SAR EVALUATION REPORT

Report No. : 25IE0112-HO-3

Applicant	:	**Panasonic Communications Co., Ltd**
Type of Equipment	:	**Color LCD Portable Unit**
Model No.	:	**KX-THA12**
FCC ID	:	**ACJ96NKX-THA12**
Test standard	:	**FCC47CFR 2.1093** **FCC OET Bulletin 65, Supplement C**
Test Result	:	**Complied**
Max SAR Measured	:	**Head 0.179W/kg (2480MHz)** **Body 0.342W/kg (2480MHz)**

1. This test report shall not be reproduced except full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the SAR profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test : May 19 and 31, 2005

Tested by : M. Ikuta

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SECTION 1 : Client information

Company Name	:	Panasonic Communications Co., Ltd.
Brand Name	:	Panasonic
Address	:	1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka, 812-8531 Japan
Telephone Number	:	+81-92-477-1405
Facsimile Number	:	+81-92-477-1487
Contact Person	:	Kunihiko Nawata

SECTION 2 : Equipment under test (E.U.T.)

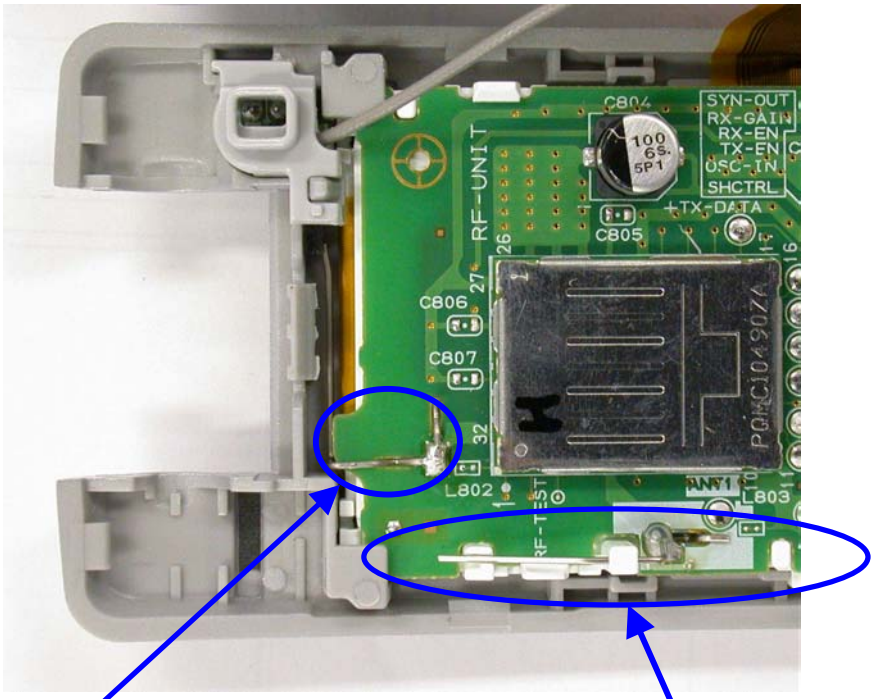
Type of Equipment	:	Color LCD Portable Unit
Model No.	:	KX-THA12
Serial No.	:	3512 80f0 8000
Country of Manufacture	:	Japan
Receipt Date of Sample	:	May 16, 2005
Condition of EUT	:	Engineering prototype (Not for sale: This sample is equivalent to mass-produced items.)
Rating	:	DC3.6V(Battery)
Size of EUT(L*W*H)	:	170*45*35
Battery option	:	Only one type Ni-MH Battery DC3.6V / 830mA.h.
Accessories	:	Headset
Category Identified	:	Portable device

Face (Color LCD)

Back(Telephone)

2.2 Product Description of EUT

Tx Frequency	: 2402MHz~2480MHz
Modulation	: FHSS
Rating (Inner)	: DC 2.5V
Max.Output Power Tested	: 21.0dBm (EIRP)
Antenna Type	: Whip Antenna
Antenna Gain	: 2.14 dBi
Position of Antenna	: See photographs of the following



Whip antenna 2
Mode 2(Sub antenna)

Whip antenna 1
Mode1, Mode 2(Main antenna)

SECTION 3 : Requirements for compliance testing defined by the FCC

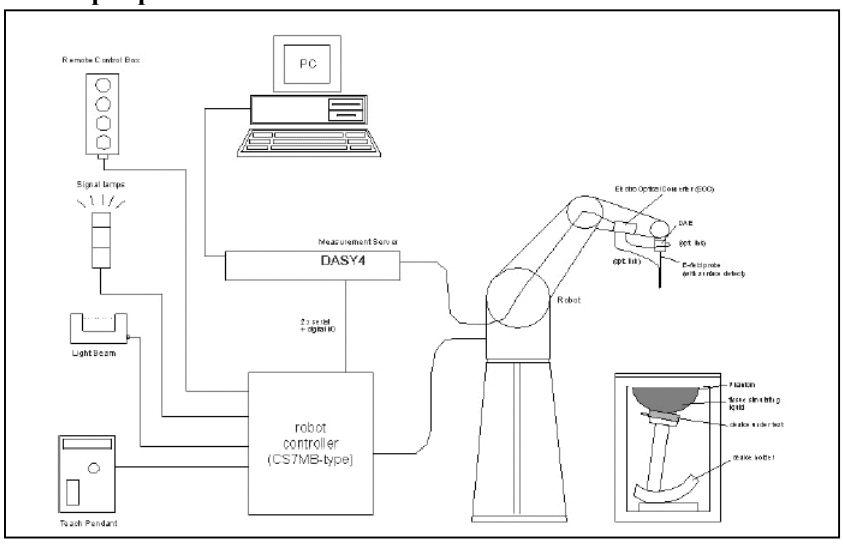
The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at
maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).
2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

SECTION 4 : Dosimetry assessment setup

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9 m), which positions the probes with a positional repeatability of better than +/- 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetry probe ET3DV6, SN: 1684 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [2] with accuracy of better than +/-10%. The spherical isotropy was evaluated with the procedure described in [3] and found to be better than +/-0.25 dB. The phantom used was the
SAM Twin Phantom as described in FCC supplement C, IEEE P1528 and CENELEC EN50361.

4.1 Configuration and peripherals



The DASY4 system for performing compliance tests consist of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software.
   An arm extension for accommodating the data acquisition electronics (DAE).

2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

3. A data acquisition electronic (DAE), which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection.
   The EOC is connected to the measurement server.

5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

7. A computer operating Windows 2000.

8. DASY4 software.

9. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

10. The SAM twin phantom enabling testing left-hand and right-hand usage.

11. The device holder for handheld mobile phones.

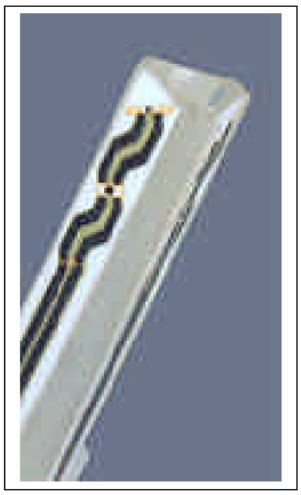
12. Tissue simulating liquid mixed according to the given recipes.

13. Validation dipole kits allowing to validate the proper functioning of the system.

4.2 System components

4.2.1 ET3DV6 Probe Specification

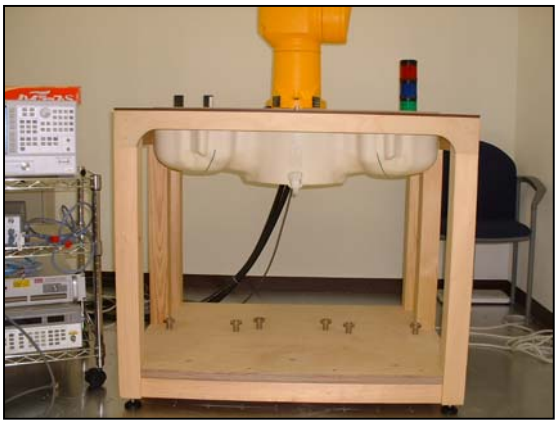
Construction:
Symmetrical design with triangular core
Built-in optical fiber for surface detection System
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol ether)
Calibration:
Basic Broad Band calibration in air from 10 MHz to 2.5 GHz
In brain and muscle simulating tissue at
Frequencies of 450 MHz, 900 MHz, 1.8 GHz and 2.45GHz (accuracy +/-8%)
Frequency:
10 MHz to 3GHz; Linearity: +/-0.2 dB
(30 MHz to 3 GHz)
Directivity:
+/-0.2 dB in brain tissue (rotation around probe axis)
+/-0.4 dB in brain tissue (rotation normal probe axis)
Dynamic Range:
5 mW/g to > 100 mW/g;Linearity: +/-0.2 dB
Optical Surface Detection:
+/-0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces.
Dimensions:
Overall length: 330 mm (Tip: 16 mm)
Tip length: 16 mm
Body diameter: 12 mm (Body: 12 mm)
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm
Application:
General dosimetric up to 3 GHz
Compliance tests of mobile phones
Fast automatic scanning in arbitrary phantoms



Inside view of ET3DV6 E-field Probe

4.2.2 SAM Phantom

Construction:
The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC EN50361 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 manually teaching three points with the robot.
Shell Thickness:
2 +/-0.2 mm
Filling Volume:
Approx. 25 liters
Dimensions:
(H x L x W): 810 x 1000 x 500 mm



SAM Phantom

4.2.3 Device Holder for Transmitters

In combination with the SAM Twin Phantom V4.0, the Mounting Device enables the rotation of the mounted transmitter
in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications.
The device holder can be locked at different phantom locations (left head, right head,flat phantom).
* Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations.
To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Device Holder

SECTION 5 : Test system specifications

Robot RX60L

Number of Axes	:	6
Payload	:	1.6 kg
Reach	:	800mm
Repeatability	:	+/-0.025mm
Control Unit	:	CS7M
Programming Language	:	V+
Manuafacture	:	Stäubli Unimation Corp. Robot Model: RX60

DASY4 Measurement sever

Features	:	166MHz low power Pentium MMX 32MB chipdisk and 64MB RAM Serial link to DAE (with watchdog supervision) 16 Bit A/D converter for surface detection system Two serial links to robot (one for real-time communication which is supervised by watchdog) Ethernet link to PC (with watchdog supervision) Emergency stop relay for robot safety chainTwo expansion slots for future applications
Manufacture	:	Schimid & Partner Engineering AG

Data Acquisition Electronic (DAE)

Features	:	Signal amplifier, multiplexer, A/D converter and control logic Serial optical link for communication with DASY4 embedded system (fully remote controlled) 2 step probe touch detector for mechanical surface detection and emergency robot stop (not in -R version)
Measurement Range	:	1 µV to > 200 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset voltage	:	< 1 µV (with auto zero)
Input Resistance	:	200 MΩ
Battery Power	:	> 10 h of operation (with two 9 V battery)
Dimension	:	60 x 60 x 68 mm
Manufacture	:	Schimid & Partner Engineering AG

Software

Item	:	Dosimetric Assesment System DASY4
Type No.	:	SD 000 401A, SD 000 402A
Software version No.	:	4.5
Manufacture / Origin	:	Schimid & Partner Engineering AG

E-Field Probe

Model	:	ET3DV6
Serial No.	:	1684
Construction	:	Triangular core fiber optic detection system
Frequency	:	10 MHz to 6 GHz
Linearity	:	+/-0.2 dB (30 MHz to 3 GHz)
Manufacture	:	Schimid & Partner Engineering AG

Phantom

Type	:	SAM Twin Phantom V4.0
Shell Material	:	Fiberglass
Thickness	:	2.0 +/-0.2 mm
Volume	:	Approx. 25 liters
Manufacture	:	Schimid & Partner Engineering AG

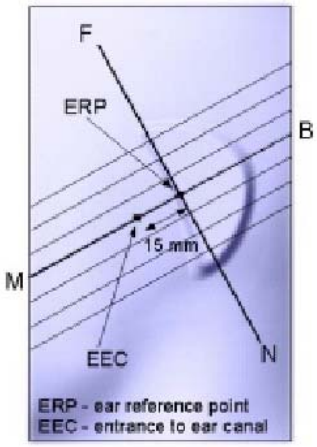
SECTION 6 : Test setup of EUT

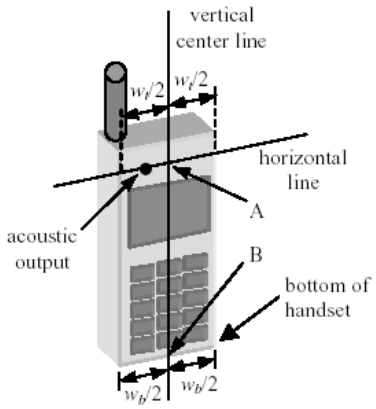
6.1 Description of the head test setup

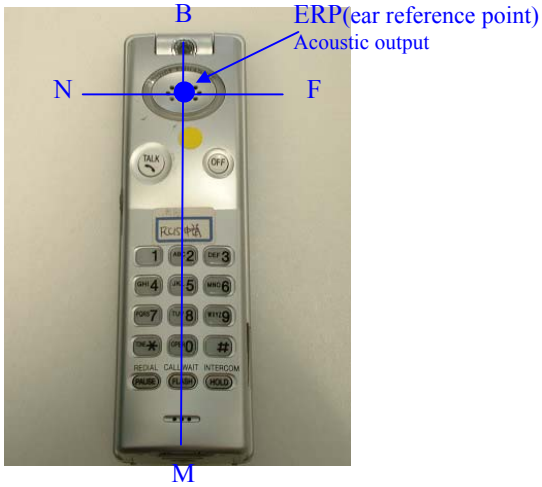
According to the OET 65 and IEEE1528, this EUT was tested on the "Cheek/Touch" and "Ear/Tilt" positions at the left head and right head section of the SAM phantom.

6.1.1 Initial ear position

A handset should be initially positioned with the earpiece region pressed against the ear spacerof a head phantom.
The device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".

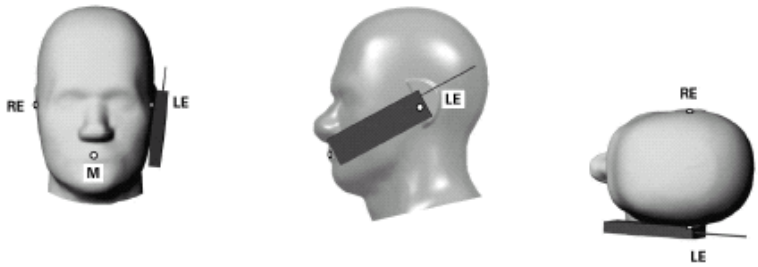






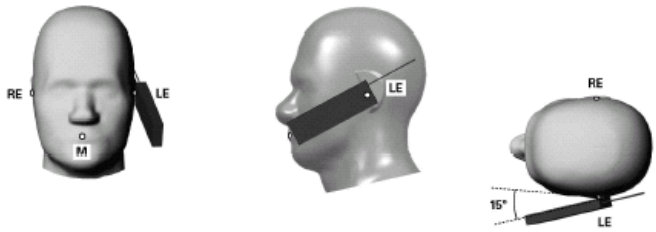
6.1.2 Cheek position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line.
This test position is established:
i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
ii) (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.



6.1.3 Tilt position

If the earpiece of the handset is not in full contact with the phantom's ear spacer and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.Otherwise the handset should be moved away from the cheek perpendicular to the line passes through both "ear reference points" for approximate 2-3 cm. While it is in this position, the handset is tilted away from the mouth with respect to the "test device reference point" by 15°. After the tilt, it is then moved back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a
tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously.



6.1.4 Antenna position

The antenna of this EUT was built-in antenna.

6.1.5 Method of measurement (Head SAR)

Step1. The searching for the worst position
This test was performed at the worst position of Step1.

Step2. The changing to the Low and High channels
The test was performed at the worst conditions of Step1.

6.2 Description of the Body-worn test setup

This EUT were tested on the “Face” and “Back” positions at the flat section of SAM phantom.
The tests were performed in the EUT with the headset.

Face Position

Back position

6.3 EUT Tune-up procedure

This EUT has Mode1 and Mode2
The frequency range and the modulation in each mode were used are shown as the following.

Mode 1

Antenna	: Whip antenna 1
TX Frequency	: 2402-2480MHz
Channel	: Low ch(2402MHz),Mid ch(2441MHz),Highch(2480MHz)
Modulation	: FHSS
Packet size	: DH5(Max.)
Crest factor	: 1.2

Mode 2

Antenna	: Whip antenna 1 (Main antenna) or Whip antenna 2 (Sub antenna)
TX Frequency	: 2402-2480MHz
Channel	: Low ch(2402MHz),Mid ch(2440MHz),High ch(2480MHz)
Modulation	: FHSS
Packet size	: DH5(Max.)
Crest factor	: 1.2

SECTION 7 : Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents [7] and is given in the following Table.

Error Description	Uncertainty value ± %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	±4.8	Normal	1	1	±4.8	∞
Axial isotropy of the probe	±4.7	Rectangular	√3	$(1-c_p)^{1/2}$	±1.9	∞
Spherical isotropy of the probe	±9.6	Rectangular	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary effects	±1.0	Rectangular	√3	1	±0.6	∞
Probe linearity	±4.7	Rectangular	√3	1	±2.7	∞
Detection limit	±1.0	Rectangular	√3	1	±0.6	∞
Readout electronics	±1.0	Normal	1	1	±1.0	∞
Response time	±0.8	Rectangular	√3	1	±0.5	∞
Integration time	±2.6	Rectangular	√3	1	±1.5	∞
RF ambient conditions	±3.0	Rectangular	√3	1	±1.7	∞
Mech. constraints of robot	±0.4	Rectangular	√3	1	±0.2	∞
Probe positioning	±2.9	Rectangular	√3	1	±1.7	∞
Extrap. and integration	±1.0	Rectangular	√3	1	±0.6	∞
Test Sample Related						
Device positioning	±2.9	Rectangular	√3	1	±2.9	29
Device holder uncertainty	±3.6	Rectangular	√3	1	±3.6	5
Power drift	±10.0	Rectangular	√3	1	±5.8	∞
Phantom and Setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	∞
Liquid conductivity (target)	±5.0	Rectangular	√3	0.64	±1.8	∞
Liquid conductivity (meas.)	±5.0	Normal	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Normal	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±12.075**	
Expanded Uncertainty (k=2)					**±24.1**	

The result of some test showed that the power drift has exceeded 5%. Therefore, the uncertainty of power drift expanded to 10%. However, the extended uncertainty (k= 2) of a test is less than 30%.

SECTION 8 : Simulated tissue liquid parameter

8.1 Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement are reported in each correspondent section.

8.2 Head 2450MHz

Type of liquid : **Head 2450 MHz**
Ambient temperature (deg.c.) : **25.0 (May 19 & 31)**
Relative Humidity (%) : **47(May 19),56(May 31)**
Liquid depth (cm) : **15.2**

Measured By : Miyo Ikuta

DIELECTRIC PARAMETERS MEASUREMENT RESULTS							
Date	Liquid Temp [deg.c]		Parameters	Target Value	Measured	Deviation [%]	Limit [%]
	Before	After					
19-May	24.3	24.3	Relative Permittivity εr	39.2	37.8	-3.6	+/-5
			Coductivity σ [mho/m]	1.80	1.87	3.9	+/-5
31-May	24.3	24.3	Relative Permittivity εr	39.2	37.7	-3.8	+/-5
			Coductivity σ [mho/m]	1.80	1.88	4.4	+/-5

8.3 Muscle 2450MHz

Type of liquid : **Muscle 2450 MHz**
Ambient temperature (deg.c.) : **25.0 (May 19)**
Relative Humidity (%) : **47(May 19)**
Liquid depth (cm) : **15.2**

Measured By : Miyo Ikuta

DIELECTRIC PARAMETERS MEASUREMENT RESULTS							
Date	Liquid Temp [deg.c]		Parameters	Target Value	Measured	Deviation [%]	Limit [%]
	Before	After					
19-May	24.3	24.3	Relative Permittivity εr	52.7	50.2	-4.7	+/-5
			Coductivity σ [mho/m]	1.95	1.98	1.5	+/-5

8.4 Simulated Tissues

Ingredient	MIXTURE(%)	
	Head 2450MHz	Muscle 2450MHz
Water	45.0	69.83
DGMBE	55.0	30.17

Note:DGMBE(Diethylenglycol-monobuthyl ether)

SECTION 9 : System validation data

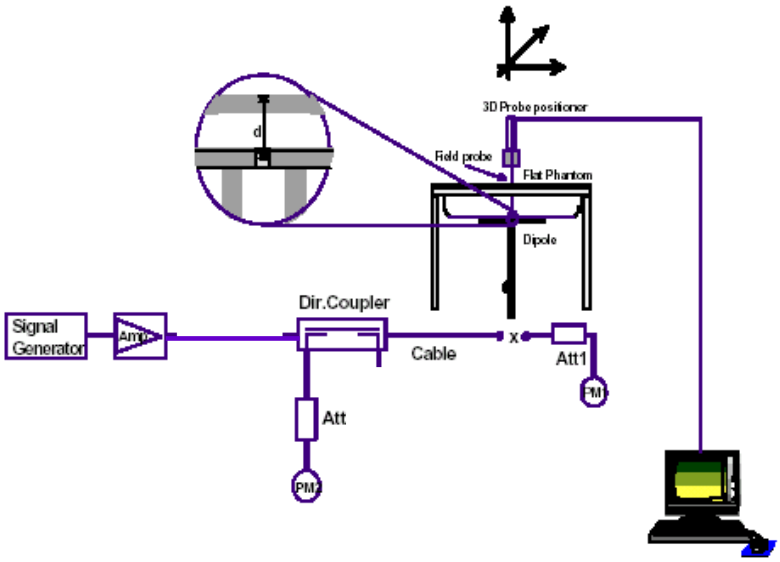
Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of +/-10%. The validation results are in the table below. Please refer to APPENDIX 5.

Type of liquid	:	**HEAD 2450MHz**
Frequency	:	**2450MHz**
Dipole	:	**D2450V2 SN:713**
Liquid depth (cm)	:	**15.2**
Ambient temperature (deg.c.)	:	**25.0 (May 19 & 31)**
Relative Humidity (%)	:	**47(May 19),56(May 31)**
Power	:	**250mW**

Measured By : Miyo Ikuta

SYSTEM PERFORMANCE CHECK										
Date	Liquid (HEAD 2450MHz)						System dipole validation target & measured			
	Liquid Temp [deg.c.]		Relative Permittivity εr		Conductivity σ [mho/m]		SAR 1g [W/kg]		Deviation [%]	Limit [%]
	Before	After	Target	Measured	Target	Measured	Target	Measured		
19-May	24.3	24.3	39.2	37.8	1.80	1.87	13.1	14.2	8.4	+/-10
31-May	24.3	24.3	39.2	37.7	1.80	1.88	13.1	14.2	8.4	+/-10

Note: Please refer to Attachment for the result representation in plot format



2450MHz System performance check setup

Test system for the system performance check setup diagram

SECTION 10 : Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-filed at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop of Step 4

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the EUT and the horizontal grid spacing was 20 mm x 20 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan) , a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 x 7 points. And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes.
This polynomial was then used to evaluate the points between the surface and the probe tip.

2. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

3. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the E-field at the same location as in Step 1.

SECTION 11 : Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg

SECTION 12 : Output Power Measurement results

Out power measurement method
The Output power has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m.
The heighest of the measuring varied between 1 and 4m and EUT was roated a full revolution in order to obtain the maximum value of the output power.
The measurements were performed for both vertical and horizontal antenna polarzation with the Spectrum Analyzer.

Spectrum Analyzer setting
Mode1: Resolution bandwidth set to 1MHz and Video bandwidth to 3MHz.
Mode2: Resolution bandwidth set to 3MHz and Video bandwidth to 10MHz.

Calculation of result
E-field [dBμV/m]= Reading (S/A) + Factor (Measurement equipment)
E-field [dBμV/m] was converted into E[V/m]
EIRP[dBm] = $10\log[((E*d)^2/30G)*10^3]$; d= 3[m], G =1

[Mode1]			
Ch	Freq. [MHz]	E-field [dBμV/m]	EIRP [dBm]
Low	2402	111.3	16.1
Mid	2441	112.2	17.0
High	2480	112.5	17.3

[Mode2] Main antenna*			
Ch	Freq. [MHz]	E-field [dBμV/m]	EIRP [dBm]
Low	2402	115.0	19.8
Mid	2440	115.8	20.6
High	2480	116.2	21.0

*The tested antenna was main antenna because its output power level is higher than that of sub antenna.

SECTION 13 : Measurement results

13.1 Head 2450MHz SAR

Liquid Depth (cm)	:	**15.2**	Model	:	**KX-THA12**
Parameters	:	**εr =37.7, σ =1.88**	Serial No.	:	**3512 80f0 8000**
Ambient Temperature[deg.c.]	:	**25.0**	Modulation	:	**FHSS**
Relative Humidity (%)	:	**56**	Crest factor	:	**1.2**

Date : May 31,2005
Measured By : Miyo Ikuta

HEAD SAR MEASUREMENT RESULTS									
Mode	Frequency				EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
	Channel	[MHz]	Packet	Phantom Section	Antenna	Setup position	Before	After	Maximum value of multi-peak
Mode 1	**Position seach**								
	Mid	2441	DH5	Left	-	Cheek	24.3	24.3	**0.032**
	Mid	2441	DH5	Left	-	Tilt	24.3	24.3	**0.038**
	Mid	2441	DH5	Right	-	Cheek	24.6	24.6	**0.056**
	Mid	2441	DH5	Right	-	Tilt	24.6	24.6	**0.046**
	Frequency Change								
	Low	2402	DH5	Right	-	Cheek	24.6	24.6	**0.045**
	High	2480	DH5	Right	-	Cheek	24.6	24.6	**0.067**
Mode 2	**Position seach**								
	Mid	2440	DH5	Left	Main	Cheek	24.3	24.2	**0.076**
	Mid	2440	DH5	Left	Main	Tilt	24.2	24.1	**0.113**
	Mid	2440	DH5	Right	Main	Cheek	24.6	24.6	**0.149**
	Mid	2440	DH5	Right	Main	Tilt	24.6	24.6	**0.104**
	Frequency Change								
	Low	2402	DH5	Right	Main	Cheek	24.6	24.6	**0.116**
	High	2480	DH5	Right	Main	Cheek	24.6	24.7	**0.179**
	Position seach								
	Mid	2440	DH5	Left	Sub	Cheek	24.2	24.2	**0.024**
	Mid	2440	DH5	Left	Sub	Tilt	24.3	24.3	**0.042**
	Mid	2440	DH5	Right	Sub	Cheek	24.6	24.6	**0.028**
	Mid	2440	DH5	Right	Sub	Tilt	24.6	24.6	**0.055**
	Frequency Change								
	Low	2402	DH5	Right	Sub	Tilt	24.7	24.8	**0.044**
	High	2480	DH5	Right	Sub	Tilt	24.8	24.8	**0.053**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							**Body SAR: 1.6 W/kg**		
Spatial Peak Uncontrolled Exposure / General Population							**(averaged over 1 gram)**		

13.2 Body 2450MHz SAR

Liquid Depth (cm)	:	**15.2**	Model	:	**KX-THA12**
Parameters	:	**εr =50.2, σ =1.98**	Serial No.	:	**3512 80f0 8000**
Ambient Temperature[deg.c.]	:	**25.0**	Modulation	:	**FHSS**
Relative Humidity (%)	:	**47**	Crest factor	:	**1.2**

Date : May 19,2005
Measured By : Miyo Ikuta

BODY SAR MEASUREMENT RESULTS										
Mode	Frequency		Packet	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
	Channel	[MHz]			Antenna	Setup position	Separation [mm]	Before	After	Maximum value of multi-peak
Mode 1	**Position Search**									
	Mid	2440	DH5	Flat	-	Face	0	24.1	24.1	**0.166**
	Mid	2440	DH5	Flat	-	Back	0	24.0	24.0	**0.057**
	Frequency Change									
	Low	2402	DH5	Flat	-	Face	0	24.0	24.0	**0.116**
	High	2480	DH5	Flat	-	Face	0	24.0	24.0	**0.158**
Mode 2	**Position Search**									
	Mid	2440	DH5	Flat	Main	Face	0	24.3	24.3	**0.320**
	Mid	2440	DH5	Flat	Main	Back	0	24.3	24.2	**0.134**
	Frequency Change									
	Low	2402	DH5	Flat	Main	Face	0	24.3	24.3	**0.261**
	High	2480	DH5	Flat	Main	Face	0	24.2	24.2	**0.342**
	Position Search									
	Mid	2440	DH5	Flat	Sub	Face	0	24.1	24.1	**0.185**
	Mid	2440	DH5	Flat	Sub	Back	0	24.1	24.1	**0.048**
	Frequency Change									
	Low	2402	DH5	Flat	Sub	Face	0	24.1	24.1	**0.179**
	High	2480	DH5	Flat	Sub	Face	0	24.1	24.1	**0.123**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population								**Body SAR: 1.6 W/kg (averaged over 1 gram)**		

SECTION 14 : Equipment & calibration information

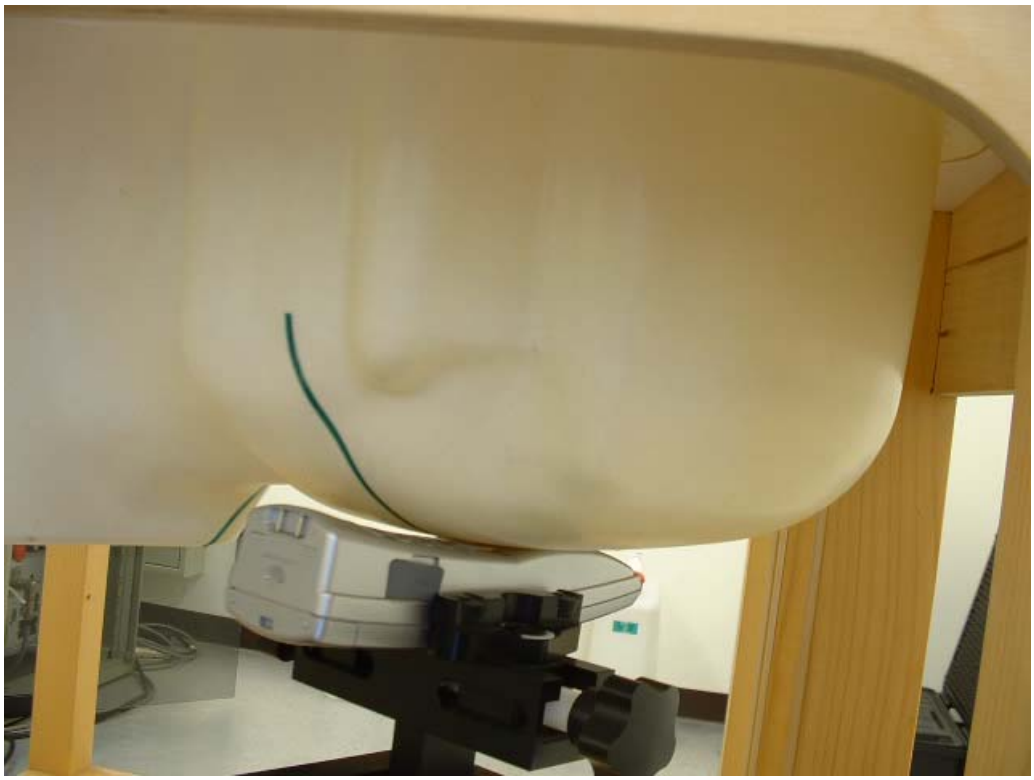
Name of Equipment	Manufacture	Model number	Serial number	Calibration	
				Last Cal	due date
Microwave Cable	Storm	421-011(90-1394-079)	01-12-001	2005/01/05	2006/01/04
Microwave Cable	Suhner	SUCOFLEX	233550/4	2005/02/03	2006/02/02
Pre Amplifer	Agilent	8449B	3008A01671	2005/02/05	2006/02/04
Horn Antenna	Schwarzbeck	BBHA9120D	258	2005/01/10	2006/01/09
Attenuator(10dB)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	2005/01/11	2006/01/10
Spectrum Analyzer	Advantest	R3273	-	2005/02/21	2006/02/20
Power Meter	Agilent	E4417A	GB41290639	2004/11/09	2005/11/08
Power Sensor	Agilent	E9300B	US40010300	2004/11/15	2005/11/14
Power Sensor	Agilent	E9327A	US40440576	2004/11/23	2005/11/22
S-Parameter Network Analyzer	Agilent	8753ES	US39174808	2003/10/23	2006/10/22
Signal Generator	Rohde&Schwarz	SML40	100023	2005/01/05	2006/01/04
RF Amplifier	OPHIR	5056F	1005	2005/05/20	2006/05/19
Dosimetric E-Field Probe	Schmid&Partner Engineering AG	ET3DV6	1684	2004/09/02	2005/09/01
Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE3	516	2005/03/10	2006/03/09
Robot,SAM Phantom	Schmid&Partner Engineering AG	DASY4	I021834	N/A	N/A
2450MHz System Validation Dipole	Schmid&Partner Engineering AG	D2450V2	713	2004/12/13	2006/12/12
Dual Directional Coupler	N/A	Narda	03702	N/A	N/A
Head 2450MHz	N/A	N/A	N/A	N/A	N/A
Body 2450MHz	N/A	N/A	N/A	N/A	N/A
Ambient Noise <0.012W/kg	SAR room	-	-	2005/5/19 2005/5/31	-

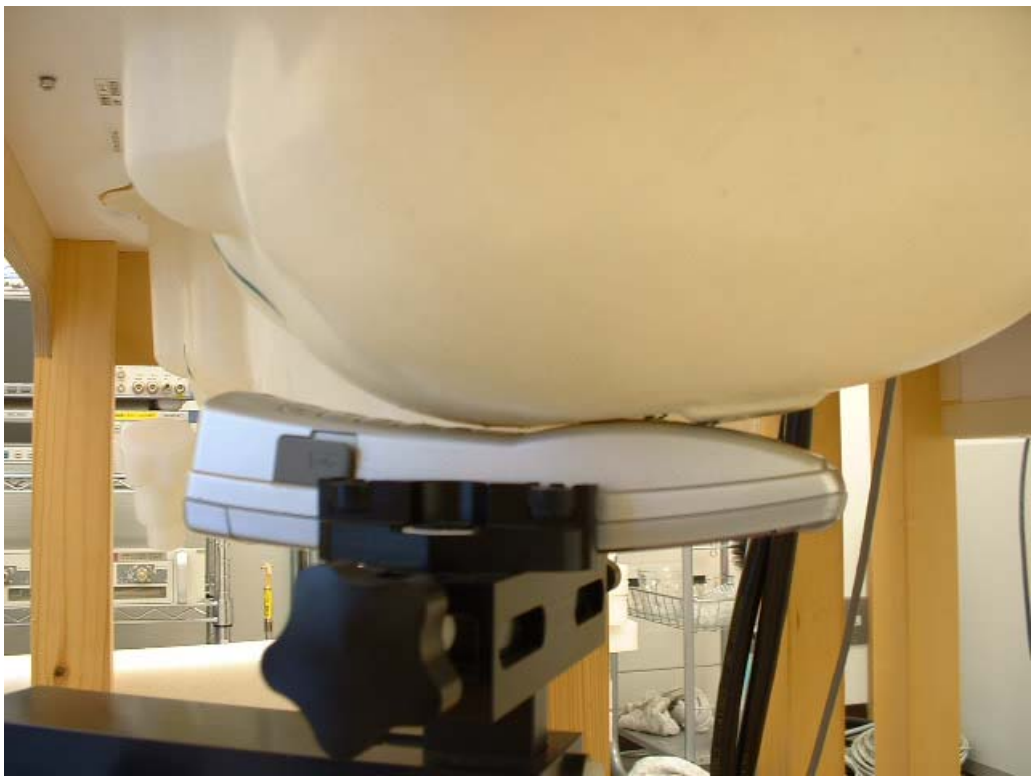
SECTION 15 : References

[1]ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.
[2] Katja Pokovic, Thomas Schmid, and Niels Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies", in ICECOM '97, Dubrovnik, October 15-17, 1997, pp. 120-124.
[3] Katja Pokovic, Thomas Schmid, and Niels Kuster, "E-_field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.
[4] W. Gander, Computermathematik, Birkhaeuser, Basel, 1992.
[5] W. H. Press, S. A. Teukolsky,W. T. Vetterling, and B. P. Flannery, Numerical Recepies in C, The Art of Scientific Computing, Second Edition, Cambridge University Press, 1992.
[6] Barry N. Taylor and Christ E. Kuyatt, "Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology,1994.
[7]SPEAG document Uncertainty document for DASY 4 System from SPEAG(Shimid & Partner Engineering AG).

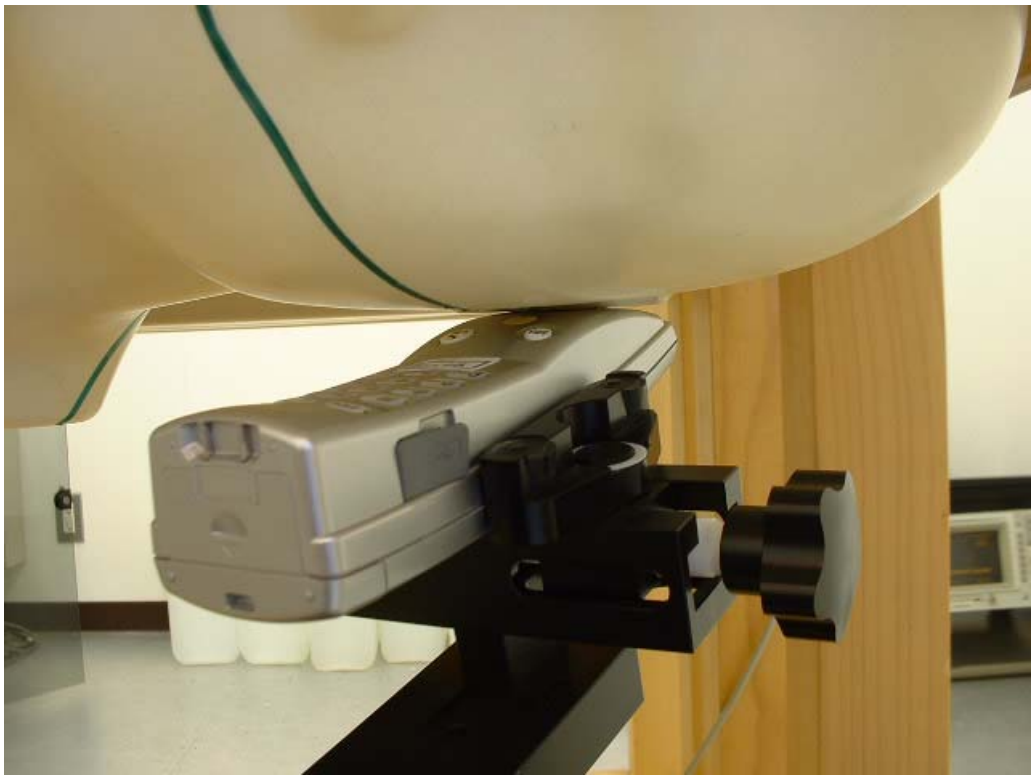
APPENDIX 1 : Photographs of test setup

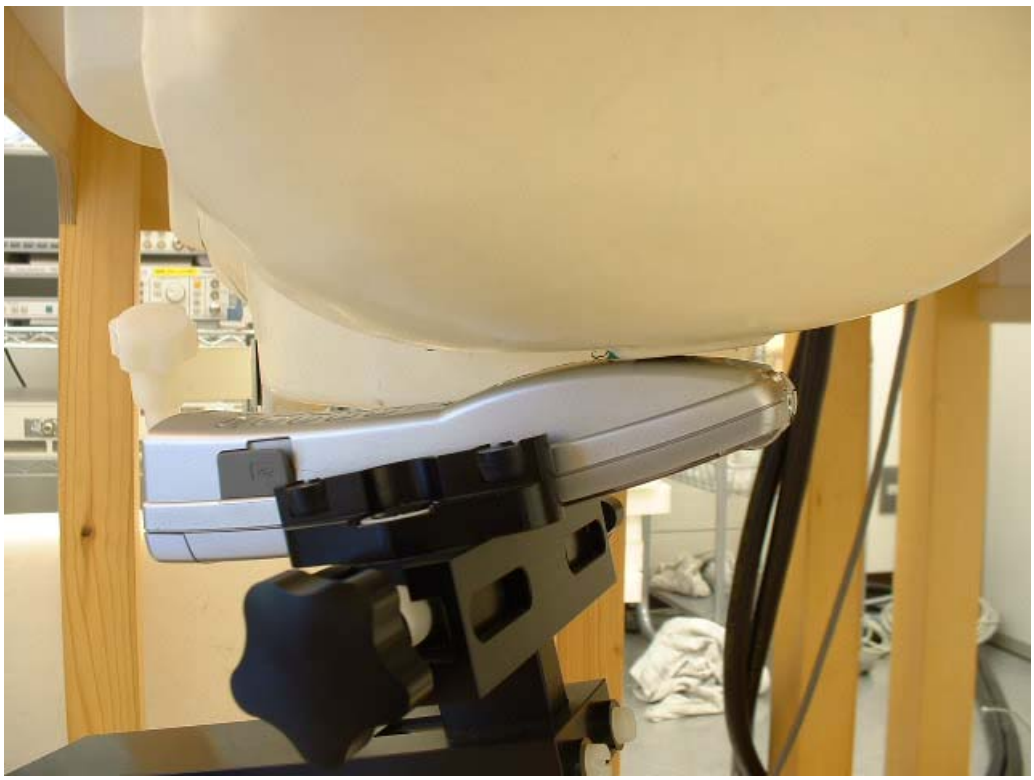
Left head / Cheek



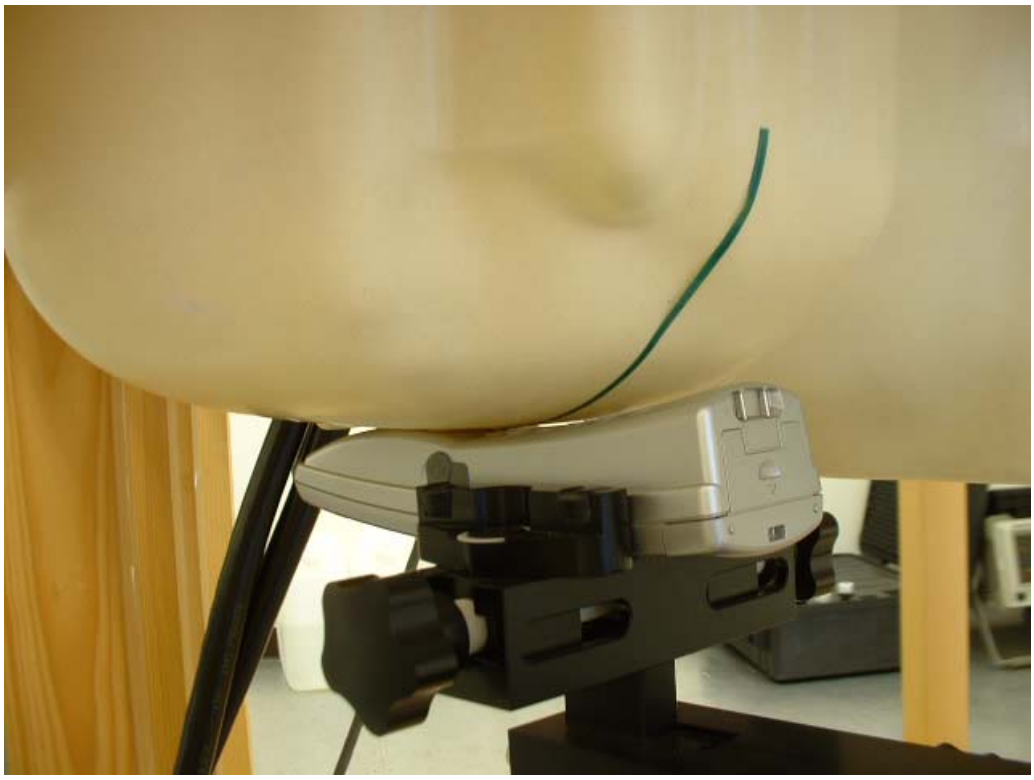


Left head / Tilt

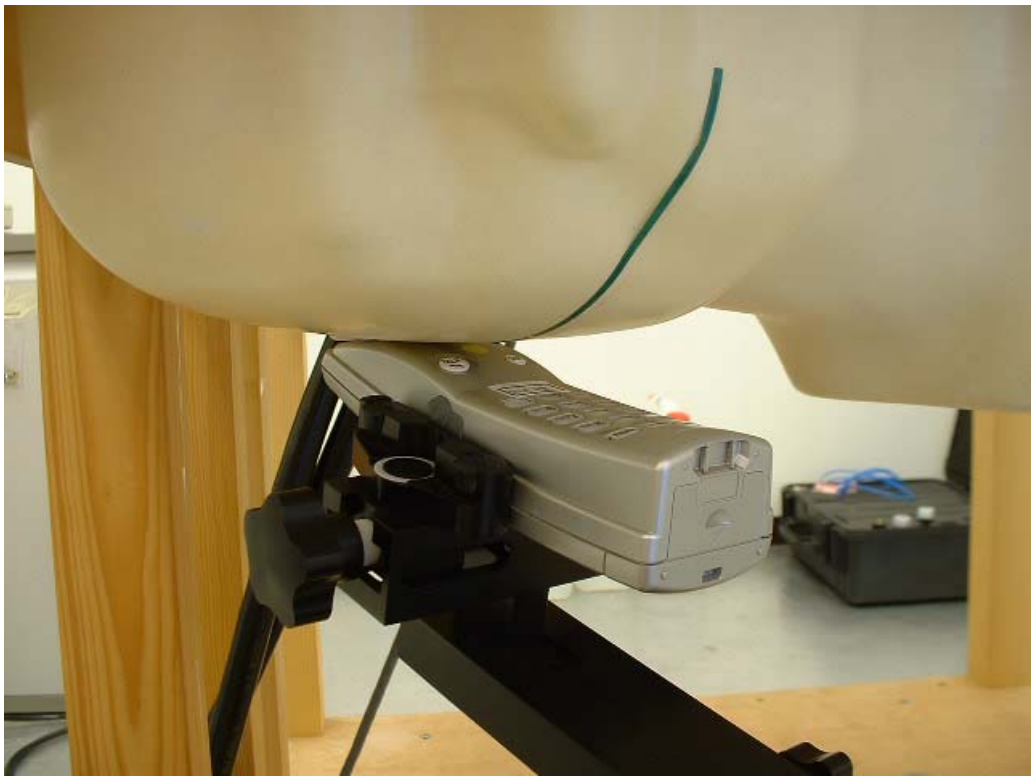


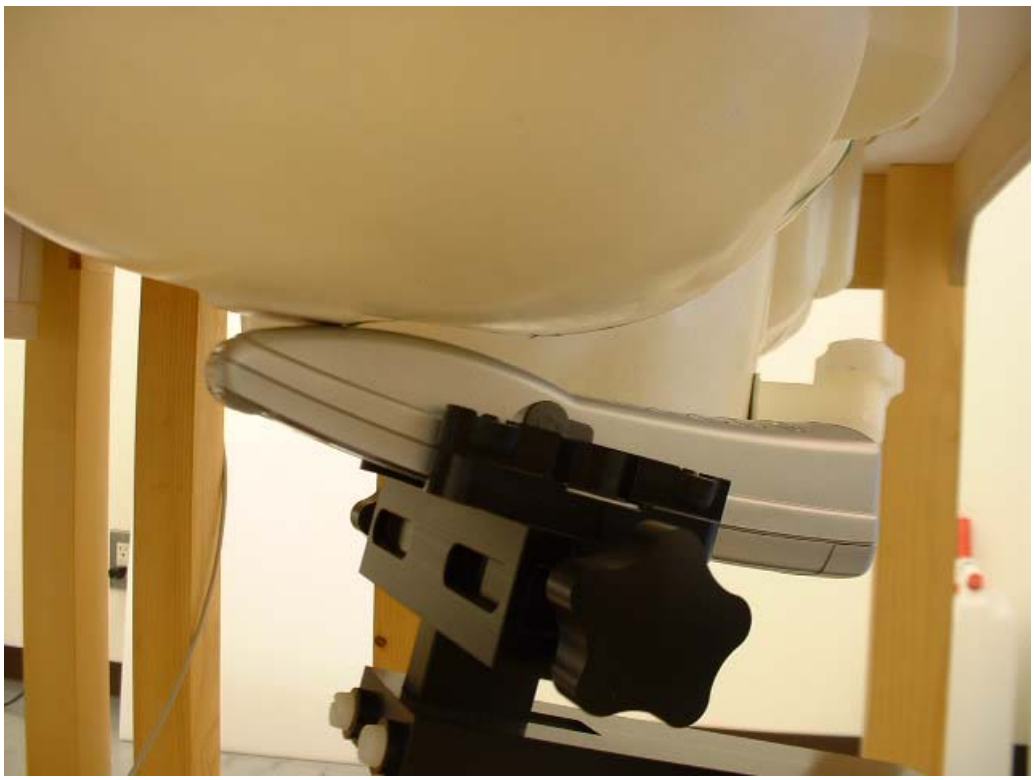


Right head / Cheek

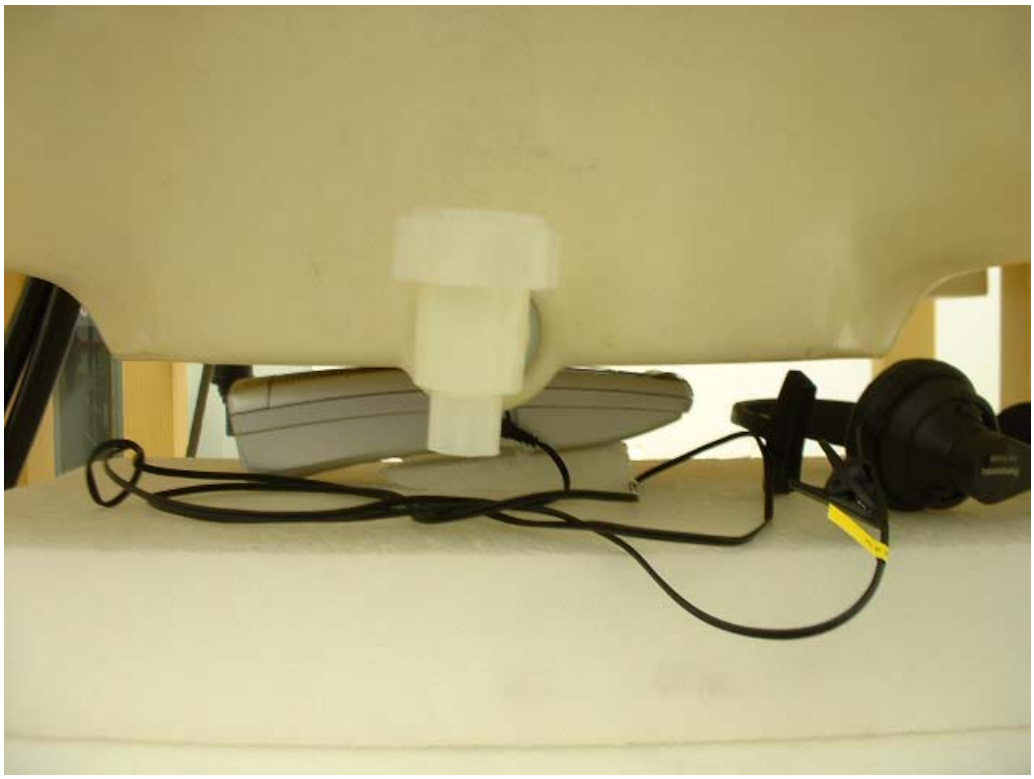


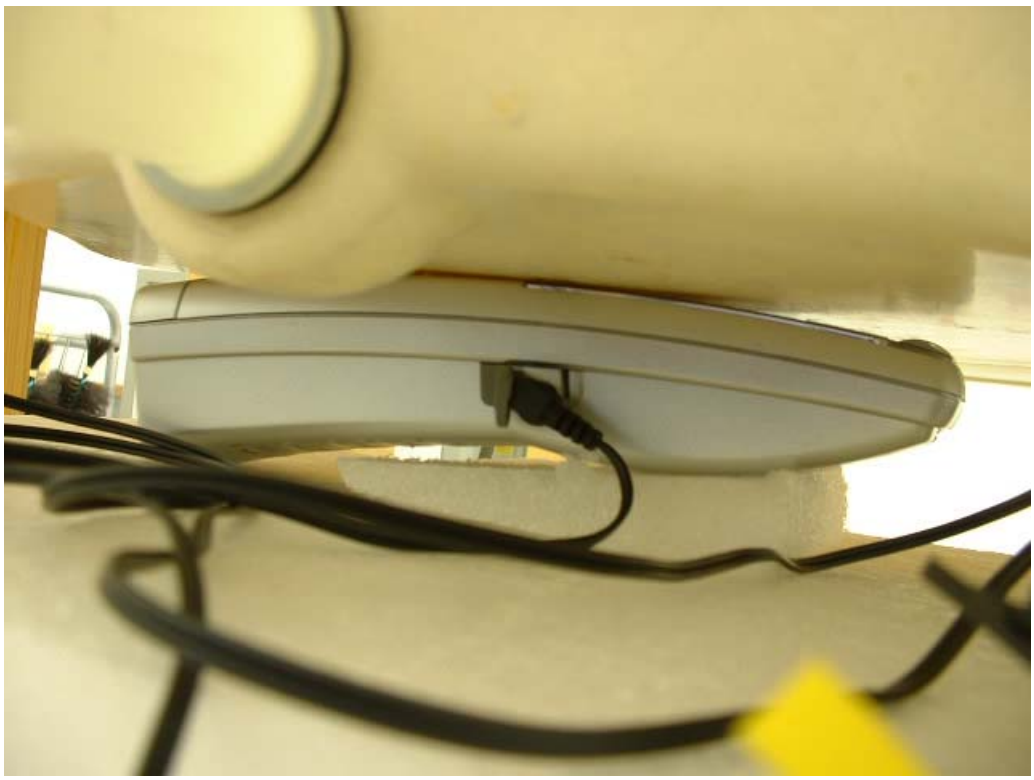
Right head / Tilt



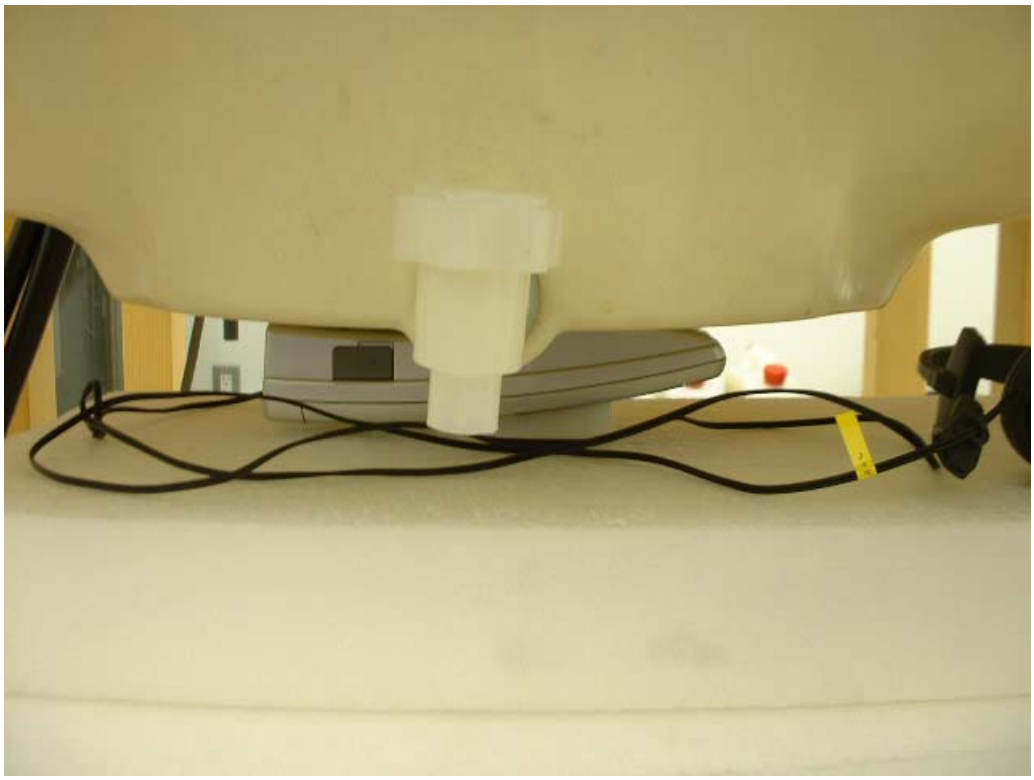


Body / Face





Body / Back



APPENDIX 2 : SAR Measurement data of Head

KX-THA12 (Mode 1) / Left Head / Cheek / 2441MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

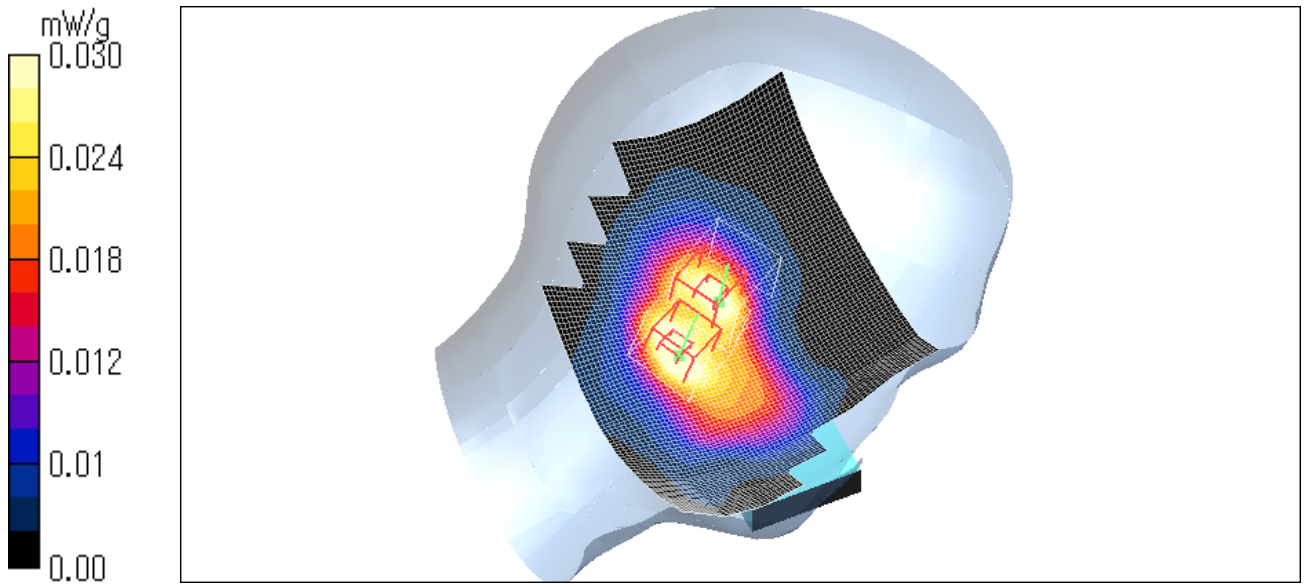
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.036 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.17 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.058 W/kg
SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.018 mW/g
Maximum value of SAR (measured) = 0.035 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.17 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.045 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.016 mW/g
Maximum value of SAR (measured) = 0.030 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.



KX-THA12 (Mode 1) / Left Head / Tilt / 2441MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

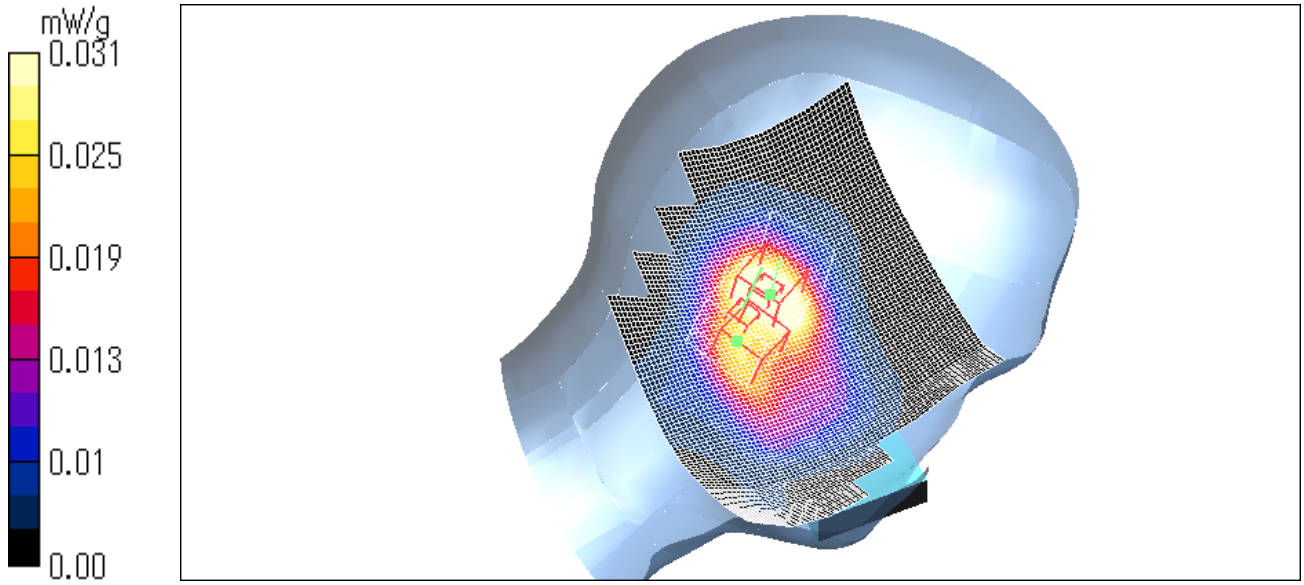
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.044 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.47 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.064 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.042 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.47 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.031 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.



KX-THA12 (Mode1) / Right Head / Cheek / 2441MHz

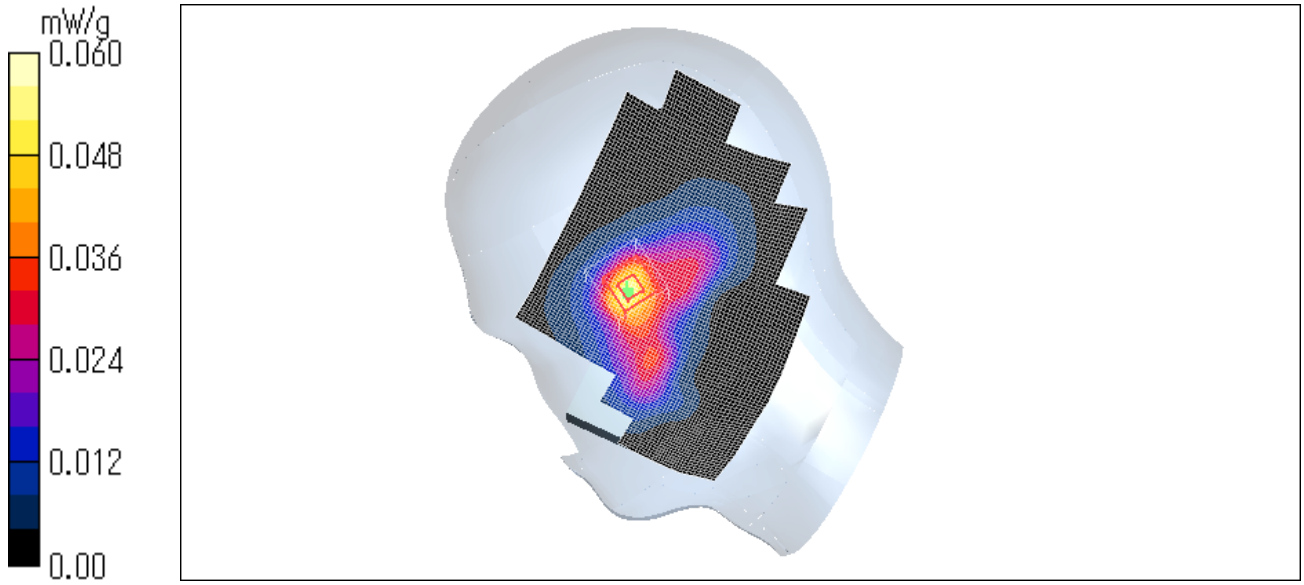
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.057 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.99 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 0.109 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.060 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode1) / Right Head / Tilt / 2441MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

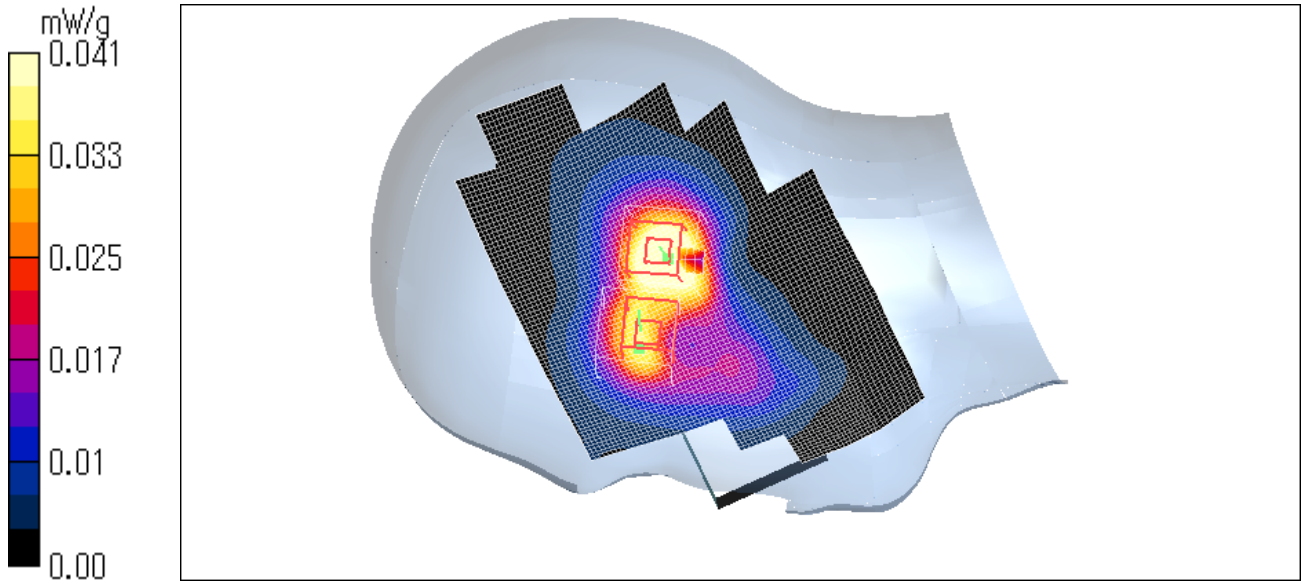
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.057 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.25 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.075 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.051 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.25 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.070 W/kg
SAR(1 g) = 0.039 mW/g; SAR(10 g) = 0.022 mW/g
Maximum value of SAR (measured) = 0.041 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode1) / Right Head / Cheek / 2402MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

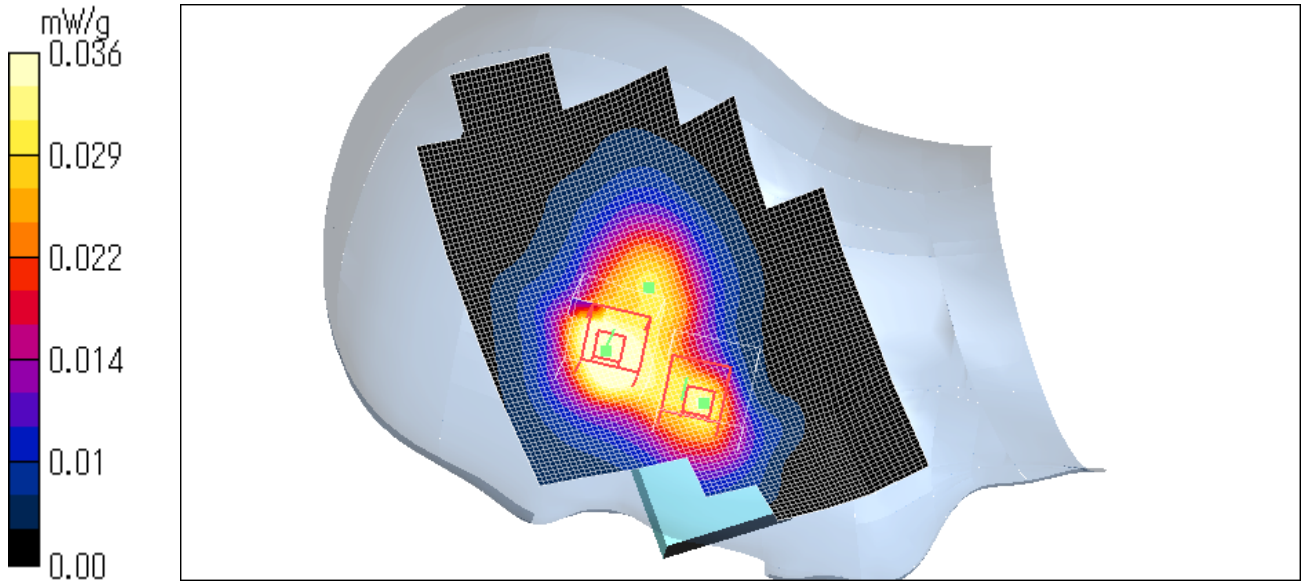
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.045 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.83 V/m; Power Drift = 0.192 dB
Peak SAR (extrapolated) = 0.084 W/kg
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.049 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.83 V/m; Power Drift = 0.192 dB
Peak SAR (extrapolated) = 0.048 W/kg
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.019 mW/g
Maximum value of SAR (measured) = 0.036 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode1)/ Right Head / Cheek / 2480MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

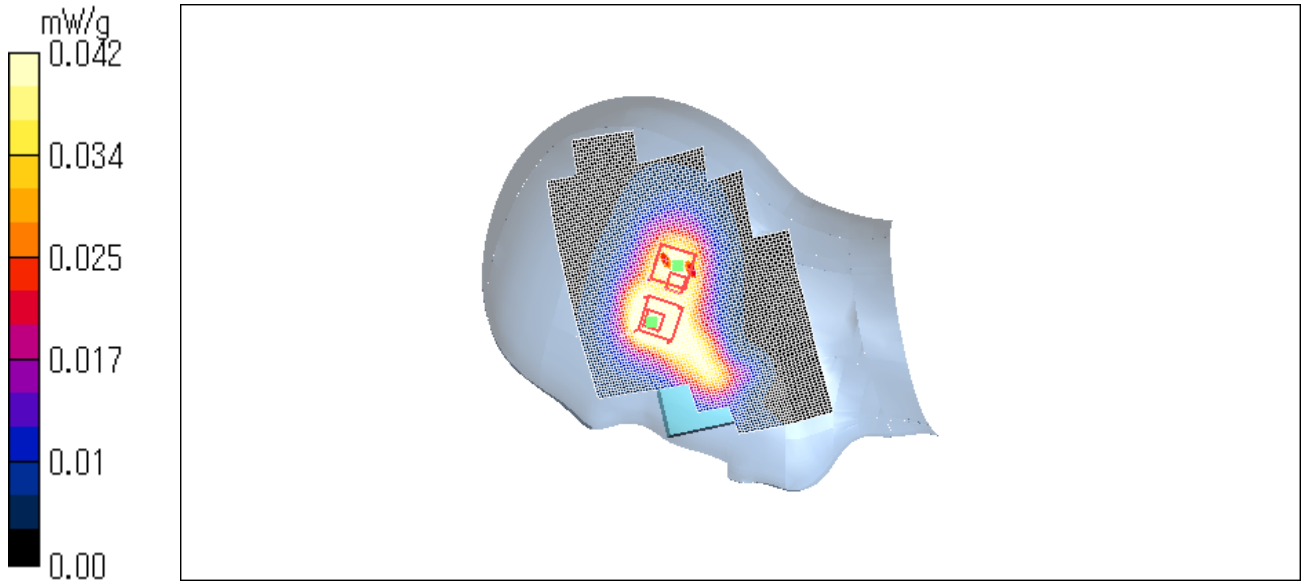
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.070 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.96 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.126 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.036 mW/g
Maximum value of SAR (measured) = 0.073 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.96 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.058 W/kg
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.042 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Left Head / Cheek / 2440MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

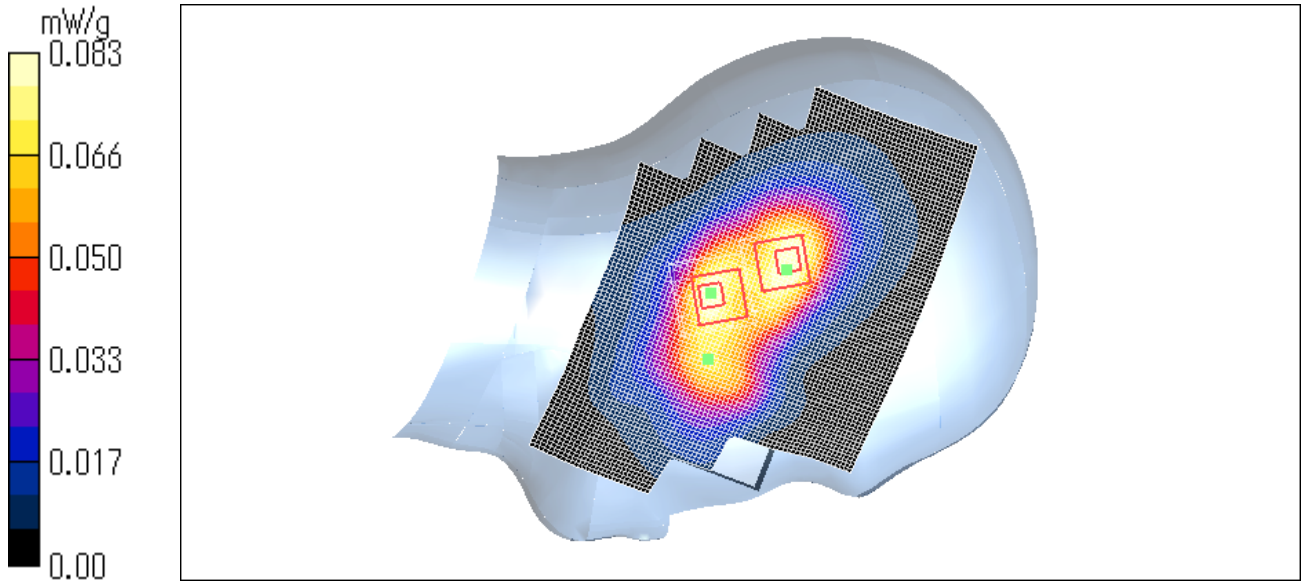
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.089 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.07 V/m; Power Drift = -0.250 dB
Peak SAR (extrapolated) = 0.128 W/kg
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.042 mW/g
Maximum value of SAR (measured) = 0.077 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.07 V/m; Power Drift = -0.250 dB
Peak SAR (extrapolated) = 0.144 W/kg
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.043 mW/g
Maximum value of SAR (measured) = 0.083 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.2 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Left Head / Tilt / 2440MHz

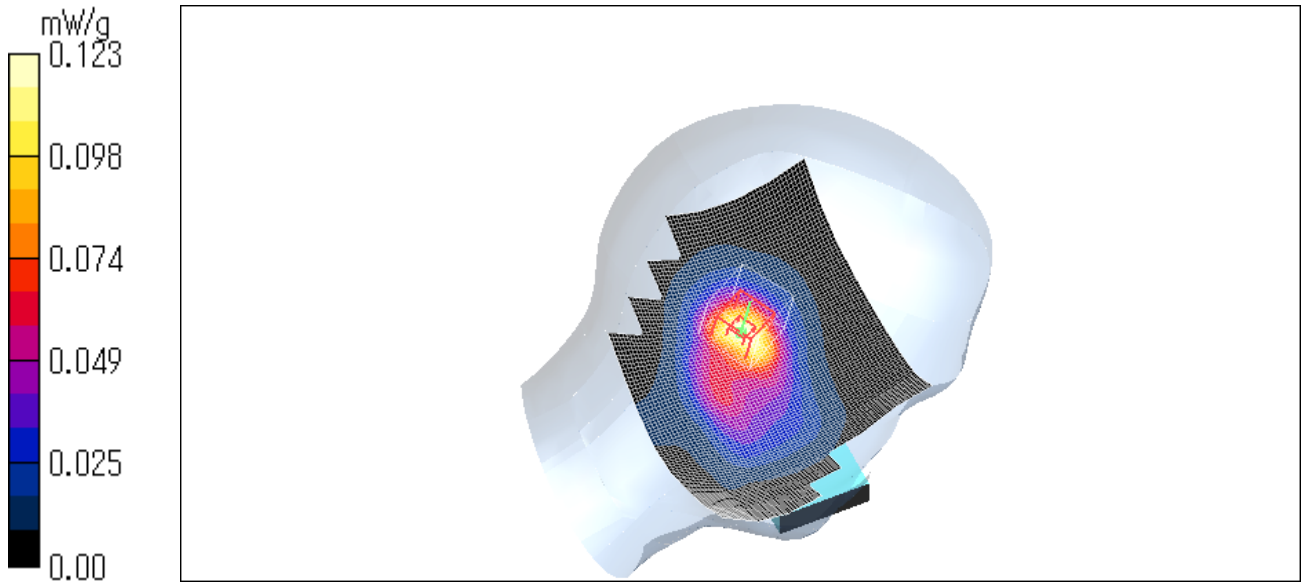
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.129 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.64 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.063 mW/g
Maximum value of SAR (measured) = 0.123 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.2 degree.C. , After 24.1 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Right Head / Cheek / 2440MHz

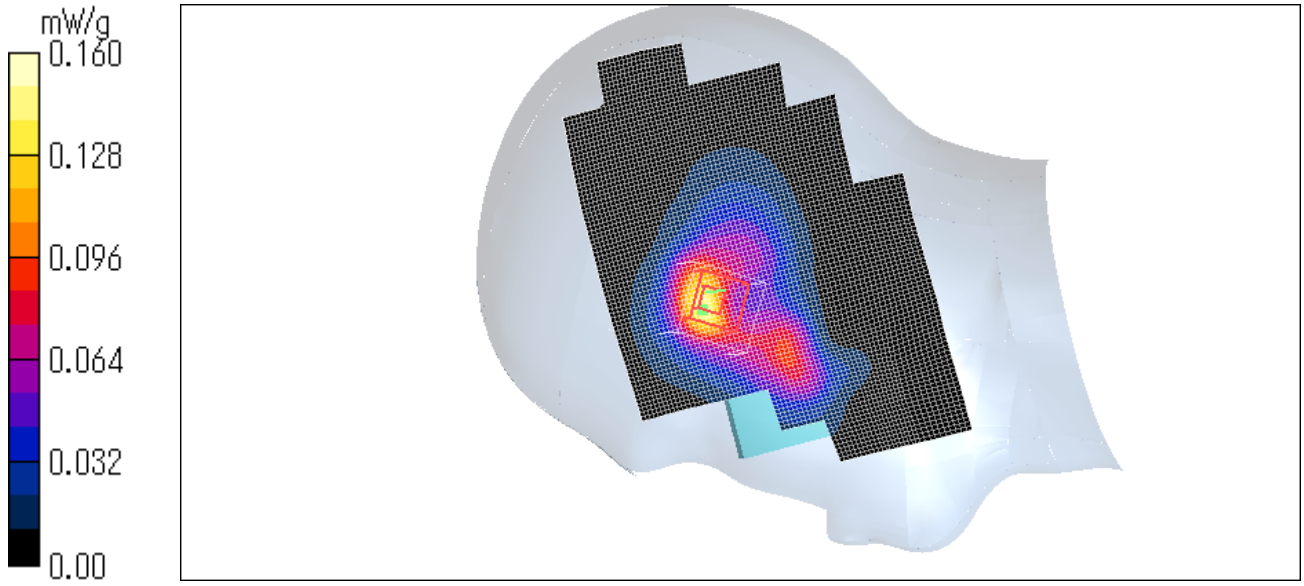
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.149 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.44 V/m; Power Drift = -0.084 dB
Peak SAR (extrapolated) = 0.269 W/kg
SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.081 mW/g
Maximum value of SAR (measured) = 0.160 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Right Head / Tilt / 2440MHz

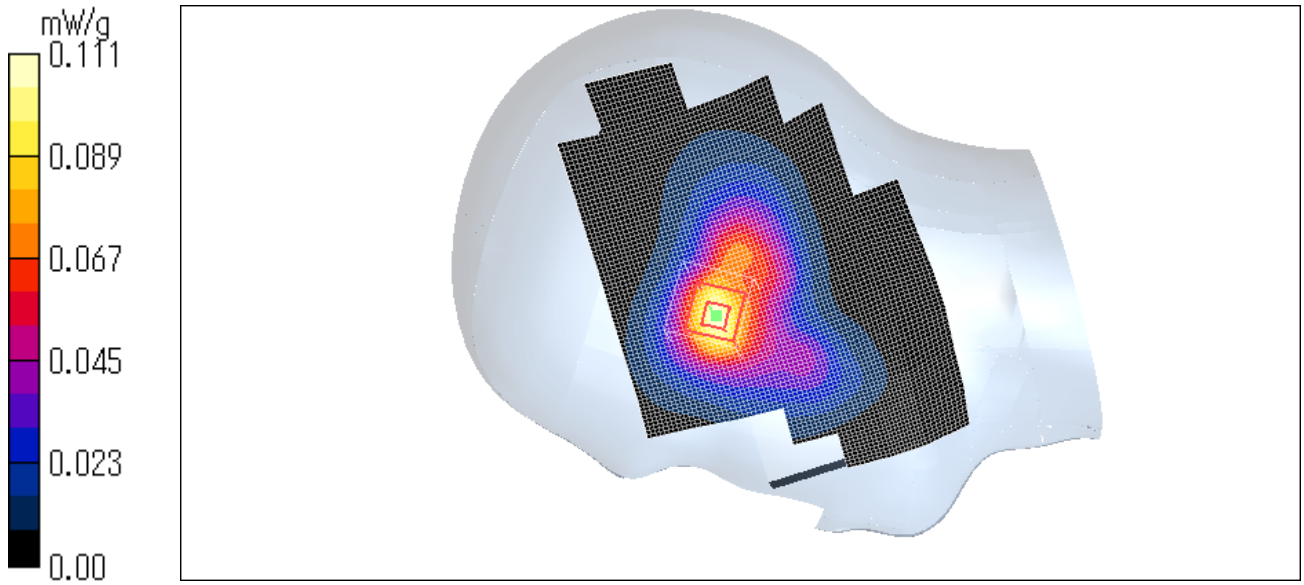
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.109 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.24 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 0.186 W/kg
SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.057 mW/g
Maximum value of SAR (measured) = 0.111 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Right Head / Cheek / 2402MHz

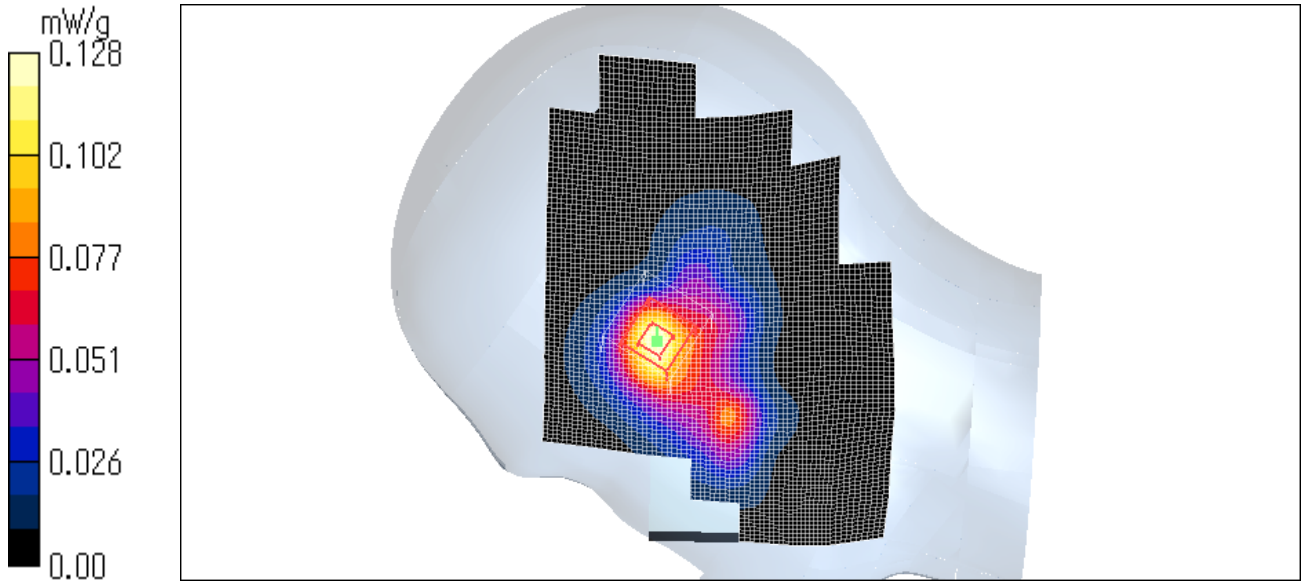
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.131 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.49 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 0.212 W/kg
SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.063 mW/g
Maximum value of SAR (measured) = 0.128 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Main Antenna) / Right Head / Cheek / 2480MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

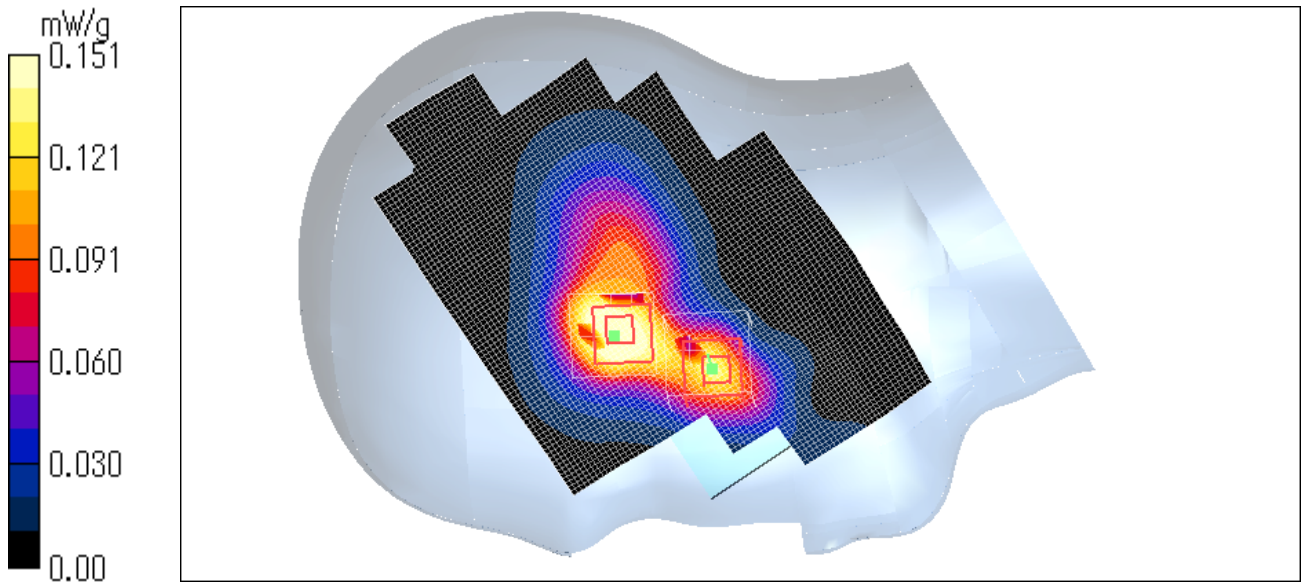
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.185 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.89 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.318 W/kg
SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.091 mW/g
Maximum value of SAR (measured) = 0.195 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.89 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.215 W/kg
SAR(1 g) = 0.133 mW/g; SAR(10 g) = 0.072 mW/g
Maximum value of SAR (measured) = 0.151 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.7 degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Left Head / Cheek / 2440MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

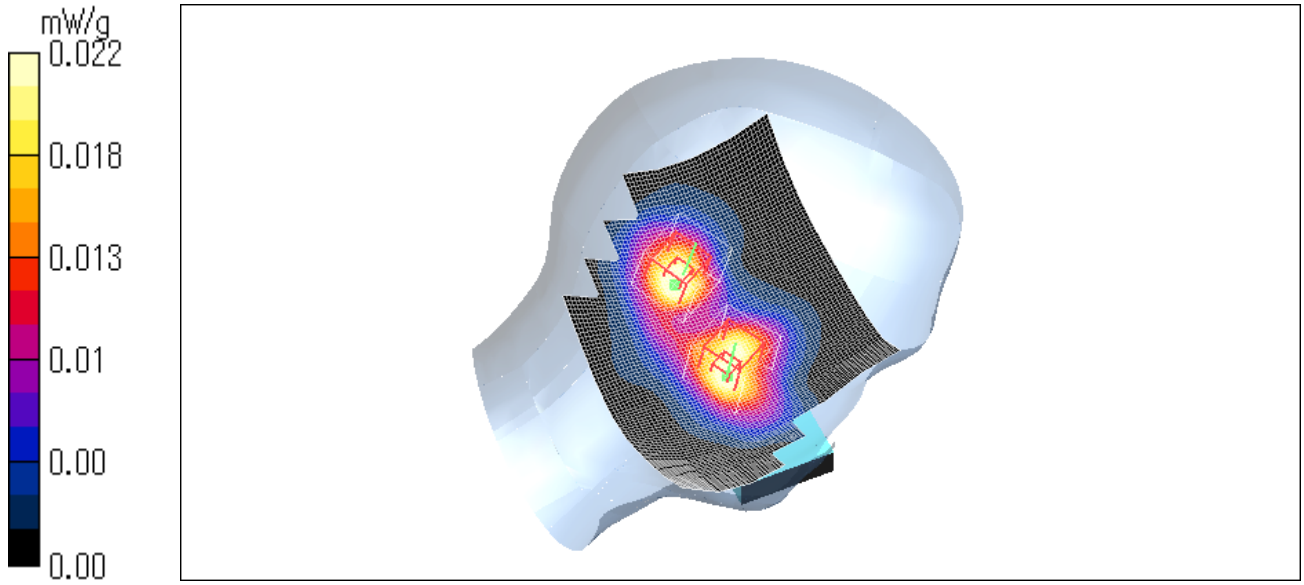
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.024 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.98 V/m; Power Drift = -0.134 dB
Peak SAR (extrapolated) = 0.044 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.026 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.98 V/m; Power Drift = -0.134 dB
Peak SAR (extrapolated) = 0.030 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.011 mW/g
Maximum value of SAR (measured) = 0.022 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.2 degree.C. , After 24.2 degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Left Head / Tilt / 2440MHz

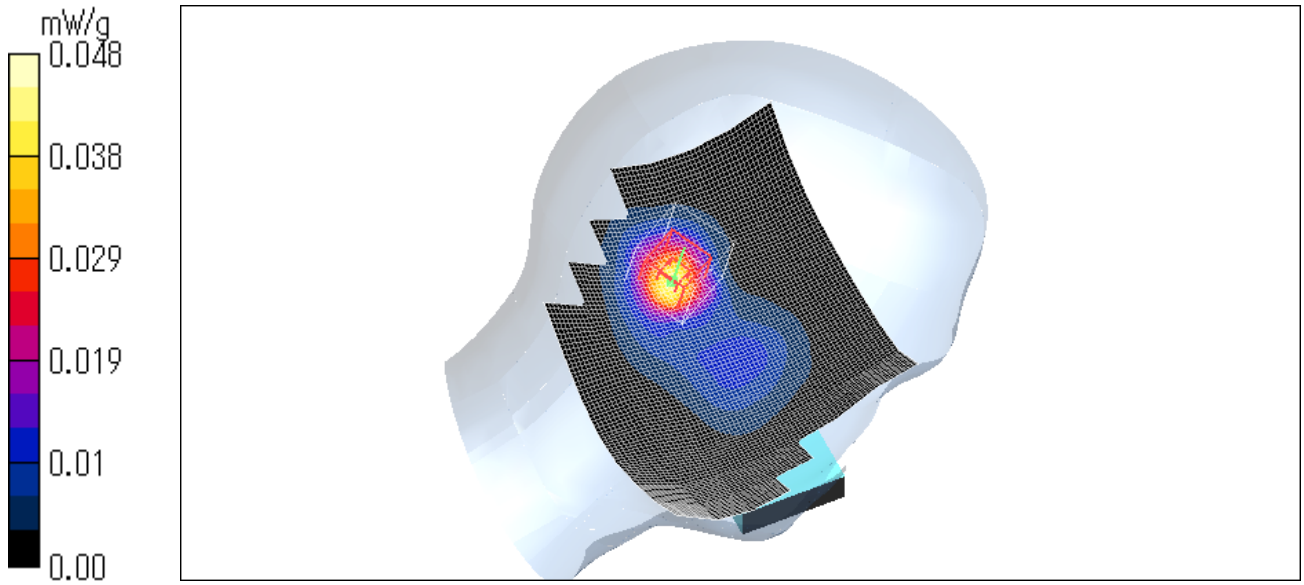
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.044 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.08 V/m; Power Drift = -0.171 dB
Peak SAR (extrapolated) = 0.072 W/kg
SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.048 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Right Head / Cheek / 2440MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

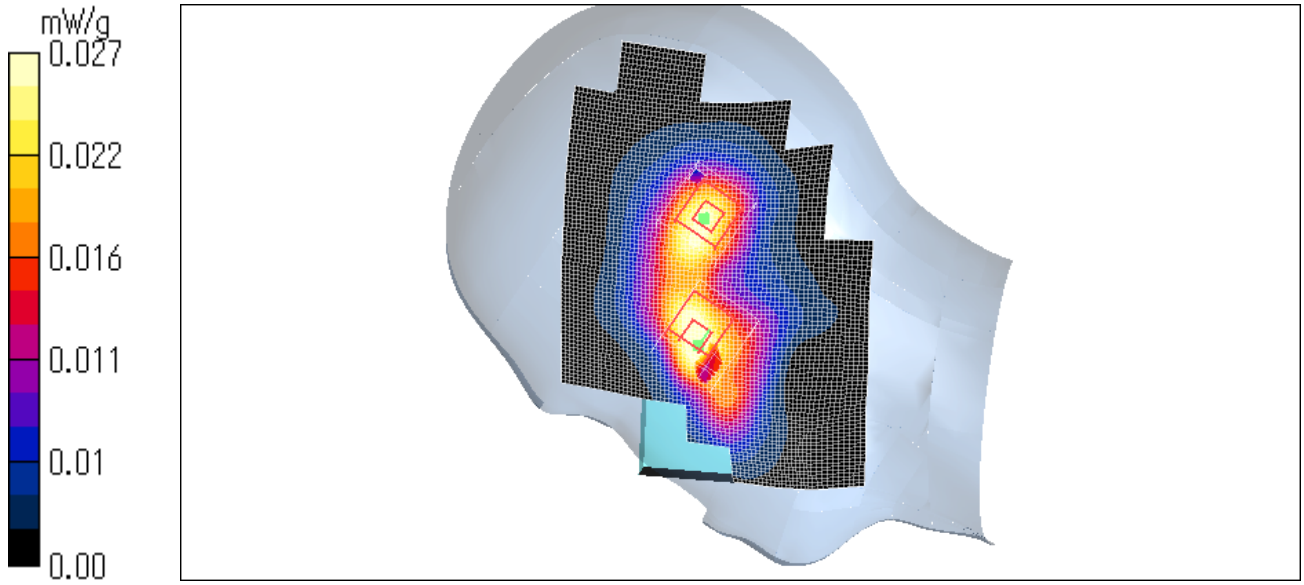
DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.029 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.84 V/m; Power Drift = -0.299 dB
Peak SAR (extrapolated) = 0.052 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.032 mW/g

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.84 V/m; Power Drift = -0.299 dB
Peak SAR (extrapolated) = 0.056 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.011 mW/g
Maximum value of SAR (measured) = 0.027 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Right Head / Tilt / 2440MHz

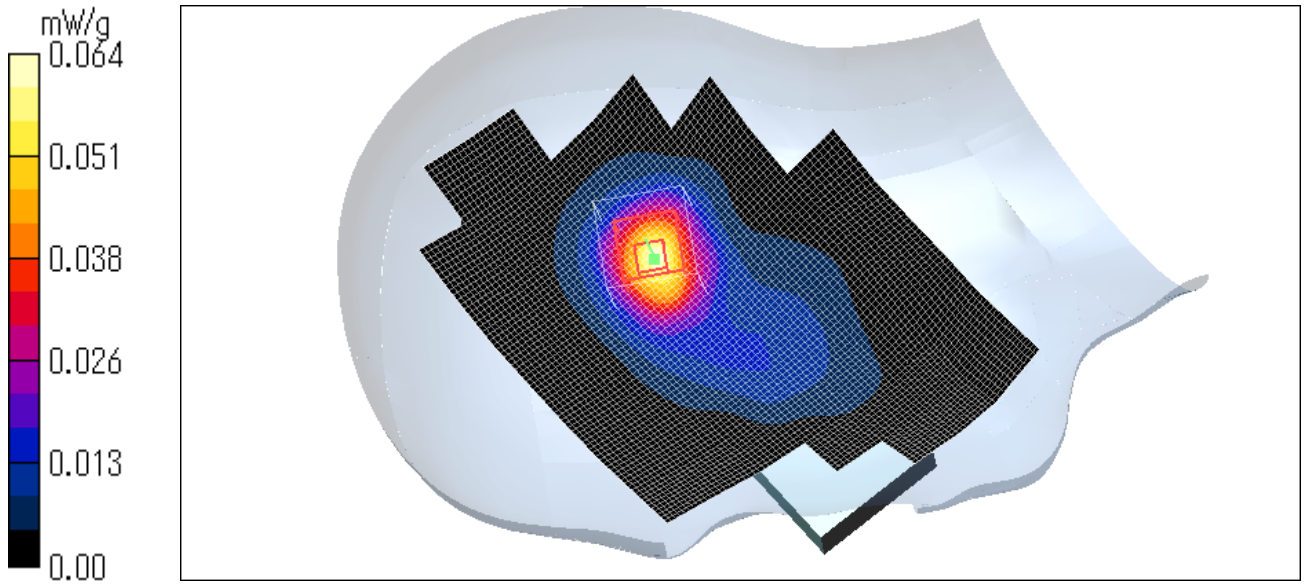
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.063 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.30 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 0.089 W/kg
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.027 mW/g
Maximum value of SAR (measured) = 0.064 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.6 degree.C. , After 24.6 degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Right Head / Tilt / 2402MHz

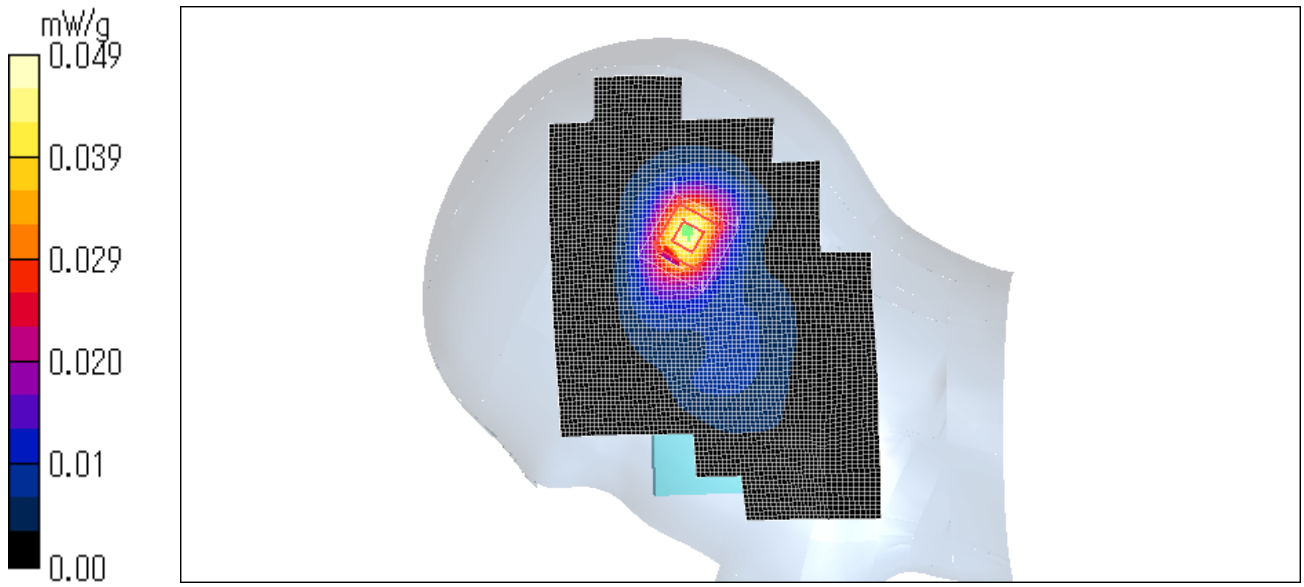
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.047 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.71 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.071 W/kg
SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.049 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.7 degree.C. , After 24.8degree.C.



KX-THA12 (Mode 2_Sub Antenna) / Right Head / Cheek / 2480MHz

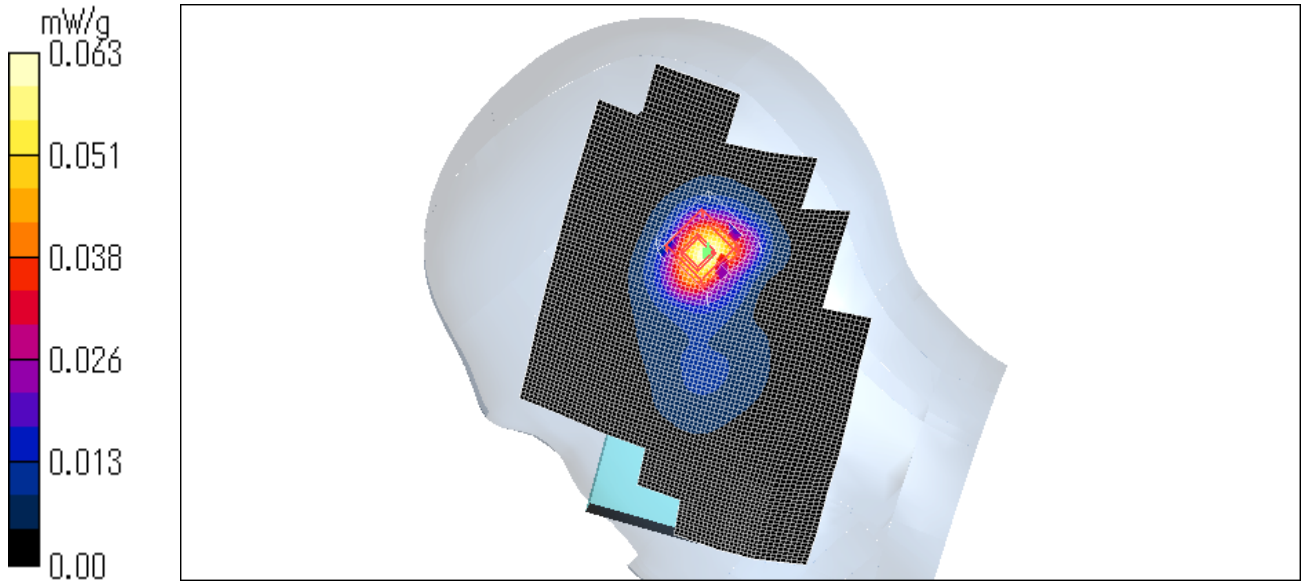
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (71x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.064 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.07 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.073 W/kg
SAR(1 g) = 0.053 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.063 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.8 degree.C. , After 24.8 degree.C.



APPENDIX 3 : SAR Measurement data of Body

KX-THA12 (Mode 1) / Body / Face / 2441MHz

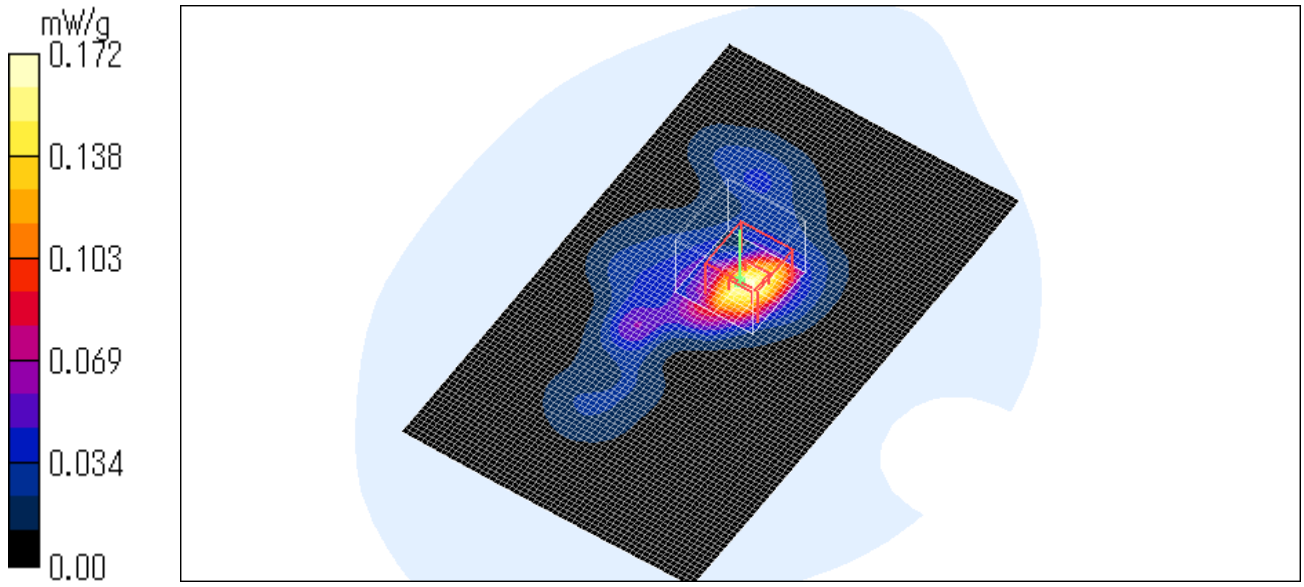
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.172 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.67 V/m; Power Drift = -0.198 dB
Peak SAR (extrapolated) = 0.372 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.172 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.1 degree.C. , After 24.1 degree.C.



KX-THA12(Mode 1) / Body / Back / 2441MHz

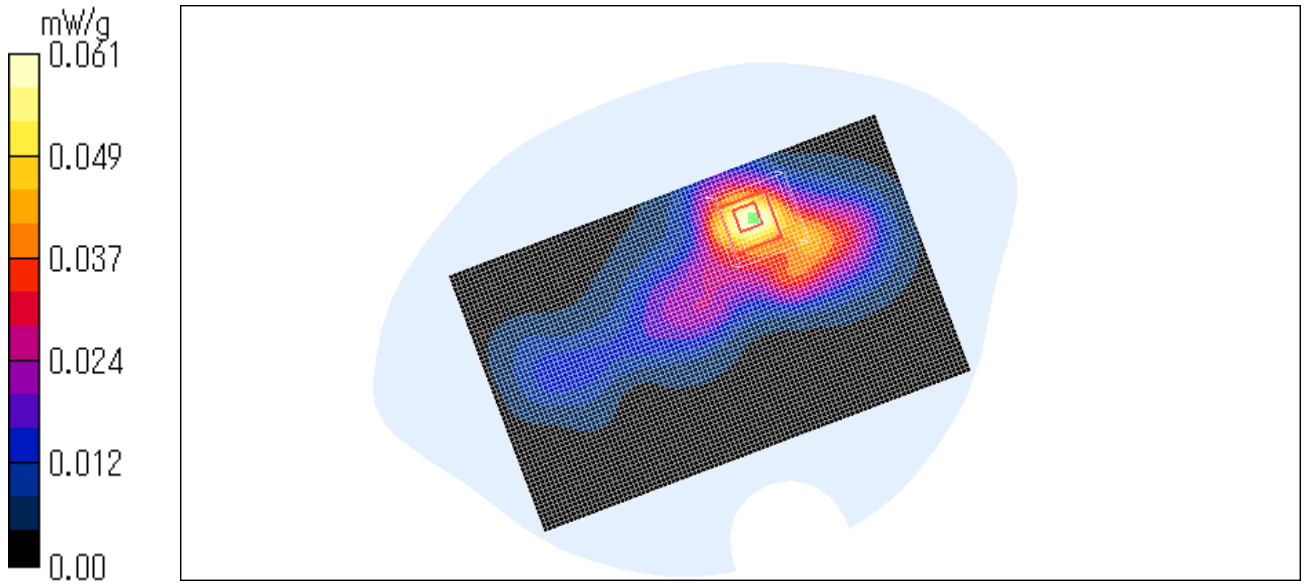
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.062 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.36 V/m; Power Drift = -0.139 dB
Peak SAR (extrapolated) = 0.116 W/kg
SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.061 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.0 degree.C. , After 24.0 degree.C.



KX-THA12(Mode 1) / Body / Face / 2402MHz

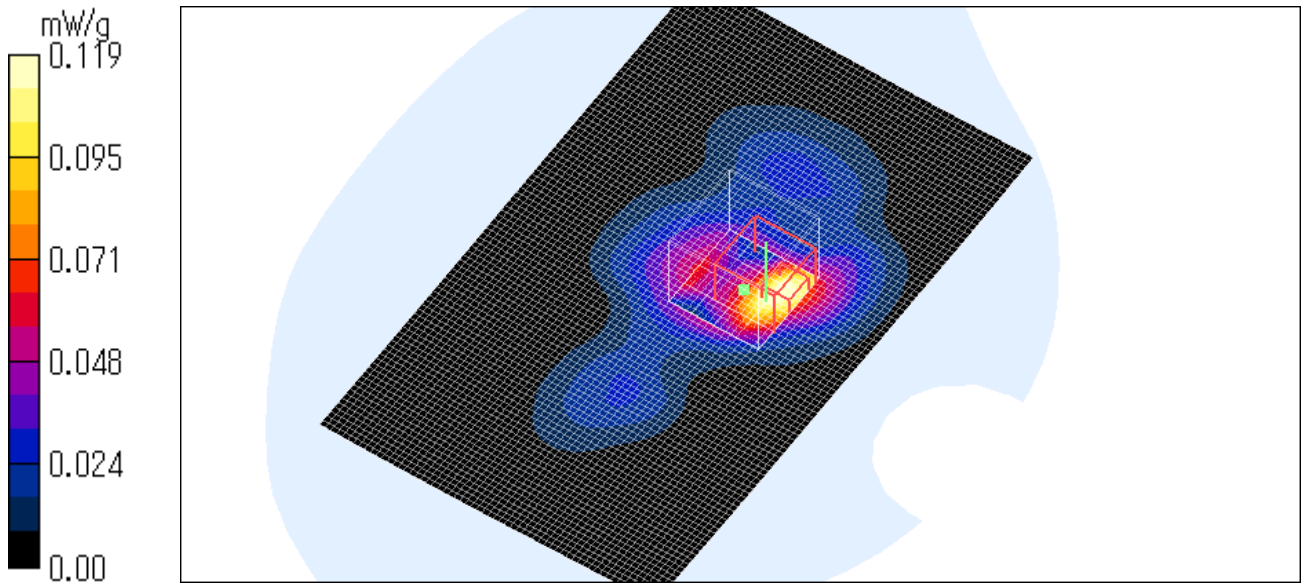
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.095 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.99 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.254 W/kg
SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.119 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.0 degree.C. , After 24.0 degree.C.



KX-THA12(Mode 1) / Body / Face / 2480MHz

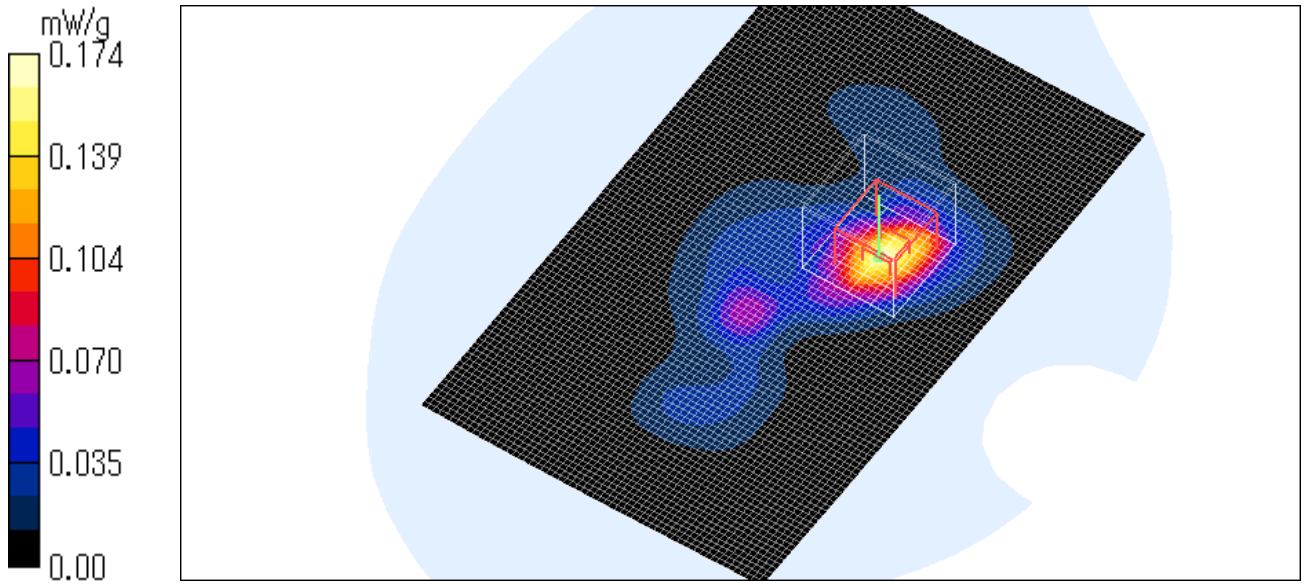
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.174 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.24 V/m; Power Drift = -0.230 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.158 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.174 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.0 degree.C. , After 24.0 degree.C.



KX-THA12(Mode 2_Main antenna) / Body / Face / 2440MHz

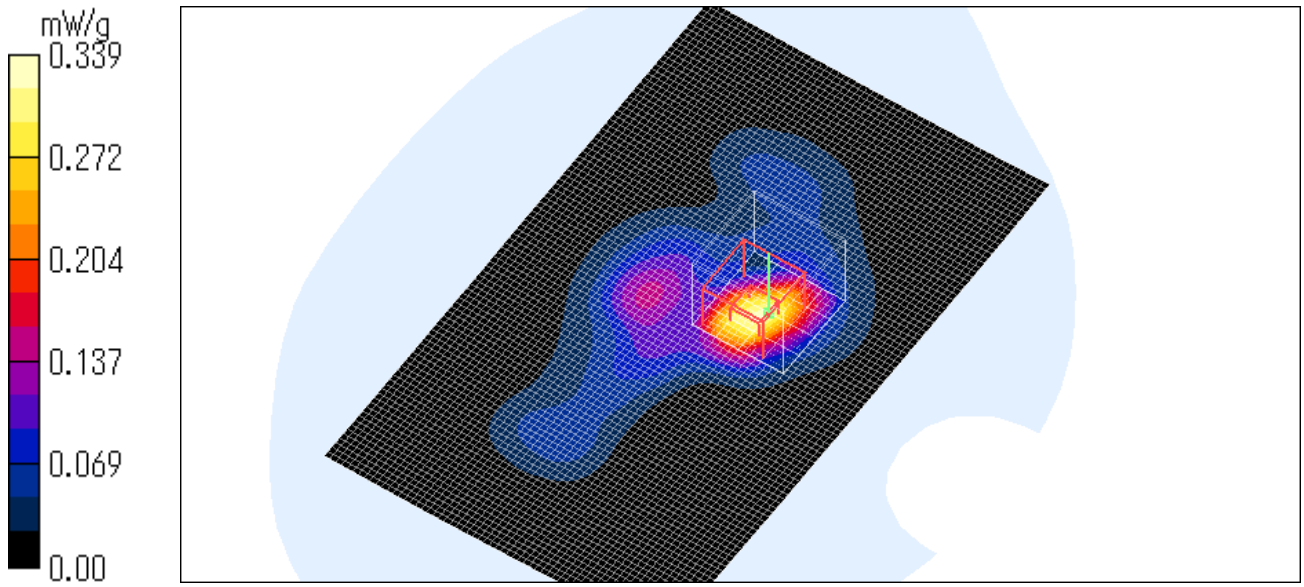
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.333 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.86 V/m; Power Drift = -0.294 dB
Peak SAR (extrapolated) = 0.691 W/kg
SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.157 mW/g
Maximum value of SAR (measured) = 0.339 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.



KX-THA12(Mode 2_Main antenna) / Body / Back / 2440MHz

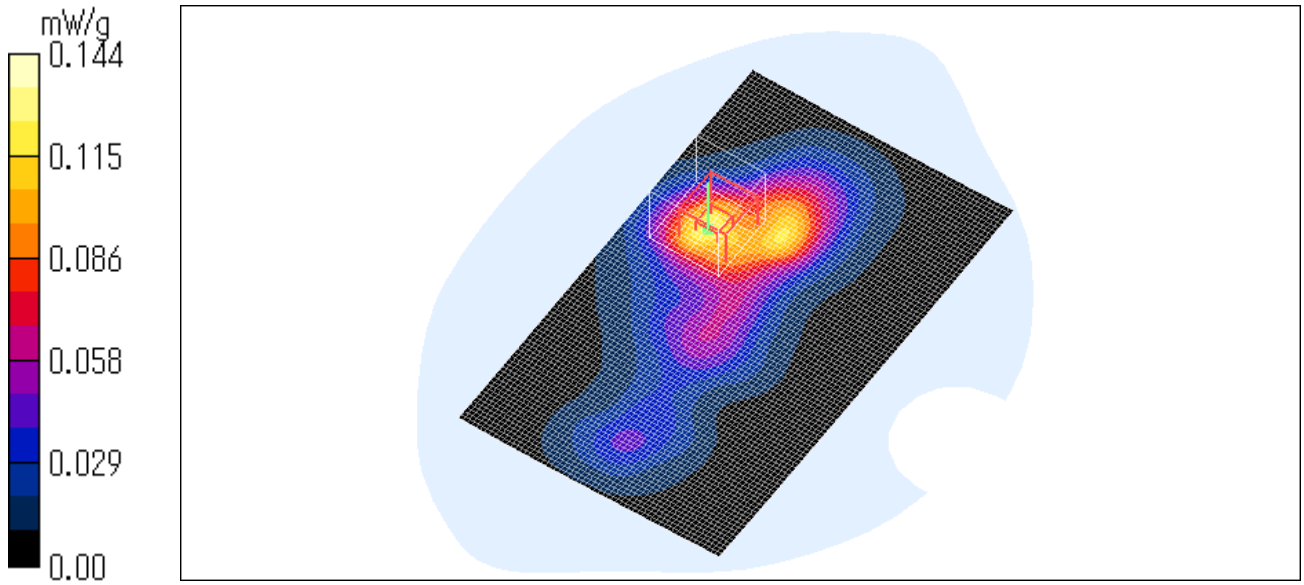
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.128 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.62 V/m; Power Drift = -0.218 dB
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.073 mW/g
Maximum value of SAR (measured) = 0.144 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.2 degree.C.



KX-THA12(Mode 2_Main antenna) / Body / Face / 2402MHz

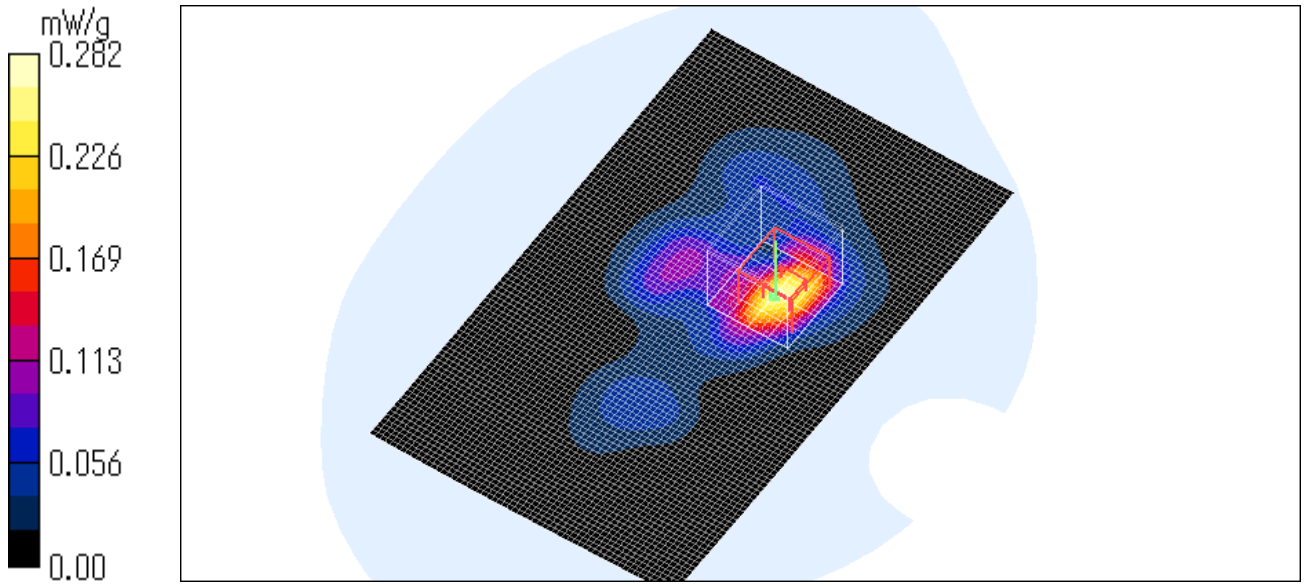
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.309 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.95 V/m; Power Drift = -0.216 dB
Peak SAR (extrapolated) = 0.564 W/kg
SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.125 mW/g
Maximum value of SAR (measured) = 0.282 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.



KX-THA12(Mode 2_Main antenna) / Body / Face / 2480MHz

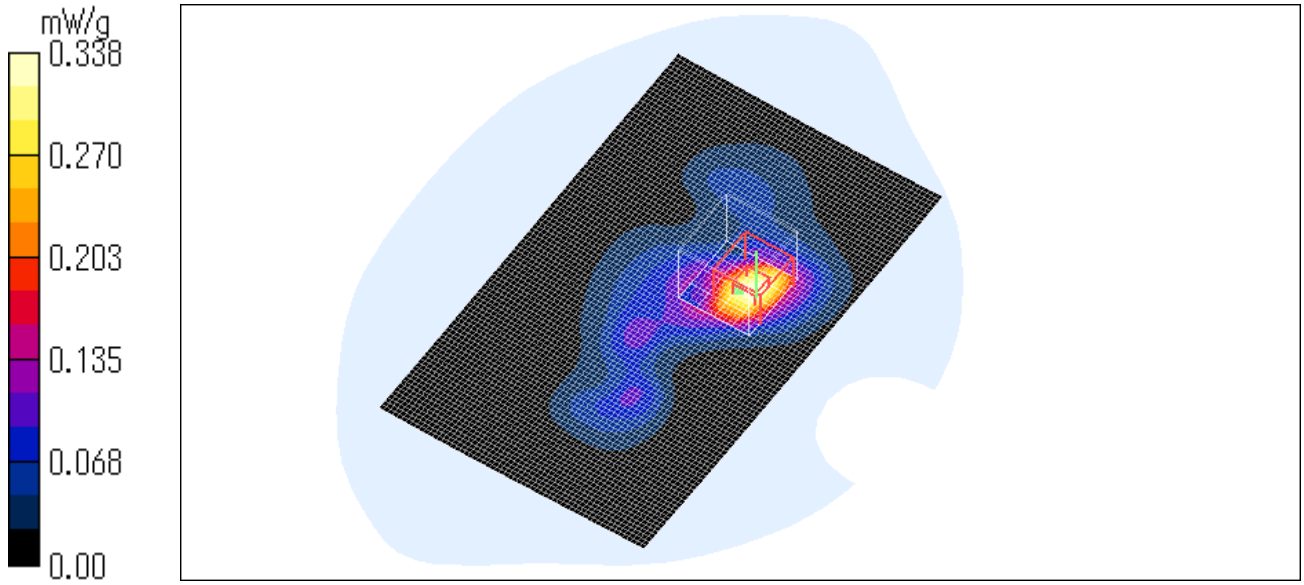
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.344 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.01 V/m; Power Drift = -0.229 dB
Peak SAR (extrapolated) = 0.751 W/kg
SAR(1 g) = 0.342 mW/g; SAR(10 g) = 0.165 mW/g
Maximum value of SAR (measured) = 0.338 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.2 degree.C. , After 24.2 degree.C.

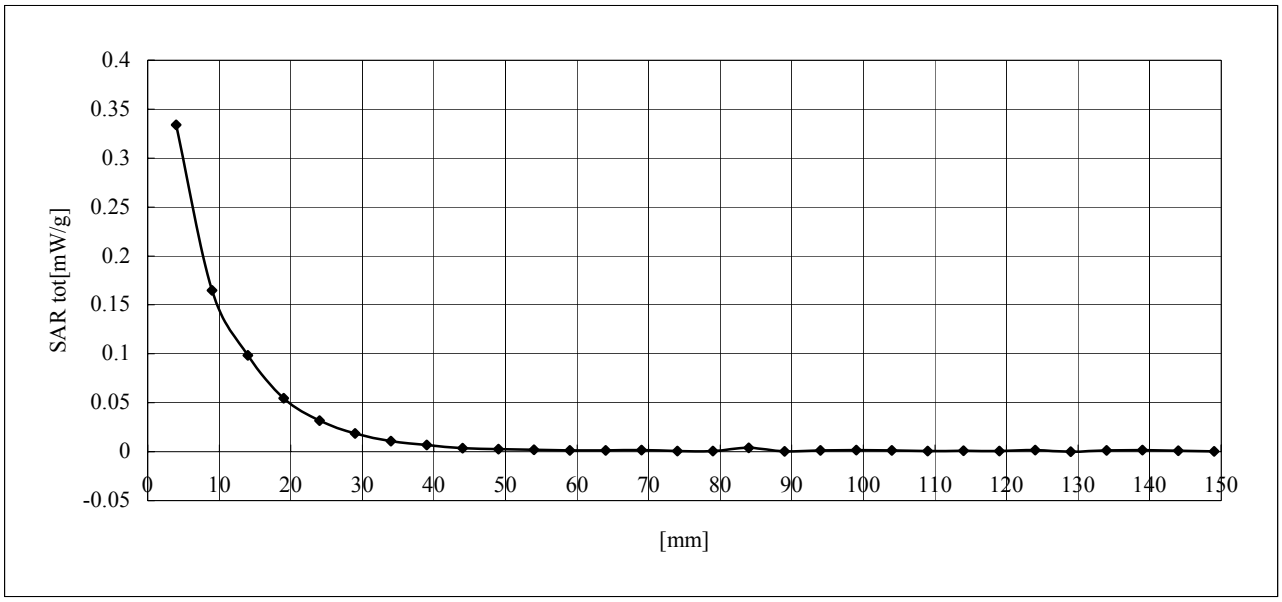


Z-axis at maximaum SAR location

KX-THA12(Mode 2_Main antenna) / Body / Face / 2480MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145



KX-THA12(Mode 2_Sub antenna) / Body / Face / 2440MHz

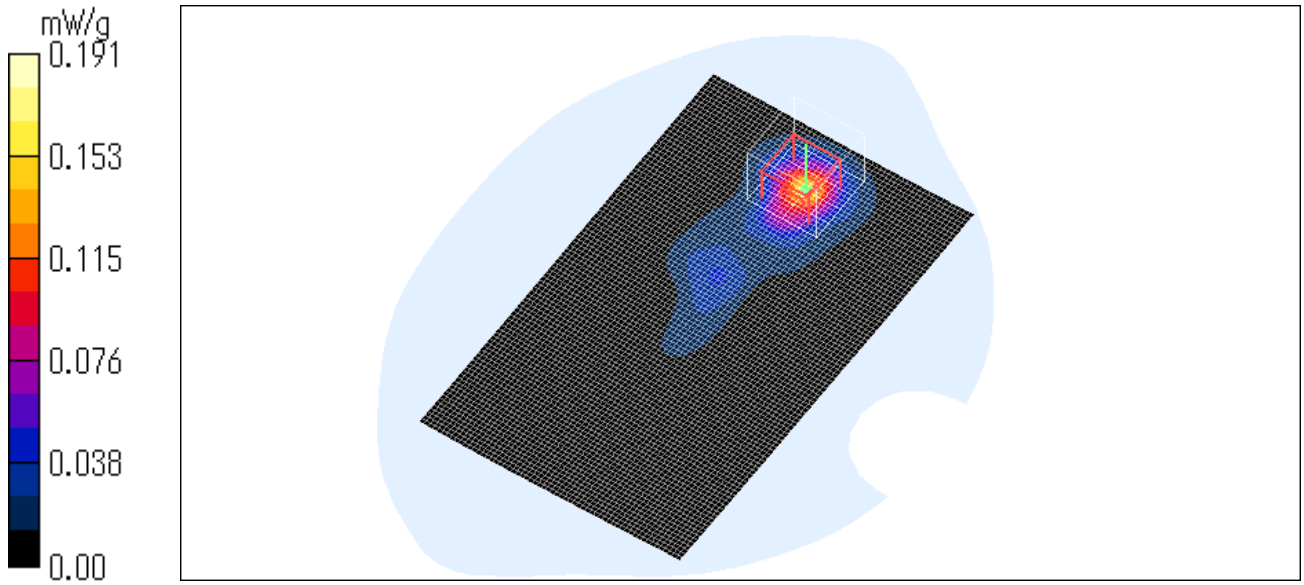
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.149 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.82 V/m; Power Drift = -0.244 dB
Peak SAR (extrapolated) = 0.466 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.079 mW/g
Maximum value of SAR (measured) = 0.191 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.1 degree.C. , After 24.1 degree.C.



KX-THA12(Mode 2_Sub antenna) / Body / Back / 2440MHz

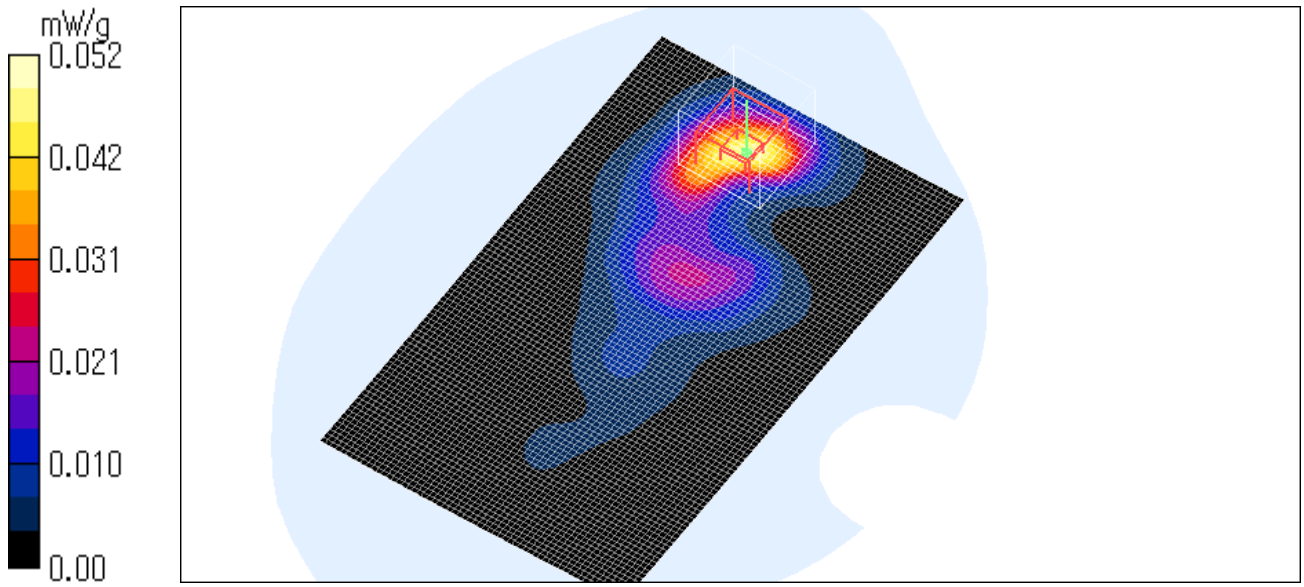
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.049 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.13 V/m; Power Drift = -0.221 dB
Peak SAR (extrapolated) = 0.096 W/kg
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.052 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.1 degree.C. , After 24.1 degree.C.



KX-THA12(Mode 2_Sub antenna) / Body / Face / 2402MHz

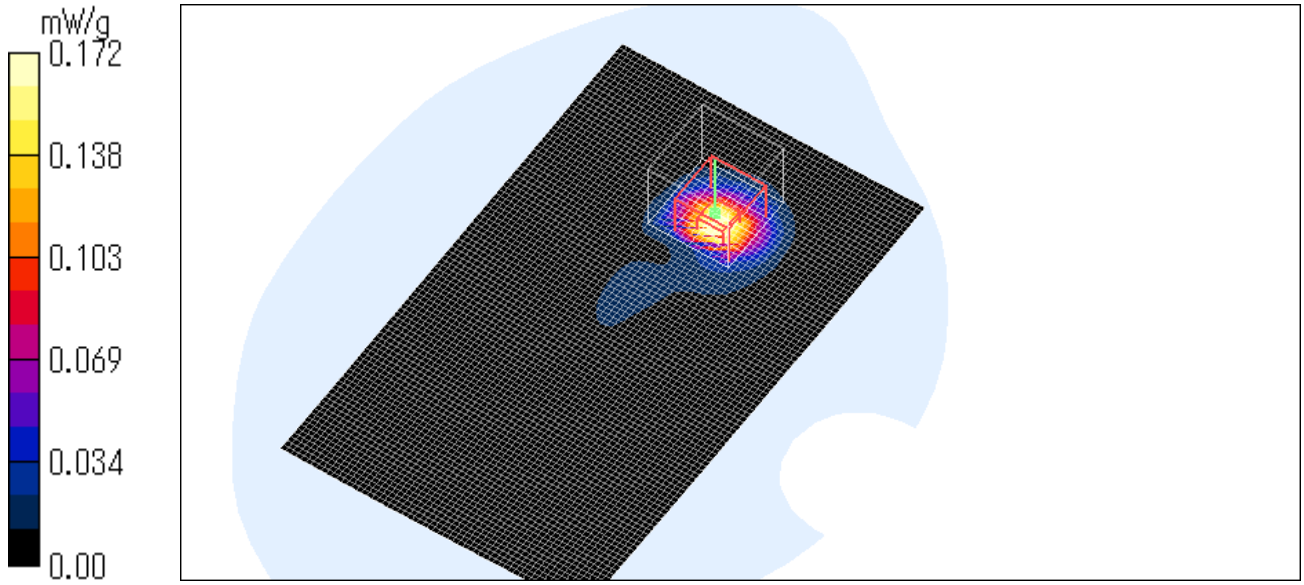
Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.159 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.51 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.441 W/kg
SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.172 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.1 degree.C. , After 24.1 degree.C.



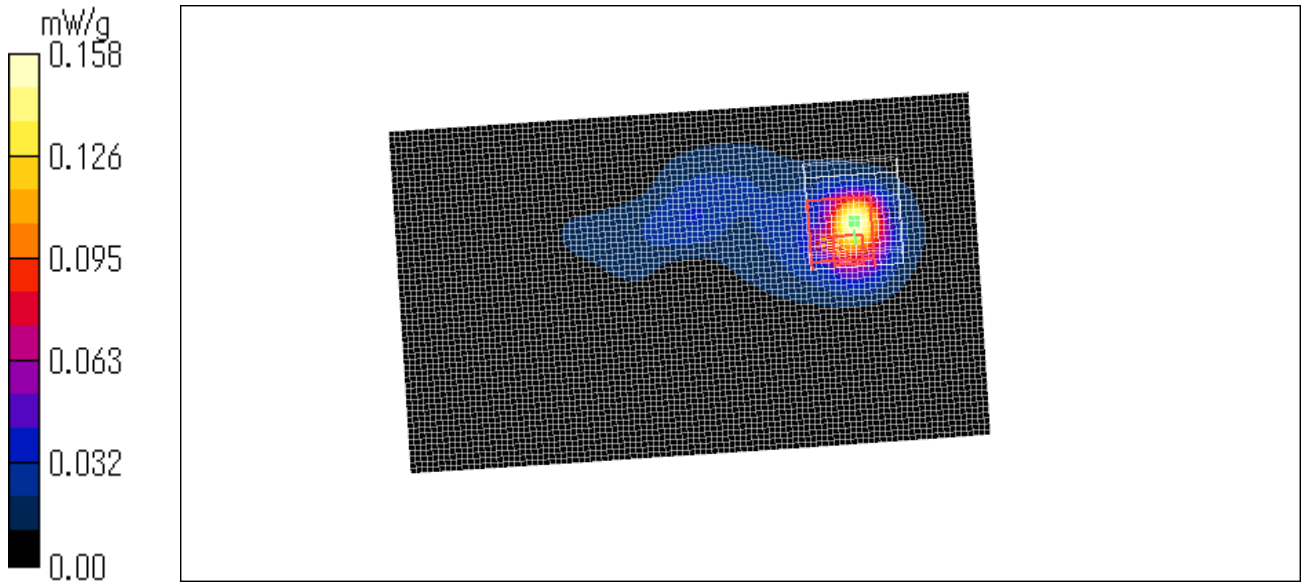
KX-THA12(Mode 2_Sub antenna) / Body / Face / 2480MHz

Duty Cycle: 1:1.2
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.14, 4.14, 4.14); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (61x101x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.161 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.51 V/m; Power Drift = -0.251 dB
Peak SAR (extrapolated) = 0.253 W/kg
SAR(1 g) = 0.123 mW/g; SAR(10 g) = 0.036 mW/g
Maximum value of SAR (measured) = 0.158 mW/g
Test Date = 05/19/05
Ambient Temperature = 25.0degree.C.
Liquid Temperature = Before 24.1 degree.C. , After 24.1 degree.C.



APPENDIX 4 : Validation Measurement data

System Validation / Dipole 2450 MHz / Forward Conducted Power : 250mW

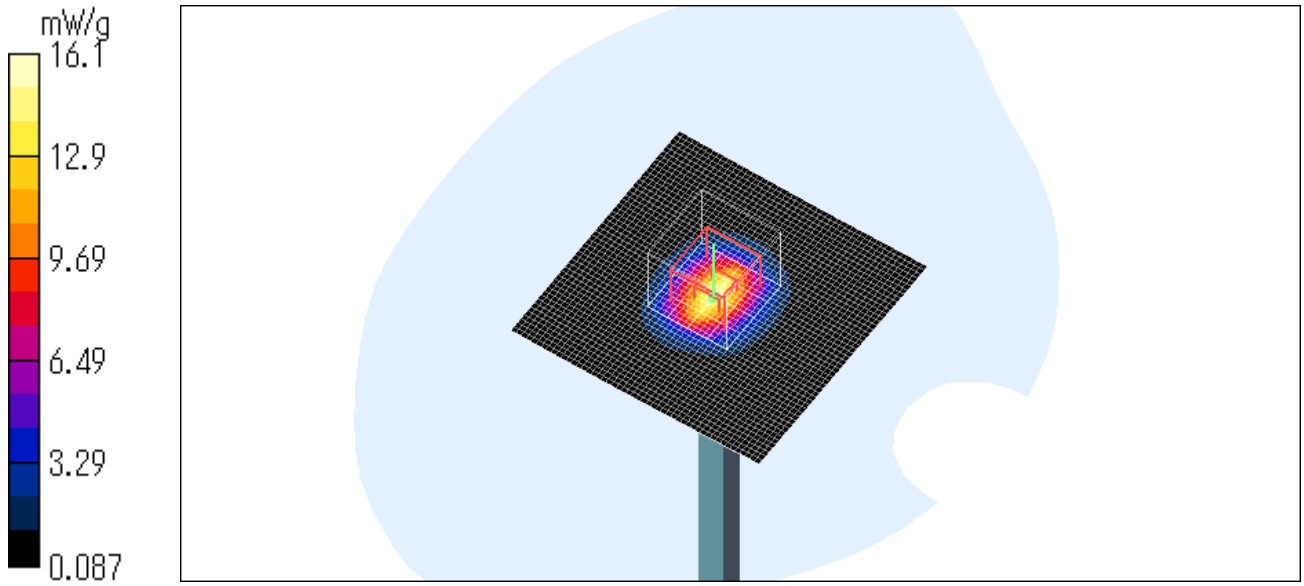
Dipole 2450 MHz; Type: D2450V2; Serial: SN:713
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.87 mho/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (51x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 21.8 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.5 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 29.3 W/kg
SAR(1 g) = 14.2 mW/g; SAR(10 g) = 6.6 mW/g
Maximum value of SAR (measured) = 16.1 mW/g

Test Date = 05/19/05
Ambient Temperature = 25.0 degree C.
Liquid Temperature = Before 24.3 degree C. , After 24.3 degree C.

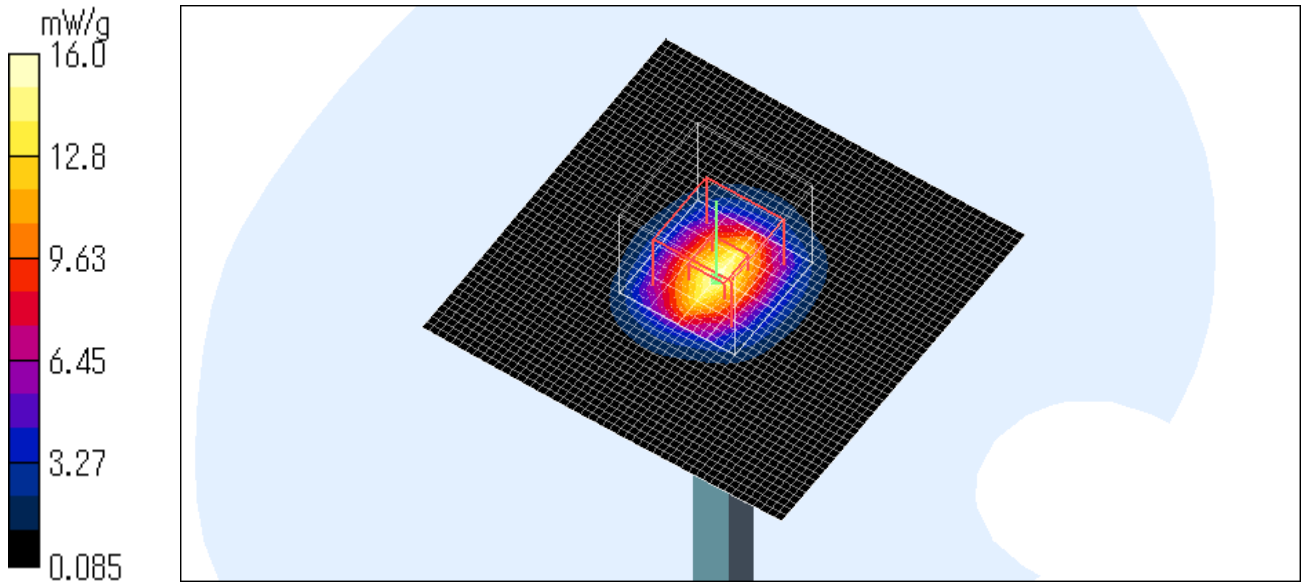


System Validation / Dipole 2450 MHz / Forward Conducted Power : 250mW

Dipole 2450 MHz; Type: D2450V2; Serial: SN:713
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:
Probe: ET3DV6 - SN1684; ConvF(4.39, 4.39, 4.39); Calibrated: 2004/09/02
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Electronics: DAE3 Sn516; Calibrated: 2005/03/10
Phantom: SAM 1196
Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 145

Area Scan (51x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 21.9 mW/g

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 96.0 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 14.2 mW/g; SAR(10 g) = 6.57 mW/g
Maximum value of SAR (measured) = 16.0 mW/g

Test Date = 05/31/05
Ambient Temperature = 25.0 degree.C.
Liquid Temperature = Before 24.3 degree.C. , After 24.3 degree.C.