SAR TEST REPORT

Equipment Under Test	CDMA cellular phone
Product Name	CDMA TS002
Model Name	CN9-J01
Company Name	Toshiba Corporation, Mobile Communications Co., Quality Management Division
Company Address	1-1, Asahigaoka 3-Chome, Hino-Shi, Tokyo, 191-8555,Japan
Date of Receipt	2009.03.05
Date of Test(s)	2009.03.22-2009.03.23
Date of Issue	2009.03.27

Standards:

FCC OET Bulletin 65 supplement C,
ANSI / IEEE C95.1, C95.3, IEEE 1528

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronic & Communication Laboratory or testing done by SGS Taiwan Electronic & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronic & Communication Laboratory in writing.

Antony Wu

Tested by : Antony Wu **Date : 2009.03.26**
Engineer

Robert Chang

Approved by : Robert Chang **Date : 2009.03.27**
Tech Manager

Contents

1. General Information

1.1 Testing Laboratory

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1.2 Details of Applicant

Company Name	Toshiba Corporation, Mobile Communications Co., Quality Management Division
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1.3 Description of EUT

EUT Name	CDMA cellular phone
Product Name	CDMA TS002
FCC ID	WVS-CN9-J01
Model Name	CN9-J01
Marketing Name	T002

Mode of Operation	GSM/GPRS/cdma2000		
Definition	Production unit		
Duty Cycle	GSM	GPRS	cdma2000
	1/8	1/4	1
Maximum RF Conducted Power (Average)	PCS 1900		cdma Cellular
	29.5dbm		24.85dbm
TX Frequency Range (MHz)	PCS 1900		cdma Cellular
	1850.2-1909.8		824.7-848.31
Channel Number (ARFCN)	PCS 1900		cdma Cellular
	512-810		1013-777
Battery Type	3.7 V Lithium-Ion		
Antenna Type	Internal Antenna		
Max. SAR Measured (1 g)	Head		Body
	0.74 mW/g (At Cellular Band_Cheek Position 384 Channel)		**0.857 mW/g** (At Cellular Band_Body 777 Channel repeated with Memory card)

1.4 Test Environment

Ambient Temperature: 22±2° C
Tissue Simulating Liquid: 22±2° C

1.5 Operation description

General:

1. The EUT is controlled by using a Radio Communication Tester (Agilent 8960), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.

3. During the SAR testing, the DASY5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. Testing Head SAR at lowest, middle and highest channel for all bands with flat phantom (note: explain in sec.1.6)
5. Testing body-worn SAR by separating **1.5cm** between back side of EUT to flat phantom.

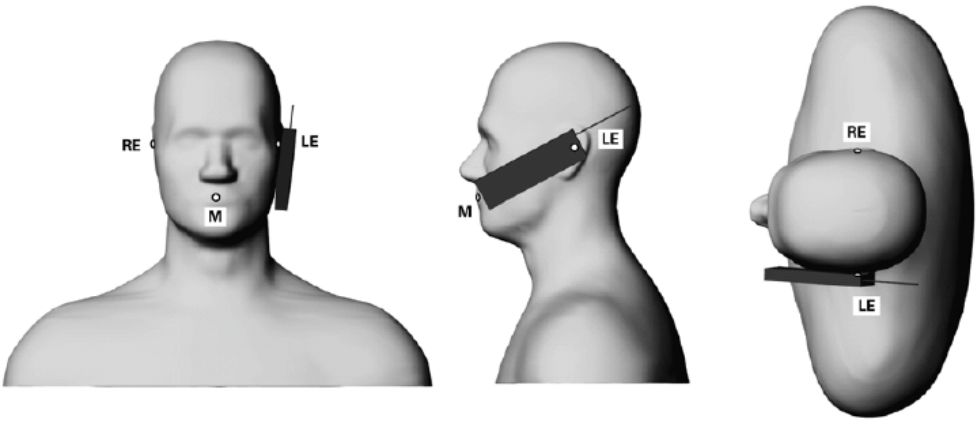
Additional configuration (Head) :

6. For highest SAR configuration in this band repeated with external Memory card inside.

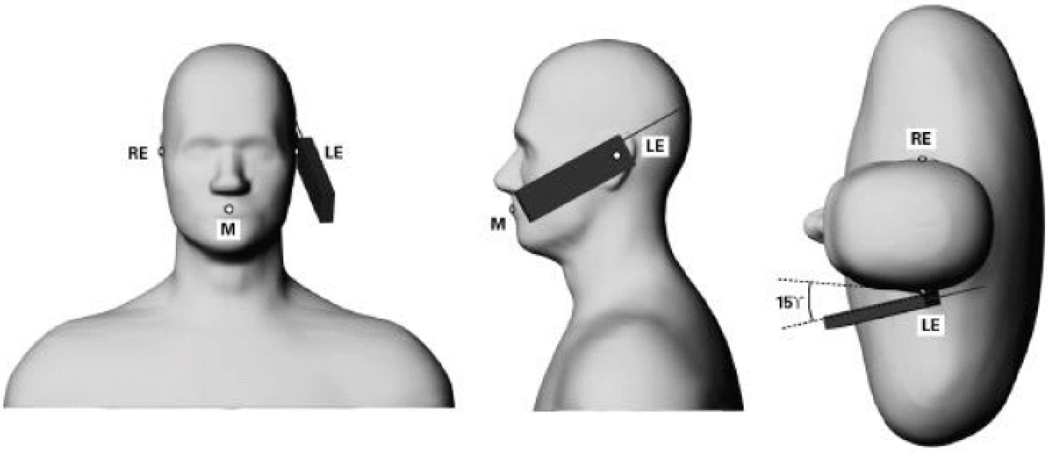
Additional configuration (Body) :

7. Testing body-worn SAR with Handset and Bluetooth transmitter OFF by separating **1.5cm** between front side of EUT to flat phantom.
8. For highest SAR configuration in this band repeated with external Memory card inside.
9. For highest SAR configuration in this band repeated with headset.

1.6 Positioning Procedure



Phone position 1, “cheek” or “touch” position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning

Cheek/Touch Position:

the handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

Due to extra long of this clam-shell type phone with antenna located in the bottom of the phone. The Hotspot happens in the mouth and Jaw area, and difficult to make whole measurement. According to KDB648474 , we use flat-phantom instead. The phones was positioned with the hinge against a smooth edge of the flat phantom where the upper half of the phone is unfolded and extended beyond the phantom side wall. The lower half of the phone is secured in the test device holder at a fixed distance below the flat phantom determined by the minimum separation along the lower edge of the phone in the cheek touching position using SAM. And , there is no left ear or right ear difference when using flat phantom.

1.7 EVALUATION PROCEDURES

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 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

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

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within –2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). 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 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated.

This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.8 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). A Model ES3DV3 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement

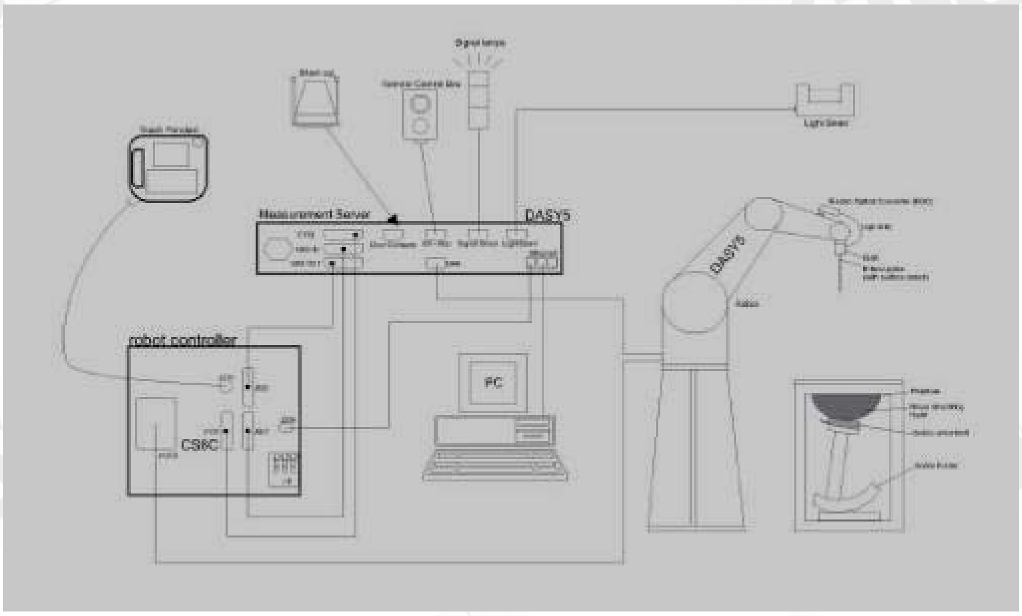

Fig.a The block diagram of SAR system

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

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software.

An arm extension is for accommodating the data acquisition electronics (DAE).

- 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.

- 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.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

1.9 System Components

ES3DV3 E-Field Probe

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration:	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL850 & HSL1900 Additional CF for other liquids and frequencies upon request	ES3DV3 E-Field Probe
Frequency:	10 MHz to > 3 GHz; Linearity: ± 0.6 dB (30 MHz to 6 GHz)	

Directivity:	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range:	10 μW/g to > 100 mW/g; Linearity: ± 0.6 dB (noise: typically < 1 μW/g)
Dimensions:	Overall length: 337 mm (Tip: 10 mm) Tip diameter: 4 mm (Body: 10 mm) Typical distance from probe tip to dipole centers: 2 mm
Application:	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

SAM PHANTOM V4.0C

Construction:	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
Shell Thickness:	2 ± 0.2 mm
Filling Volume:	Approx. 25 liters
Dimensions:	Height: 850 mm; Length: 1000 mm; Width: 500 mm

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DEVICE HOLDER

Construction	In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).	 Device Holder

1.10 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 850 & 1900 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was in the range 22.2°C, the relative humidity was in the range 62% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

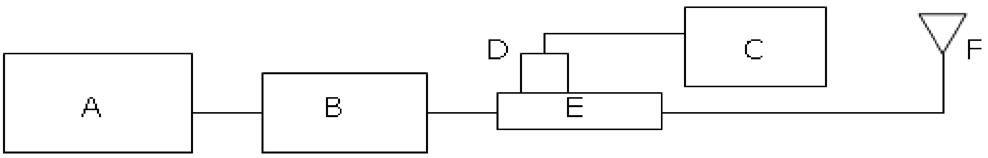

Fig.b The block diagram for SAR system verification

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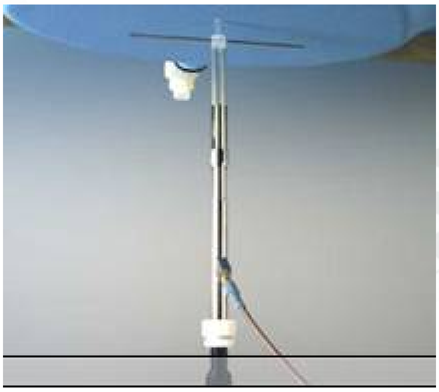
A. Agilent Model 8648D Signal Generator
B. Mini circuits Model ZHL-42 Amplifier
C. Agilent Model E4416A Power Meter
D. Agilent Model 8481H Power Sensor
E. Agilent Model 778D Dual directional coupling
F. Reference dipole antenna


Photograph of the dipole Antenna

Validation Kit	Frequency (MHz)	Target SAR (1g) (Pin=250mW)	Measured SAR (1g)	Variation	Measured Date
D835V2 S/N: 4d063	835 MHz (Head)	2.29 mW/g	2.36 mW/g	3.1%	2009/03/23
D835V2 S/N: 4d063	835 MHz (Body)	2.44 mW/g	2.39 mW/g	2%	2009/03/22
D1900V2 S/N: 5d027	1900MHZ (Head)	10.3 mW/g	10.7 mW/g	3.8%	2009/03/23
D1900V2 S/N: 5d027	1900MHZ (Body)	9.64 mW/g	9.95 mW/g	3.2%	2009/03/22

Table 1. Result of System validation

1.11 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the HP Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjuncation with HP 8753D Network Analyzer (30 KHz-6000MHz) by using a procedure detailed in Section V.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the ear reference point of the phantom was 15cm±5mm during all tests. (Appendix Fig .2)

Frequency (MHz)	Tissue type	Measurement date/ Limits	Dielectric Parameters		
			ρ	σ (S/m)	Simulated Tissue Temperature(° C)

850	Head	Measured, 2009.03.23	42.2	0.907	21.7
		Recommended Limits	38.38-42.42	0.84-0.92	20-24
850	Body	Measured, 2009.03.22	55.2	0.95	21.7
		Recommended Limits	50.73-56.07	0.94-1.04	20-24
1900	Head	Measured, 2009.03.23	40.3	1.47	21.7
		Recommended Limits	38.1-42.11	1.4-1.54	20-24
1900	Body	Measured, 2009.03.22	53.7	1.57	21.7
		Recommended Limits	48.83-53.97	1.48-1.64	20-24

Table 2. Dielectric Parameters of Tissue Simulant Fluid

The composition of the brain tissue simulating liquid for 850 & 1900 band:

Ingredient	850MHz (Head)	850MHz (Body)	1900MHz (Head)	1900MHz (Body)
DGMBE	X	X	444.52 g	300.67g
Water	532.98 g	631.68 g	552.42 g	716.56 g
Salt	18.3 g	11.72 g	3.06 g	4.0 g
Preventol D-7	2.4 g	1.2 g	X	X
Cellulose	3.2 g	X	X	X
Sugar	766.0 g	600 g	X	X
Total amount	1 L (1.0kg)	1 L (1.0kg)	1 L (1.0kg)	1 L (1.0kg)

Table 3. Recipes for tissue simulating liquid

1.12 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1–1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for

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occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR (Brain)	1.60 m W/g	8.00 m W/g
Spatial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

Table 4. RF exposure limits

Notes:
1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

2. Summary of Results

cdma Cellular Band

Mouth with flatphantom (Cheek Position)						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.7	24.85dbm	0.414	22.1	21.7
	384	836.52	24.70dbm	0.74	22.1	21.7
	777	848.31	24.72dbm	0.626	22.1	21.7
Mouth with flatphantom(Cheek Position) _repeated with Memory card						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	384	836.52	24.70dbm	0.642	22.1	21.7
Mouth with flatphantom (15° Tilt Position)						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.7	24.85dbm	0.117	22.1	21.7
	384	836.52	24.70dbm	0.191	22.1	21.7
	777	848.31	24.72dbm	0.139	22.1	21.7
Body worn						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.7	24.85dbm	0.546	22.1	21.7
	384	836.52	24.70dbm	0.734	22.1	21.7
	777	848.31	24.72dbm	0.777	22.1	21.7
Body worn_ repeated for EUT front to phantom						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	777	848.31	24.72dbm	0.499	22.1	21.7
Body worn_ repeated with Memory card						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	777	848.31	24.72dbm	0.857	22.1	21.7

Body Worn_ repeated with headset

Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	777	848.31	24.72dbm	0.774	22.1	21.7

PCS 1900

Mouth with flatphantom (Cheek Position)						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900 MHz	512	1850.2	29.5dbm	0.369	22.1	21.7
	661	1800	29.3dbm	0.449	22.1	21.7
	810	1909.8	28.7dbm	0.472	22.1	21.7
Mouth with flatphantom (15° Tilt Position)						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900 MHz	512	1850.2	29.5dbm	0.162	22.1	21.7
	661	1800	29.3dbm	0.175	22.1	21.7
	810	1909.8	28.7dbm	0.183	22.1	21.7
Body worn with GPRS mode						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900 MHz	512	1850.2	25.1dbm	0.316	22.1	21.7
	661	1800	24.8dbm	0.348	22.1	21.7
	810	1909.8	24.3dbm	0.288	22.1	21.7

Note: SAR measurement results for the Mobile Phone at maximum output power.

3. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration
Schmid & Partner Engineering AG	Dosimetric E-FieldProbe	ES3DV3	3172	Jun.23.2008
Schmid & Partner Engineering AG	850MHz System Validation Dipole	D835V2	4d063	Jun.06.2008
		D1900V2	5d027	Apr.15.2008
Schmid & Partner Engineering AG	Data acquisition Electronics	DAE4	856	May.07.2008
Schmid & Partner Engineering AG	Software	DASY 5 V5.0 Build125	N/A	Calibration not required
Schmid & Partner Engineering AG	Phantom	SAM	N/A	Calibration not required
Agilent	Network Analyzer	8753D	3410A56662	Apr.16.2008
Agilent	Dielectric Probe Kit	85070D	US01440168	Calibration not required
Agilent	Dual-directional coupler	778D	50313	Aug.26.2008
Agilent	RF Signal Generator	E4438c	MY45093613	May.21.2008
Agilent	Power Sensor	8481H	MY41091361	May.20.2008
Agilent	Radio Communication Test	E5515c	GB44051912	Nov.05 .2008

4. Measurements

Date/Time: 03/23/2009 08:18:08

Mouth with flatphantom,cheek position_CH1013

DUT: CN9-J01;

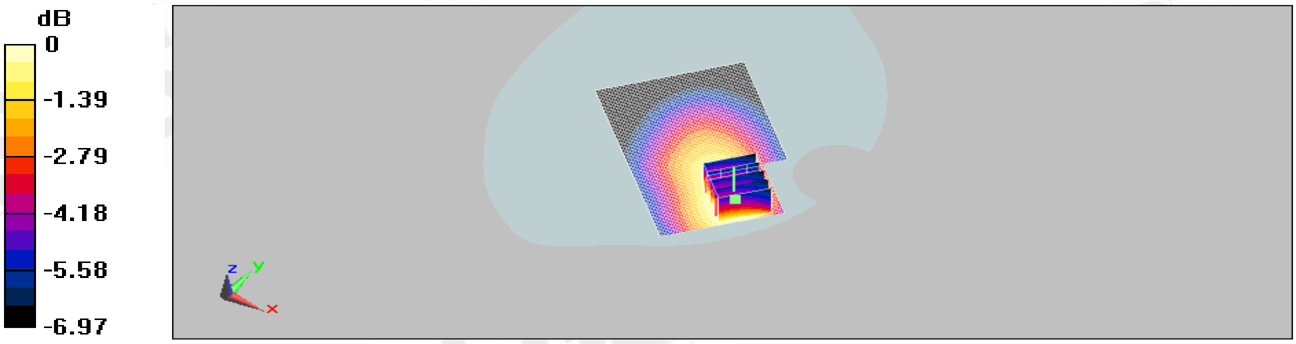
Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 824.7 MHz; σ = 0.897 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x111x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.445 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.1 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 0.545 W/kg

SAR(1 g) = 0.414 mW/g; SAR(10 g) = 0.312 mW/g
Maximum value of SAR (measured) = 0.434 mW/g



0 dB = 0.434mW/g

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Mouth with flatphantom,cheek position_CH384

DUT: CN9-J01 ;

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 836.52 MHz; σ = 0.908 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

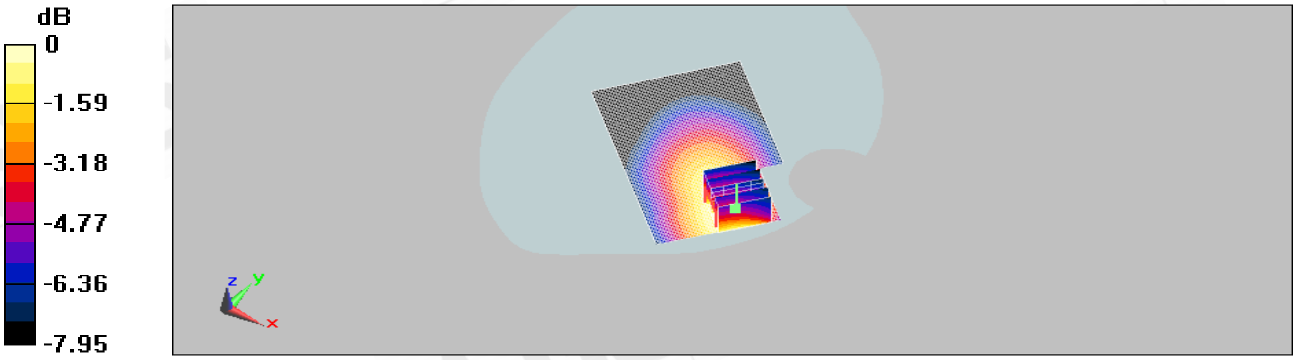
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x111x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.793 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 1 W/kg

SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.543 mW/g
Maximum value of SAR (measured) = 0.777 mW/g



0 dB = 0.777mW/g

Mouth with flatphantom,cheek position_CH777

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 848.31 MHz; σ = 0.92 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

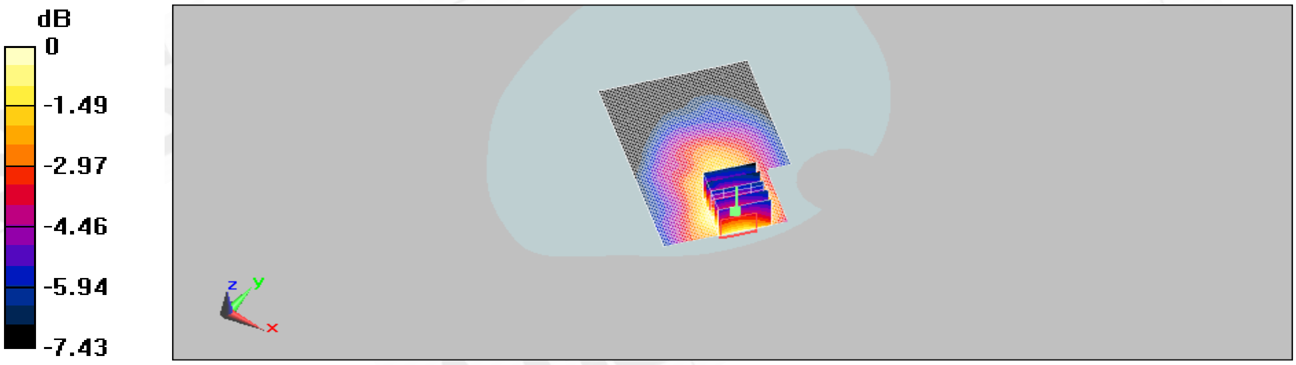
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM2; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x111x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.670 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.626 mW/g; SAR(10 g) = 0.462 mW/g
Maximum value of SAR (measured) = 0.657 mW/g



0 dB = 0.657mW/g

Mouth with flatphantom,cheek position_CH384 repeated with Memory card

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 836.52 MHz; $\sigma = 0.908$ mho/m; $\varepsilon_r = 42.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

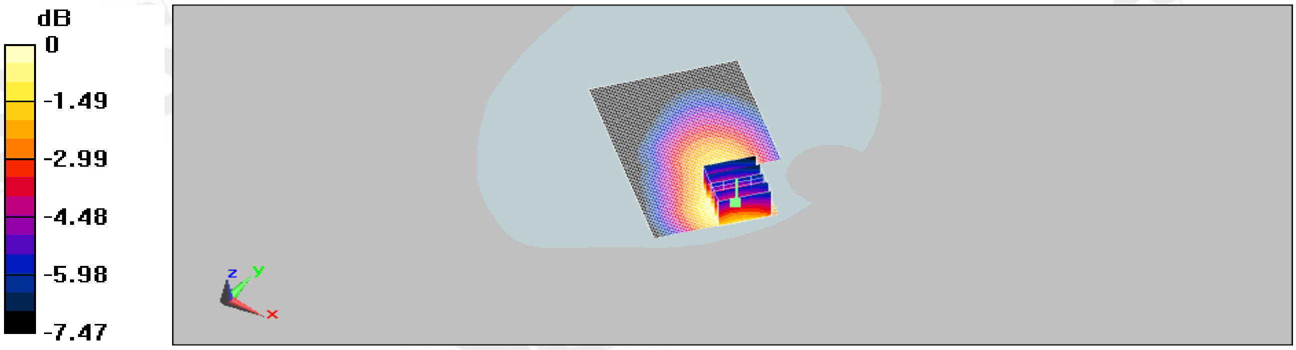
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.700 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = -0.079 dB
Peak SAR (extrapolated) = 0.851 W/kg

SAR(1 g) = 0.642 mW/g; SAR(10 g) = 0.471 mW/g
Maximum value of SAR (measured) = 0.674 mW/g



0 dB = 0.674mW/g

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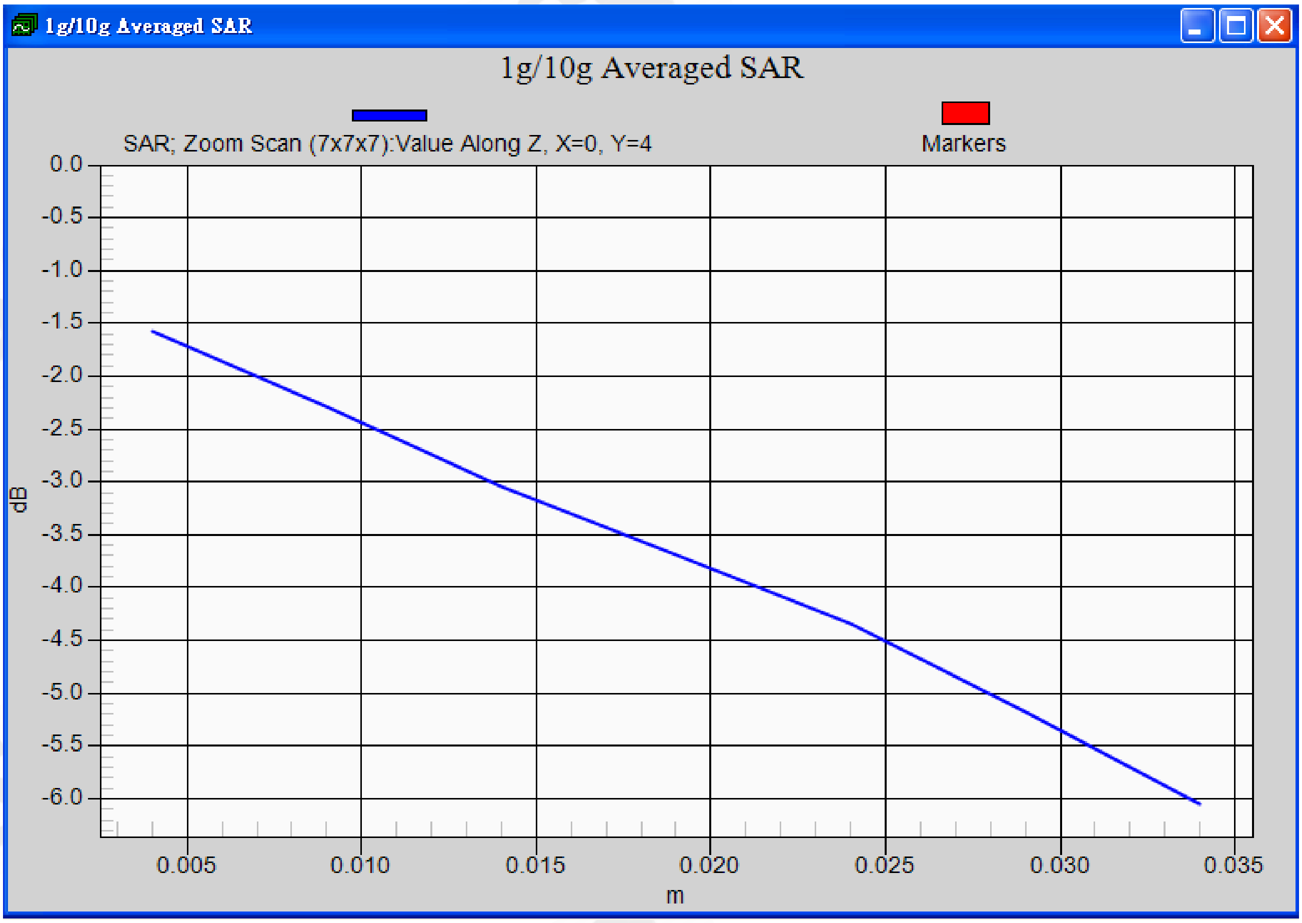

1g/10g Averaged SAR
1g/10g Averaged SAR
SAR; Zoom Scan (7x7x7):Value Along Z, X=0, Y=4
Markers
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
-4.5
-5.0
-5.5
-6.0
dB
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Mouth with flatphantom, tilt position_CH1013

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 824.7 MHz; σ = 0.897 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

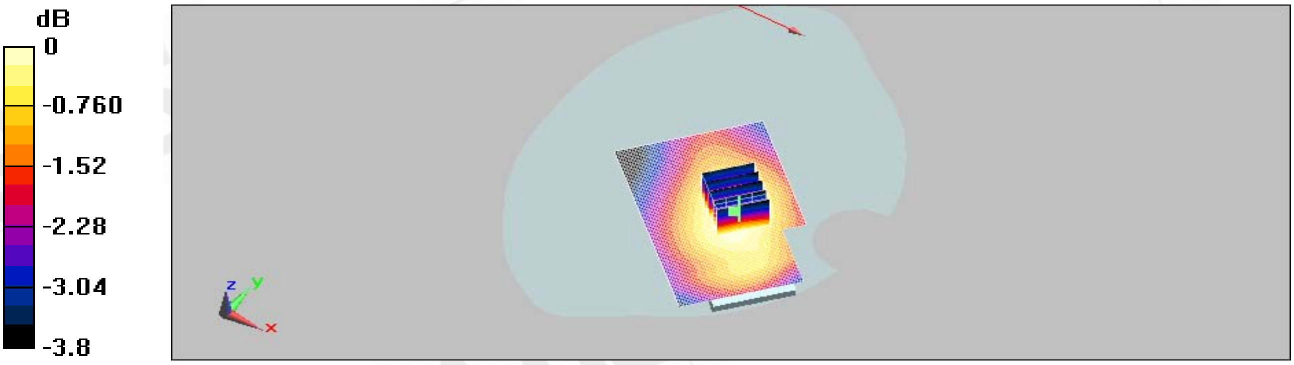
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.122 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = -0.00428 dB
Peak SAR (extrapolated) = 0.138 W/kg

SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.122 mW/g



0 dB = 0.122mW/g

Mouth with flatphantom, tilt position_CH384

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 836.52 MHz; $\sigma = 0.908$ mho/m; $\varepsilon_r = 42.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

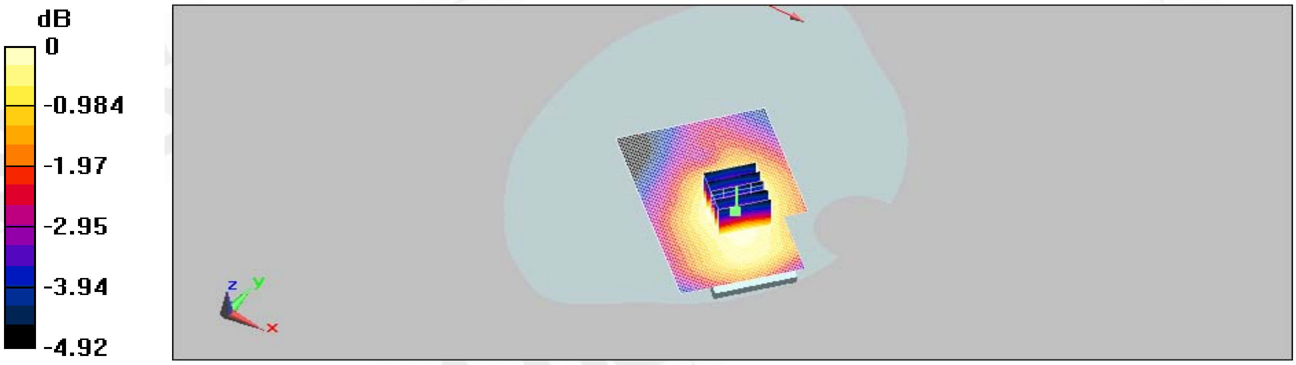
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM2; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.203 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.185 dB
Peak SAR (extrapolated) = 0.228 W/kg

SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.152 mW/g
Maximum value of SAR (measured) = 0.200 mW/g



0 dB = 0.200mW/g

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Mouth with flatphantom, tilt position_CH777

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Head 900 Medium parameters used (extrapolated): f = 848.31 MHz; σ = 0.92 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

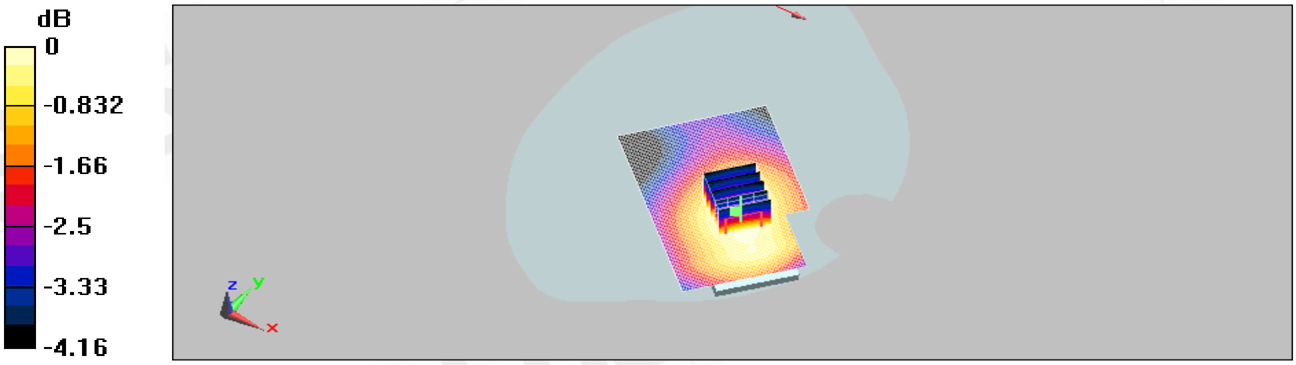
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM2; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.146 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.93 V/m; Power Drift = 0.109 dB
Peak SAR (extrapolated) = 0.162 W/kg

SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.115 mW/g
Maximum value of SAR (measured) = 0.145 mW/g



0 dB = 0.145mW/g

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Date/Time: 03/22/2009 23:09:17

BODY_CH1013

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 824.7 MHz; $\sigma = 0.948$ mho/m; $\varepsilon_r = 55.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

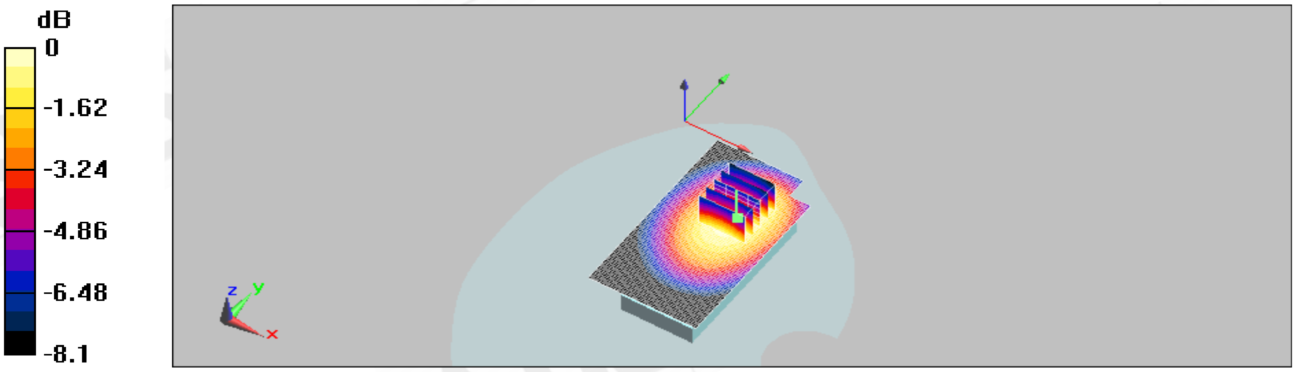
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.569 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.61 V/m; Power Drift = 0.136 dB
Peak SAR (extrapolated) = 0.698 W/kg

SAR(1 g) = 0.546 mW/g; SAR(10 g) = 0.406 mW/g
Maximum value of SAR (measured) = 0.574 mW/g



0 dB = 0.574mW/g

Date/Time: 03/22/2009 23:38:46

BODY_CH384

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 836.52 MHz; σ = 0.952 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

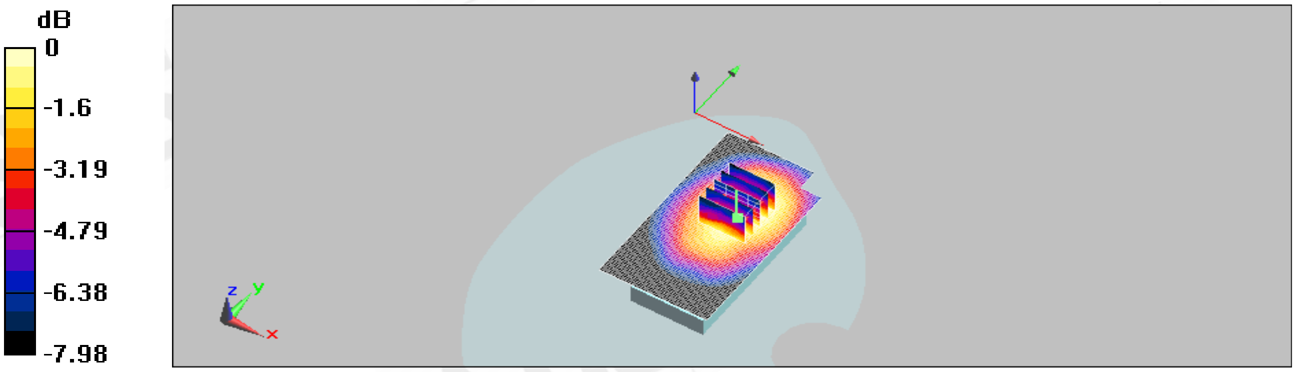
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.817 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = -0.176 dB
Peak SAR (extrapolated) = 1.17 W/kg

SAR(1 g) = 0.734 mW/g; SAR(10 g) = 0.534 mW/g
Maximum value of SAR (measured) = 0.794 mW/g



0 dB = 0.794mW/g

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BODY_CH777

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 848.31 MHz; σ = 0.965 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

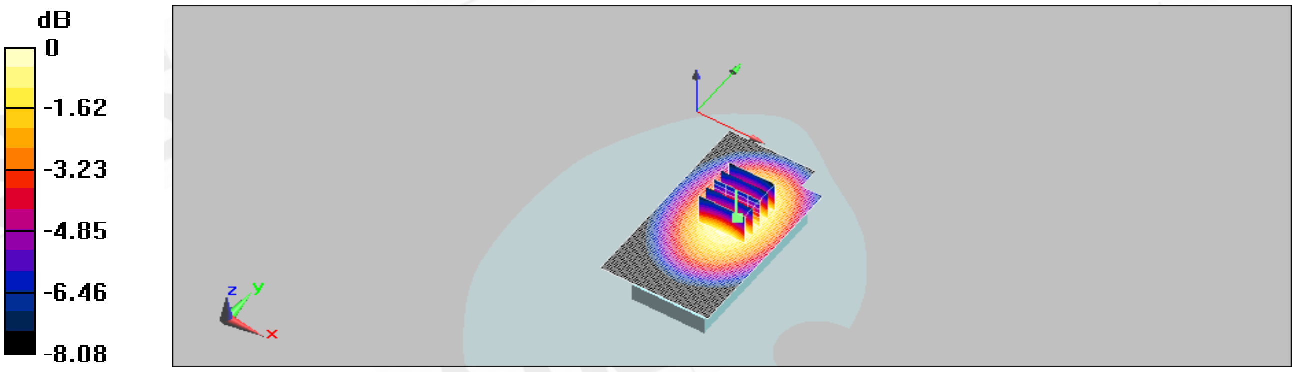
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.812 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.981 W/kg

SAR(1 g) = 0.777 mW/g; SAR(10 g) = 0.577 mW/g
Maximum value of SAR (measured) = 0.822 mW/g



0 dB = 0.822mW/g

Date/Time: 03/23/2009 00:37:04

BODY_CH777 repeated for EUT front to phantom

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 848.31 MHz; σ = 0.965 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

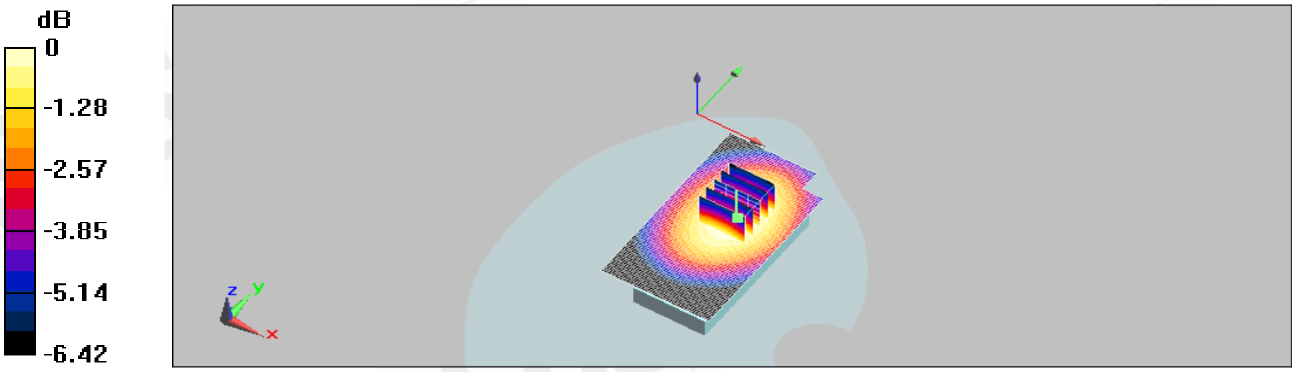
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.539 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 0.623 W/kg

SAR(1 g) = 0.499 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.525 mW/g



0 dB = 0.525mW/g

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BODY_CH777 repeated with Memory card

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 848.31 MHz; $\sigma = 0.965$ mho/m; $\varepsilon_r = 55.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

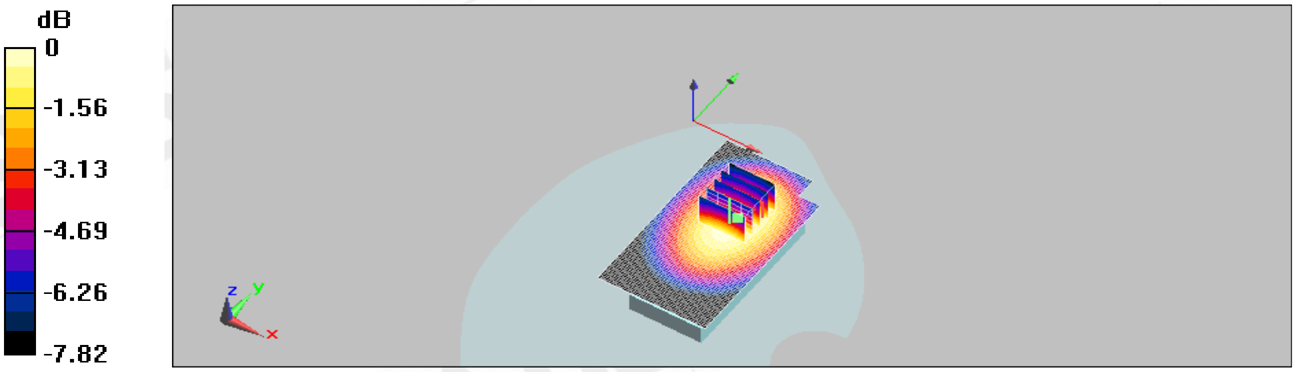
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.902 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.642 mW/g
Maximum value of SAR (measured) = 0.908 mW/g



0 dB = 0.908mW/g

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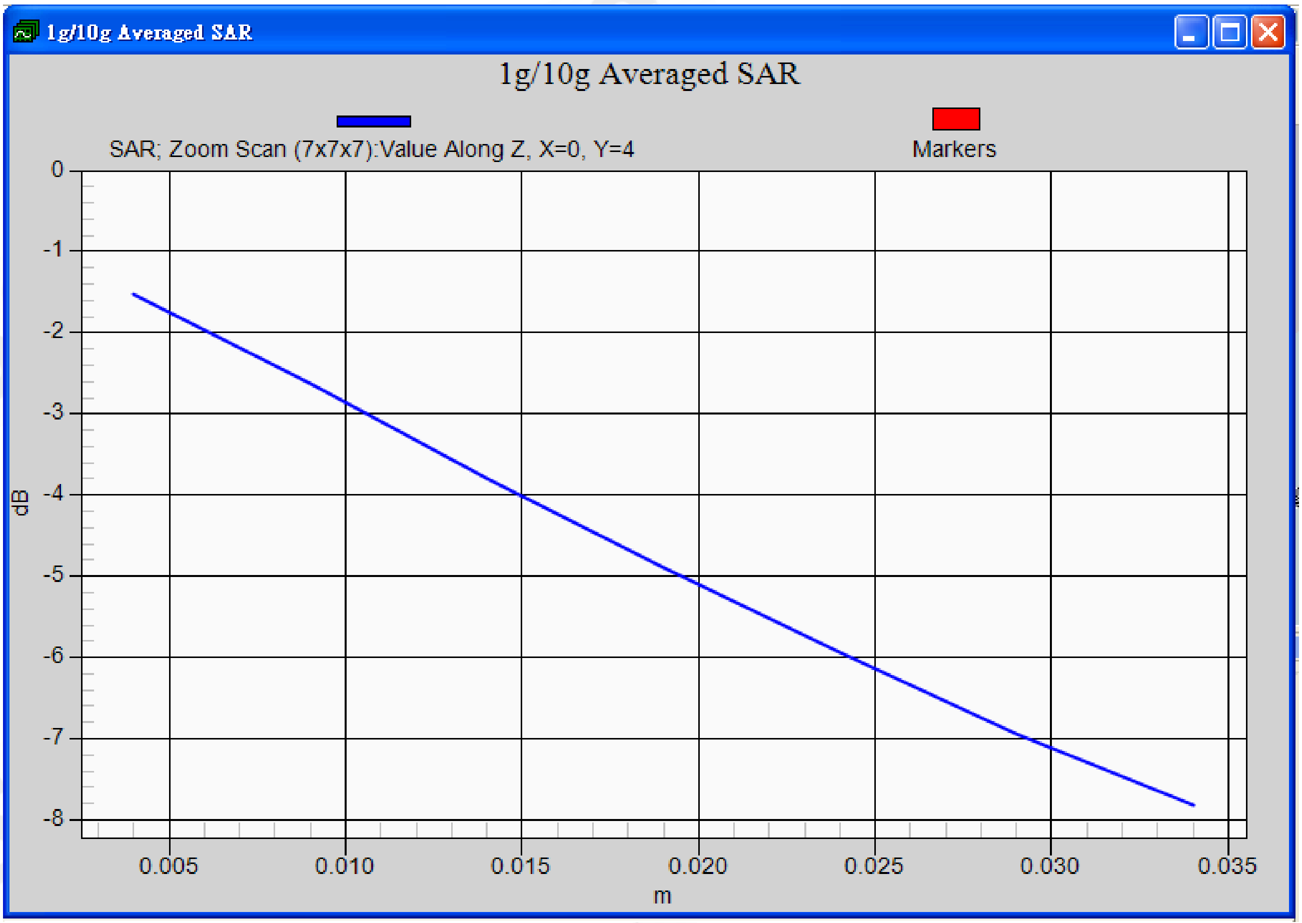

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Date/Time: 03/23/2009 01:41:08

BODY_CH777 repeated with headset

DUT: CN9-J01;

Communication System: CDMA_Cellular; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Body900 Medium parameters used (extrapolated): f = 848.31 MHz; σ = 0.965 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

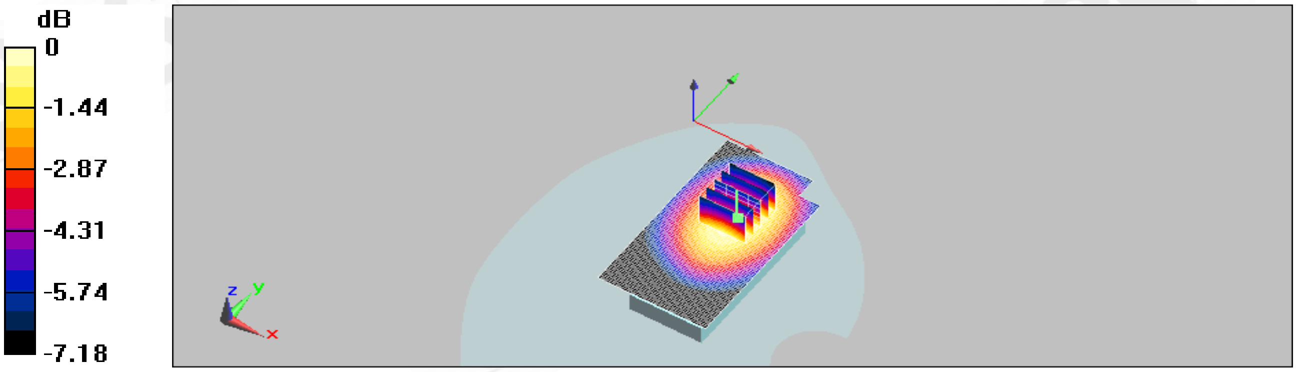
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.803 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.047 dB
Peak SAR (extrapolated) = 0.972 W/kg

SAR(1 g) = 0.774 mW/g; SAR(10 g) = 0.583 mW/g
Maximum value of SAR (measured) = 0.826 mW/g



0 dB = 0.826mW/g

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Date/Time: 03/23/2009 04:03:59

Mouth with flatphantom, cheek position_CH512

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.43 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

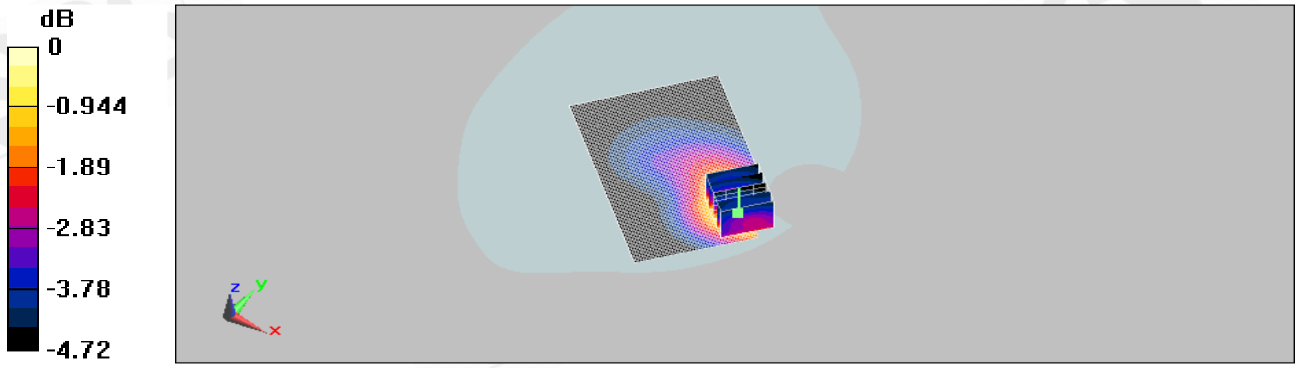
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.394 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = 0.00181 dB
Peak SAR (extrapolated) = 0.517 W/kg

SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.275 mW/g
Maximum value of SAR (measured) = 0.387 mW/g



0 dB = 0.387mW/g

Date/Time: 03/23/2009 04:31:02

Mouth with flatphantom, cheek position_CH661

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

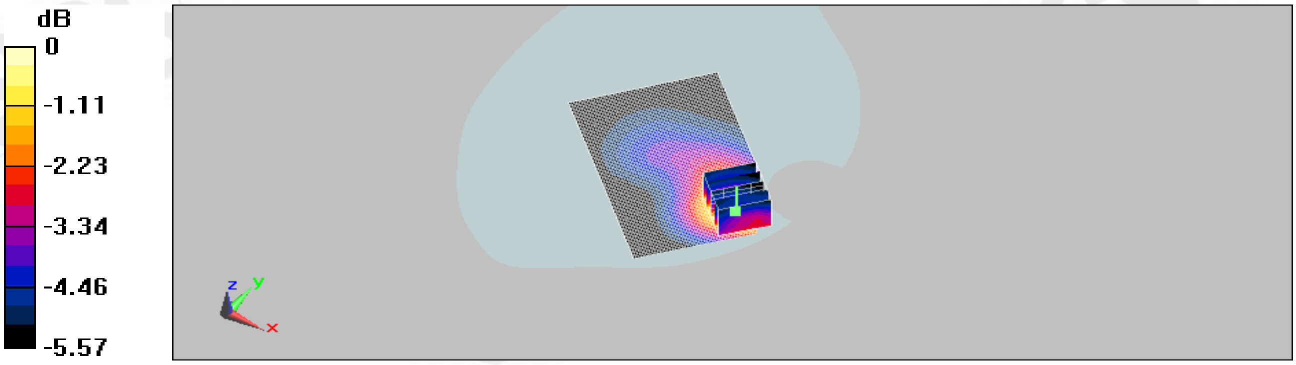
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.484 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.166 dB
Peak SAR (extrapolated) = 0.641 W/kg

SAR(1 g) = 0.449 mW/g; SAR(10 g) = 0.321 mW/g
Maximum value of SAR (measured) = 0.473 mW/g



0 dB = 0.473mW/g

Date/Time: 03/23/2009 05:03:32

Mouth with flatphantom, cheek position_CH810

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1910 MHz; σ = 1.48 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

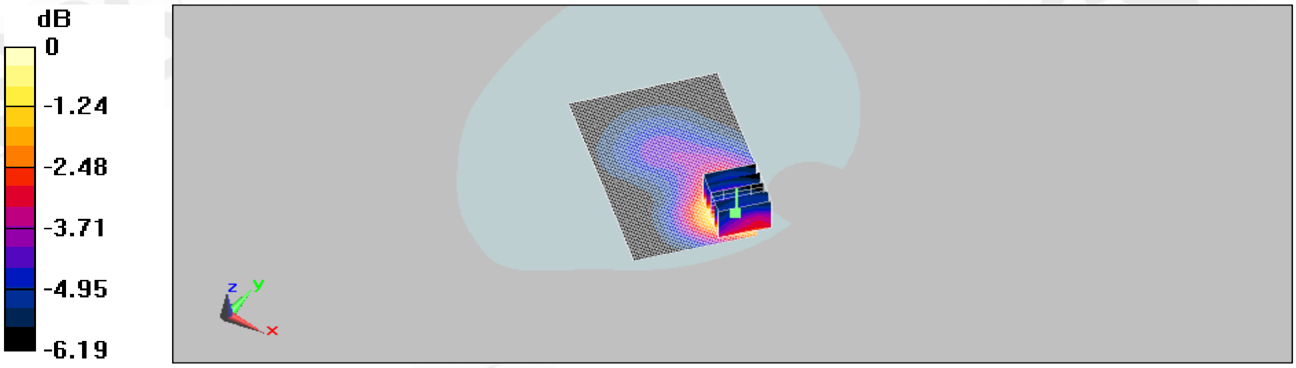
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,cheek position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.516 mW/g

Mouth with flatphantom,cheek position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.198 dB
Peak SAR (extrapolated) = 0.689 W/kg

SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.502 mW/g



0 dB = 0.502mW/g

Date/Time: 03/23/2009 05:31:05

Mouth with flatphantom, tilt position_CH512

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.43 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

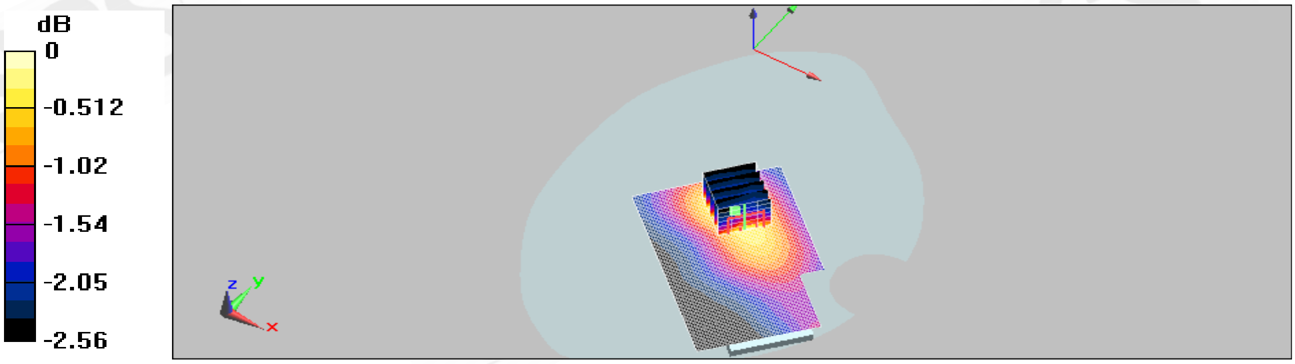
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.167 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.064 dB
Peak SAR (extrapolated) = 0.193 W/kg

SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 0.174 mW/g



0 dB = 0.174mW/g

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Date/Time: 03/23/2009 06:02:16

Mouth with flatphantom, cheek position_CH661

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

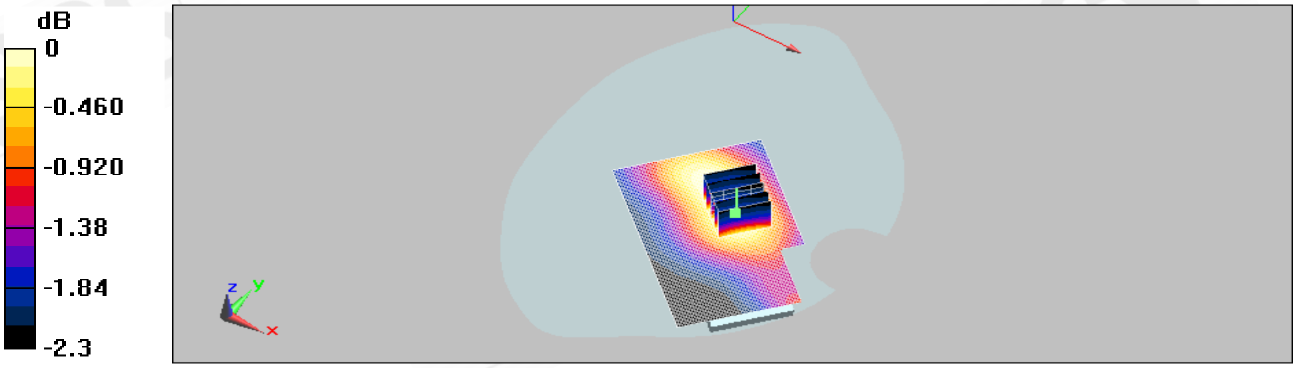
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.183 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = -0.144 dB
Peak SAR (extrapolated) = 0.202 W/kg

SAR(1 g) = 0.175 mW/g; SAR(10 g) = 0.150 mW/g
Maximum value of SAR (measured) = 0.179 mW/g



0 dB = 0.179mW/g

Date/Time: 03/23/2009 06:33:03

Mouth with flatphantom, cheek position_CH810

DUT: CN9-J01

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1910 MHz; σ = 1.48 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

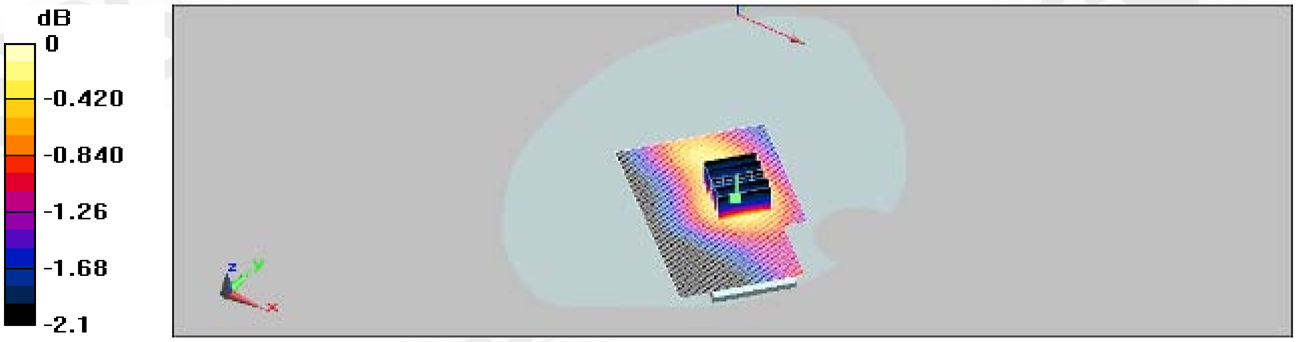
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Mouth with flatphantom,tilt position /Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.189 mW/g

Mouth with flatphantom,tilt position /Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.210 W/kg

SAR(1 g) = 0.183 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.189 mW/g



0 dB = 0.189mW/g

Date/Time: 03/22/2009 19:56:49

BODY_CH512

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:2
Medium: Body1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.51 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

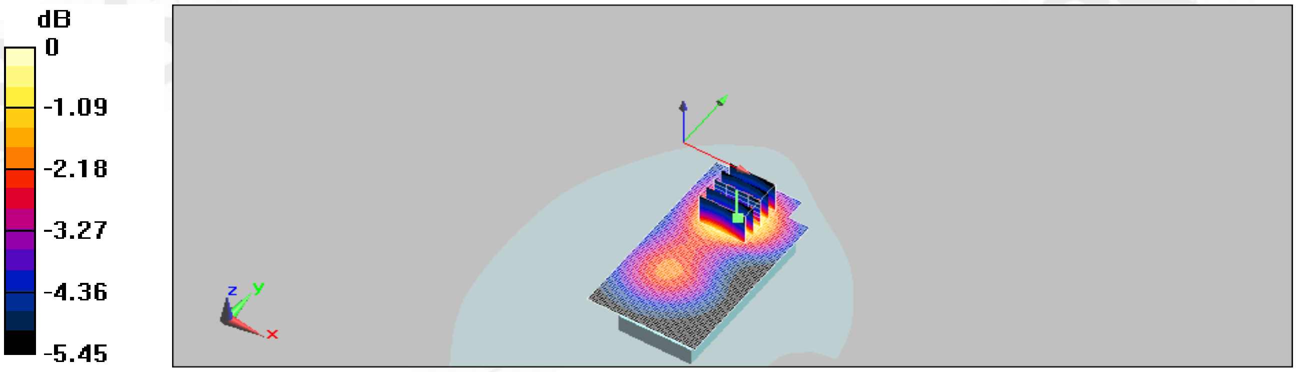
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.73, 4.73, 4.73); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.336 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.84 V/m; Power Drift = 0.127 dB
Peak SAR (extrapolated) = 0.435 W/kg

SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.228 mW/g
Maximum value of SAR (measured) = 0.332 mW/g



0 dB = 0.332mW/g

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Date/Time: 03/22/2009 20:28:16

BODY_CH661

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: Body1900 Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

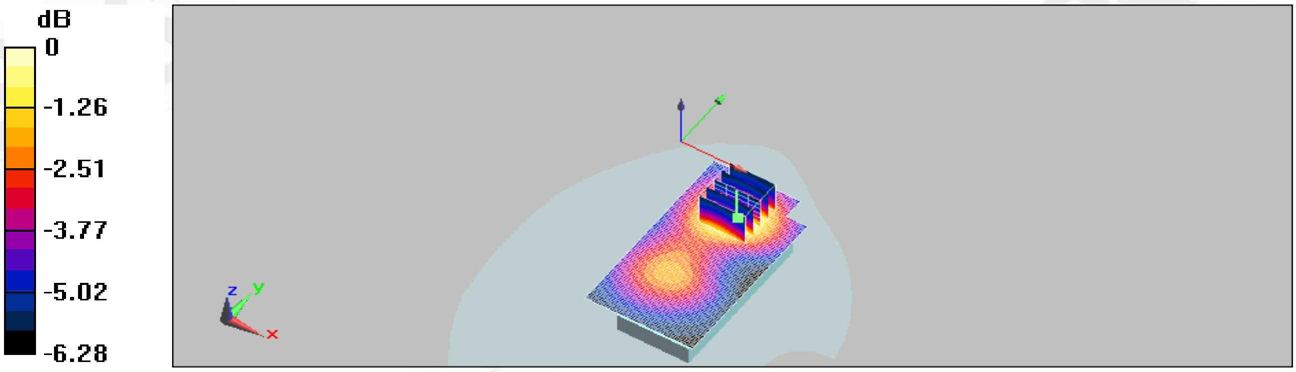
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.73, 4.73, 4.73); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.379 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.46 V/m; Power Drift = -0.093 dB
Peak SAR (extrapolated) = 0.496 W/kg

SAR(1 g) = 0.348 mW/g; SAR(10 g) = 0.246 mW/g
Maximum value of SAR (measured) = 0.367 mW/g



0 dB = 0.367mW/g

Date/Time: 03/22/2009 20:57:29

BODY_CH810

DUT: CN9-J01;

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: Body1900 Medium parameters used: f = 1910 MHz; σ = 1.58 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

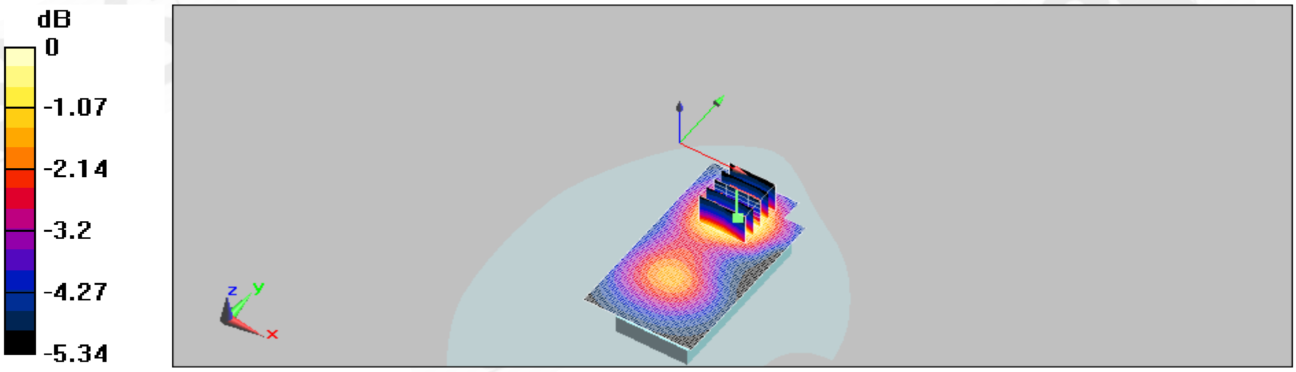
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.73, 4.73, 4.73); Calibrated: 6/23/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.315 mW/g

BODY/Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.09 V/m; Power Drift = -0.176 dB
Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 0.299 mW/g



0 dB = 0.299mW/g

5. System Verification

Date/Time: 03/23/2009 07:46:15

DUT: Dipole 835 MHz;

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL900 Medium parameters used (extrapolated): f = 835 MHz; σ = 0.907 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

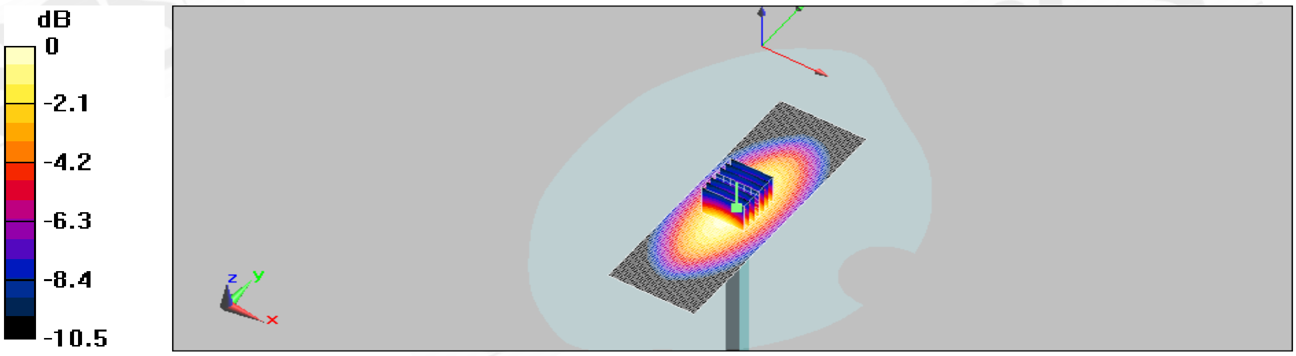
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.66, 5.66, 5.66); Calibrated: 6/23/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.71 mW/g

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.3 V/m; Power Drift = 0.00896 dB
Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.57 mW/g
Maximum value of SAR (measured) = 2.72 mW/g



0 dB = 2.72mW/g

Date/Time: 03/22/2009 22:11:26

DUT: Dipole 835 MHz;

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL900 Medium parameters used (extrapolated): f = 835 MHz; σ = 0.95 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

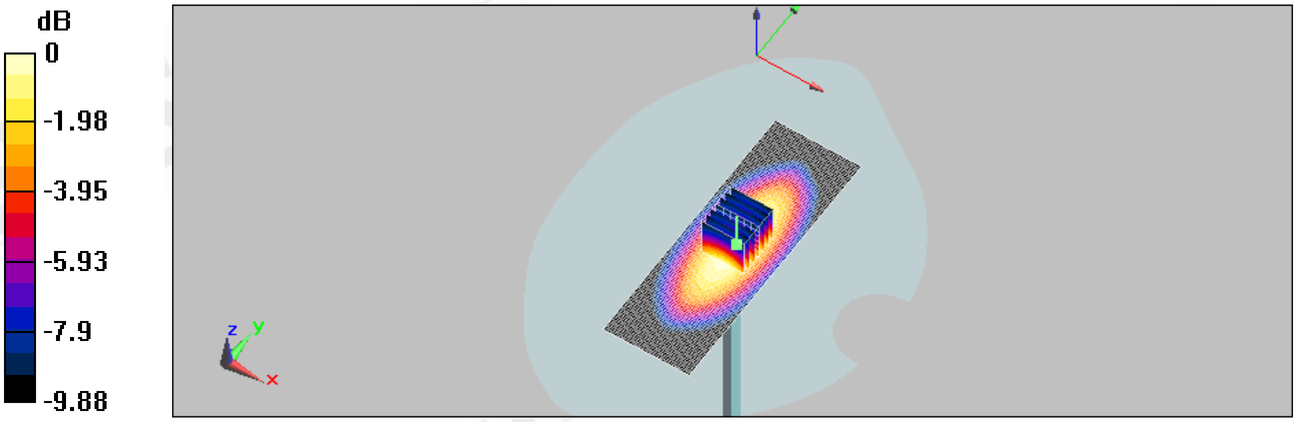
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.61, 5.61, 5.61); Calibrated: 6/23/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.61 mW/g

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.7 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 3.33 W/kg

SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.5 mW/g
Maximum value of SAR (measured) = 2.6 mW/g



0 dB = 2.6mW/g

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Date/Time: 03/23/2009 02:56:03

DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

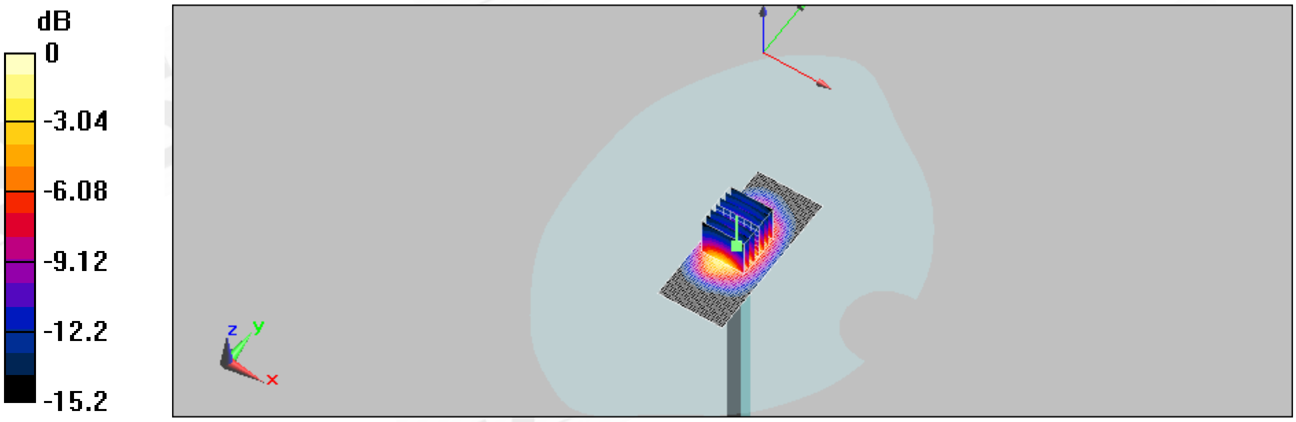
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.97, 4.97, 4.97); Calibrated: 6/23/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.9 mW/g

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.7 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.56 mW/g
Maximum value of SAR (measured) = 12.9 mW/g



0 dB = 12.9mW/g

Date/Time: 03/22/2009 18:49:10

DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

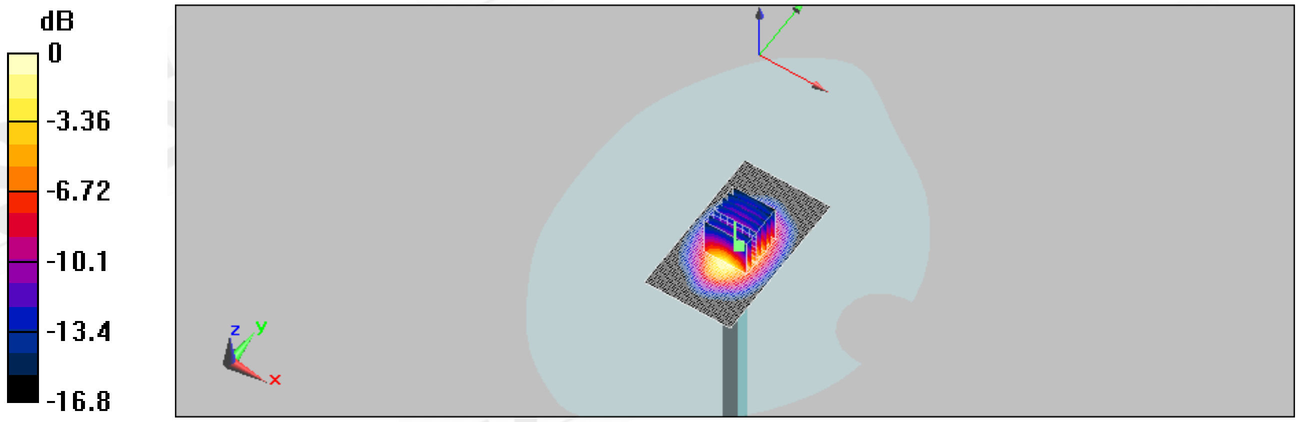
DASY5 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.73, 4.73, 4.73); Calibrated: 6/23/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/7/2008
- Phantom: SAM1; Type: SAM;
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.6 mW/g

d=15mm, Pin=250mW, dist=3.4mm : Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.1 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 9.95 mW/g; SAR(10 g) = 5.15 mW/g
Maximum value of SAR (measured) = 12.2 mW/g



0 dB = 12.2mW/g

6. DAE & Probe Calibration certificate

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

S Schweizerischer Kalibrierdienst
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S Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client SGS (Audeu)

Certificate No: **DAE4-856_May08**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BG - SN: 856
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	May 7, 2008
Condition of the calibrated item	In Tolerance

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	04-Oct-07 (No: 6467)	Oct-08
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-07 (No: 6465)	Oct-08
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	25-Jun-07 (in house check)	In house check: Jun-08

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	D. Steffen
Approved by:	Fin Bomholt	R&D Director	i.V. [illegible]

Issued: May 7, 2008

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

Certificate No: DAE4-856_May08 Page 1 of 5

Calibration Laboratory of
Schmid & Partner
Engineering AG
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Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS (Auden)**

Certificate No: **ES3-3172_Jun08**

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3172

Calibration procedure(s): QA CAL-01.v6 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes

Calibration date: June 23, 2008

Condition of the calibrated item: In Tolerance

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: June 24, 2008

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Certificate No: ES3-3172_Jun08 Page 1 of 9

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Calibration Laboratory of
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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
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 (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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Probe ES3DV3

SN:3172

Manufactured: January 23, 2008
Calibrated: June 23, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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DASY - Parameters of Probe: ES3DV3 SN:3172

Sensitivity in Free Space[A]

NormX	**1.38** ± 10.1%	µV/(V/m)^2
NormY	**1.15** ± 10.1%	µV/(V/m)^2
NormZ	**0.94** ± 10.1%	µV/(V/m)^2

Diode Compression[B]

DCP X	**93** mV
DCP Y	**93** mV
DCP Z	**89** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	11.8	6.1
SAR_{be} [%]	With Correction Algorithm	0.6	0.2

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

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	10.2	6.5
SAR_{be} [%]	With Correction Algorithm	0.4	0.4

Sensor Offset

Probe Tip to Sensor Center **2.0** mm

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

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

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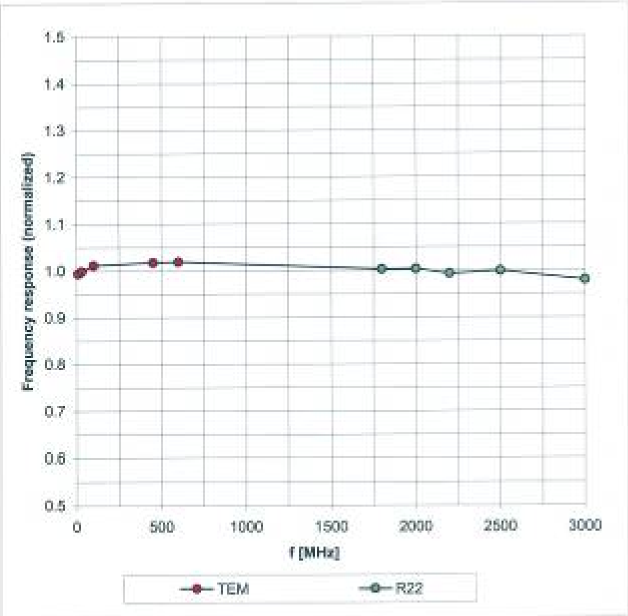
ES3DV3 SN:3172 June 23, 2008

Frequency Response of E-Field

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



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

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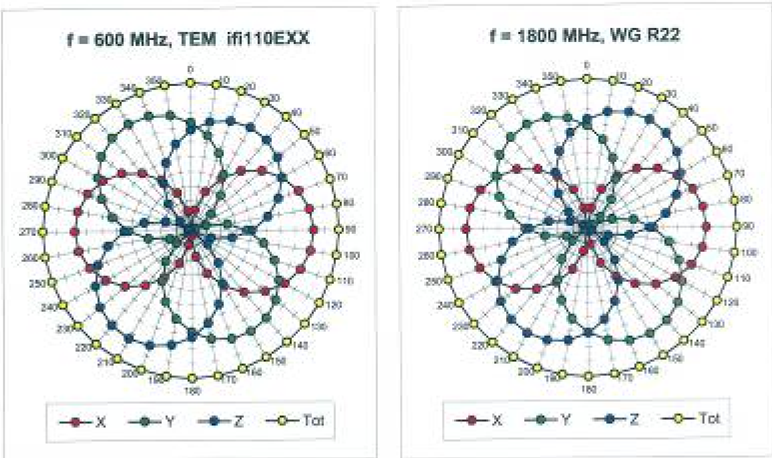
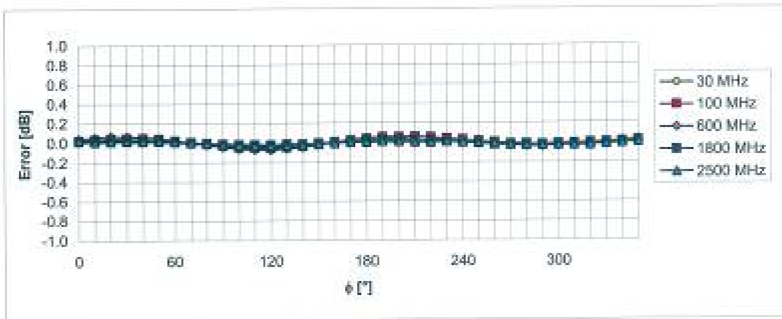
ES3DV3 SN:3172 June 23, 2008

Receiving Pattern (ϕ), ϑ = 0°





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

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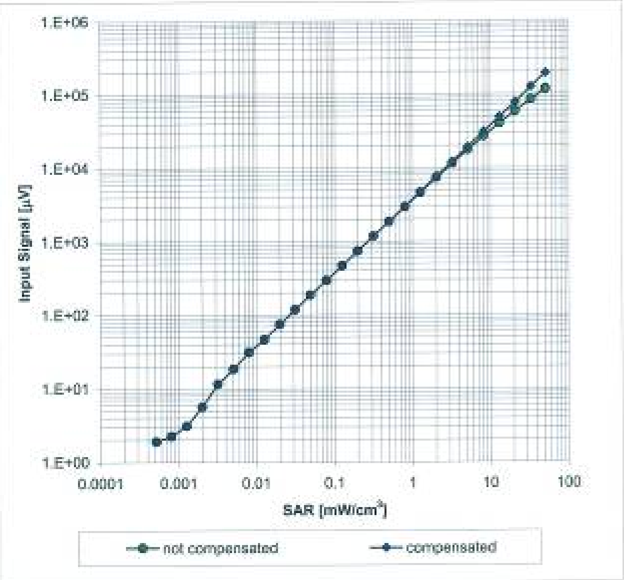
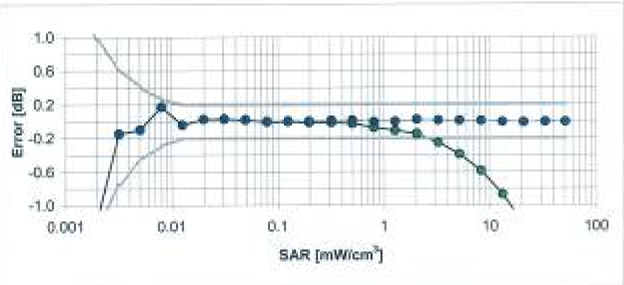
ES3DV3 SN:3172 June 23, 2008

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)





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

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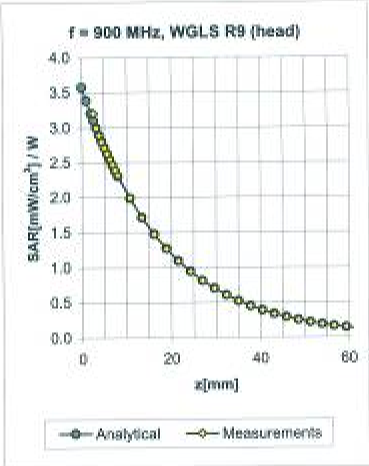
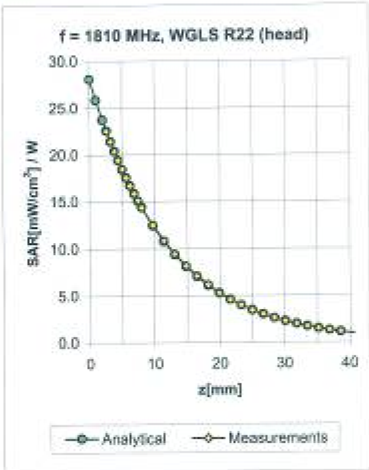
ES3DV3 SN:3172 June 23, 2008

Conversion Factor Assessment





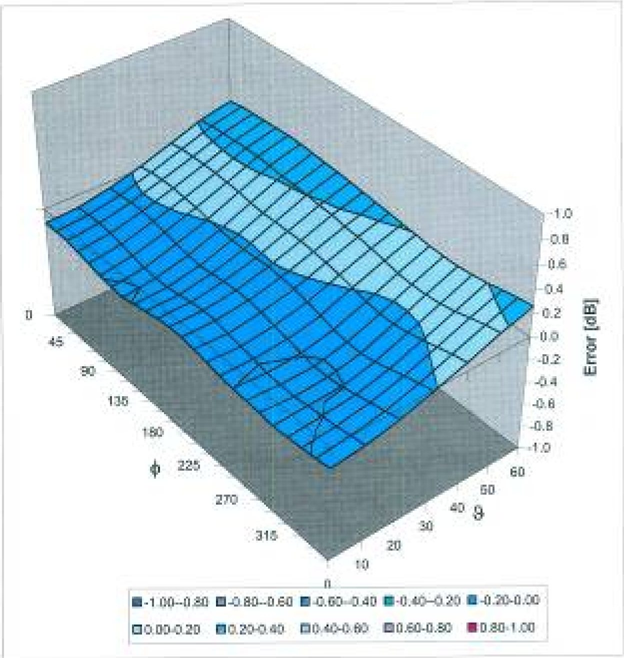
f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.23	2.36	5.66	± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.32	2.07	4.97	± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.65	1.40	4.80	± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.72	1.34	4.38	± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.35	1.83	5.61	± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.55	1.50	4.73	± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.80	1.35	4.57	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.75	1.25	3.92	± 11.0% (k=2)

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

ES3DV3 SN:3172 June 23, 2008

Deviation from Isotropy in HSL

Error (φ, ϑ), f = 900 MHz



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

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7. Uncertainty Analysis

DASY5 Uncertainty Budget

According to IEEE 1528 [1]

Error Description	Uncertainty value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±5.9 %	N	1	1	1	±5.9 %	±5.9 %	∞
Axial Isotropy	±4.7 %	R	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	±4.0 %	R	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
Liquid Conductivity (target)	±5.0 %	R	$\sqrt{3}$	0.64	0.43	±1.8 %	±1.2 %	∞
Liquid Conductivity (meas.)	±2.5 %	N	1	0.64	0.43	±1.6 %	±1.1 %	∞
Liquid Permittivity (target)	±5.0 %	R	$\sqrt{3}$	0.6	0.49	±1.7 %	±1.4 %	∞
Liquid Permittivity (meas.)	±2.5 %	N	1	0.6	0.49	±1.5 %	±1.2 %	∞
Combined Std. Uncertainty						±10.9 %	±10.7 %	387
Expanded STD Uncertainty						±21.9 %	±21.4 %	

Table 19.6: Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528 [1] . The budget is valid for the frequency range 300 MHz - 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

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8. Phantom description

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s p e a g
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 C
Series No	TP-1150 and higher
Manufacturer	SPEAG Zeughausstrasse 43 CH-8004 Zürich Switzerland

Tests
The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.	< 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

Standards
[1] CENELEC EN 50361
[2] IEEE Std 1528-2003
[3] IEC 62209 Part I
[4] FCC OET Bulletin 65, Supplement C, Edition 01-01
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity
Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date 07.07.2005

Signature / Stamp

s p e a g
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Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Doc No 881 – QD 000 P40 C – F   Page 1 (1)

9. System Validation from Original equipment supplier

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Engineering AG
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Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D835V2-4d063_Jun08**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d063
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	June 06, 2008
Condition of the calibrated item	In Tolerance

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Type-N mismatch combination	SN: 5047.2 / 06327	08-Aug-07 (No. 217-00721)	Aug-08
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	04-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

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

Issued: June 13, 2008

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Certificate No: D835V2-4d063_Jun08 Page 1 of 9

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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..

Certificate No: D835V2-4d063_Jun08 Page 2 of 9

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	40.4 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature during test	(21.6 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.29 mW / g
SAR normalized	normalized to 1W	9.16 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**9.14 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR normalized	normalized to 1W	6.08 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**6.05 mW / g ± 16.5 % (k=2)**

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

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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	53.4 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature during test	(21.5 ± 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	2.44 mW / g
SAR normalized	normalized to 1W	9.76 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**9.43 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 mW / g
SAR normalized	normalized to 1W	6.44 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**6.28 mW / g ± 16.5 % (k=2)**

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 Ω - 2.4 jΩ
Return Loss	-28.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.2 Ω - 4.2 jΩ
Return Loss	- 26.7 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	November 27, 2006

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DASY4 Validation Report for Head TSL

Date/Time: 05.06.2008 14:11:53

Test Laboratory: SPEAG, Zurich, Switzerland

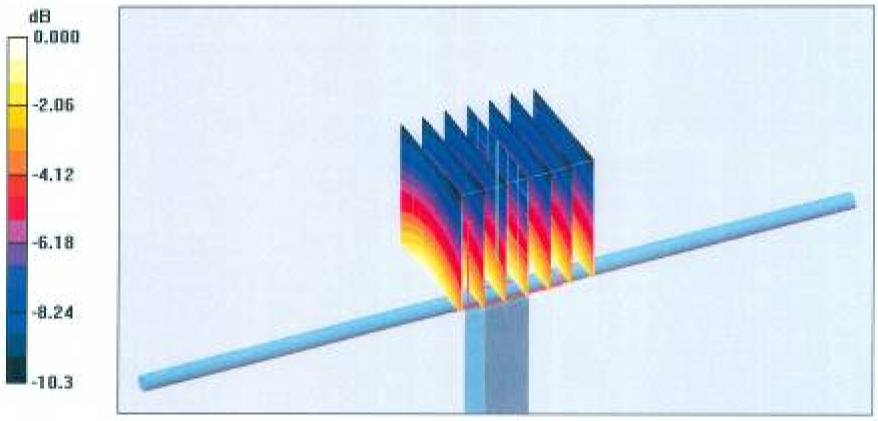
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: CW-835; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL 900 MHz;
Medium parameters used: f = 835 MHz; σ = 0.879 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

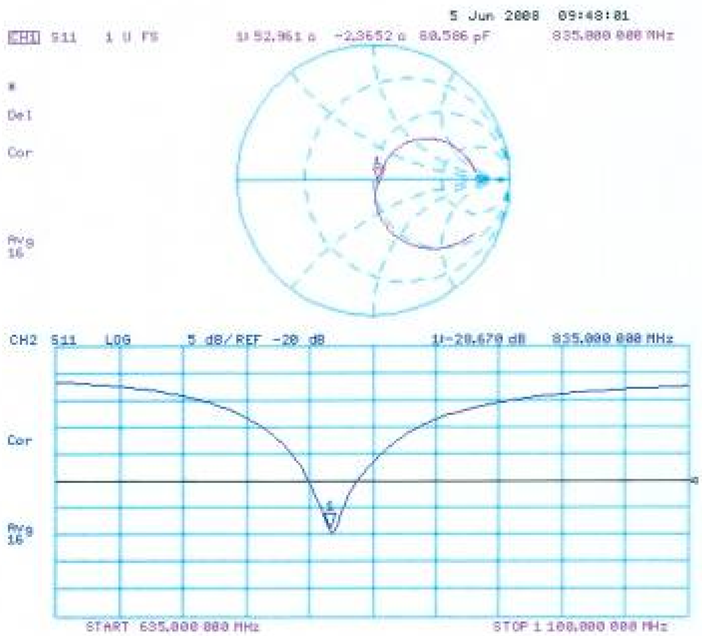
- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.3 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.58 mW/g



0 dB = 2.58mW/g

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-4d063_Jun08 Page 7 of 9

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DASY4 Validation Report for Body TSL

Date/Time: 06.06.2008 14:01:1

Test Laboratory: SPEAG, Zurich, Switzerland

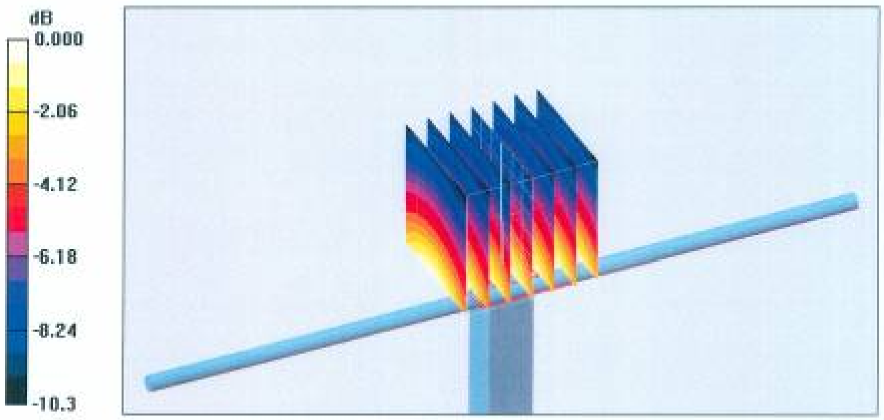
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL900;
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.9, 5.9, 5.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.6 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.73 mW/g



0 dB = 2.73mW/g

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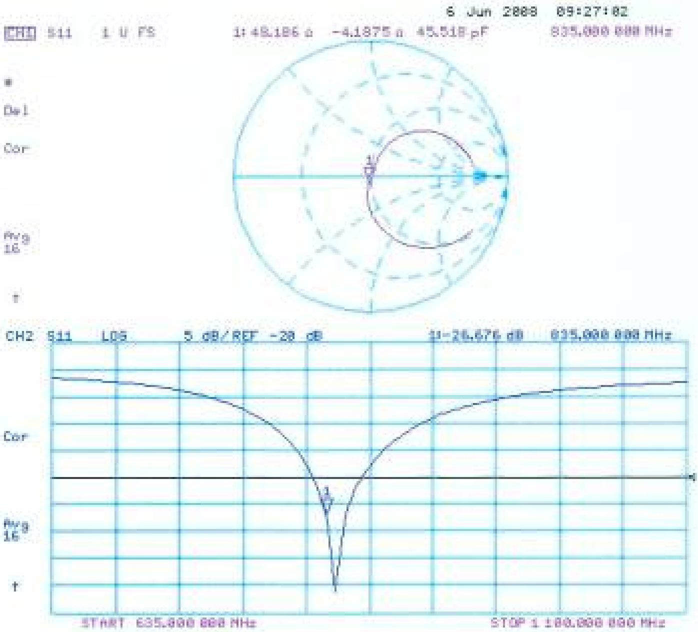
Impedance Measurement Plot for Body TSL



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D1900V2-5d027_Apr08**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d027
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	April 15, 2008
Condition of the calibrated item	In Tolerance

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (No. 217-00718)	Aug-08
Type-N mismatch combination	SN: 5047.2 / 06327	08-Aug-07 (No. 217-00721)	Aug-08
Reference Probe ES3DV2	SN: 3025	01-Mar-08 (No. ES3-3025_Mar08)	Mar-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-08
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 17, 2008

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

Certificate No: D1900V2-5d027_Apr08 Page 1 of 9

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
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 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.

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Measurement Conditions

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

DASY Version	DASY4	V4.7
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	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	40.1 ± 6 %	1.47 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 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	10.3 mW / g
SAR normalized	normalized to 1W	41.2 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**40.2 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.30 mW / g
SAR normalized	normalized to 1W	21.2 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**21.0 mW / g ± 16.5 % (k=2)**

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

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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	51.4 ± 6 %	1.56 mho/m ± 6 %
Body TSL temperature during test	(20.7 ± 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	9.64 mW / g
SAR normalized	normalized to 1W	38.6 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**37.2 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.07 mW / g
SAR normalized	normalized to 1W	20.3 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**19.8 mW / g ± 16.5 % (k=2)**

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.9 Ω + 6.2 jΩ
Return Loss	- 24.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.6 Ω + 6.3 jΩ
Return Loss	- 23.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 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	December 17, 2002

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DASY4 Validation Report for Head TSL

Date/Time: 08.04.2008 13:49:58

Test Laboratory: SPEAG, Zurich, Switzerland

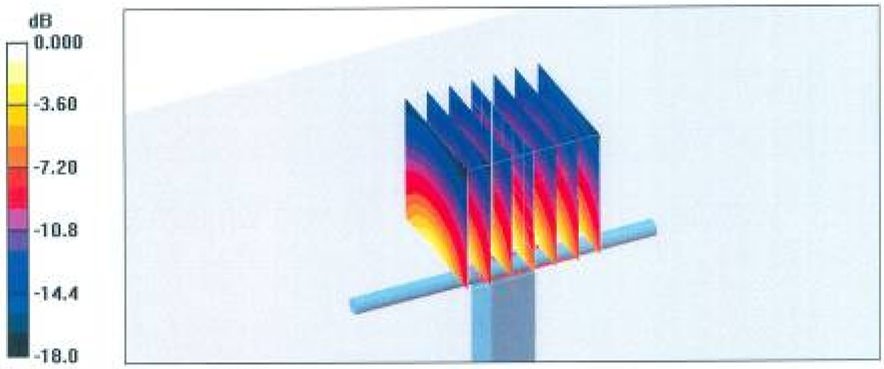
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.2 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 19.1 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.3 mW/g
Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.9mW/g

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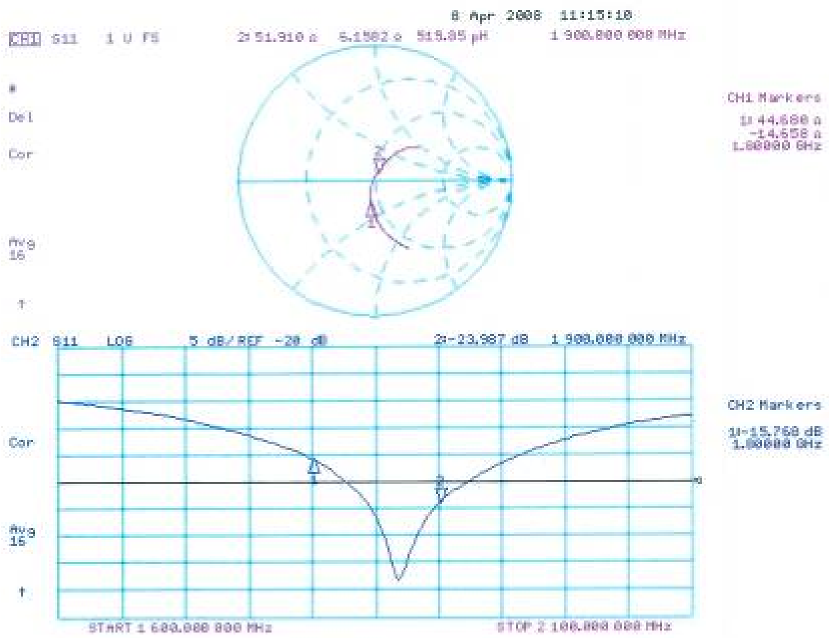
Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d027_Apr08 Page 7 of 9

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DASY4 Validation Report for Body TSL

Date/Time: 15.04.2008 13:51:25

Test Laboratory: SPEAG, Zurich, Switzerland

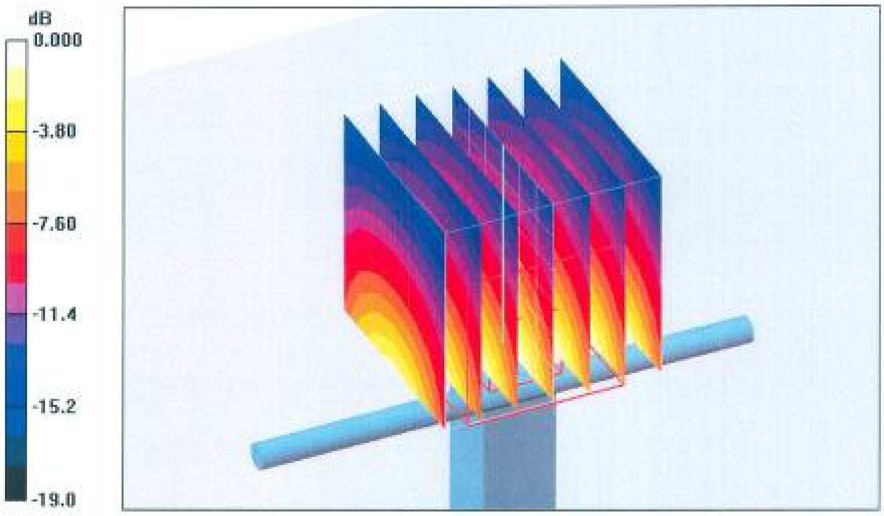
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.5, 4.5, 4.5); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.3 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.64 mW/g; SAR(10 g) = 5.07 mW/g
Maximum value of SAR (measured) = 11.7 mW/g



0 dB = 11.7mW/g

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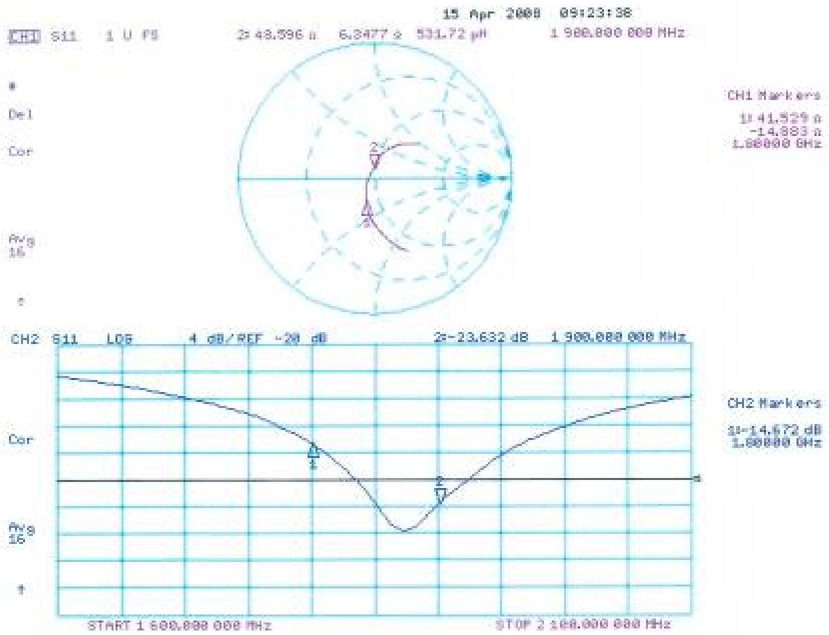
Impedance Measurement Plot for Body TSL



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End of 1st part of report

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