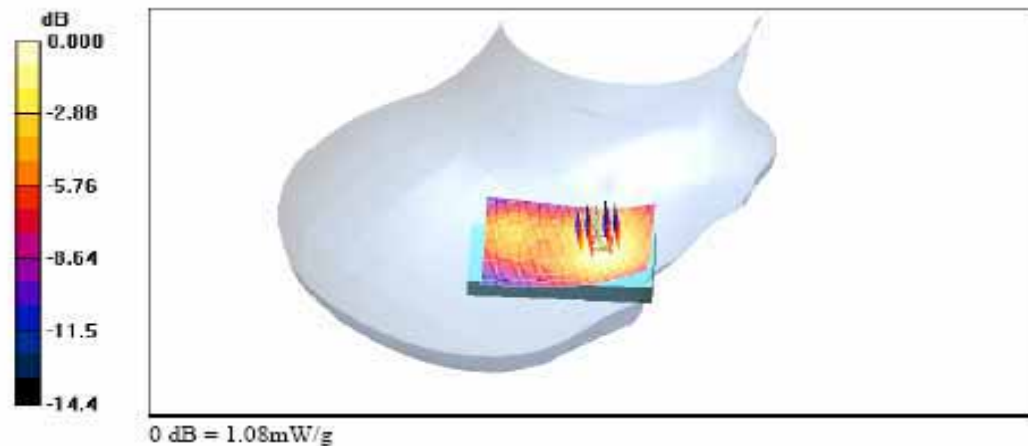
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.2 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.968 mW/g

Maximum value of SAR (measured) = 1.08 mW/g



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Date/Time: 2006-07-21 11:54:17

Test Laboratory: ESTECH

CH600 LEFT TILT SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.597 mW/g

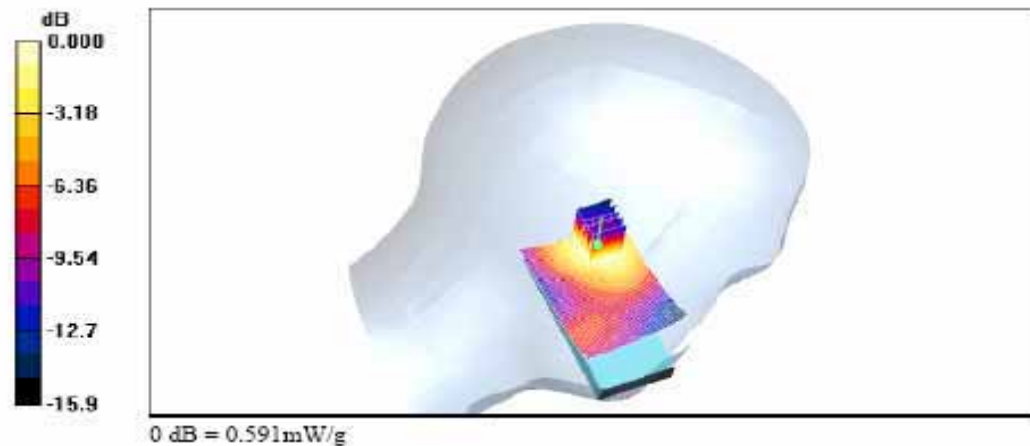
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.5 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.815 W/kg

SAR(1 g) = 0.534 mW/g

Maximum value of SAR (measured) = 0.591 mW/g



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Date/Time: 2006-07-21 12:19:07

Test Laboratory: ESTECH

CH600 RIGHT TILT SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.545 mW/g

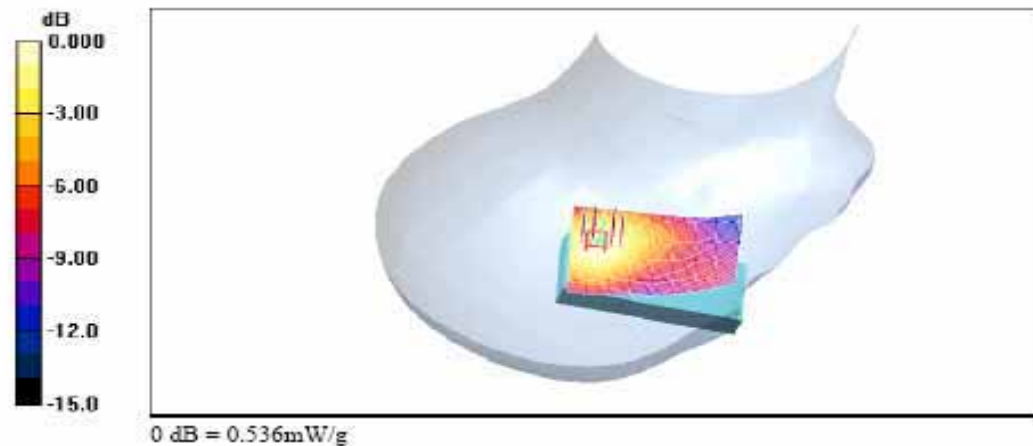
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.3 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.715 W/kg

SAR(1 g) = 0.489 mW/g

Maximum value of SAR (measured) = 0.536 mW/g



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Date/Time: 2006-07-21 14:09:10

Test Laboratory: ESTECH

CH600 LEFT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.531 mW/g

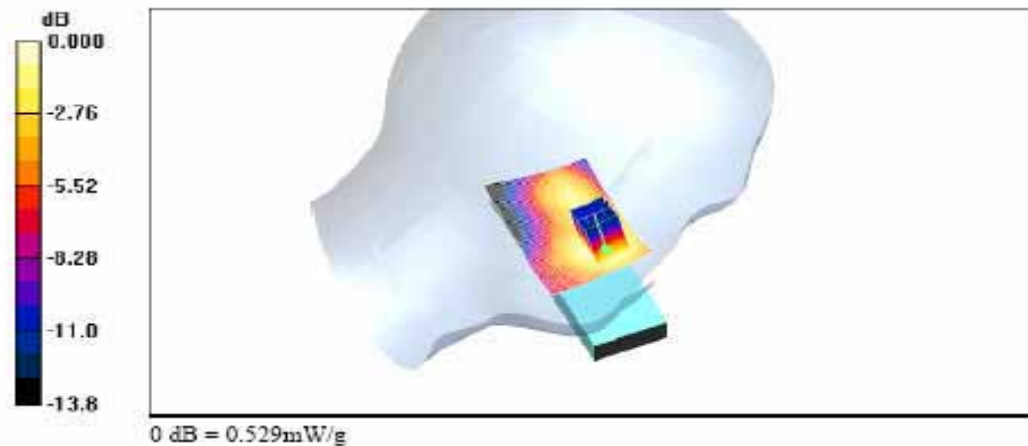
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.03 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.694 W/kg

SAR(1 g) = 0.482 mW/g

Maximum value of SAR (measured) = 0.529 mW/g



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Date/Time: 2006-07-21 13:43:20

Test Laboratory: ESTECH

CH600 RIGHT TOUCH SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 49%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.729 mW/g

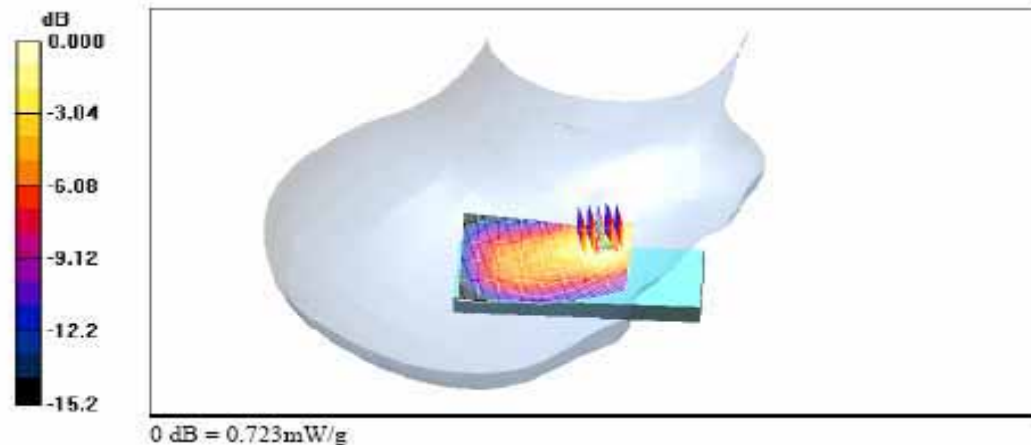
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.33 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 0.994 W/kg

SAR(1 g) = 0.656 mW/g

Maximum value of SAR (measured) = 0.723 mW/g



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Date/Time: 2006-07-21 14:25:04

Test Laboratory: ESTECH

CH600 LEFT TILT SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20 °C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.491 mW/g

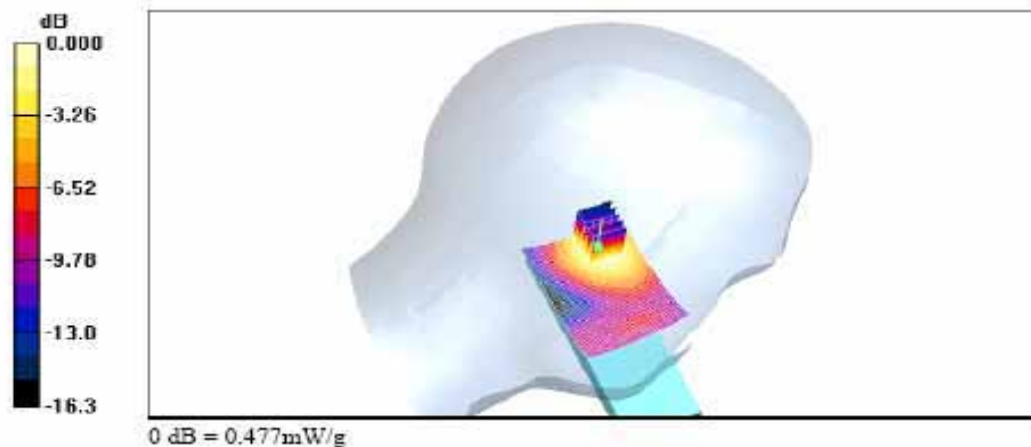
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.5 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 0.655 W/kg

SAR(1 g) = 0.428 mW/g

Maximum value of SAR (measured) = 0.477 mW/g



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Date/Time: 2006-07-21 13:55:48

Test Laboratory: ESTECH

CH600 RIGHT TILT SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 20°C, Humidity : 48%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.409 mW/g

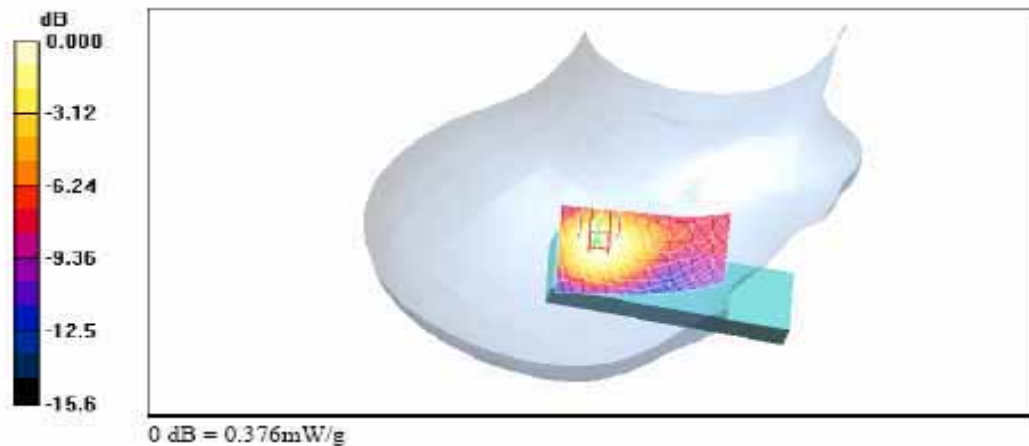
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.510 W/kg

SAR(1 g) = 0.343 mW/g

Maximum value of SAR (measured) = 0.376 mW/g



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Date/Time: 2006-07-21 16:33:54

Test Laboratory: ESTECH

CH1175 LEFT TOUCH SLIDE IN-BT

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

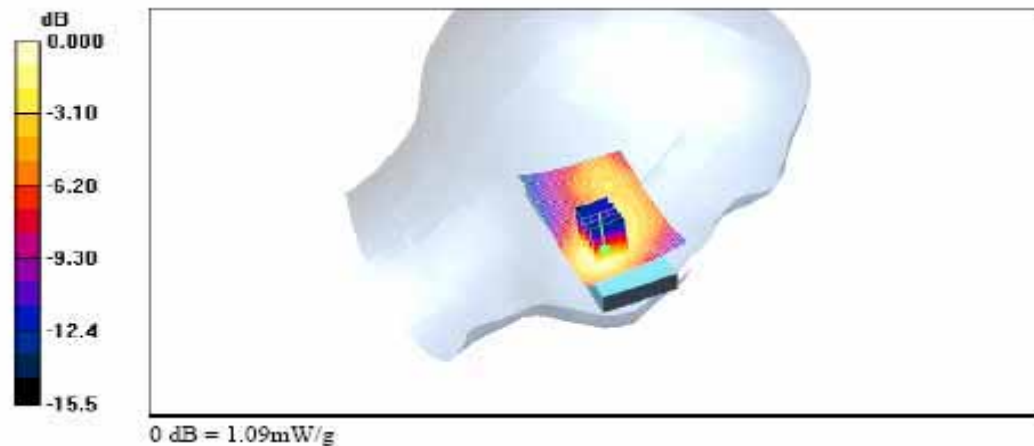
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 0.970 mW/g

Maximum value of SAR (measured) = 1.09 mW/g



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Date/Time: 2006-07-21 16:07:03

Test Laboratory: ESTECH

CHI175 LEFT TOUCH SLIDE IN-ZSCAN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

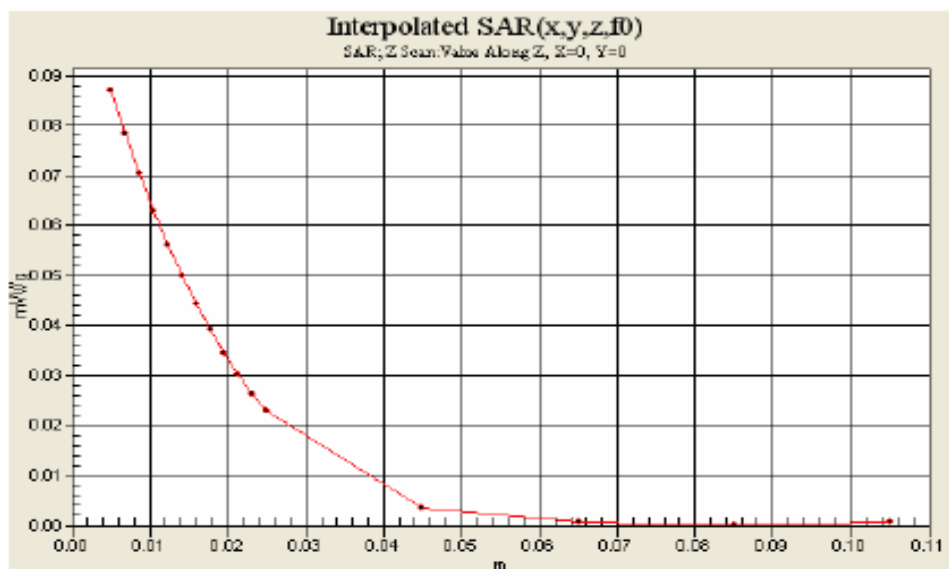
Medium parameters used: $f = 1909$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(5.14, 5.14, 5.14); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 49%



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Test Laboratory: ESTECH

CH25 BODY SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$

kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.593 mW/g

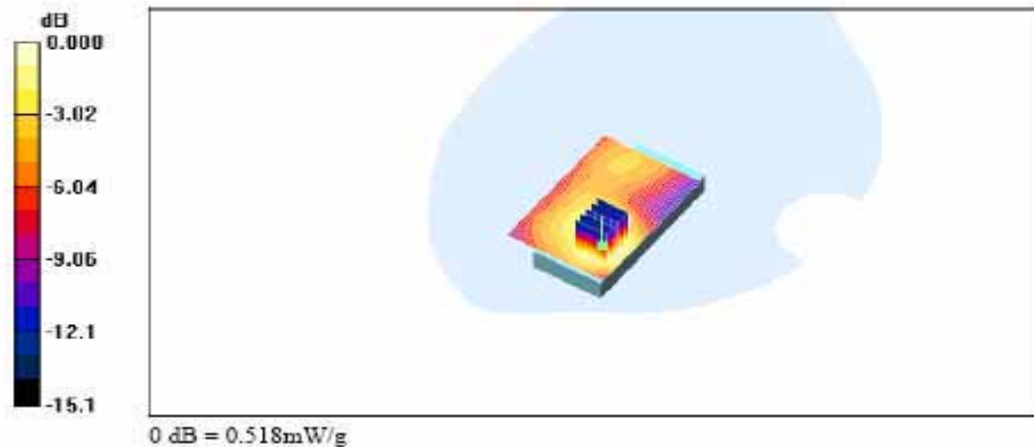
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.1 V/m; Power Drift = -0.126 dB

Peak SAR (extrapolated) = 0.776 W/kg

SAR(1 g) = 0.477 mW/g

Maximum value of SAR (measured) = 0.518 mW/g



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Date/Time: 2006-07-21 18:19:16

Test Laboratory: ESTECH

CH600 BODY SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.870 mW/g

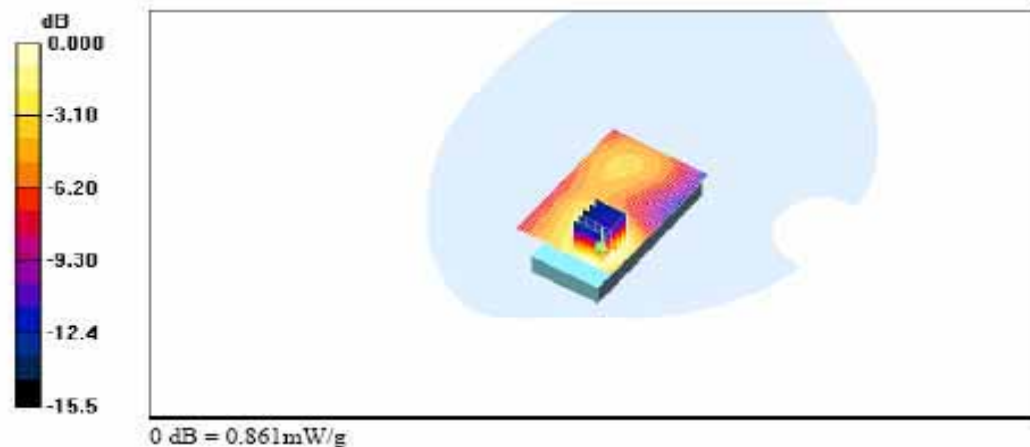
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.1 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.788 mW/g

Maximum value of SAR (measured) = 0.861 mW/g



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Date/Time: 2006-07-21 20:09:22

Test Laboratory: ESTECH

CHI175 BODY SLIDE IN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.983 mW/g

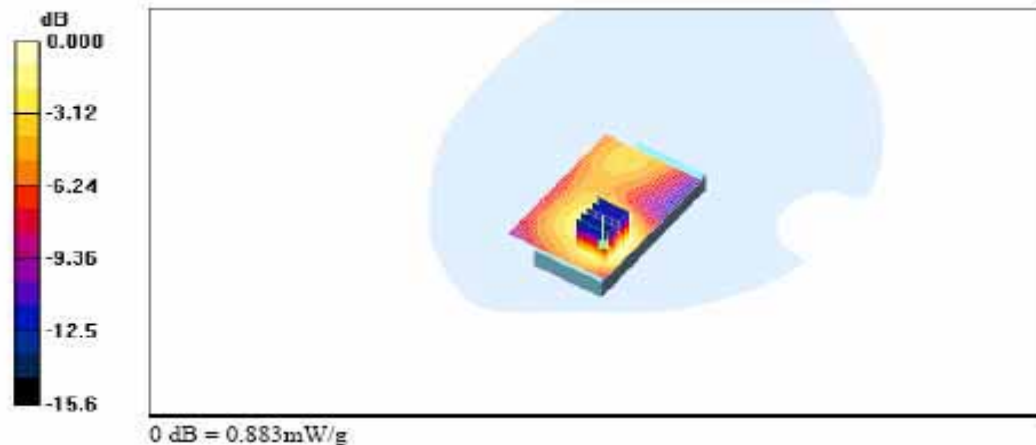
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.6 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.808 mW/g

Maximum value of SAR (measured) = 0.883 mW/g



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Date/Time: 2006-07-21 18:52:24

Test Laboratory: ESTECH

CH600 BODY SLIDE UP

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800Mhz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 47%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.720 mW/g

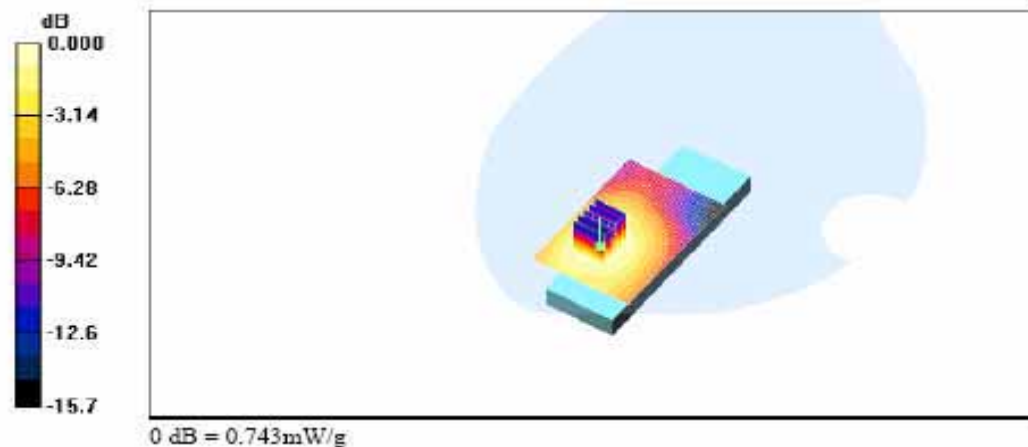
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.91 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.693 mW/g

Maximum value of SAR (measured) = 0.743 mW/g



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Test Laboratory: ESTECH

CHI175 BODY SLIDE IN-BT

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%

Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.08 mW/g

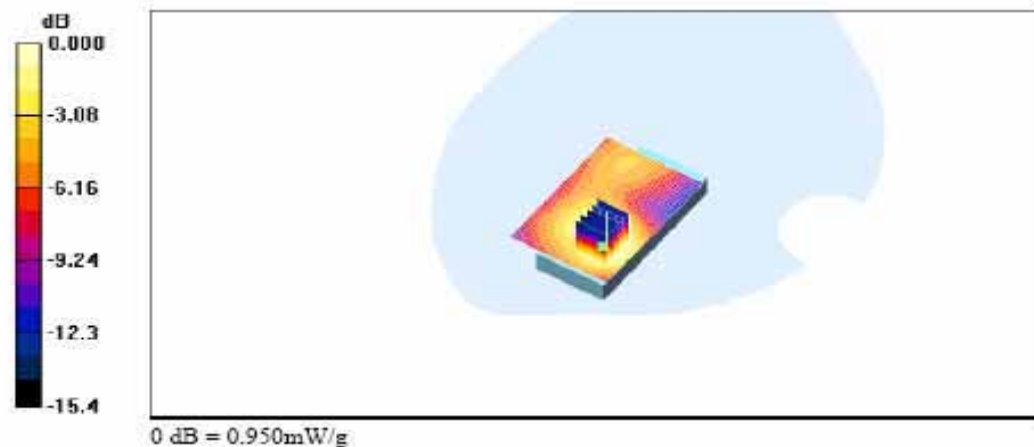
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.0 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.874 mW/g

Maximum value of SAR (measured) = 0.950 mW/g



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Test Laboratory: ESTECH

CH1175 BODY SLIDE IN-BT-ZSCAN

DUT: MX800; Type: SLIDE TYPE; Serial: NONE

Communication System: PCS FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1

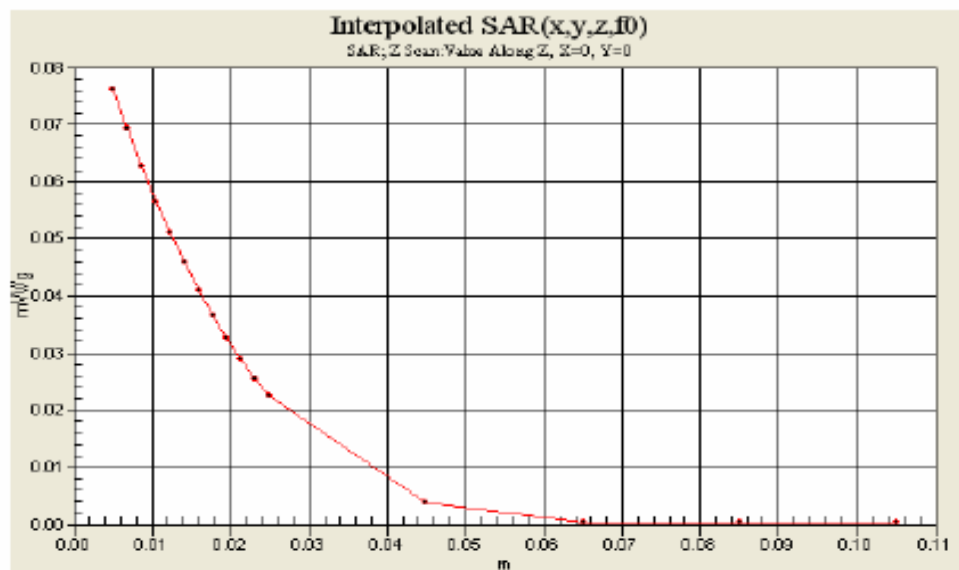
Medium parameters used: $f = 1909$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1750; ConvF(4.54, 4.54, 4.54); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn551; Calibrated: 2006-04-27
- Phantom: SAM MIC 1800MHz; Type: SAM MIC 1800MHz; Serial: TP-1263
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161
- Temperature : 21 °C, Humidity : 46%





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APPENDIX D : Calibration Certificates



Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Estech (Dymstec)**

Certificate No: **D835V2-475_Feb05**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 475**

Calibration procedure(s) **QA CAL-05.v6**
Calibration procedure for dipole validation kits

Calibration date: **February 24, 2005**

Condition of the calibrated item **In Tolerance**

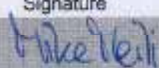
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov-05

Calibrated by:	Name Mika Mesli	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 25, 2005

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.5
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	42.2 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	2.25 mW / g
SAR normalized	normalized to 1W	9.00 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.02 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.48 mW / g
SAR normalized	normalized to 1W	5.92 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	5.93 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.4 Ω - 2.4 j Ω
Return Loss	- 29.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.384 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 15, 2002

DASY4 Validation Report for Head TSL

Date/Time: 24.02.2005 12:21:57

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN475

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 42.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.24, 6.24, 6.24); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 17; Postprocessing SW: SEMCAD, V1.8 Build 144

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.43 mW/g

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.1 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 3.27 W/kg

SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.48 mW/g

Maximum value of SAR (measured) = 2.44 mW/g



0 dB = 2.44 mW/g

21 Feb 2005 12:10:52

CH1 S11 1 U F5

1:52.414 α -2.3535 α 88.987 pF

835.000 000 MHz

*

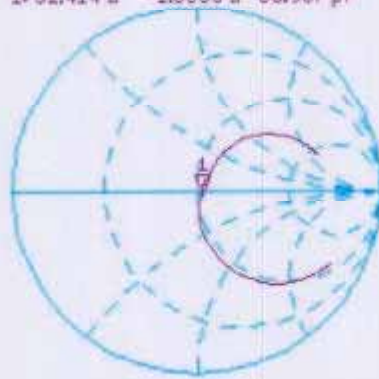
De1

Cor

Avg

16

↑



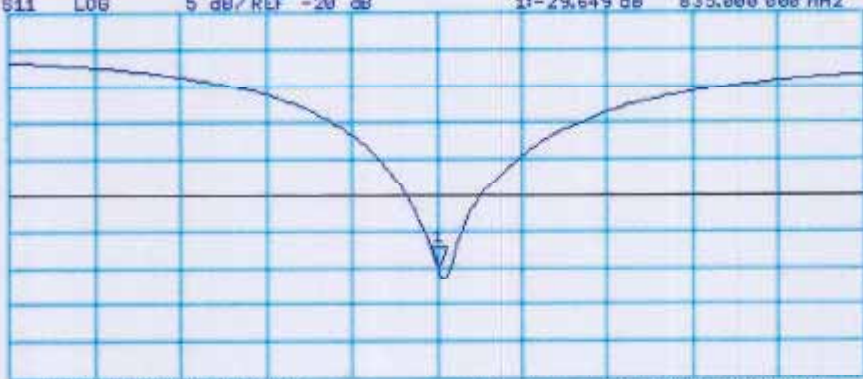
CH2 S11 LOG 5 dB/ REF -20 dB 1:-29.649 dB 835.000 000 MHz

Cor

Avg

16

↑



CENTER 835.000 000 MHz

SPAN 400.000 000 MHz

Schmid & Partner Engineering AG

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IMPORTANT NOTICE

DIPOLE TRANSPORTATION CASE

Important Note:

Please use only this suitcase for any future dipole transportation!

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Schmid & Partner Engineering AG

June 2003