SAR Evaluation Report

FCC ID : TARCDU-550

Project Reference No. : NK2GR080

Product Type : Dual Band CDMA 1x- EVDO wireless USB Modem

Brand Name : CMOTECH

Model : CDU-550

Tested According to : IEEE Standard C95.1 / OET Bulletin 65 Supplement C

Tested Period : April. 06. 2006 to April. 12. 2006

Tested by	Seob Lee		date : April. 13. 2006
Verified by	Seonteag.Jin		date : April. 13. 2006

This test results are only related to the item tested.
This test report is only limited to the client company and the product.
This report must not be used by the client to claim product endorsement by any agency of the U.S. Government.

Lab Address : Nemko Korea Co., Ltd
300-2, Osan-Ri, Mohyun-Myun, Yongin-City, Gyunggi-Do, Korea
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Contents of This Report

1.General Information

1.1 Applicant

Company Name:	CMOTech. Co.,Ltd
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Phone/Fax:	Phone: +82-2-785-5540 / +82-2-785-2369
Contact Name:	Jae Ho Yang

1.2 Manufacturer

Company Name:	CMOTech. Co.,Ltd
Company Address:	5F BLD. Etronix 17-10 Yoido-dog, Youngdungpo-gu, Seoul Korea (150-874)
Phone/Fax:	Phone: +82-2-785-5540 / +82-2-785-2369
Contact Name:	Jae Ho Yang

1.3 Description of Device

Category:	Dual Band CDMA 1x-EVDO wireless USB Modem
Model Name:	CDU-550
Brand Name:	CMOTECH
Serial Number:	0000001
Frequency of Operation	CDMA835 : Tx : 824MHz ~ 849MHz, Rx : 869MHz ~ 894MHz PCS :Tx : 1850MHz ~ 1910MHz, Rx : 1930MHz ~ 1990MHz
Power Output (Conducted)	0.25W (24.0dBm)
Type of Oscillation	PLL Synthesizer & VCTCXO(19.2MHz)
Modulation Method	OQPSK , QPSK
Channel Spacing	1.23MHz
Modulation	Code Division Multiple Access (CDMA)
Operating Condition	-20 to +60℃ 85%(at 50(C), relative humidity (non-condensing)
Power Supply	+5V DC from USB Host connector
Antenna Type	Monopole Antenna
Dimensions	91mm X 41mm X 9.8mm
Weight	Approx. 30g
Remarks:	-

2. General Test Condition

2.1 Location

Nemko Korea
300-2, Osan-Ri, Mohyun-Myun, Yongin-City, Gyunggi-Do
Phone : 82-31-322-2333 , Fax : 82-31-322-2332

2.2 Operating Environment

Parameters	Recording during test	Accepted deviation
Ambient temperature	20±2℃	15 ~ 30℃
Relative humidity	45±15%	20 ~ 75%

2.3 Support Equipment

Equipment	Manufacturer	Model Name	Serial Number
Laptop	SONY	PCG-6C7P	J000RJJ8
Laptop	SAMSUNG	SENS X10 SE	184C93DY400118T
Laptop	DELL	LATITUDE D400	7WV381S

2.4 Test Frequency

CDMA		PCS CDMA	
Test Channel	**Test Frequency (MHz)**	**Test Channel**	**Test Frequency (MHz)**
1013	824.70	25	1851.25
363	835.89	600	1880.00
777	848.31	1175	1908.75

2.5 Position Information

Top Position : Laptop - keyboard side facing phantom, EUT

Bottom Position : Laptop - Rear side facing phantom, EUT

Vertical Position : Laptop - top / bottom side edge facing phantom, EUT

Max Position with Earphone : Laptop - keyboard or Rear side facing phantom, EUT

3. Description of Test Equipment

3.1 SAR Measurement Setup

Robotic System

Measurements are performed using the DASY4 automated dosimetric assessment system. Which is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of high precision robotics system (Stäubli), robot controller, measurement server, H/P computer, nearfield 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. 3.1).

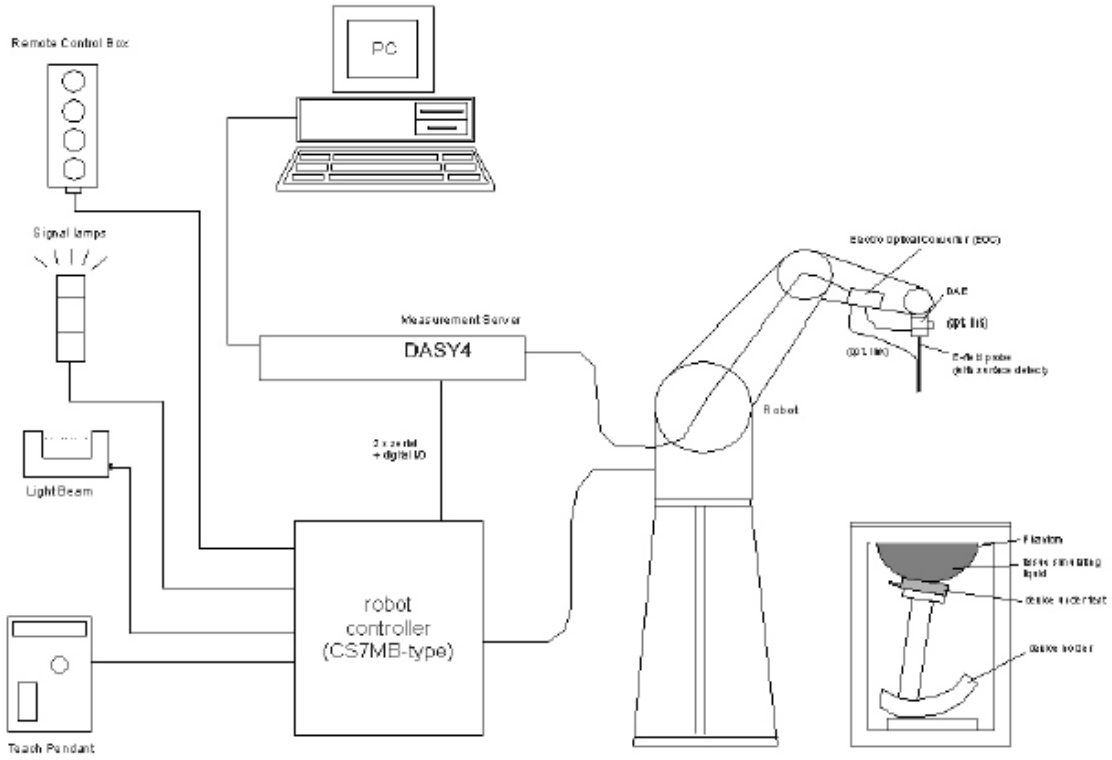


Figure 3.1 SAR Measurement System Setup

System Hardware

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and a remote control is used to drive the robot motors. The PC consists of the H/P computer with Windows XP system and SAR Measurement Software DASY4, LCD monitor, mouse and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot.
A Data Acquisition Electronic (DAE) circuit that performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc.
This 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 measurement server.

System Electronics

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with autozeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server 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.

3.2 E-field Probe

The SAR measurement were conducted with the dosimetric probe ES3DV3, designed in the classical triangular configuration (see Fig.3.3) 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 multi-fiber line ending at the front of the probe tip (see Fig.3.4). It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface.

Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches 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 a System maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero.

The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting (see Fig.3.2). The approach is stopped at reaching the maximum.

Figure3.2 DAE System

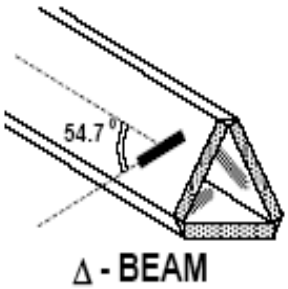


Figure 3.3 Triangular Probe Configuration

Figure 3.4 Probe Thick-Film Technique

Probe Specifications

Construction : Symmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic DGBE)

Calibration : Basic Broad Band Calibration In air from 10 MHz to 3.0 GHz
In brain and muscle simulating tissue at Frequencies of HSL900,
HSL1800 MHz, Calibration certificates please find attached.

Frequency : 10 MHz to > 6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)

Directivity ±0.2 dB in HSL (rotation around probe axis)
±0.3 dB in HSL (rotation normal to probe axis)

Dynamic Range 5μW/g to > 100mW/g; Linearity: ±0.2dB

Dimensions Overall length: 330mm (Tip : 20mm)
Tip diameter: 4.0mm (Body : 12mm)
Distance from probe tip to dipole centers: 2.0mm

Application General dosimetry up to 3 GHz
Compliance tests of mobile phones
Fast automatic scanning in arbitrary phantoms

Optical Surface Detection
± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces

3.3 SAM Phantom

The SAM Twin Phantom V4.0C is constructed of a 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.
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.
(See Figure 3.5)

Figure 3.5 SAM Twin Phantom

Phantom Specification

Construction : The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209. 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 evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Shell Thickness : 2 ± 0.2 mm
Filling Volume : Approx. 25 liters
Dimensions : Height; 830 mm; Length: 1000 mm; Width: 500 mm

3.4 Device Holder for Transmitters

In combination with the SAM Twin Phantom V4.0, the Mounting Device (see Fig. 3.6) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation point is the ear opening.
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 .
To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Figure 3.6Device Holder

4. Measurement Procedure

EUT at the maximum power level is placed by a non metallic device holder in the above described positions at a shell phantom of a human being.
The distribution of the electric field strength *E* is measured in the tissue simulating liquid within the shell phantom.
For this miniaturized field probes with high sensitivity and low field disturbance are used.
Afterwards the corresponding SAR values are calculated with the known electrical conductivity σ and the mass density *p* of the tissue in the SEMCAD software.
The software is able to determine the averaged SAR values (averaging region 1g or 10g) for compliance testing.

The measurements are done by two scans: first a coarse scan determines the region of the maximum SAR, afterwards the averaged SAR is measured in a second scan within the sharp of a cube. The measurement times takes about 20 minutes.

The following steps are used for each test position:

STEP 1
Establish a call with the maximum output power with a base station simulator.
The connection between the mobile phone and the base station simulator is established via air interface.

STEP 2
Measurement of the local E-Field value at a fixed location (P1).
This value serves as a reference value for calculating a possible power drift.

STEP 3
Measurement of the SAR distribution with a grid spacing of 15mm × 15mm and a constant distance to the inner surface of the phantom.
Since the sensors cannot directly measure at the inner surface of the phantom.
Since the sensors can not directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With this values the area of the maximum SAR is calculated by a interpolation scheme (combination of a least-square fitted function and a weighted average method). Additional peaks within 3dB of the maximum SAR are searched.

STEP 4
Around this points, a cube of 30mm×30mm×30mm is assessed by measuring 5×5×5 points.
With these data, the peak spatial-average SAR value can be calculated with the SEMCAD software.

STEP 5
The used extrapolation and interpolation routines are all based on the modified Quadratic Shepard's method [DASY4].

STEP 6
Repetition of the E-Field measurement at the fixed location(P1) and repetition of the whole procedure if the two results differ by more than ±0.22dB.

4.1 Head / Muscle Simulating Mixture Characterization

The brain mixture consists of a viscous gel using hydroxethyl-cellullose (HEC) gelling agent and saline solution. Preservation with a bacteriacide 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 incorporated in the following table.

Ingredients (% by weight)	**Frequency (MHz)**									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Typical Composition of Ingredients for Liquid Tissue Phantoms

4.2 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table.

Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

4.3 FCC Limits for Specific Absorption Rate (SAR)

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE 1: See Section 1 for discussion of exposure categories.

NOTE 2: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

NOTE 3: At frequencies above 6.0 GHz, SAR limits are not applicable and MPE limits for power density should be applied at 5 cm or more from the transmitting device.

Note 4: The time averaging criteria for field strength and power density do not apply to general population SAR limit of 47 CFR §2.1093.

5. Definition of Reference Points

5.1 EAR Reference Point

Figure 5.1 shows the front, back and side views of SAM. The point “M” is the reference point
For the center of mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP.
The ERPs are 15 mm posterior to the entrance to ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 5.2.

Figure 5.1 Front, back and side view of SAM

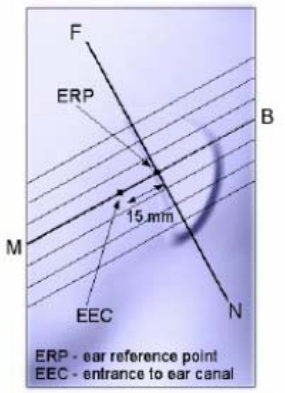


Figure 5.2 Close up side view

The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) perpendicular to the reference plane and passing through the RE(or LE) is called the Reference Pivoting Line (see Figure 5.3).
Line B-M is perpendicular to the N-F line. Both N-F and B-M Lines should be marked on the external phantom shell to Facilitate handset positioning.
Posterior to the N-F line, the thickness of the phantom shell with the shape of an ear is a flat surface 6 mm thick at the ERPs.

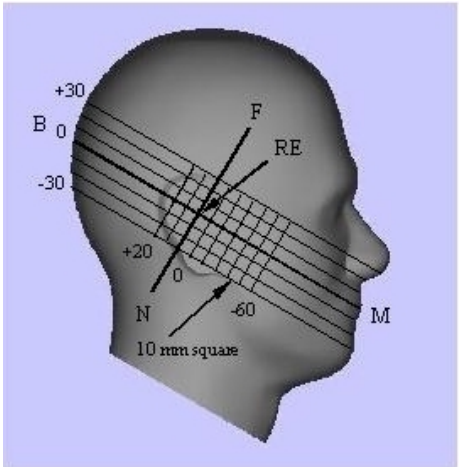


Figure 5.3 Side view of the phantom showing relevant markings

5.2 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. 5.4).
The “test device reference point” was than located at the same level as the center of the eat reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at it’s tip 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.

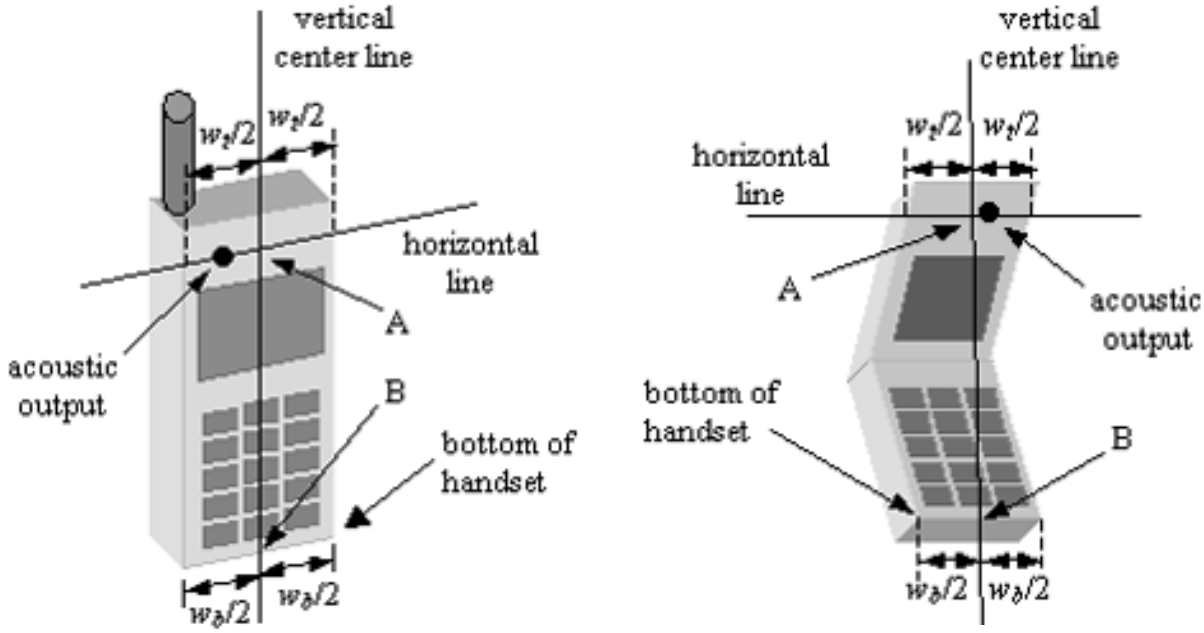


Figure 5.4 Handset vertical and horizontal reference lines

6. Test Configuration Positions

6.1 Cheek/Touch Position

Step 1
The test device was positioned with the handset close to the surface of the phantom such that point. A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6.1), 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.

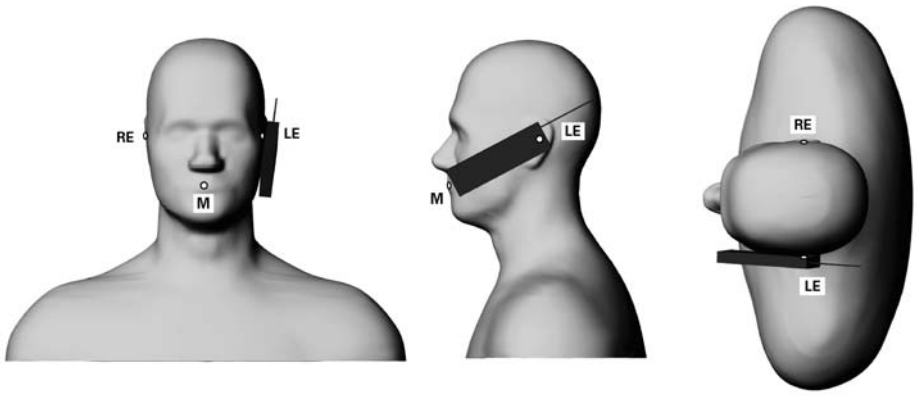


Figure 6.1 Front, Side and Top View of Cheek/Touch Position

Step 2
The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.

Step 3
While maintaining the handset in this plane, the handset was rotated around the LE-RE line Until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).

Step 4
Rotate the handset around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.

Step 5
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, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear cheek.(See Figure 5.2)

6.2 EAR/Tilt 15° Position

With the test device aligned in the “Cheek/Touch Position”:

Step 1
Repeat steps 1 to 5 of 5.2 to place the device in the “Cheek/Touch Position”

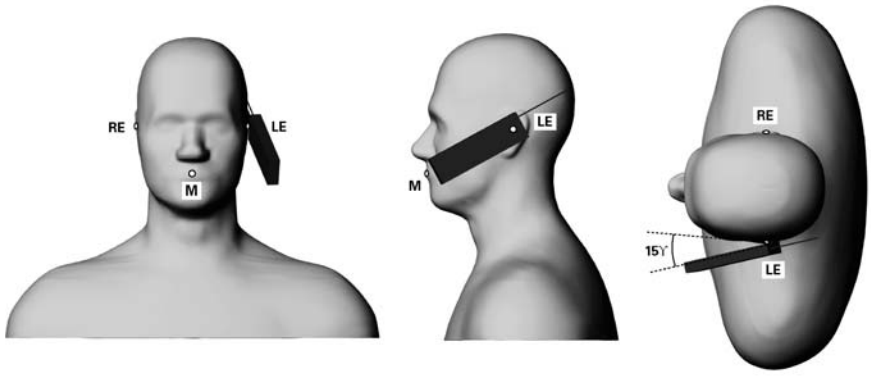


Figure 6.2 Front, side and Top View of Ear/Tilt 15° Position

Step 2
While maintaining the orientation of the phone, the phone was retracted parallel to the rference plane far enough to enable a rotation of the phone by 15 degree.

Step 3
The phone was then rotated around the horizontal line by 15 degree.

Step 4
While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head.
(In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced.
The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head. (See Figure 6.2)

6.3 Body-worn and Other Configurations

6.3.1 Phantom Requirements

For body-worn and other configurations a flat phantom shall be used which is comprised of material with electrical properties similar to the corresponding tissues.

6.3.2 Test Position

The body-worn configurations shall be tested with the supplied accessories (belt-clips, holsters, etc.) attached to the device in normal use configuration. Devices with a headset output shall be tested with a connected headset. Since the Supplement C to OET Bulletin 65 was mainly issued for mobile phones it is only a guideline and therefore some requirements are not usable or practical for devices other than mobile phones.

6.3.3 Test to be Performed

For purpose of determining test requirements, accessories may be divided into two categories: those that do not contain metallic components and those that do. For multiple accessories that do not contain metallic components, the device may be tested only with that accessory which provides the closet spacing to the body.
For multiple accessories that contain metallic components, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component, only the accessory that provides the closet spacing to the body must be tested.
If the manufacturer provides none body accessories, a separation distance of 1.5 cm between the back of the device and the flat phantom is recommended. Other separation distances may be used, but they shall not exceed 2.5cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.
For devices with retractable antenna, the SAR test shall be performed with the antenna fully extended and fully retracted. Other factors that may affect the exposure shall also be tested. For example, optional antennas or optional battery packs which may significantly change the volume, lengths, flip open/closed, etc. of the device or any other accessories which might have the potential to considerably increase the peak spatial-average SAR value.
The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the high and low channel is optional.

* In this test, This Device is with belt-clip but only used for the holster covering USB DONGLE connection part and this USB DONGLE can’t be attached to computer with this holster. So it’s impossible to perform test with the holster.

7. Measurement Uncertainty

DASY4 Uncertainty Budget
According to IEEE 1528 [1]

Error Description	Uncertainty value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±5.9%	N	1	1	1	±5.9%	±5.9%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Conditions	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	$\sqrt{3}$	0.64	0.43	±1.8%	±1.2%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid Permittivity (target)	±5.0%	R	$\sqrt{3}$	0.6	0.49	±1.7%	±1.4%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.6	0.49	±1.5%	±1.2%	∞
Combined Std. Uncertainty						±10.8%	±10.6%	330
Expanded STD Uncertainty						**±21.6%**	**±21.1%**	

8. System Verification

8.1 Tissue Verification

For the measurement of the following parameters the HP 85070E dielectric probe kit is used, representing the open-ended slim form probe measurement procedure. The measured values should be within ±5% of the recommended values given by the IEEE Standard C95.1 / OET Bulletin 65 Supplement C.

Table 8.1 Measured Tissue Parameters

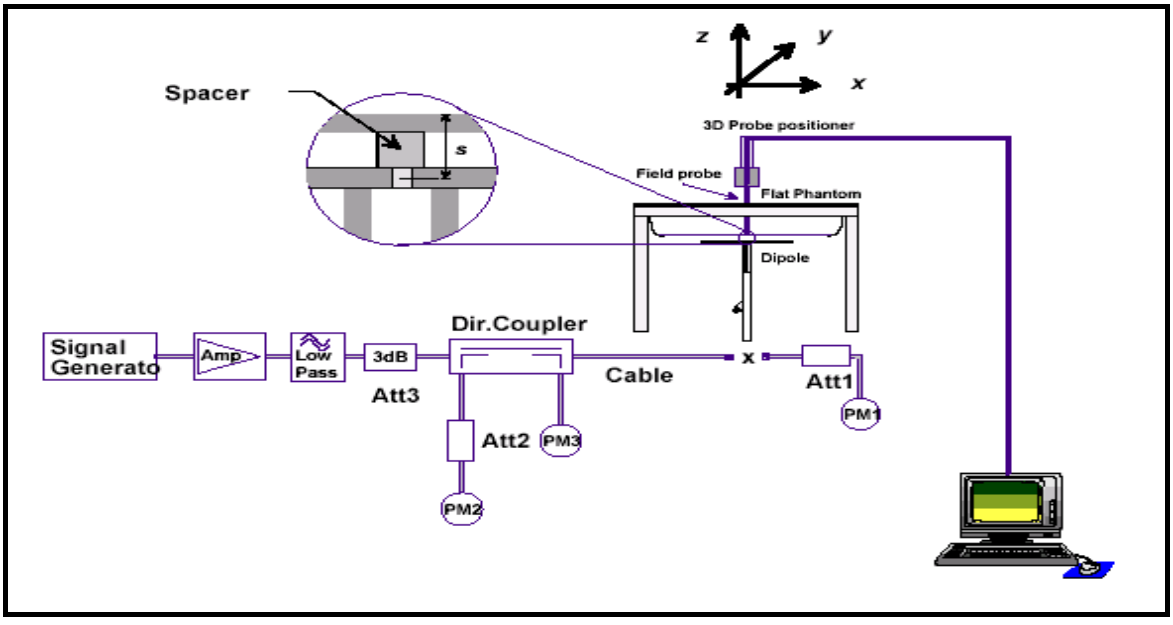
	CDMA 835MHz Muscle		PCS CDMA Muscle	
Date	April 09, 2006		April 07, 2006	
Liquid Temperature(°C)	21.2°C		20.7°C	
	Recommended Value	Measured Value	Recommended Value	Measured Value
Dielectric Constant (ε)	55.2±2.76	**53.3**	53.3±2.660	**53.2**
Conductivity(σ)	0.97 ±0.048	**0.986**	1.52 ±0.076	**1.55**

8.2 Test System Validation

The simplified performance check was realized using the dipole validation kits.
The input power of the dipole antennas were 250mW and they were placed under the flat Part of the SAM phantoms.
The target and measured results are listed in the table 8.2

Table 8.2 System Validation Results

Tissue	Date	Liquid Temperature(°C)	Targeted SAR (mW/g)	Measured SAR (mW/g)	Deviation (%)
			1g	1g	1g
835MHz Muscle	April 09, 2006	21.2°C	2.375	**2.41**	**1.47**
1900MHz Muscle	April 07, 2006	20.7°C	9.925	**9.93**	**0.05**



Dipole Validation Test Setup

8.3 Measurement Result of Test Data (CDMA 835MHz Validation)

Date/Time: 2006-04-09 12:39:29

Test Laboratory: Nemko Korea File Name: CDMA835 Validation.da4

DUT: Dipole 835 MHz Type: D835V2 Serial: D835V2 - SN:4d017 Applicant Name: Cmotech Co.,Ltd

Communication System: CW Frequency: 835 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 835 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

CDMA835 Validation/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm

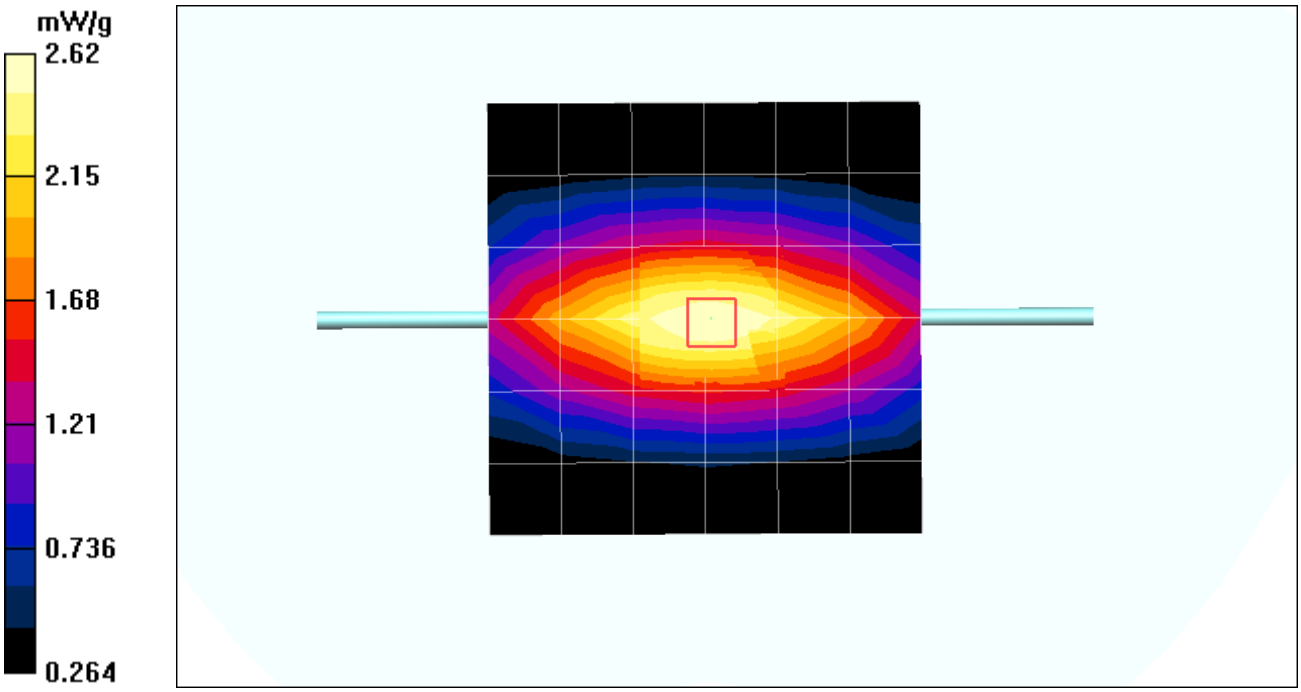
Maximum value of SAR (measured) = 2.62 mW/g

CDMA835 Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.8 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 3.49 W/kg

SAR(1 g) = 2.41 mW/g



8.4 Measurement Result of Test Data (PCS Validation)

Date/Time: 2006-04-07 10:01:30

Test Laboratory: Nemko Korea File Name: PCS Validation.da4

DUT: Dipole 1900 MHz Type: D1900V2 Serial: D1900V2 - SN:5d059 Applicant Name: Cmotech Co.,Ltd

Communication System: CW Frequency: 1900 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 1900.2 MHz; σ = 1.55 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

PCS Validation/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 11.2 mW/g

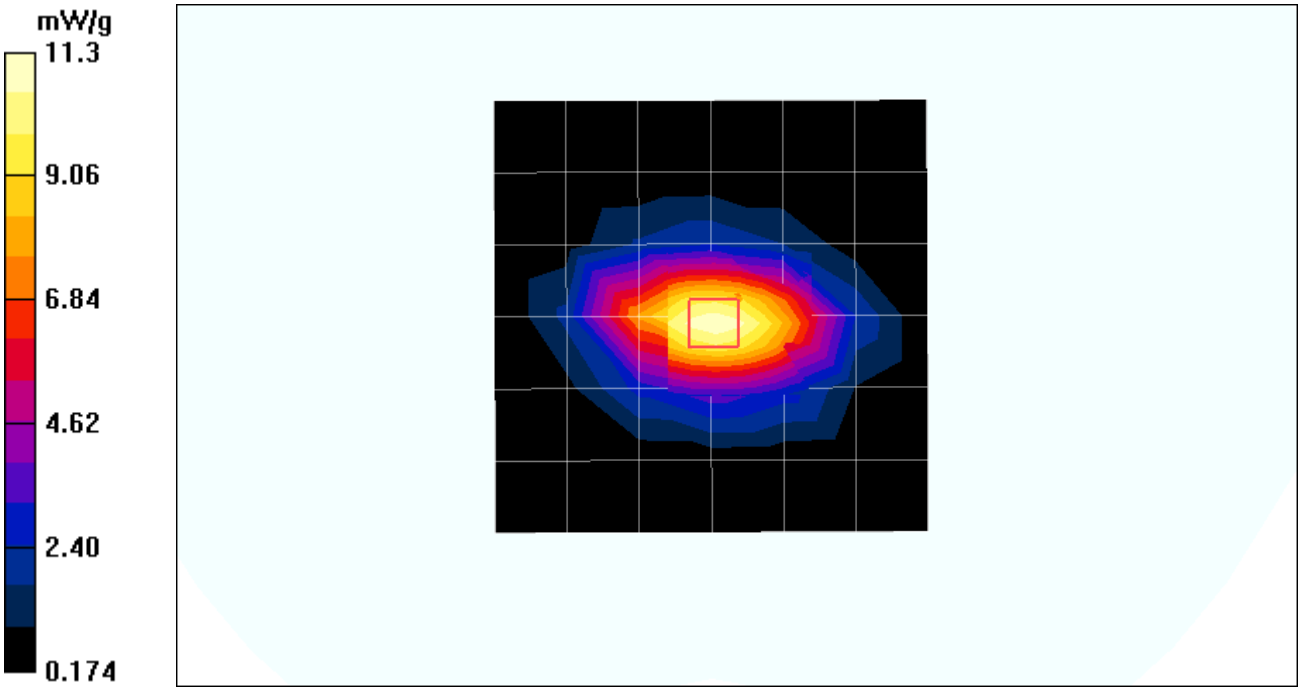
PCS Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.6 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.93 mW/g

Maximum value of SAR (measured) = 11.3 mW/g



9. SAR Measurement Results

Procedures Used To Establish Test Signal

The device was placed into continuous transmit mode using a base station simulator. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR

♦ **Maximum SAR (CDMA 835MHz)**

Laptop	Application	CH	Frequency (MHz)	Position	SAR Limit (W/kg)	Measured SAR (W/kg)	Result
SENS x10 SE	CDMA2000	363	835.89	TOP	1.6	**1.030**	**Passed**

♦ **Maximum SAR (PCS CDMA)**

Laptop	Application	CH	Frequency (MHz)	Position	SAR Limit (W/kg)	Measured SAR (W/kg)	Result
Latitude D400	CDMA2000	25	1851.25	TOP	1.6	**1.310**	**Passed**

Conducted Measurement Output Power

Test Results

Mode	Channel	Frequency (MHz)	Output Power in (mW)	Output Power in (dBm)
CDMA 835MHz	1013	824.70	220	23.42
	363	835.89	228	23.58
	777	848.31	230	23.62
PCS CDMA	25	1851.25	240	23.80
	600	1880.00	193	22.85
	1175	1908.75	224	23.50

9.1 SAR Data Summary (CDMA 835MHz)

9.1.1 Laptop 1 [SONY PCG-6C7P]

Date of Test : April 10.2006
Mixture Type: 835MHz Muscle
Tissue Depth: 15.0 cm

Mode	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
CDMA 835	1x EV-DO	1013	824.70	0.151	TOP	0.504
		363	835.89	-0.037	TOP	0.699
		777	848.31	0.029	TOP	0.692
		363	835.89	-0.026	Bottom	0.636
		363	835.89	0.070	Vertical	0.106
	CDMA2000	363	835.89	-0.085	TOP with Earphone	0.870

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-10 5:40:22

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH1013 -1.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 824.7 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.978 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH1013/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.570 mW/g

SONY PCG-6C7P Top Position CH1013/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

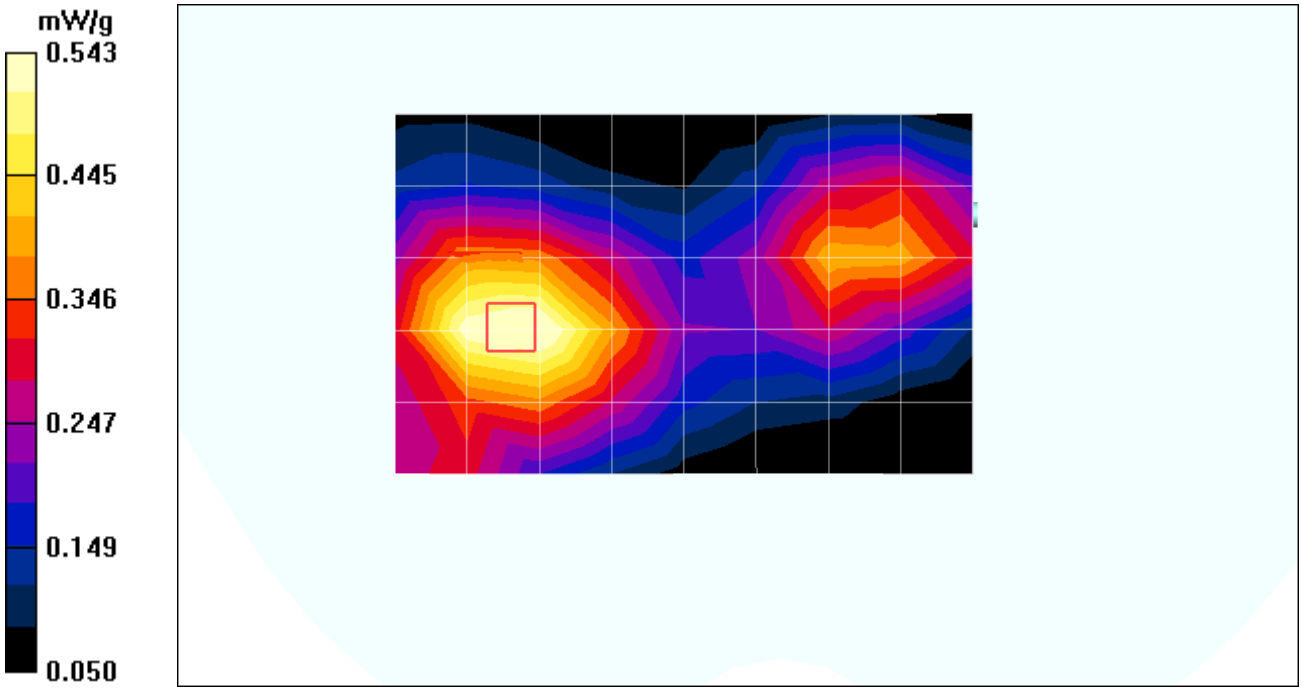
Reference Value = 18.3 V/m; Power Drift = 0.151 dB

Peak SAR (extrapolated) = 0.737 W/kg

SAR(1 g) = 0.504 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

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



Date/Time: 2006-04-10 5:15:24

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH363 -1.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.731 mW/g

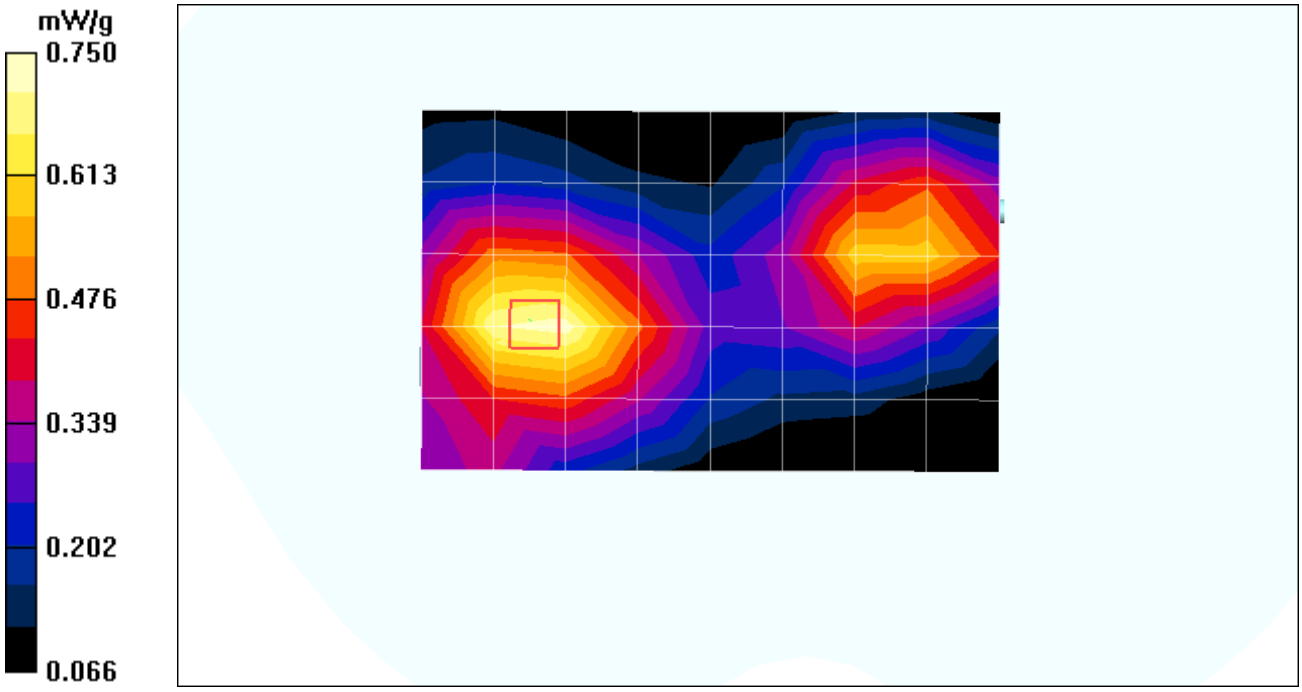
SONY PCG-6C7P Top Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.5 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.699 mW/g

Maximum value of SAR (measured) = 0.750 mW/g



Date/Time: 2006-04-10 5:59:57

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH777 -1.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 848.31 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 848.5 MHz; σ = 0.993 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH777/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.673 mW/g

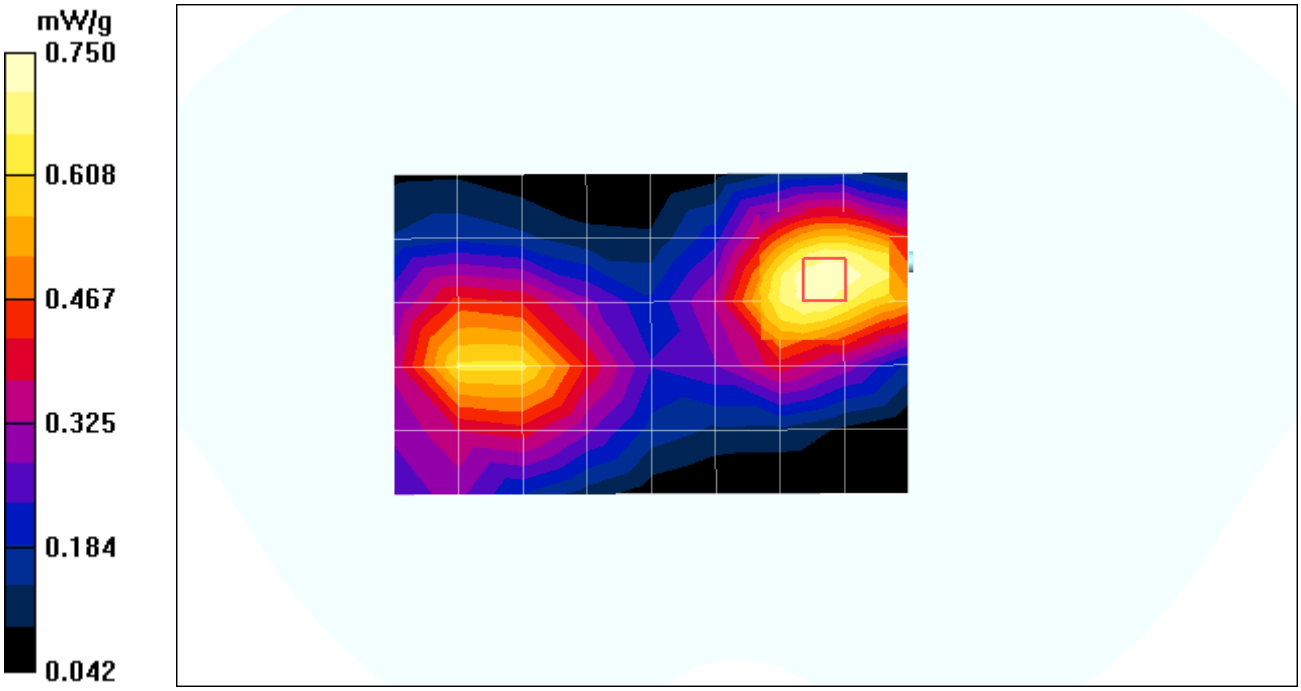
SONY PCG-6C7P Top Position CH777/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.9 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.692 mW/g

Maximum value of SAR (measured) = 0.750 mW/g



Date/Time: 2006-04-10 6:20:36

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Bottom Position CH363 -1.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Bottom Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.663 mW/g

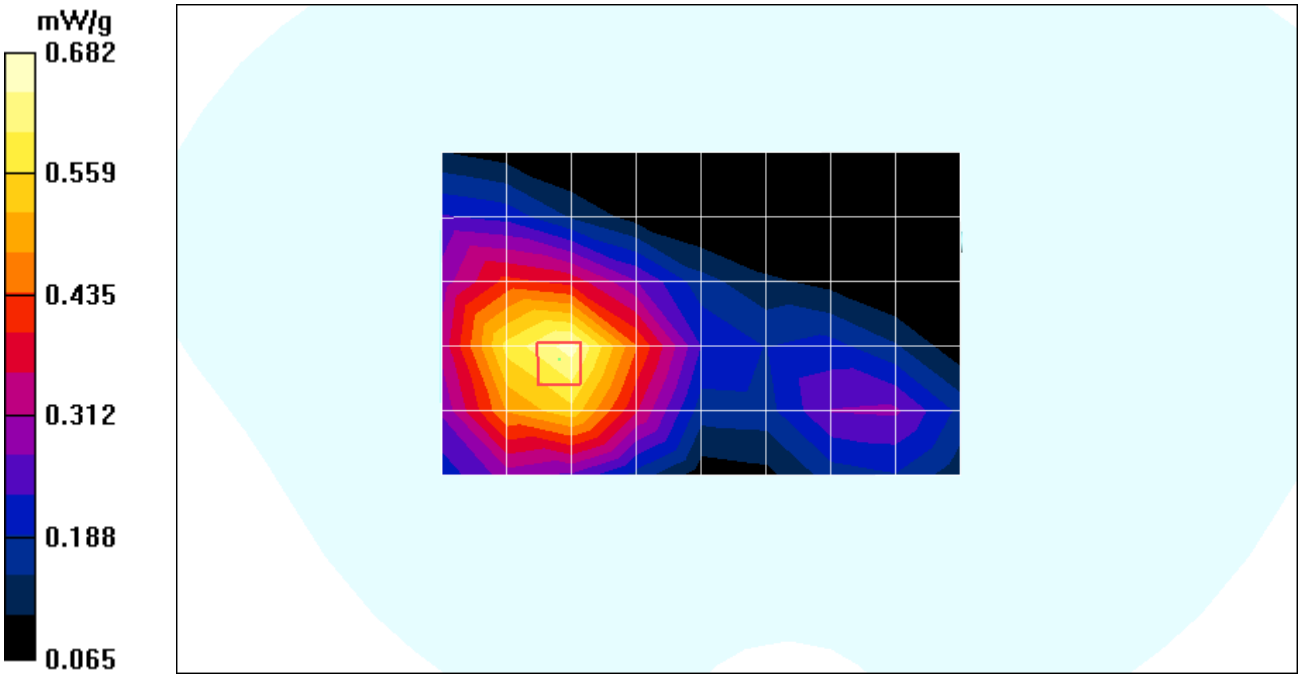
SONY PCG-6C7P Bottom Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.4 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 0.899 W/kg

SAR(1 g) = 0.636 mW/g

Maximum value of SAR (measured) = 0.682 mW/g



Date/Time: 2006-04-10 12:41:43

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Vertical Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Vertical Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.113 mW/g

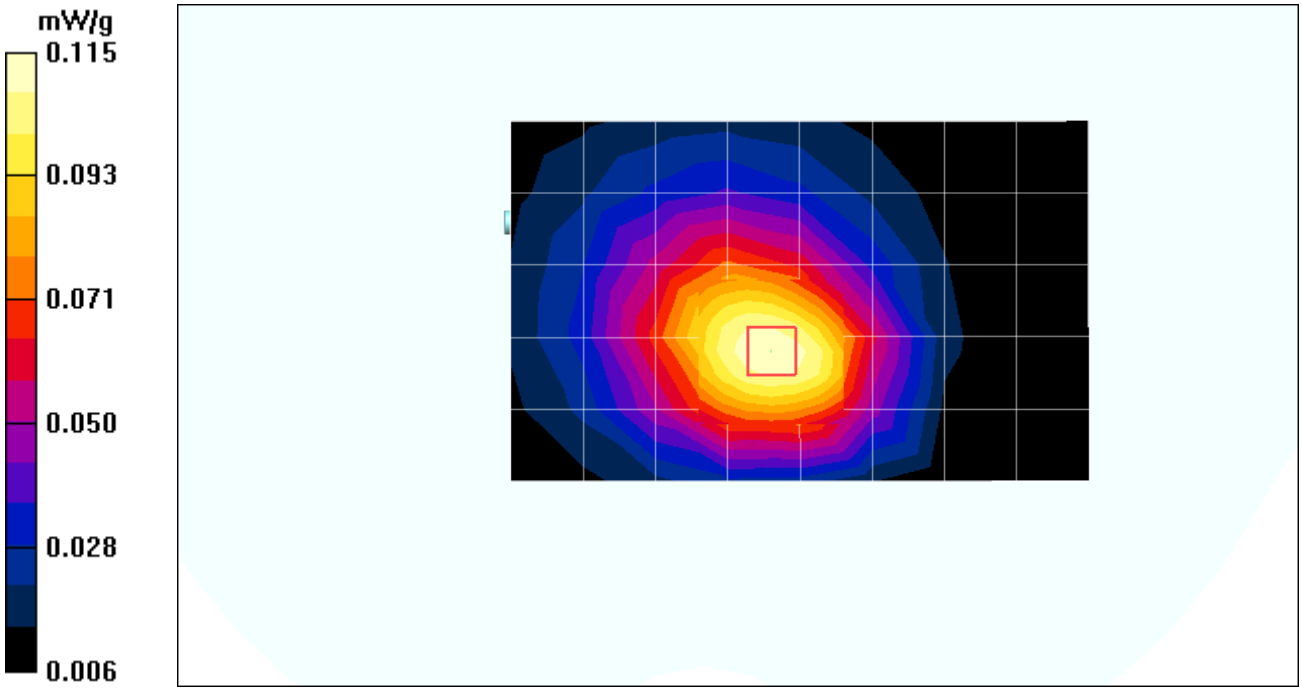
SONY PCG-6C7P Vertical Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 0.159 W/kg

SAR(1 g) = 0.106 mW/g

Maximum value of SAR (measured) = 0.115 mW/g



Date/Time: 2006-04-10 6:46:21

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P TOp Position eith Earphone CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position eith Earphone CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.00 mW/g

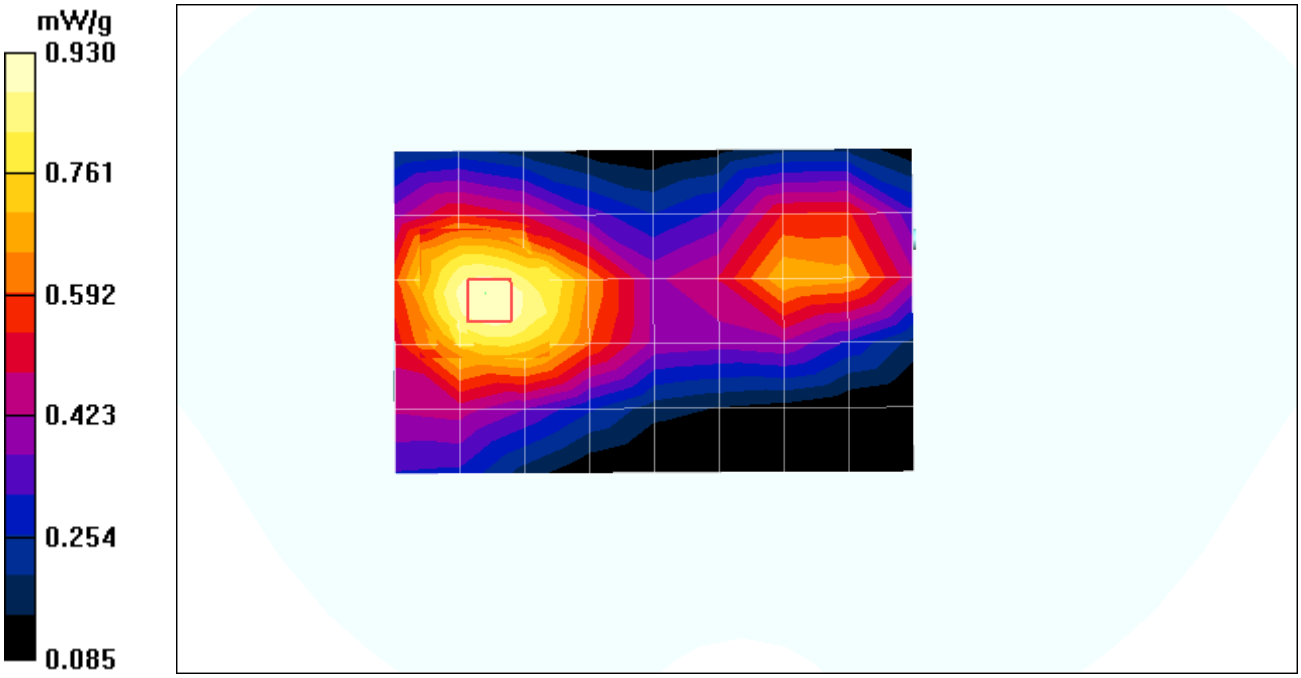
SONY PCG-6C7P Top Position eith Earphone CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.0 V/m; Power Drift = -0.085 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.870 mW/g

Maximum value of SAR (measured) = 0.930 mW/g



9.1.2 Laptop 2 [SAMSUNG SENS X10 SE]

Date of Test : April 10.2006
Mixture Type: 835MHz Muscle
Tissue Depth: 15.0 cm

Mode	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
CDMA 835	1x EV-DO	1013	824.70	**-0.035**	TOP	**0.625**
		363	835.89	**0.219**	TOP	**0.832**
		777	848.31	**0.009**	TOP	**0.704**
		363	835.89	**0.109**	Bottom	**0.770**
		363	835.89	**0.194**	Vertical	**0.101**
	CDMA2000	363	835.89	**0.048**	TOP with Earphone	**1.030**

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-10 11:19:42

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH1013.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 824.7 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.978 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH1013/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.628 mW/g

Samsung SENS X10 SE Bottom Position CH1013/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

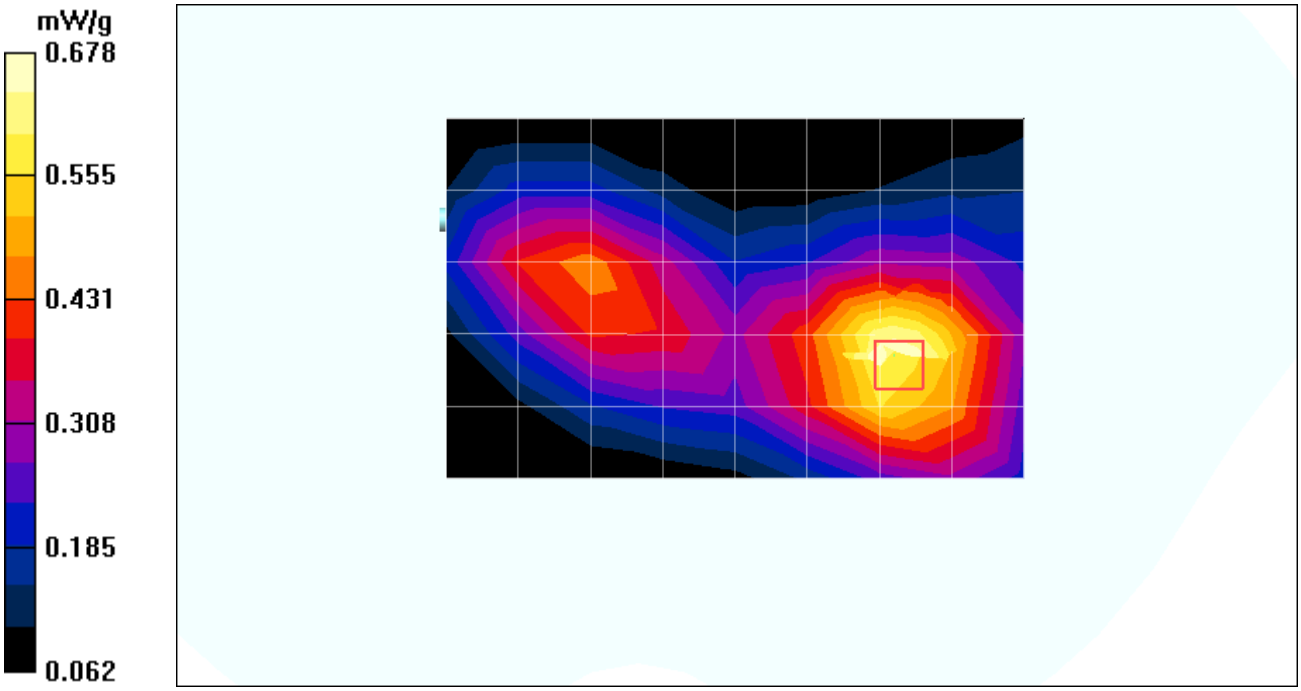
Reference Value = 22.1 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.918 W/kg

SAR(1 g) = 0.625 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.678 mW/g



Date/Time: 2006-04-10 10:58:42

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.819 mW/g

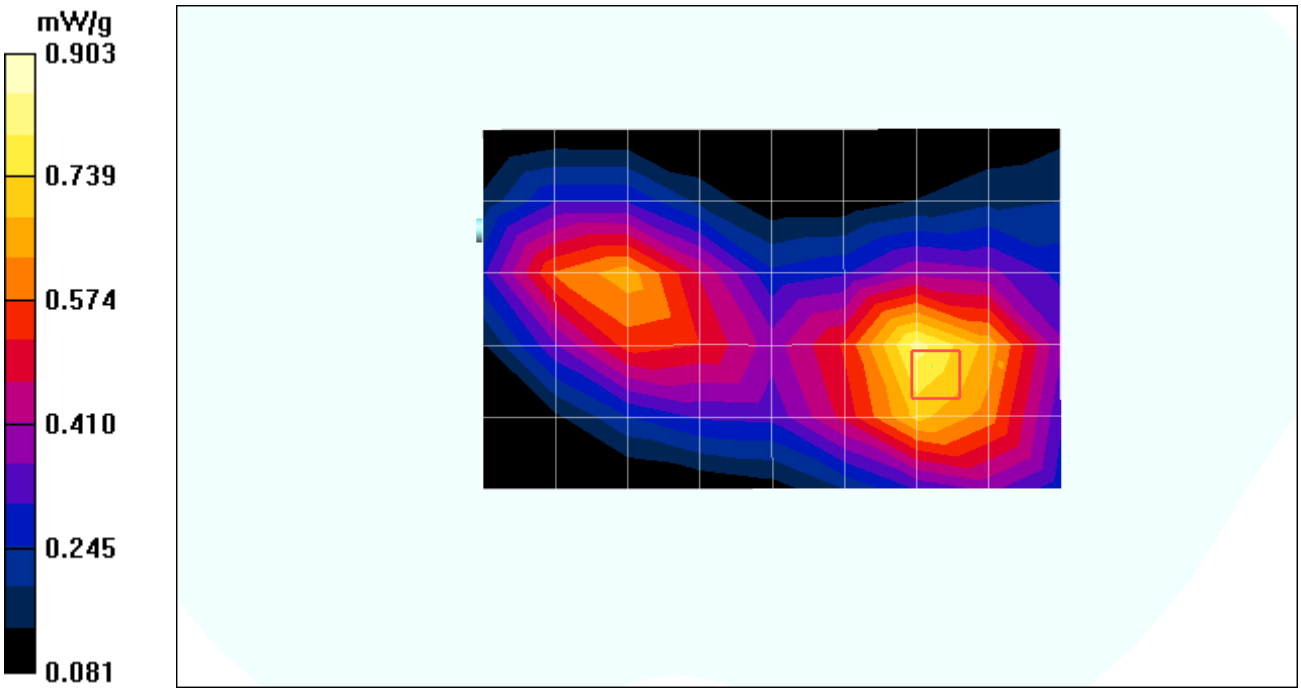
Samsung SENS X10 SE Bottom Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.5 V/m; Power Drift = 0.219 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.832 mW/g

Maximum value of SAR (measured) = 0.903 mW/g



Date/Time: 2006-04-10 11:37:45

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH777.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 848.31 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 848.5 MHz; σ = 0.993 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH777/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.692 mW/g

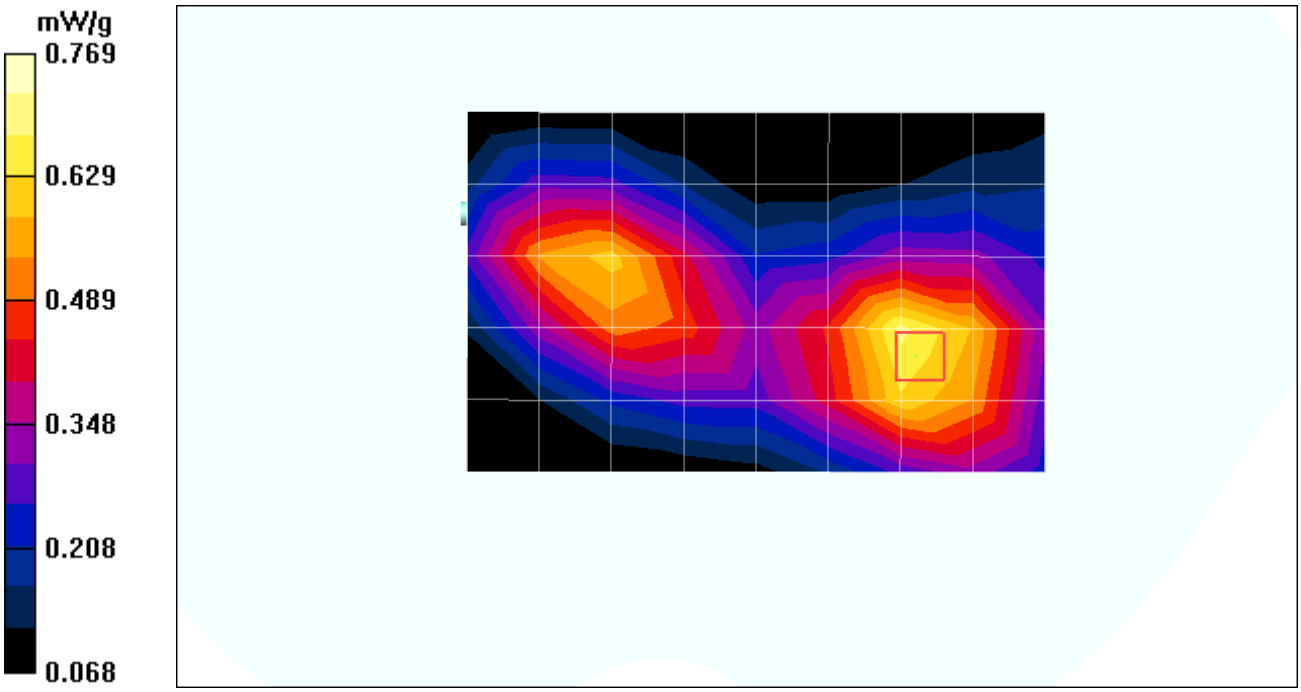
Samsung SENS X10 SE Bottom Position CH777/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.6 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.704 mW/g

Maximum value of SAR (measured) = 0.769 mW/g



Date/Time: 2006-04-10 11:56:31

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Top Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Top Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.735 mW/g

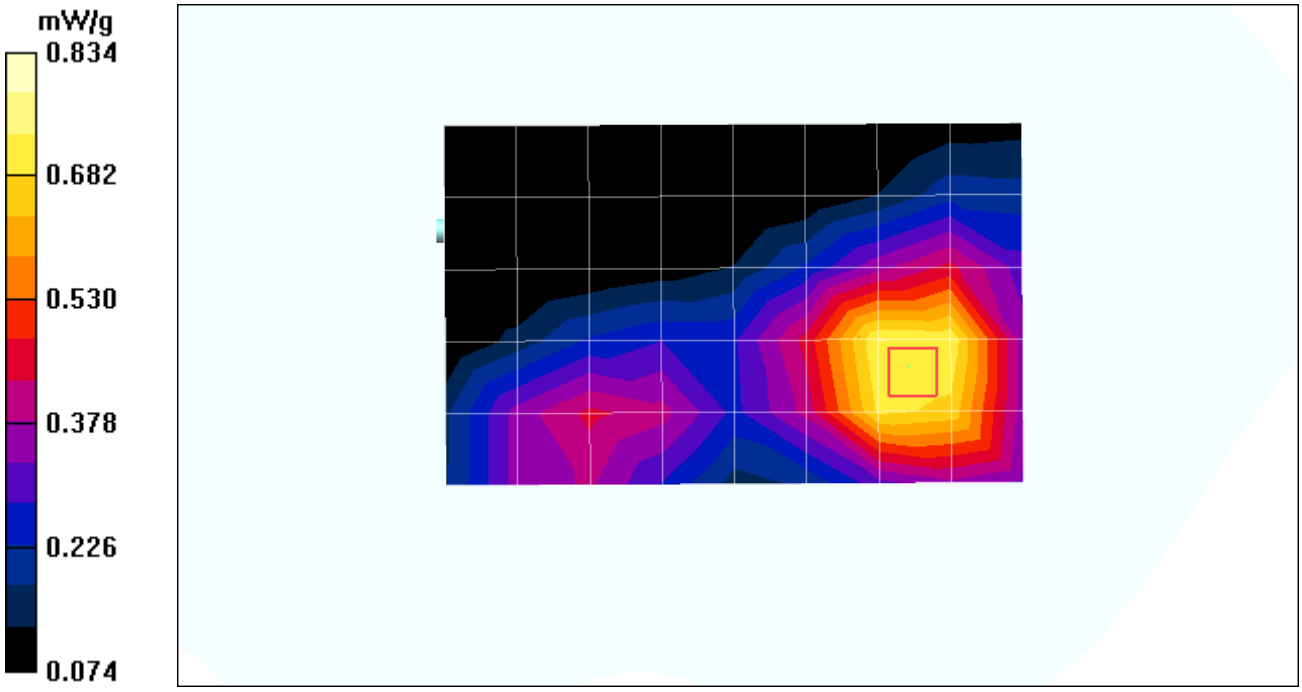
Samsung SENS X10 SE Top Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.2 V/m; Power Drift = 0.109 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.770 mW/g

Maximum value of SAR (measured) = 0.834 mW/g



Date/Time: 2006-04-10 12:18:48

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Vertical Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Vertical Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.096 mW/g

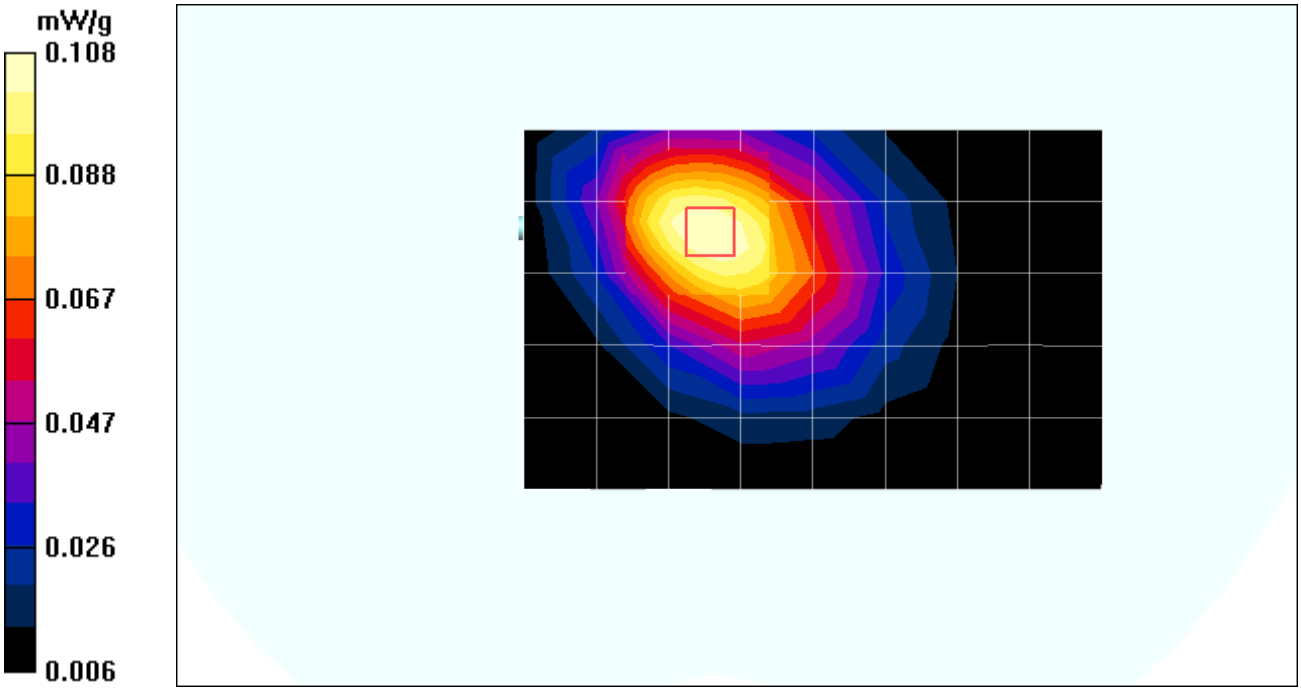
Samsung SENS X10 SE Vertical Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.59 V/m; Power Drift = 0.194 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.101 mW/g

Maximum value of SAR (measured) = 0.108 mW/g



Date/Time: 2006-04-10 7:16:26

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position with Earphone CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position with Earphone CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.13 mW/g

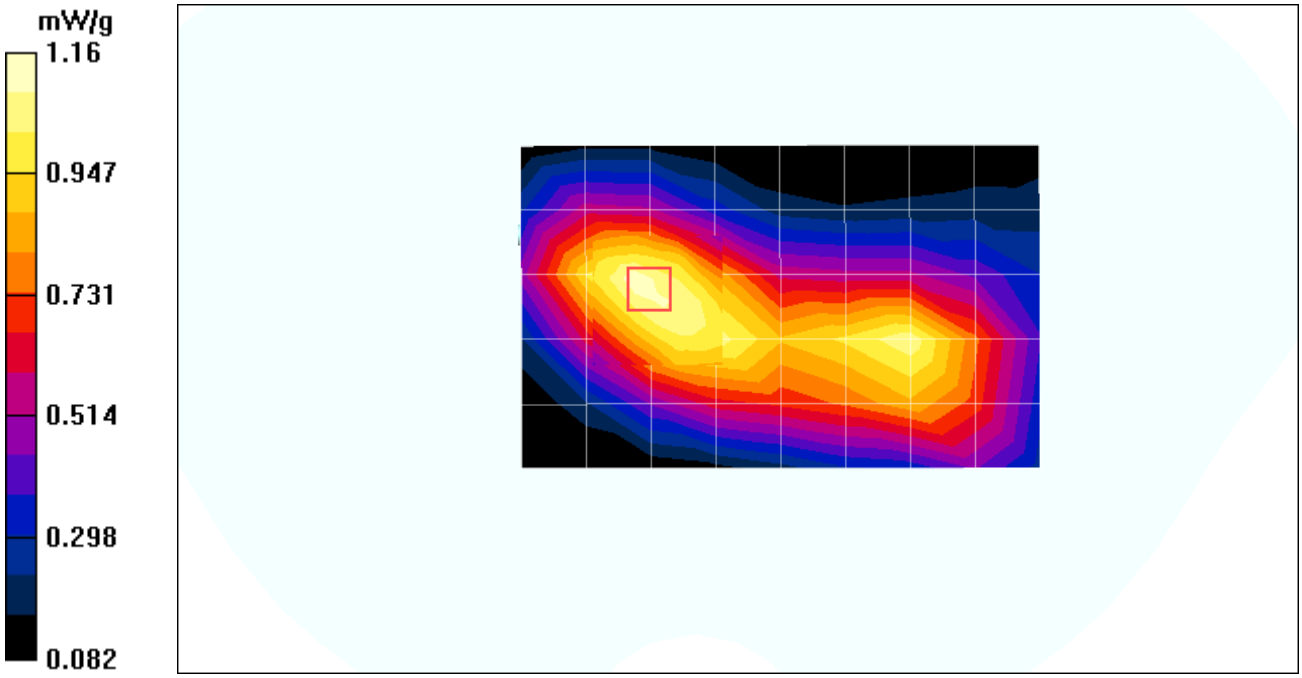
Samsung SENS X10 SE Bottom Position with Earphone CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 36.3 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.03 mW/g

Maximum value of SAR (measured) = 1.16 mW/g



9.1.3 Laptop 3 [DELL Latitude D400]

Date of Test : April 10.2006
Mixture Type: 835MHz Muscle
Tissue Depth: 15.0 cm

Mode	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
CDMA 835	1x EV-DO	1013	824.70	0.022	TOP	0.382
		363	835.89	-0.058	TOP	0.583
		777	848.31	0.008	TOP	0.463
		363	835.89	-0.154	Bottom	0.294
		363	835.89	0.128	Vertical	0.111
	CDMA2000	363	835.89	0.215	TOP with Earphone	0.615

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-10 3:29:34

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH1013.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 824.7 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 824.7 MHz; σ = 0.978 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH1013/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.410 mW/g

DELL Latitude D400 Bottom Position CH1013/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

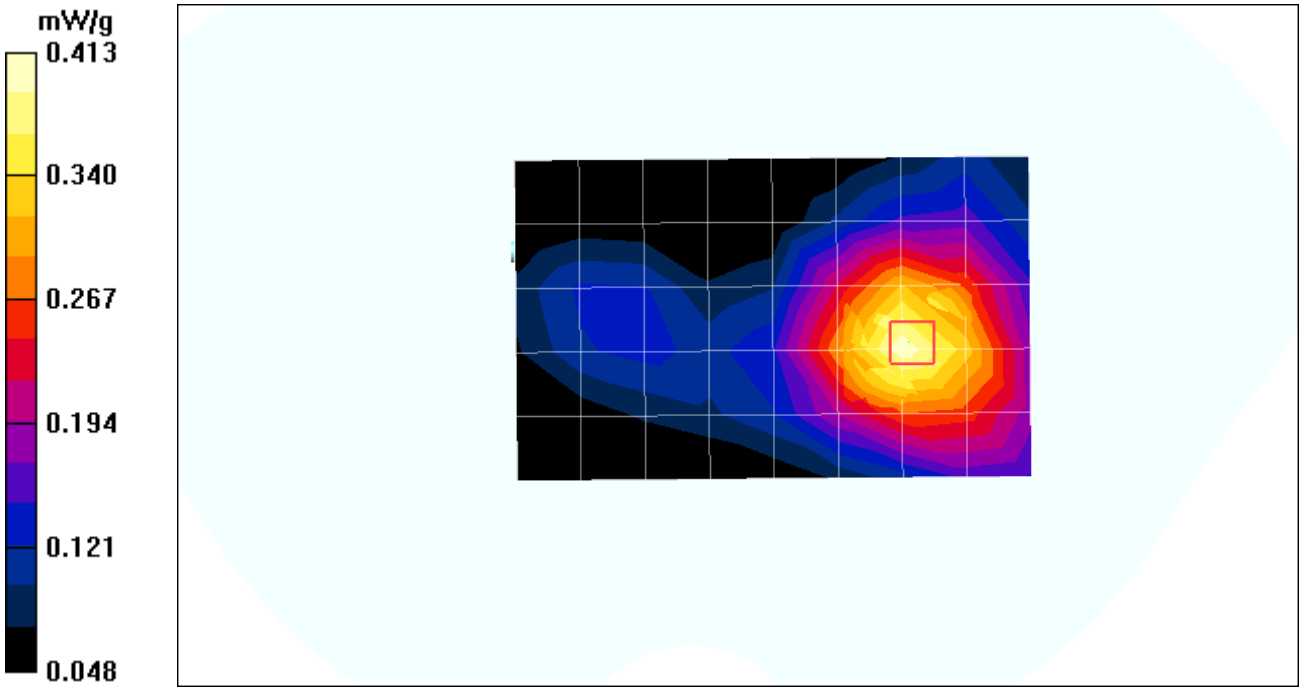
Reference Value = 11.1 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.543 W/kg

SAR(1 g) = 0.382 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.413 mW/g



Date/Time: 2006-04-10 3:11:26

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.584 mW/g

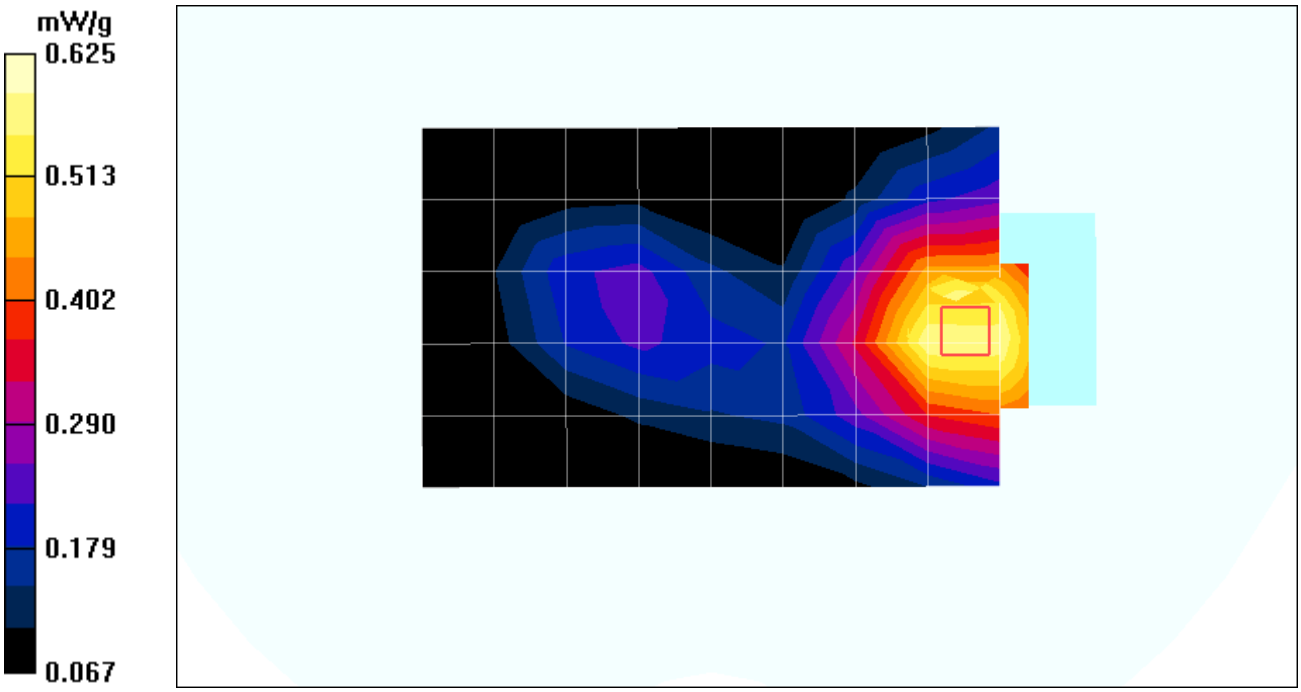
DELL Latitude D400 Bottom Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.3 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.815 W/kg

SAR(1 g) = 0.583 mW/g

Maximum value of SAR (measured) = 0.625 mW/g



Date/Time: 2006-04-10 3:47:29

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH777.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 848.31 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 848.5 MHz; σ = 0.993 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH777/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.487 mW/g

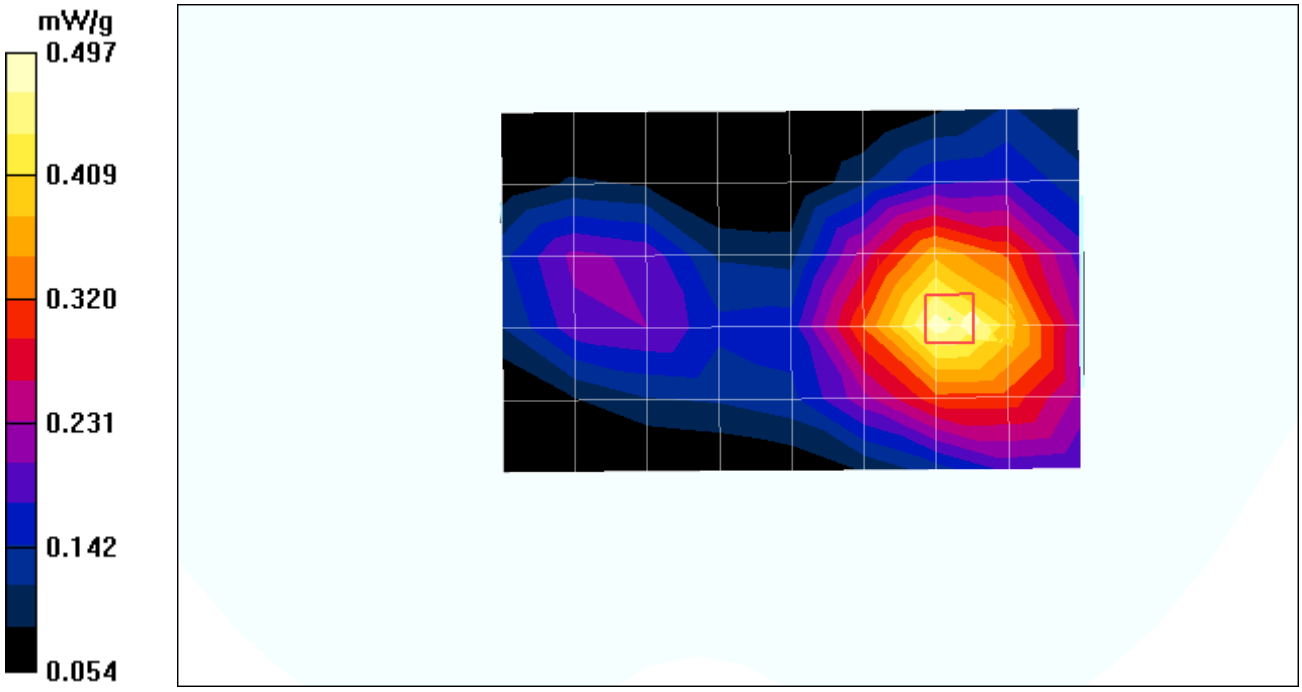
DELL Latitude D400 Bottom Position CH777/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.4 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.659 W/kg

SAR(1 g) = 0.463 mW/g

Maximum value of SAR (measured) = 0.497 mW/g



Date/Time: 2006-04-10 4:11:03

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Top Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Top Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.291 mW/g

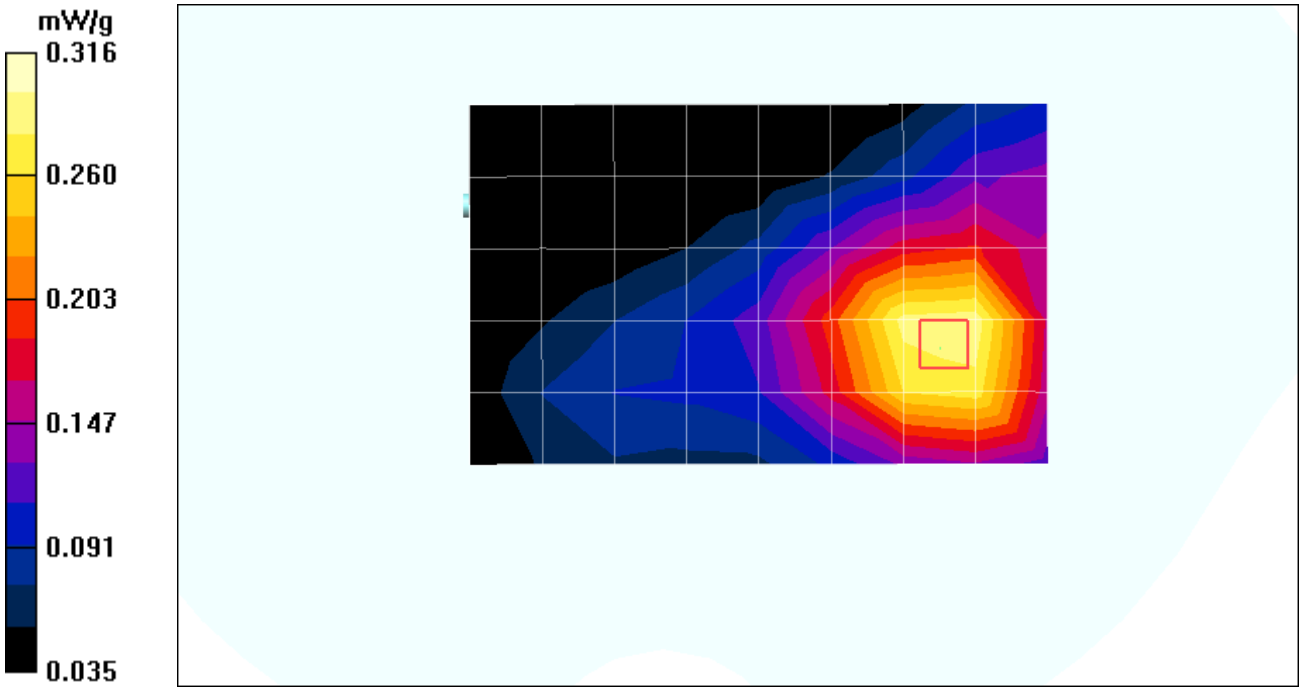
DELL Latitude D400 Top Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.75 V/m; Power Drift = -0.154 dB

Peak SAR (extrapolated) = 0.415 W/kg

SAR(1 g) = 0.294 mW/g

Maximum value of SAR (measured) = 0.316 mW/g



Date/Time: 2006-04-10 4:30:38

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Vertical Position CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Vertical Position CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.109 mW/g

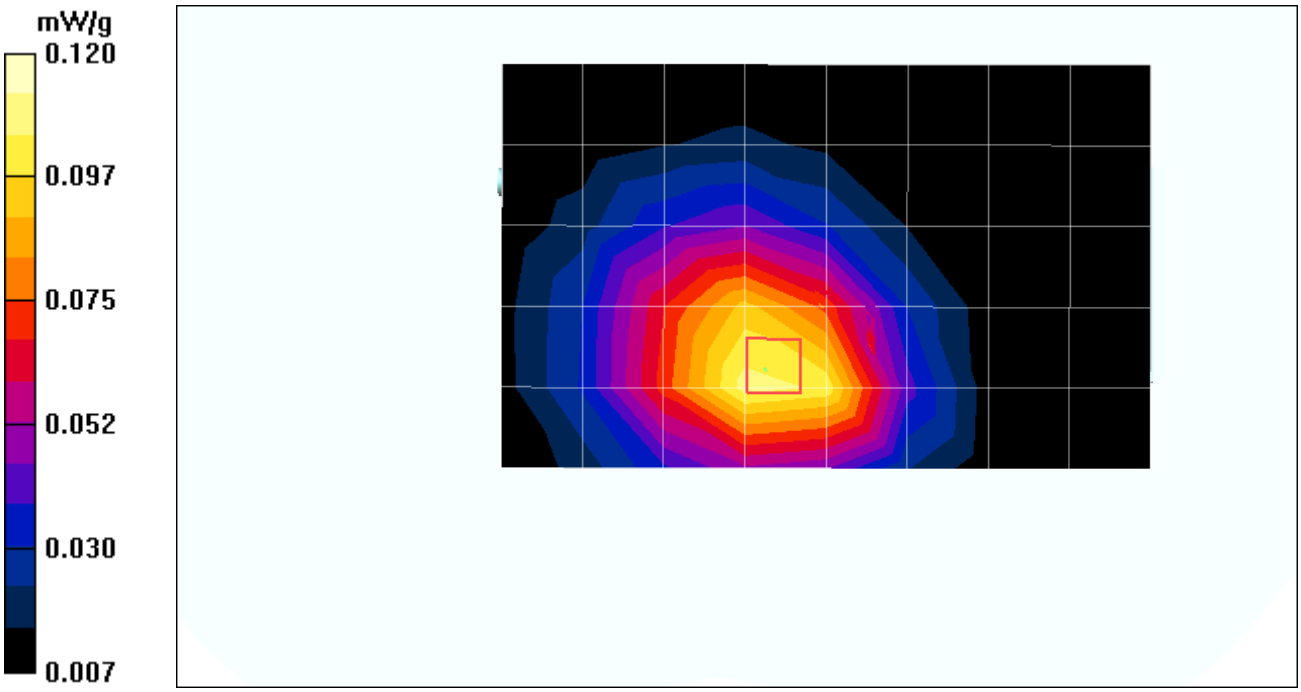
DELL Latitude D400 Vertical Position CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.50 V/m; Power Drift = 0.128 dB

Peak SAR (extrapolated) = 0.167 W/kg

SAR(1 g) = 0.111 mW/g

Maximum value of SAR (measured) = 0.120 mW/g



Date/Time: 2006-04-10 7:52:22

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position with Earphone CH363.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co., Ltd

Communication System: CDMA Frequency: 835.89 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used: f = 836 MHz; σ = 0.986 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(6.35, 6.35, 6.35); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 SE Bottom Position with Earphone CH363/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.727 mW/g

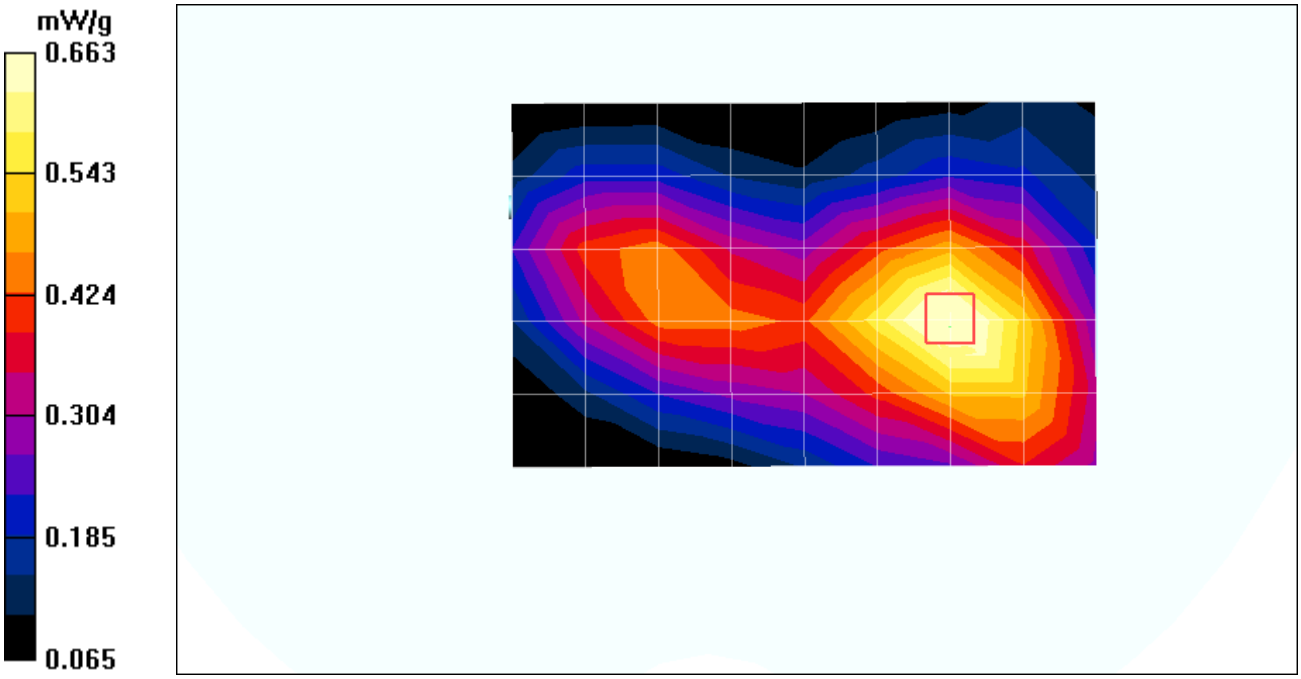
DELL Latitude D400 SE Bottom Position with Earphone CH363/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.8 V/m; Power Drift = 0.215 dB

Peak SAR (extrapolated) = 0.856 W/kg

SAR(1 g) = 0.615 mW/g

Maximum value of SAR (measured) = 0.663 mW/g



9.2 SAR Data Summary (PCS)

9.2.1 Laptop 1 [SONY PCG-6C7P]

Date of Test : April 07.2006
Mixture Type: 1900MHz Muscle
Tissue Depth: 15.2 Cm

Modulation	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
PCS	1x EV-DO	25	1851.25	-0.091	TOP	0.684
		600	1880.00	-0.104	TOP	0.447
		1175	1908.75	-0.188	TOP	0.518
		600	1880.00	-0.203	Bottom	0.387
		600	1880.00	0.107	Vertical	0.093
	CDMA2000	25	1851.25	-0.096	TOP with Earphone	1.110

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-07 5:35:11

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.802 mW/g

SONY PCG-6C7P Top Position CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

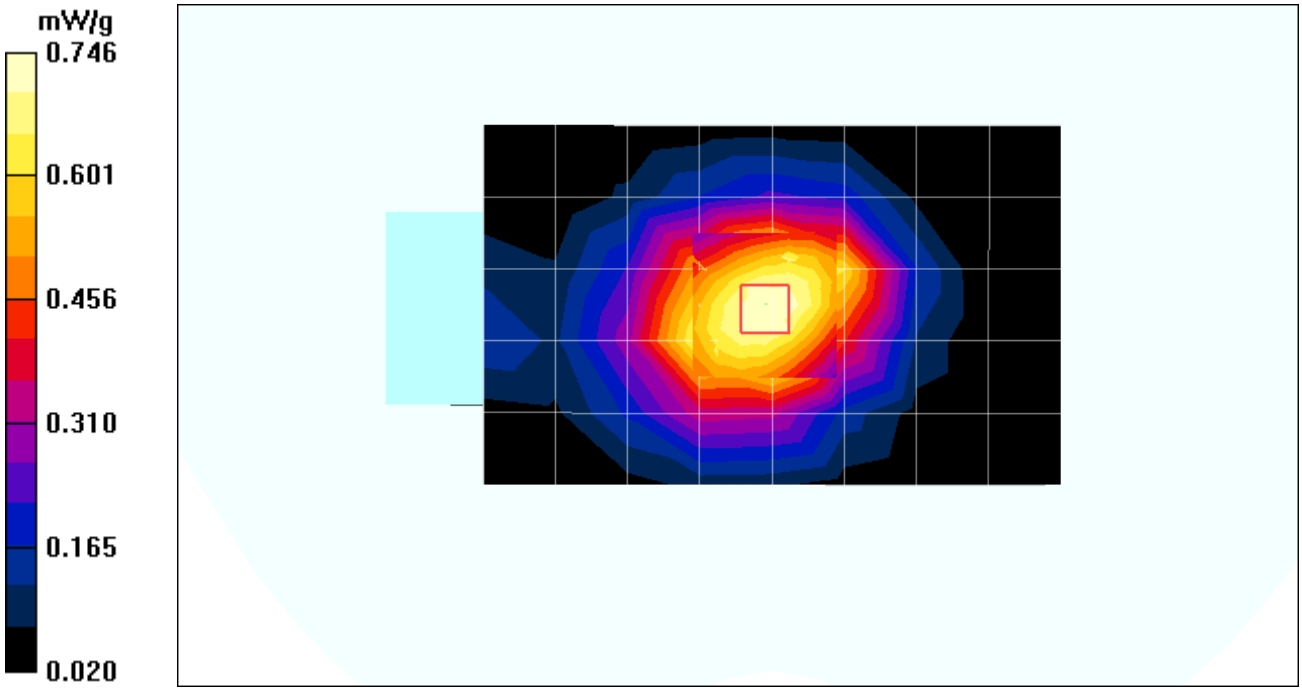
Reference Value = 28.4 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.684 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.746 mW/g



Date/Time: 2006-04-07 5:56:30

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.445 mW/g

SONY PCG-6C7P Top Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

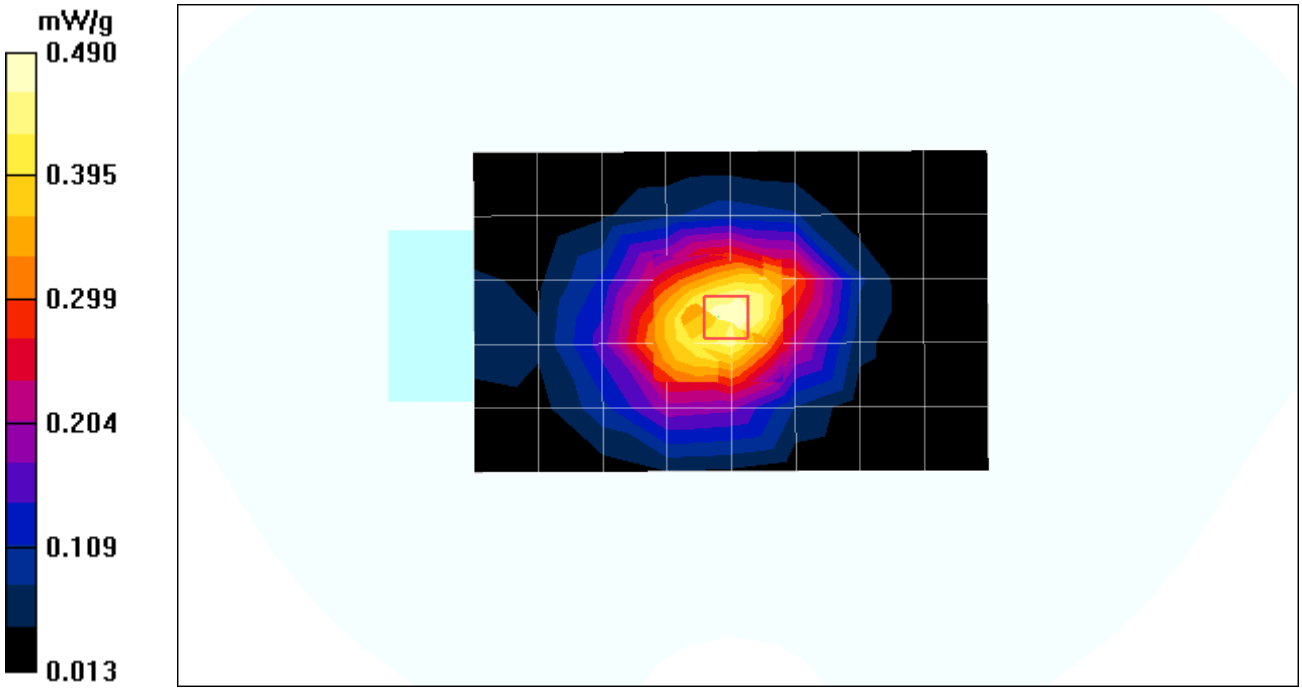
Reference Value = 19.5 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 0.742 W/kg

SAR(1 g) = 0.447 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.490 mW/g



Date/Time: 2006-04-07 6:13:36

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position CH1175.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1908.75 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Top Position CH1175/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.517 mW/g

SONY PCG-6C7P Top Position CH1175/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

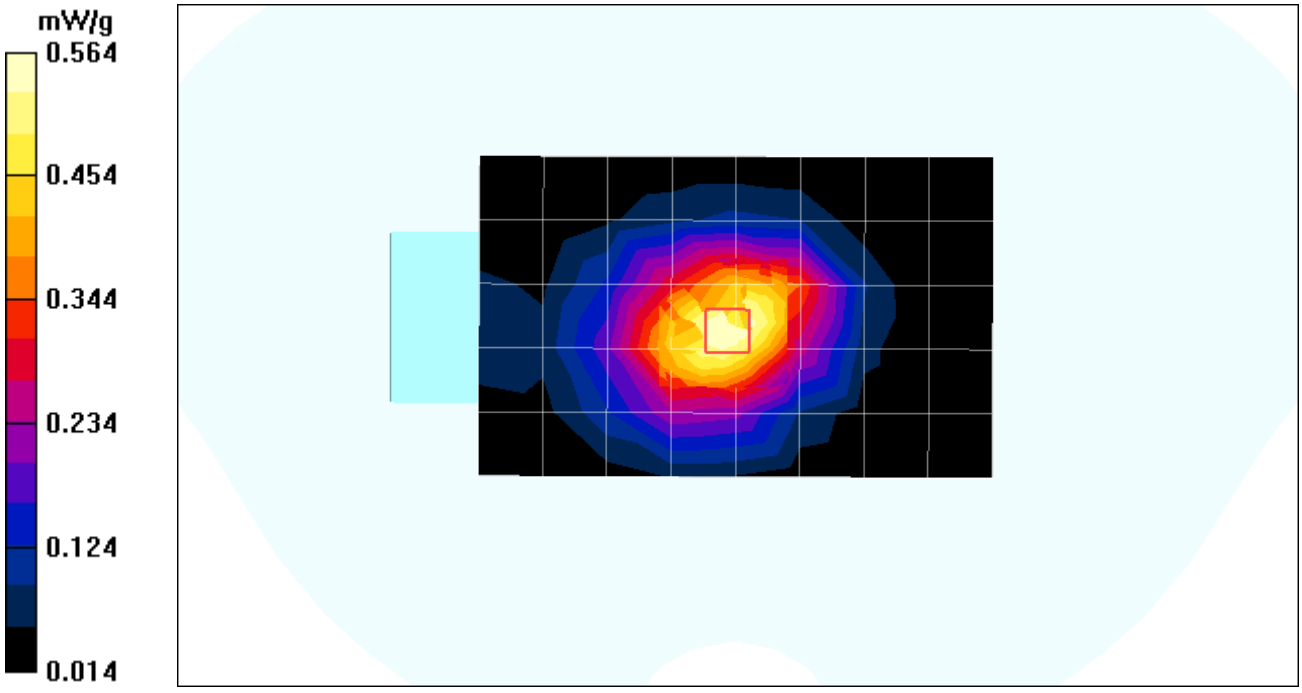
Reference Value = 20.3 V/m; Power Drift = -0.188 dB

Peak SAR (extrapolated) = 0.873 W/kg

SAR(1 g) = 0.518 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.564 mW/g



Date/Time: 2006-04-07 6:32:48

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Bottom Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Bottom Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.381 mW/g

SONY PCG-6C7P Bottom Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

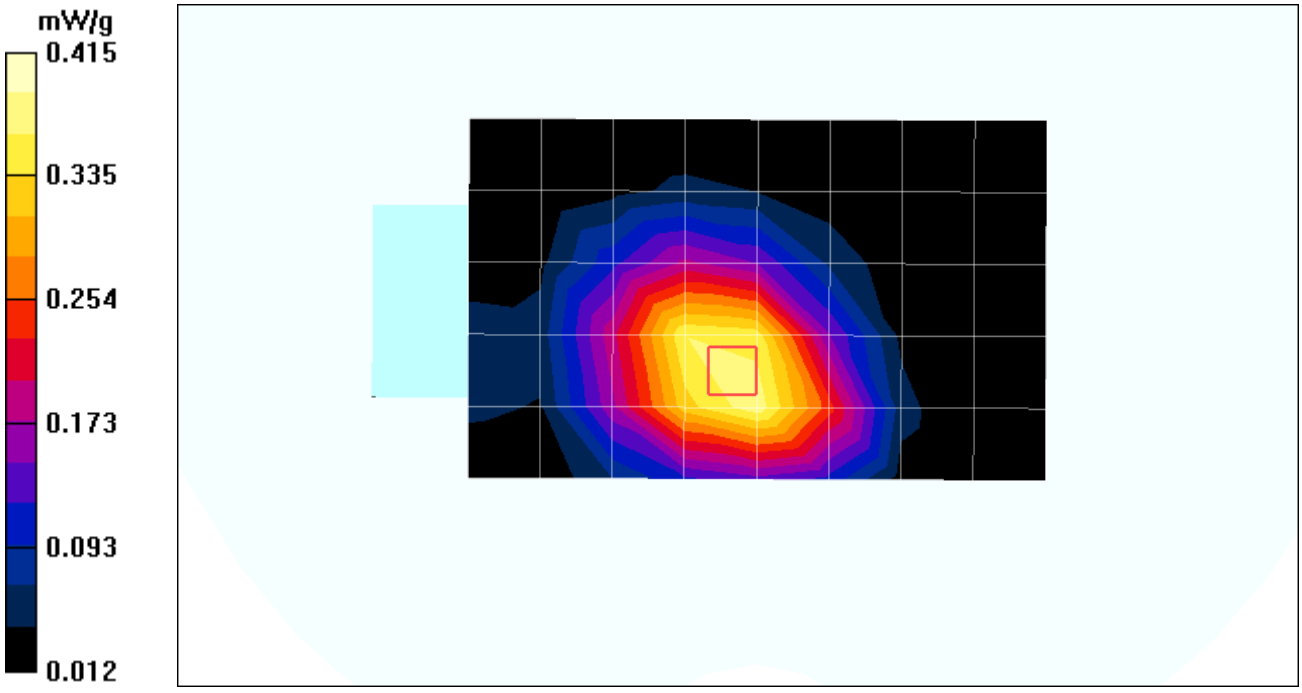
Reference Value = 13.7 V/m; Power Drift = -0.203 dB

Peak SAR (extrapolated) = 0.616 W/kg

SAR(1 g) = 0.387 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.415 mW/g



Date/Time: 2006-04-07 6:51:10

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Vertical Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Vertical Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.096 mW/g

SONY PCG-6C7P Vertical Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

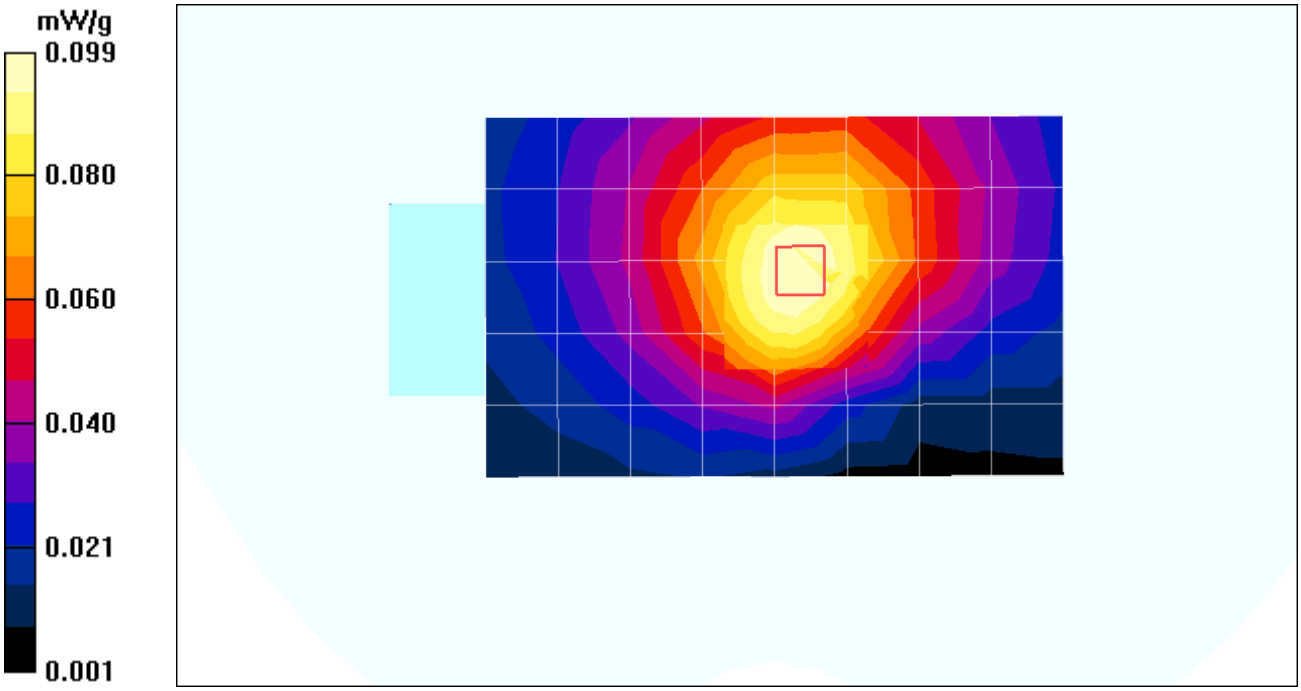
Reference Value = 8.34 V/m; Power Drift = 0.107 dB

Peak SAR (extrapolated) = 0.147 W/kg

SAR(1 g) = 0.093 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.099 mW/g



Date/Time: 2006-04-07 3:15:20

Test Laboratory: Nemko Korea File Name: SONY PCG-6C7P Top Position with Earphone CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

SONY PCG-6C7P Bottom Position with Earphone CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

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

SONY PCG-6C7P Bottom Position with Earphone CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

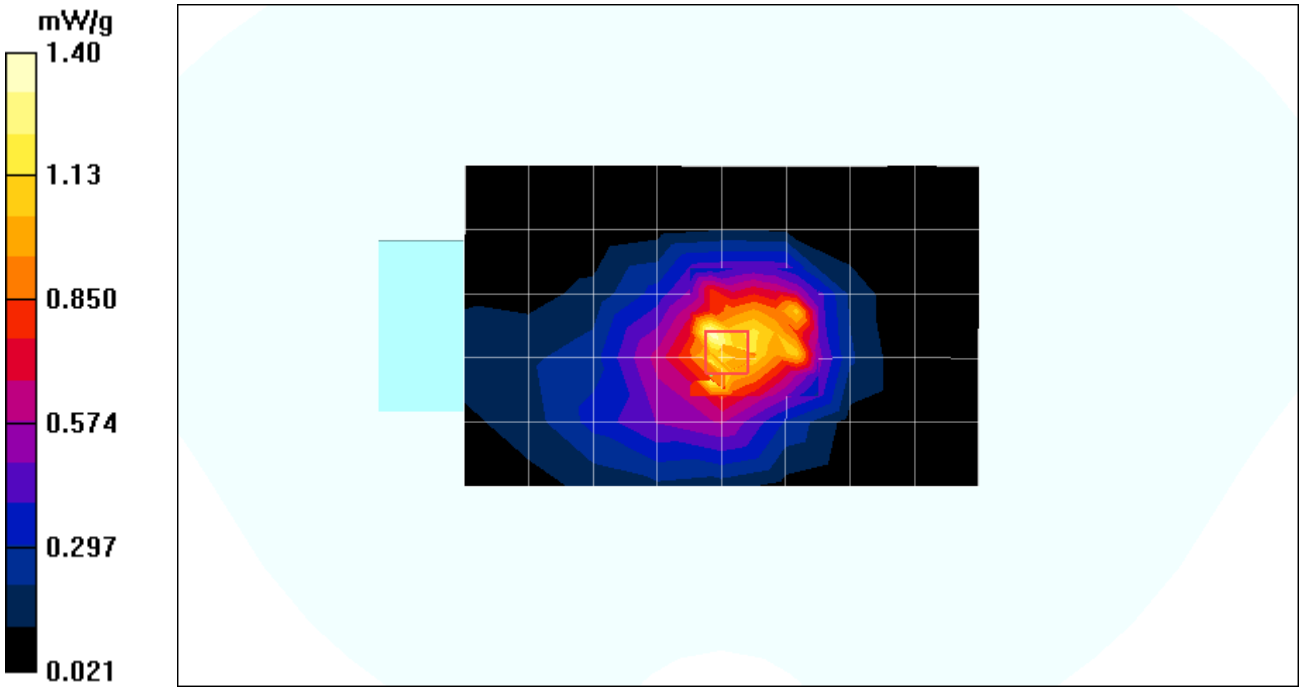
Reference Value = 28.2 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 2.26 W/kg

SAR(1 g) = 1.11 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.40 mW/g



9.2.2 Laptop 2 [SAMSUNG SENS X10 SE]

Date of Test : April 07.2006
Mixture Type: 1900MHz Muscle
Tissue Depth: 15.2 Cm

Modulation	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
PCS	1x EV-DO	25	1851.25	**-0.011**	TOP	**0.955**
		600	1880.00	**0.044**	TOP	**0.589**
		1175	1908.75	**0.050**	TOP	**0.699**
		600	1880.00	**0.011**	Bottom	**0.422**
		600	1880.00	**0.034**	Vertical	**0.120**
	CDMA2000	25	1851.25	**-0.195**	TOP with Earphone	**1.310**

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-07 11:55:51

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

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

Samsung SENS X10 SE Bottom Position CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

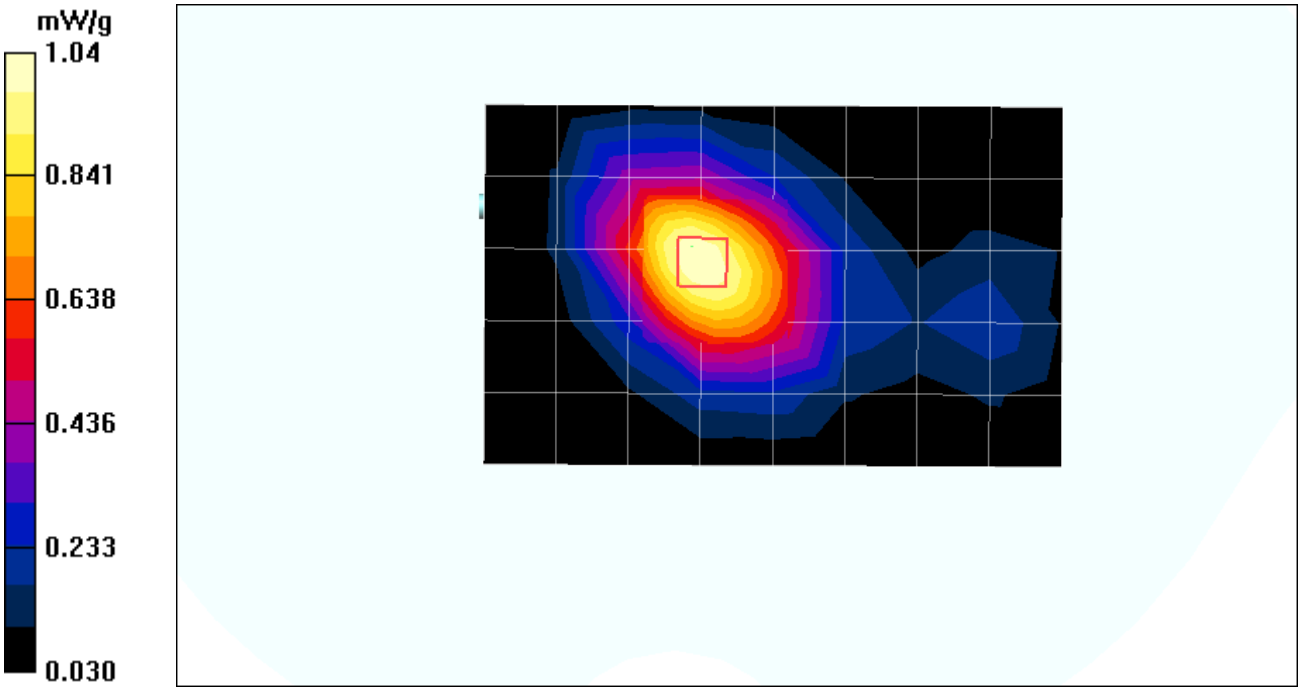
Reference Value = 25.7 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.955 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.04 mW/g



Date/Time: 2006-04-07 11:00:59

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.638 mW/g

Samsung SENS X10 SE Bottom Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

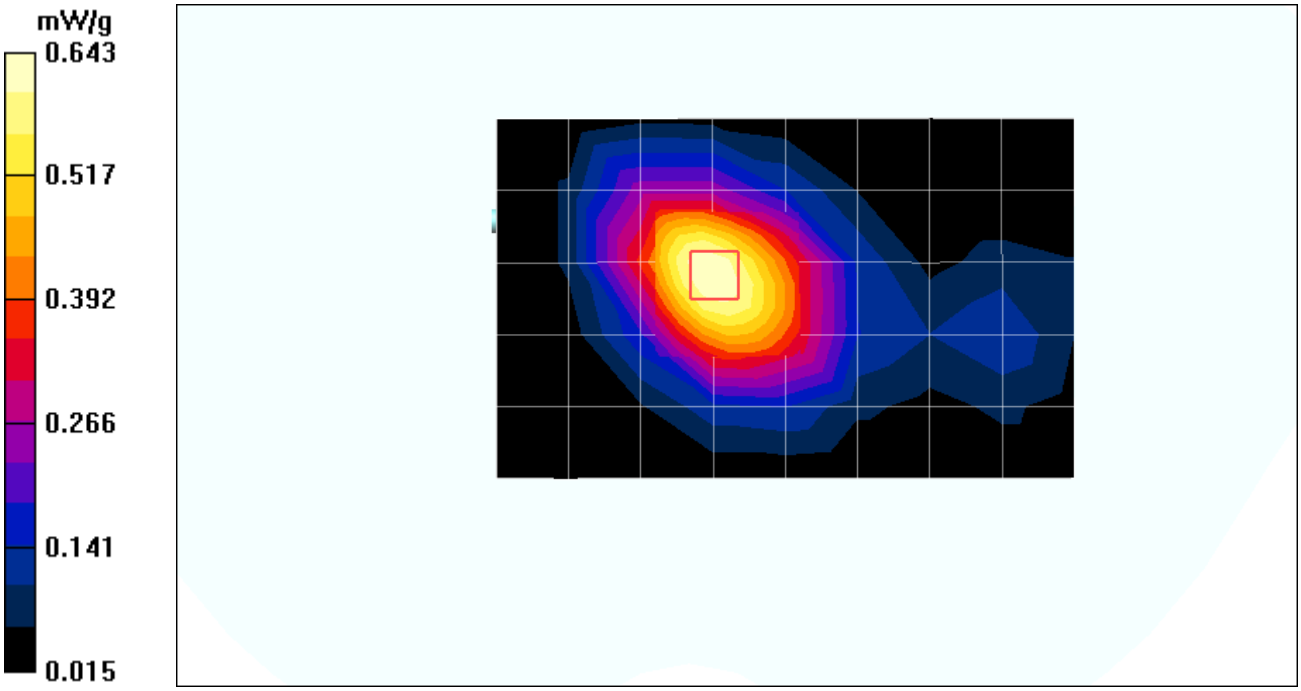
Reference Value = 20.0 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.976 W/kg

SAR(1 g) = 0.589 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

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



Date/Time: 2006-04-07 12:13:15

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position CH1175.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1908.75 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position CH1175/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.742 mW/g

Samsung SENS X10 SE Bottom Position CH1175/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

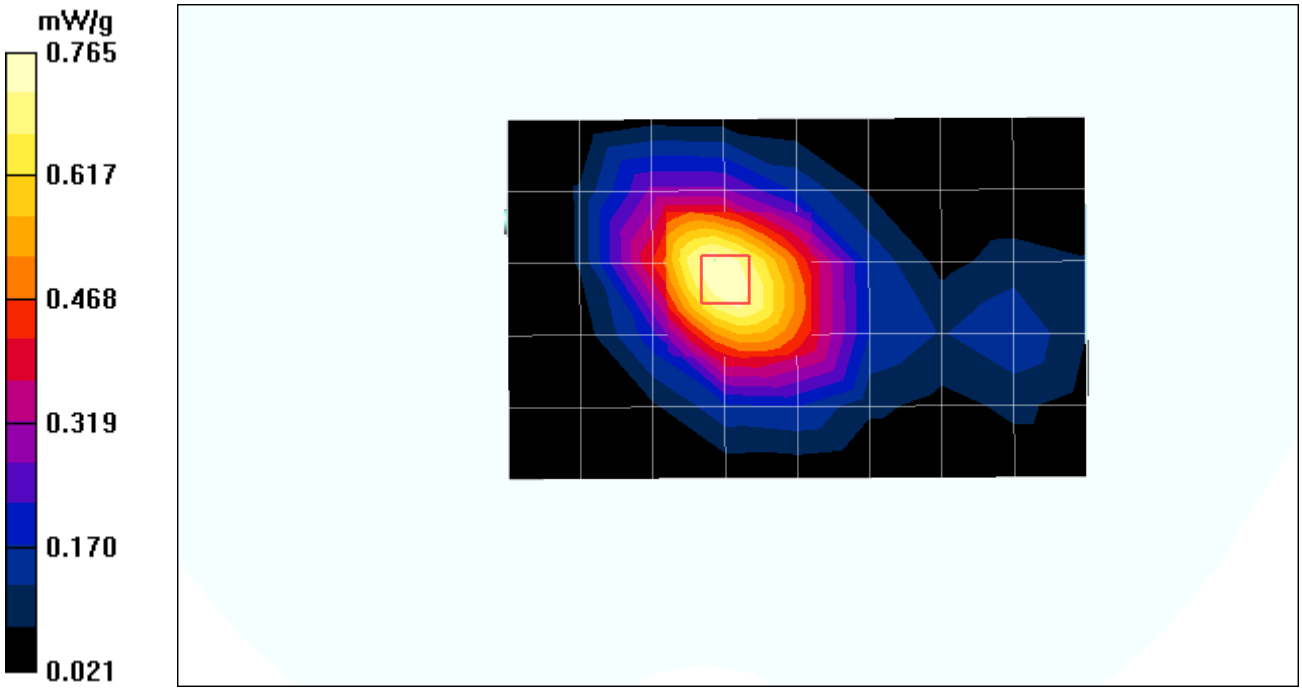
Reference Value = 21.6 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.699 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.765 mW/g



Date/Time: 2006-04-07 12:34:17

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Top Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Top Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.482 mW/g

Samsung SENS X10 SE Top Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

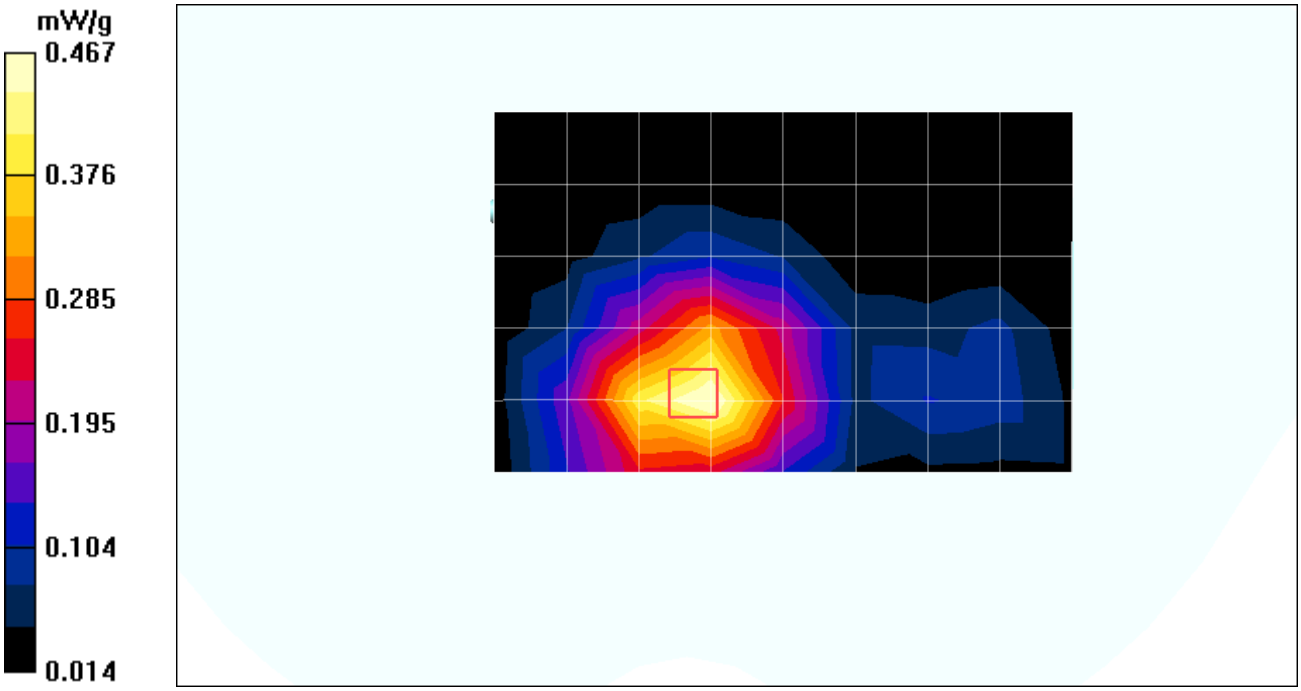
Reference Value = 12.2 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.688 W/kg

SAR(1 g) = 0.422 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.467 mW/g



Date/Time: 2006-04-07 1:04:34

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Vertical Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Vertical Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.127 mW/g

Samsung SENS X10 SE Vertical Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

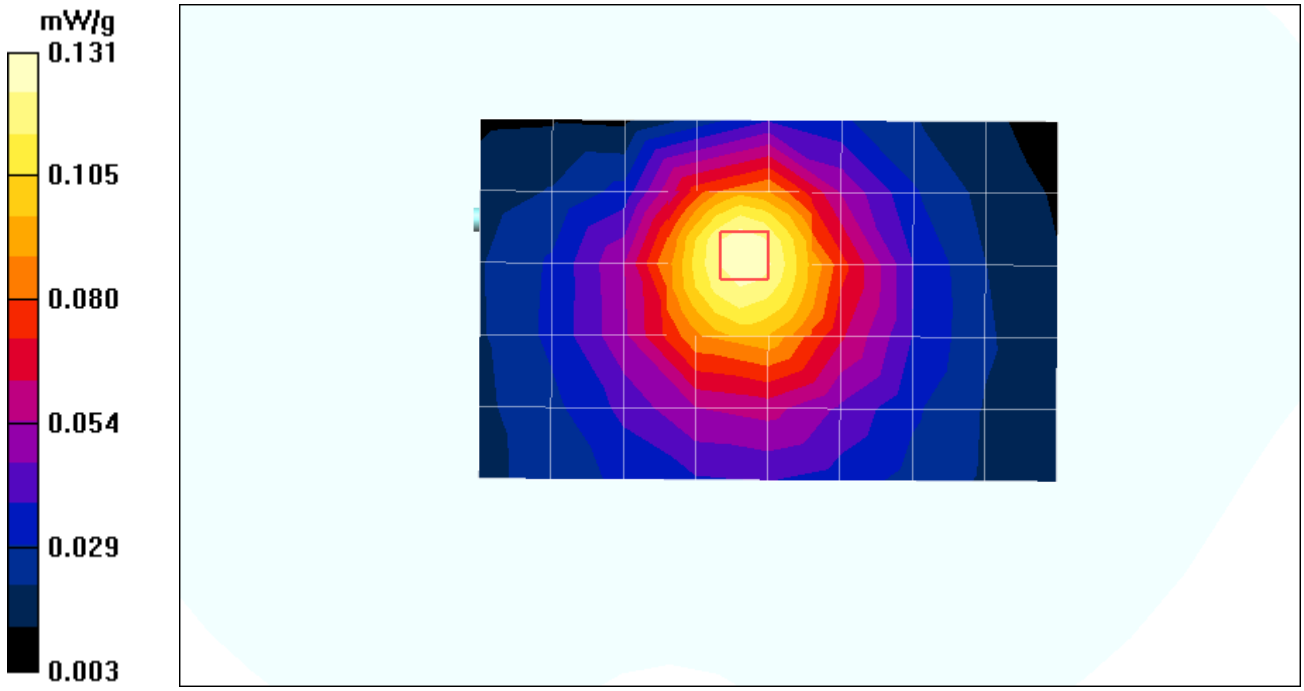
Reference Value = 7.90 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.195 W/kg

SAR(1 g) = 0.120 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.131 mW/g



Date/Time: 2006-04-07 2:22:19

Test Laboratory: Nemko Korea File Name: Samsung SENS X10 SE Bottom Position with Earphone CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Samsung SENS X10 SE Bottom Position with Earphone CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.34 mW/g

Samsung SENS X10 SE Bottom Position with Earphone CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

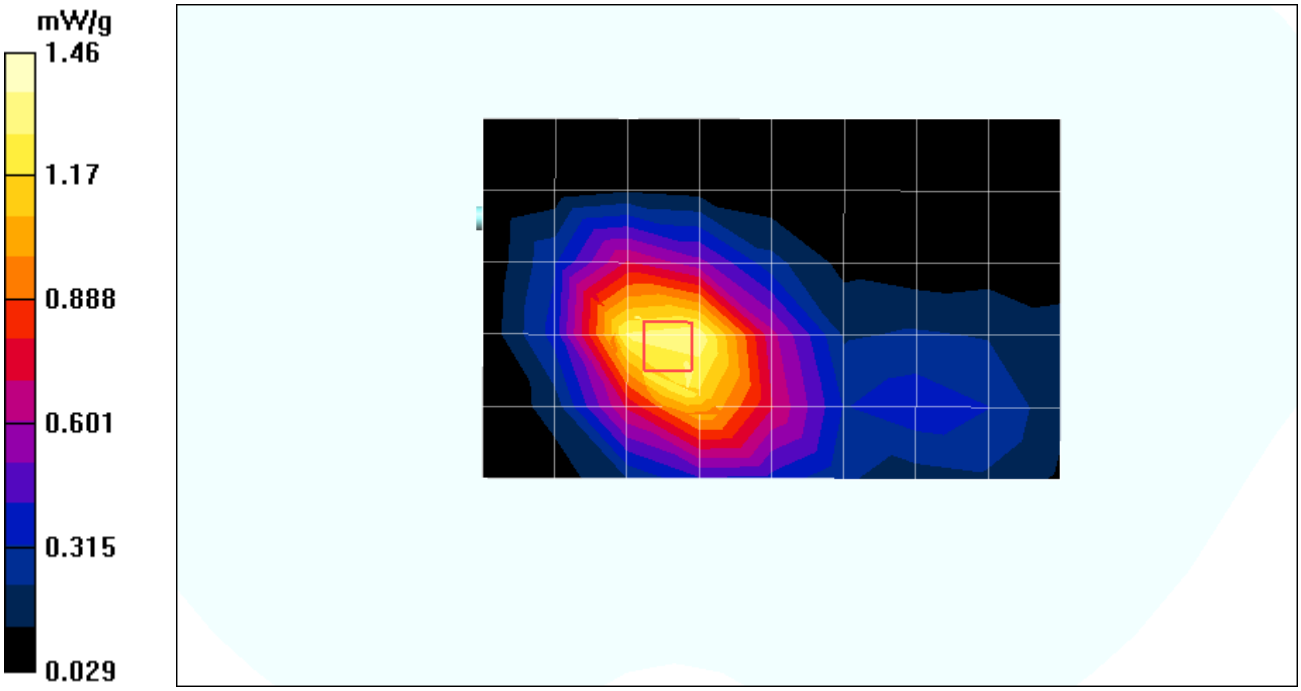
Reference Value = 30.8 V/m; Power Drift = -0.195 dB

Peak SAR (extrapolated) = 2.30 W/kg

SAR(1 g) = 1.31 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.46 mW/g



9.2.3 Laptop 3 [DELL Latitude D400]

Date of Test : April 07.2006
Mixture Type: 1900MHz Muscle
Tissue Depth: 15.2 Cm

Modulation	Application	Frequency		Power Drift (dB)	Antenna Position	1g SAR (W/kg)
		CH	Freq. (MHz)			
PCS	1x EV-DO	25	1851.25	**0.135**	TOP	**0.807**
		600	1880.00	**-0.072**	TOP	**0.497**
		1175	1908.75	**-0.198**	TOP	**0.580**
		600	1880.00	**-0.201**	Bottom	**0.209**
		600	1880.00	**0.001**	Vertical	**0.102**
	CDMA2000	25	1851.25	**-0.161**	TOP with Earphone	**1.180**

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 worst-case results are reported.
3. SAR Measurement System ■ DASY4
4. Phantom Configuration ☐ Left Head ■ Flat Phantom ☐ Right Head
5. SAR Configuration ☐ Head ■ Body ☐ Hand
6. Test Signal Call Mode ☐ Manu. Test Codes ■ Base Station Simulator

Date/Time: 2006-04-07 4:05:22

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.13 mW/g

DELL Latitude D400 Bottom Position CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

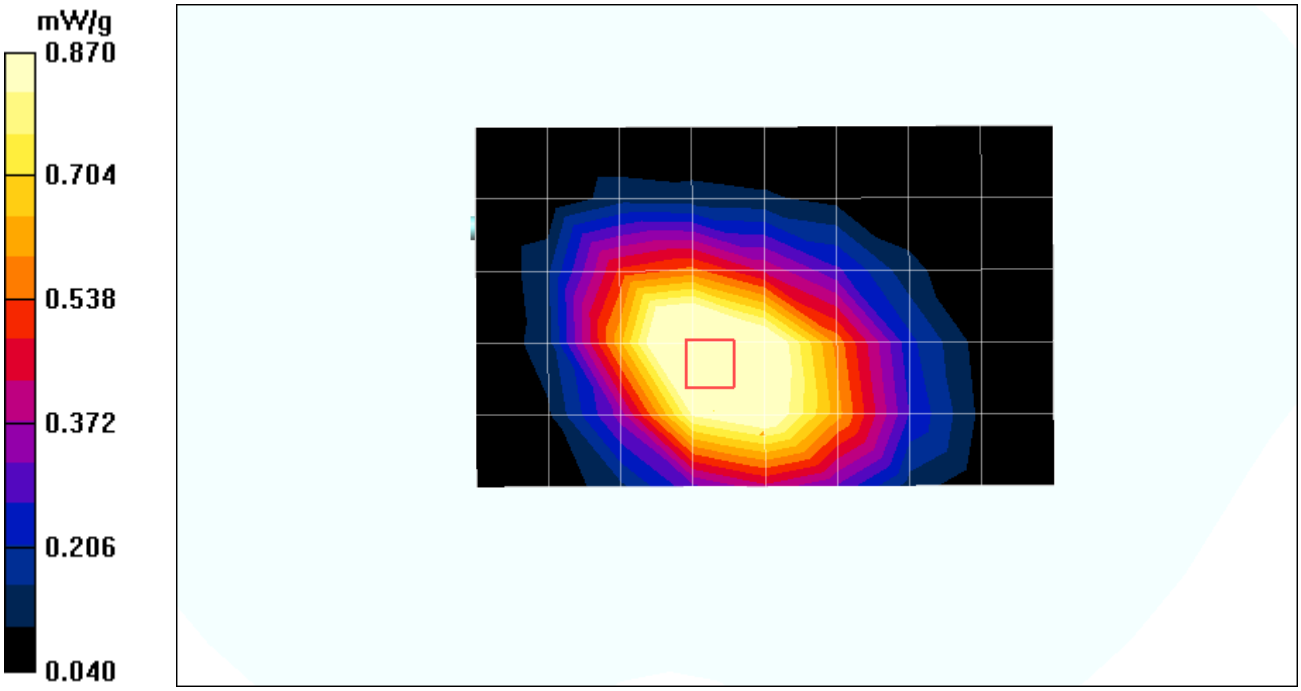
Reference Value = 28.7 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.807 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

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



Date/Time: 2006-04-07 4:22:50

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.514 mW/g

DELL Latitude D400 Bottom Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

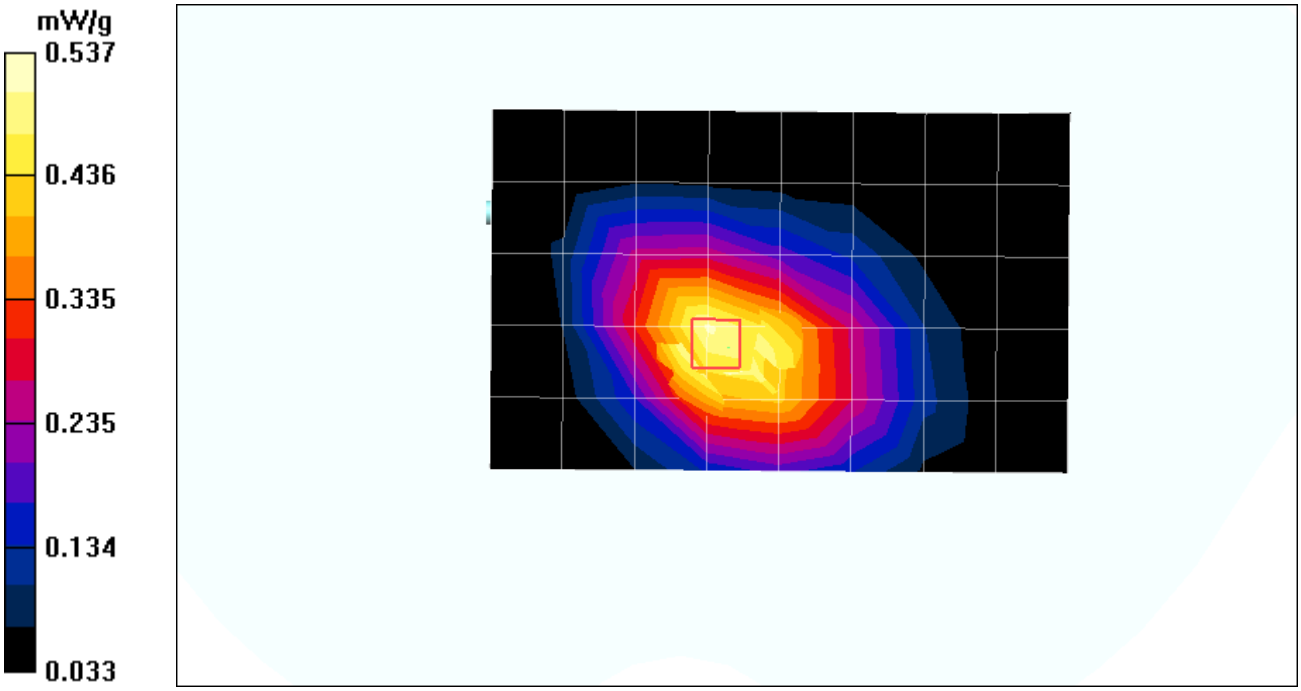
Reference Value = 17.8 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 0.777 W/kg

SAR(1 g) = 0.497 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.537 mW/g



Date/Time: 2006-04-07 4:40:10

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position CH1175.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1908.75 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position CH1175/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.592 mW/g

DELL Latitude D400 Bottom Position CH1175/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

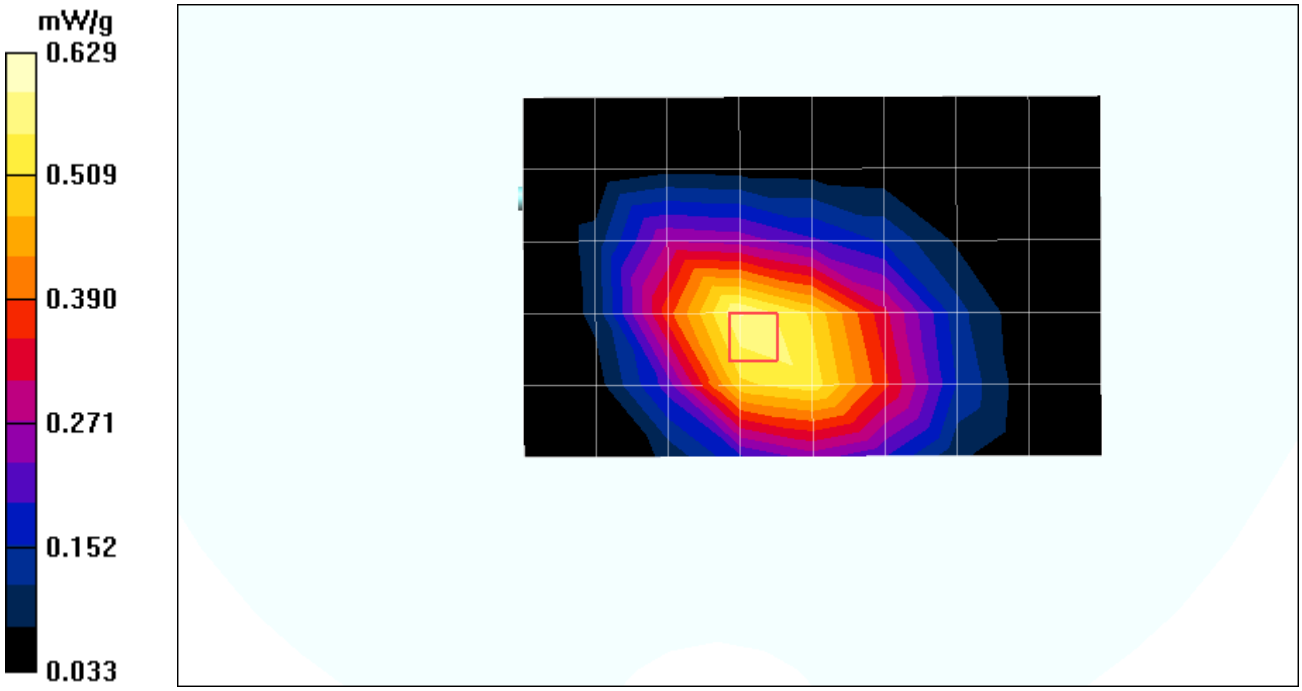
Reference Value = 18.7 V/m; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 0.933 W/kg

SAR(1 g) = 0.580 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.629 mW/g



Date/Time: 2006-04-07 4:58:25

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Top Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1908.75 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Top Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.215 mW/g

DELL Latitude D400 Top Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

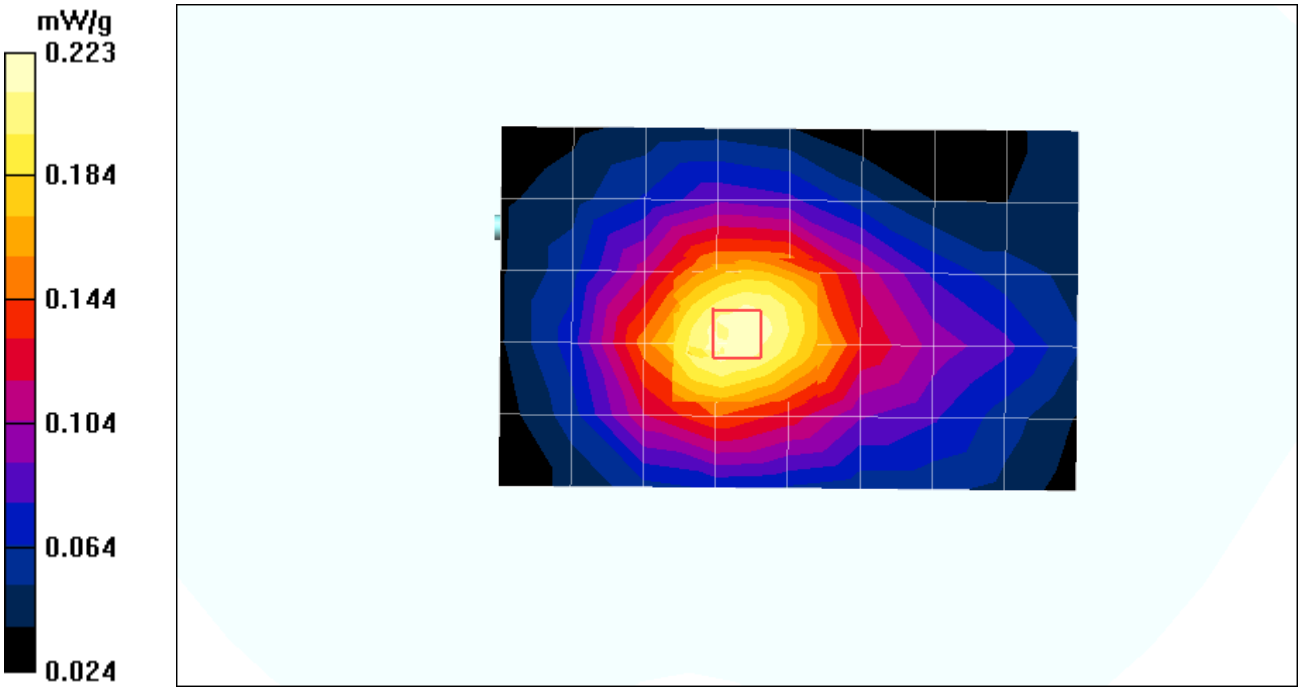
Reference Value = 11.8 V/m; Power Drift = -0.201 dB

Peak SAR (extrapolated) = 0.315 W/kg

SAR(1 g) = 0.209 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.223 mW/g



Date/Time: 2006-04-07 7:09:35

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Vertical Position CH600.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1880 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Vertical Position CH600/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.103 mW/g

DELL Latitude D400 Vertical Position CH600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

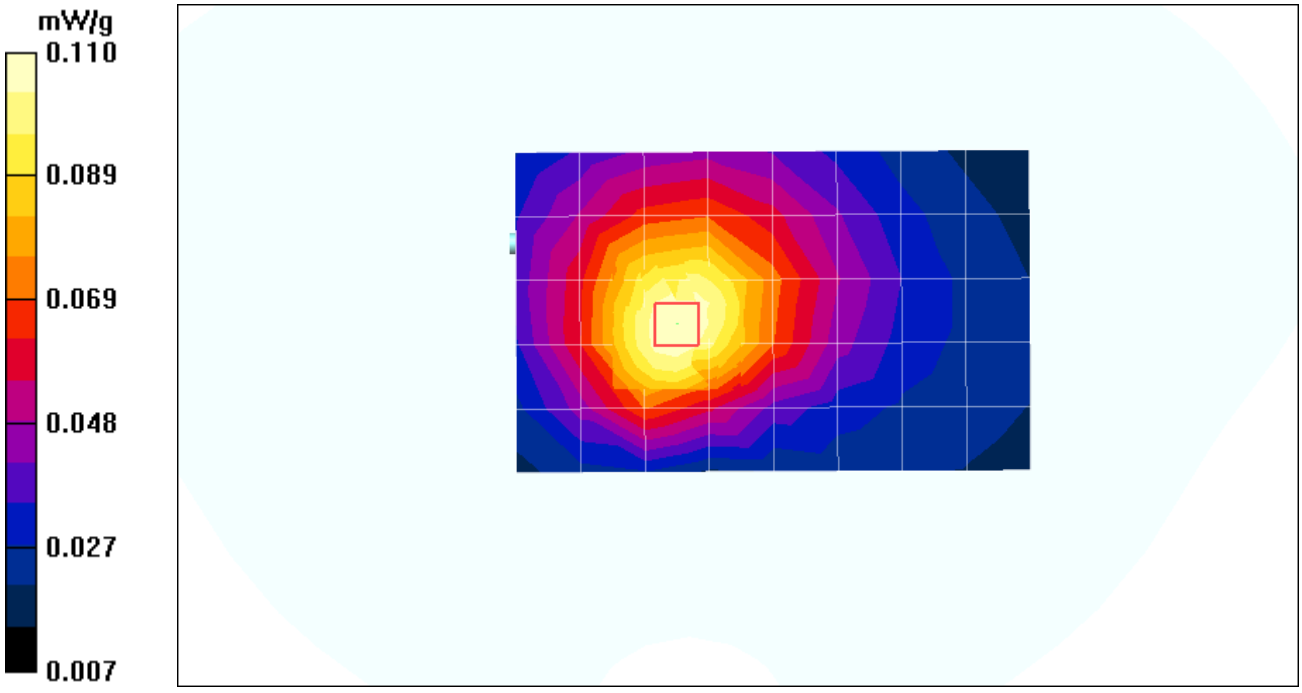
Reference Value = 9.41 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.160 W/kg

SAR(1 g) = 0.102 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.110 mW/g



Date/Time: 2006-04-07 3:38:28

Test Laboratory: Nemko Korea File Name: DELL Latitude D400 Bottom Position with Earphone CH25.da4

DUT: TARCDU-550 Type: USB Serial: 000000001 Applicant Name: Cmotech Co.,Ltd

Communication System: PCS Frequency: 1851.25 MHz

Duty Cycle: 1:1 Phantom section: Flat Section

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.5 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

DASY4 Configuration:

Probe: ET3DV6 - SN1591; ConvF(4.67, 4.67, 4.67); Calibrated: 2006-03-23

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn672; Calibrated: 2006-03-17

Phantom: SAM Phantom; Type: SAM; Serial: TP-1358

Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

DELL Latitude D400 Bottom Position with Earphone CH25/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.38 mW/g

DELL Latitude D400 Bottom Position with Earphone CH25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

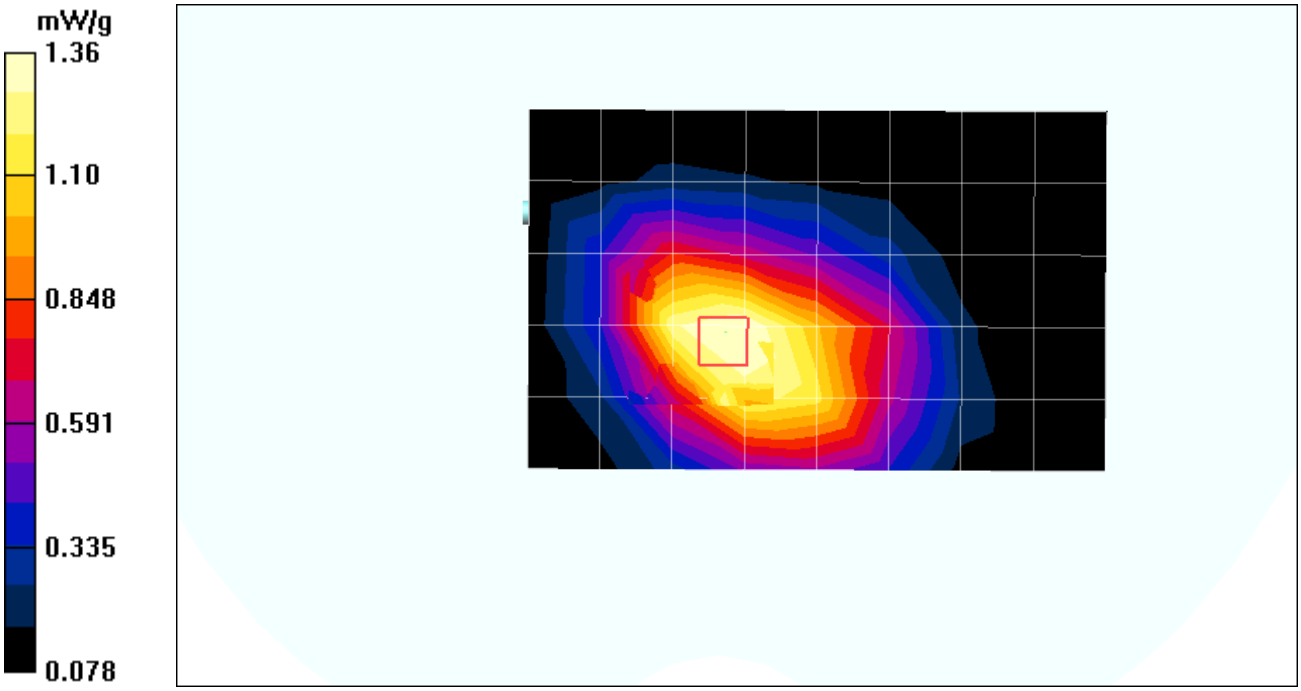
Reference Value = 31.8 V/m; Power Drift = -0.161 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.18 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.36 mW/g



10. SAR Test Equipment

Table 10.1 Test Equipment Calibration

Description	Model	Serial No.	Calibration Date	Calibration Interval
Staubli Robot Unit	RX60L	F05/51E1A1/A/01	N/A	N/A
Data Acquisition Electronics	DAE4	672	March.17. 2006	1 year
E-Field Probe	ET3DV6	1591	March.23. 2006	1 year
Electro-Optical Converter	EOC3	398	N/A	N/A
SAM Twin Phantom V4.0C	TP-1358	SM 00 T02 DA	N/A	N/A
Validation Dipole Antenna	D835V2	4d017	February.20. 2006	2 year
Validation Dipole Antenna	D900V2	1d016	April.05. 2006	2 year
Validation Dipole Antenna	D1800V2	2d111	February.17. 2006	2 year
Validation Dipole Antenna	D1900V2	5d059	April.11. 2006	2 year
VSA Series Transmitter Tester	E4406A	US39480757	August.17.2005	1 year
PSA Series Spectrum Analyzer	E4440A	MY44022567	December.31.2005	1 year
Wireless Communications Test Set	8960 Series 10	GB43193659	June.09. 2005	1 year
Dielectric Probe Kit	85070E	MY44300121	N/A	N/A
Network Analyzer	8753ES	US39171172	Mar.10. 2006	1 year
Power Amplifier	NKRFSPA	NK00SP18	May.24. 2005	1 year
Power Meter	437B	2912U01687	December.06.2005	1 year
Power Sensor	8481A	3318A83210	August.17.2005	1 year
Power Meter	NRVS	835360/002	December.06.2005	1 year
Power Sensor	NRV-Z32	836019/028	December.06.2005	1 year
Series Signal Generator	E4436B	US39260598	December.06.2005	1 year

Note:

The E-field probe was calibrated by SPEAG, by waveguide technique procedure. Dipole Validation measurement is performed by Nemkokorea Lab. before each test. The brain simulating material is calibrated by Nemkokorea using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

11. References

[1] IEEE 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003

[2] EN 50361:2001, “Basic standard fields from mobile phones (200MHz – 3 GHz)”, July 2001

[3] IEC 62209 - 1, “Specific Absorption Rate (SAR) in the frequency range of 300 MHz to 3 GHz

[4] IEC 62209 - 2, Draft Version 0.9, “Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body - Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation and Procedures
Part 2: Procedure to determine the Specific Absorption Rate (SAR) for … including accessories and multiple transmitters”, December 2004

[5] OET Bulletin 65, Supplement C, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, Edition 01-01

[6] ANSI-PC63.19-2001, Draft 3.6, “American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids”, April 2005

APPENDIX A

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 (*p*). It is also defined as the rate of RF energy absorption pet unit mass at a point in an absorbing body (see Fig. A.1).

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{pdv}\right)$$

Figure A.1 SAR Mathematical Equation

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

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

Where :

σ = conductivity of the tissue-simulant material (S/m)
p = mass density of the tissue-simulant material (kg/m3)
E = Total RMS electric field strength (V/m)

Note:
The primary factors that control rate or energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

APPENDIX B : Probe Calibration

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

Client Dymstec

Certificate No: ET3-1591_Mar06

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1591
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	March 23, 2006
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 ± 3)°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 E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: March 23, 2006

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

Certificate No: ET3-1591_Mar06 Page 1 of 9

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

S Schweizerischer Kalibrierdienst
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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
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) 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
b) 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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ET3DV6

SN:1591

Manufactured:	May 18, 2001
Last calibrated:	July 22, 2004
Recalibrated:	March 23, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1591 **March 23, 2006**

DASY - Parameters of Probe: ET3DV6 SN:1591

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.88** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**95** mV
NormY	**1.84** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**95** mV
NormZ	**1.83** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**95** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	7.6	4.2
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	6.4	3.5
SAR_{be} [%]	With Correction Algorithm	0.2	0.3

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

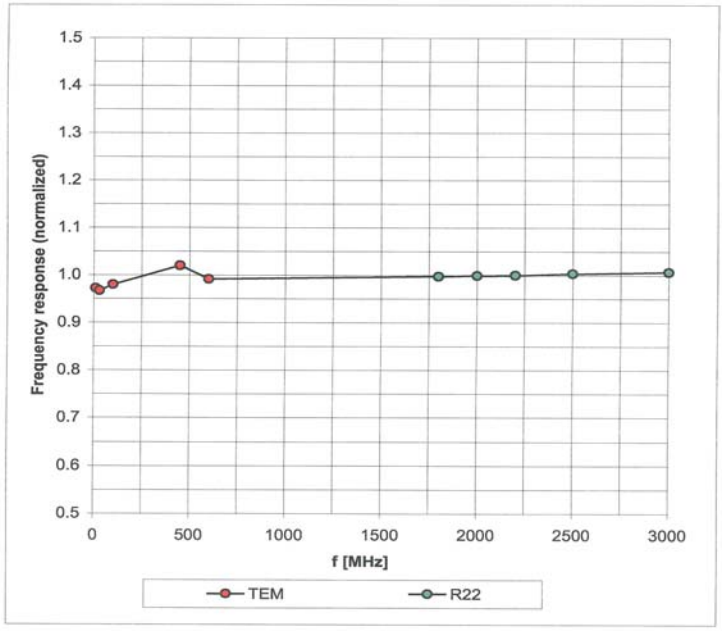
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).
[B] Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1591 March 23, 2006

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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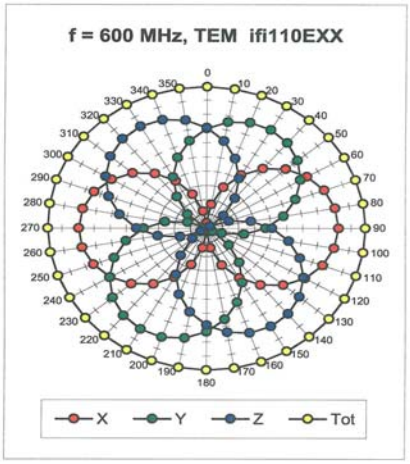
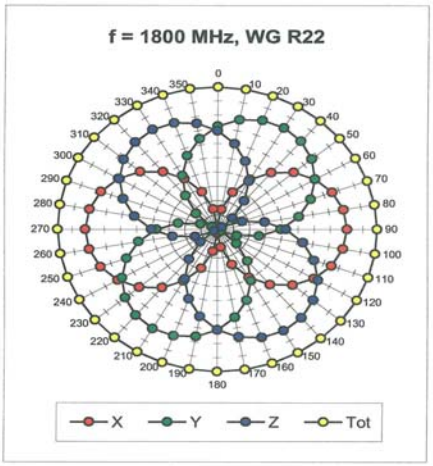
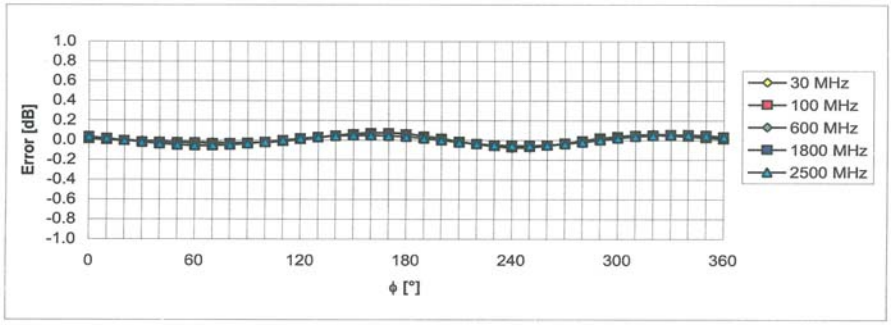
ET3DV6 SN:1591 March 23, 2006

Receiving Pattern (ϕ), ϑ = 0°







Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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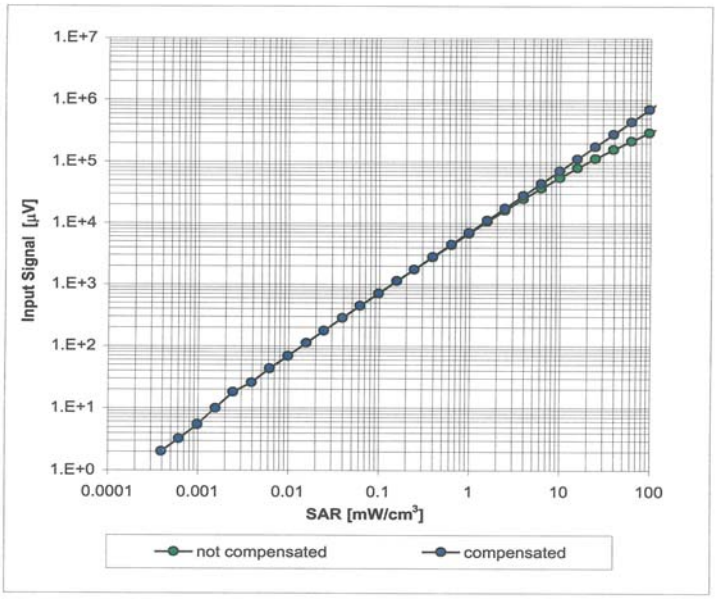
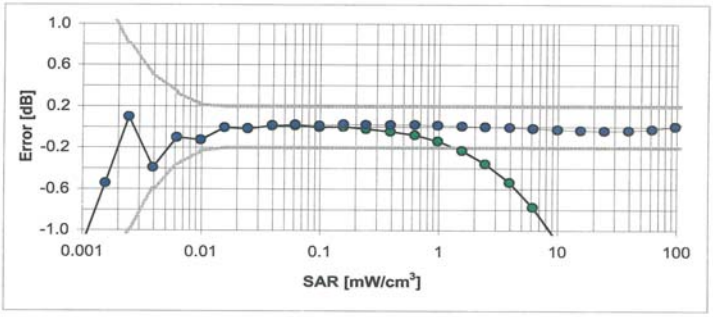
ET3DV6 SN:1591 March 23, 2006

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)



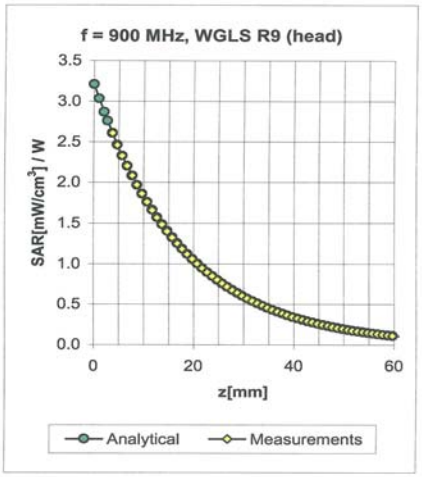


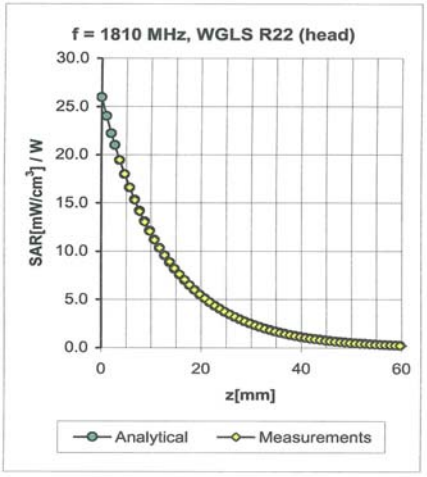
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ET3-1591_Mar06 Page 7 of 9

ET3DV6 SN:1591 March 23, 2006

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.49	1.91	6.87 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.43	2.66	5.41 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.58	2.15	4.59 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.40	2.24	6.35 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.63	2.34	4.67 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.62	2.03	4.18 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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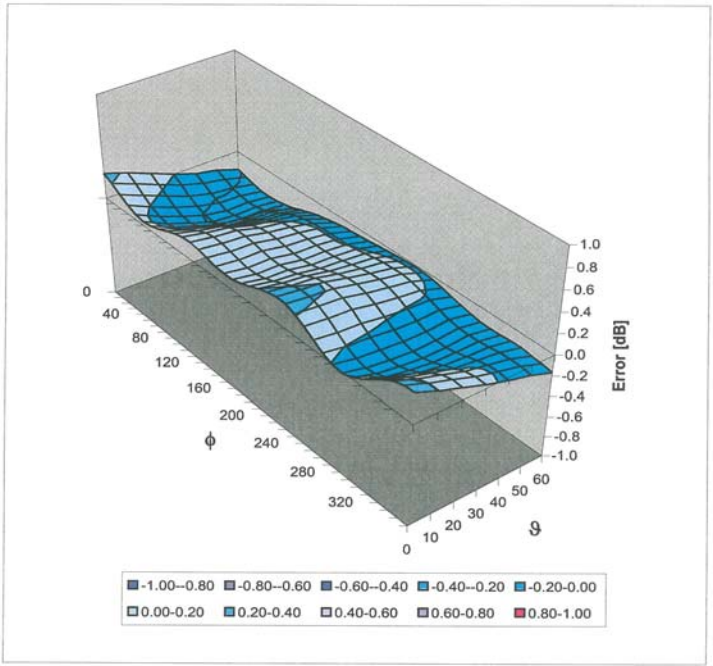
ET3DV6 SN:1591 March 23, 2006

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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APPENDIX C : Photographs of EUT

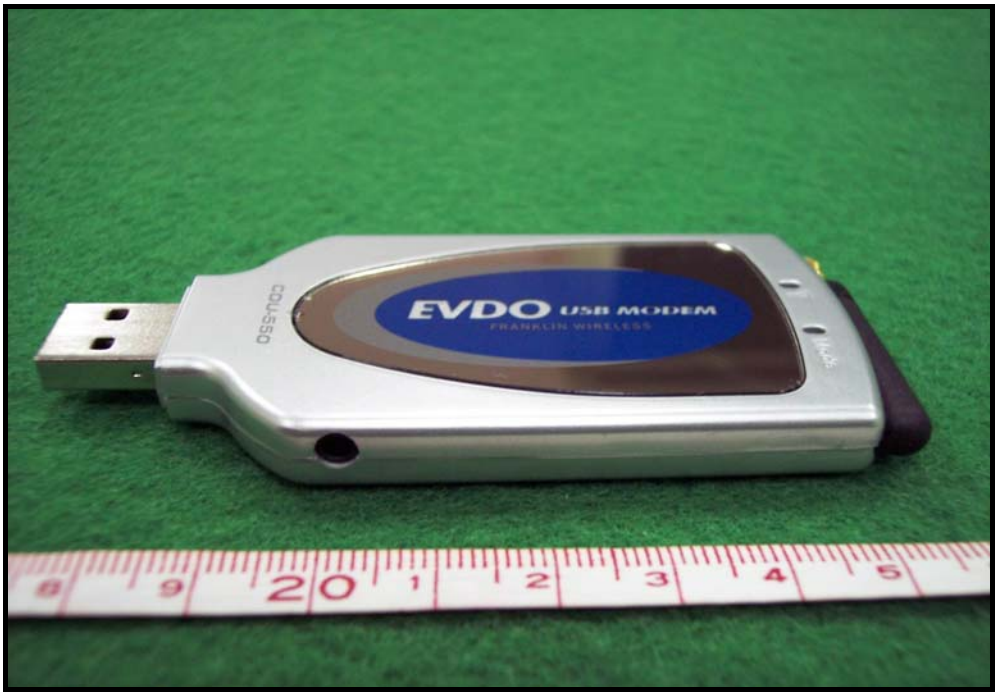
The Front View with Case

The Rear View with Case

The Front View without Case

The Rear View without Case

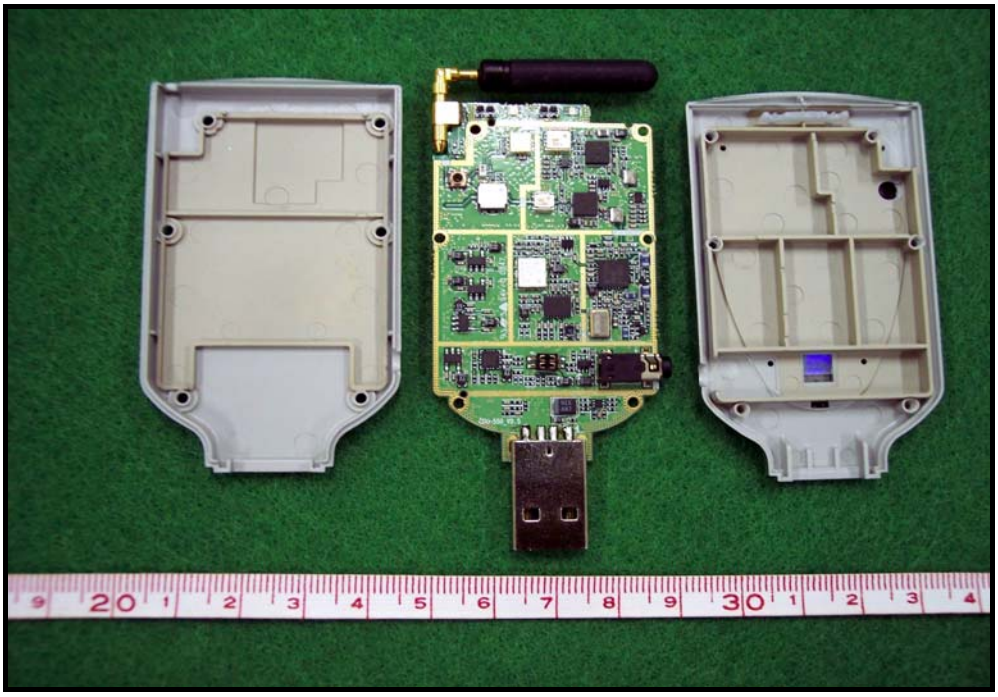
The Left Side View



The Right Side View

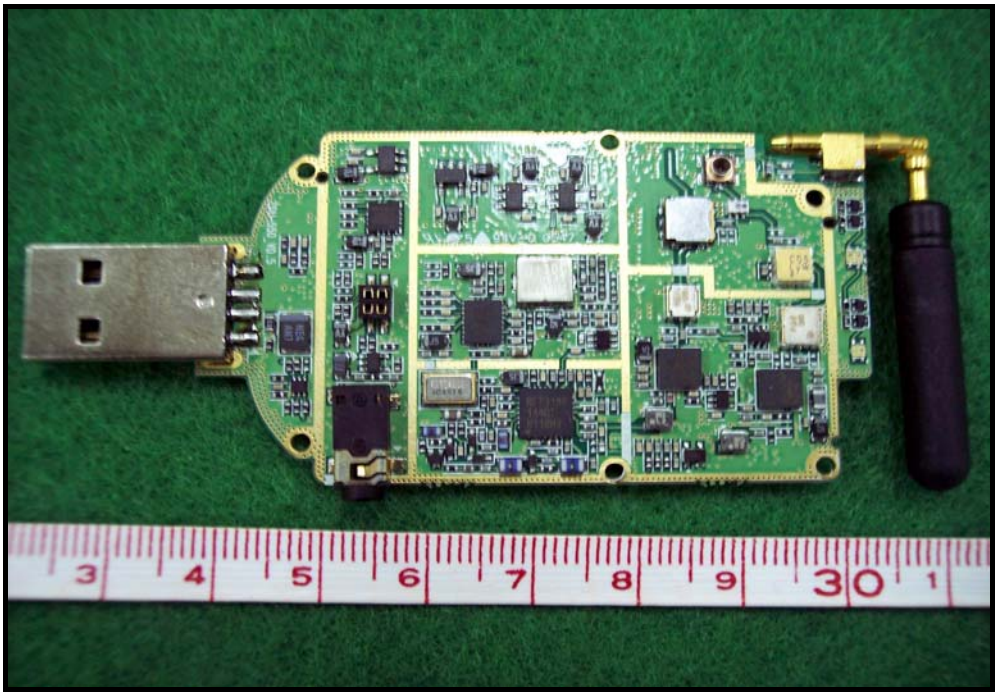
The Interface side View

The Topside View

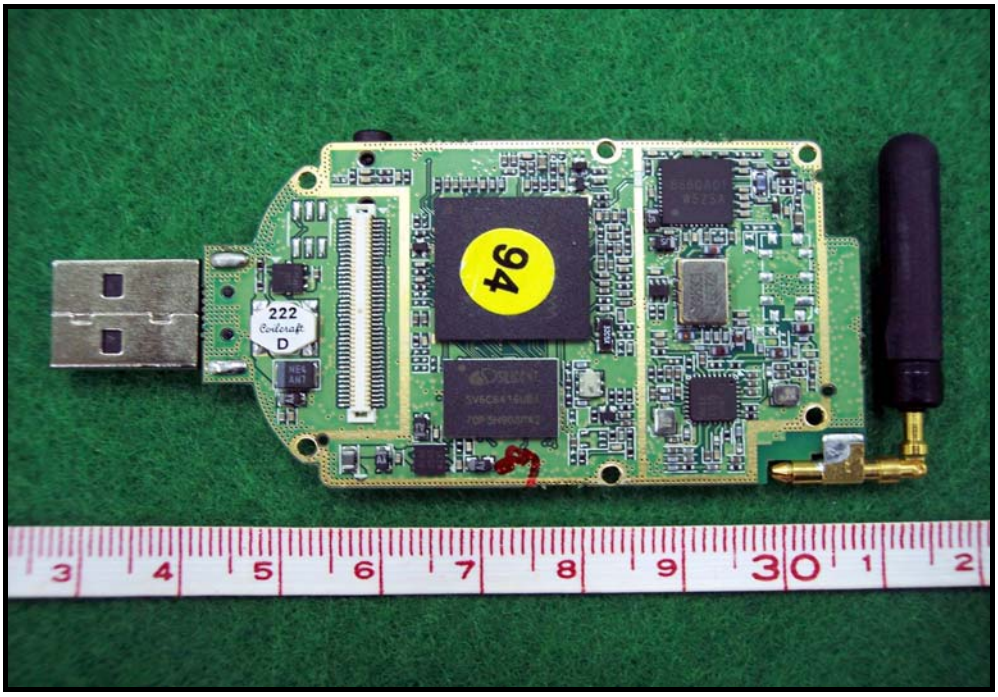


Overall View of EUT

The External USB Cable



The Inside View of Main board



The Inside View of Main board

Label View of EUT

APPENDIX D : Test Position of EUT

1. SONY (PCG-6C7P)

Top Position

Bottom Position

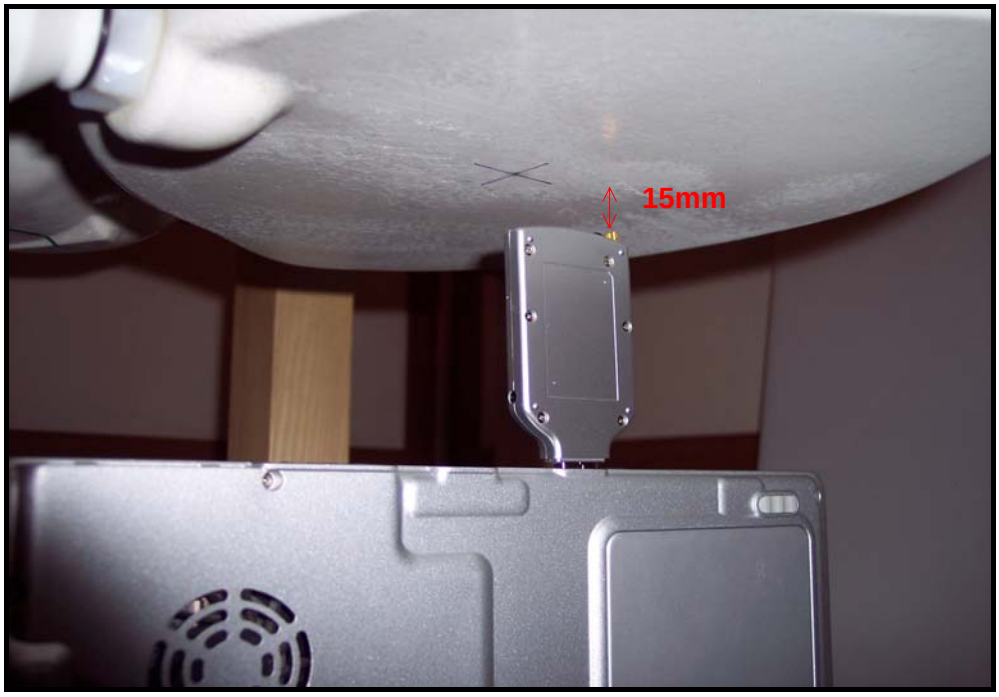
Vertical Position

Top Position with Earphone

2. SAMSUNG (SENS X10 SE)

Top Position

Bottom Position



Vertical Position

Bottom Position with Earphone

3. DELL (Latitude D400)

Top Position

Bottom Position

Vertical Position

Top Position with Earphone