A Test Lab Techno Corp.

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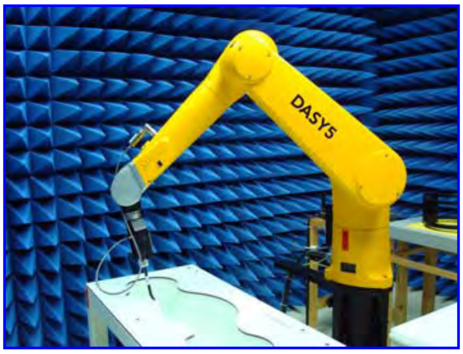
SAR EVALUATION REPORT

Test Report No.	:	1109FS11-02
Applicant	:	VERZO Technology, LLC.
Product Type	:	PDA Phone
Trade Name	:	VERZO
Model Number	:	KINZO
Dates of Receive	:	Aug. 23, 2011
Dates of Test	:	Aug. 24 ~ Dec. 06, 2011
Date of Issued	:	Dec. 07, 2011
Test Environment	:	Ambient Temperature： 22 ±2 ° C Relative Humidity：40 - 70 %
Standard	:	ANSI/IEEE C95.1-1999 IEEE Std. 1528-2003 47 CFR Part §2.1093; FCC/OET Bulletin 65 Supplement C [July 2001]
Max. SAR	:	0.754 W/kg Head SAR 0.683 W/kg Body SAR
Test Lab Location	:	Chang-an Lab



1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Kevin Tsai (Kevin Tsai)

Tested By : Bill Hu (Bill Hu)

Contents

1. Description of Equipment under Test (EUT)

Applicant	VERZO Technology, LLC.	
Applicant Address	Delnicka 12, Praha 7, Prague, 17000, Czech Republic	
Manufacture	VERZO Technology, LLC.	
Manufacture Address	Delnicka 12, Praha 7, Prague, 17000, Czech Republic	
Product Type	PDA Phone	
Trade Name	VERZO	
Model Number	KINZO	
FCC ID	Z2UKINZO	
RF Function	GSM/GPRS/EGPRS 850 (Device Class B, Multi-slot Class 10) GSM/GPRS/EGPRS 1900 (Device Class B, Multi-slot Class 10) WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II WCDMA(RMC 12.2K) / HSDPA / HSUPA Band V IEEE 802.11b / 802.11g / draft 802.11n 2.4GHz Standard-20MHz Bluetooth	
Tx Frequency	Band	Operate Frequency (MHz)
	GSM/GPRS/EGPRS 850	824.2 - 848.8
	GSM/GPRS/EGPRS 1900	1850.2 - 1909.8
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II	1852.4 - 1907.6
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band V	826.4 - 846.4
	IEEE 802.11b / 802.11g	2412 - 2462
	draft 802.11n 2.4GHz Standard-20MHz	2412 - 2462
	Bluetooth	2402 - 2480
RF Conducted Power (Avg.)	Band	Power (W / dBm)
	GSM/GPRS/EGPRS 850	1.862 / 32.70
	GSM/GPRS/EGPRS 1900	0.871 / 29.40
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II	0.219 / 23.41
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band V	0.227 / 23.56
	IEEE 802.11b	0.015 / 11.70
	IEEE 802.11g	0.014 / 11.50
	draft 802.11n 2.4GHz Standard-20MHz	0.014 / 11.40
	Bluetooth	0.001 / 0.35
Max. SAR Measurement	0.754 W/kg Head SAR 0.683 W/kg Body SAR	
Antenna Type	Internal Type	
Device Category	Portable Device	
RF Exposure Environment	General Population / Uncontrolled	
Battery Option	Standard	
Application Type	Certification	

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment / general population exposure limits specified in Standard C95.1-1999 and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2003.

2. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **VERZO Technology, LLC.** **Trade Name：VERZO** **Model(s)：KINZO.** The test procedures, as described in American National Standards, Institute C95.1-1999〔1〕, FCC/OET Bulletin 65 Supplement C [July 2001] were employed and they specify the maximum exposure limit of 1.6mW/g as averaged over any 1 gram of tissue for portable devices being used within 20cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

2.1 SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

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

Figure 2. SAR Mathematical Equation

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

$$\mathrm{SAR} = \frac{\sigma E^2}{\rho}$$

Where：

σ = conductivity of the tissue (S/m)

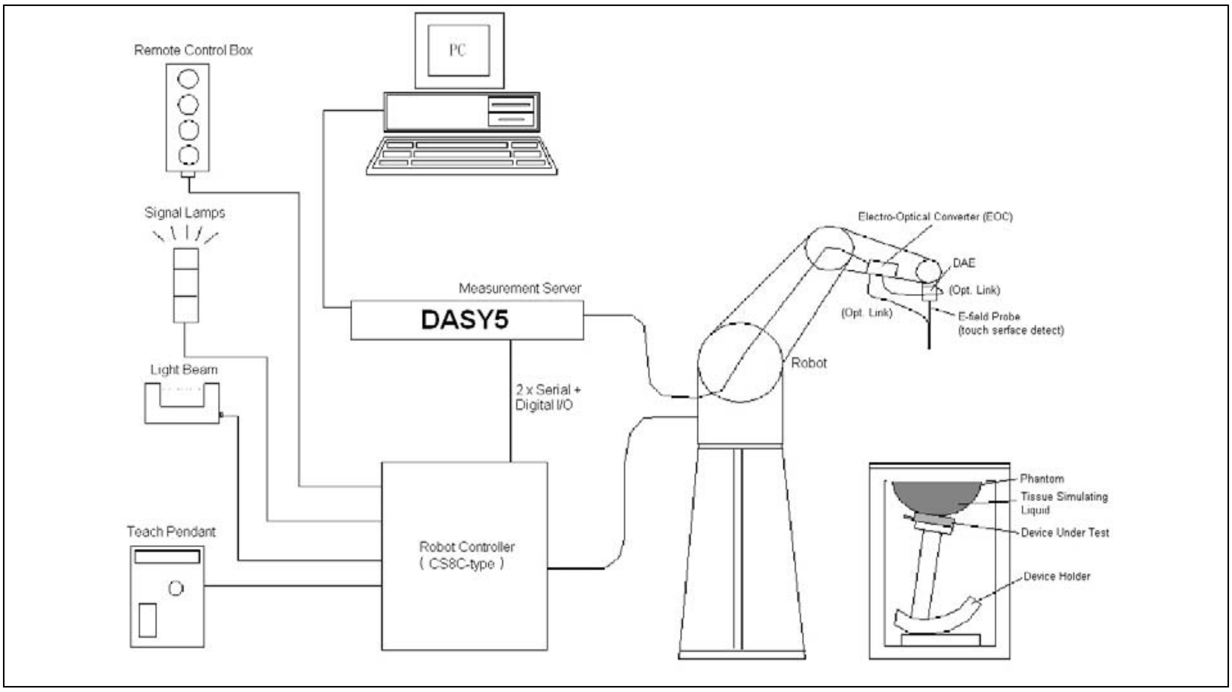
ρ = mass density of the tissue (kg/m^3)

E = RMS electric field strength (V/m)

＊Note：

The primary factors that control rate of 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〔2〕

3. SAR Measurement Setup



The DASY5 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2000 or Windows XP.
7. DASY5 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. Validation dipole kits allowing validating the proper functioning of the system.

3.1 DASY5 E-Field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration〔3〕and optimized for dosimetric evaluation. The probes is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

3.1.1 E-Field Probe Specification

Construction	Symmetrical design with triangular core
	Built-in optical fiber for surface detection System
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.q., glycol)
Calibration	In air from 10 MHz to 6 GHz
	In brain and muscle simulating tissue at frequencies of 2450MHz (accuracy ±8%)
	Calibration for other liquids and frequencies upon request
Frequency	±0.2 dB (30 MHz to 6 GHz) for EX3DV4
	±0.2 dB (30 MHz to 4 GHz) for EX3DV3
Directivity	±0.3 dB in brain tissue (rotation around probe axis)
	±0.5 dB in brain tissue (rotation normal probe axis)
Dynamic Range	10 μW/g to $>$ 100mW/g; Linearity: ±0.2dB
Dimensions	Overall length: 337mm
	Tip length: 20mm
	Body diameter: 12mm
	Tip diameter: 2.5mm for EX3DV4
	Distance from probe tip to dipole centers: 1.0mm for EX3DV4
Application	General dosimetry up to 6GHz
	Compliance tests of mobile phones
	Fast automatic scanning in arbitrary phantoms

Figure 3. E-field Probe

Figure 4. Probe setup on robot

3.1.2 E-Field Probe Calibration process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies 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 rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

Temperature Assessment

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

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

Where：

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (head or body),

ΔT = Temperature increase due to RF exposure.

Or $$\mathbf{SAR} = \frac{|E|^2 \sigma}{\rho}$$

Where：

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

3.2 Data Acquisition Electronic (DAE) System

Cell Controller

Processor：	Intel Core(TM)2 CPU
Clock Speed：	@ 1.86GHz
Operating System：	Windows XP Professional

Data Converter

Features：	Signal Amplifier, multiplexer, A/D converter, and control logic
Software：	DASY5 v5.0 (Build 125) & SEMCAD X Version 13.4 Build 125
Connecting Lines：	Optical downlink for data and status info
	Optical uplink for commands and clock

3.3 Robot

Positioner：	Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability：	±0.02 mm
No. of Axis：	6

3.4 Measurement Server

Processor：	PC/104 with a 400MHz intel ULV Celeron
I/O-board：	Link to DAE4 (or DAE3)
	16-bit A/D converter for surface detection system
	Digital I/O interface
	Serial link to robot
	Direct emergency stop output for robot

3.5 Device Holder

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

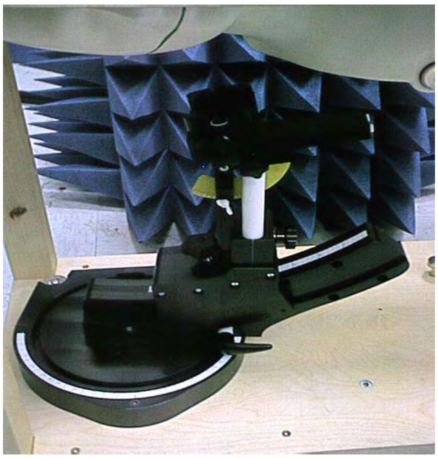


Figure 5. Device Holder

3.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	1000×500 mm (L×W)

Table 1. Specification of SAM v4.0

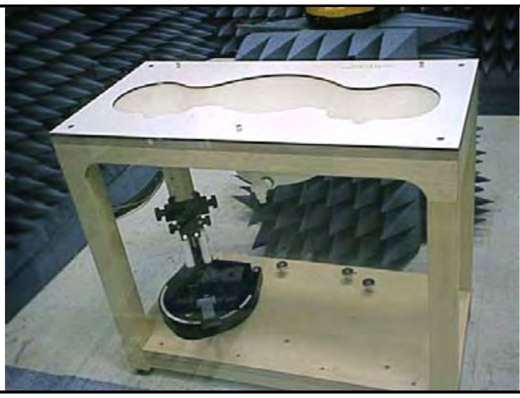


Figure 6. SAM Twin Phantom

3.7 Oval Flat Phantom - ELI 4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (Oval Flat) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of wireless portable device usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 30 liters
Dimensions	190×600×400 mm (H×L×W)

Table 2. Specification of ELI 4.0

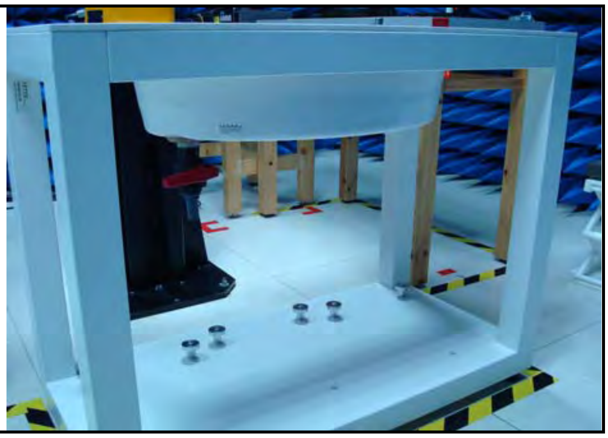


Figure 7. Oval Flat Phantom

3.8 Data Storage and Evaluation

3.8.1 Data Storage

The DASY5 software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension DA5 The post processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

3.8.2 Data Evaluation

The DASY5 post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	dcpi
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as：

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated：

E-field probes： $$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

H-field probes：

$$H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

with V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)

μ V/(V/m)^2 for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude)：

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

∗**Note**：That the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770} \quad \text{or} \quad P_{pwe} = \frac{H_{tot}^2}{37.7}$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

4. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue. The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)				

Table 3. Tissue dielectric parameters for head and body phantoms

4.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H_20), resistivity ≥ 16 M Ω -as basis for the liquid
- Sugar: refied white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops) -to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20°C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobuthyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

4.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.

Note: The goal dielectric parameters (at 22 ℃) must be achieved within a tolerance of ±5% for εand ±5% for σ.

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

Salt: 99^+% Pure Sodium Chloride Sugar: 98^+% Pure Sucrose

Water: De-ionized, 16 MΩ^+ resistivity HEC: Hydroxyethyl Cellulose

DGBE: 99^+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

4.3 Liquid Confirmation

4.3.1 Parameters

Liquid Verify								
Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70%								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835MHz Head	824MHz	22.0	εr	41.50	41.34	-0.39%	± 5	08/24/2011
			σ	0.90	0.89	-1.11%	± 5	
	835MHz	22.0	εr	41.50	41.18	-0.77%	± 5	
			σ	0.90	0.90	0.00%	± 5	
	849MHz	22.0	εr	41.50	41.00	-1.20%	± 5	
			σ	0.90	0.92	2.22%	± 5	
835MHz Head	824MHz	22.0	εr	41.50	41.34	-0.39%	± 5	08/27/2011
			σ	0.90	0.89	-1.11%	± 5	
	835MHz	22.0	εr	41.50	41.18	-0.77%	± 5	
			σ	0.90	0.90	0.00%	± 5	
	849MHz	22.0	εr	41.50	41.00	-1.20%	± 5	
			σ	0.90	0.92	2.22%	± 5	
1900MHz Head	1850MHz	22.0	εr	40.00	38.37	-4.08%	± 5	08/26/2011
			σ	1.40	1.35	-3.57%	± 5	
	1900MHz	22.0	εr	40.00	38.19	-4.53%	± 5	
			σ	1.40	1.37	-2.14%	± 5	
	1910MHz	22.0	εr	40.00	38.12	-4.70%	± 5	
			σ	1.40	1.38	-1.43%	± 5	
1900MHz Head	1850MHz	22.0	εr	40.00	38.37	-4.08%	± 5	08/28/2011
			σ	1.40	1.35	-3.57%	± 5	
	1900MHz	22.0	εr	40.00	38.19	-4.53%	± 5	
			σ	1.40	1.37	-2.14%	± 5	
	1910MHz	22.0	εr	40.00	38.12	-4.70%	± 5	
			σ	1.40	1.38	-1.43%	± 5	
2450MHz Head	2412MHz	22.0	εr	39.20	39.68	1.21%	± 5	12/06/2011
			σ	1.80	1.75	-2.86%	± 5	
	2450MHz	22.0	εr	39.20	39.56	0.91%	± 5	
			σ	1.80	1.80	0.00%	± 5	
	2462MHz	22.0	εr	39.20	39.54	0.86%	± 5	
			σ	1.80	1.82	1.10%	± 5	

Table 4. Measured Tissue dielectric parameters for head phantoms

Liquid Verify								
Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70%								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835MHz Body	824MHz	22.0	εr	55.20	54.54	-1.20%	± 5	08/31/2011
			σ	0.97	0.97	0.00%	± 5	
	835MHz	22.0	εr	55.20	54.39	-1.47%	± 5	
			σ	0.97	0.98	1.03%	± 5	
	849MHz	22.0	εr	55.20	54.31	-1.61%	± 5	
			σ	0.97	1.00	3.09%	± 5	
1900MHz Body	1850MHz	22.0	εr	53.30	52.17	-2.12%	± 5	09/01/2011
			σ	1.52	1.45	-4.61%	± 5	
	1900MHz	22.0	εr	53.30	52.04	-2.36%	± 5	
			σ	1.52	1.50	-1.32%	± 5	
	1910MHz	22.0	εr	53.30	52.03	-2.38%	± 5	
			σ	1.52	1.51	-0.66%	± 5	
2450MHz Body	2412MHz	22.0	εr	52.70	51.37	-2.52%	± 5	08/30/2011
			σ	1.95	1.90	-2.56%	± 5	
	2450MHz	22.0	εr	52.70	51.28	-2.69%	± 5	
			σ	1.95	1.96	0.51%	± 5	
	2462MHz	22.0	εr	52.70	51.26	-2.73%	± 5	
			σ	1.95	1.97	1.03%	± 5	

Table 5. Measured Tissue dielectric parameters for body phantoms

4.3.2 Liquid Depth

The liquid level was during measurement 15cm ±0.5cm.

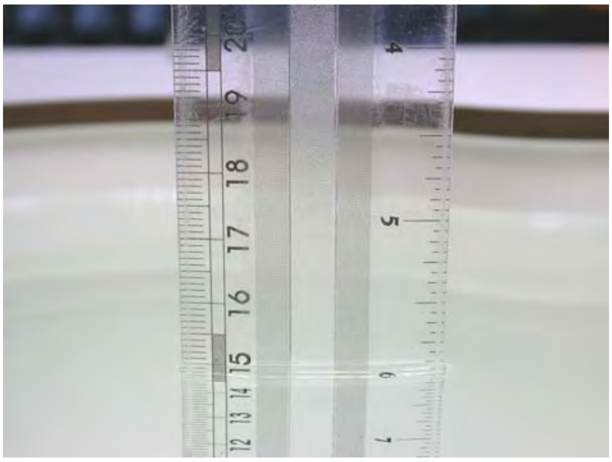


Figure 8. Head-Tissue-Simulating-Liquid

Figure 9. Body-Tissue-Simulating-Liquid

5. SAR Testing with RF Transmitters

5.1 SAR Testing with HSDPA Transmitters

HSDPA Date Devices setup for SAR Measurement.

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below.[32] The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.[33]

Sub-test	βc	βd	βd (SF)	βc/βd	βhs$^{(1,2)}$	CM (dB)$^{(3)}$	MRP (dB)$^{(3)}$
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15$^{(4)}$	15/15$^{(4)}$	64	12/15$^{(4)}$	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note

1. Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ Ahs = βhs/βc = 30/15 ⇔ βhs= 30/15 *βc
2. For theHS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude(EVM) with HS-DPCCH test in clause 5.13.1A and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with βhs = 30/15 *βc and Δ_{CQI} = 24/15 with βhs = 24/15*βc
3. CM = 1 for βc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
4. For subtest 2 the βc/βd ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 11/15 and βd = 15/15.

Table 6. Setup for Release 5 HSDPA

HSPA Date Devices setup for SAR Measurement.

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. Body exposure conditions generally apply to these devices, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations without HSPA. The default test configuration is to establish a radio link between the DUT and a communication test set to configure a 12.2 kbps RMC (reference measurement channel) in Test Loop Mode 1. SAR for HSPA is selectively measured with HS-DPCCH, EDPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest SAR configuration in WCDMA with 12.2 kbps RMC only. An FRC is configured according to HSDPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Subtest 5 requirements. SAR for other HSPA sub-test configurations is also confirmed selectively according to output power, exposure conditions and E-DCH UE Category. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. The UE Categories for HSDPCCH and HSPA should be clearly identified in the SAR report. The following procedures are applicable only if Maximum Power Reduction (MPR) is implemented according to Cubic Metric (CM) requirements.

When voice transmission and head exposure conditions are applicable to a WCDMA/HSPA data device, head exposure is measured according to the 'Head SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. In addition, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document.

The highest body SAR measured in Antenna Extended & Retracted configurations on a channel in 12.2 kbps RMC. The possible channels are the High, Middle & Low channel. Contact the FCC Laboratory for test and approval requirements if the maximum output power measured in E-DCH Sub-test 2 - 4 is higher than Sub-test 5.

Sub-test	βc	βd	βd (SF)	βc/βd	βhs[1]	βec	βed	Bed (SF)	Bed (codes)	CM[2] (dB)	MPR (dB)	AG[4] Index	E-TFCI
1	11/15[3]	15/15[3]	64	11/15[3]	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	βed1: 47/15 βed2: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15[4]	15/15[4]	64	15/15[4]	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: ΔACK, ΔNACK and ΔCQI = 8 ⇔ Ahs = βhs/βc = 30/15 ⇔ βhs= 30/15 *βc.

Note 2: CM = 1 for βc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.

Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: βed can not be set directly; it is set by Absolute Grant Value.

Table 7. Setup for Release 6 HSPA / Release 7 HSPA+

5.2 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable.

5.2.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined

for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate.

The same data pattern should be used for all measurements.

5.2.2 Frequency Channel Configurations

802.11 a/b/g and 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channels 1, 6 and 11. 802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; channels 104, 116, 124 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz §15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. 4.9 GHz is tested on channels 1, 10 and 5 or 6, whichever has the higher output power, for 5 MHz channels; channels 11, 15 and 19 for 10 MHz channels; and channels 21 and 25 for 20 MHz channels. These are referred to as the "default test channels". 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.

802.11 Test Channels per FCC Requirement

Mode		GHz	Channel	Turbo Channel	Default Test "Channels" §15.247 802.11b	Default Test "Channels" §15.247 802.11g	Default Test "Channels" UNII	Default Test "Channels" UNII
802.11 b/g		2412	1		✓	▽		
802.11 b/g		2437	6	6	✓	▽		
802.11 b/g		2462	11		✓	▽		
802.11a	UNII	5.18	36				✓	
802.11a	UNII	5.20	40	42 (5.21 GHz)				*
802.11a	UNII	5.22	44	42 (5.21 GHz)				*
802.11a	UNII	5.24	48	50 (5.25 GHz)				
802.11a	UNII	5.26	52	50 (5.25 GHz)			✓	
802.11a	UNII	5.28	56	58 (5.29 GHz)				*
802.11a	UNII	5.30	60	58 (5.29 GHz)				*
802.11a	UNII	5.32	64				✓	
802.11a	UNII	5.500	100	Unknown				*
802.11a	UNII	5.520	104	Unknown			✓	
802.11a	UNII	5.540	108	Unknown				*
802.11a	UNII	5.560	112	Unknown				*
802.11a	UNII	5.580	116	Unknown			✓	
802.11a	UNII	5.600	120	Unknown				*
802.11a	UNII	5.620	124	Unknown			✓	
802.11a	UNII	5.640	128	Unknown				*
802.11a	UNII	5.660	132	Unknown				*
802.11a	UNII	5.680	136	Unknown			✓	
802.11a	UNII	5.700	140	Unknown				*
802.11a	UNII or §15.247	5.745	149		✓		✓	
802.11a	UNII or §15.247	5.765	153	152 (5.76 GHz)		*		*
802.11a	UNII or §15.247	5.785	157		✓			*
802.11a	UNII or §15.247	5.805	161	160 (5.80 GHz)		*	✓	
802.11a	§15.247	5.825	165		✓			

5.3 Conducted Power

Band	Mode	CH	Frequency (MHz)	RF Conducted Output Power (dBm)	
				Time Average	Average burst
GSM 850	---	Lowest	824.2	23.11	32.30
		Middle	836.6	23.11	32.30
		Highest	848.8	23.51	**32.70**
GPRS 850	4Down1Up duty factor: 8.3	Lowest	824.2	23.11	32.30
		Middle	836.6	23.11	32.30
		Highest	848.8	23.21	32.40
	3Down2Up duty factor: 4.2	Lowest	824.2	26.07	32.30
		Middle	836.6	26.07	32.30
		Highest	848.8	26.17	32.40
EGPRS 850	4Down1Up duty factor: 8.3	Lowest	824.2	18.31	27.50
		Middle	836.6	18.31	27.50
		Highest	848.8	18.21	27.40
	3Down2Up duty factor: 4.2	Lowest	824.2	21.07	27.30
		Middle	836.6	21.17	27.40
		Highest	848.8	21.07	27.30

Band	Mode	CH	Frequency (MHz)	RF Conducted Output Power (dBm)	
				Time Average	Average burst
GSM 1900	---	Lowest	1850.2	20.21	**29.40**
		Middle	1880.0	20.11	29.30
		Highest	1909.8	20.11	29.30
GPRS 1900	4Down1Up duty factor: 8.3	Lowest	1850.2	20.21	29.40
		Middle	1880.0	20.11	29.30
		Highest	1909.8	20.11	29.30
	3Down2Up duty factor: 4.2	Lowest	1850.2	23.17	29.40
		Middle	1880.0	23.07	29.30
		Highest	1909.8	23.07	29.30
EGPRS 1900	4Down1Up duty factor: 8.3	Lowest	1850.2	16.61	25.80
		Middle	1880.0	16.51	25.70
		Highest	1909.8	16.61	25.80
	3Down2Up duty factor: 4.2	Lowest	1850.2	19.57	25.80
		Middle	1880.0	19.47	25.70
		Highest	1909.8	19.57	25.80

Band	Sub-test	CH	Frequency (MHz)	RF Conducted Output Power (dBm)
				Average
WCDMA Band II	---	Lowest	1852.4	**23.41**
		Middle	1880.0	23.27
		Highest	1907.6	23.26
HSDPA Band II	1	Lowest	1852.4	22.63
		Middle	1880.0	22.50
		Highest	1907.6	22.53
	2	Lowest	1852.4	22.60
		Middle	1880.0	22.47
		Highest	1907.6	22.49
	3	Lowest	1852.4	22.10
		Middle	1880.0	21.98
		Highest	1907.6	22.01
	4	Lowest	1852.4	22.11
		Middle	1880.0	21.92
		Highest	1907.6	22.01
HSUPA Band II	1	Lowest	1852.4	22.00
		Middle	1880.0	22.75
		Highest	1907.6	22.83
	2	Lowest	1852.4	19.93
		Middle	1880.0	20.71
		Highest	1907.6	20.78
	3	Lowest	1852.4	20.99
		Middle	1880.0	21.68
		Highest	1907.6	21.80
	4	Lowest	1852.4	19.95
		Middle	1880.0	20.71
		Highest	1907.6	20.82
	5	Lowest	1852.4	21.97
		Middle	1880.0	22.68
		Highest	1907.6	22.75

Band	Sub-test	CH	Frequency (MHz)	RF Conducted Output Power (dBm)
				Average
WCDMA Band V	---	Lowest	826.4	**23.56**
		Middle	836.6	23.47
		Highest	846.4	23.52
HSDPA Band V	1	Lowest	826.4	23.00
		Middle	836.6	22.90
		Highest	846.4	23.03
	2	Lowest	826.4	23.01
		Middle	836.6	22.90
		Highest	846.4	23.00
	3	Lowest	826.4	22.46
		Middle	836.6	22.37
		Highest	846.4	22.48
	4	Lowest	826.4	22.46
		Middle	836.6	22.39
		Highest	846.4	22.46
HSUPA Band V	1	Lowest	826.4	23.00
		Middle	836.6	22.96
		Highest	846.4	23.01
	2	Lowest	826.4	20.94
		Middle	836.6	20.92
		Highest	846.4	20.98
	3	Lowest	826.4	21.96
		Middle	836.6	21.93
		Highest	846.4	22.00
	4	Lowest	826.4	20.96
		Middle	836.6	20.91
		Highest	846.4	21.01
	5	Lowest	826.4	22.97
		Middle	836.6	22.91
		Highest	846.4	22.96

Band	Data Rate	CH	Frequency (MHz)	RF Conducted Output Power (dBm)
				Average
IEEE 802.11b	1 M	1	2412.0	**11.70**
		6	2437.0	11.18
		11	2462.0	11.23
	2 M	1	2412.0	11.67
		6	2437.0	11.22
		11	2462.0	11.25
	5.5 M	1	2412.0	11.53
		6	2437.0	10.98
		11	2462.0	11.11
	11 M	1	2412.0	11.49
		6	2437.0	10.90
		11	2462.0	11.05
IEEE 802.11g	6 M	1	2412.0	**11.50**
		6	2437.0	10.95
		11	2462.0	10.90
	9 M	1	2412.0	11.40
		6	2437.0	10.85
		11	2462.0	10.85
	12 M	1	2412.0	11.47
		6	2437.0	10.82
		11	2462.0	10.80
	18 M	1	2412.0	11.34
		6	2437.0	10.72
		11	2462.0	10.77
	24 M	1	2412.0	11.05
		6	2437.0	10.55
		11	2462.0	10.55
	36 M	1	2412.0	10.87
		6	2437.0	10.33
		11	2462.0	10.30
	48 M	1	2412.0	10.75
		6	2437.0	10.21
		11	2462.0	10.25
	54 M	1	2412.0	10.66
		6	2437.0	10.10
		11	2462.0	10.10

Band	Data Rate	CH	Frequency (MHz)	RF Conducted Output Power (dBm)
				Average
Draft 802.11n_HT20	6.5M	1	2412.0	**11.40**
		6	2437.0	10.80
		11	2462.0	10.80
	13M	1	2412.0	11.29
		6	2437.0	10.72
		11	2462.0	10.70
	19.5M	1	2412.0	11.19
		6	2437.0	10.56
		11	2462.0	10.55
	26M	1	2412.0	11.00
		6	2437.0	10.45
		11	2462.0	10.40
	39M	1	2412.0	10.80
		6	2437.0	10.27
		11	2462.0	10.20
	52M	1	2412.0	10.65
		6	2437.0	10.00
		11	2462.0	10.07
	58.5M	1	2412.0	10.61
		6	2437.0	9.96
		11	2462.0	9.95
	65M	1	2412.0	10.10
		6	2437.0	9.60
		11	2462.0	9.55

5.4 Simultaneous Transmitting Evaluate

RF Conducted Power		
Band	dBm	W
GSM/GPRS/EGPRS 850	26.17	0.417
GSM/GPRS/EGPRS 1900	23.17	0.209
WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II	23.41	0.219
WCDMA(RMC 12.2K) / HSDPA / HSUPA Band V	23.56	0.227
IEEE 802.11b	11.70	0.015
IEEE 802.11g	11.50	0.014
draft 802.11n 2.4GHz Standard-20MHz	11.40	0.014
Bluetooth	0.35	0.001

Antenna Distance	
Antenna Account	Distance (cm)
BT to WLAN	0
BT to GSM(License)	9.782
WLAN to GSM(License)	9.782

BT and GSM/WCDMA and WLAN simultaneously SAR Description

(1) Antenna Distance

1a.BT & GSM/WCDMA　9.782 cm

1b.BT & WLAN　0cm

(2)GSM/BT – with antenna separation distance greater than >5cm – BT power is less than 2*Pref , Then both stand alone for BT and simultaneous SAR of GSM/BT is not required.

(3) WLAN/BT – Antenna is not simultaneously transmission, Therefore Simultaneous SAR is not required.

(4) GSM/WCDMA/WLAN Stand-alone SAR is required due to routine evaluation requirements.

(5) GSM/WLAN – The sum of simultaneous SAR Evaluation as below (table 8 and table 9)

(6) Highest Simultaneous SAR Evaluation:

Head SAR：∑SAR=WCDMA Band II+ WLAN 802.11b=0.788 mW/g < SAR limit: 1.6mW/g

Body SAR：∑SAR=GPRS 850+ WLAN 802.11b=0.701 mW/g < SAR limit: 1.6mW/g

Therefore, the Simultaneous SAR is not required.

Note:

1. Simultaneous Transmitting Summery, please find the table 8 as below.
2. Simultaneous Transmission Summation of SAR, please find the table 9 as below.

Table 8.

Simultaneous Transmitting Summery				
Simultaneous transmitting	802.11b	802.11g	802.11n	BT
GSM/GPRS/EGPRS 850	Y	Y	Y	N
GSM/GPRS/EGPRS 1900	Y	Y	Y	N
BT	N	N	N	N

Table 9.

Right-Cheek mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.166	0.020	0.186	<1.6
Simult Tx	Configuration	PCS 1900 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.163	0.020	0.183	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.278	0.020	0.298	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.103	0.020	0.123	<1.6

Right-Tilted mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.105	0.028	0.132	<1.6
Simult Tx	Configuration	PCS 1900 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.155	0.028	0.183	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.290	0.028	0.318	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.050	0.028	0.078	<1.6

Left-Cheek mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.424	0.034	0.458	<1.6
Simult Tx	Configuration	PCS 1900 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.397	0.034	0.431	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.754	0.034	0.788	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.200	0.034	0.234	<1.6

Left-Tilted mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.236	0.039	0.275	<1.6
Simult Tx	Configuration	PCS 1900 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.156	0.039	0.195	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.294	0.039	0.333	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Head SAR	Flat	0.108	0.039	0.147	<1.6

Back surface mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.346	0.018	0.364	<1.6
Simult Tx	Configuration	GPRS 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.683	0.018	0.701	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.346	0.018	0.364	<1.6
Simult Tx	Configuration	GSM PCS SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.238	0.018	0.256	<1.6
Simult Tx	Configuration	GPRS PCS SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.48	0.018	0.498	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.441	0.018	0.459	<1.6

Front surface mode					
The sum of the 1-g SAR					
Simult Tx	Configuration	GSM 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.271	0.00211	0.27311	<1.6
Simult Tx	Configuration	GPRS 850 SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.533	0.00211	0.53511	<1.6
Simult Tx	Configuration	WCDMA Band V SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.224	0.00211	0.22611	<1.6
Simult Tx	Configuration	GSM PCS SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.16	0.00211	0.16211	<1.6
Simult Tx	Configuration	GPRS PCS SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.301	0.00211	0.30311	<1.6
Simult Tx	Configuration	WCDMA Band II SAR mW/g	WLAN SAR mW/g	∑ SAR mW/g	∑ SAR
Body SAR	Flat	0.299	0.00211	0.30111	<1.6

6. System Performance Check

6.1 Symmetric Dipoles for System Validation

Construction	Symmetrical dipole with l/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Frequency	835, 1900, 2450 MHz
Return Loss	＞20 dB at specified validation position
Power Capability	＞100 W (f＜1GHz); ＞40 W (f＞1GHz)
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request
Dimensions	D835V2: dipole length 161 mm; overall height 340 mm D1900V2: dipole length 67.7 mm; overall height 300 mm D2450V2：dipole length 51.5 mm; overall height 300 mm

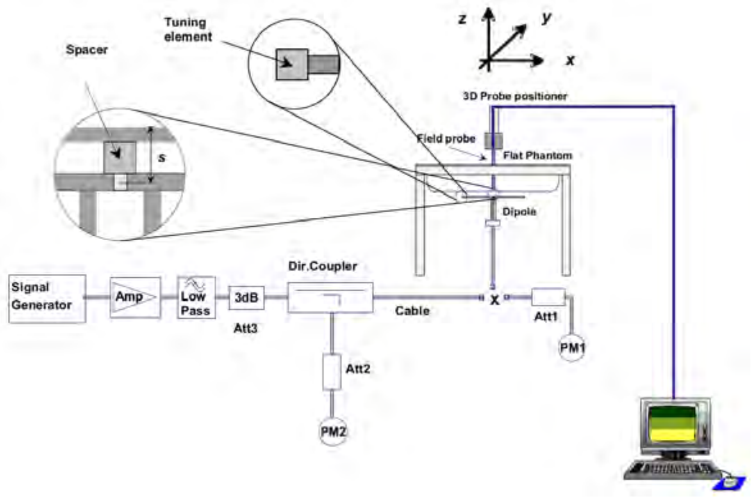


Figure 10. System Verification Setup Diagram

Figure 11. Validation Kit

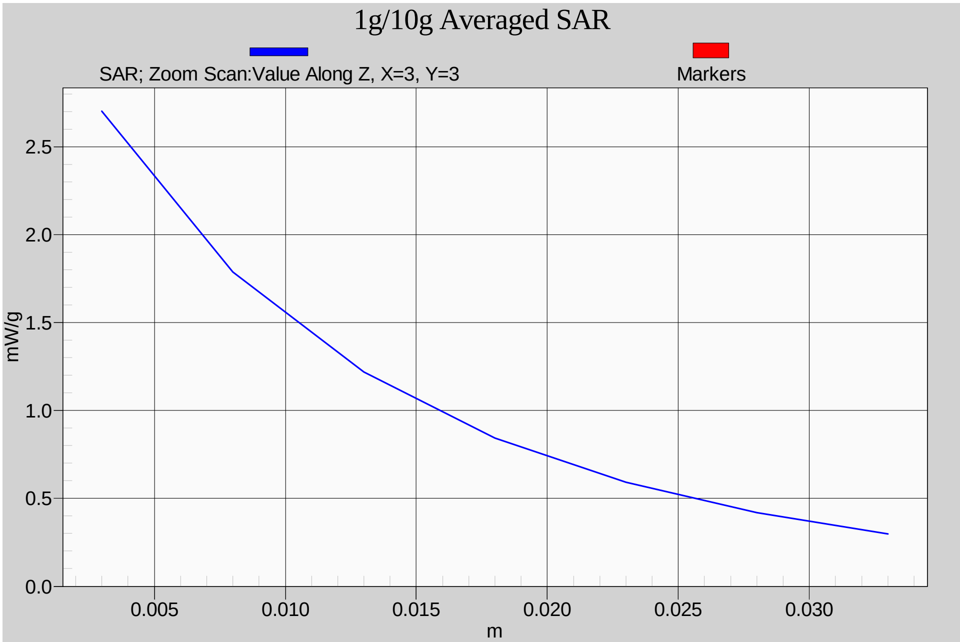
6.2 Validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ± 7%. The validation was performed at 835, 1900 and 2450 MHz.

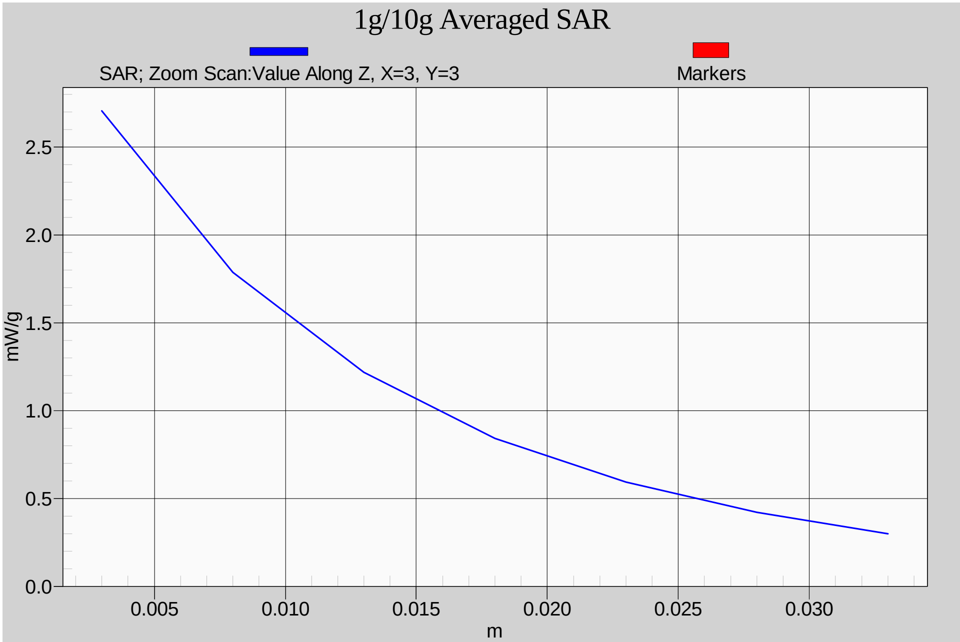
Validation kit	Mixture Type	SAR_{1g} [mW/g]	SAR_{10g} [mW/g]	Date of Calibration
D835V2-SN4d092	Head	9.25	6.07	06/22/2011
	Body	9.43	6.22	
D1900V2-SN5d111	Head	39.90	21.00	07/23/2011
	Body	41.90	22.50	
D2450V2-SN712	Head	37.24	41.16	02/23/2011
	Body	50.40	23.30	

Frequency (MHz)	Power (dBm)	SAR_{1g} (mW/g)	SAR_{10g} (mW/g)	Drift (dB)	Difference percentage		Date
					1g	10g	
835 (Head)	250mW	2.30	1.50	0.011	-0.5 %	-1.2 %	08/24/2011
	Normalize to 1 Watt	9.20	6.00				
835 (Head)	250mW	2.30	1.50	0.024	-0.5 %	-1.2 %	08/27/2011
	Normalize to 1 Watt	9.20	6.00				
1900 (Head)	250mW	9.99	5.15	0.064	0.2 %	-1.9 %	08/26/2011
	Normalize to 1 Watt	39.96	20.60				
1900 (Head)	250mW	10.40	5.39	0.057	4.3 %	2.7 %	08/28/2011
	Normalize to 1 Watt	41.60	21.56				
2450 (Head)	250mW	13.4	6.15	0.100	1.3 %	0.4 %	12/06/2011
	Normalize to 1 Watt	53.6	24.6				
835 (Body)	250mW	2.32	1.51	-0.013	-1.6 %	-2.9 %	08/31/2011
	Normalize to 1 Watt	9.28	6.04				
1900 (Body)	250mW	10.7	5.46	0.042	2.1 %	-2.9 %	09/01/2011
	Normalize to 1 Watt	42.8	21.84				
2450 (Body)	250mW	13.00	5.95	-0.058	3.2 %	2.1 %	08/30/2011
	Normalize to 1 Watt	52.00	23.80				

Z-axis Plot of System Performance Check

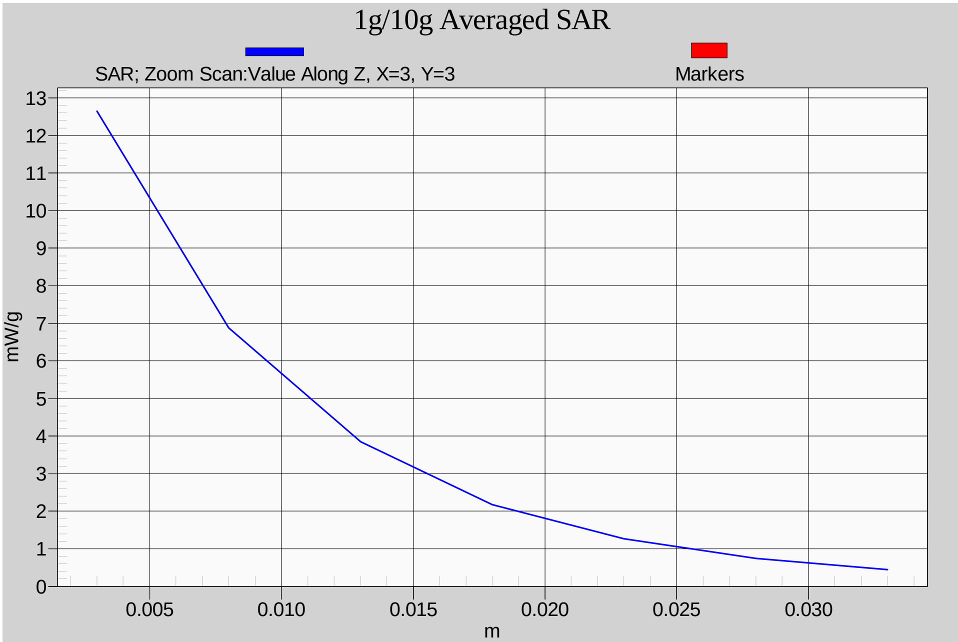


Head-Tissue-Simulating-Liquid 835MHz (08/24/2011)

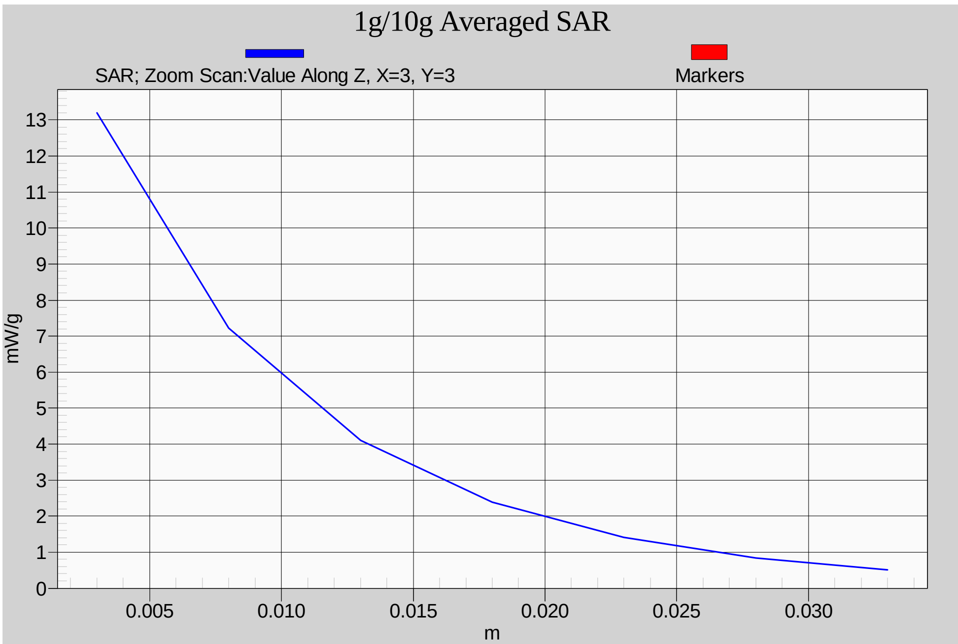


Head-Tissue-Simulating-Liquid 835MHz (08/27/2011)

Z-axis Plot of System Performance Check

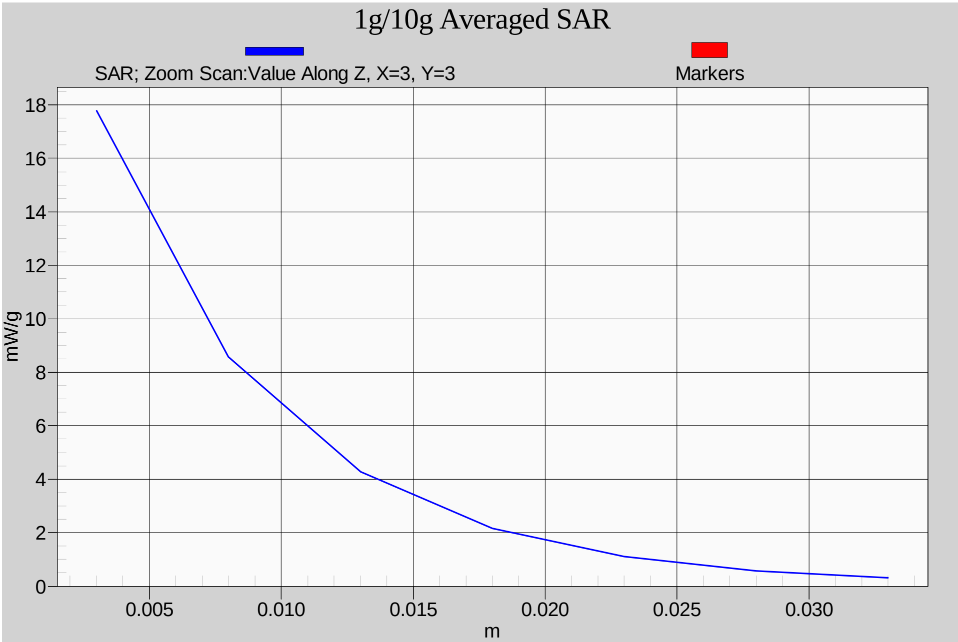


Head-Tissue-Simulating-Liquid 1900MHz (08/26/2011)

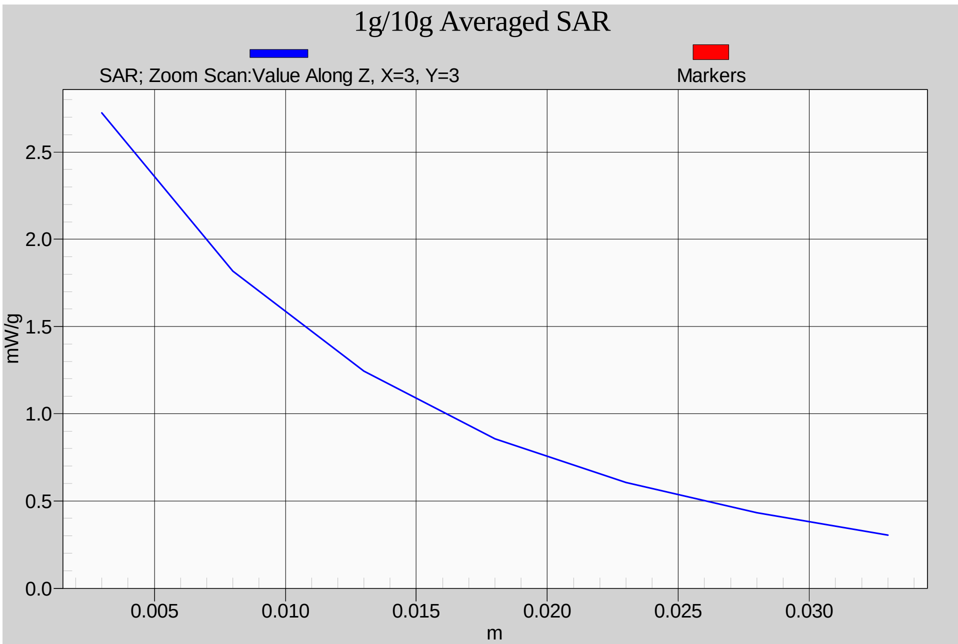


Head-Tissue-Simulating-Liquid 1900MHz (08/28/2011)

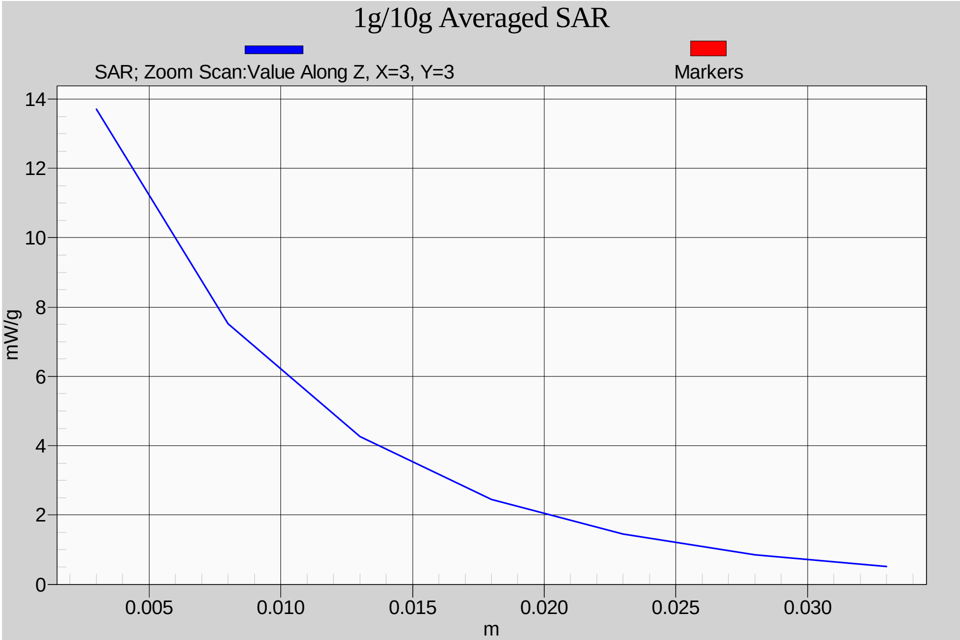
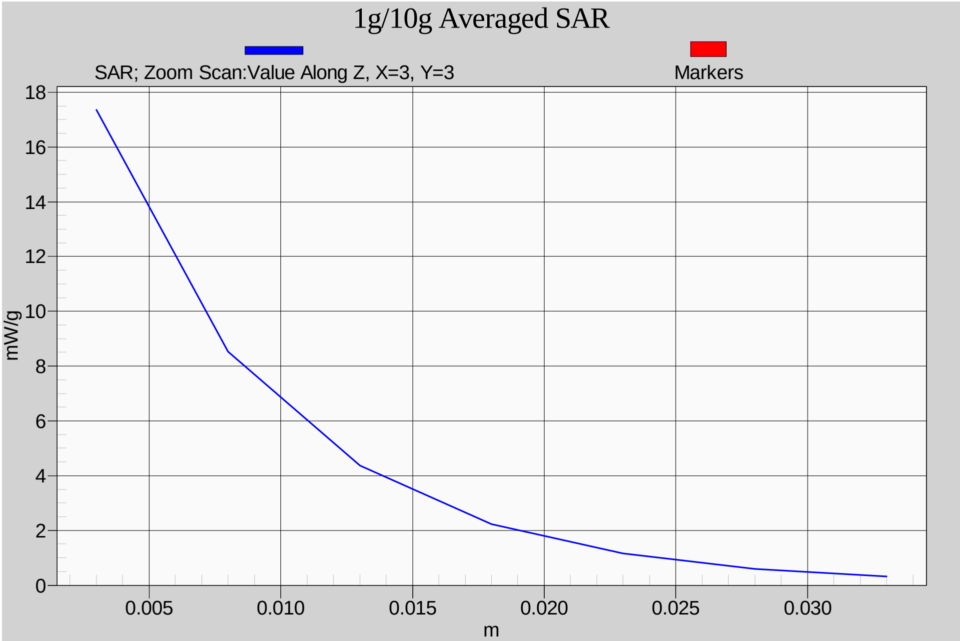
Z-axis Plot of System Performance Check



Head-Tissue-Simulating-Liquid 2450MHz



Body-Tissue-Simulating-Liquid 835MHz

Z-axis Plot of System Performance Check
 **Body-Tissue-Simulating-Liquid 1900MHz**
 **Body-Tissue-Simulating-Liquid 2450MHz**

7. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Field Probe	EX3DV4	3632	01/19/2011	01/19/2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3578	06/21/2011	06/21/2012
SPEAG	835MHz System Validation Kit	D835V2	4d092	06/22/2011	06/22/2012
SPEAG	1900MHz System Validation Kit	D1900V2	5d111	07/22/2011	07/22/2012
SPEAG	2450MHz System Validation Kit	D2450V2	712	02/23/2011	02/23/2012
SPEAG	Data Acquisition Electronics	DAE4	779	01/31/2011	01/31/2012
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	SAM V4.0	TP-1150	NCR	
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/C/01	NCR	
SPEAG	Software	DASY5 V5.0 Build 125	N/A	NCR	
SPEAG	Software	SEMCAD V13.4 Build 125	N/A	NCR	
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	
Agilent	ENA Series Network Analyzer	E5071B	MY42404655	07/07/2011	07/07/2012
R&S	Power Sensor	NRP-Z22	100179	05/27/2011	05/27/2012
Agilent	MXG Vector Signal Generator	N5182A	MY47420962	05/16/2011	05/16/2012
Agilent	Dual Directional Coupler	778D	50334	NCR	
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	
Mini-Circuits	Power Amplifier	ZVE-8G-SMA	D042005 671800514	NCR	

Table 10. Test Equipment List

8. Measurement Uncertainty

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than ±20.10 %〔8〕.

According to Std. C95.3〔9〕, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ±1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ±2dB can be expected.

According to CENELEC〔10〕, typical worst-case uncertainty of field measurements is ±5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ±3 dB.

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1g)	c_i (10g)	Std. Unc. (1-g)	Std. Unc. (10-g)	v_i or V_{eff}
Measurement System									
u1	Probe Calibration (*k*=1)	±5.5%	Normal	1	1	1	±5.5%	±5.5%	∞
u2	Probe Isotropy	±7.6%	Rectangular	$\sqrt{3}$	0.7	0.7	±3.1%	±3.1%	∞
u3	Boundary Effect	±1.0%	Rectangular	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
u4	Linearity	±4.7%	Rectangular	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
u5	System Detection Limit	±1.0%	Rectangular	$\sqrt{3}$	1	1	±0.58%	±0.58%	∞
u6	Readout Electronics	±0.3%	Normal	1	1	1	±0.3%	±0.3%	∞
u7	Response Time	±0.8%	Rectangular	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
u8	Integration Time	±2.6%	Rectangular	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
u9	RF Ambient Conditions	±0%	Rectangular	$\sqrt{3}$	1	1	±0%	±0%	∞
u10	RF Ambient Reflections	±0%	Rectangular	$\sqrt{3}$	1	1	±0%	±0%	∞
u11	Probe Positioner Mechanical Tolerance	±0.4%	Rectangular	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
u12	Probe Positioning with respect to Phantom Shell	±2.9%	Rectangular	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
u13	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	±1.0%	Rectangular	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Test sample Related									
u14	Test sample Positioning	±3.6%	Normal	1	1	1	±3.6%	±3.6%	89
u15	Device Holder Uncertainty	±3.5%	Normal	1	1	1	±3.5%	±3.5%	5
u16	Output Power Variation - SAR drift measurement	±5.0%	Rectangular	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Tissue Parameters									
u17	Phantom Uncertainty (shape and thickness tolerances)	±4.0%	Rectangular	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
u18	Liquid Conductivity - deviation from target values	±5.0%	Rectangular	$\sqrt{3}$	0.64	0.43	±1.8%	±1.2%	∞
u19	Liquid Conductivity - measurement uncertainty	±1.93%	Normal	1	0.64	0.43	±1.24%	±0.83%	69
u20	Liquid Permittivity - deviation from target values	±5.0%	Rectangular	$\sqrt{3}$	0.6	0.49	±1.7%	±1.4%	∞
u21	Liquid Permittivity - measurement uncertainty	±1.4%	Normal	1	0.6	0.49	±0.84%	±1.69%	69
Combined standard uncertainty			RSS				±10.05%	±9.98%	313
Expanded uncertainty (95% CONFIDENCE LEVEL)			*k*=2				±20.10%	±19.96%	

Table 11. Uncertainty Budget of DASY

9. Measurement Procedure

The measurement procedures are as follows:

1. For WLAN function, engineering testing software installed on Notebook can provide continuous transmitting signal.
2. Measure output power through RF cable and power meter
3. Set scan area, grid size and other setting on the DASY software
4. Find out the largest SAR result on these testing positions of each band
5. Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

1. Power reference measurement
2. Area scan
3. Zoom scan
4. Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages

1. Extraction of the measured data (grid and values) from the Zoom Scan
2. Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. Generation of a high-resolution mesh within the measured volume
4. Interpolation of all measured values form the measurement grid to the high-resolution grid
5. Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. Calculation of the averaged SAR within masses of 1g and 10g

9.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 7x7x9 points with step size 5, 5 and 3 mm for 300 MHz to 3 GHz, and 7x7x9 points with step size 5, 5 and 3 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

9.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the DUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

9.5 Power Drift Monitoring

All SAR testing is under the DUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of DUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

10. SAR Test Results Summary

10.1 Head SAR

Measurement Results								
Band	Frequency		Power (dBm)	Phantom Position	Spacing (mm)	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
	CH	MHz						
GSM 850	251	848.8	32.70	Right-cheek	0	0.166	0.104	---
	251	848.8	32.70	Right-Tilted	0	0.104	-0.023	---
	251	848.8	32.70	Left-cheek	0	**0.424**	0.007	---
	251	848.8	32.70	Left-Tilted	0	0.236	0.029	---
GSM 1900	512	1850.2	29.40	Right-cheek	0	0.163	0.005	---
	512	1850.2	29.40	Right-Tilted	0	0.155	0.010	---
	512	1850.2	29.40	Left-cheek	0	**0.397**	-0.060	---
	512	1850.2	29.40	Left-Tilted	0	0.156	-0.004	---
WCDMA Band II	9262	1852.4	23.41	Right-cheek	0	0.278	0.060	---
	9262	1852.4	23.41	Right-Tilted	0	0.290	0.013	---
	9262	1852.4	23.41	Left-cheek	0	**0.754**	0.051	---
	9262	1852.4	23.41	Left-Tilted	0	0.294	0.003	---
WCDMA Band V	4132	826.4	23.56	Right-cheek	0	0.103	0.091	---
	4132	826.4	23.56	Right-Tilted	0	0.050	0.138	---
	4132	826.4	23.56	Left-cheek	0	**0.200**	0.105	---
	4132	826.4	23.56	Left-Tilted	0	0.108	-0.091	---
IEEE 802.11b 1 M	01	2412	11.70	Right-cheek	0	0.020	0.171	---
	01	2412	11.70	Right-Tilted	0	0.028	0.133	---
	01	2412	11.70	Left-cheek	0	0.034	0.167	---
	01	2412	11.70	Left-Tilted	0	**0.039**	0.190	---
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram			

10.2 Body SAR

Measurement Results									
Band	Frequency		Power (dBm)	Phantom Position	Spacing (mm)	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
	CH	MHz							
GSM 850	251	848.8	32.70	Flat	15	Headset	0.271	-0.013	Front Surface to Phantom
	251	848.8	32.70	Flat	15	Headset	**0.346**	0.000	Back Surface to Phantom
GSM 1900	512	1850.2	29.40	Flat	15	Headset	0.160	0.030	Front Surface to Phantom
	512	1850.2	29.40	Flat	15	Headset	**0.238**	-0.113	Back Surface to Phantom
WCDMA Band II	9262	1852.4	23.41	Flat	15	Headset	0.299	0.044	Front Surface to Phantom
	9262	1852.4	23.41	Flat	15	Headset	**0.441**	0.039	Back Surface to Phantom
WCDMA Band V	4132	826.4	23.56	Flat	15	Headset	0.224	0.130	Front Surface to Phantom
	4132	826.4	23.56	Flat	15	Headset	**0.346**	0.012	Back Surface to Phantom
GPRS 850 3Down2Up	251	848.8	32.40	Flat	15	Headset	0.533	-0.003	Front Surface to Phantom
	251	848.8	32.40	Flat	15	Headset	**0.683**	-0.036	Back Surface to Phantom
GPRS 1900 3Down2Up	512	1850.2	29.40	Flat	15	Headset	0.301	0.088	Front Surface to Phantom
	512	1850.2	29.40	Flat	15	Headset	**0.480**	-0.091	Back Surface to Phantom
IEEE 802.11b Rate 1M	1	2412.0	11.70	Flat	15	Headset	0.002	-0.109	Front Surface to Phantom
	1	2412.0	11.70	Flat	15	Headset	**0.018**	0.051	Back Surface to Phantom
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population						1.6 W/kg (mW/g) Averaged over 1 gram			

Notes:

1. The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC/OET Bulletin 65, Supplement C [June 2001], IEEE1528-2003 and RSS-102.
2. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings.
5. Base on power table (section 5.3), the worst case is 802.11b CH1 rate 1M, therefore the test sample was investigated on this configuration.
6. 802.11g & 802.11n power are not more than 802.11b 0.25dB, therefore 802.11g Stand-alone SAR is not required.
8. If the Channel's SAR 1g of maximum conducted power is > 0.8 mW/g, low, middle and high channel are supposed to be tested.
9. HSDPA & HSUPA power are not more than WCDMA 0.25dB and the SAR value of WCDMA <1.2 mW/g, therefore HSDPA & HSUPA Stand-alone SAR is not required.
12. BT power is not more than 60/f, therefore stand-alone SAR is not required.
13. Wifi hot-spot is unsupported.
14. VOIP is supported.

10.3 Std. C95.1-1999 RF Exposure Limit

Human Exposure	Population Uncontrolled Exposure (W/kg) or (mW/g)	Occupational Controlled Exposure (W/kg) or (mW/g)
Spatial Peak SAR* (head)	1.60	8.00
Spatial Peak SAR** (Whole Body)	0.08	0.40
Spatial Peak SAR*** (Partial-Body)	1.60	8.00
Spatial Peak SAR**** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 12. Safety Limits for Partial Body Exposure

Notes：

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

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

*** The Spatial Average value of the SAR averaged over the partial – body.

**** 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.

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

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

11. Conclusion

The SAR test values found for the portable mobile phone **VERZO Technology, LLC.** **Trade Name：VERZO** **Model(s)：KINZO** is below the maximum recommended level of 1.6 W/kg (mW/g).

12. References

[1] Std. C95.1-1999, "*American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz",* New York.

[2] NCRP, National Council on Radiation Protection and Measurements, "*Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields"*, NCRP report NO. 86, 1986.

[3] T. Schmid, O. Egger, and N. Kuster, "*Automatic E-field scanning system for dosimetric assessments*", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.

[4] K. Poković, T. Schmid, and N. Kuster, "*Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency*", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.

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[6] N. Kuster, and Q. Balzano, "*Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz"*, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

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[12] KDB 648474 D01 SAR Handsets Multi Xmiter and Ant v01r05

[13] KDB 941225 D01 SAR Test for 3G Devices 3G-SAR

[14] KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE

[15] KDB 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01

[16] KDB 941225 D06 Hot Spot SAR v01

Appendix A - System Performance Check

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/24/2011 3:55:18 PM

System Performance Check at 835MHz_20110824_Head

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

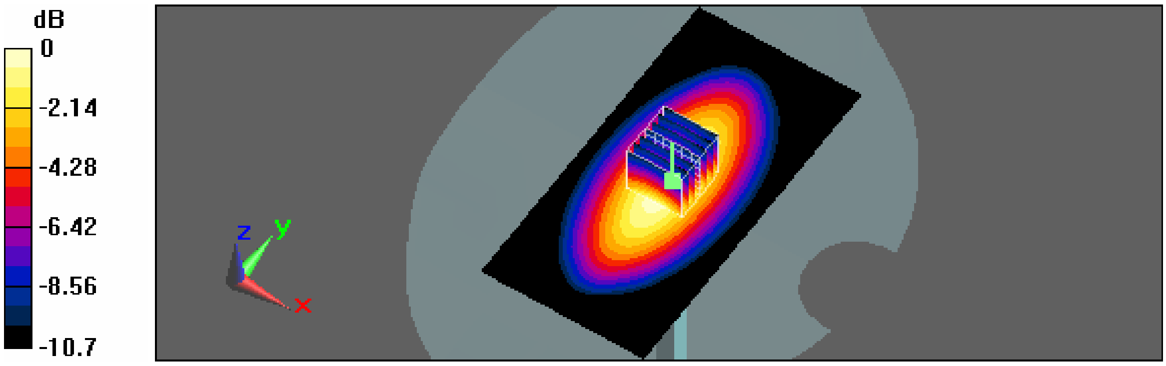
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.904 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 835MHz/Area Scan (61x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.7 mW/g

System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.6 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 3.5 W/kg
SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.5 mW/g
Maximum value of SAR (measured) = 2.7 mW/g



0 dB = 2.7mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/27/2011 8:43:41 PM

System Performance Check at 835MHz_20110827_Head

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

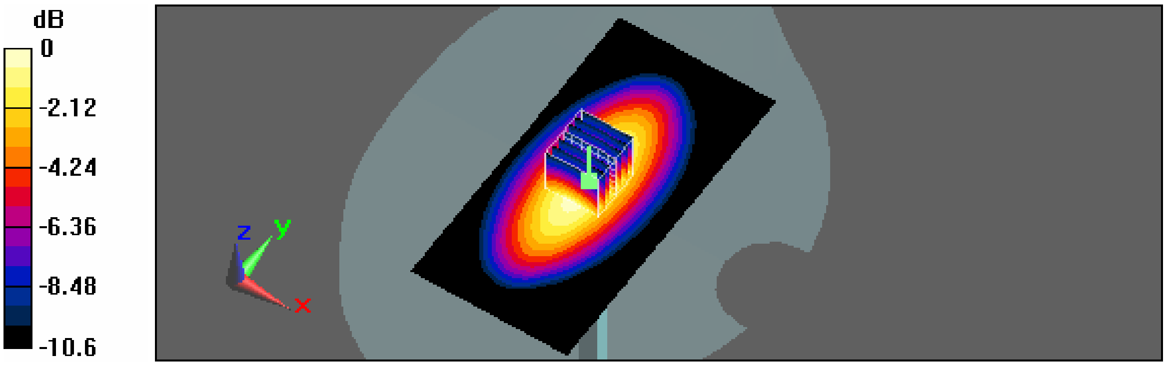
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.904 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 835MHz/Area Scan (61x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.73 mW/g

System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.4 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 3.51 W/kg
SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.5 mW/g
Maximum value of SAR (measured) = 2.71 mW/g



0 dB = 2.71mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/26/2011 4:26:06 PM

System Performance Check at 1900MHz_20110826_Head

DUT: Dipole D1900V2_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111

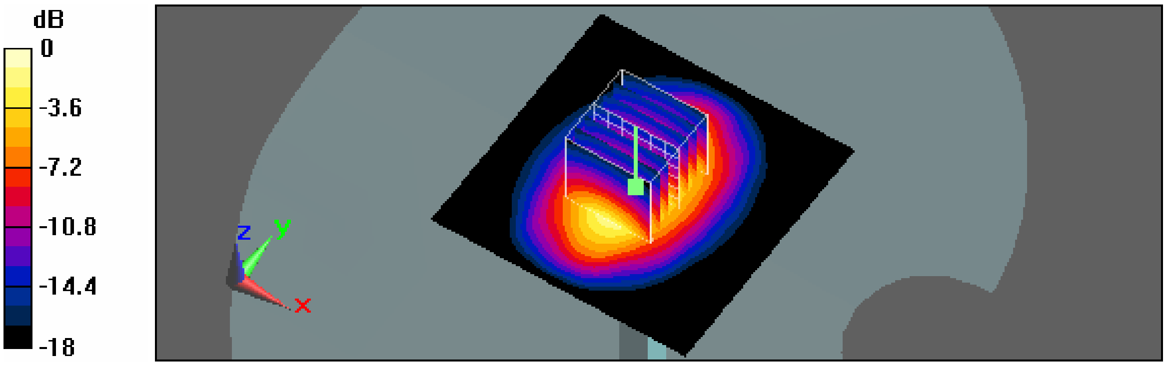
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.37 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 1900MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.7 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.5 V/m; Power Drift = 0.064 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 9.99 mW/g; SAR(10 g) = 5.15 mW/g
Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 9:28:32 PM

System Performance Check at 1900MHz_20110828_Head

DUT: Dipole D1900V2_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111

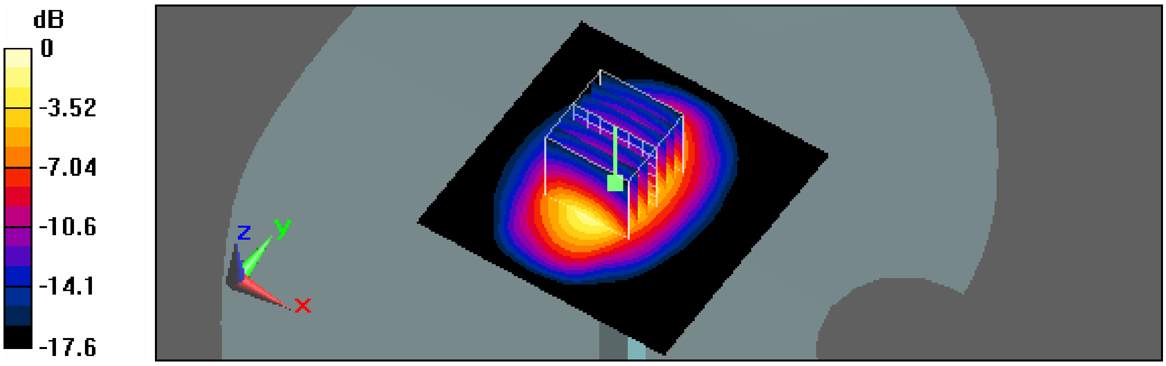
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.37 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 1900MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.1 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.1 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.39 mW/g
Maximum value of SAR (measured) = 13.2 mW/g



0 dB = 13.2mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/6/2011 12:20:23 AM

System Performance Check at 2450MHz_20111206_Head

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712

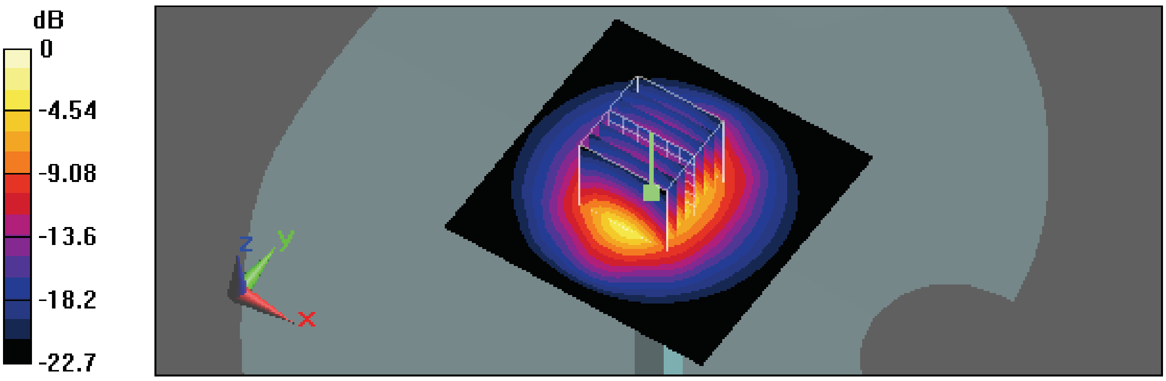
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.8 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3578; ConvF(6.42, 6.42, 6.42); Calibrated: 6/21/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 2450MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 17.5 mW/g

System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.2 V/m; Power Drift = 0.100 dB
Peak SAR (extrapolated) = 28.3 W/kg
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.15 mW/g
Maximum value of SAR (measured) = 17.8 mW/g



0 dB = 17.8mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 7:34:37 PM

System Performance Check at 835MHz_20110831_Body

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

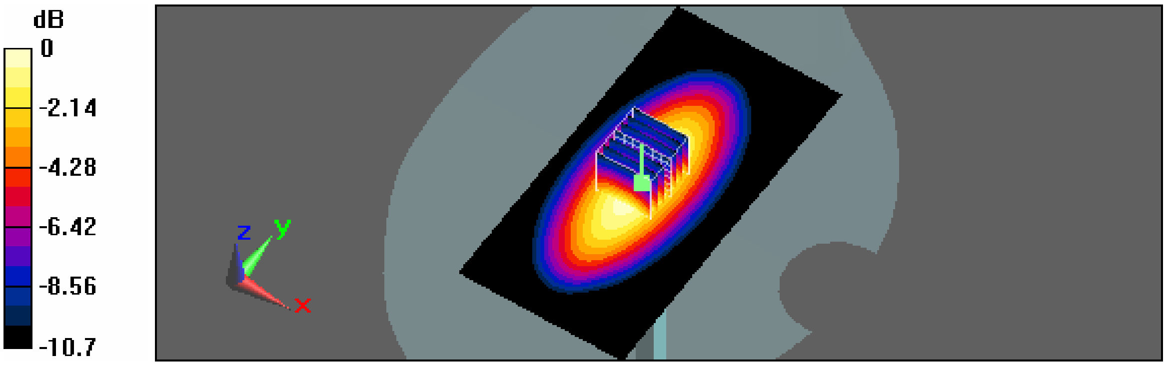
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 54.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 835MHz/Area Scan (61x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.73 mW/g

System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.4 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 3.5 W/kg
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.51 mW/g
Maximum value of SAR (measured) = 2.72 mW/g



0 dB = 2.72mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 12:25:23 AM

System Performance Check at 1900MHz_20110901_Body

DUT: Dipole D1900V2_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111

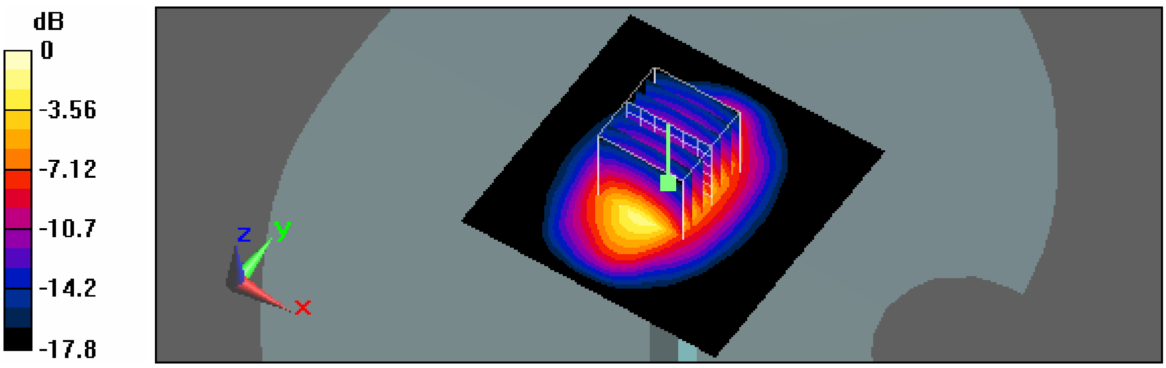
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.5 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 1900MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.7 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.9 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 20 W/kg
SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.46 mW/g
Maximum value of SAR (measured) = 13.7 mW/g



0 dB = 13.7mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/30/2011 7:19:51 PM

System Performance Check at 2450MHz_20110830_Body

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712

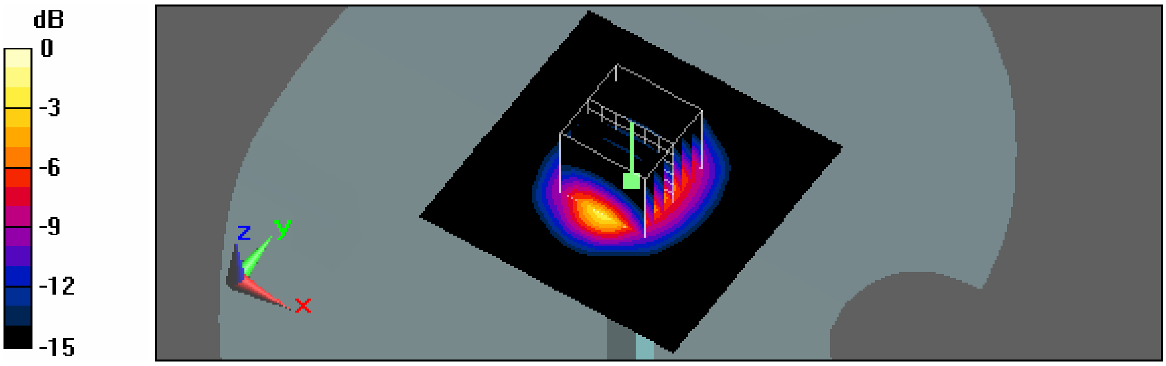
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.96 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.23, 7.23, 7.23); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 2450MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 17.5 mW/g

System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.4 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 27 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 5.95 mW/g
Maximum value of SAR (measured) = 17.4 mW/g



0 dB = 17.4mW/g

Appendix B - SAR Measurement Data

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/24/2011 4:50:20 PM

RC_GSM850 CH251

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

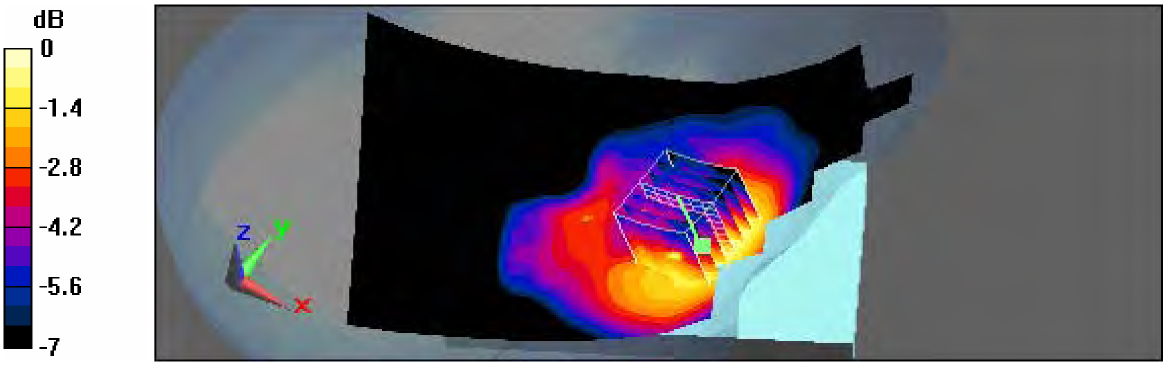
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.918 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.185 mW/g

Right Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.29 V/m; Power Drift = 0.104 dB
Peak SAR (extrapolated) = 0.224 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.124 mW/g
Maximum value of SAR (measured) = 0.194 mW/g



0 dB = 0.194mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/25/2011 11:55:15 AM

RT_GSM850 CH251

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

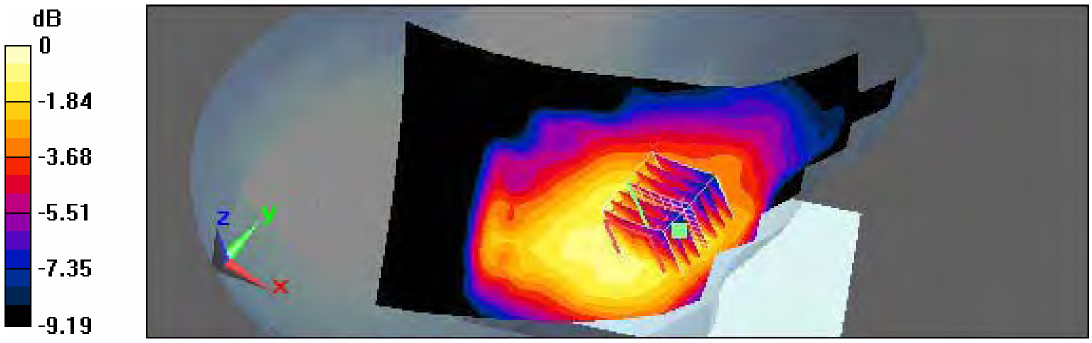
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; $\sigma = 0.918$ mho/m; $\varepsilon_r = 41$; $\rho = 1000$ kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Tilted/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.109 mW/g

Right Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.42 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.079 mW/g
Maximum value of SAR (measured) = 0.128 mW/g



0 dB = 0.128mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/25/2011 1:05:35 PM

LC_GSM850 CH251

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

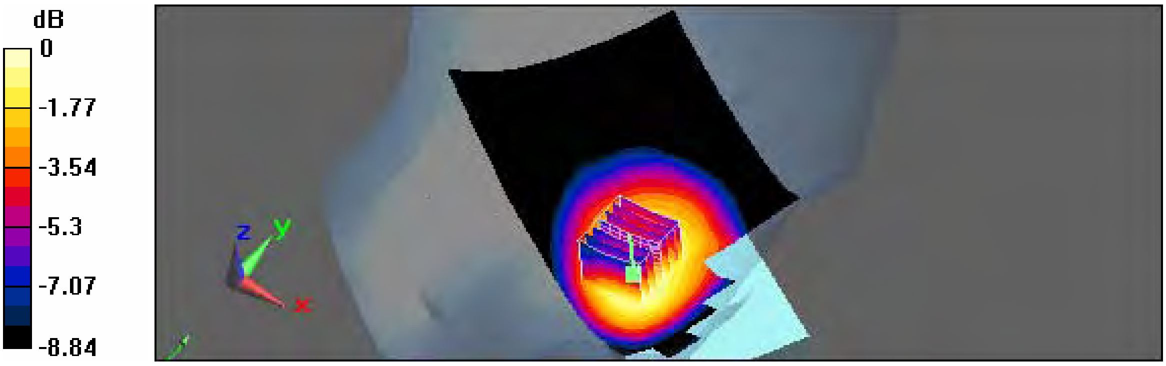
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.918 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.488 mW/g

Left Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.51 V/m; Power Drift = 0.0065 dB
Peak SAR (extrapolated) = 0.586 W/kg
SAR(1 g) = 0.424 mW/g; SAR(10 g) = 0.308 mW/g
Maximum value of SAR (measured) = 0.478 mW/g



0 dB = 0.478mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/25/2011 1:32:46 PM

LT_GSM850 CH251

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

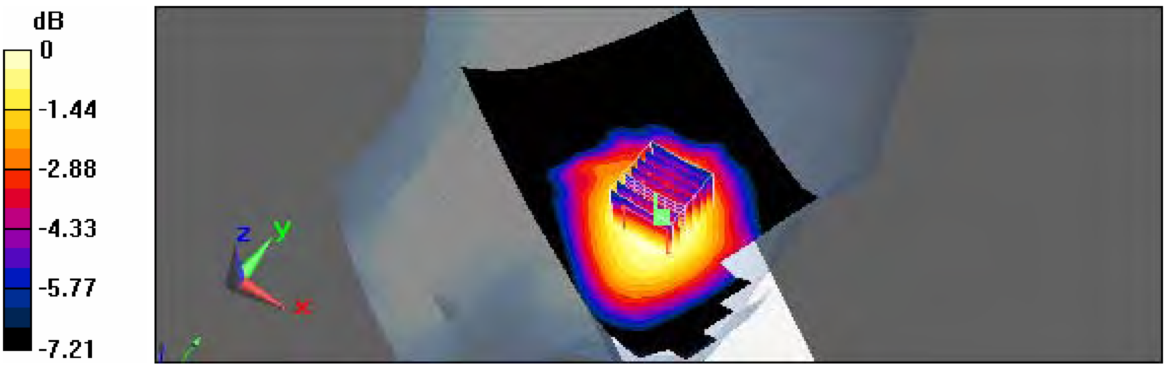
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.918 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Tilted/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.263 mW/g

Left Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 8.15 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.300 W/kg
SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.182 mW/g
Maximum value of SAR (measured) = 0.262 mW/g



0 dB = 0.262mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/26/2011 8:48:29 PM

RC_PCS CH512

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

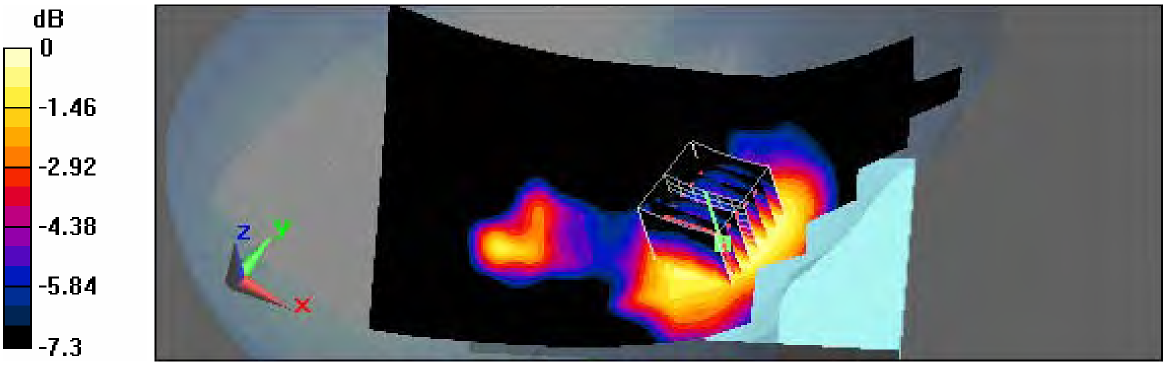
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.195 mW/g

Right Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.61 V/m; Power Drift = 0.00501 dB
Peak SAR (extrapolated) = 0.231 W/kg
SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.187 mW/g



0 dB = 0.187mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/26/2011 9:20:31 PM

RT_PCS CH512

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

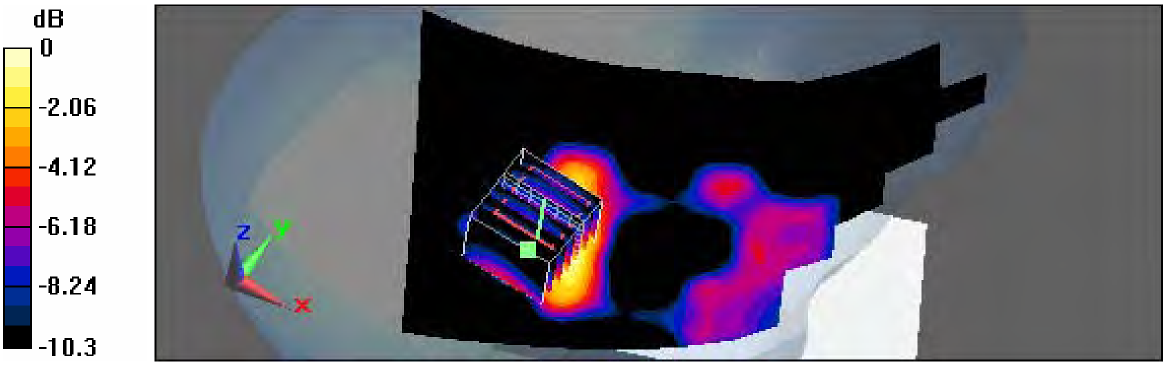
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Tilted/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.284 mW/g

Right Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.4 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 0.251 W/kg
SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.089 mW/g
Maximum value of SAR (measured) = 0.188 mW/g



0 dB = 0.188mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/26/2011 10:01:01 PM

LC_PCS CH512

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

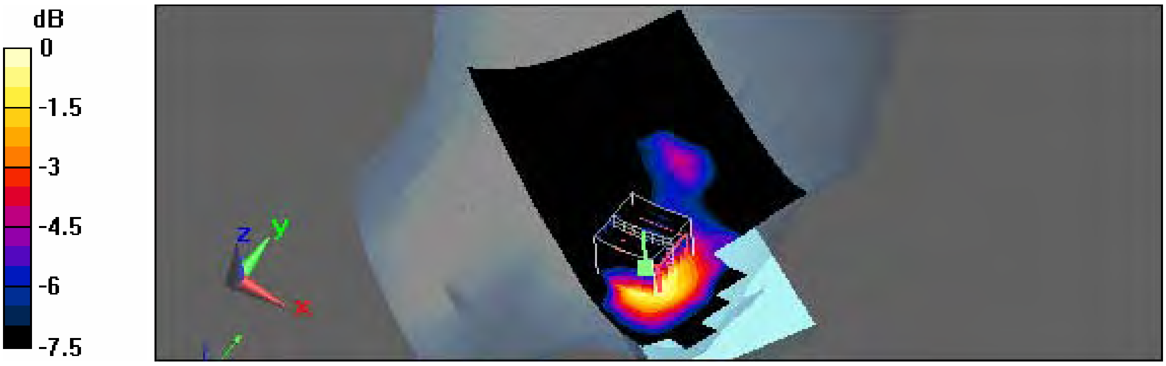
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.495 mW/g

Left Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.62 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 0.595 W/kg
SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.252 mW/g
Maximum value of SAR (measured) = 0.466 mW/g



0 dB = 0.466mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/26/2011 11:01:30 PM

LT_PCS CH512

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

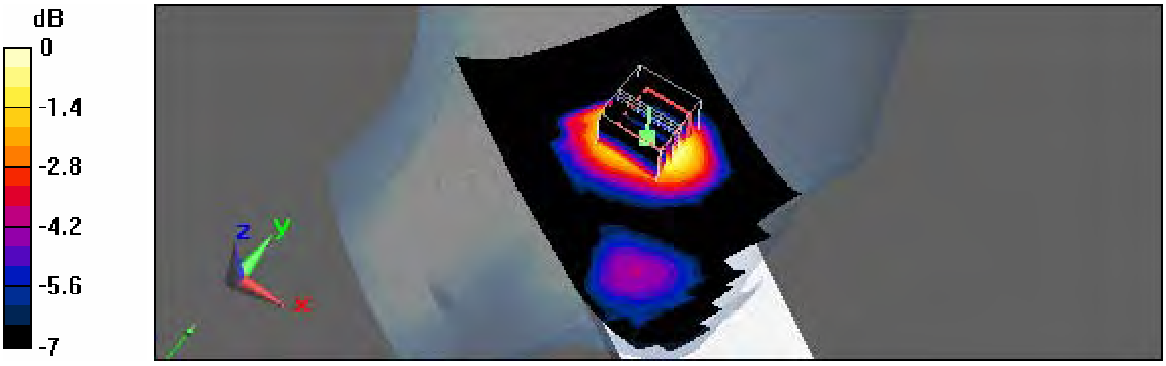
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Tilted/Area Scan (101x181x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.181 mW/g

Left Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.74 V/m; Power Drift = -0.0041 dB
Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.156 mW/g; SAR(10 g) = 0.100 mW/g
Maximum value of SAR (measured) = 0.181 mW/g



0 dB = 0.181mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 11:11:17 PM

RC_WCDMA Band II CH9262

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

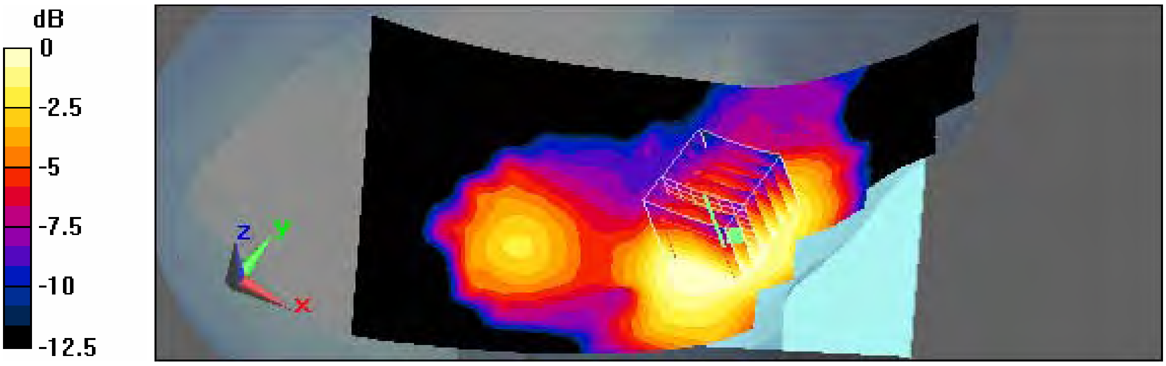
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Cheek/Area Scan (101x181x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.328 mW/g

Right Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.4 V/m; Power Drift = 0.060 dB
Peak SAR (extrapolated) = 0.394 W/kg
SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.193 mW/g
Maximum value of SAR (measured) = 0.322 mW/g



0 dB = 0.322mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 11:53:11 PM

RT_WCDMA Band II CH9262

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

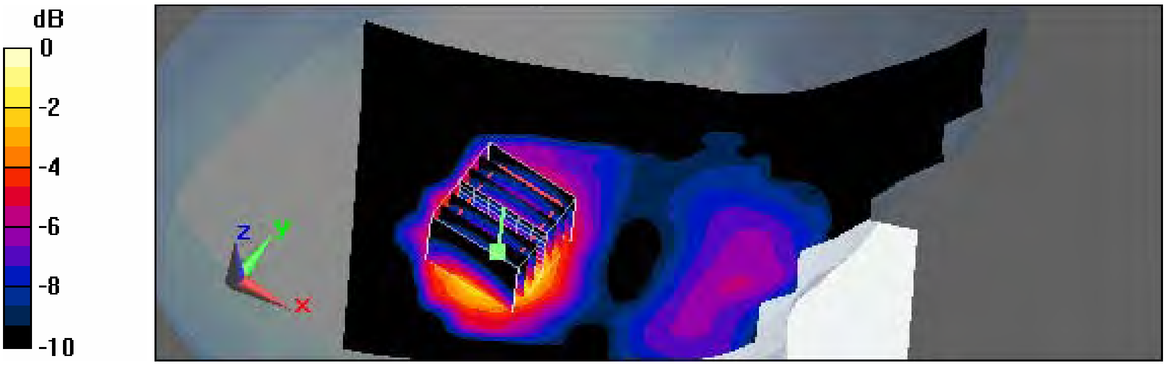
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Tilted/Area Scan (101x181x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.355 mW/g

Right Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 15.6 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.473 W/kg
SAR(1 g) = 0.290 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.351 mW/g



0 dB = 0.351mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/29/2011 12:52:33 AM

LC_WCDMA Band II CH9262

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

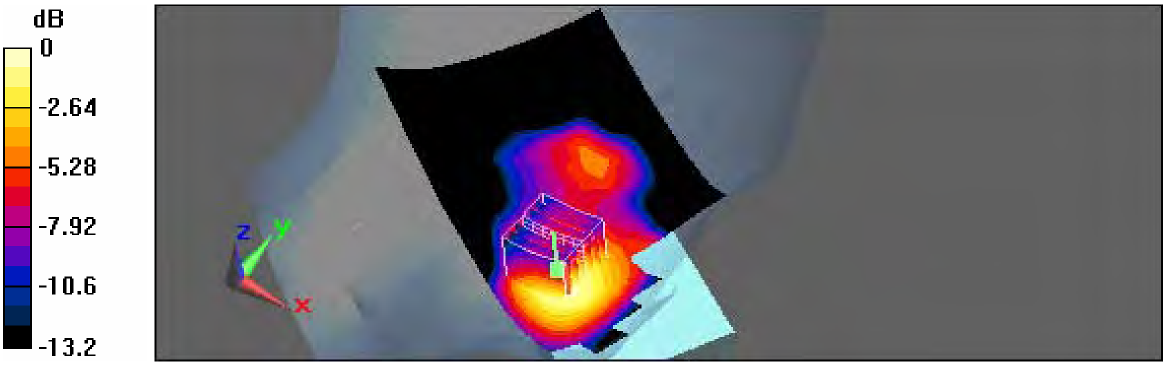
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.947 mW/g

Left Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.36 V/m; Power Drift = 0.051 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.475 mW/g
Maximum value of SAR (measured) = 0.887 mW/g



0 dB = 0.887mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/29/2011 2:18:03 AM

LT_WCDMA Band II CH9262

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

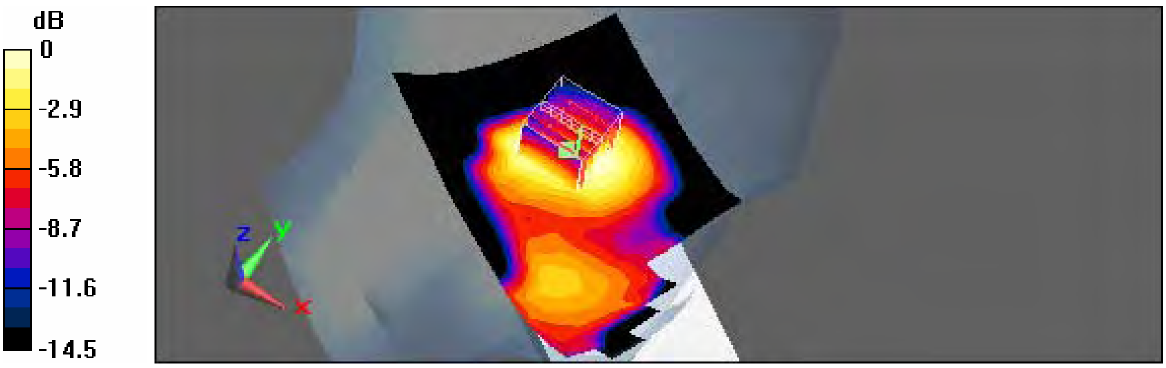
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.35 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(8.02, 8.02, 8.02); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Tilted/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.383 mW/g

Left Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 14.3 V/m; Power Drift = 0.00319 dB
Peak SAR (extrapolated) = 0.416 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.190 mW/g
Maximum value of SAR (measured) = 0.336 mW/g



0 dB = 0.336mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 12:05:20 AM

RC_WCDMA Band V CH4132

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

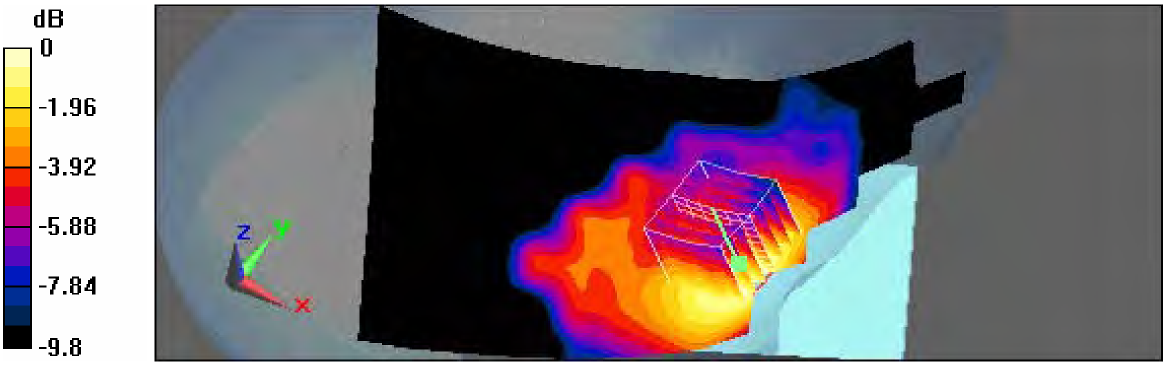
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.896 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.123 mW/g

Right Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.71 V/m; Power Drift = 0.091 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.103 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.121 mW/g



0 dB = 0.121mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 1:07:38 AM

RT_WCDMA Band V CH4132

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

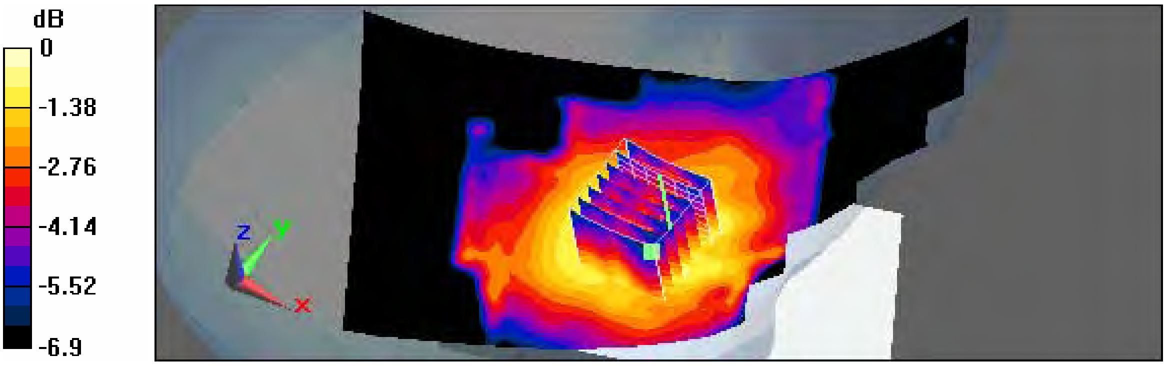
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.896 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Tilted/Area Scan (101x181x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.056 mW/g

Right Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.29 V/m; Power Drift = 0.138 dB
Peak SAR (extrapolated) = 0.065 W/kg
SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.059 mW/g



0 dB = 0.059mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 1:50:36 AM

LC_WCDMA Band V CH4132

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

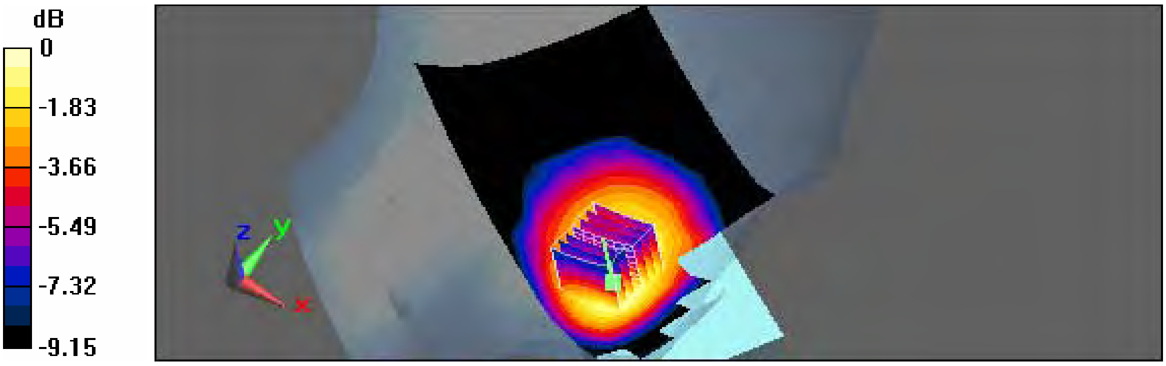
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.896 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.232 mW/g

Left Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.38 V/m; Power Drift = 0.105 dB
Peak SAR (extrapolated) = 0.283 W/kg
SAR(1 g) = 0.200 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.228 mW/g



0 dB = 0.228mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/28/2011 2:51:57 AM

LT_WCDMA Band V CH4132

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

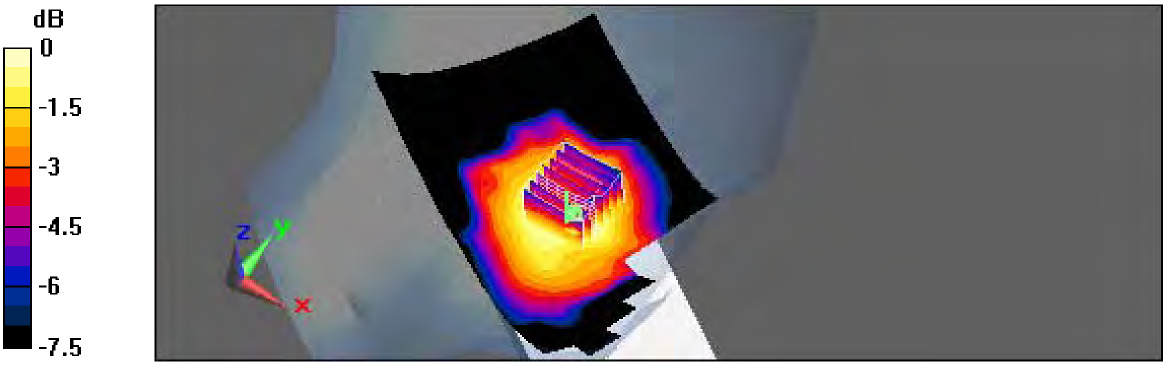
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.896 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.09, 9.09, 9.09); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Tilted/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.122 mW/g

Left Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.4 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 0.137 W/kg
SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.083 mW/g
Maximum value of SAR (measured) = 0.118 mW/g



0 dB = 0.118mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/6/2011 1:15:49 AM

RC_802.11b CH1_1M

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

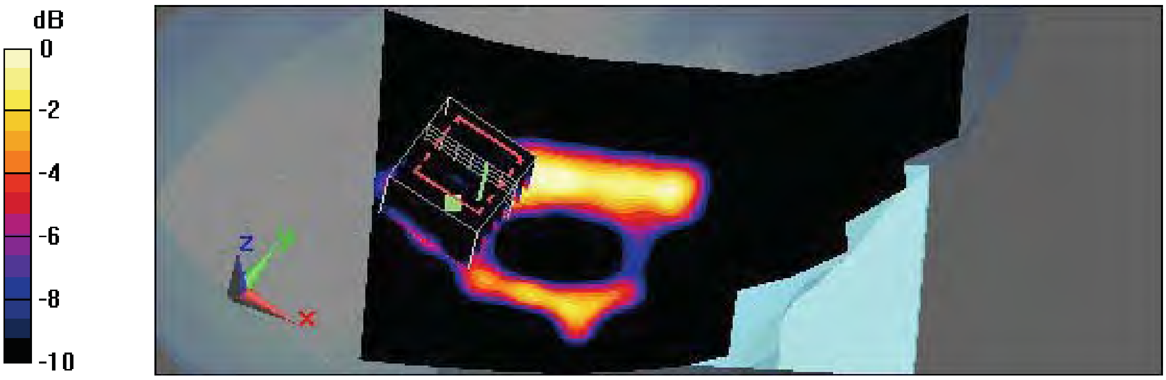
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.75 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3578; ConvF(6.42, 6.42, 6.42); Calibrated: 6/21/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Cheek/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.039 mW/g

Right Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3 V/m; Power Drift = 0.171 dB
Peak SAR (extrapolated) = 0.041 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.00908 mW/g
Maximum value of SAR (measured) = 0.027 mW/g



0 dB = 0.027mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/6/2011 2:02:57 AM

RT_802.11b CH1_1M

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

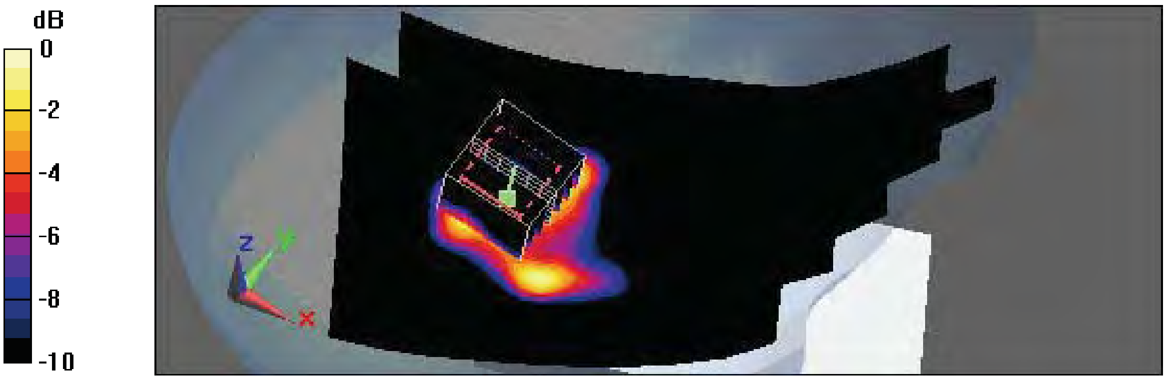
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.75 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3578; ConvF(6.42, 6.42, 6.42); Calibrated: 6/21/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Right Tilted/Area Scan (71x131x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.041 mW/g

Right Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.2 V/m; Power Drift = 0.133 dB
Peak SAR (extrapolated) = 0.055 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.037 mW/g



0 dB = 0.037mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/6/2011 2:55:43 AM

LC_802.11b CH1_1M

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

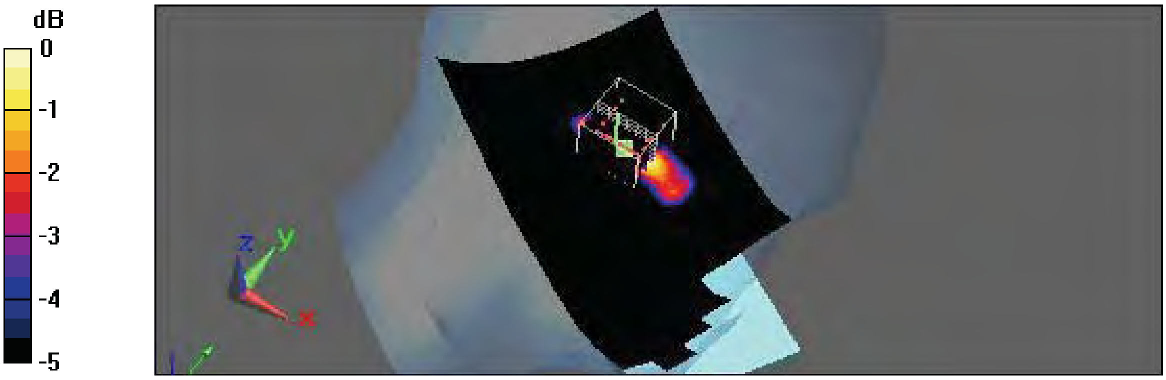
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.75 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3578; ConvF(6.42, 6.42, 6.42); Calibrated: 6/21/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Cheek/Area Scan (71x131x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.047 mW/g

Left Cheek/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.38 V/m; Power Drift = 0.167 dB
Peak SAR (extrapolated) = 0.072 W/kg
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.044 mW/g



0 dB = 0.044mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/6/2011 3:38:23 AM

LT_802.11b CH1_1M

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

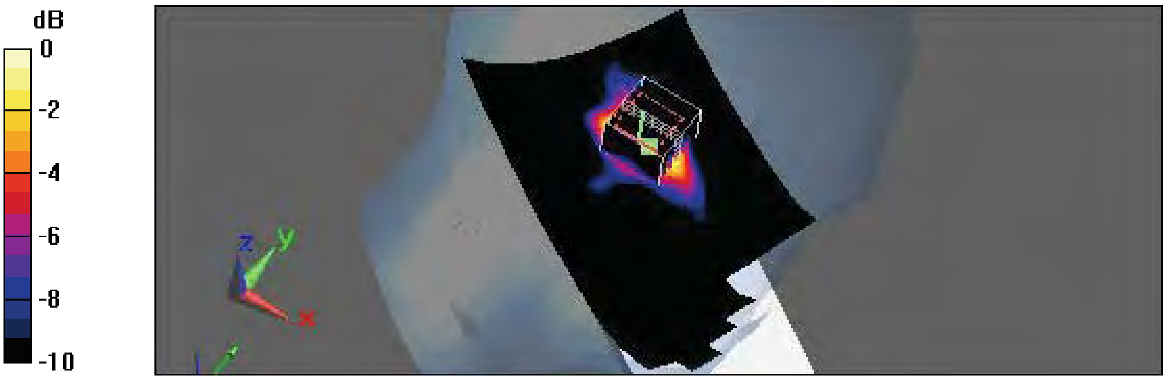
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.75 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3578; ConvF(6.42, 6.42, 6.42); Calibrated: 6/21/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Left Tilted/Area Scan (71x131x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.055 mW/g

Left Tilted/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.66 V/m; Power Drift = 0.190 dB
Peak SAR (extrapolated) = 0.079 W/kg
SAR(1 g) = 0.039 mW/g; SAR(10 g) = 0.018 mW/g
Maximum value of SAR (measured) = 0.050 mW/g



0 dB = 0.050mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 9:20:12 PM

Flat_GSM 850 CH251_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

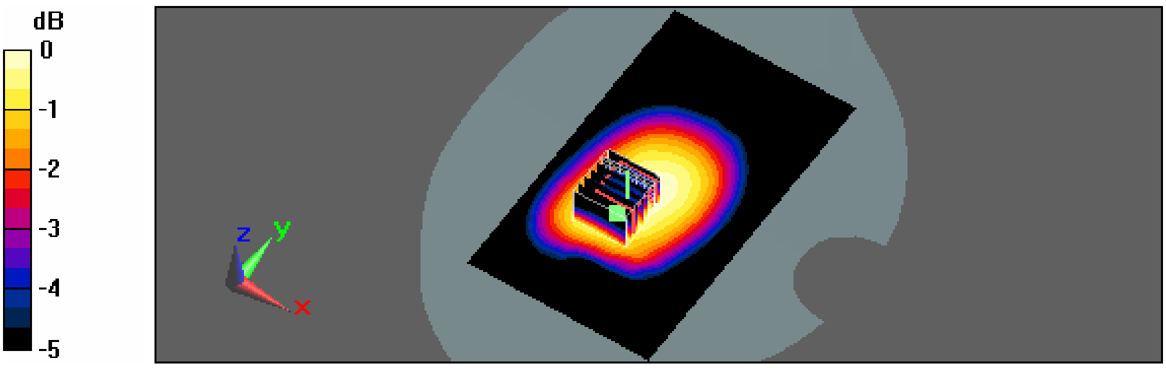
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.296 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.9 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.203 mW/g
Maximum value of SAR (measured) = 0.300 mW/g



0 dB = 0.300mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 9:50:57 PM

Flat_GSM 850 CH251_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

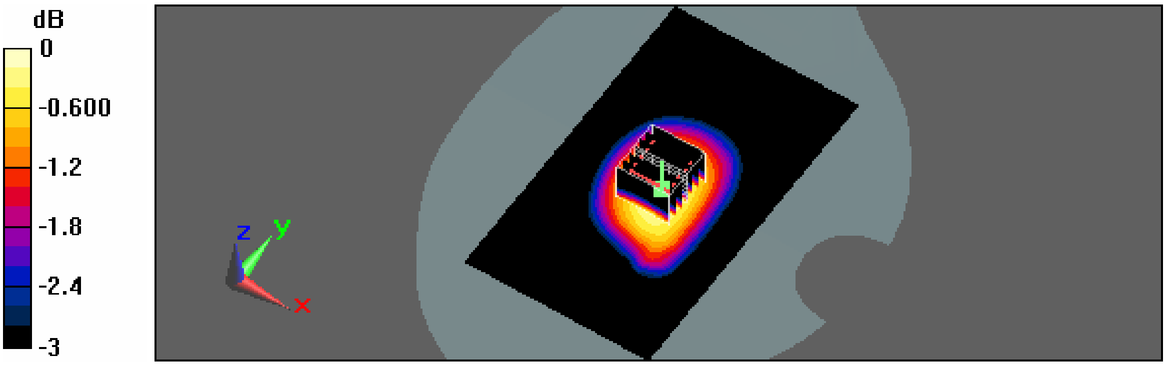
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; $\sigma = 0.997$ mho/m; $\varepsilon_r = 54.3$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.383 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.4 V/m; Power Drift = 0.000392 dB
Peak SAR (extrapolated) = 0.451 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.259 mW/g
Maximum value of SAR (measured) = 0.385 mW/g



0 dB = 0.385mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 1:55:01 AM

Flat_PCS CH512_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

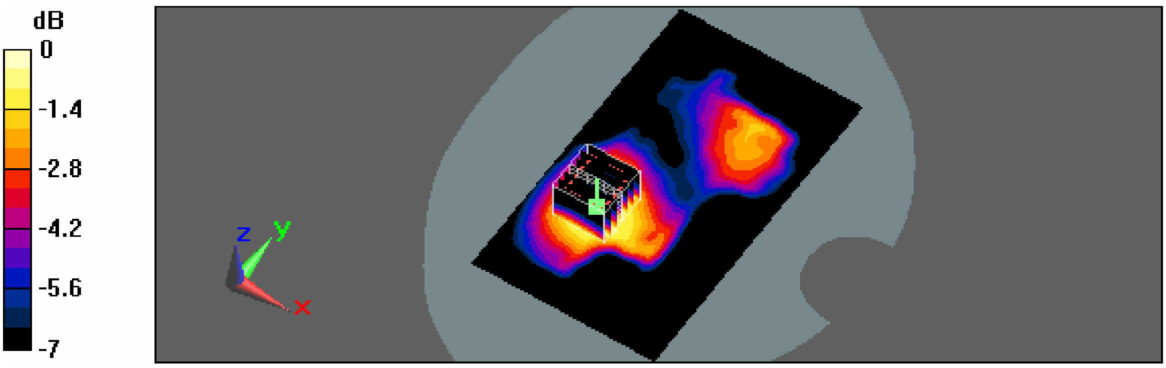
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.45 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.191 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.33 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.101 mW/g
Maximum value of SAR (measured) = 0.188 mW/g



0 dB = 0.188mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 2:25:34 AM

Flat_PCS CH512_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

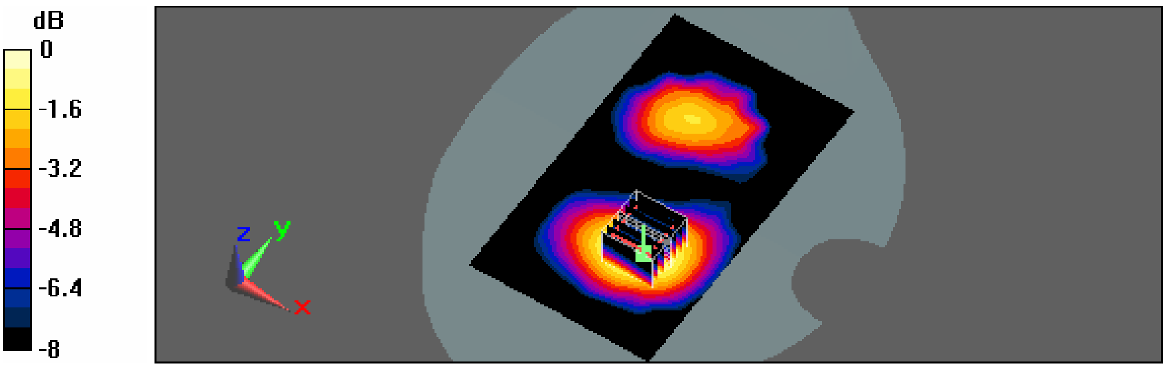
Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.45 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.289 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.29 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.377 W/kg
SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.148 mW/g
Maximum value of SAR (measured) = 0.282 mW/g



0 dB = 0.282mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 3:23:48 AM

Flat_WCDMA Band II CH9262_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

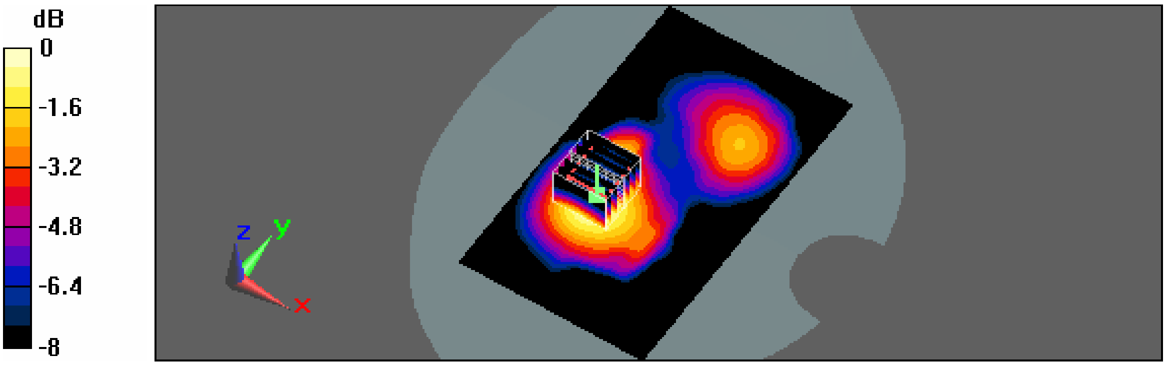
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.46 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.366 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.92 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 0.466 W/kg
SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.187 mW/g
Maximum value of SAR (measured) = 0.353 mW/g



0 dB = 0.353mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 2:55:48 AM

Flat_WCDMA Band II CH9262_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

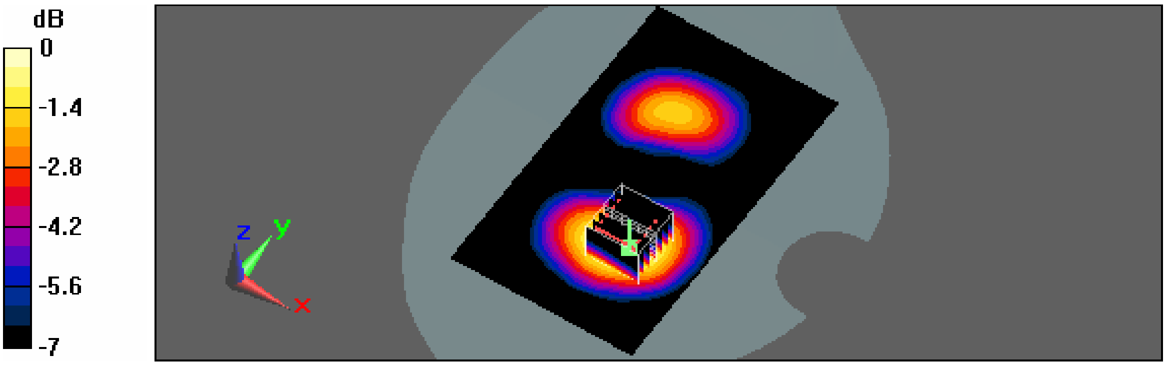
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.46 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.535 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.24 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.696 W/kg
SAR(1 g) = 0.441 mW/g; SAR(10 g) = 0.276 mW/g
Maximum value of SAR (measured) = 0.525 mW/g



0 dB = 0.525mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 10:52:16 PM

Flat_WCDMA Band V CH4132_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

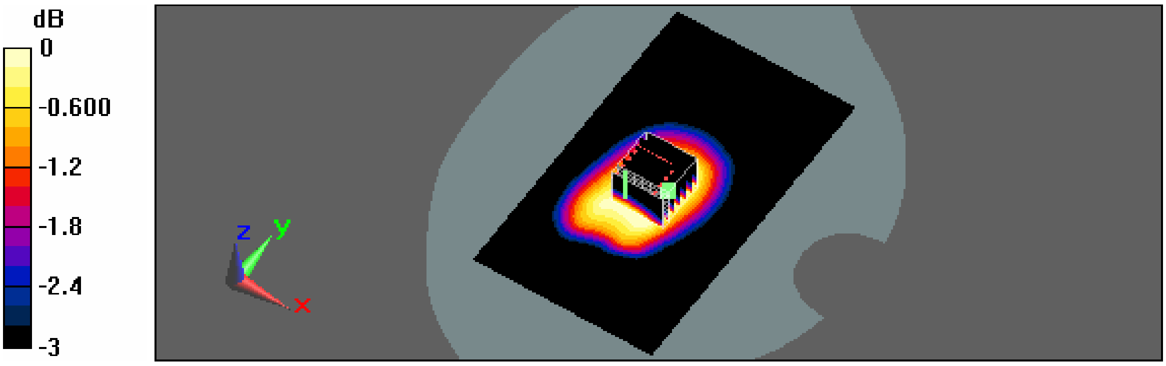
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.972 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.264 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 15.4 V/m; Power Drift = 0.130 dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.248 mW/g



0 dB = 0.248mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 10:22:01 PM

Flat_WCDMA Band V CH4132_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

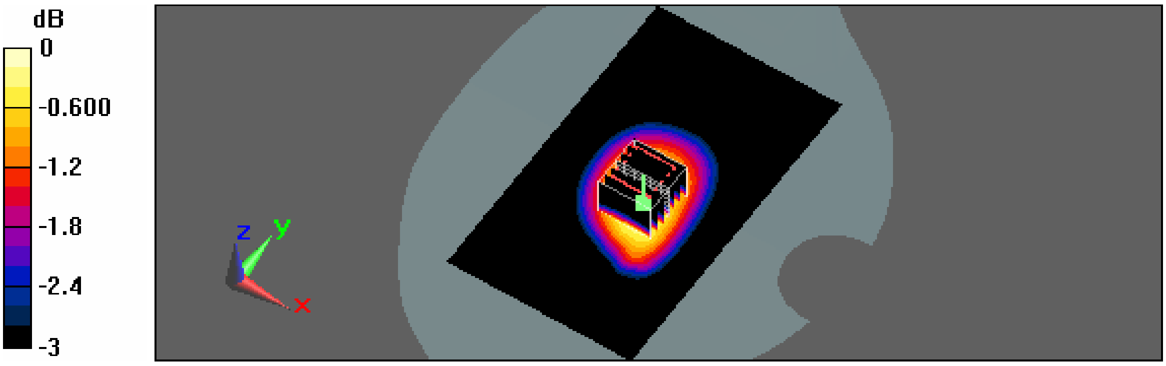
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.972 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.379 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.2 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.452 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.259 mW/g
Maximum value of SAR (measured) = 0.384 mW/g



0 dB = 0.384mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 8:49:07 PM

Flat_GPRS 850 CH251_3D2U_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

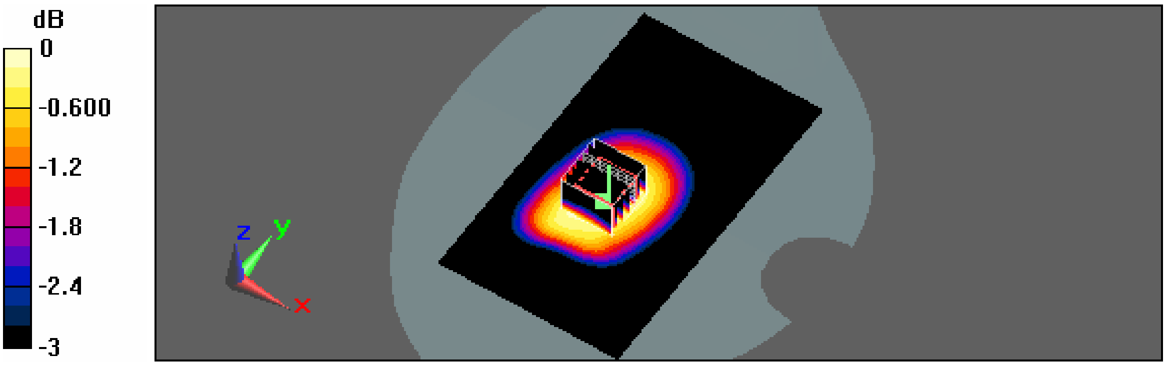
Communication System: GPRS 850 (3Down, 2Up); Frequency: 848.8 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.587 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 23.6 V/m; Power Drift = -0.00329 dB
Peak SAR (extrapolated) = 0.691 W/kg
SAR(1 g) = 0.533 mW/g; SAR(10 g) = 0.403 mW/g
Maximum value of SAR (measured) = 0.589 mW/g



0 dB = 0.589mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 8:18:44 PM

Flat_GPRS 850 CH251_3D2U_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

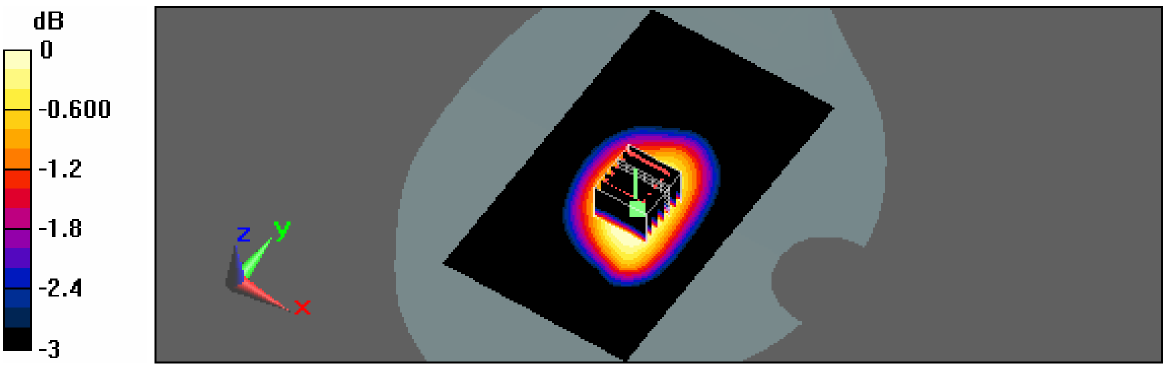
Communication System: GPRS 850 (3Down, 2Up); Frequency: 848.8 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(9.28, 9.28, 9.28); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.813 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 28.3 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.509 mW/g
Maximum value of SAR (measured) = 0.755 mW/g



0 dB = 0.755mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 1:24:15 AM

Flat_GPRS PCS CH512_3D2U_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

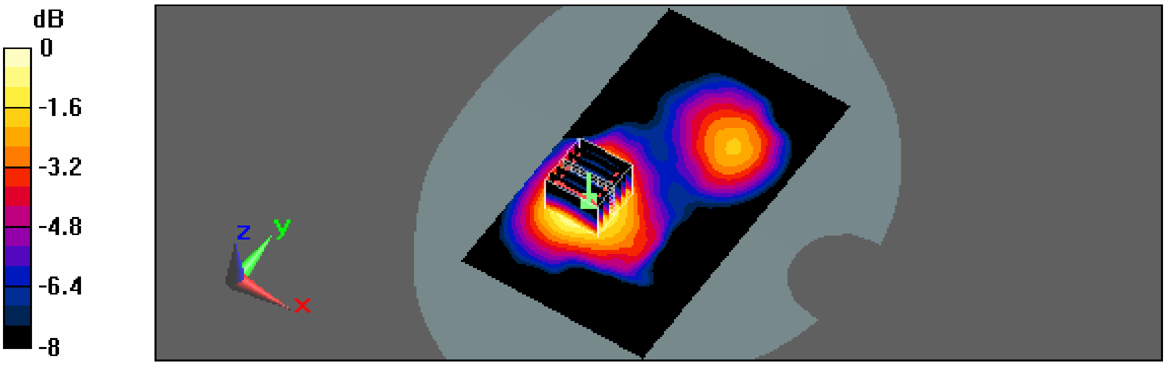
Communication System: GPRS PCS (3Down,2Up); Frequency: 1850.2 MHz;Duty Cycle: 1:4.2
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.45 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.356 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.42 V/m; Power Drift = 0.088 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.352 mW/g



0 dB = 0.352mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 9/1/2011 12:53:24 AM

Flat_GPRS PCS CH512_3D2U_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

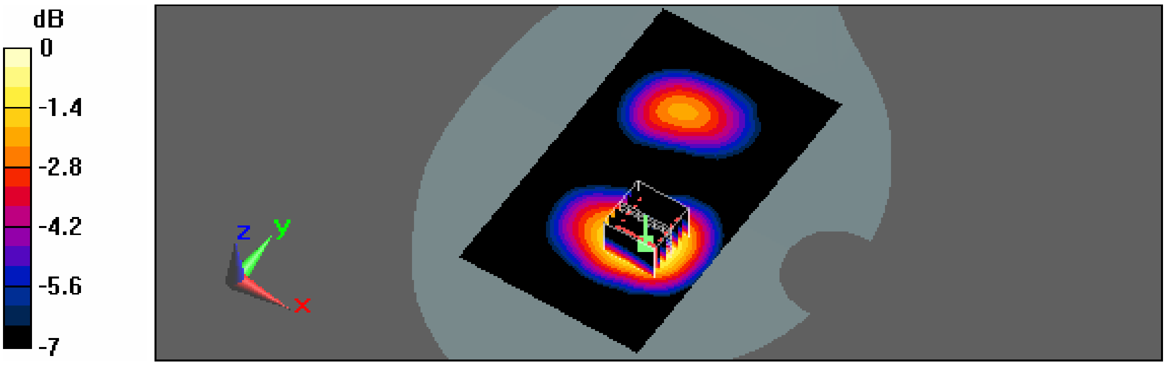
Communication System: GPRS PCS (3Down,2Up); Frequency: 1850.2 MHz;Duty Cycle: 1:4.2
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.45 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.39, 7.39, 7.39); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.572 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.46 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 0.771 W/kg
SAR(1 g) = 0.480 mW/g; SAR(10 g) = 0.297 mW/g
Maximum value of SAR (measured) = 0.569 mW/g



0 dB = 0.569mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/31/2011 3:02:29 AM

Flat_802.11b CH1_1M_Headset_Front Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

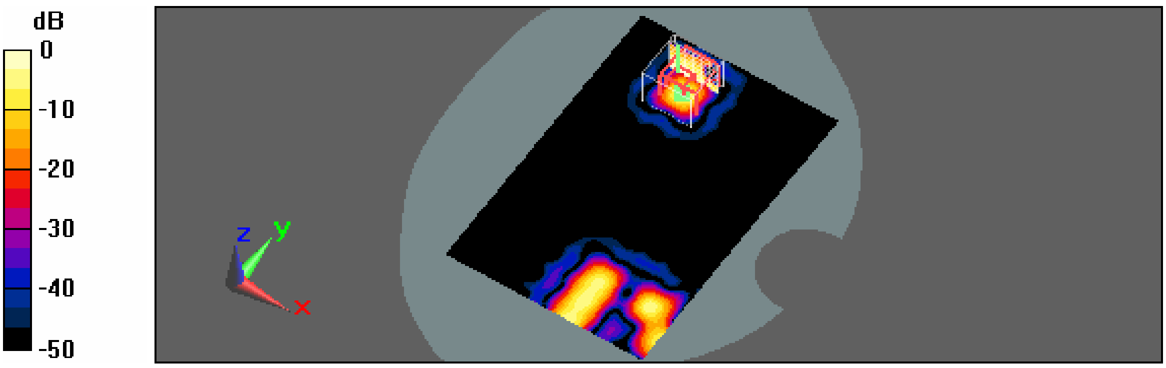
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.9 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.23, 7.23, 7.23); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (81x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.017 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 0.603 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 0.035 W/kg
SAR(1 g) = 0.00211 mW/g; SAR(10 g) = 0.000217 mW/g
Maximum value of SAR (measured) = 0.023 mW/g



0 dB = 0.023mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/30/2011 10:21:50 PM

Flat_802.11b CH1_1M_Headset_Back Surface to Phantom_15mm

DUT: KINZO; Type: PDA Phone; Serial: 359112042004804

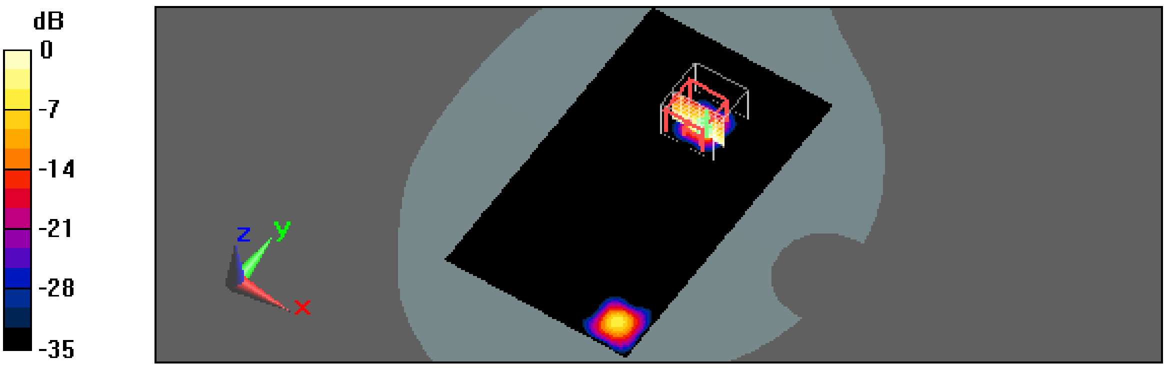
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.9 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3632; ConvF(7.23, 7.23, 7.23); Calibrated: 1/19/2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/31/2011
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1150 and higher
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (71x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.023 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 1.91 V/m; Power Drift = 0.051 dB
Peak SAR (extrapolated) = 0.065 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00453 mW/g
Maximum value of SAR (measured) = 0.028 mW/g



0 dB = 0.028mW/g

Appendix C - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ D835V2 SN:4d092 Calibration No.D835V2-4d092_Jun11
- Dipole _ D1900V2 SN:5d111 Calibration No.D1900V2-5d111_Jul11
- Dipole _ D2450V2 SN:712 Calibration No.D2450V2-712_Feb11
- Probe _ EX3DV4 SN:3632 Calibration No.EX3-3632_Jan11
- Probe _ EX3DV4 SN:3578 Calibration No.EX3-3578_Jun11
- DAE _ DAE4 SN:779 Calibration No.DAE4-779_Jan11

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Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **D835V2-4d092_Jun11**

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d092

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: June 22, 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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	8-Jun-11 (No. DAE4-601_Jun11)	Jun-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 22, 2011

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.52 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.22 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.1 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.65 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.38 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.2 Ω - 2.2 jΩ
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.2 Ω - 4.8 jΩ
Return Loss	- 25.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 15, 2009

DASY5 Validation Report for Head TSL

Date: 22.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

D835_4d092_H_110622_CL

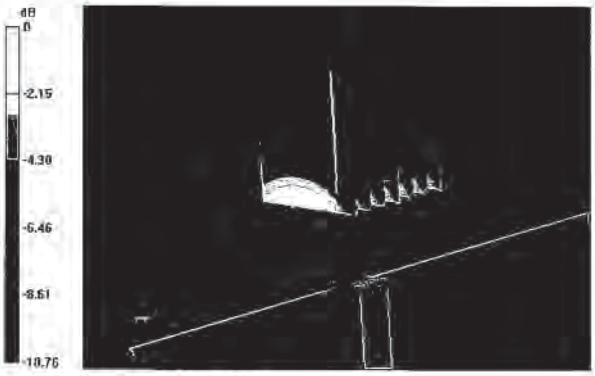
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.89$ mho/m; $\varepsilon_r = 40.8$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

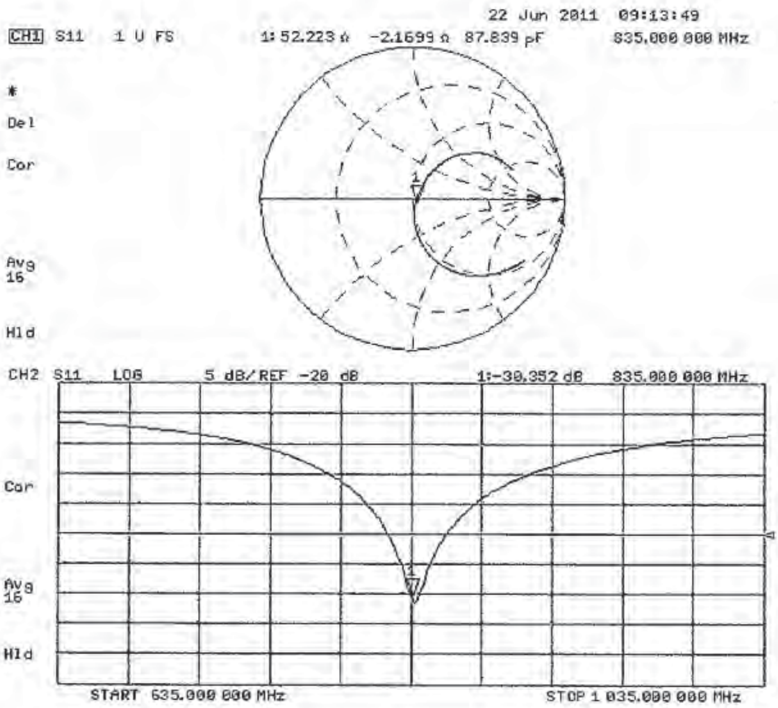
- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.812 V/m; Power Drift = 0.0016 dB
Peak SAR (extrapolated) = 3.508 W/kg
SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 2.748 mW/g



0 dB = 2.750mW/g

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-4d092_Jun11 Page 6 of 8

DASY5 Validation Report for Body TSL

Date: 22.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

D835_4d092_M_110622_CL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

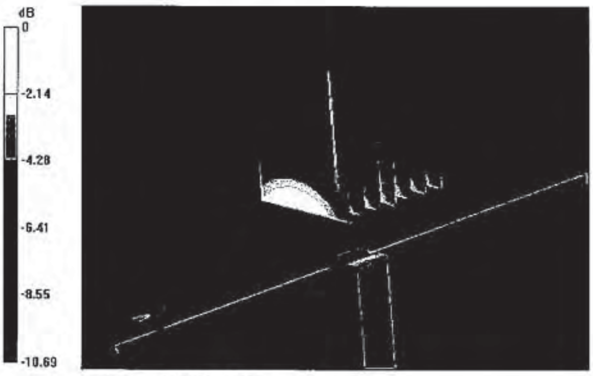
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.99$ mho/m; $\varepsilon_r = 53.1$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

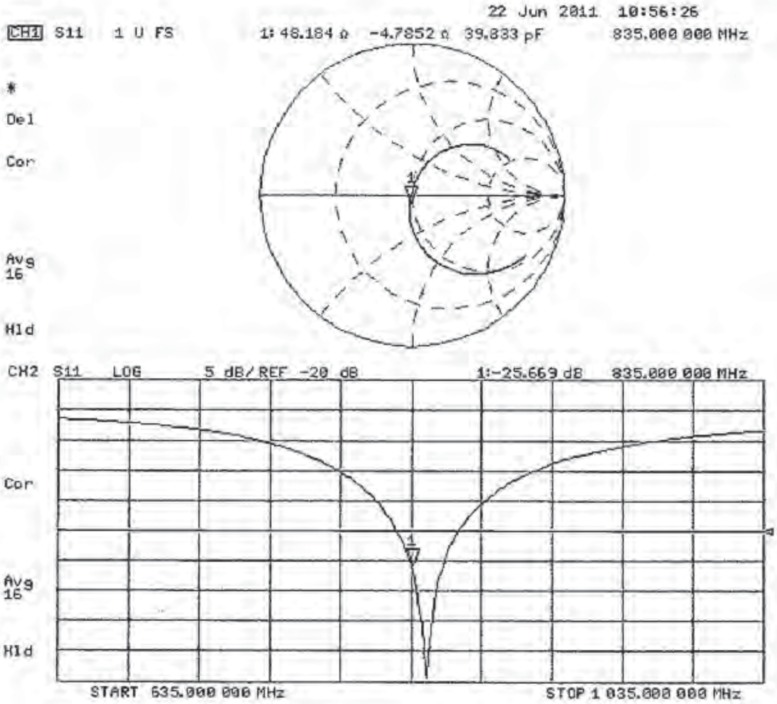
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.717 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.594 W/kg
SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.864 mW/g



0 dB = 2.860mW/g

Impedance Measurement Plot for Body TSL



Certificate No: D835V2-4d092_Jun11 Page 8 of 8

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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **D1900V2-5d111_Jul11**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d111
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 22, 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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	D. Iliev
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 22, 2011

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.42 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.25 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.8 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	1.53 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.39 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.5 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω + 6.7 jΩ
Return Loss	- 23.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.9 Ω + 6.6 jΩ
Return Loss	- 21.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.201 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 28, 2008

DASY5 Validation Report for Head TSL

Date: 20.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

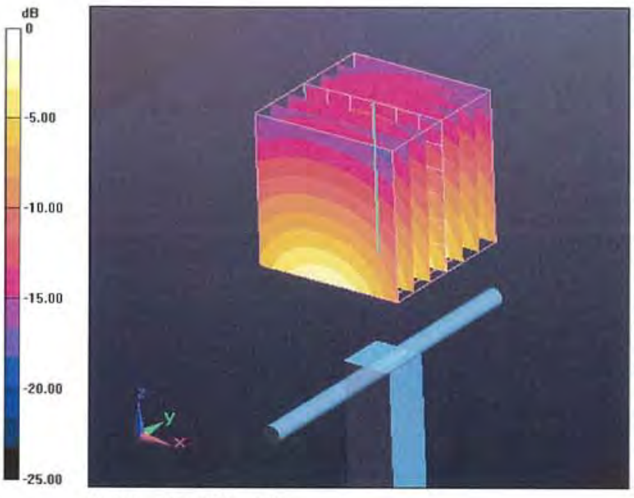
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d111

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.42 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

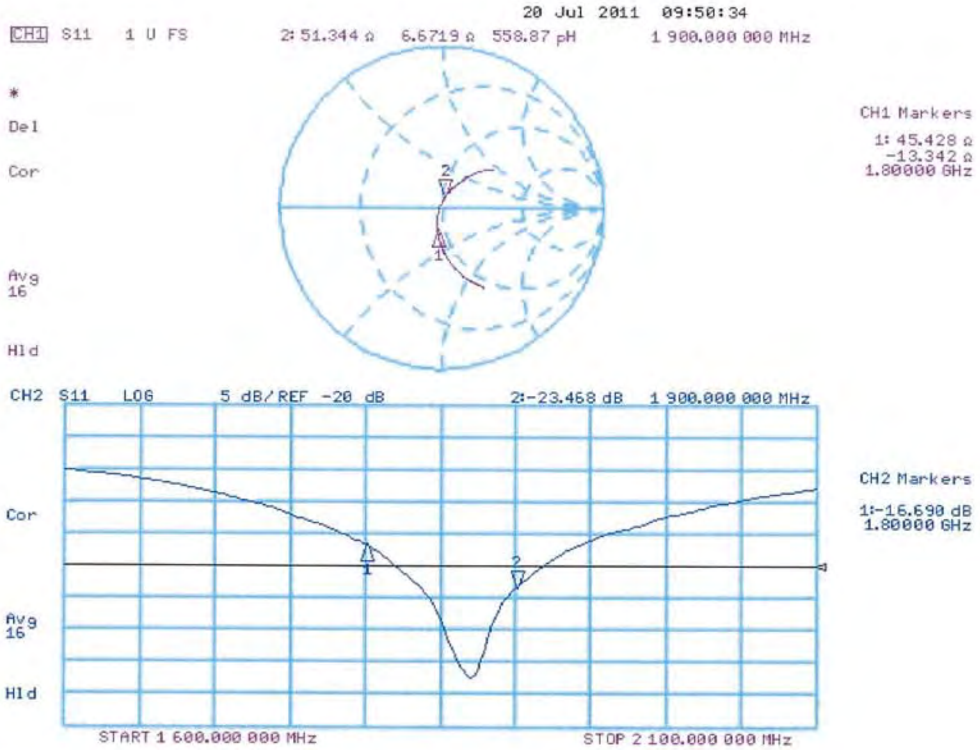
- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.068 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 18.391 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 12.667 mW/g



0 dB = 12.670mW/g

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d111_Jul11 Page 6 of 8

DASY5 Validation Report for Body TSL

Date: 22.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

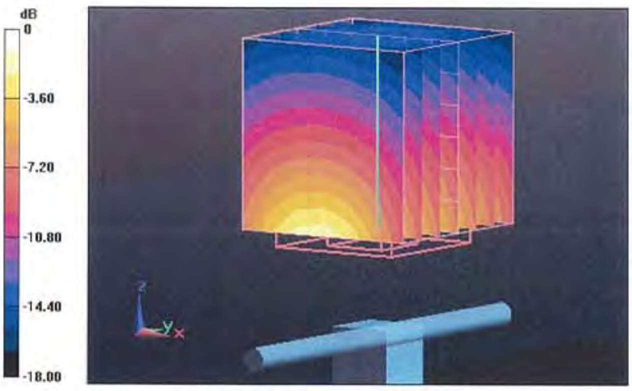
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d111

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

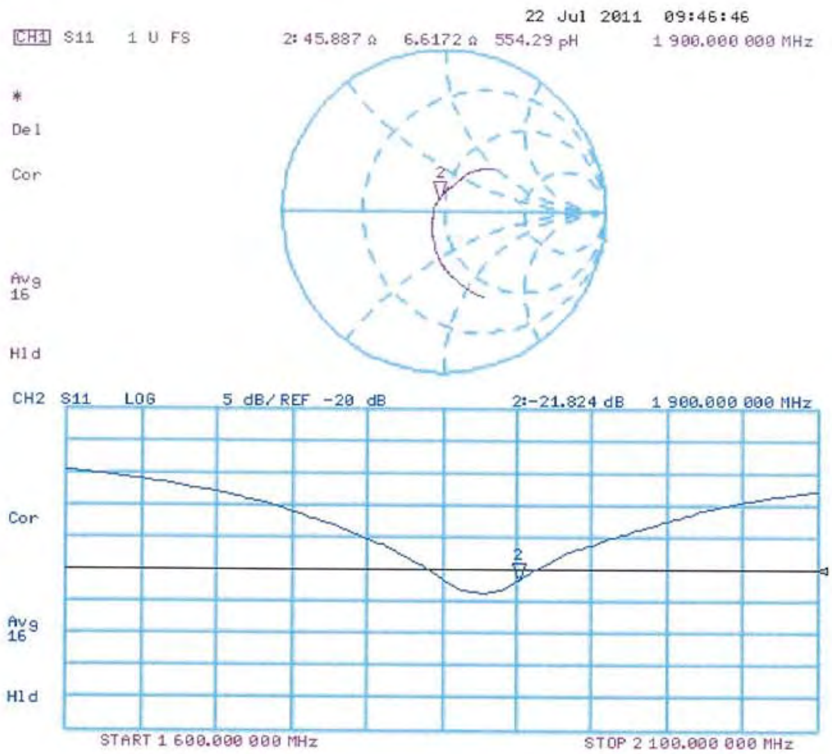
- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.720 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 18.122 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.39 mW/g
Maximum value of SAR (measured) = 12.882 mW/g



0 dB = 12.880mW/g

Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d111_Jul11 Page 8 of 8

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Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No: D2450V2-712_Feb11

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 712
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits
Calibration date:	February 23, 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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	D. Iliev
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 24, 2011

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.73 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.08 mW / g
SAR normalized	normalized to 1W	24.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.2 ± 6 %	1.94 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.6 mW / g
SAR normalized	normalized to 1W	50.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**50.4 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.83 mW / g
SAR normalized	normalized to 1W	23.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.3 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.3 Ω + 1.7 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.8 Ω + 5.5 jΩ
Return Loss	- 25.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.146 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 05, 2002

DASY5 Validation Report for Head TSL

Date/Time: 23.02.2011 12:42:01

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.73 mho/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

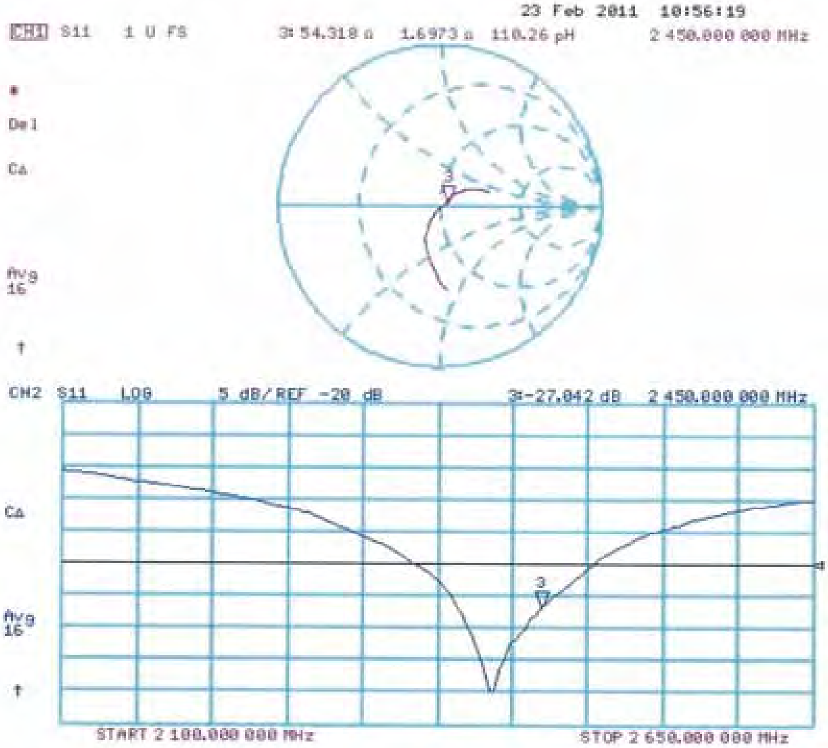
DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.5 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 26.439 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 6.08 mW/g
Maximum value of SAR (measured) = 16.525 mW/g

0 dB = 16.530mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 18.02.2011 14:36:14

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

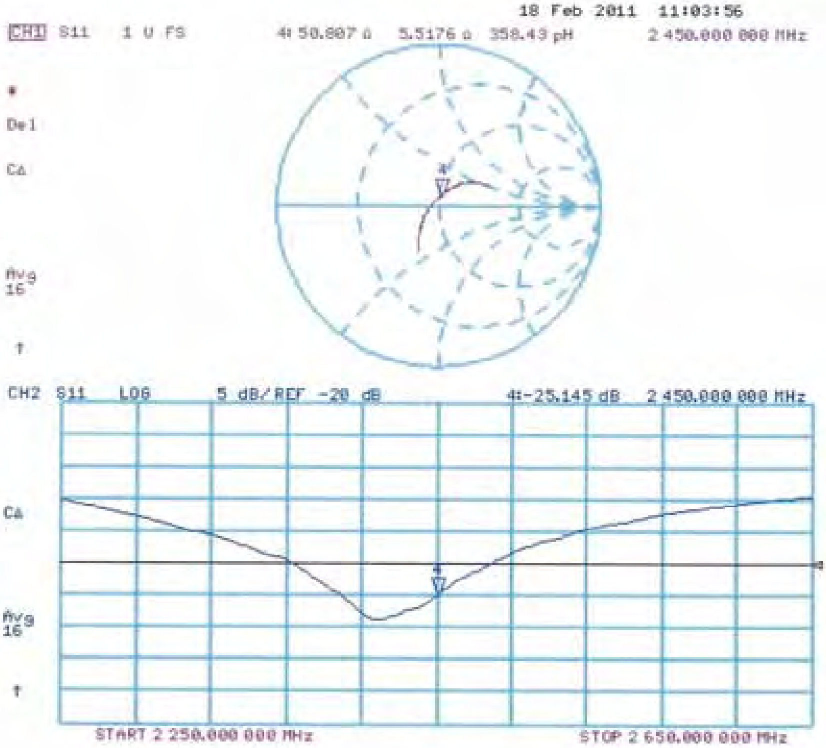
DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.420 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 26.751 W/kg
SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.83 mW/g
Maximum value of SAR (measured) = 16.714 mW/g

0 dB = 16.710mW/g

Impedance Measurement Plot for Body TSL



Certificate No: D2450V2-712_Feb11 Page 9 of 9

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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **EX3-3632_Jan11**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3632
Calibration procedure(s)	QA CAL-01.v7, QA CAL-12.v6, QA CAL-23.v4 and QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 19, 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	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_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

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 20, 2011

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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:

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

Probe EX3DV4

SN:3632

Manufactured:	November 1, 2007
Last calibrated:	January 26, 2010
Recalibrated:	January 19, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3632

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.46	0.44	0.39	± 10.1%
DCP (mV)[B]	97.4	94.9	97.4	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	133.3	± 3.4 %
			Y	0.00	0.00	1.00	110.0	
			Z	0.00	0.00	1.00	125.1	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3632

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	9.40	9.40	9.40	0.12	2.85 ± 13.3%
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	9.51	9.51	9.51	0.67	0.64 ± 11.0%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	9.09	9.09	9.09	0.66	0.64 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	8.16	8.16	8.16	0.51	0.74 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	8.02	8.02	8.02	0.58	0.68 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.28	7.28	7.28	0.33	0.91 ± 11.0%

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

DASY/EASY - Parameters of Probe: EX3DV4 SN:3632

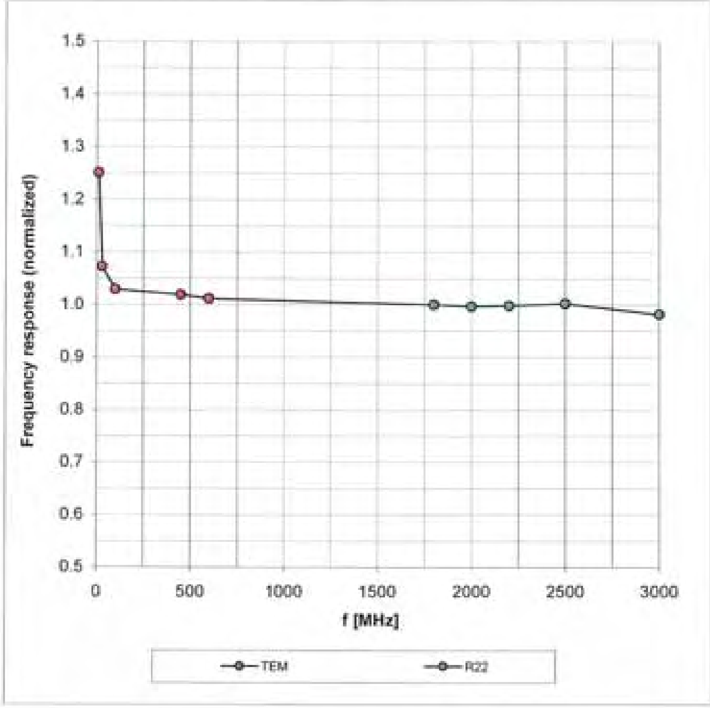
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	10.05	10.05	10.05	0.05	1.80 ± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	9.33	9.33	9.33	0.78	0.63 ± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	9.28	9.28	9.28	0.73	0.66 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.57	7.57	7.57	0.83	0.60 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.39	7.39	7.39	0.67	0.65 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.23	7.23	7.23	0.28	1.07 ± 11.0%

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

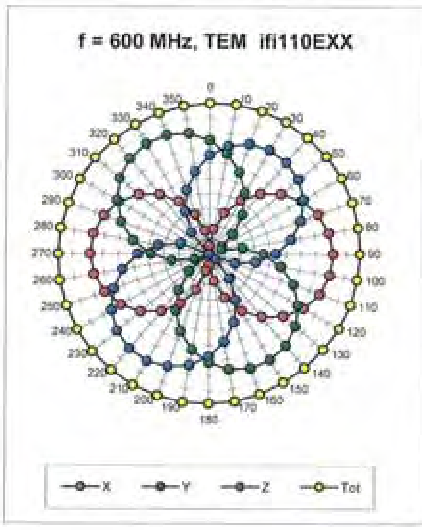
Frequency Response of E-Field

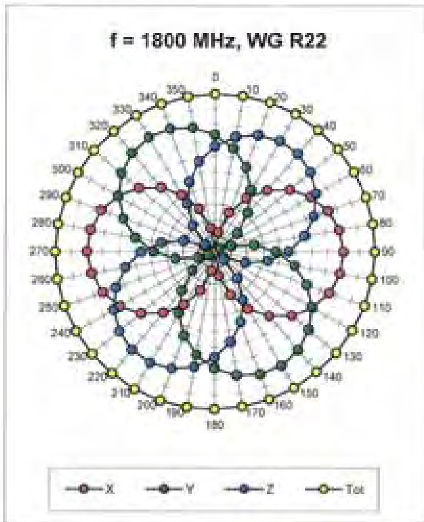
(TEM-Cell:ifi110 EXX, Waveguide: R22)

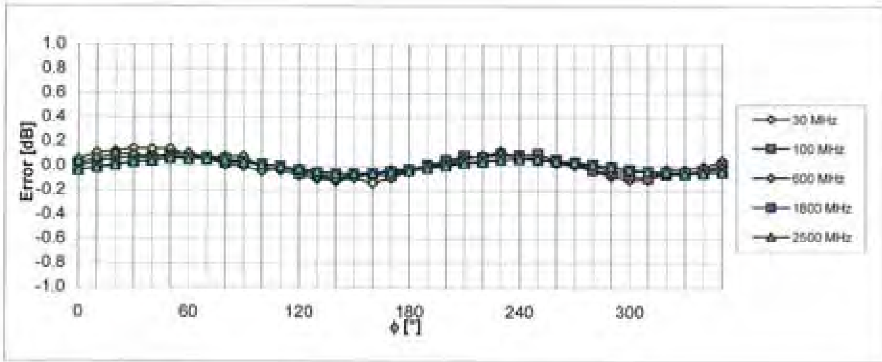


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), $\vartheta = 0°$



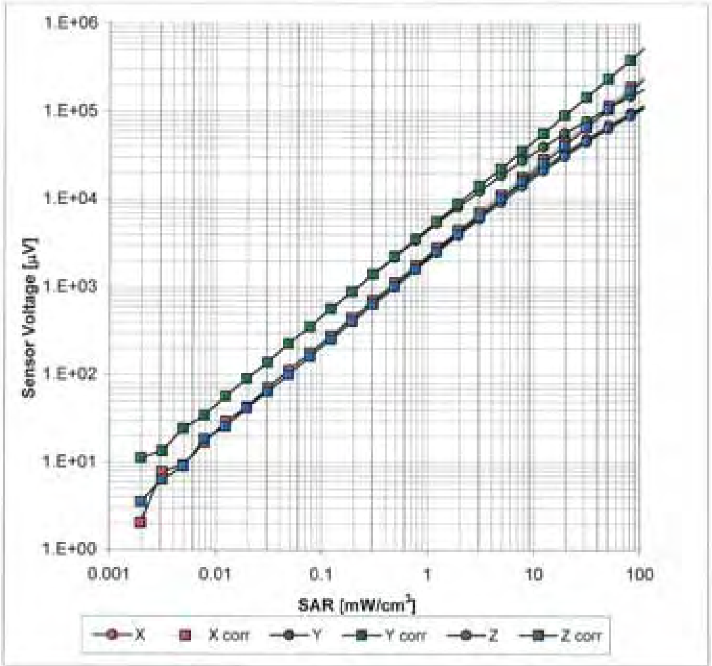


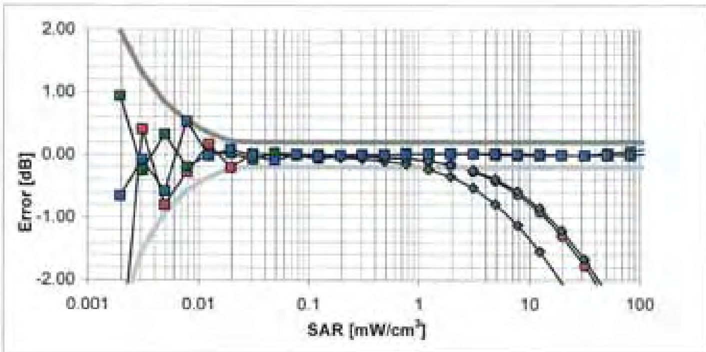


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

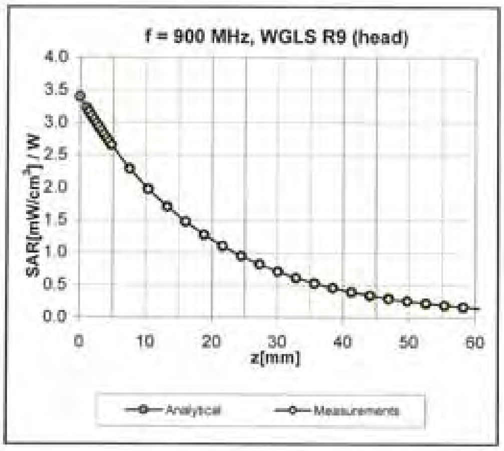
(TEM cell, f = 900 MHz)

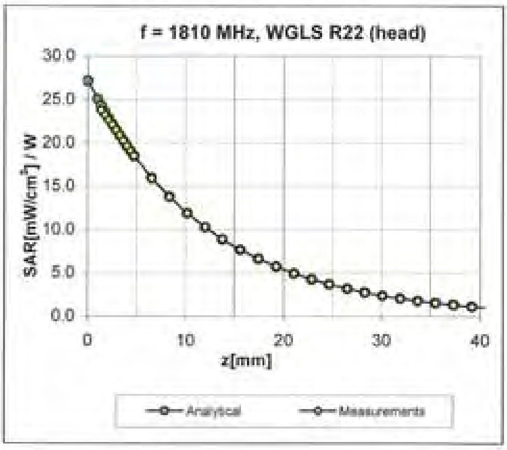




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

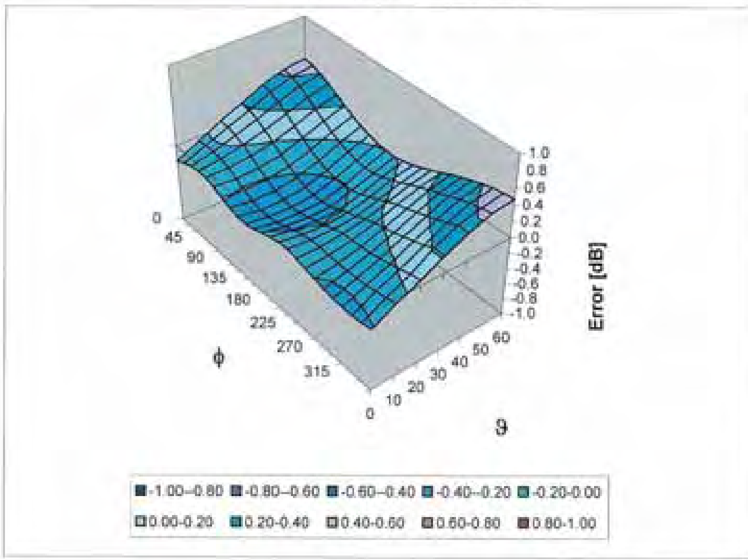
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

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

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Accreditation No.: **SCS 108**

Client: **Auden**

Certificate No: **EX3-3578_Jun11**

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3578

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: June 21, 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	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	3-May-11 (No. DAE4-654_May11)	May-12
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

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

Issued: June 21, 2011

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) 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:

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

Probe EX3DV4

SN:3578

Manufactured: November 4, 2005
Calibrated: June 21, 2011

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3578

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.53	0.50	0.56	± 10.1 %
DCP (mV)[B]	101.0	99.8	100.5	

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	117.4	±1.7 %
			Y	0.00	0.00	1.00	116.2	
			Z	0.00	0.00	1.00	123.2	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see 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:3578

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	8.66	8.66	8.66	0.80	0.71	± 12.0 %
835	41.5	0.90	8.33	8.33	8.33	0.80	0.69	± 12.0 %
900	41.5	0.97	8.21	8.21	8.21	0.80	0.69	± 12.0 %
1750	40.1	1.37	7.62	7.62	7.62	0.80	0.70	± 12.0 %
1900	40.0	1.40	7.26	7.26	7.26	0.80	0.69	± 12.0 %
2000	40.0	1.40	7.21	7.21	7.21	0.80	0.68	± 12.0 %
2450	39.2	1.80	6.42	6.42	6.42	0.80	0.68	± 12.0 %
5200	36.0	4.66	4.26	4.26	4.26	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.06	4.06	4.06	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.12	4.12	4.12	0.45	1.80	± 13.1 %
5600	35.5	5.07	3.94	3.94	3.94	0.40	1.80	± 13.1 %
5800	35.3	5.27	3.84	3.84	3.84	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.

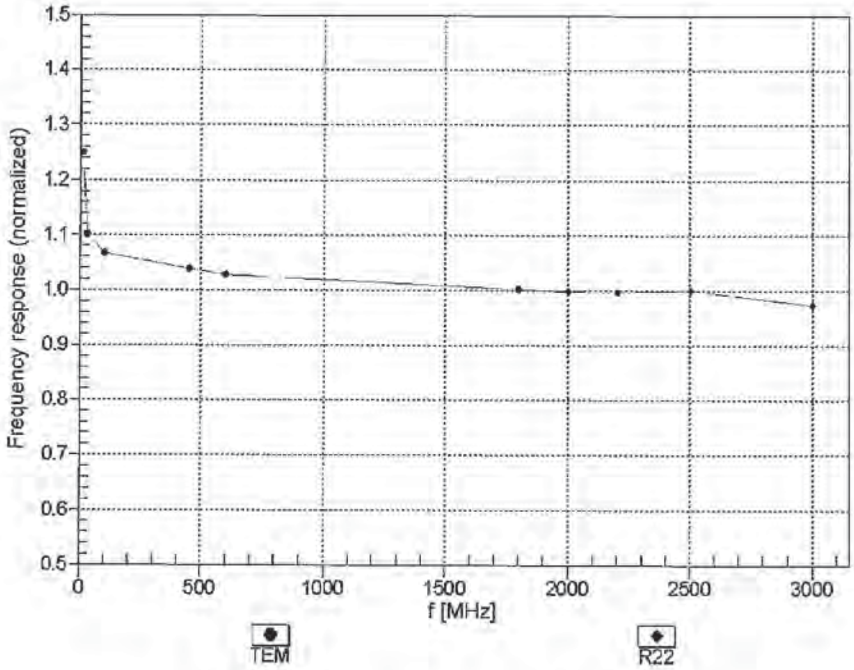
DASY/EASY - Parameters of Probe: EX3DV4- SN:3578

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	8.77	8.77	8.77	0.80	0.75	± 12.0 %
835	55.2	0.97	8.45	8.45	8.45	0.80	0.75	± 12.0 %
900	55.0	1.05	8.34	8.34	8.34	0.80	0.72	± 12.0 %
1750	53.4	1.49	7.19	7.19	7.19	0.80	0.75	± 12.0 %
1900	53.3	1.52	6.68	6.68	6.68	0.80	0.73	± 12.0 %
2000	53.3	1.52	6.68	6.68	6.68	0.80	0.73	± 12.0 %
2450	52.7	1.95	6.18	6.18	6.18	0.80	0.50	± 12.0 %
5200	49.0	5.30	3.74	3.74	3.74	0.55	1.90	± 13.1 %
5300	48.9	5.42	3.49	3.49	3.49	0.55	1.90	± 13.1 %
5500	48.6	5.65	3.40	3.40	3.40	0.60	1.90	± 13.1 %
5600	48.5	5.77	3.11	3.11	3.11	0.65	1.90	± 13.1 %
5800	48.2	6.00	3.23	3.23	3.23	0.65	1.90	± 13.1 %

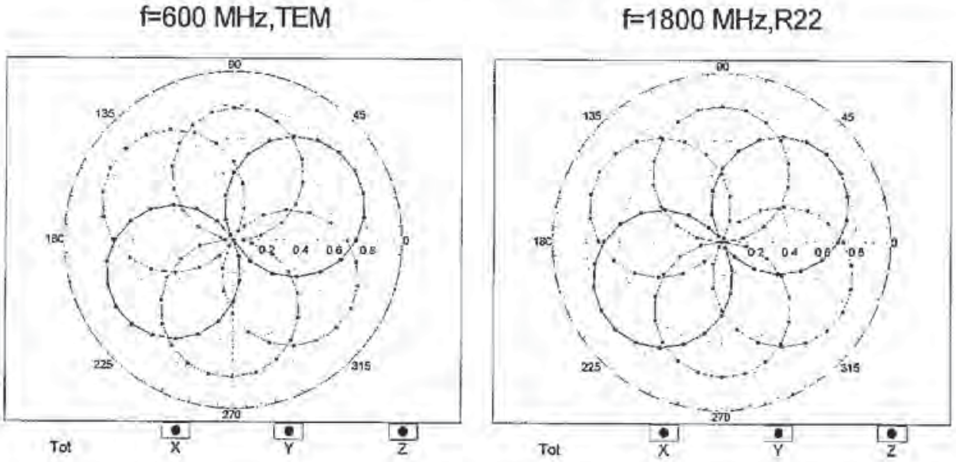
[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of 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.

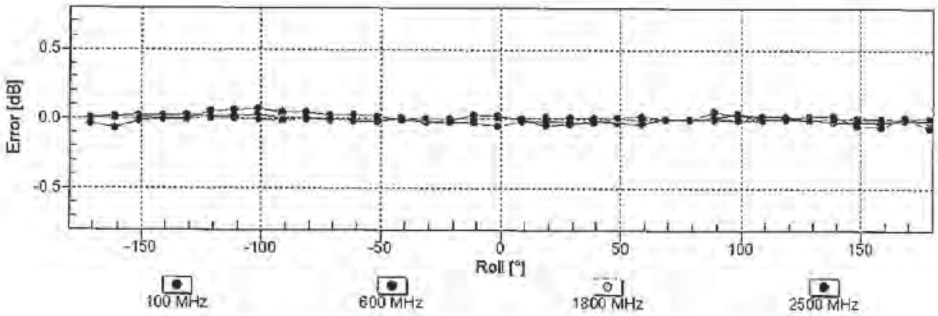
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

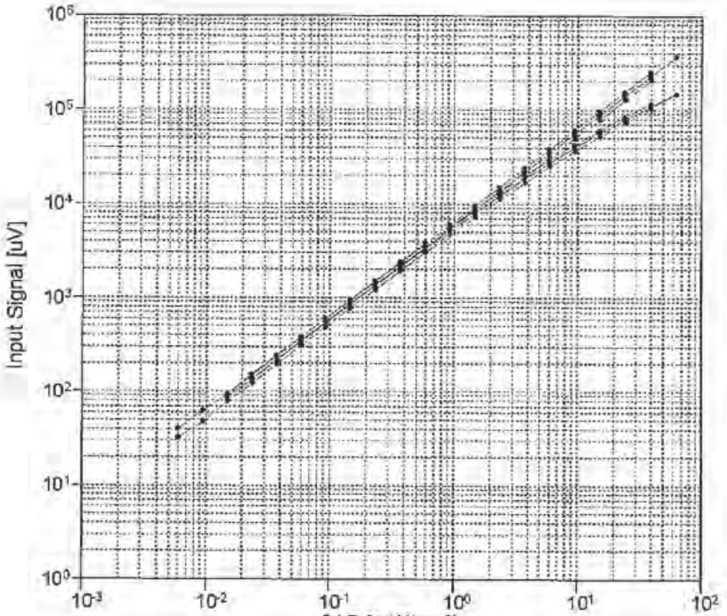
Receiving Pattern (ϕ), $\vartheta = 0°$



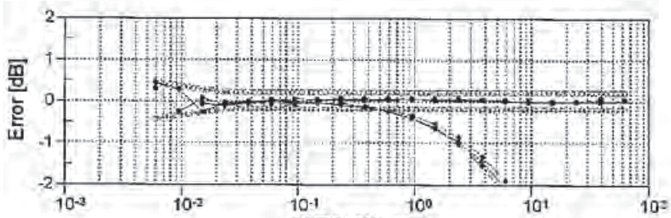


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)



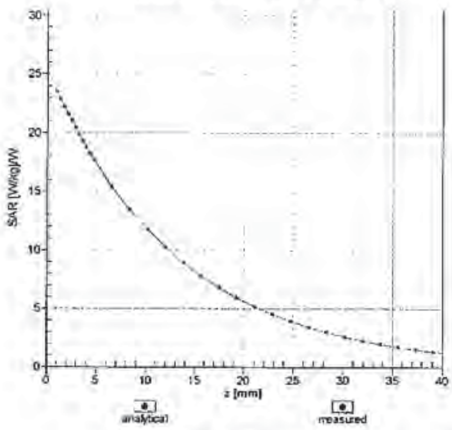
X compensated | X not compensated | Y compensated
Y not compensated | Z compensated | Z not compensated

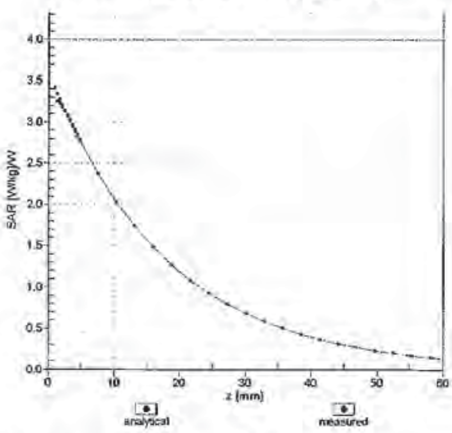


X compensated | X not compensated | Y compensated
Y not compensated | Z compensated | Z not compensated

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

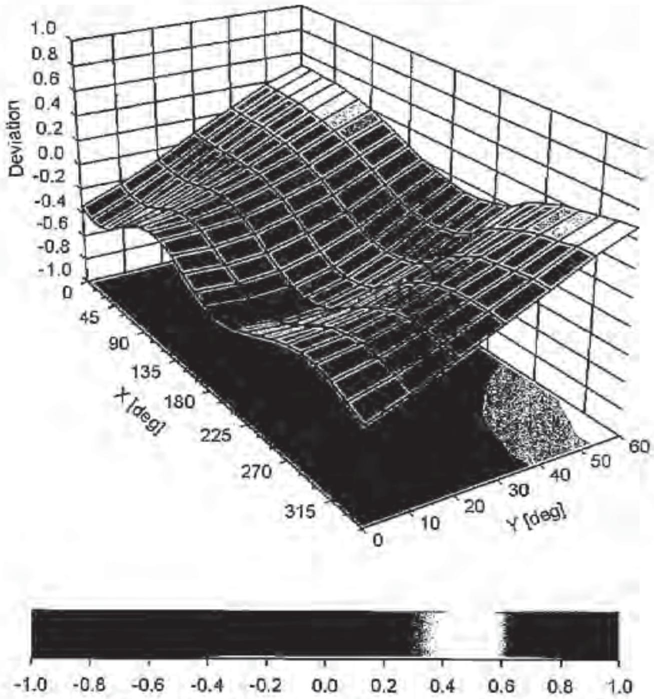
Conversion Factor Assessment





Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3578

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

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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **DAE4-779_Jan11**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 779
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	January 31, 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
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	i.V.

Issued: January 31, 2011

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

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Accreditation No.: **SCS 108**

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100…+300 mV

Low Range: 1LSB = 61nV , full range = -1…….+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.517 ± 0.1% (k=2)	403.748 ± 0.1% (k=2)	403.972 ± 0.1% (k=2)
Low Range	3.96927 ± 0.7% (k=2)	3.98585 ± 0.7% (k=2)	3.99915 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	155.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200001.8	6.19	0.00
Channel X	+ Input	20003.75	4.25	0.02
Channel X	- Input	-19996.56	3.04	-0.02
Channel Y	+ Input	200005.0	0.90	0.00
Channel Y	+ Input	20000.78	1.38	0.01
Channel Y	- Input	-19996.43	2.97	-0.01
Channel Z	+ Input	200002.2	-1.15	-0.00
Channel Z	+ Input	19999.59	0.19	0.00
Channel Z	- Input	-19995.05	4.35	-0.02

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.4	0.25	0.01
Channel X	+ Input	200.27	0.37	0.18
Channel X	- Input	-199.08	1.12	-0.56
Channel Y	+ Input	2000.1	0.19	0.01
Channel Y	+ Input	199.01	-0.89	-0.45
Channel Y	- Input	-199.30	0.50	-0.25
Channel Z	+ Input	1999.6	-0.40	-0.02
Channel Z	+ Input	199.22	-0.88	-0.44
Channel Z	- Input	-200.27	-0.37	0.19

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-3.66	-5.39
	- 200	5.82	4.90
Channel Y	200	13.39	13.58
	- 200	-14.98	-15.16
Channel Z	200	2.20	2.53
	- 200	-4.84	-4.61

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.33	-0.57
Channel Y	200	1.97	-	3.29
Channel Z	200	1.19	-0.28	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15613	15134
Channel Y	15831	16218
Channel Z	16150	17743

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.26	-1.03	0.79	0.42
Channel Y	0.52	-1.04	2.07	0.58
Channel Z	-2.22	-3.25	-0.85	0.44

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9