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TEST REPORT ON SAR

Model Tested: GT-I9108
FCC ID (Requested): A3LGTI9108
Job No: FI-127
Report No: FI-127-S1

- Abstract -

This document reports on SAR Tests carried out in accordance with FCC/OET Bulletin 65, Supplement C(June 2001).

Prepared By

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1. GENERAL INFORMATION

Test Dates : Jun.18~22,2011, Jul.28, 2011
Manufacturer : SAMSUNG ELECTRONICS Co., Ltd.
Address : 416 Maetan3-Dong, Suwon City, Korea
Test Standard : §2.1093; FCC/OET Bulletin 65, Supplement C(June 2001)
FCC Classification : Licensed Portable Transmitter Held to Ear (PCE)
Digital Transmission System(DTS)
Unlicensed National Information Infrastructure TX(NII)
Tested for : FCC/TCB Certification

2. DESCRIPTION OF DEVICE

Test Sample : 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Model Number : GT-I9108
Serial Number : Identical prototype (S/N : # FI-127-G)
Tx Freq.Range: 1850.20 ~ 1909.80 MHz (GSM1900)
2412 ~ 2462MHz (2.4GHz WLAN)
5180 ~ 5240 MHz(5.2 GHz WLAN)
5260 ~ 5320 MHz(5.3 GHz WLAN)
5500 ~ 5700 MHz(5.5 GHz WLAN)
5745 ~ 5825 MHz(5.8 GHz WLAN)
Rx Freq.Range: 1930.20 ~ 1989.80 MHz (GSM1900)
2412 ~ 2462 MHz (2.4GHz WLAN)
5180 ~ 5240 MHz(5.2 GHz WLAN)
5260 ~ 5320 MHz(5.3 GHz WLAN)
5500 ~ 5700 MHz(5.5 GHz WLAN)
5745 ~ 5825 MHz(5.8 GHz WLAN)
Antenna Manufacturer : TYCO
Model No.: 2108134G
GPRS Multi slot class Class 12
EDGE Multi slot class Class 10
GSM Class B
DTM Multislots N/A
Antenna Dimensions : 62.13X14.80X6.67(mm)
Separation distance between
Main and Bluetooth antenna : 23mm

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3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR Measurement Setup

Robotic System

Measurements are performed using the DASY4 (or DASY5) 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, Samsung computer, near-field probe, probe alignment sensor, and the SAM twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Fig. 3.1).

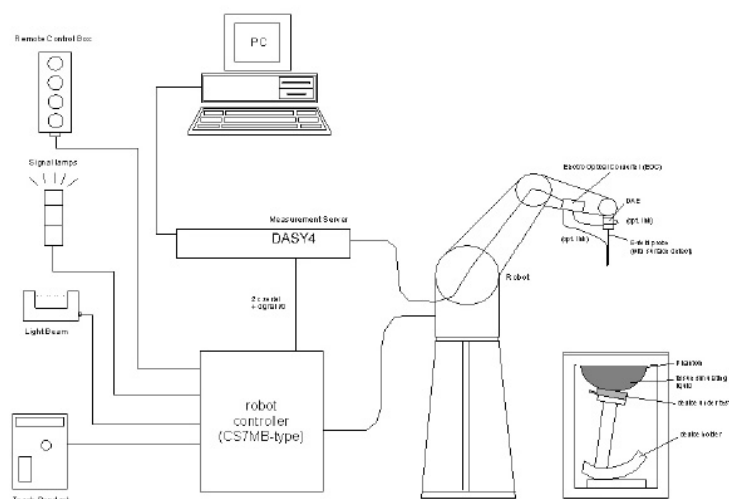


Figure 3.1 SAR Measurement System Setup

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 Samsung computer with Windows XP system and SAR Measurement Software DASY4 (or DASY5), 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. 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.

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System Electronics

The DAE4(or DAE3) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, 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 ES3DV2, ES3DV3, EX3DV4 and ET3DV6, 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. 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

Figure 3.2 DAE System stopped at reaching the maximum.

Probe Specifications

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

Calibration Basic Broad Band Calibration in air: 10-3000 MHz
 Conversion Factors (CF) for HSL 900 and HSL 1800

Additional CF for other liquids and frequencies upon request

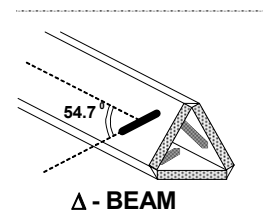


Figure 3.3 Triangular Probe Configuration

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

Directivity **[ES3DV3], [ET3DV6]**
 ± 0.2 dB in HSL (rotation around probe axis)
 ± 0.3 dB in tissue material (rotation normal to probe axis)
[EX3DV4]
 ± 0.3 dB in HSL (rotation around probe axis)
 ± 0.5 dB in tissue material (rotation normal to probe axis)

Dynamic Range **[ES3DV3], [ET3DV6]**
 $5\mu\text{W/g}$ to $> 100\text{mW/g}$; Linearity: $\pm 0.2\text{dB}$
[EX3DV4]
 $10\mu\text{W/g}$ to $> 100\text{ mW/g}$; Linearity: ± 0.2 dB

Dimensions **[ES3DV3], [ES3DV2]**
Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 3.9 mm (Body: 12 mm)
Distance from probe tip to dipole centers: 2.1 mm
[EX3DV4]
Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5 mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 1 mm
[ET3DV6]
Overall length: 330mm
Tip length: 16mm
Body diameter: 12mm
Tip diameter: 6.8mm
Distance from probe tip to dipole centers: 2.7mm



[ES3DV3] ,[ES3DV2]



[EX3DV4]

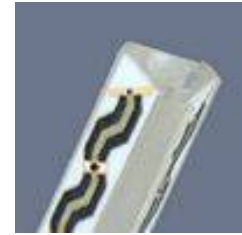
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Application **[ES3DV3], [ES3DV2]**

General dosimetry up to 5 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

[EX3DV4]

High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30 %.



[ET3DV6]

[ET3DV6]

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

Optical

[ET3DV6]

Surface

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

Detection

3.3 Phantom

SAM Twin Phantom

The SAM Twin Phantom V4.0 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)



Figure3.5 SAM Twin Phantom

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SAM Twin Phantom Specification

Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, EN 62209-1. 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.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Height: 810 mm; Length: 1000 mm; Width: 500 mm

Modular Flat Phantom

The Modular Flat Phantom V5.1 is constructed of a fiberglass shell integrated in a wooden table. Also It consists of three identical flat phantoms (modules) which can be installed and removed separately without emptying the liquid, as well as a wooden support.. It enables the dosimetric evaluation of 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 3.6)



Figure 3.6 Modular Flat Phantom

Modular Flat Phantom Specification

Construction	The shell corresponds to the specifications of IEEE 1528-2003. It enables the dosimetric evaluation of body mounted usage above 800 MHz at the flat phantom region. A cover prevents evaporation of the liquid		
Shell Thickness	2 ± 0.2 mm		
Filling Volume	Approx. 10 liters		
Dimension	Wooden support - Height: 810 mm; Length: 830 mm; Width: 500 mm Each Module - Height:190 mm; Length: 200 mm; width: 300 mm		

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3.4 Brain Simulating Mixture Characterization

The brain mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bactericide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue.

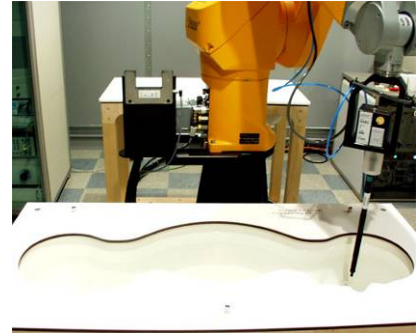


Figure 3.7 Simulated Tissue

Table 3.1 Composition of the Brain Tissue Equivalent Matter

INGREDIENTS	1900MHz Brain	1900MHz Muscle	2450MHz Brain	2450MHz Muscle	5200~5800MHz Brain	5200~5800MHz Muscle
WATER	55.24%	70.23%	71.88%	73.4%	65.52%	78.66%
SUGAR	-	-	-	-		
SALT	0.31%	0.29%	0.16%	0.06%		
DGBE	44.45%	29.48%	7.99%	26.54%		
Triton X-100	-	-	19.97%	-	17.24%	10.67%
BACTERIACIDE	-	-	-	-		
HEC	-	-	-	-		
Dielectric Constant Target	40	53.3	39.2	52.7	35.575	48.539
Conductivity Target (S/m)	1.4	1.52	1.8	1.95	5.018	5.708

3.5 Device Holder for Transmitters

In combination with the Twin SAM Phantom V4.0, the Mounting Device (see Fig. 3.7) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is

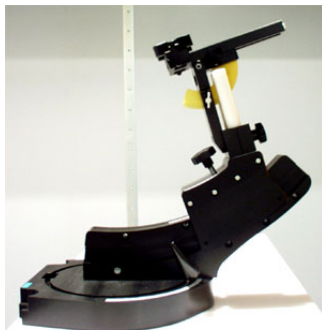


Figure 3.8 Device Holder

the ear opening. The devices can be easily, accurately and repeatedly be positioned according to the EN 50360:2001 and FCC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

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

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3.6 Validation Dipole

The reference dipole should have a return loss better than –20 dB (measured in the setup) at the resonant frequency to reduce the uncertainty in the power measurement.

Frequency	1900, 2450 MHz, 5000MHz
Return Loss	< -20 dB at specified validation position
Dimensions	D1900V2: dipole length: 68 mm; overall height: 300 mm D2450V2: dipole length: 51.8 mm; overall height: 300 mm D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

Note:

Usage of SAR dipoles calibrated less than 2 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibration in KDB 450824

D2450V2 S/N:807	Parameters			
Date of Cal	Return loss (dB)	Deviation (%)	Impedance (Ω)	Deviation (Ω)
2010.02.04	-26.8	0	54.4	0
2011.03.31	-26.6	0.75	50.1	-4.3

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3.7 Equipment Calibration

Table 3.2 Test Equipment Calibration

Type	Calibration Due Date	Serial No.
SPEAG E-Field Probe EX3DV4	Apr.14, 2012	3750
SPEAG DAE4	Feb.22, 2012	486
SPEAG Validation Dipole D1900V2	Feb.23, 2013	5d082
SPEAG Validation Dipole D2450V2	Feb.04, 2012	807
SPEAG Validation Dipole D5GHzV2	Mar. 14,2013	1099
Stäubli Robot RX90BL	Not Required	F02/5R79A1/A/01
SPEAG SAM Twin Phantom V4.0	Not Required	TP-1247
SPEAG SAM Twin Phantom V4.0	Not Required	TP-1248
Modular Phantom	Not Required	1001
E4438C Signal Generator	Jan.26, 2012	MY45094010
NRVD Dual Channel Power Meter	Feb.07, 2012	836416/028
NRV-Z53 Thermal Power Sensor	Feb.07, 2012	835324/001
NRV-Z53 Thermal Power Sensor	Feb.07, 2012	835324/006
E4419B Power Meter	Nov.30, 2011	GB43312299
E9300B Power Sensor	Jan.28, 2012	MY41495557
BBS3Q7ECK Power Amp	Jan.20, 2012	1052
HP-8753ES Network Analyzer	Oct.29, 2011	US39173712
HP85070C Dielectric Probe Kit	Not Required	US99360087
DASY4 S/W (ver 4.7)	Not Required	-
E4440A Spectrum Analyzer	Feb.24, 2012	MY45304704
777D Dual Directional Coupler	Mar.24, 2012	07526
Base Station Simulator	Dec.20, 2011	GB46490112
772D Dual Directional Coupler	Mar.4,2012	ZA200100954
PRE-AMPLIFIER 8449B	Dec.15,2011	3008A00691

NOTE:

The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Validation measurement is performed by Samsung Lab. before each test. (see § 7.2) The brain simulating material is calibrated by Samsung using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material. (see § 7.1)

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4. SAR MEASUREMENT PROCEDURE

The evaluation was performed using the following procedure.

STEP 1

The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

STEP 2

The SAR distribution at the exposed side of the head was measured at a distance of 3.9mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20mm x 20mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation. If area scan will be performed at over 4.5GHz, the projected area of transmitter are measured in an area scan with a resolution ≤ 1.0 cm.

STEP 3

Around this point, a volume of 32mm x 32mm x 30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points for below 3 GHz and a volume of 24mm x 24mm x 20mm was assessed by measuring 7 x 7 x 11 point for over 3 GHz. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the center of the dipoles is 2.7mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluated the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using 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). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

STEP 4

The SAR value at the same location as in step 1 was again measured.

(If the value changed by more than 5%, the evaluation is repeated.)

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5. DESCRIPTION OF TEST POSITION

5.1 SAM Phantom Shape

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

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.

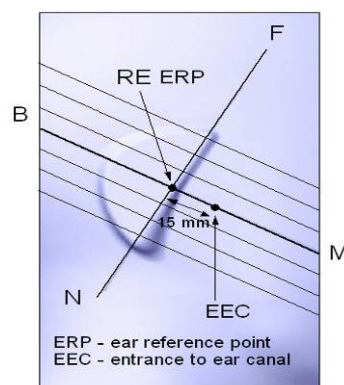


Figure 5.2 Close up side view

5.2 “cheek” Position

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 then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its tip and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head

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phantoms on the ear reference point

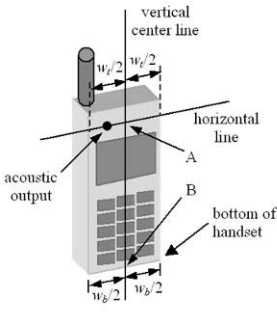


Figure 5.4 Handset vertical and horizontal reference lines

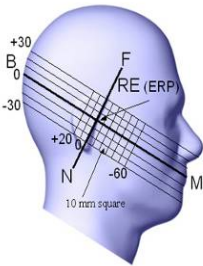
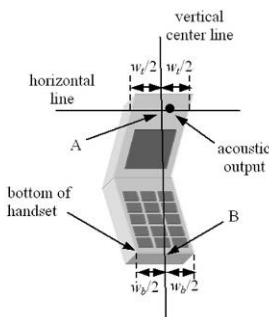


Figure 5.3 Side view of the phantom showing relevant markings

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 5.5), 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

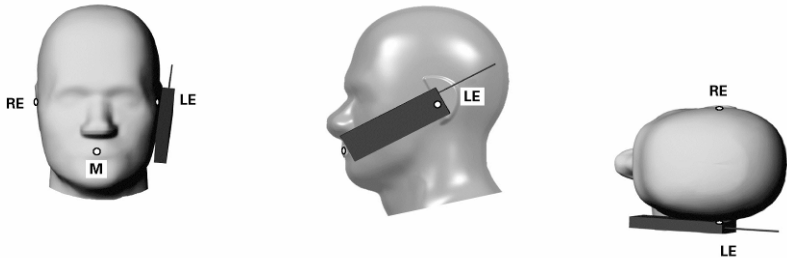


Figure 5.5 Front, Side and Top View of Cheek/Touch Position

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).

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Step 4

Rotate the handset around the vertical centerline until the phone (horizontal line) was symmetrical with 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.

5.3 “tilted” Position

With the test device aligned in the “cheek” position :

Step 1

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

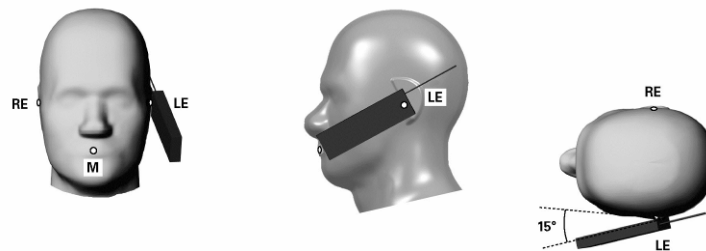


Figure 5.6 Front, side and Top View of Ear/Tilt 15° Position

Step 2

While maintaining the orientation of the phone, the phone was retracted parallel to the reference 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.

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5.4 Body Configurations for Single TX SAR considerations

5.4.1 Transmit Antenna Separation Distances

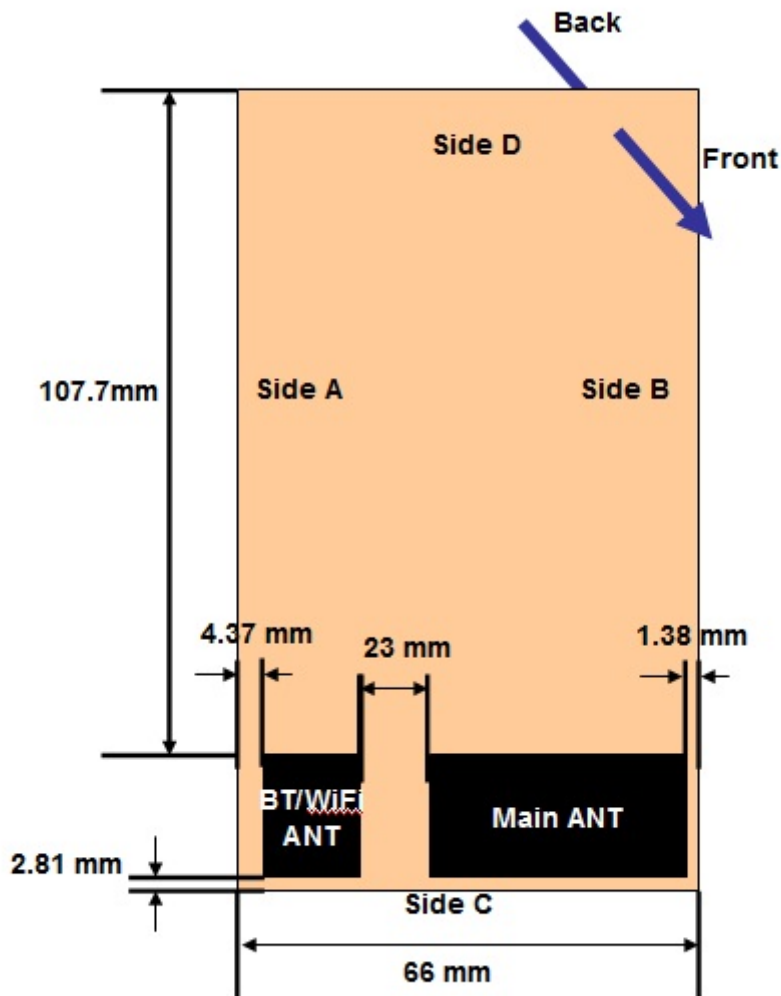


Figure 5.7 Antenna Locations, as viewed from front of device

Note : Per Oct 2010 TCB FCC Workshop, the edges with antennas within 2.5Cm are required to be evaluated for SAR

Table 5.1 Mobile Hotspot Sides for SAR Testing

Mode	Back	Front	Side A	Side B	Side C	Side D
GSM1900	Yes	Yes	No	Yes	Yes	No
WLAN	Yes	Yes	Yes	No	Yes	No

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6. MEASUREMENT UNCERTAINTY

Table 6.1 Uncertainty Budget at 1900MHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	C _i	Standard uncertainty (±%)	v_i^2 or v_{eff}
Measurement System						
Probe Calibration	12.00	normal	2.000	1	6.00	∞
Axial Isotropy	4.70	rectangular	1.732	0.7	1.90	∞
Hemispherical Isotropy	9.60	rectangular	1.732	0.7	3.88	∞
Linearity	4.70	rectangular	1.732	1	2.71	∞
System Detection Limits	0.25	rectangular	1.732	1	0.14	∞
Boundary effects	1.00	rectangular	1.732	1	0.58	∞
Readout electronics	0.30	normal	1.000	1	0.30	∞
Response time	0.80	rectangular	1.732	1	0.46	∞
RF ambient conditions	3.00	rectangular	1.732	1	1.73	∞
Integration time	0.00	rectangular	1.732	1	0.00	∞
Mechanical constrains of robot	1.50	rectangular	1.732	1	0.87	∞
Probe positioning	2.90	rectangular	1.732	1	1.67	∞
Extrapolation and integration	1.00	rectangular	1.732	1	0.58	∞
Test Sample Related						
Test Sample positioning	1.50	normal	1.000	1	1.50	14
Device holded uncertainty	3.44	normal	1.000	1	3.44	∞
Power Drift	5.00	rectangular	1.732	1	2.89	∞
Phantom and Setup						
Modular Phantom uncertainty	6.02	normal	1.000	1	6.02	2
Phantom uncertainty	4.00	rectangular	1.732	1	2.31	∞
Liquid conductivity (deviation from target)	5.00	rectangular	1.732	0.64	1.85	∞
Liquid conductivity (measurement error)	1.84	normal	1.000	0.64	1.18	∞
Liquid permittivity (deviation from target)	5.00	rectangular	1.732	0.6	1.73	∞
Liquid permittivity (measurement error)	4.54	normal	1.000	0.6	2.73	∞
Combined Standard Uncertainty		Normal	-	-	12.24	62037
Extended Standard Uncertainty(K=2.00)					24.48	62037

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Table 6.2 Uncertainty Budget at 2450MHz

Error Description	Uncertainty Value ($\pm\%$)	Probability Distribution	Divisor	C_i	Standard uncertainty ($\pm\%$)	v_i^2 or v_{eff}
Measurement System						
Probe Calibration	12.00	normal	2.000	1	6.00	∞
Axial Isotropy	4.70	rectangular	1.732	0.7	1.90	∞
Hemispherical Isotropy	9.60	rectangular	1.732	0.7	3.88	∞
Linearity	4.70	rectangular	1.732	1	2.71	∞
System Detection Limits	0.25	rectangular	1.732	1	0.14	∞
Boundary effects	1.00	rectangular	1.732	1	0.58	∞
Readout electronics	0.30	normal	1.000	1	0.30	∞
Response time	0.80	rectangular	1.732	1	0.46	∞
RF ambient conditions	3.00	rectangular	1.732	1	1.73	∞
Integration time	0.00	rectangular	1.732	1	0.00	∞
Mechanical constrains of robot	1.50	rectangular	1.732	1	0.87	∞
Probe positioning	2.90	rectangular	1.732	1	1.67	∞
Extrapolation and integration	1.00	rectangular	1.732	1	0.58	∞
Test Sample Related						
Test Sample positioning	4.22	normal	1.000	1	4.22	14
Device holded uncertainty	3.44	normal	1.000	1	3.44	∞
Power Drift	5.00	rectangular	1.732	1	2.89	∞
Phantom and Setup						
Modular Phantom uncertainty	2.32	Normal	1.0001	1	2.32	2
Phantom uncertainty	4.00	rectangular	1.732	1	2.31	∞
Liquid conductivity (deviation from target)	5.00	rectangular	1.732	0.64	1.85	∞
Liquid conductivity (measurement error)	2.04	normal	1.000	0.64	1.30	∞
Liquid permittivity (deviation from target)	5.00	rectangular	1.732	0.6	1.73	∞
Liquid permittivity (measurement error)	4.27	normal	1.000	0.6	2.56	∞
Combined Standard Uncertainty		Normal	-	-	11.57	792
Extended Standard Uncertainty(K=2.00)					23.15	792

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Table 6.3 Uncertainty Budget at 5800MHz

Error Description	Uncertainty Value ($\pm\%$)	Probability Distribution	Divisor	C_i	Standard uncertainty ($\pm\%$)	v_i^2 or v_{eff}
Measurement System						
Probe Calibration	13.1	normal	2.000	1	6.55	∞
Axial Isotropy	4.70	rectangular	1.732	0.7	1.90	∞
Hemispherical Isotropy	9.60	rectangular	1.732	0.7	3.88	∞
Linearity	4.70	rectangular	1.732	1	2.71	∞
System Detection Limits	0.25	rectangular	1.732	1	0.14	∞
Boundary effects	1.00	rectangular	1.732	1	0.58	∞
Readout electronics	0.30	normal	1.000	1	0.30	∞
Response time	0.80	rectangular	1.732	1	0.46	∞
RF ambient conditions	3.00	rectangular	1.732	1	1.73	∞
Integration time	0.00	rectangular	1.732	1	0.00	∞
Mechanical constrains of robot	1.50	rectangular	1.732	1	0.87	∞
Probe positioning	2.90	rectangular	1.732	1	1.67	∞
Extrapolation and integration	1.00	rectangular	1.732	1	0.58	∞
Test Sample Related						
Test Sample positioning	4.22	normal	1.000	1	4.22	14
Device holded uncertainty	3.44	normal	1.000	1	3.44	∞
Power Drift	5.00	rectangular	1.732	1	2.89	∞
Phantom and Setup						
Modular Phantom uncertainty	2.32	Normal	1.0001	1	2.32	2
Phantom uncertainty	4.00	rectangular	1.732	1	2.31	∞
Liquid conductivity (deviation from target)	5.00	rectangular	1.732	0.64	1.85	∞
Liquid conductivity (measurement error)	1.12	normal	1.000	0.64	1.30	∞
Liquid permittivity (deviation from target)	5.00	rectangular	1.732	0.6	1.73	∞
Liquid permittivity (measurement error)	3.06	normal	1.000	0.6	2.56	∞
Combined Standard Uncertainty		Normal	-	-	11.68	822
Extended Standard Uncertainty(K=2.00)					23.36	822

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7. SYSTEM VERIFICATION

7.1 Tissue Verification

Table 7.1 MEASURED TISSUE PARAMETERS(5GHz Head)

Tissue Type	Calibrated for Tests Performed on	Measured Frequency (MHz)	Measured Dielectric Constant	Measured Dielectric Constant	Measured Conductivity (S/m)	Target Dielectric Constant	Target Conductivity (S/m)	Dielectric Constant Dev(%)	Conductivity Dev(%)
5200~5800H	07/28/2011	5170	34.71	34.71	4.81	36.03	4.629	3.80%	-3.76%
		5210	34.63	34.63	4.86	35.99	4.67	3.93%	-3.91%
		5250	34.56	34.56	4.85	35.95	4.71	4.02%	-2.89%
		5270	34.52	34.52	4.93	35.93	4.73	4.08%	-4.06%
		5310	35.05	35.05	4.86	35.89	4.77	2.40%	-1.85%
		5350	34.34	34.34	5.02	35.85	4.81	4.40%	-4.18%
		5470	34.97	34.97	5.16	35.695	4.934	2.07%	-4.38%
		5510	34.88	34.88	5.06	35.635	4.976	2.16%	-1.66%
		5550	34.80	34.80	5.26	35.575	5.018	2.23%	-4.60%
		5570	34.77	34.77	5.29	35.545	5.039	2.23%	-4.74%
		5610	34.67	34.67	5.34	35.49	5.08	2.37%	-4.87%
		5650	34.59	34.59	5.31	35.45	5.12	2.49%	-3.71%
		5670	34.74	34.74	5.32	35.43	5.14	1.99%	-3.38%
		5710	34.68	34.68	5.37	35.39	5.18	2.05%	-3.54%
		5750	34.63	34.63	5.41	35.35	5.22	2.08%	-3.51%
		5770	34.57	34.57	5.42	35.33	5.24	2.20%	-3.32%
		5810	34.49	34.49	5.48	35.29	5.281	2.32%	-3.63%
		5850	34.43	34.43	5.52	35.25	5.323	2.38%	-3.57%

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Table 7.2 MEASURED TISSUE PARAMETERS(5GHz Body)

Tissue Type	Calibrated for Tests Performed on	Measured Frequency (MHz)	Measured Dielectric Constant	Measured Conductivity (S/m)	Target Dielectric Constant	Target Conductivity (S/m)	Dielectric Constant Dev(%)	Conductivity Dev(%)
5200~5800B	06/27/2011	5170	48.39	5.45	49.055	5.264	-1.36%	3.53%
		5210	48.21	5.51	49.001	5.311	-1.61%	3.75%
		5250	48.13	5.56	48.946	5.358	-1.67%	3.77%
		5270	48.1	5.59	48.919	5.381	-1.67%	3.88%
		5310	47.98	5.64	48.865	5.428	-1.81%	3.91%
		5350	47.89	5.69	48.811	5.47	-1.89%	4.02%
		5470	47.19	5.65	48.648	5.615	-3.00%	0.62%
		5510	47.12	5.69	48.594	5.661	-3.03%	0.51%
		5550	47.02	5.75	48.539	5.708	-3.13%	0.74%
		5570	47.98	5.77	48.512	5.731	-1.10%	0.68%
		5610	46.89	5.82	48.458	5.778	-3.24%	0.73%
		5650	46.81	5.87	48.404	5.825	-3.29%	0.77%
		5670	46.17	5.73	48.376	5.848	-4.56%	-2.02%
		5710	46.17	5.79	48.322	5.895	-4.45%	-1.78%
		5750	46.09	5.85	48.268	5.942	-4.51%	-1.55%
		5770	46.07	5.88	48.241	5.965	-4.50%	-1.42%
		5810	46	5.93	48.186	6.012	-4.54%	-1.36%
		5850	45.92	5.98	48.132	6.058	-4.60%	-1.29%

Table 7.3 MEASURED TISSUE PARAMETERS(2450MHz,1900MHz)

	1900MHzHead		1900MHzBody		2450MHzHead		2450MHzBody	
	Target	Measured	Target	Measured	Target	Measured	Target	Measured
Date	Jun22,2011		Jun22,2011		Jun.18,2011		Jun.18,2011	
Liquid Temperature(°C)	21.9		22.1		21.9		21.8	
Dielectric Constant: ϵ'	40	39.6	53.3	52.1	39.2	38	52.7	51.9
Conductivity:	1.4	1.36	1.52	1.55	1.8	1.86	1.95	2.03
Tissue Batch Number	1900F3001P		1900B1001Q		2450MF1001Y		2450B2001A	

The measured value must be within $\pm 5\%$ of the target value.

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7.2 Test System Validation

Prior to assessment, the system is verified to the $\pm 10\%$ of the specification at 1900MHz, 2450MHz, 5200MHz, 5500MHz and 5800MHz by using the system validation kit(s).
(see Appendix E, Graphic Plot Attached)

Table 7.2 System Validation Results

System Validation Kit	Tissue	Targeted SAR _{1g} (mW/g)	Normalized SAR _{1g} (mW/g)	Measured SAR _{1g} (mW/g)	Deviation (%)	Date	Liquid Temperature(°C)	Ambient Temperature(°C)	Input Power (mW)
5d082	1900MHz Brain	41.4	41.4	4.14	0	Jun.22, 2011	21.9	22.3	100
5d082	1900MHz Muscle	40.7	40.3	4.03	-0.98	Jun.22, 2011	22.1	22.6	100
807	2450MHz Brain	54.4	54.8	5.48	0.74	Jun.18, 2011	21.9	22.0	100
807	2450MHz Muscle	51.1	51.2	5.12	0.20	Jun.18, 2011	21.8	22.0	100
1099	5200MHz Brain	82.6	81.0	1.62	-1.93	Jul.28, 2011	21.9	22.3	20
1099	5200MHz Muscle	75.6	75.6	1.53	1.19	Jul.28, 2011	21.9	22.3	20
1099	5500MHz Brain	88.9	93	1.86	4.61	Jul.28, 2011	21.9	22.3	20
1099	5500MHz Muscle	80.5	80.5	1.61	0	Jul.28, 2011	21.9	22.3	20
1099	5800MHz Brain	82.6	80.5	1.61	-2.54	Jul.28, 2011	21.9	22.3	20
1099	5800MHz Muscle	75.1	71	1.42	5.46	Jul.28, 2011	21.9	22.3	20

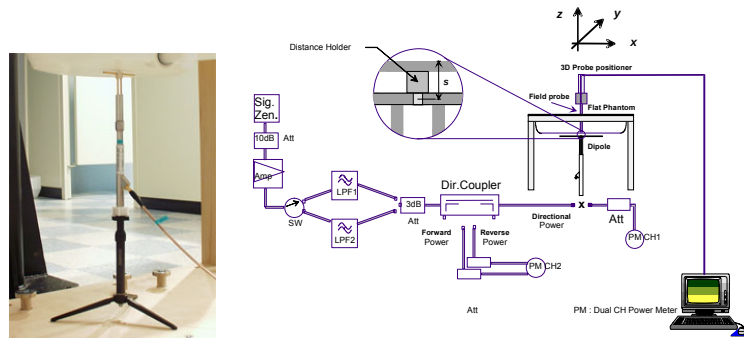


Figure 7.1 Dipole Validation Test Setup

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8. SAR MEASUREMENT RESULTS

Procedures Used To Establish Test Signal

The handset was placed into simulated call mode using base station simulator. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR. When test modes are not available or inappropriate for testing a handset, the actual transmission is activated through a base station simulator or similar equipment. See data pages for actual procedure used in measurement.

Device Test Conditions

The handset is battery operated. Each SAR measurement was taken with a fully charged battery. In order to verify that the device was tested at full power, conducted output power measurements were performed before and after each SAR measurement to confirm the output power. If a conducted power deviation of more than 5% occurred, the test was repeated. And all Tx(1~4Tx) conducted power were also investigated for Body-Worn SAR Measurement. In case of EGPRS, CP chipset doesn't support 3Tx and 4Tx slot unlike GPRS.

Table 8.1 GPRS Power Table for GT-I9108

		Maximum Burst-Averaged Output Power						
		Voice(dBm)	GPRS(dBm)				EDGE(dBm)	
			1Tx slot	2Tx slot	3Tx slot	4Tx slot	1Tx slot	2Tx slot
GSM1900	512	29.1	29.1	29.1	26.1	26.06	27.23	25.78
	661	29.23	29.23	29.2	26.2	26.15	26.77	25.65
	810	29.27	29.27	29.25	26.24	26.2	27.25	25.37
		Calculated Frame-Averaged Output Power						
		Voice(dBm)	GPRS(dBm)				EDGE(dBm)	
			1Tx slot	2Tx slot	3Tx slot	4Tx slot	1Tx slot	2Tx slot
GSM1900	512	20.07	20.07	23.08	21.84	23.05	18.20	19.76
	661	20.20	20.20	23.18	21.94	23.14	17.74	19.63
	810	20.24	20.24	23.23	21.98	23.19	18.22	19.35

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Table 8.2 IEEE 802.11b Average RF Power

Mode	Frequency [MHz]	Channel	Conducted Power[dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	16.68	16.69	16.71	16.75
802.11b	2437	6	16.98	16.84	17.02	16.99
802.11b	2462	11	17.08	17.08	17.16	17.17

Table 8.3 IEEE 802.11g Average RF Power

Mode	Frequency [MHz]	Channel	Conducted Power[dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	11.25	11.22	11.29	11.30	11.40	11.35	11.32	11.25
802.11g	2437	6	11.55	11.54	11.62	11.65	11.56	11.55	11.62	11.60
802.11g	2462	11	11.62	11.65	11.59	11.60	11.60	11.62	11.60	11.60

Table 8.3 IEEE 802.11n Average RF Power

Mode	Frequency [MHz]	Channel	Conducted Power[dBm]							
			Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11g	2412	1	12.18	12.21	12.15	12.16	12.14	12.04	12.12	12.19
802.11g	2437	6	12.36	12.34	12.32	12.33	12.31	12.34	12.38	12.32
802.11g	2462	11	12.36	12.32	12.37	12.247	12.33	12.31	12.36	12.39

Table 8.4 IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36	12.16	12.22	12.17	12.14	12.18	12.04	12.32	12.43
802.11a	5200	40	12.14	12.35	12.23	12.3	12.33	12.38	12.44	12.49
802.11a	5220	44	12.18	12.07	12.2	12.2	12.15	12.1	12.13	12.16
802.11a	5240	48	12.27	12.34	12.19	12.13	12.24	12.23	12.33	12.2
802.11a	5260	52	12.12	12.19	12.18	12.24	12.22	12.3	12.28	12.27
802.11a	5280	56	12.15	12.18	12.2	12.18	12.13	12.17	12.21	12.3
802.11a	5300	60	12.14	12.22	12.15	12.13	12.1	12.07	12.11	12.04
802.11a	5320	64	13.02	12.96	13	13.11	13.1	12.8	13.11	13.17
802.11a	5500	100	12.4	12.37	12.46	12.42	12.43	12.43	12.47	12.49
802.11a	5520	104	12.3	12.33	12.28	12.32	12.37	12.34	12.33	12.36
802.11a	5540	108	12.17	12.24	12.21	12.23	12.26	12.249	12.28	12.23
802.11a	5560	112	12.2	12.16	12.11	12.14	12.17	12.15	12.27	12.29
802.11a	5580	116	11.96	12.04	12.06	12.03	12.1	12.07	12.18	12.06
802.11a	5600	120	11.98	11.99	12.03	11.97	12.01	12.06	12.11	12.03
802.11a	5620	124	11.9	11.97	11.95	11.98	11.99	11.94	11.97	11.98
802.11a	5640	128	11.86	11.84	11.88	11.91	11.94	11.93	11.98	11.89
802.11a	5660	132	11.83	11.81	11.78	11.81	11.83	11.9	11.87	11.84
802.11a	5680	136	11.79	11.71	11.74	11.71	11.81	11.77	11.83	11.79
802.11a	5700	140	11.77	11.78	11.73	11.8	11.76	11.74	11.68	11.83
802.11a	5745	149	11.94	11.94	11.96	11.9	12.01	11.86	11.98	11.91
802.11a	5765	153	11.7	11.77	11.7	11.66	11.61	11.48	11.6	11.59
802.11a	5785	157	11.5	11.38	11.57	11.44	11.58	11.53	11.42	11.44
802.11a	5805	161	12	11.87	12.06	12.1	12.16	12.02	12.16	12.23
802.11a	5825	165	12.15	12.07	12.22	12.28	12.38	12.21	12.29	12.44

Table 8.5 IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	5180	36	9.62	9.61	9.66	9.69	9.72	9.85	9.71	9.76
802.11n	5200	40	9.52	9.56	9.62	9.68	9.61	9.63	9.64	9.65
802.11n	5220	44	9.47	9.51	9.56	9.58	9.50	9.59	9.65	9.69
802.11n	5240	48	9.37	9.42	9.49	9.48	9.51	9.44	9.46	9.57
802.11n	5260	52	10.25	10.27	10.36	10.32	10.35	10.42	10.43	10.44
802.11n	5280	56	10.21	10.16	10.18	10.31	10.35	10.36	10.28	10.32
802.11n	5300	60	10.12	10.14	10.15	10.19	10.25	10.22	10.21	10.23
802.11n	5320	64	10.01	10.06	10.03	10.07	10.15	10.13	10.14	10.15
802.11n	5500	100	9.63	9.68	9.62	9.74	9.70	9.71	9.72	9.71
802.11n	5520	104	9.49	9.54	9.59	9.53	9.52	9.60	9.59	9.58
802.11n	5540	108	9.41	9.40	9.39	9.44	9.50	9.43	9.48	9.52
802.11n	5560	112	9.30	9.29	9.33	9.28	9.34	9.35	9.38	9.37
802.11n	5580	116	9.19	9.26	9.23	9.20	9.29	9.33	9.31	9.28
802.11n	5600	120	9.12	9.09	9.13	9.14	9.21	9.22	9.29	9.26
802.11n	5620	124	9.03	9.10	9.13	9.11	9.12	9.15	9.16	9.13
802.11n	5640	128	8.99	8.87	8.78	9.00	8.92	9.01	9.09	9.08
802.11n	5660	132	8.85	8.87	8.92	8.91	8.93	9.02	8.97	8.99
802.11n	5680	136	8.79	8.83	8.86	8.83	8.91	8.90	8.87	8.94
802.11n	5700	140	8.74	8.82	8.84	8.83	8.88	8.89	8.85	8.91
802.11n	5745	149	12.07	12.09	12.11	12.09	12.16	12.11	12.13	12.15
802.11n	5765	153	12.00	12.08	12.09	12.11	12.10	12.17	12.18	12.19
802.11n	5785	157	12.11	12.16	12.10	12.13	12.14	12.17	12.19	12.17
802.11n	5805	161	12.12	12.14	12.18	12.17	12.19	12.20	12.22	12.21
802.11n	5825	165	12.14	12.17	12.21	12.22	12.16	12.24	12.23	12.21

Simultaneous Transmission

Refer to the FCC OET document, 'SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas' (Feb 2008)

Table 8.6 Output Power Thresholds for Unlicensed Transmitters

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P Ref	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this table				

Table 8.7 Summary of SAR Evaluation Requirements for Cell phones with Multiple Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	<u>Routine evaluation required</u>	SAR not required: <u>Unlicensed only</u> - o when stand-alone 1-g SAR is not required and antenna is > 5 cm from other antennas <u>Licensed & Unlicensed</u> - o when the sum of the 1-g SAR is <1.6 W/kg for all simultaneous transmitting antennas - o when SAR to antenna separation ratio of simultaneous transmitting antenna pair is < 0.3
Unlicensed Transmitters	When there is no simultaneous transmission – - o output < 60/f: SAR not required - o output ≥ 60/f: stand-alone SAR required When there is simultaneous transmission – <u>Stand-alone SAR not required when</u> - o output ≤ 2.P_{Ref} and antenna is > 5.0 cm from other antennas - o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas - o output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg <u>Otherwise stand-alone SAR is required</u> When stand-alone SAR is required - o test SAR on highest output channel for each wireless mode and exposure condition - o if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	SAR required: <u>Licensed & Unlicensed</u> antenna pairs with SAR to antenna separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in standalone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply

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Table 8.8 Simultaneous Transmission Scenario (Head to Ear)

Simult Tx	Configuration	GSM1900 SAR(W/Kg)	WIFI 2.4 GHz SAR(W/Kg)	Σ SAR(W/Kg)
Head SAR	Right Cheek	0.079	0.080	0.159
	Right Tilt	0.013	0.061	0.074
	Left Cheek	0.077	0.165	0.242
	Left Tilt	0.021	0.033	0.054
Simult Tx	Configuration	GSM1900 SAR(W/Kg)	WIFI 5GHz SAR(W/Kg)	Σ SAR(W/Kg)
Head SAR	Right Cheek	0.079	0.139	0.218
	Right Tilt	0.013	0.062	0.075
	Left Cheek	0.077	0.151	0.228
	Left Tilt	0.021	0.025	0.046

Table 8.9 Simultaneous Transmission Scenario in Hotspot mode

Simult Tx	Configuration	GSM1900 SAR(W/Kg)	WIFI 2.4 GHz SAR(W/Kg)	Σ SAR(W/Kg)
Body SAR	Back	0.377	0.092	0.469
	Front	0.160	0.104	0.264
	Side A	-	0.075	0.075
	Side B	0.111	-	0.111
	Side C	0.439	0.064	0.503
	Side D	-	-	-

Note : “-“SAR Result shown in the table are zero for summation purposes. SAR was not required to be measured due to exclusions mentioned in Section 5.4. WIFI 5 GHz is disabled in hotspot mode.

Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. Therefore, no volumetric SAR summation is required per FCC KDB Publication 648474 since the numerical sums are below the limit.

Based on the output power, antenna separation distance, and Body SAR, a stand-alone BT SAR test is not required. The summation of BT SAR and Licensed Transmitter SAR is $0.439 + 0 = 0.439$, which is less than 1.6 W/Kg, therefore, a simultaneous SAR evaluation is not required.

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8.1 GSM1900 Head SAR Results

Frequency		Mode	Conducted		Side	Test Position	Antenna Type	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End						
1880	661	GSM1900	29.24	29.31	Right	Cheek/Touch	Intenna	Standard	0.079	0.110
1880	661	GSM1900	29.27	29.35	Right	Ear/Tilt 15°	Intenna	Standard	0.013	0.0062
1880	661	GSM1900	29.14	29.17	Left	Cheek/Touch	Intenna	Standard	0.077	0.181
1880	661	GSM1900	29.28	29.31	Left	Ear/Tilt 15°	Intenna	Standard	0.021	0.094
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						1.6W/kg (mW/g) averaged over 1 gram				

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is $15.2 \pm 0.2\text{cm}$
- Battery is fully charged for all readings.
- Test Configuration ☐ Manu. Test Codes ☒ Base Station Simulator
- Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June, 2001), if the SAR measured at the middle channel for each test configuration (left, right, cheek/touch, tilt/ear, extended and retracted) is least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

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8.2 GPRS1900 Body SAR Results

Frequency		Mode	Conducted		Test Position	Antenna Type	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End					
1880	661	GSM1900	29.25	29.27	10mm Back 2Tx	Intenna	Standard	0.365	0.0048
1880	661	GSM1900	29.26	29.29	10mm Back 3Tx	Intenna	Standard	0.286	0.101
1880	661	GSM1900	26.17	26.18	10mm Back 4Tx	Intenna	Standard	0.377	-0.030
1880	661	GSM1900	26.27	26.25	10mm Front 4Tx	Intenna	Standard	0.160	0.169
1880	661	GSM1900	26.24	26.21	10mm Side C 4Tx	Intenna	Standard	0.439	-0.030
1880	661	GSM1900	26.29	26.25	10mm side B 4Tx	Intenna	Standard	0.111	-0.128
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						1.6W/kg (mW/g) averaged over 1 gram			

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is 15.2 ± 0.2 cm
- Battery is fully charged for all readings.
- Test Configuration ☐ With Holster ☒ Without Holster
- Justification for reduced test configurations: This model supports GPRS CLASS 12(max 4Tx) and EDGE. The burst power and timing period is more than 2dB higher in GPRS mode than in GSM1900and EDGE mode. Hence, the GSM1900 and EDGE mode was not reported. And all Tx(1~4Tx) cases were also investigated and the worst-case results are reported.(4Tx)
- Body SAR was tested at 1cm distance because battery operated personal wireless routers(hotspots) enable multiple Wi-Fi connections, per TCB workshop October 2010. But position 'Side A' and 'Side D' were not tested because antenna distance was >2.5cm.

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8.3 2.4GHz WLAN Head SAR Results

Frequency		Mode	Conducted		Side	Test Position	Antenna Type	Data Rate(Mbps)	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End							
2462	11	WLAN	16.97	17.04	Right	Cheek/Touch	Intenna	11	Standard	0.080	0.000619
2462	11	WLAN	16.87	16.88	Right	Ear/Tilt 15°	Intenna	11	Standard	0.061	0.148
2462	11	WLAN	16.98	16.94	Left	Cheek/Touch	Intenna	11	Standard	0.165	0.183
2462	11	WLAN	16.88	16.92	Left	Ear/Tilt 15°	Intenna	11	Standard	0.033	-0.137
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						1.6W/kg (mW/g) averaged over 1 gram					

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is $15.2 \pm 0.2\text{cm}$
- Battery is fully charged for all readings.
- Test Configuration ☒ Manu. Test Codes ☐ Base Station Simulator
- Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June, 2001), if the SAR measured at the middle channel for each test configuration (left, right, cheek/touch, tilt/ear, extended and retracted) is least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
- Justification for reduced test configurations for WIFI channels per Publication 248227 and April 2010 FCC/TCB Meeting Notes: Other IEEE 802.11 modes (including 802.11n) were investigated since the average output powers were greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
- WLAN Transmission was verified using a spectrum analyzer.

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8.4 2.4GHz WLAN Body SAR Results

Frequency		Mode	Conducted		Test Position	Antenna Type	Data Rate(Mbps)	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End						
2462	11	WLAN	16.98	17.01	10mm Back	Intenna	11	Standard	0.092	0.011
2462	11	WLAN	16.85	16.98	10mm Front	Intenna	11	Standard	0.104	0.050
2462	11	WLAN	16.97	16.95	10mm side C	Intenna	11	Standard	0.064	0.081
2462	11	WLAN	16.85	16.98	10mm side A	Intenna	11	Standard	0.075	0.171
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						1.6W/kg (mW/g) averaged over 1 gram				

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is 15.2 ± 0.2 cm
- Battery is fully charged for all readings.
- Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June, 2001), if the SAR measured at the middle channel for each test configuration (left, right, cheek/touch, tilt/ear, extended and retracted) is least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
- Justification for reduced test configurations for WIFI channels per Publication 248227 and April 2010 FCC/TCB Meeting Notes: Other IEEE 802.11 modes (including 802.11n) were investigated since the average output powers were greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
- WLAN Transmission was verified using a spectrum analyzer.
- Side B and Side D were not tested since the antenna distance from the edges was greater than 2.5 cm per Oct 2010 TCB Workshop guidance (see Section 5.4).

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8.5 5GHz WLAN Head SAR Results

Frequency		Mode	Conducted		Side	Test Position	Data Rate(Mbps)	Antenna Type	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End							
5240	48	5.2 GHz	12.16	12.19	Right	Cheek/Touch	6	Intenna	Standard	0.139	-0.028
5320	64	5.3 GHz	12.94	13.02	Right	Cheek/Touch	6	Intenna	Standard	0.083	0.064
5500	100	5.5 GHz	12.31	12.34	Right	Cheek/Touch	6	Intenna	Standard	0.114	-0.101
5825	165	5.8 GHz	12.38	12.41	Right	Cheek/Touch	54	Intenna	Standard	0.054	0.067
5240	48	5.2 GHz	12.34	12.28	Right	Ear/Tilt 15°	6	Intenna	Standard	0.029	0.108
5320	64	5.3 GHz	13.02	13.09	Right	Ear/Tilt 15°	6	Intenna	Standard	0.037	-0.009
5500	100	5.5 GHz	12.31	12.35	Right	Ear/Tilt 15°	6	Intenna	Standard	0.062	-0.163
5825	165	5.8 GHz	12.41	12.37	Right	Ear/Tilt 15°	54	Intenna	Standard	0.033	-0.084
5240	48	5.2 GHz	12.24	12.20	Left	Cheek/Touch	6	Intenna	Standard	0.139	-0.052
5320	64	5.3 GHz	13.09	13.11	Left	Cheek/Touch	6	Intenna	Standard	0.107	-0.195
5500	100	5.5 GHz	12.34	12.38	Left	Cheek/Touch	6	Intenna	Standard	0.151	-0.068
5825	165	5.8 GHz	12.42	12.36	Left	Cheek/Touch	54	Intenna	Standard	0.112	-0.131
5240	48	5.2 GHz	12.22	12.12	Left	Ear/Tilt 15°	6	Intenna	Standard	0.019	0.008
5320	64	5.3 GHz	13.10	13.05	Left	Ear/Tilt 15°	6	Intenna	Standard	0.016	0.074
5500	100	5.5 GHz	12.22	12.29	Left	Ear/Tilt 15°	6	Intenna	Standard	0.025	-0.169
5825	165	5.8 GHz	12.39	12.41	Left	Ear/Tilt 15°	54	Intenna	Standard	0.014	0.032
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						1.6W/kg (mW/g) averaged over 1 gram					

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is $15.2 \pm 0.2\text{cm}$
- Battery is fully charged for all readings.
- Test Configuration ☒ Manu. Test ☐ Base Station Simulator
Codes
- Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June, 2001), if the SAR measured at the middle channel for each test configuration (left, right, cheek/touch, tilt/ear, extended and retracted) is least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
- Justification for reduced test configurations for WIFI channels per Publication 248227 and April 2010 FCC/TCB Meeting Notes: Other IEEE 802.11 modes (including 802.11n) were investigated since the average output powers were greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
- WLAN Transmission was verified using a spectrum analyzer.

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8.6 5GHzWLAN Body SAR Results

Frequency		Mode	Conducted		Test Position	Antenna Type	Data Rate(Mbps)	Battery	SAR Level (W/kg)	Power Drift(dB)
MHz	Ch		Start	End						
5240	48	WLAN	12.17	12.18	1.5 cm [w/o]	Intenna	6	Standard	0.0928	0.113
5320	64	WLAN	13.04	13.01	1.5 cm [w/o]	Intenna	6	Standard	0.0746	0.0944
5500	100	WLAN	12.25	12.35	1.5 cm [w/o]	Intenna	6	Standard	0.0465	-0.11
5825	165	WLAN	12.33	12.34	1.5 cm [w/o]	Intenna	54	Standard	0.0573	0.0979
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General					1.6W/kg (mW/g) averaged over 1 gram					

NOTES:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [June 2001].
- All modes of operation were investigated, and the worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plot.
- Liquid tissue depth is $15.2 \pm 0.2\text{cm}$
- Battery is fully charged for all readings.
- Test Configuration ☐ With Holster ☒ Without Holster
- Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June, 2001), if the SAR measured at the middle channel for each test configuration (left, right, cheek/touch, tilt/ear, extended and retracted) is least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
- Justification for reduced test configurations for WIFI channels per Publication 248227 and April 2010 FCC/TCB Meeting Notes: Other IEEE 802.11 modes (including 802.11n) were investigated since the average output powers were greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
- WLAN Transmission was verified using a spectrum analyzer

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9. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

The highest reported SAR values are as follows:

GSM1900: Head: 0.079W/Kg : Body-worn: 0.439W/Kg

2.4GHz WLAN: Head: 0.165W/Kg : Body-worn: 0.104W/Kg

5GHz WLAN: Head: 0.151W/Kg : Body-worn: 0.0928W/Kg

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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 per unit mass at a point in an absorbing body (see Fig. A.1) .

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

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 Process

Dosimetric Assessment Procedure

Each probe is calibrated according to a dosimetric assessment procedure described in **K. Pokovic, T.Schmid, N. Kuster, *Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies*, ICECOM97, Oct. 1997, pp. 120-124** with an accuracy better than +/-10%. The spherical isotropy was evaluated with the procedure described in **K. Pokovic, T.Schmid, N. Kuster, *E-field Probe with improved isotropy in brain simulating liquids*, Proceedings of the ELMAR, Zadar, June 23-25, 1996, pp. 172-175** and found to be better than +/-0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is tested.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz (see Fig. B.1), and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

Temperature Assessment

E-field temperature correlation calibration is performed in a flat phantom flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe (see Fig. B.2).

$$SAR = C \frac{\Delta T}{\Delta t}$$

$$SAR = \frac{|E|^2 \cdot \sigma}{p}$$

where:

Δt = exposure time (30 seconds)

C = heat capacity of tissue (brain or muscle).

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E-field;

where:

σ = simulated tissue conductivity

p = Tissue density (1.25 g/cm³ for brain tissue)

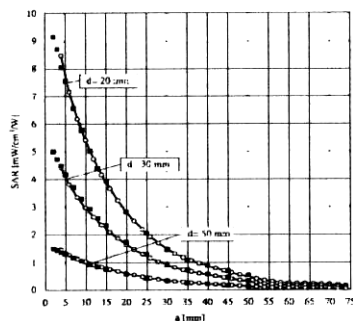


Figure B.1. E-Field and Temperature measurements at 900MHz

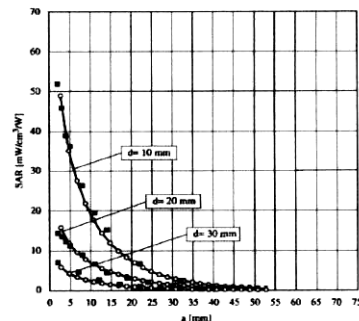


Figure B.2. E-Field and temperature measurements at 1.9GHz

APPENDIX C

ANSI/IEEE C95.1 – 1992 RF EXPOSURE LIMITS

Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is the exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table C.1 Safety Limits for Partial Body Exposure

	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)
SPATIAL PEAK SAR ¹ Brain	1.60	8.00
SPATIAL PEAK SAR ² Whole Body	0.08	0.40
SPATIAL PEAK SAR ³ Hands, Feet, Ankles, Wrists	4.00	20.00

¹ The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as tissue volume in the shape of a cube) and over the appropriate averaging time.

² The Spatial Average value of the SAR averaged over the whole body.

³ The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

APPENDIX D

The Validation Measurements

DUT: Dipole 1900 MHz; Serial: 5d082

Program Name: 1900MHz Dipole Validation 2011.06.22

Procedure Name: 1900MHz @ 100mW

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

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

Medium parameters used: $f = 1900 \text{ MHz}$, $\sigma = 1.36 \text{ mho/m}$, $\epsilon_r = 39.6$, $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

1900MHz @ 100mW/Area Scan (51x51x1): Measurement grid: $dx=20\text{mm}, dy=20\text{mm}$
Maximum value of SAR (interpolated) = 5.61 mW/g

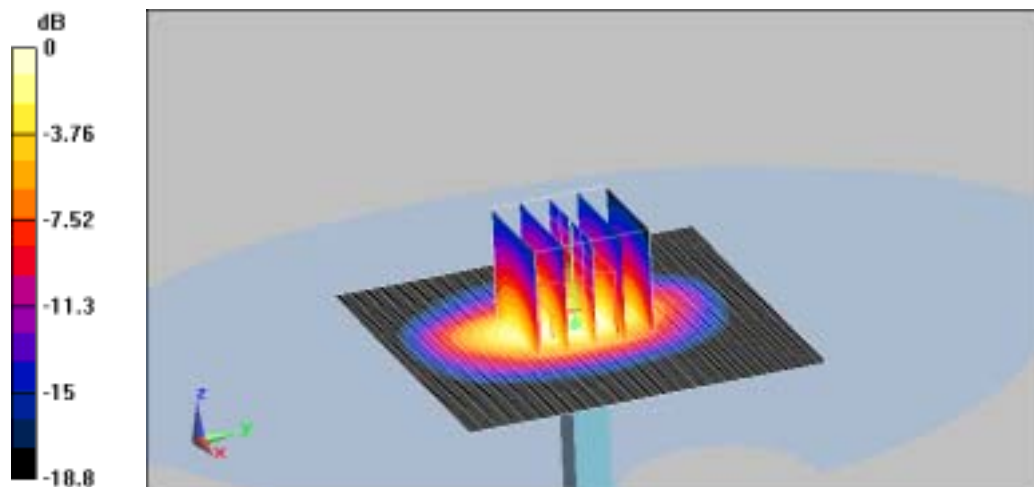
1900MHz @ 100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}, dy=8\text{mm}, dz=5\text{mm}$

Reference Value = 53 V/m; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 7.83 W/kg

SAR(1 g) = 4.14 mW/g; SAR(10 g) = 212 mW/g

Maximum value of SAR (measured) = 4.56 mW/g



0 dB = 4.56 mW/g

DUT: Dipole 1900 MHz; Serial: 5d082

Program Name: 1900MHz Dipole Validation 2011.06.22

Procedure Name: 1900MHz @ 100mW

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

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

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.12, 7.12, 7.12); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

1900MHz @ 100mW/Area Scan (51x51x1): Measurement grid: $dx=20\text{mm}, dy=20\text{mm}$
Maximum value of SAR (interpolated) = 4.71 mW/g

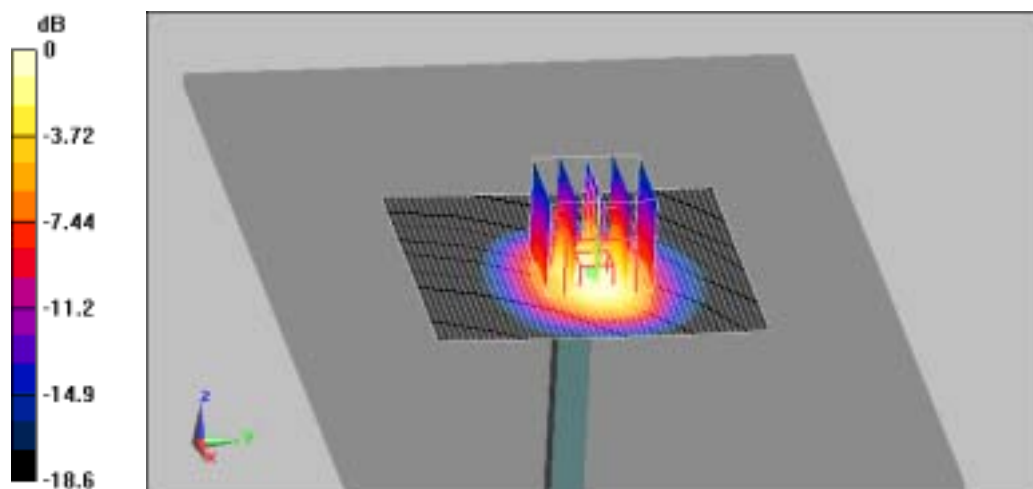
1900MHz @ 100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}, dy=8\text{mm}, dz=5\text{mm}$

Reference Value = 48.5V/m; Power Drift = -0.31 dB

Peak SAR(extrapolated) = 7.43 W/kg

SAR(1 g) = 4.03 mW/g; SAR(10 g) = 2.09 mW/g

Maximum value of SAR (measured) = 4.48 mW/g



0 dB = 4.48 mW/g

DUT: Dipole 2450 MHz; Serial:807

Program Name: 2450MHz Dipole Validation 2011.06.18

Procedure Name: 2450MHz @ 100mW

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.9;Test Date-18/Jun/2011

Communication System: CW; Frequency: 2450 MHz Duty Cycle: 1:1

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

2450MHz @ 100mW/Area Scan (51x51x1): Measurement grid: $dx=20\text{mm}, dy=20\text{mm}$
Maximum value of SAR (interpolated) = 7.37 mW/g

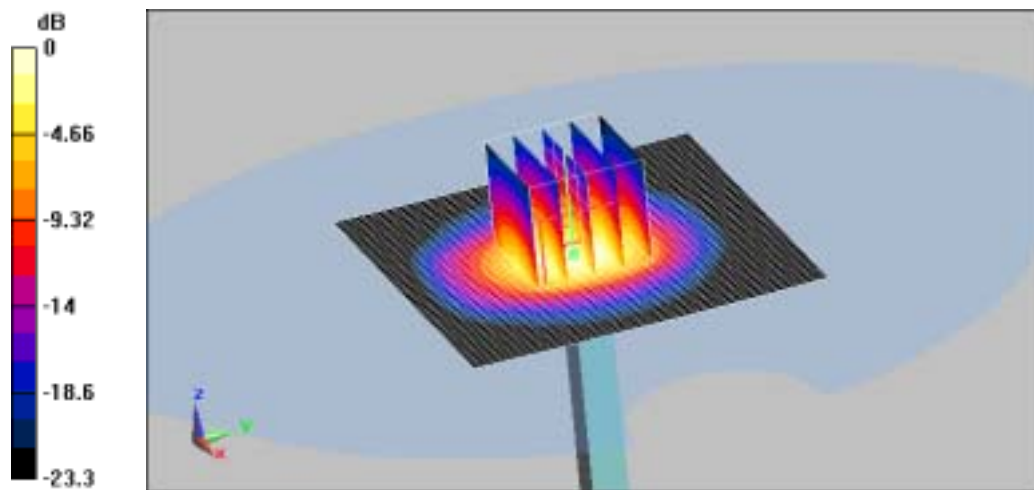
2450MHz @ 100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}, dy=8\text{mm}, dz=5\text{mm}$

Reference Value = 56.8V/m; Power Drift = -0.09 dB

Peak SAR(extrapolated) = 11.9 W/kg

SAR(1 g) = 5.48 mW/g; SAR(10 g) = 2.5 mW/g

Maximum value of SAR (measured) = 6.15 mW/g



0 dB = 6.15 mW/g

DUT: Dipole 2450 MHz; Serial: 807

Program Name: 2450MHz Dipole Validation 2011.06.18

Procedure Name: 2450MHz @ 100mW

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.8;Test Date-18/Jun/2011

Communication System: CW; Frequency: 2450 MHz Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz $\sigma = 2.03$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.76, 6.76, 6.76); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

2450MHz @ 100mW/Area Scan (51x51x1): Measurement grid: dx=20mm,dy=20mm
Maximum value of SAR (interpolated) = 5.83 mW/g

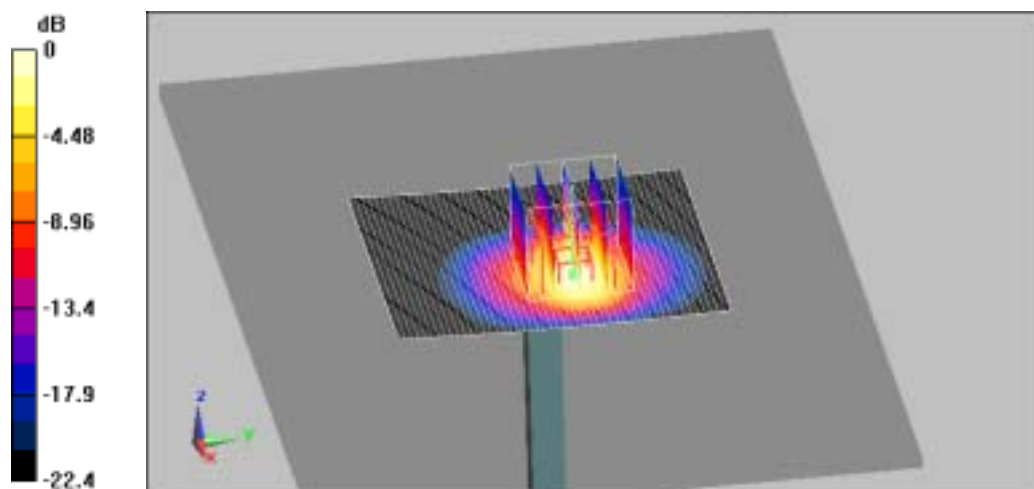
2450MHz @ 100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33 V/m; Power Drift = -0.037 dB

Peak SAR(extrapolated) = 10.7 W/kg

SAR(1 g) = 5.12 mW/g; SAR(10 g) = 234 mW/g

Maximum value of SAR (measured) = 5.84 mW/g



0 dB = 5.84 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5200MHz Dipole Validation 2011.07.28

Procedure Name: 5200MHz @ 20mW

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5200 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5200 \text{ MHz}$, $\sigma = 4.86 \text{ mho/m}$, $\epsilon_r = 34.6$, $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.61, 4.61, 4.61); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5200MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 3.53 mW/g

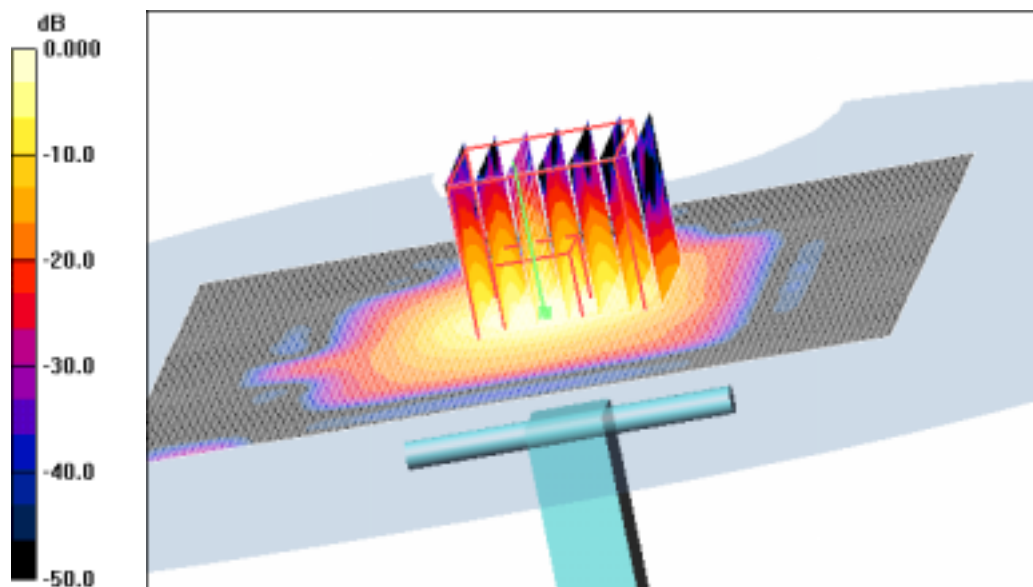
5200MHz @ 20mW/Zoom Scan (7x7x1)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 29.2V/m; Power Drift = -0.173 dB

Peak SAR(extrapolated) = 6.96 W/kg

SAR(1 g) = 162 mW/g; SAR(10 g) = 0.414 mW/g

Maximum value of SAR (measured) = 3.44 mW/g



0 dB = 3.44 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5500MHz Dipole Head Validation 2011.07.28

Procedure Name: 5500MHz @ 20mW

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5500 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5500 \text{ MHz}$, $\sigma = 5.05 \text{ mho/m}$, $\epsilon_r = 34.9$, $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5500MHz @ 20mW/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 29.6V/m; Power Drift = 0.0% dB

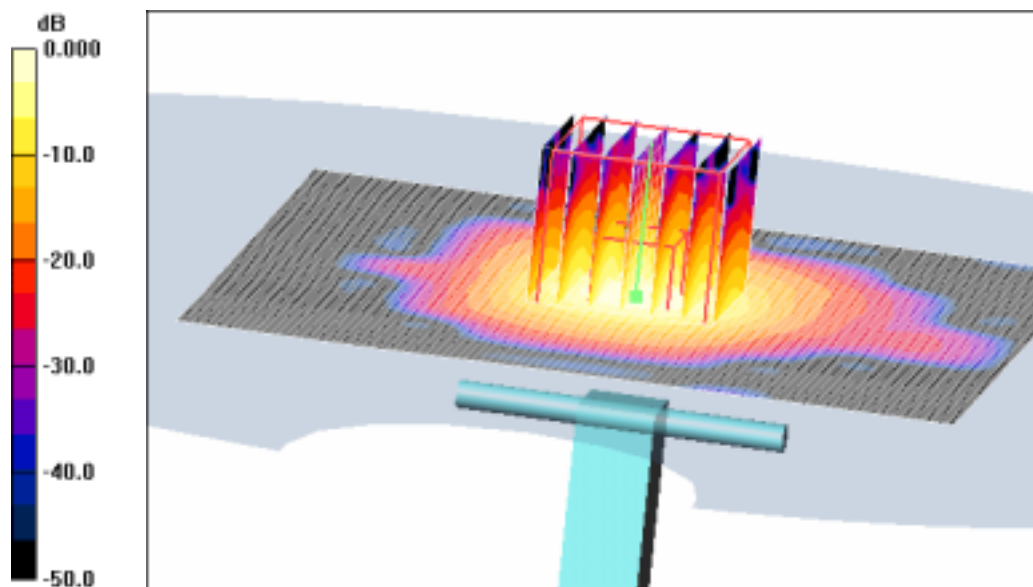
Peak SAR(extrapolated) = 7.89 W/kg

SAR(1 g) = 186 mW/g; SAR(10 g) = 0.515 mW/g

Maximum value of SAR (measured) = 3.90 mW/g

5500MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 3.85 mW/g



0 dB = 3.85 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5800MHz Dipole Head Validation 2011.07.28

Procedure Name: 5800MHz @ 20mW

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5800 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5800 \text{ MHz}$, $\sigma = 5.48 \text{ mho/m}$, $\epsilon_r = 34.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.07, 4.07, 4.07); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5800MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 3.31 mW/g

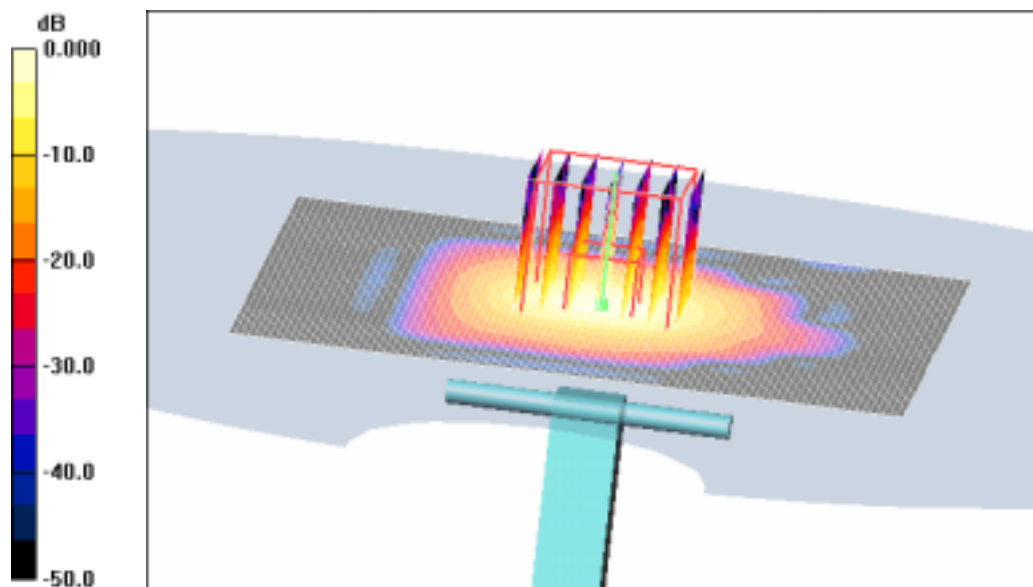
5800MHz @ 20mW/Zoom Scan (7x7x1)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 26.4V/m; Power Drift = 0.16 dB

Peak SAR(extrapolated) = 7.01 W/kg

SAR(1 g) = 161 mW/g; SAR(10 g) = 0.452 mW/g

Maximum value of SAR (measured) = 3.43 mW/g



0 dB = 3.43 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5200MHz Dipole Body Validation 2011.07.28

Procedure Name: 5200MHz @ 20mW

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5200 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5200 \text{ MHz}$, $\sigma = 5.38 \text{ mho/m}$, $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.02, 4.02, 4.02); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5200MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 3.24 mW/g

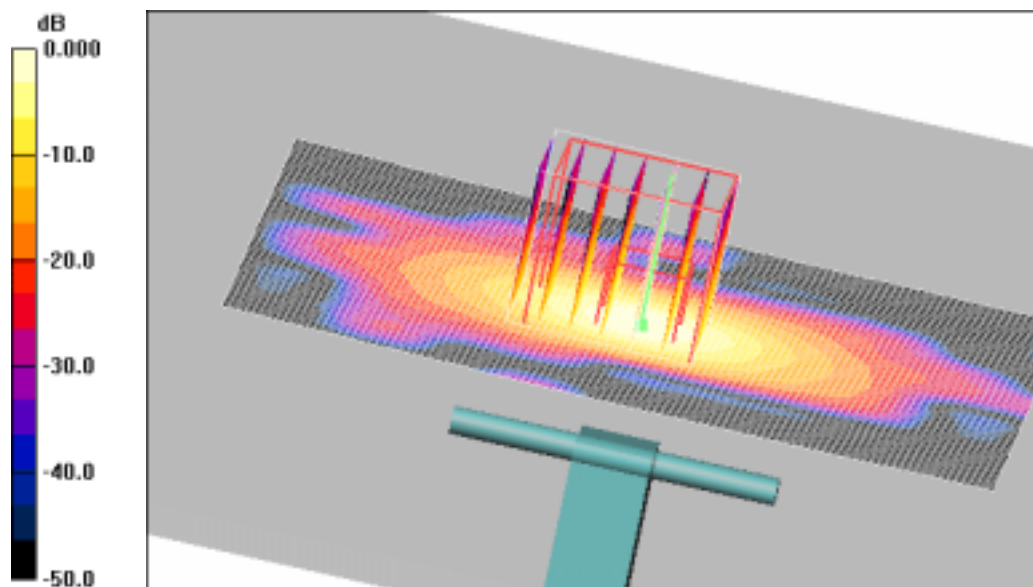
5200MHz @ 20mW/Zoom Scan (7x7x1)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 25.0V/m; Power Drift = 0.00 dB

Peak SAR(extrapolated) = 6.09 W/kg

SAR(1 g) = 153 mW/g; SAR(10 g) = 0.390 mW/g

Maximum value of SAR (measured) = 3.19 mW/g



0 dB = 3.19 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5500MHz Dipole Body Validation 2011.07.28

Procedure Name: 5500MHz @ 20mW

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5500 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5500 \text{ MHz}$, $\sigma = 5.69 \text{ mho/m}$, $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(3.52, 3.52, 3.52); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5500MHz @ 20mW/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 17.1V/m; PowerDrift = 0.17 dB

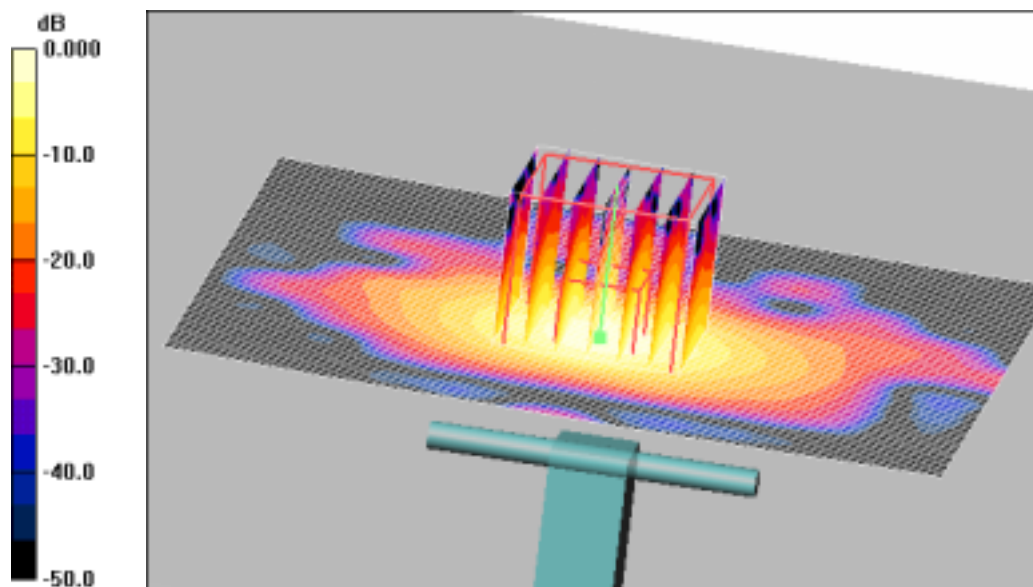
Peak SAR(extrapolated) = 6.51 W/kg

SAR(1 g) = 161 mW/g; SAR(10 g) = 0.446 mW/g

Maximum value of SAR (measured) = 3.38 mW/g

5500MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 3.36 mW/g



0 dB = 3.36 mW/g

DUT: Dipole 5000MHz; Serial: D5GHzV2 - SN:1099

Program Name: 5800MHz Dipole Body Validation 2011.07.28

Procedure Name: 5800MHz @ 20mW

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System: CW; Frequency: 5800 MHz Duty Cycle: 1:1

Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.93 \text{ mho/m}$; $\epsilon_r = 46$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(3.53, 3.53, 3.53); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

5800MHz @ 20mW/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 3.07 mW/g

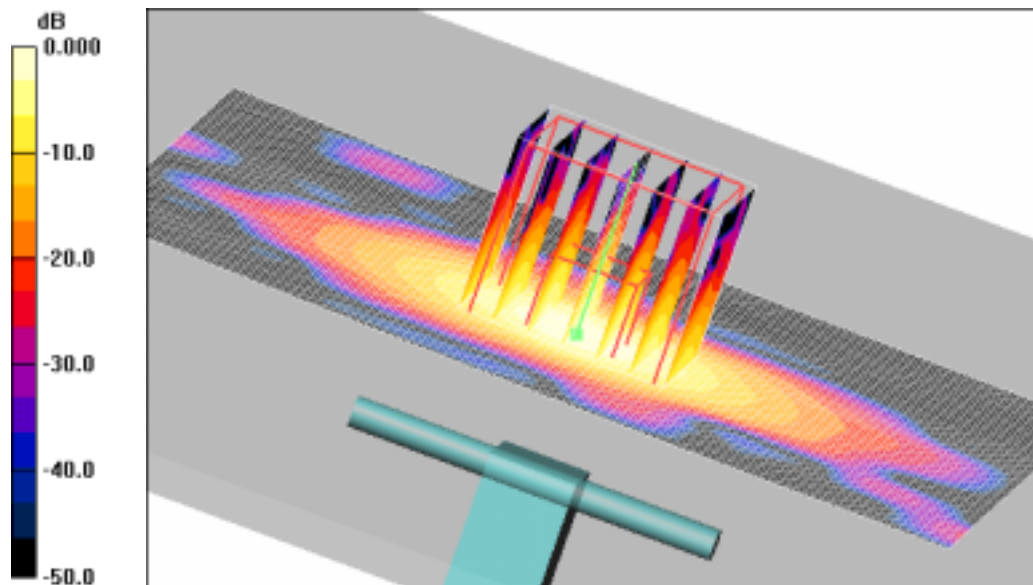
5800MHz @ 20mW/Zoom Scan (7x7x1)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 16.0V/m ; Power Drift = 0.1% dB

Peak SAR(extrapolated) = 5.82 W/kg

SAR(1 g) = 142 mW/g ; SAR(10 g) = 0.393 mW/g

Maximum value of SAR (measured) = 3.02 mW/g



0 dB = 3.02 mW/g

APPENDIX E

Plots of The SAR Measurements

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GSM1900 Right (Job No. : FI-127)

Procedure Name: Cheek, Ch661, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

Communication System: GSM 1900;Frequency: 1880 MHzDuty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Area Scan (61x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.074 mW/g

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

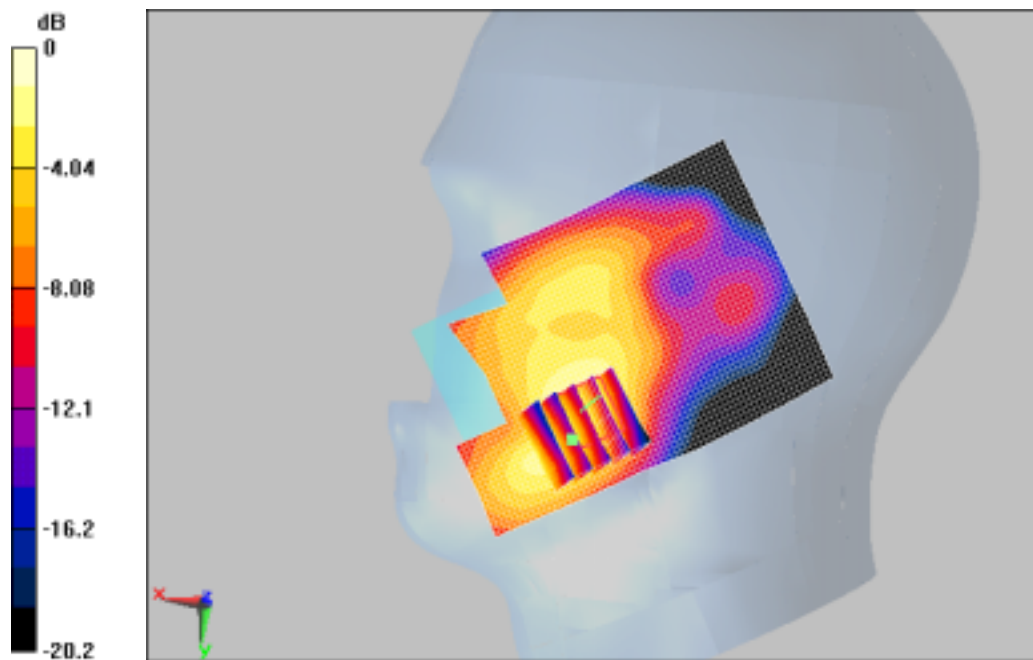
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.93V/m ; PowerDrift = 0.1D dB

Peak SAR(extrapolated) = 0.130 W/g

SAR(1 g) = 0.079 mW/g ; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.085 mW/g



0 dB = 0.08mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GSM1900 Right (Job No. : FI-127)

Procedure Name: Tilt, Ch.661, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

Communication System: GSM 1900; Frequency: 1880 MHz Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Tilt, Ch.661, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.016 mW/g

Tilt, Ch.661, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

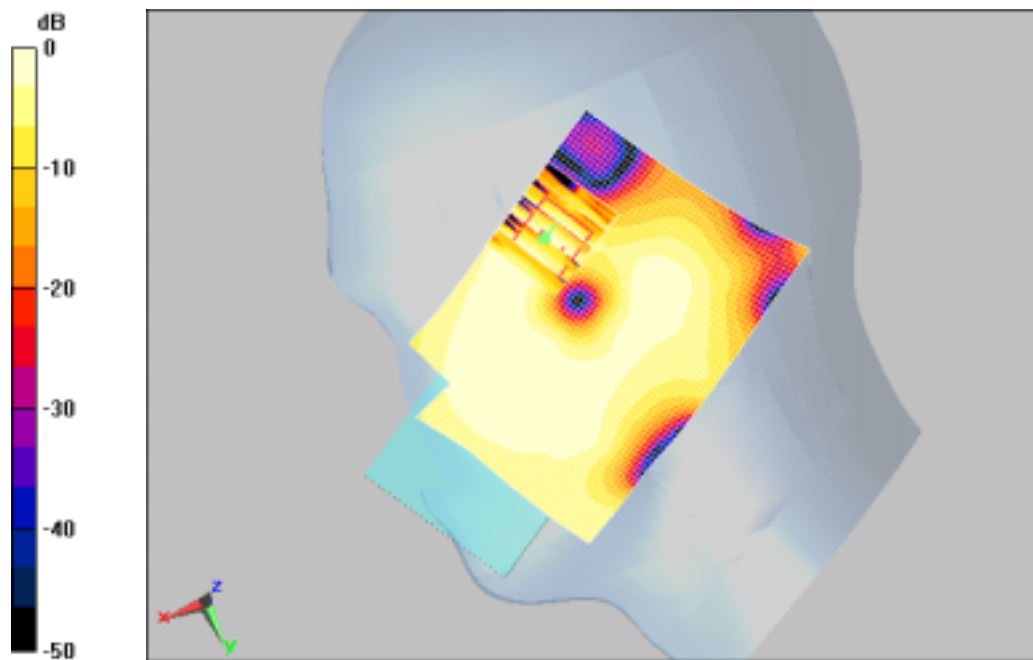
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.75V/m ; Power Drift = 0.002 dB

Peak SAR(extrapolated) = 0.033 W/kg

SAR(1 g) = 0.013 mW/g ; SAR(10 g) = 0.00574 mW/g

Maximum value of SAR (measured) = 0.013 mW/g



0 dB = 0.03 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GSM1900 Left (Job No. : FI-127)

Procedure Name: Cheek, Ch661, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

Communication System: GSM 1900;Frequency: 1880 MHzDuty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Area Scan (61x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.089 mW/g

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

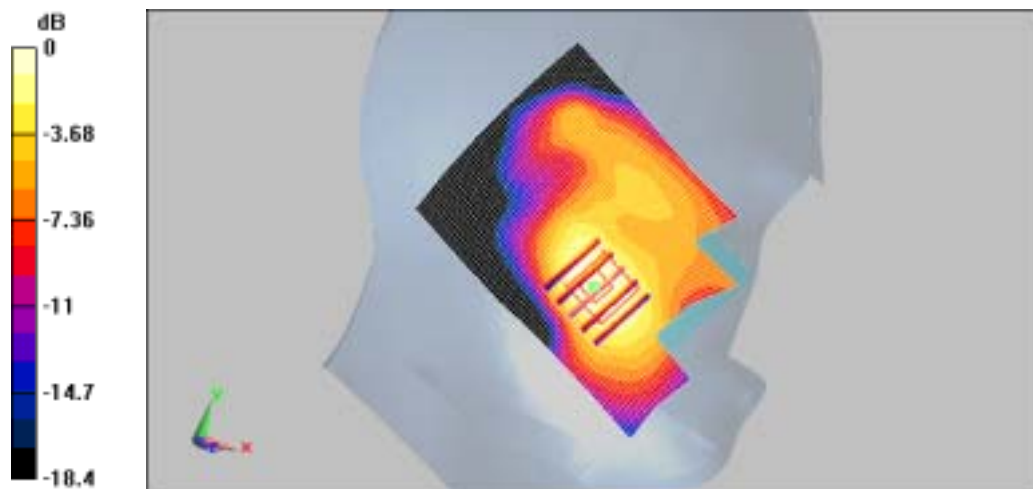
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.05V/m ; PowerDrift = 0.18 dB

Peak SAR(extrapolated) = 0.120 W/g

SAR(1 g) = 0.077 mW/g ; SAR(10 g) = 0.048 mW/g

Maximum value of SAR (measured) = 0.085 mW/g



0 dB = 0.08mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GSM1900 Left (Job No. : FI-127)

Procedure Name: Tilt, Ch.661, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

Communication System: GSM 1900;Frequency: 1880 MHzDuty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Tilt, Ch.661, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.023 mW/g

Tilt, Ch.661, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

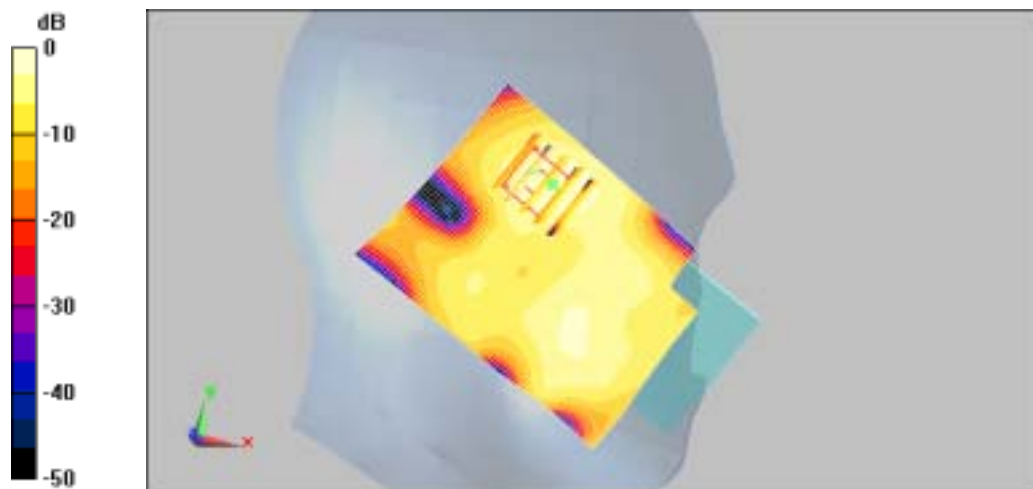
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.55V/m ; PowerDrift = 0.09 dB

Peak SAR(extrapolated) = 0.036 W/g

SAR(1 g) = 0.021 mW/g ; SAR(10 g) = 0.012 mW/g

Maximum value of SAR (measured) = 0.024 mW/g



0 dB = 0.02mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GSM1900 Right (Job No. : FI-127)

Procedure Name: Cheek, Ch661, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-22/Jun/2011

Communication System: GSM 1900;Frequency: 1880 MHzDuty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.16, 7.16, 7.16); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Area Scan (61x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.074 mW/g

Cheek, Ch.661, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

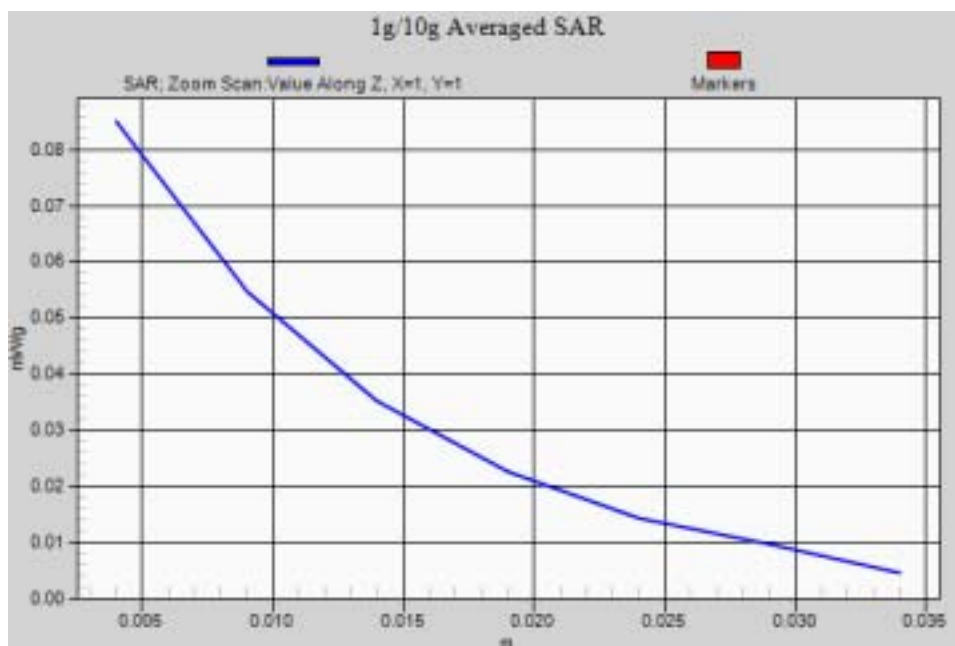
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.93V/m ; PowerDrift = 0.1D dB

Peak SAR(extrapolated) = 0.130 W/kg

SAR(1 g) = 0.079 mW/g ; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.085 mW/g



DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GPRS1900 Body (Job No. : FI-127)

Procedure Name: Body, Ch.661, Ant.Intenna, Bat.Standard, Back, 4Tx

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

Communication System:GPRS 1900;Frequency: 1880 MHzDuty Cycle: 1:2.075

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.12, 7.12, 7.12); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.661,Ant.Intenna, BatStandard, Back, 4Tx/Area Scan (101x141x1):

Measurement grid: $dx=0\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.427 mW/g

Body, Ch.661,Ant.Intenna, BatStandard, Back, 4Tx/Zoom Scan(5x5x7)/Cube 0:

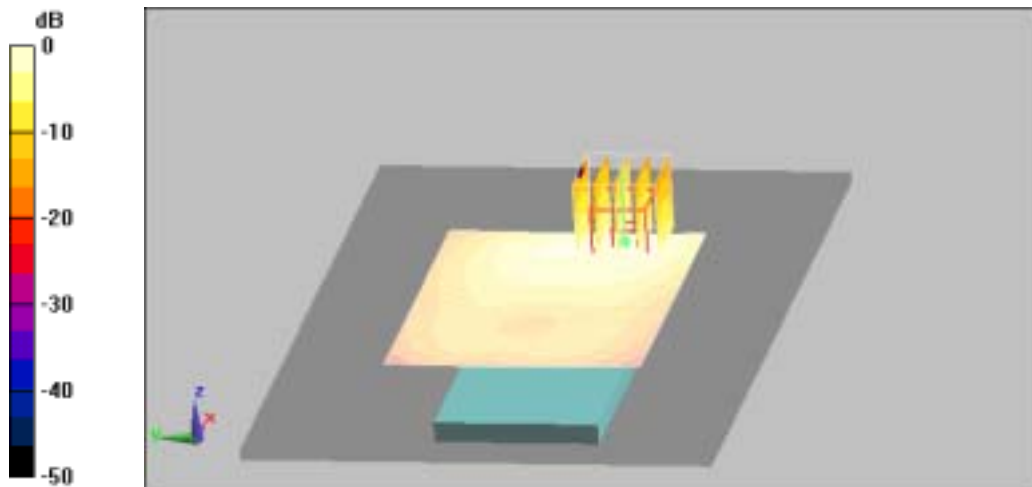
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.71V/m ; PowerDrift = -0.00 dB

Peak SAR(extrapolated) = 0.657 W/kg

SAR(1 g) = 0.77 mW/g ; SAR(10 g) = 0.200 mW/g

Maximum value of SAR (measured) = 0.433 mW/g



0 dB = 0.43mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GPRS1900 Body (Job No. : FI-127)

Procedure Name: Body, Ch.661, Ant.Intenna, Bat.Standard, Front, 4Tx

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

Communication System:GPRS 1900;Frequency: 1880 MHzDuty Cycle: 1:2.075

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(7.12, 7.12, 7.12); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.661,Ant.Intenna, BatStandard, Front, 4Tx/Area Scan (101x141x1):

Measurement grid: $dx=0\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.195 mW/g

Body, Ch.661,Ant.Intenna, BatStandard, Front, 4Tx/Zoom Scan(5x5x7)/Cube 0

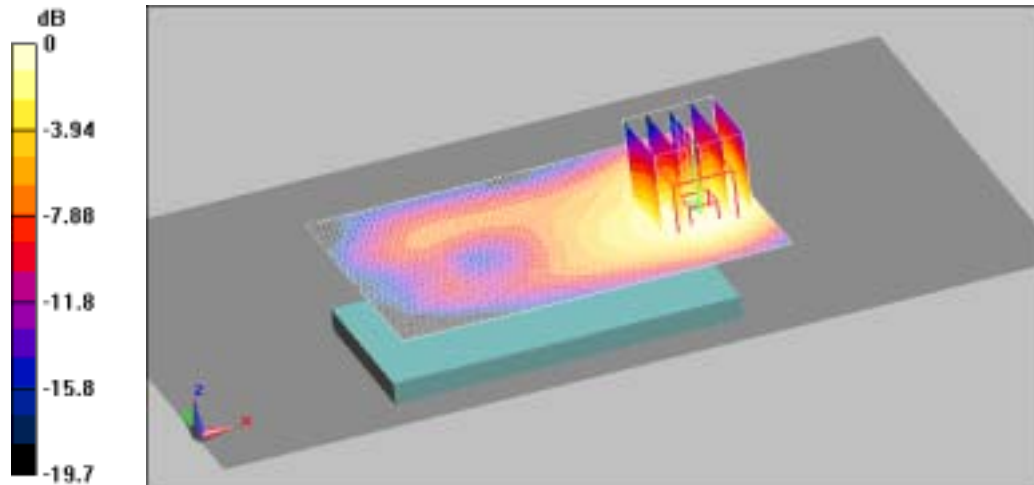
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.61V/m ; PowerDrift = 0.10 dB

Peak SAR(extrapolated) = 0.253 W/kg

SAR(1 g) = 0.160 mW/g ; SAR(10 g) = 0.096 mW/g

Maximum value of SAR (measured) = 0.173 mW/g



0 dB = 0.17mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GPRS1900 Body (Job No. : FI-127)

Procedure Name: Body, Ch.661, Ant.Intenna, Bat.Standard, Side C, 4Tx

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

Communication System:GPRS 1900;Frequency: 1880 MHzDuty Cycle: 1:2.075

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750;ConvF(7.12, 7.12, 7.12);Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.661,Ant.Intenna, BatStandard, Side C,4Tx/Area Scan (101x141x1):

Measurement grid: $dx=0\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.515 mW/g

Body, Ch.661,Ant.Intenna, BatStandard, Side C,4Tx/Zoom Scan (5x5x7)/Cube 0:

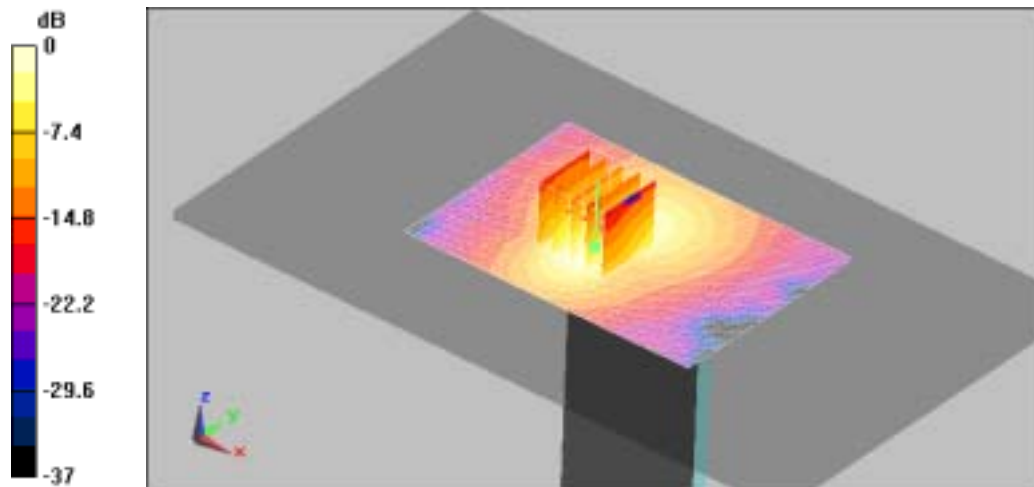
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.9V/m ; PowerDrift = -0.00 dB

Peak SAR(extrapolated) = 0.784 W/g

SAR(1 g) = 0.439 mW/g ; SAR(10 g) = 0.229 mW/g

Maximum value of SAR (measured) = 0.506 mW/g



0 dB = 0.506mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GPRS1900 Body (Job No. : FI-127)

Procedure Name: Body, Ch.661, Ant.Intenna, Bat.Standard, Side B, 4Tx

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

Communication System:GPRS 1900;Frequency: 1880 MHzDuty Cycle: 1:2.075

Medium parameters used: $f = 1880 \text{ MHz}$ $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750;ConvF(7.12, 7.12, 7.12);Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.661,Ant.Intenna, BatStandard, Side B,4Tx/Area Scan (51x71x1):

Measurement grid: $dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.098 mW/g

Body, Ch.661,Ant.Intenna, BatStandard, Side B,4Tx/Zoom Scan (5x5x7)/Cube 0:

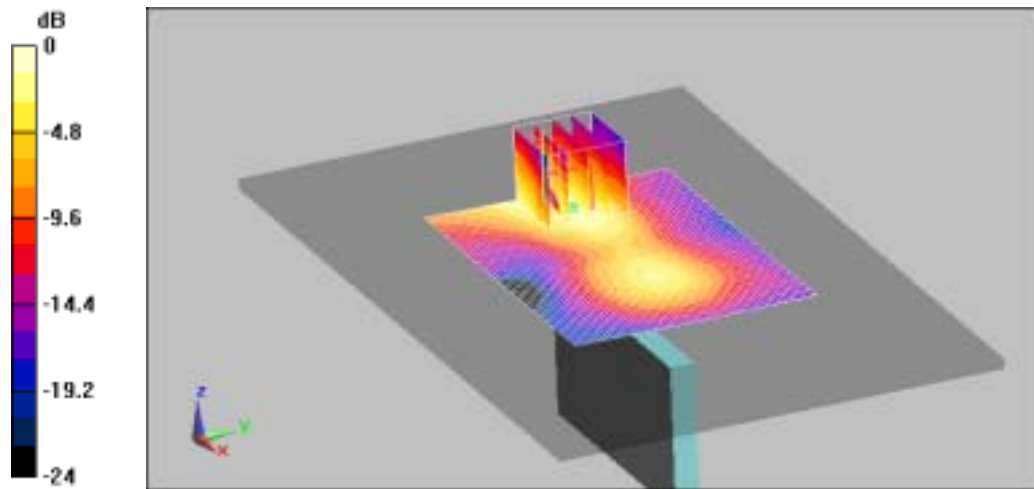
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.58V/m ; PowerDrift = -0.28 dB

Peak SAR(extrapolated) = 0.263 W/g

SAR(1 g) = 0.111 mW/g ; SAR(10 g) = 0.060 mW/g

Maximum value of SAR (measured) = 0.116 mW/g



0 dB = 0.116mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 GPRS1900 Body (Job No. : FI-127)

Procedure Name: Body, Ch.661, Ant.Intenna, Bat.Standard, Side C, 4Tx

Meas. Ambient Temp(celsius)-22.6,Tissue Temp(celsius)-22.1;Test Date-22/Jun/2011

Communication System:GPRS 1900;Frequency: 1880 MHzDuty Cycle: 1:2.075

Medium parameters used: $f = 1880 \text{ MHz}$, $\sigma = 1.55 \text{ mho/m}$, $\epsilon_r = 52.1$, $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750;ConvF(7.12, 7.12, 7.12);Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.661,Ant.Intenna, BatStandard, Side C,4Tx/Area Scan (101x141x1):

Measurement grid: $dx=0\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.515 mW/g

Body, Ch.661,Ant.Intenna, BatStandard, Side C,4Tx/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.9V/m ; PowerDrift = -0.00 dB

Peak SAR(extrapolated) = 0.784 W/kg

SAR(1 g) = 0.439 mW/g ; SAR(10 g) = 0.229 mW/g

Maximum value of SAR (measured) = 0.506 mW/g



DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Right (Job No. : FI-127)

Procedure Name: Cheek, Ch11, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.9;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.094 mW/g

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

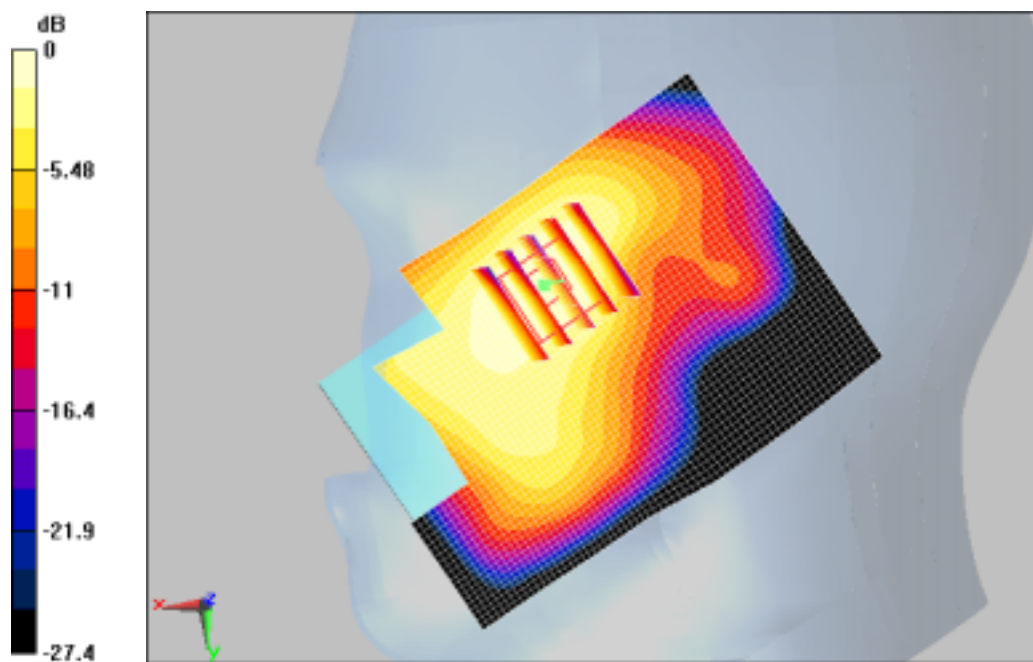
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.97V/m ; PowerDrift = 0.00619 dB

Peak SAR(extrapolated) = 0.136 W/g

$\text{SAR}(1 \text{ g}) = 0.080 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.047 \text{ mW/g}$

Maximum value of SAR (measured) = 0.087 mW/g



0 dB = 0.08 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Right (Job No. : FI-127)

Procedure Name: Tilt, Ch.11, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.9;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Tilt, Ch.11, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.093 mW/g

Tilt, Ch.11, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

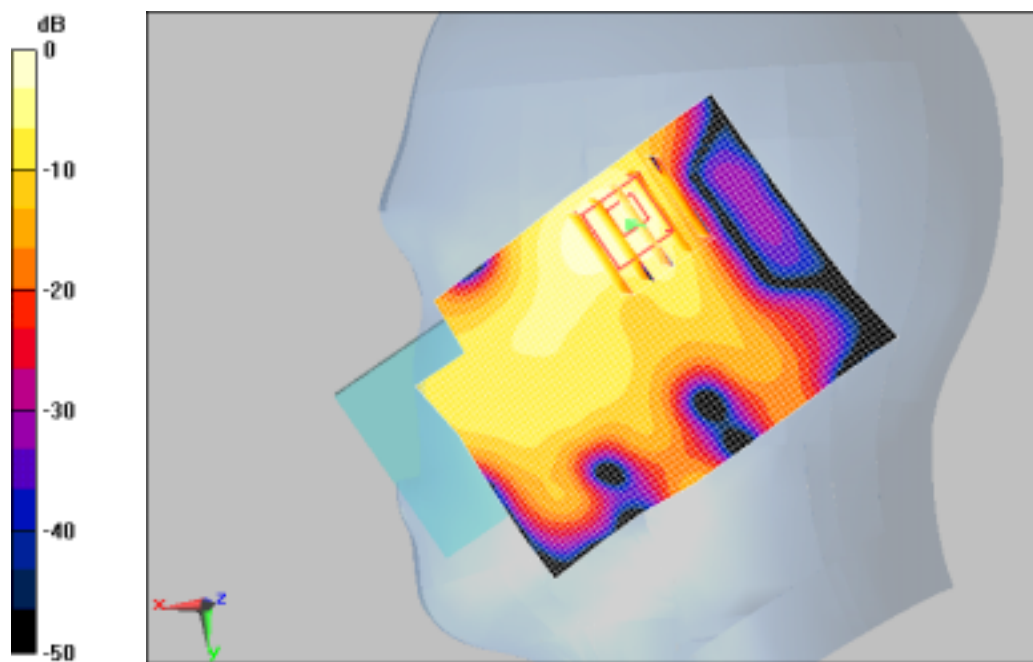
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 2.27V/m ; PowerDrift = 0.14 dB

Peak SAR(extrapolated) = 0.107 W/kg

SAR(1 g) = 0.061 mW/g ; SAR(10 g) = 0.031 mW/g

Maximum value of SAR (measured) = 0.065 mW/g



0 dB = 0.06mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Left (Job No. : FI-127)

Procedure Name: Cheek, Ch11, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.9;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.160 mW/g

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

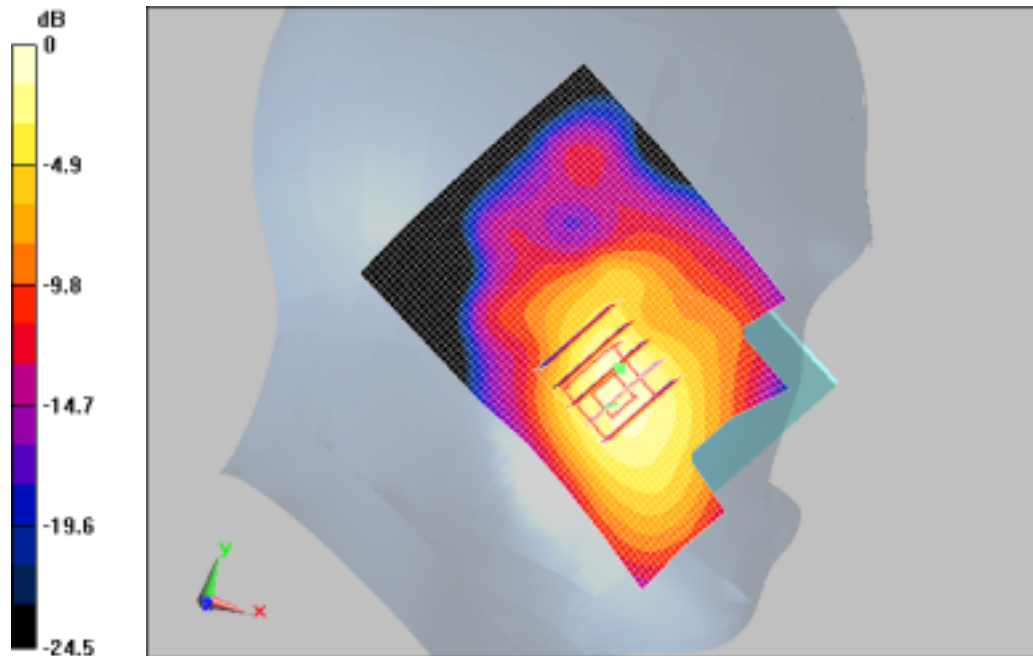
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.7 V/m ; Power Drift = 0.183 dB

Peak SAR(extrapolated) = 0.293 W/g

$\text{SAR}(1 \text{ g}) = 0.165 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.090 \text{ mW/g}$

Maximum value of SAR (measured) = 0.181 mW/g



0 dB = 0.18 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Left (Job No. : FI-127)

Procedure Name: Tilt, Ch.11, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.9;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.86 \text{ rho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Tilt, Ch.11, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.039 mW/g

Tilt, Ch.11, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

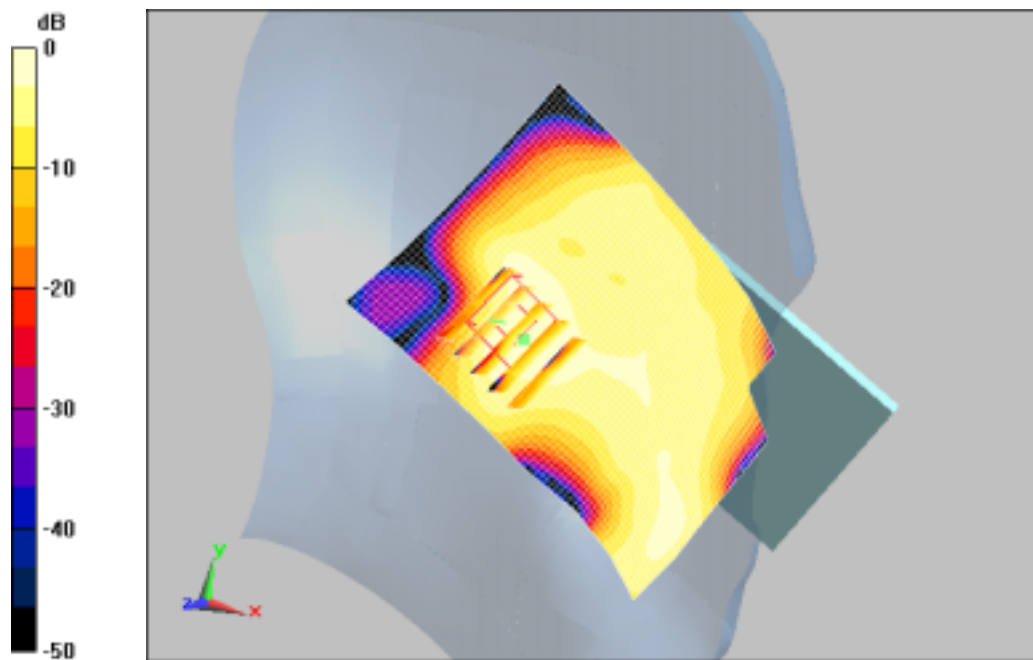
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 2.6 V/m ; Power Drift = -0.137 dB

Peak SAR(extrapolated) = 0.063 W/kg

SAR(1 g) = 0.033 mW/g ; SAR(10 g) = 0.017 mW/g

Maximum value of SAR (measured) = 0.036 mW/g



0 dB = 0.03 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Left (Job No. : FI-127)

Procedure Name: Cheek, Ch11, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.5,Tissue Temp(celsius)-21.9;Test Date-19/Jul/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.47, 6.47, 6.47); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #1; Type: SAM; Serial: TP-1248
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.160 mW/g

Cheek, Ch.11, Ant.Intenna, Bat.Standard/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

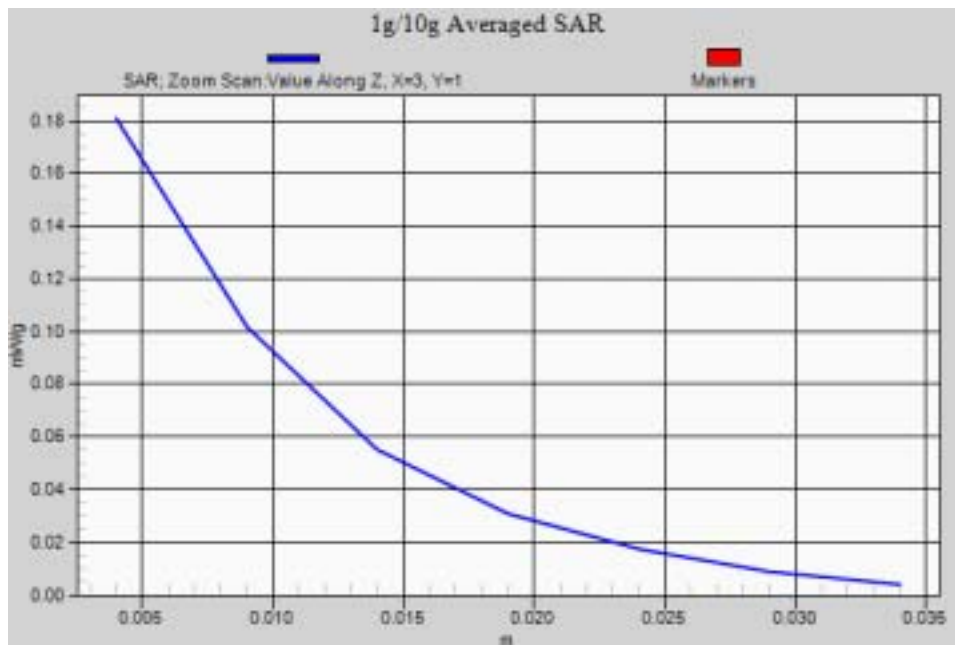
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.7 V/m ; Power Drift = 0.183 dB

Peak SAR(extrapolated) = 0.293 W/kg

$\text{SAR}(1 \text{ g}) = 0.165 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.090 \text{ mW/g}$

Maximum value of SAR (measured) = 0.181 mW/g



DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Body (Job No : FI-127)

Procedure Name: Body, Ch.11, Ant.Intenna, BatStandard, Back

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.8;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.03 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.76, 6.76, 6.76); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.11, Ant.Intenna, BatStandard, Back/Area Scan (51x71x1): Measurement grid:
dx=20mm, dy=20mm

Maximum value of SAR (interpolated) = 0.090 mW/g

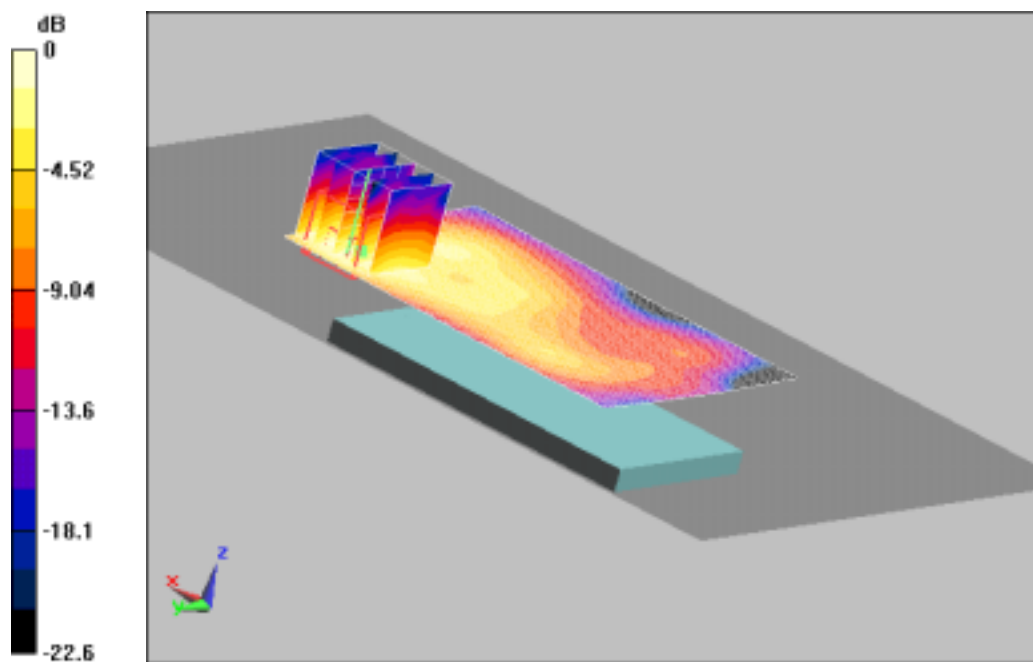
Body, Ch.11, Ant.Intenna, BatStandard, Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.73V/m; PowerDrift = 0.011 dB

Peak SAR(extrapolated) = 0.175 W/g

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.049 mW/g

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



0 dB = 0.09mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Body (Job No : FI-127)

Procedure Name: Body, Ch.11, Ant.Intenna, BatStandard, Front

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.8;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.03 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.76, 6.76, 6.76); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.11, Ant.Intenna, BatStandard, Front/Area Scan (101x141x1): Measurement

grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.111 mW/g

Body, Ch.11, Ant.Intenna, BatStandard, Front/Zoom Scan (5x5x7)/Cube 0: Measurement

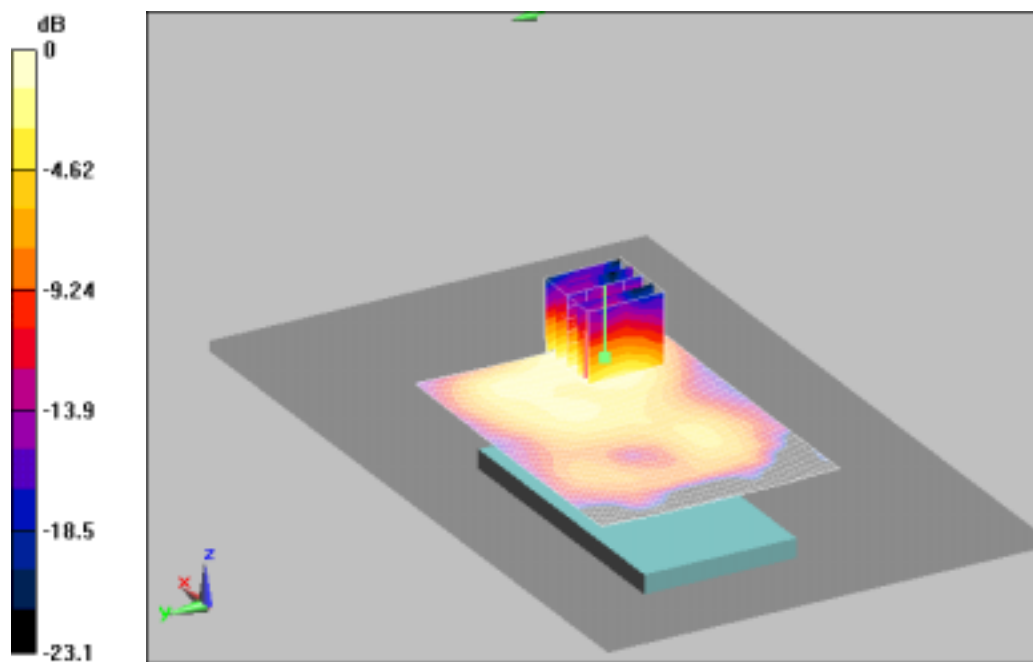
grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.18V/m; PowerDrift = 0.03 dB

Peak SAR(extrapolated) = 0.186 W/g

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.056 mW/g

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



0 dB = 0.15mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Body (Job No : FI-127)

Procedure Name: Body, Ch.11, Ant.Intenna, BatStandard, Side C

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.8;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.03 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750;ConvF(6.76, 6.76, 6.76);Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.11, Ant.Intenna, BatStandard, Side C/Area Scan (101x141x1): Measurement

grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.069 mW/g

Body, Ch.11, Ant.Intenna, BatStandard, Side C/Zoom Scan (5x5x7)/Cube 0 Measurement

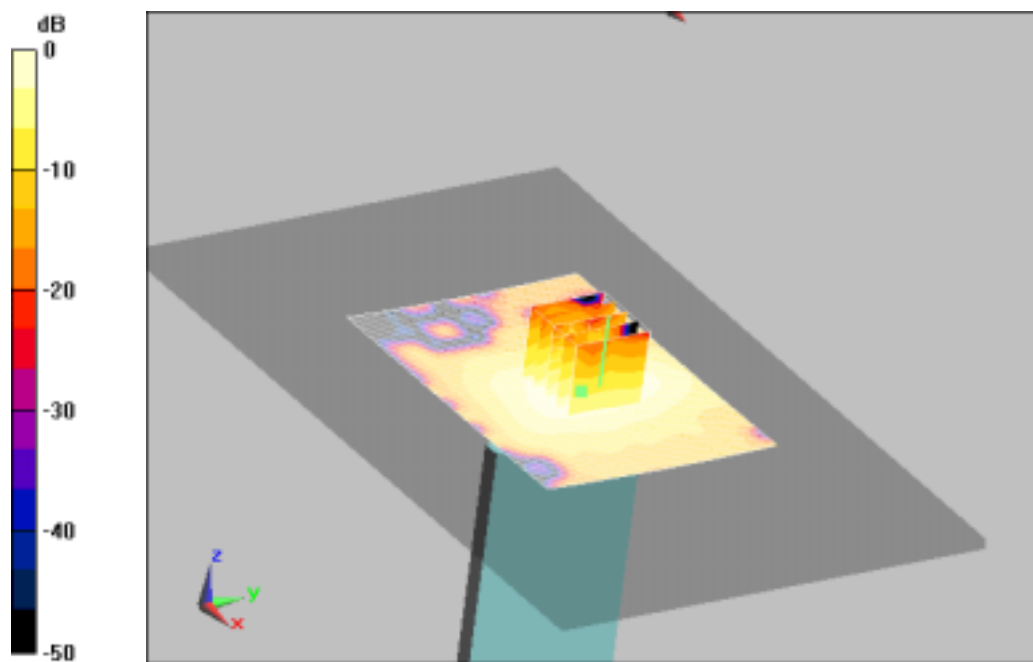
grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.23V/m; PowerDrift = 0.08 dB

Peak SAR(extrapolated) = 0.120 W/g

SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.069 mW/g



0 dB = 0.00mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Body (Job No : FI-127)

Procedure Name: Body, Ch.11, Ant.Intenna, Bat.Standard, Side A

Meas. Ambient Temp(celsius)-22.0,Tissue Temp(celsius)-21.8;Test Date-18/Jun/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.03 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.76, 6.76, 6.76); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.11, Ant.Intenna, Bat.Standard, Side A/Area Scan (51x71x1): Measurement grid:

$dx=20\text{mm}$, $dy=20\text{mm}$

Maximum value of SAR (interpolated) = 0.086 mW/g

Body, Ch.11, Ant.Intenna, Bat.Standard, Side A/Zoom Scan (5x5x7)/Cube 0 Measurement

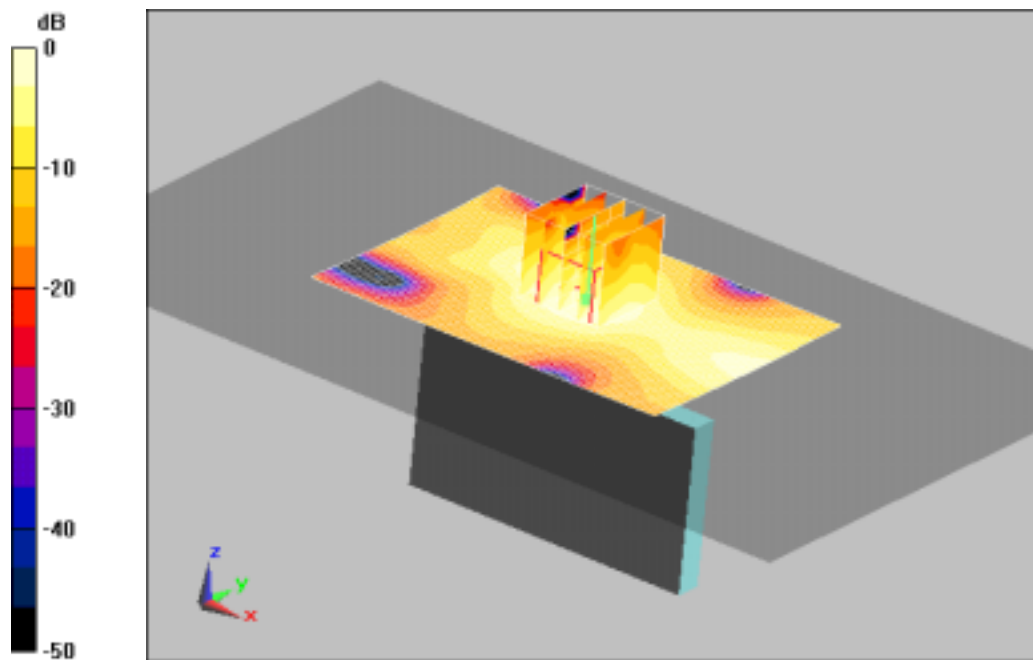
grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.95V/m ; Power Drift = 0.17 dB

Peak SAR(extrapolated) = 0.139 W/kg

SAR(1 g) = 0.075 mW/g ; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.081 mW/g



0 dB = 0.08mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN Body (Job No : FI-127)

Procedure Name: Body, Ch.11, Ant.Intenna, Bat.Standard, Front

Meas. Ambient Temp(celsius)-22.5,Tissue Temp(celsius)-21.9;Test Date-18/Jul/2011

Communication System:WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.03 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(6.76, 6.76, 6.76); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.11, Ant.Intenna, Bat.Standard, Front/Area Scan (101x141x1): Measurement

grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.111 mW/g

Body, Ch.11, Ant.Intenna, Bat.Standard, Front/Zoom Scan (5x5x7)/Cube 0: Measurement

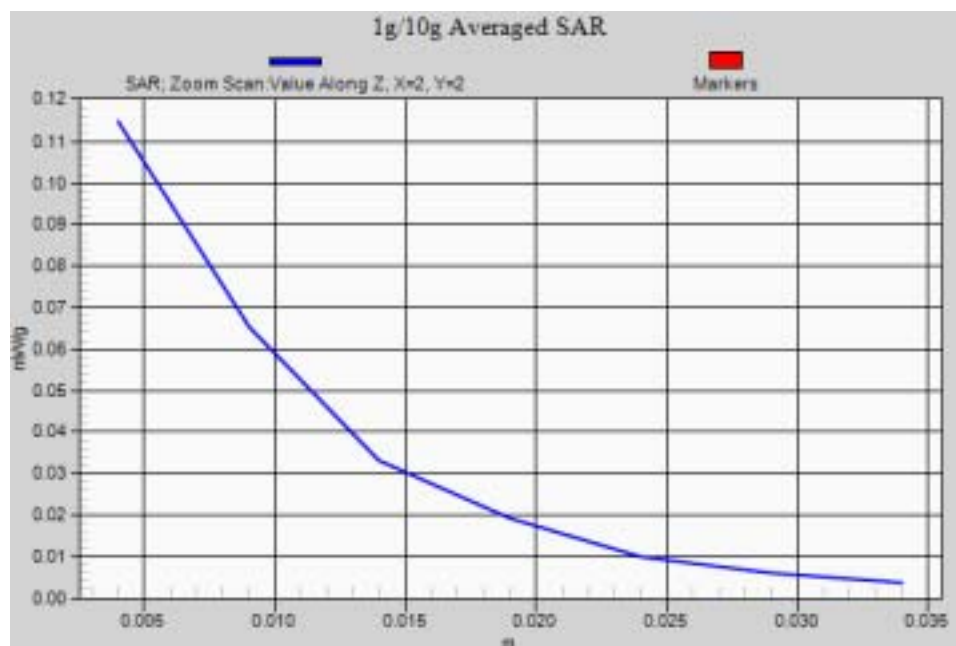
grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.18V/m; Power Drift = 0.03 dB

Peak SAR(extrapolated) = 0.186 W/g

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.056 mW/g

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



DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Cheek, Ch48, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5240 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5240 \text{ MHz}$, $\sigma = 4.85 \text{ mho/m}$, $\epsilon_r = 34.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.61, 4.61, 4.61); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch48, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.248 mW/g

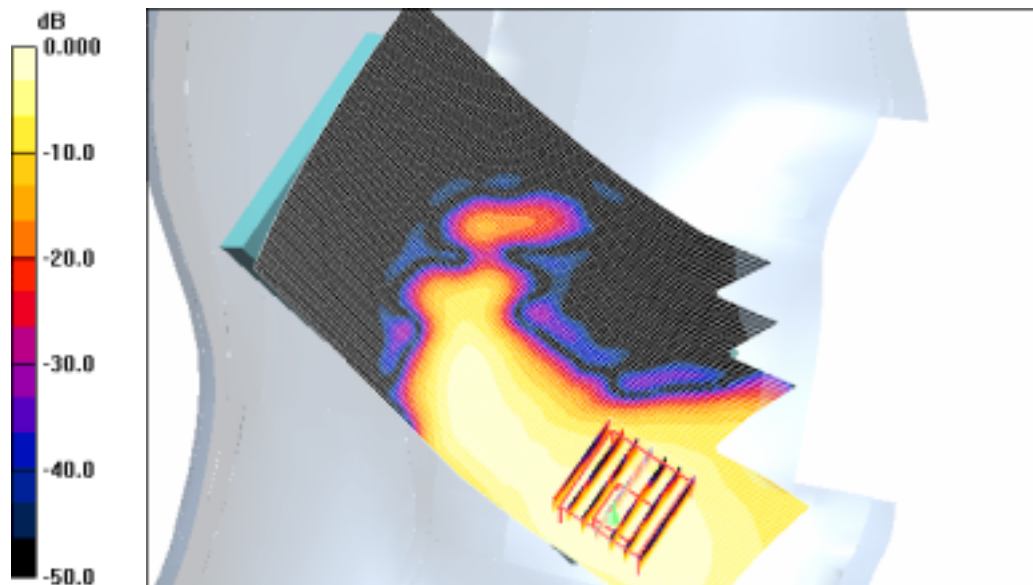
Cheek, Ch48, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.86V/m; Power Drift = -0.52 dB

Peak SAR(extrapolated) = 0.461 W/g

SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.053 mW/g

Maximum value of SAR (measured) = 0.251 mW/g



0 dB = 0.25mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Tilt, Ch.48, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5240 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5240 \text{ MHz}$ $\sigma = 4.85 \text{ mho/m}$; $\epsilon_r = 34.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.61, 4.61, 4.61); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.48, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube 0: Measurement grid:

$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.96V/m; PowerDrift = 0.008 dB

Peak SAR(extrapolated) = 0.092 W/g

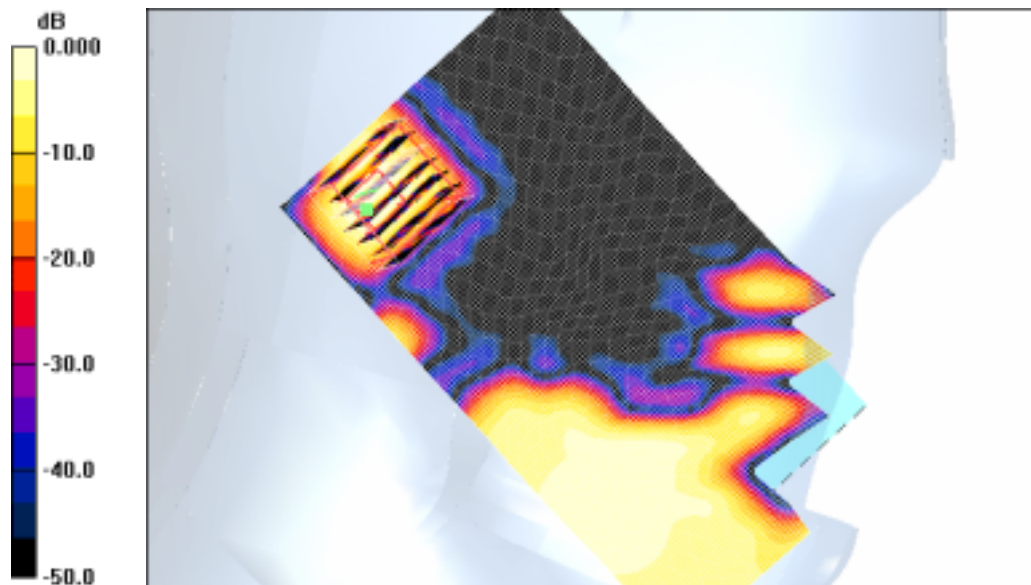
SAR(1 g) = 0.019 mW/g; SAR(10 g) = 0.00585 mW/g

Maximum value of SAR (measured) = 0.046 mW/g

Tilt, Ch.48, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.074 mW/g



0 dB = 0.074mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Cheek, Ch48, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5240 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5240 \text{ MHz}$ $\sigma = 4.85 \text{ mho/m}$; $\epsilon_r = 34.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.61, 4.61, 4.61); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch48, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 3.00V/m ; Power Drift = -0.08 dB

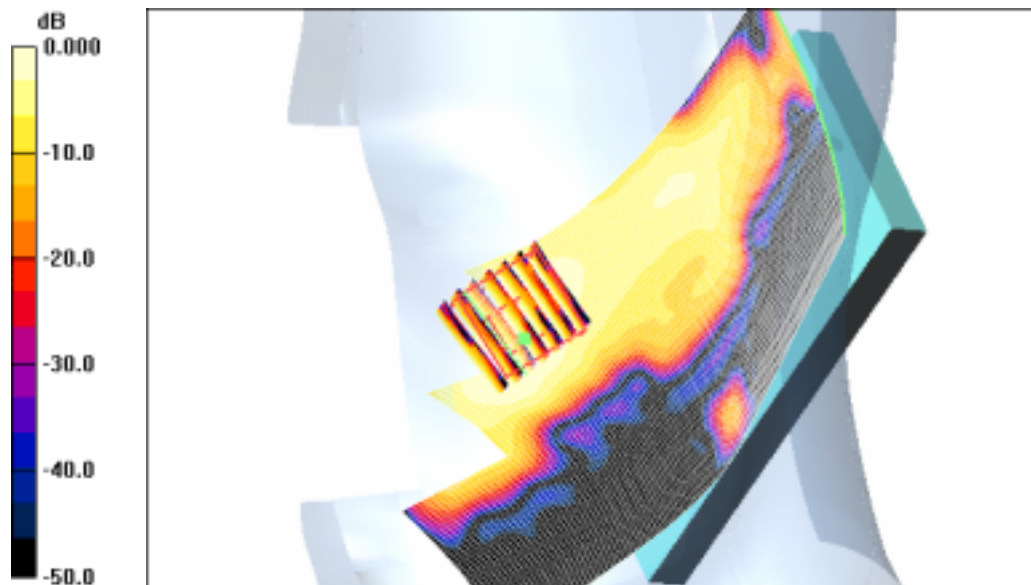
Peak SAR(extrapolated) = 0.418 W/kg

SAR(1 g) = 0.139 mW/g ; SAR(10 g) = 0.052 mW/g

Maximum value of SAR (measured) = 0.261 mW/g

Cheek, Ch48, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.249 mW/g



0 dB = 0.29mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Tilt, Ch.48, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5240 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5240 \text{ MHz}$ $\sigma = 4.85 \text{ mho/m}$; $\epsilon_r = 34.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.61, 4.61, 4.61); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.48, Ant.Intenna, Bat.Standard/Area Scan 2 (81x141x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.141 mW/g

Tilt, Ch.48, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid:

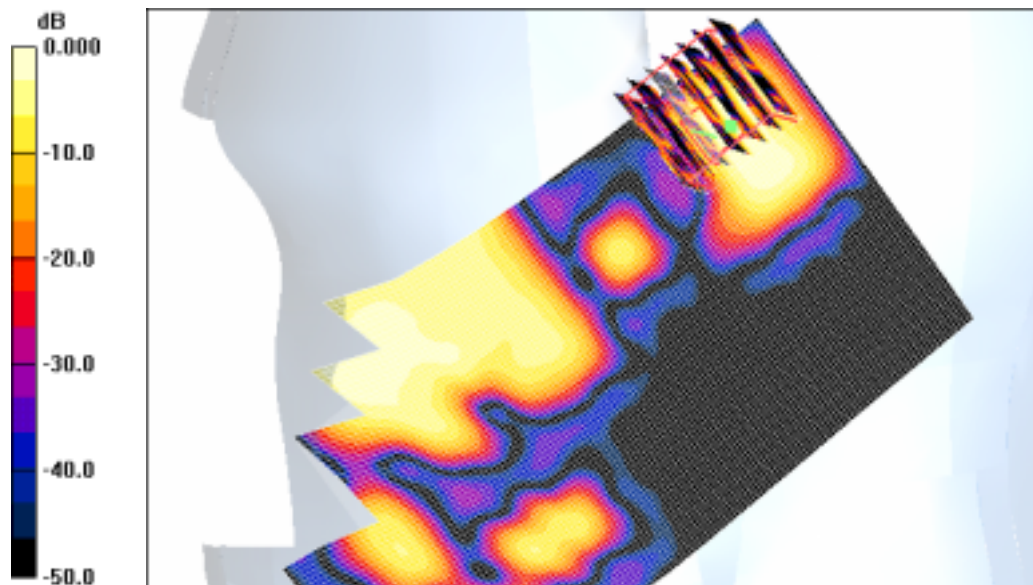
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.42V/m; PowerDrift = 0.18 dB

Peak SAR(extrapolated) = 0.151 W/g

SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.0065 mW/g

Maximum value of SAR (measured) = 0.064 mW/g



0 dB = 0.06 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Cheek, Ch64, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5320 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5320 \text{ MHz}$ $\sigma = 4.86 \text{ mho/m}$; $\epsilon_r = 35$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.4, 4.4, 4.4); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch64, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 4.05V/m ; Power Drift = -0.05 dB

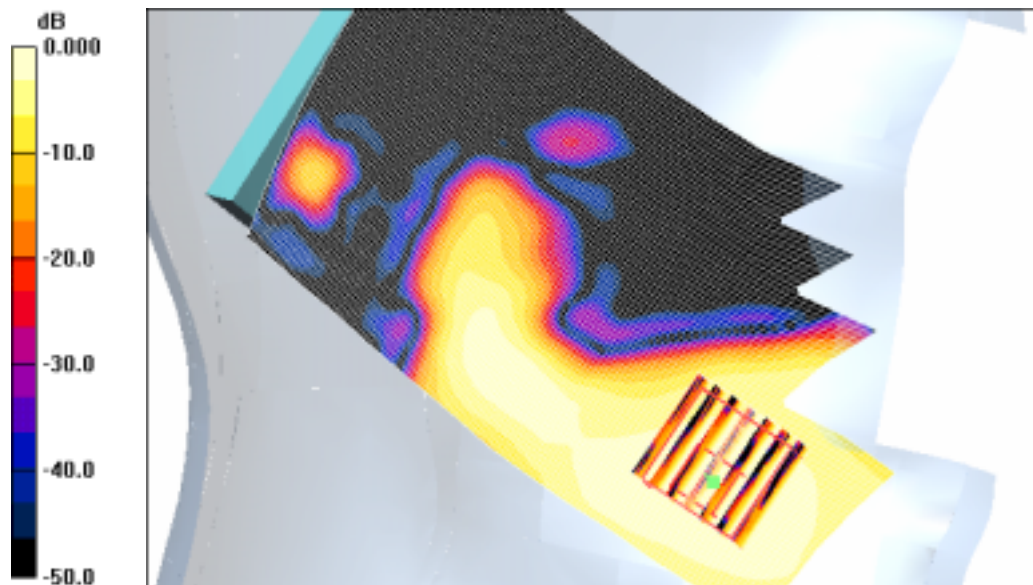
Peak SAR(extrapolated) = 0.355 W/kg

SAR(1 g) = 0.107 mW/g ; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.189 mW/g

Cheek, Ch64, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.196 mW/g



0 dB = 0.19 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Tilt, Ch.64, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5320 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5320 \text{ MHz}$ $\sigma = 4.86 \text{ mho/m}$; $\epsilon_r = 35$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.4, 4.4, 4.4); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.64, Ant.Intenna, Bat.Standard/Zoom Scan 2(7x7x11)/Cube 0: Measurement grid:

$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 3.05V/m ; PowerDrift = 0.07 dB

Peak SAR(extrapolated) = 0.157 W/kg

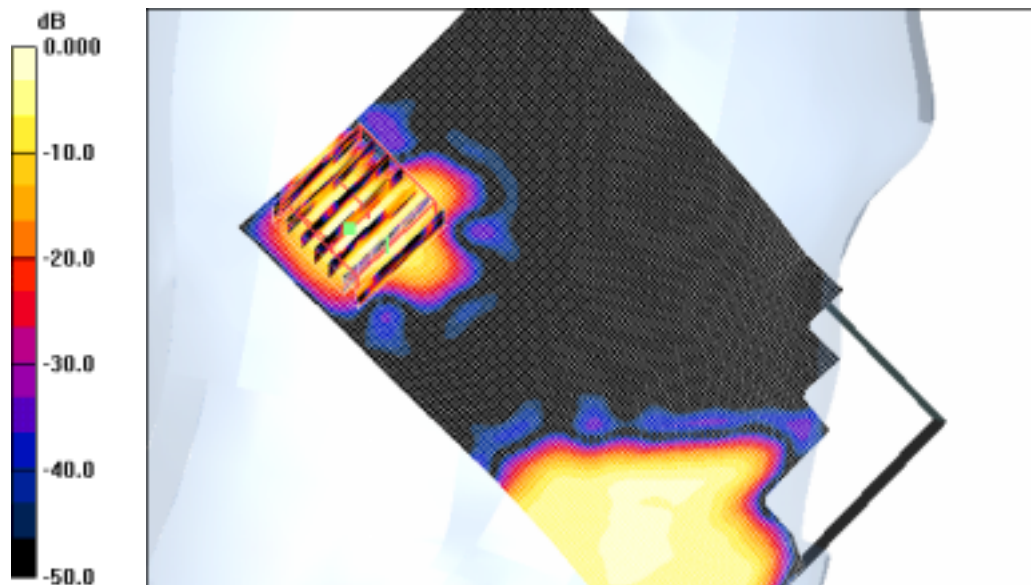
SAR(1 g) = 0.016 mW/g ; SAR(10 g) = 0.00539 mW/g

Maximum value of SAR (measured) = 0.039 mW/g

Tilt, Ch.64, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

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



0 dB = 0.001 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Cheek, Ch64, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5320 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5320 \text{ MHz}$ $\sigma = 4.86 \text{ mho/m}$; $\epsilon_r = 35$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.4, 4.4, 4.4); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch64, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.281 mW/g

Cheek, Ch64, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube 0: Measurement grid:

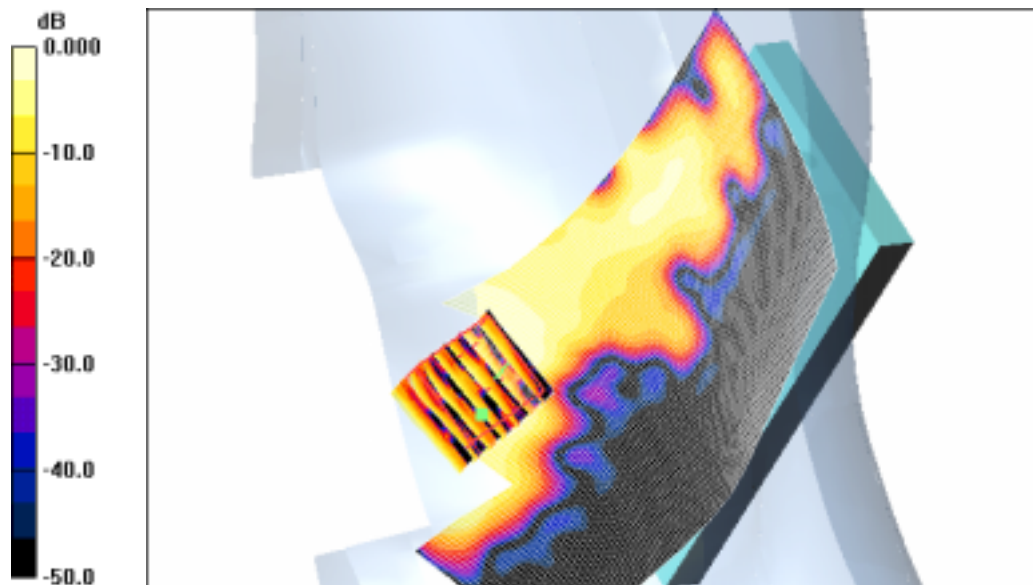
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.95V/m ; PowerDrift = 0.004 dB

Peak SAR(extrapolated) = 0.206 W/kg

SAR(1 g) = 0.083 mW/g ; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.152 mW/g



0 dB = 0.12 mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Tilt, Ch.64, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System: WLAN 5000MHz; Frequency: 5320 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5320 \text{ MHz}$ $\sigma = 4.86 \text{ mho/m}$; $\epsilon_r = 35$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.4, 4.4, 4.4); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.64, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.151 mW/g

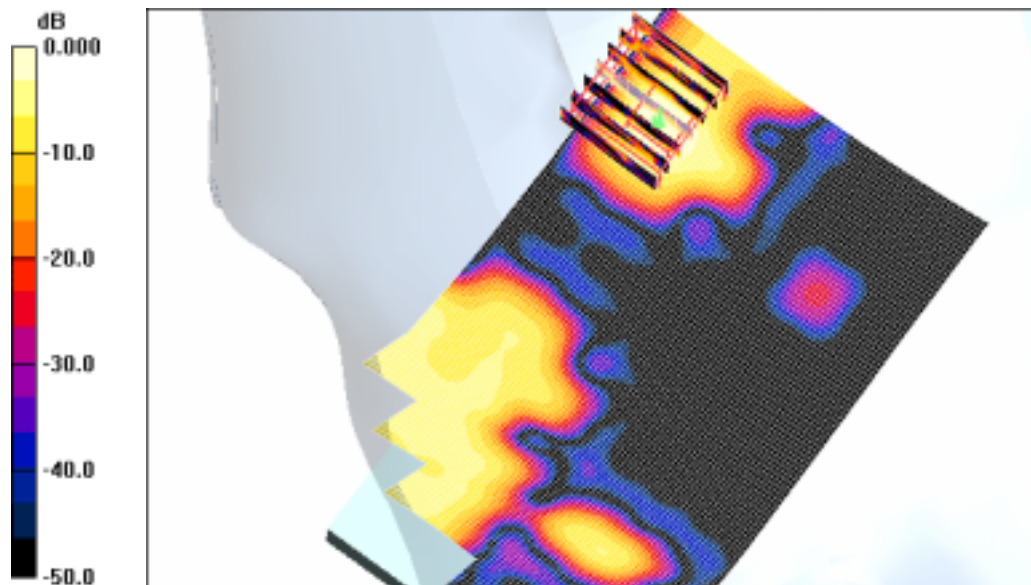
Tilt, Ch.64, Ant.Intenna, Bat.Standard/Zoom Scan 22 (7x7x11)/Cube 0 Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.32V/m; PowerDrift = -0.009 dB

Peak SAR(extrapolated) = 0.167 W/g

SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.00719 mW/g

Maximum value of SAR (measured) = 0.088 mW/g



0 dB = 0.08mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Cheek, Ch100, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5500 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$ $\sigma = 5.05 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch.100, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement

grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 4.11V/m; Power Drift = -0.08 dB

Peak SAR(extrapolated) = 0.512 W/g

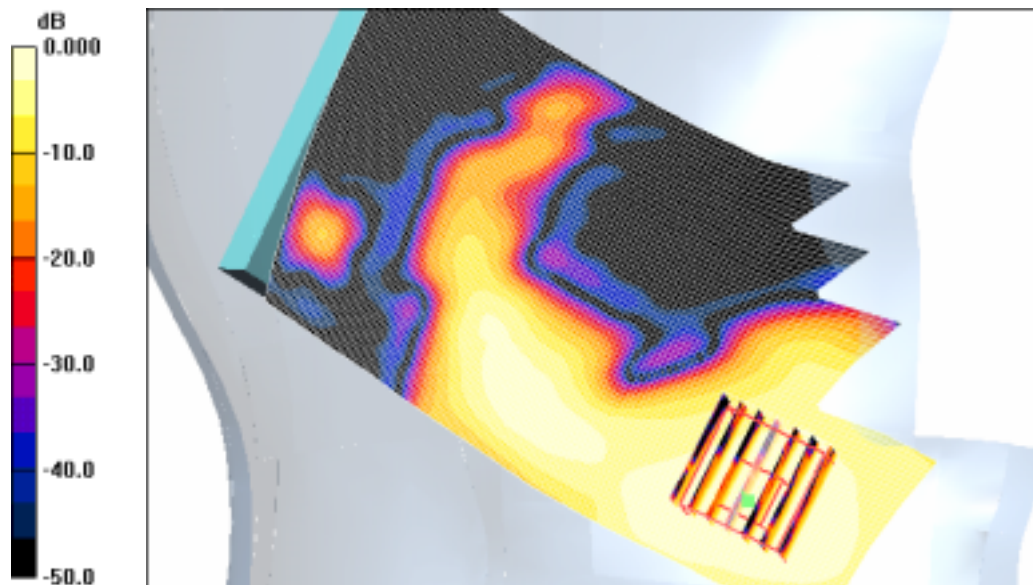
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.058 mW/g

Maximum value of SAR (measured) = 0.270 mW/g

Cheek, Ch.100, Ant.Intenna, Bat.Standard/Area Scan (1x14x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.270 mW/g



0 dB = 0.270mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Tilt, Ch100, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5500 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$ $\sigma = 5.05 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch100, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.126 mW/g

Tilt, Ch100, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube Q: Measurement grid:

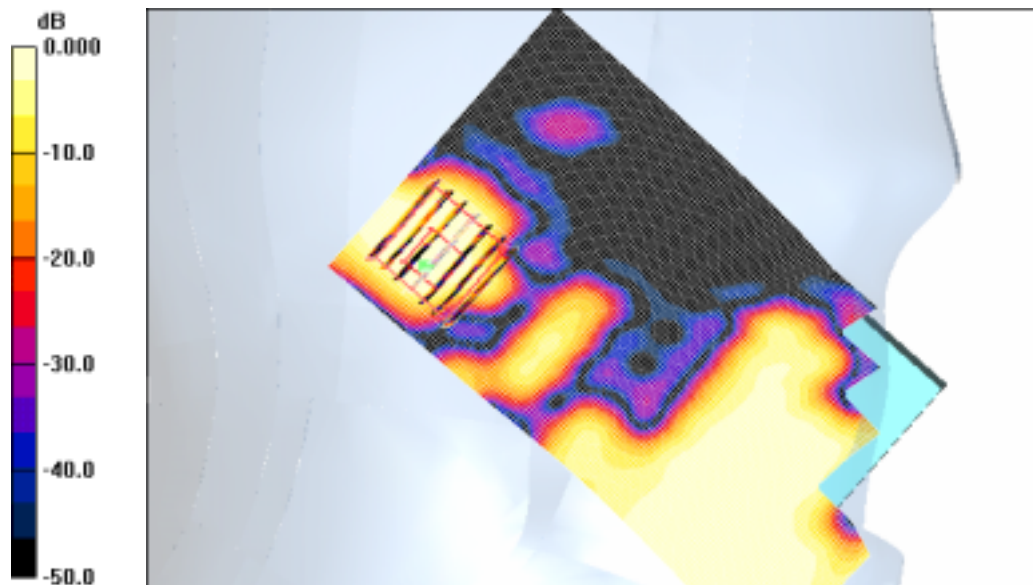
dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.19V/m; PowerDrift = -0.69 dB

Peak SAR(extrapolated) = 0.085 W/g

SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.00834 mW/g

Maximum value of SAR (measured) = 0.057 mW/g



0 dB = 0.07mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Cheek, Ch100, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5500 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$, $\sigma = 5.05 \text{ mho/m}$, $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch.100, Ant.Intenna, Bat.Standard/Area Scan 81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.365 mW/g

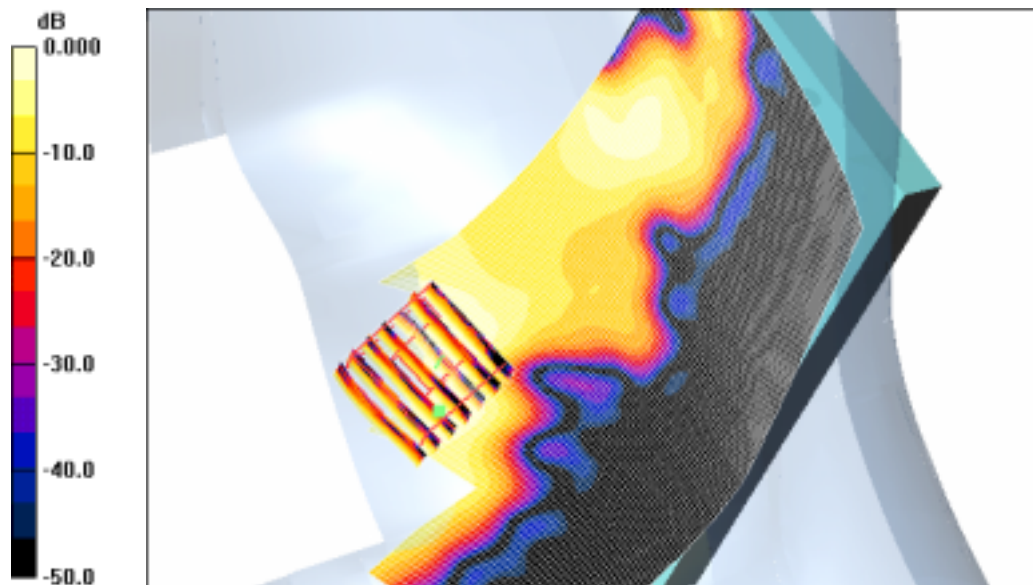
Cheek, Ch.100, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.38V/m; PowerDrift = -0.01 dB

Peak SAR(extrapolated) = 0.355 W/g

SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.042 mW/g

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



0 dB = 0.25mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Tilt, Ch.100, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System: WLAN 5000MHz; Frequency: 5500 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$ $\sigma = 5.05 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.100, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.233 mW/g

Tilt, Ch.100, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube 0: Measurement grid:

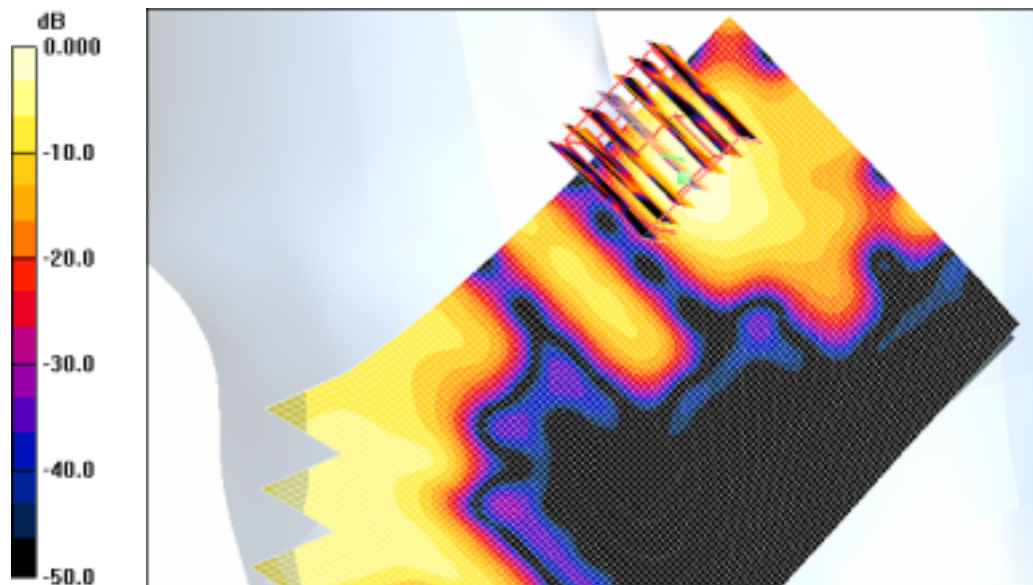
dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.93V/m; PowerDrift = -0.63 dB

Peak SAR(extrapolated) = 0.238 W/g

SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.013 mW/g

Maximum value of SAR (measured) = 0.142 mW/g



0 dB = 0.142mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Cheek, Ch165, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5825 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5825 \text{ MHz}$ $\sigma = 5.48 \text{ mho/m}$; $\epsilon_r = 34.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.07, 4.07, 4.07); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch.165, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 4.20V/m; Power Drift = -0.31 dB

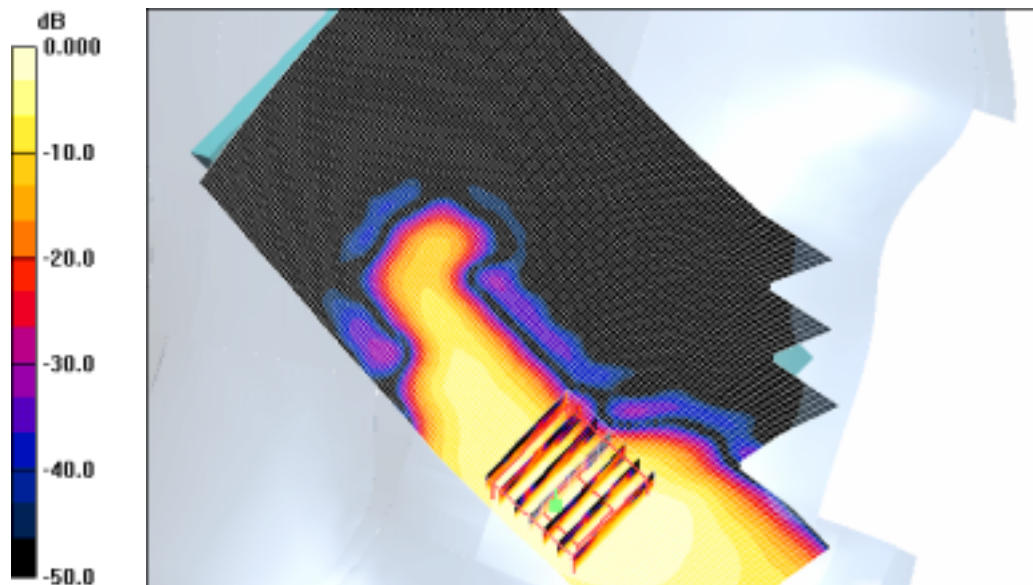
Peak SAR(extrapolated) = 0.369 W/kg

SAR(1 g) = 0.112 mW/g; SAR(10 g) = 0.038 mW/g

Maximum value of SAR (measured) = 0.209 mW/g

Cheek, Ch.165, Ant.Intenna, Bat.Standard/Area Scan (1x141x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.230 mW/g



0 dB = 0.23mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Tilt, Ch165, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5825 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5825 \text{ MHz}$, $\sigma = 5.48 \text{ mho/m}$, $\epsilon_r = 34.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.07, 4.07, 4.07); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch165, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.062 mW/g

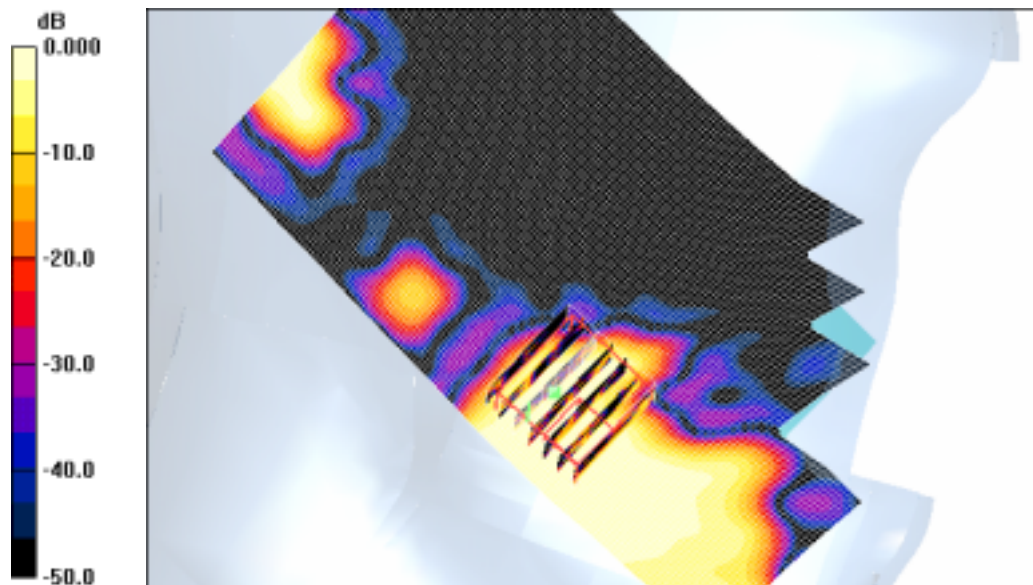
Tilt, Ch165, Ant.Intenna, Bat.Standard/Zoom Scan 22 (7x7x11)/Cube 0 Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.99V/m; PowerDrift = 0.032 dB

Peak SAR(extrapolated) = 0.103 W/kg

SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00369 mW/g

Maximum value of SAR (measured) = 0.035 mW/g



0 dB = 0.08mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Cheek, Ch165, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5825 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5825 \text{ MHz}$, $\sigma = 5.48 \text{ mho/m}$, $\epsilon_r = 34.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.07, 4.07, 4.07); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch.165, Ant.Intenna, Bat.Standard/Area Scan (81x141x1): Measurement grid:

dx=10mm, dy=10mm

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

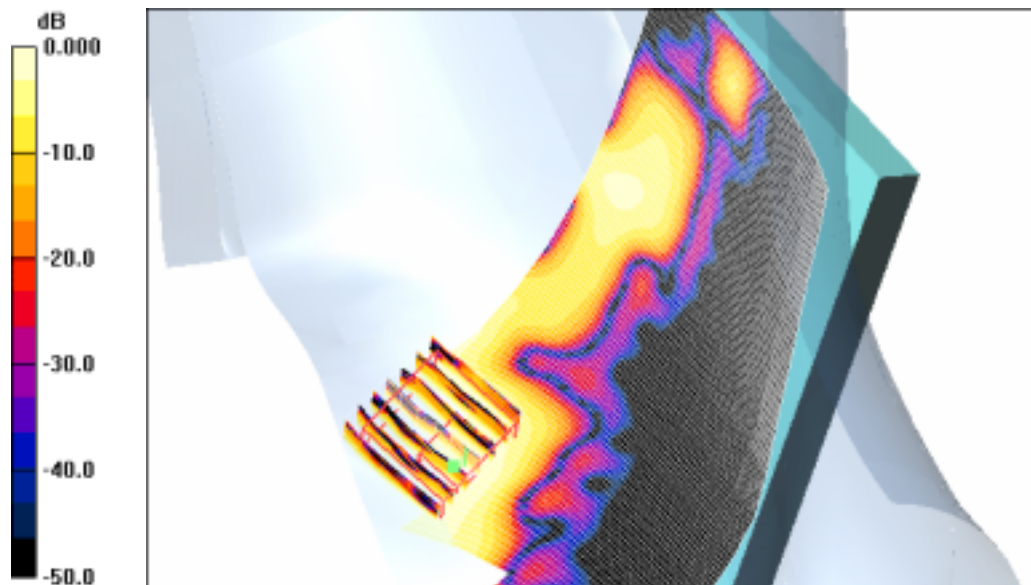
Cheek, Ch.165, Ant.Intenna, Bat.Standard/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.32V/m; PowerDrift = 0.067 dB

Peak SAR(extrapolated) = 0.155 W/g

SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.020 mW/g

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



0 dB = 0.10mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Head Right (Job No : FI-127)

Procedure Name: Tilt, Ch.165, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5825 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5825 \text{ MHz}$, $\sigma = 5.48 \text{ mho/m}$, $\epsilon_r = 34.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.07, 4.07, 4.07); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt, Ch.165, Ant.Intenna, Bat.Standard/Zoom Scan 2(7x7x11)/Cube 0: Measurement

grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.44V/m ; PowerDrift = -0.04 dB

Peak SAR(extrapolated) = 0.172 W/kg

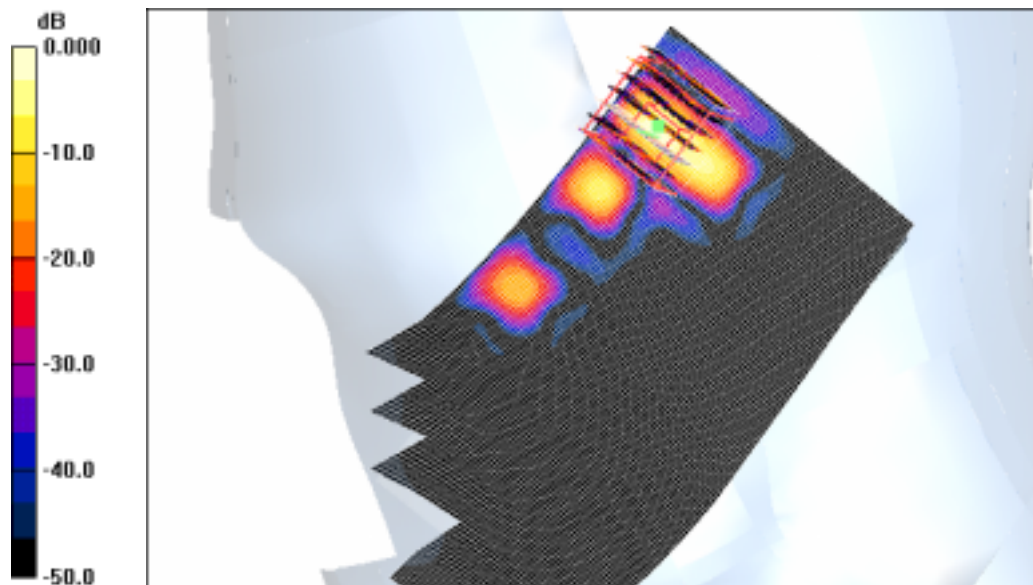
SAR(1 g) = 0.033 mW/g ; SAR(10 g) = 0.00614 mW/g

Maximum value of SAR (measured) = 0.088 mW/g

Tilt, Ch.165, Ant.Intenna, Bat.Standard/Area Scan (81x41x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.094 mW/g



0 dB = 0.09mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 WLAN 5GHz Left (Job No. : FI-127)

Procedure Name: Cheek, Ch100, Ant.Intenna, Bat.Standard

Meas. Ambient Temp(celsius)-22.3,Tissue Temp(celsius)-21.9;Test Date-28/Jul/2011

Communication System:WLAN 5000MHz; Frequency: 5500 MHzDuty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$, $\sigma = 5.05 \text{ mho/m}$, $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.23, 4.23, 4.23); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: SAM PHANTOM #2; Type: SAM; Serial: TP-1247
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek, Ch.100, Ant.Intenna, Bat.Standard/Zoom Scan 2 (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 4.11V/m ; Power Drift = -0.08 dB

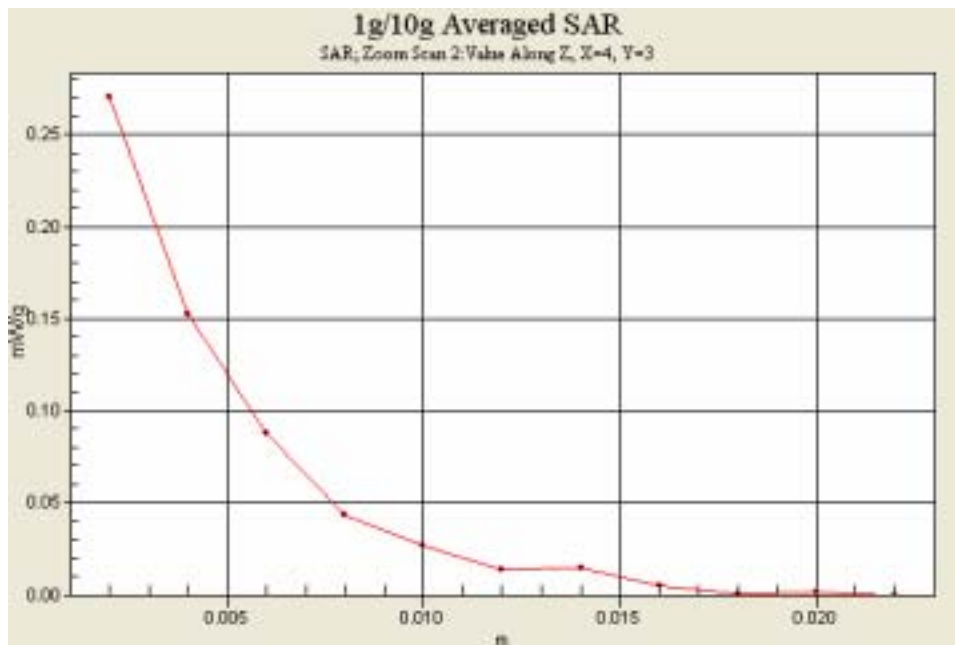
Peak SAR(extrapolated) = 0.512 W/kg

SAR(1 g) = 0.151 mW/g ; SAR(10 g) = 0.058 mW/g

Maximum value of SAR (measured) = 0.270 mW/g

Cheek, Ch.100, Ant.Intenna, Bat.Standard/Area Scan (1x14x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.270 mW/g



DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 5GHz WLAN Body (Job No. : FI-127)

Procedure Name: Body, Ch.48, Ant.Intenna, Bat.Standard, Back

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System:5GHz; Frequency: 5240 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5240 \text{ MHz}$, $\sigma = 5.56 \text{ mho/m}$, $\epsilon_r = 48.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.02, 4.02, 4.02); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.48, Ant.Intenna, Bat.Standard, Back/Area Scan (81x131x1): Measurement grid:
dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.197 mW/g

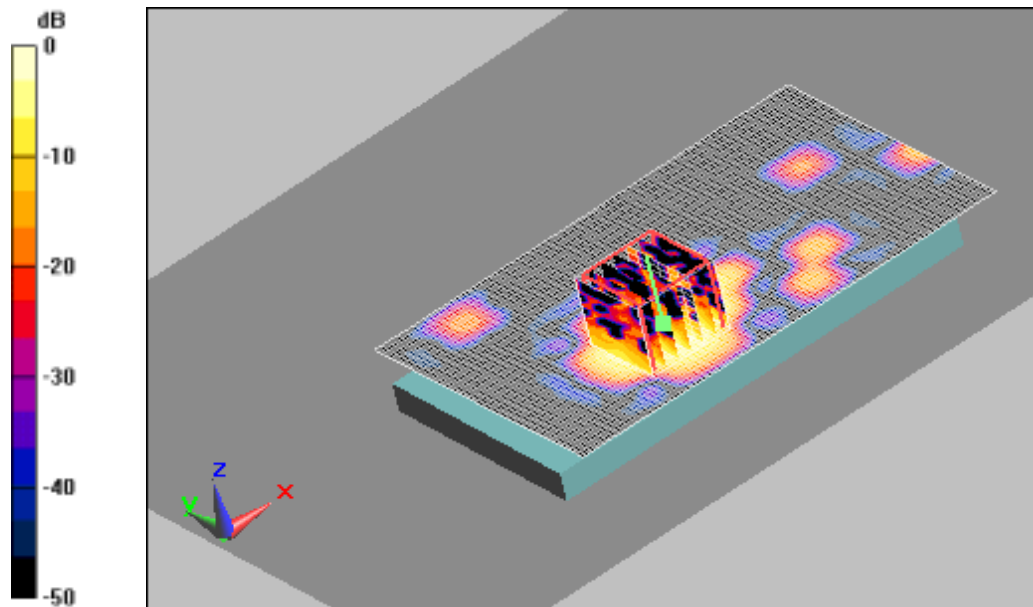
Body, Ch.48, Ant.Intenna, Bat.Standard, Back/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.29V/m; Power Drift = 0.13 dB

Peak SAR(extrapolated) = 0.305 W/g

SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.178 mW/g



0 dB = 0.18mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 5GHz WLAN Body (Job No. : FI-127)

Procedure Name: Body, Ch.64, Ant.Intenna, Bat.Standard, Back

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System:5GHz; Frequency: 5320 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5320 \text{ MHz}$ $\sigma = 5.64 \text{ mho/m}$; $\epsilon_r = 48$; $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(3.83, 3.83, 3.83); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.64, Ant.Intenna, Bat.Standard, Back/Area Scan (81x131x1): Measurement grid:
dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.177 mW/g

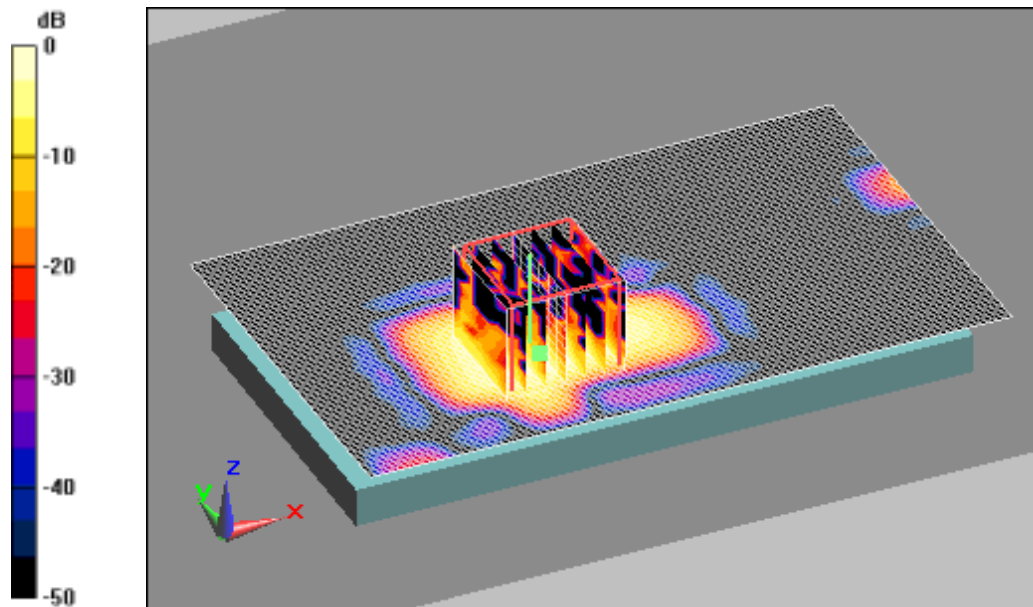
Body, Ch.64, Ant.Intenna, Bat.Standard, Back/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.1 V/m; Power Drift = 0.094 dB

Peak SAR(extrapolated) = 0.266 W/g

SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.156 mW/g



0 dB = 0.15mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 5GHz WLAN Body (Job No. : FI-127)

Procedure Name: Body, Ch.100, Ant.Intenna, Bat.Standard, Back

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System:5GHz; Frequency: 5500 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5500 \text{ MHz}$, $\sigma = 5.69 \text{ mho/m}$, $\epsilon_r = 47.1$, $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(3.52, 3.52, 3.52); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.100,Ant.Intenna, BatStandard, Back/Area Scan (81x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Body, Ch.100,Ant.Intenna, BatStandard, Back/Zoom Scan (7x7x11)/Cube 0:

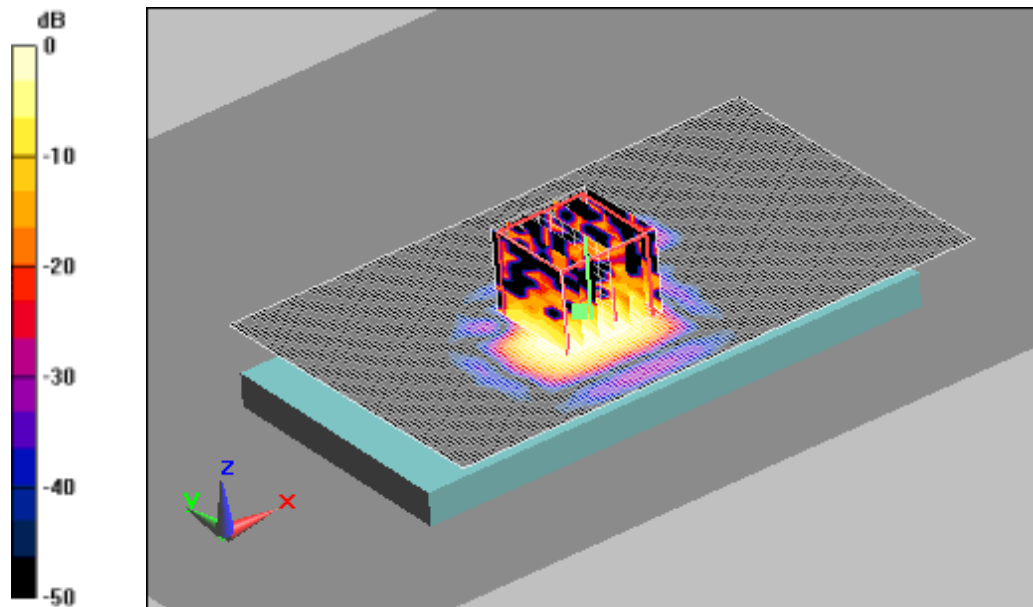
Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.08V/m ; PowerDrift = -0.110 dB

Peak SAR(extrapolated) = 0.288 W/kg

SAR(1 g) = 0.047 mW/g ; SAR(10 g) = 0.013 mW/g

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



0 dB = 0.10mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 5GHz WLAN Body (Job No. : FI-127)

Procedure Name: Body, Ch.165 Ant.Intenna, BatStandard, Back

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System:5GHz; Frequency: 5825 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5825$ MHz $\sigma = 5.93$ mho/m; $\epsilon_r = 46$; $\rho = 1000$ kg/m³

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(3.53, 3.53, 3.53); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.165 Ant.Intenna, BatStandard, Back/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.162 mW/g

Body, Ch.165 Ant.Intenna, BatStandard, Back/Zoom Scan (7x7x11)/Cube 0: Measurement

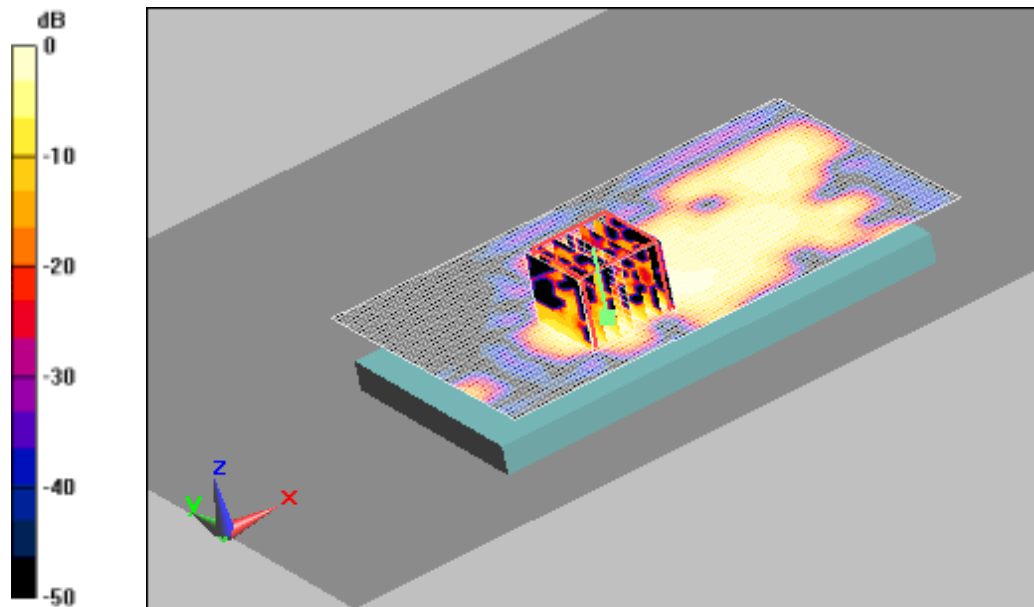
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.06V/m; PowerDrift = 0.03 dB

Peak SAR(extrapolated) = 0.230 W/g

SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.133 mW/g



0 dB = 0.13mW/g

DUT: GT-I9108; Serial: FI-127-G

Program Name: GT-I9108 5GHz WLAN Body (Job No. : FI-127)

Procedure Name: Body, Ch.48, Ant.Intenna, Bat.Standard, Back

Meas. Ambient Temp(celsius)-22.4,Tissue Temp(celsius)-21.8;Test Date-28/Jul/2011

Communication System:5GHz; Frequency: 5240 MHzDuty Cycle: 1:1

Medium parameters used: $f = 5240 \text{ MHz}$, $\sigma = 5.56 \text{ mho/m}$, $\epsilon_r = 48.1$, $\rho = 1000 \text{ kg/m}^3$

Phantom section:Center Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3750; ConvF(4.02, 4.02, 4.02); Calibrated: 2011-04-14
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn486; Calibrated: 2011-02-22
- Phantom: Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: 1001
- Measurement SW: DASY4, V4.7 Build 80; SEMCADX Version 13.4 Build 125

Body, Ch.48, Ant.Intenna, Bat.Standard, Back/Area Scan (81x131x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.197 mW/g

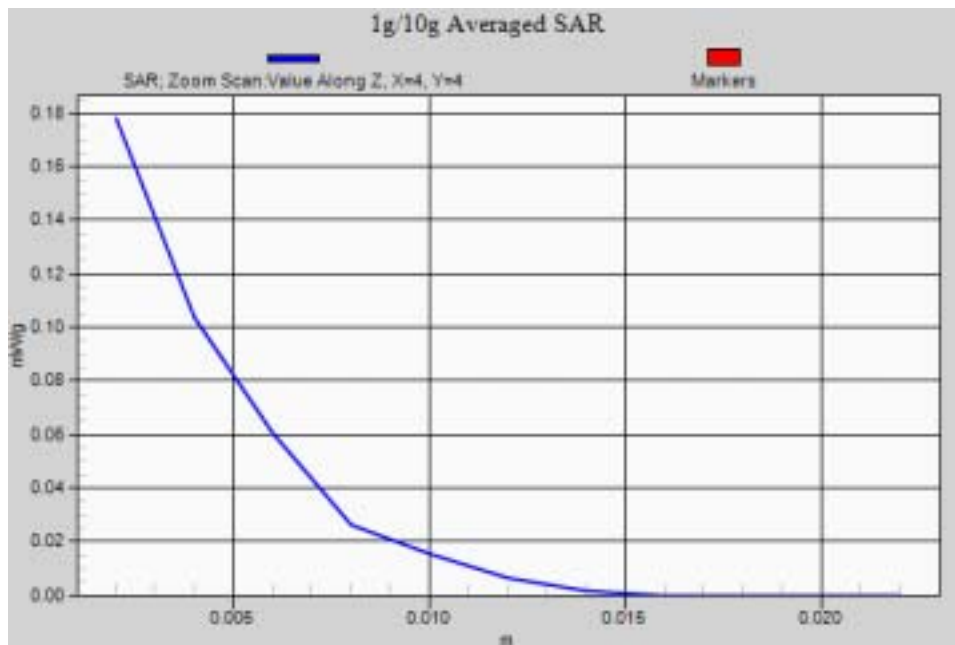
Body, Ch.48, Ant.Intenna, Bat.Standard, Back/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.29V/m ; Power Drift = 0.1B dB

Peak SAR(extrapolated) = 0.305 W/kg

SAR(1 g) = 0.093 mW/g ; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.178 mW/g



APPENDIX F

Probe Calibration



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Client **Samsung (Dymstec)**

Certificate No: **EX3-3750_Apr11**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3750**

Calibration procedure(s) **QA CAL-01.v7, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v3**
Calibration procedure for dosimetric E-field probes

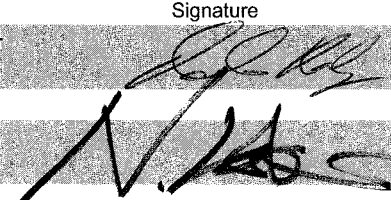
Calibration date: **April 14, 2011**

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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41495277	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_Apr10)	Apr-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: April 14, 2011

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,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*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}** are numerical linearization parameters in dB assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- VR**: VR is the validity range of the calibration related to the average diode voltage or DAE voltage in mV.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ 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 NORM_{x,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 EX3DV4

SN:3750

Manufactured: March 26, 2010
Calibrated: April 14, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3750

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$) ^A	0.45	0.51	0.55	± 10.1 %
DCP (mV) ^B	96.3	100.0	95.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	107.2	±3.0 %
			Y	0.00	0.00	1.00	120.0	
			Z	0.00	0.00	1.00	115.4	

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 E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3750

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	8.65	8.65	8.65	0.79	0.69	± 12.0 %
850	41.5	0.92	8.26	8.26	8.26	0.79	0.70	± 12.0 %
1750	40.1	1.37	7.37	7.37	7.37	0.78	0.63	± 12.0 %
1900	40.0	1.40	7.16	7.16	7.16	0.71	0.68	± 12.0 %
2450	39.2	1.80	6.47	6.47	6.47	0.65	0.66	± 12.0 %
3500	37.9	2.91	5.92	5.92	5.92	0.26	1.50	± 13.1 %
5200	36.0	4.66	4.61	4.61	4.61	0.45	1.80	± 13.1 %
5300	35.9	4.76	4.40	4.40	4.40	0.45	1.80	± 13.1 %
5500	35.6	4.96	4.23	4.23	4.23	0.45	1.80	± 13.1 %
5600	35.5	5.07	4.01	4.01	4.01	0.50	1.80	± 13.1 %
5800	35.3	5.27	4.07	4.07	4.07	0.50	1.80	± 13.1 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4- SN:3750

Calibration Parameter Determined in Body Tissue Simulating Media

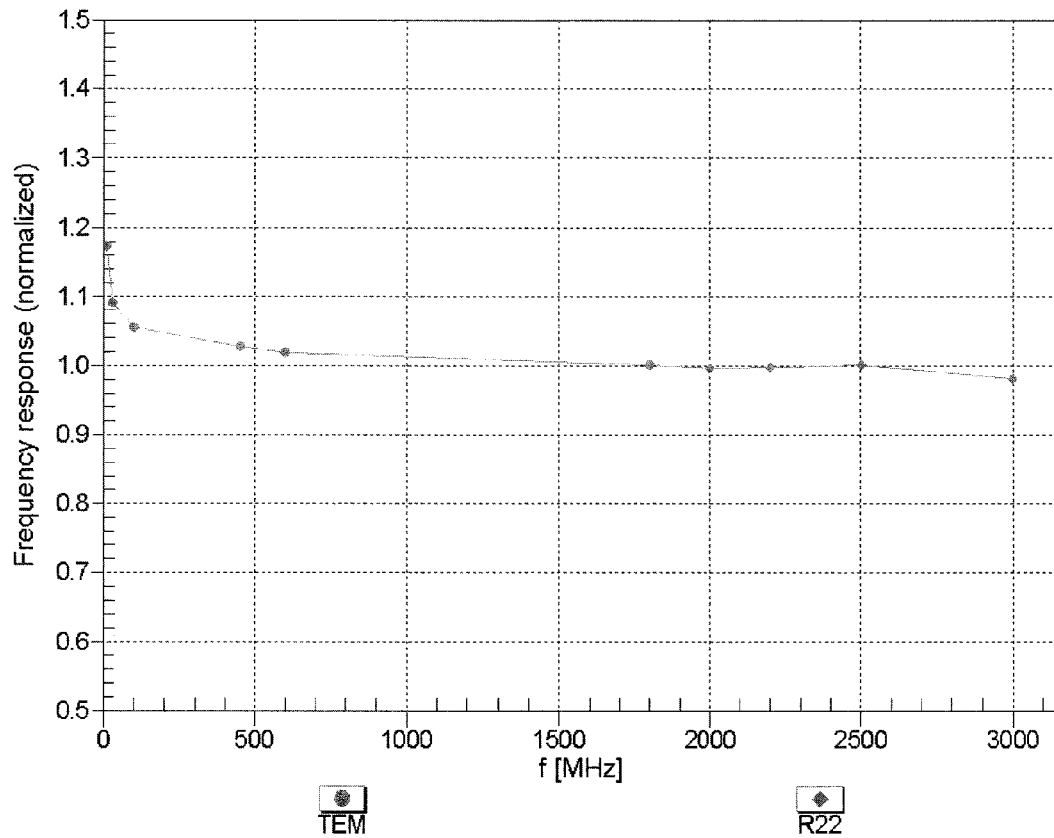
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	8.48	8.48	8.48	0.79	0.72	± 12.0 %
850	55.2	0.99	8.34	8.34	8.34	0.79	0.70	± 12.0 %
1750	53.4	1.49	7.49	7.49	7.49	0.79	0.73	± 12.0 %
1900	53.3	1.52	7.12	7.12	7.12	0.79	0.70	± 12.0 %
2450	52.7	1.95	6.76	6.76	6.76	0.79	0.65	± 12.0 %
3500	51.3	3.31	5.67	5.67	5.67	0.28	1.60	± 13.1 %
5200	49.0	5.30	4.02	4.02	4.02	0.50	1.90	± 13.1 %
5300	48.9	5.42	3.83	3.83	3.83	0.52	1.90	± 13.1 %
5500	48.6	5.65	3.52	3.52	3.52	0.55	1.90	± 13.1 %
5600	48.5	5.77	3.35	3.35	3.35	0.58	1.90	± 13.1 %
5800	48.2	6.00	3.53	3.53	3.53	0.58	1.90	± 13.1 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field

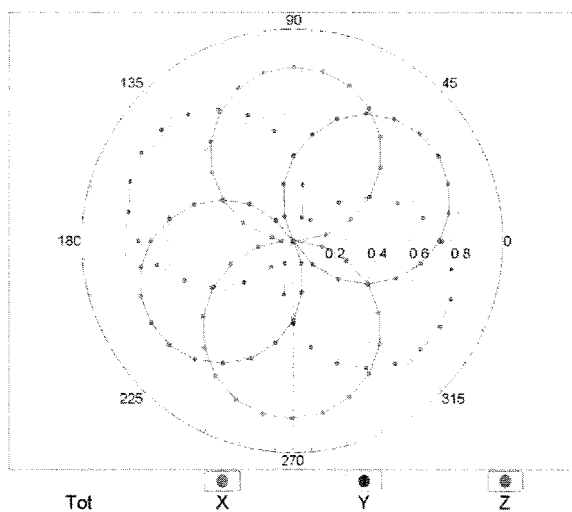
(TEM-Cell:ifi110 EXX, Waveguide: R22)



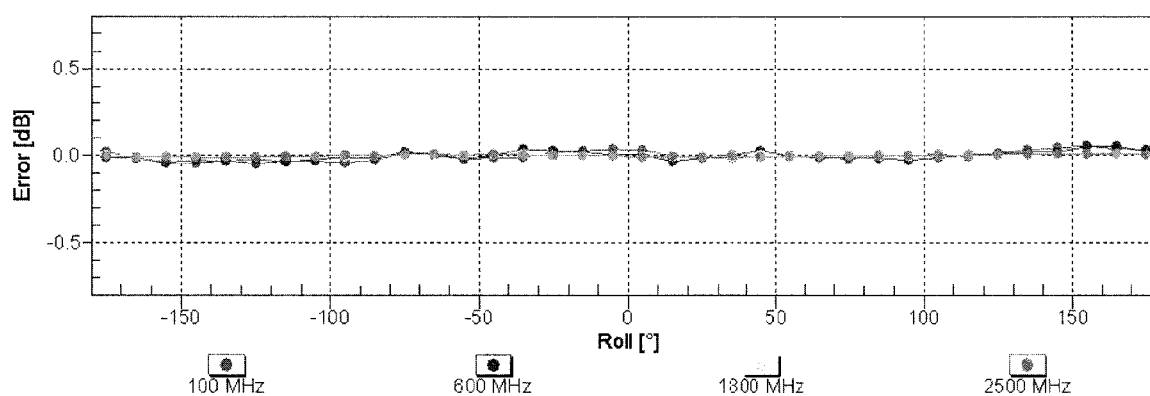
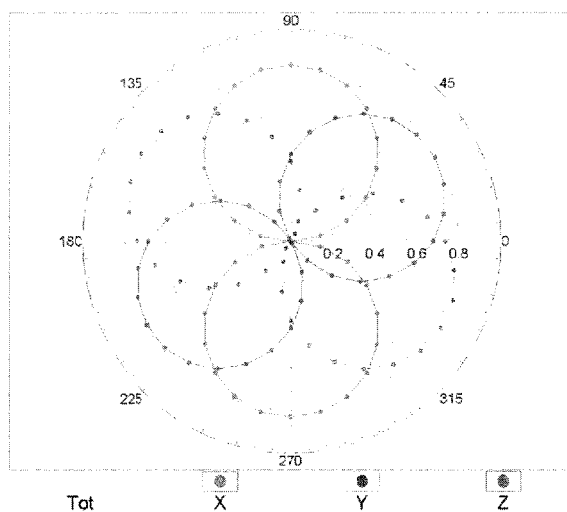
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

f=600 MHz,TEM

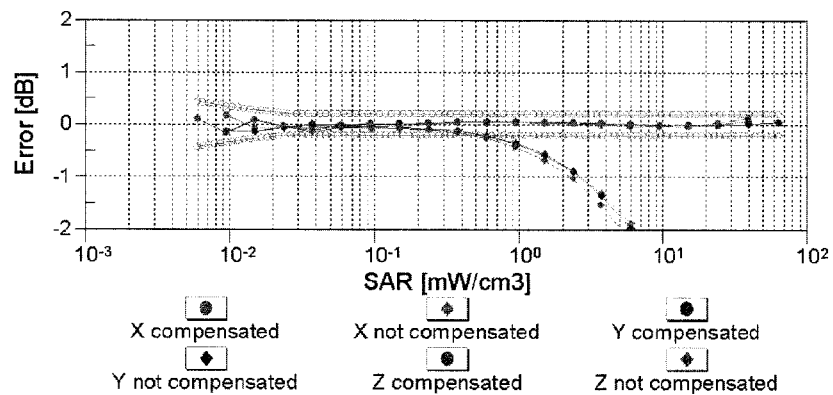
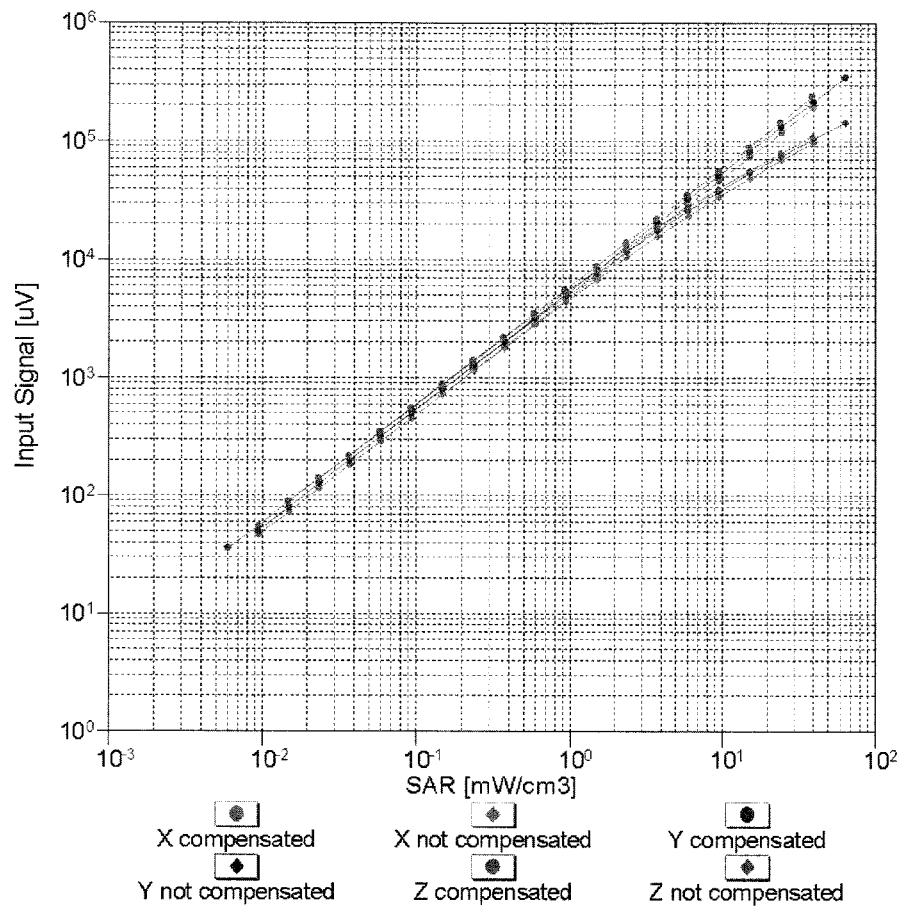


f=1800 MHz,R22



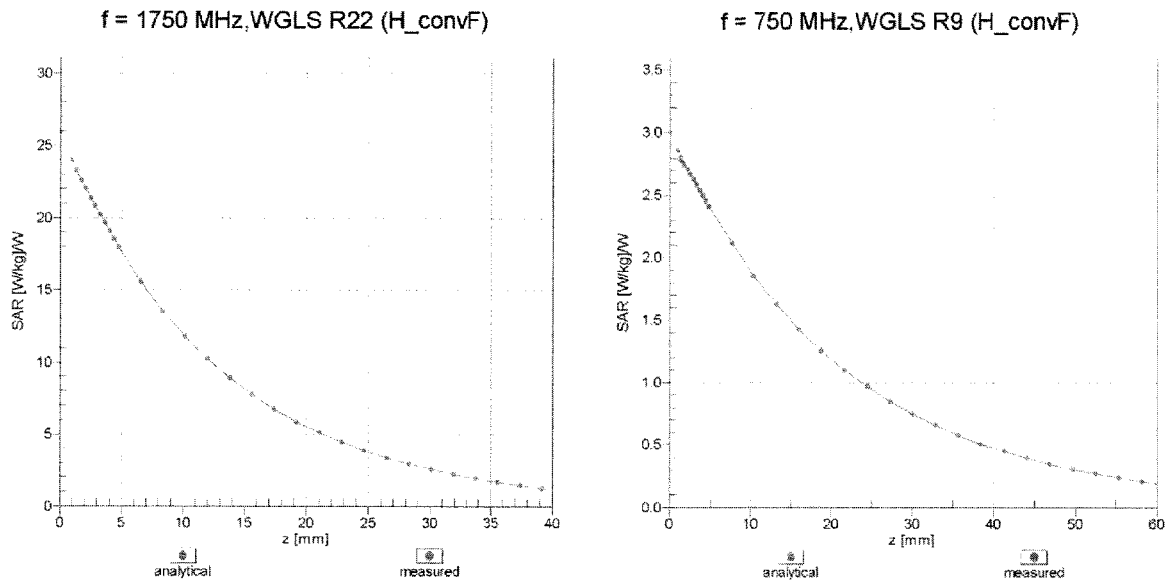
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell , $f = 900 \text{ MHz}$)



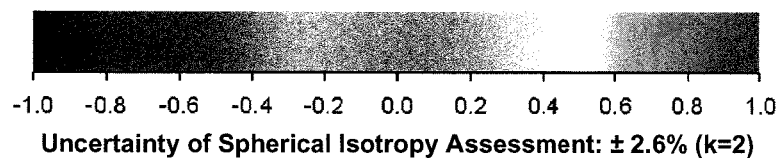
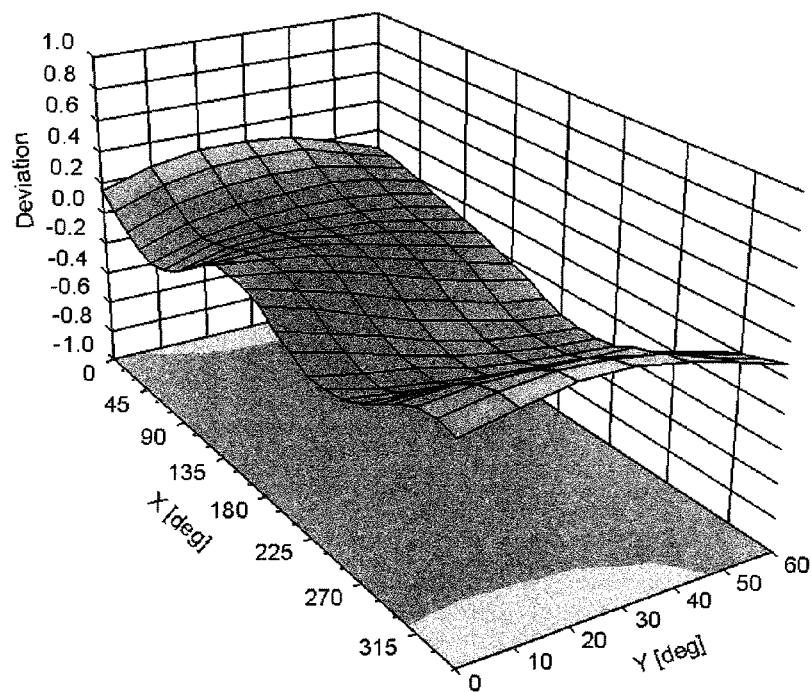
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), $f = 900 \text{ MHz}$



DASY/EASY - Parameters of Probe: EX3DV4 - SN:3750

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm