

SAR TEST REPORT

Equipment Under Test	ZTE H520 CDMA/GSM Dual-Mode handset
Model Name	ZTE H520
Company Name	ZTE CORPORATIION
Company Address	ZTE Plaza, Keji Road , South Hi-Tech industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Date of Receipt	2007.09.14
Date of Test(s)	2007.010.01-2007.10.03
Date of Issue	2007.11.09

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.

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Tested by : Ricky Huang
Sr. Engineer

Date : 2007.10.04

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Date : 2007.11.09

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1. General Information

1.1 Testing Laboratory

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1.2 Details of Applicant

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Telephone	86-21-68895196
Fax	86-021-50801070
Contact Person	Li Dezi
E-mail	li.dz@zte.con.cn
Web site	Http://www.zte.com.cn

1.3 Description of EUT

EUT Name	ZTE H520 CDMA/GSM Dual-Mode handset
FCC ID	Q78-ZTEH520
Model Name	ZTE H520
Brand name	ZTE
Definition	Production unit
IMEI Code	355626010000000
Mode of Operation	CDMA Cellular

Modulation mode	QPSK	
Duty Cycle	CDMA Cellular	
	1	
Maximum RF Conducted Power (Average)	CDMA Cellular	
	23.91 dBm	
TX Frequency Range (MHz)	CDMA Cellular	
	824.70-848.31	
Channel Number (ARFCN)	CDMA Cellular	
	1013-777	
Battery Type	3.7 V Lithium-Ion	
Antenna Type	Internal Antenna	
Antenna Gain (Average, dBi)	CDMA Cellular	
	-2.63	
H/W Version	cg8C	
S/W Version	C_NZ_H520_NNNN01NV1.0.0B02	
Max. SAR Measured (1 g)	Head	Body
	1.56 W/kg (At Left-Cheek 384 Channel)	0.718 W/kg (At Body 1013 Channel)

1.4 Test Environment

Ambient Temperature: 22.2° C

Tissue Simulating Liquid: 21.7° C

Relative Humidity: 62 %

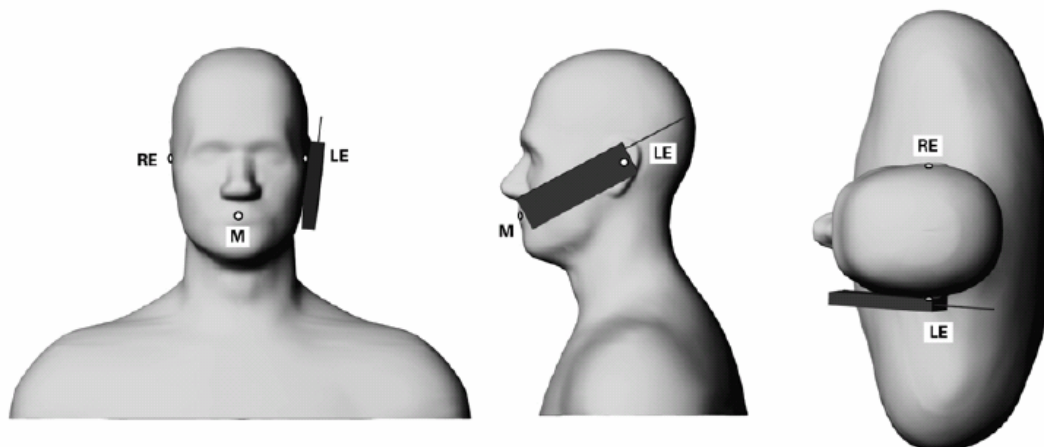
1.5 Operation description

1. The EUT controlled by using a Wireless Communication Tester (Agilent 8960), and the communication between the EUT and the tester is established by air link. 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.
2. In each band perform SAR testing for each operation mode using the center frequency on both the left and right sides of the head, cheek and tilt positions to find the maximum mass-averaged SAR value of these configurations (the worst case configuration).
3. Measure the low-end and the high-end frequencies of the configuration giving rise to the maximum mass-averaged SAR in head positions.

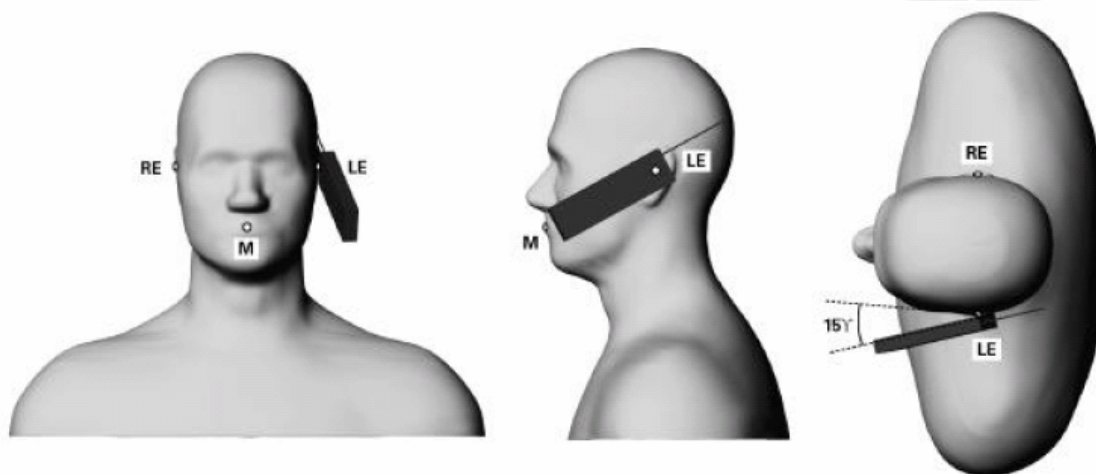
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4. During the SAR testing, the DASY4 system checks power drift by comparing the -field strength of one specific location measured at the beginning with that measured at the end of the SAR testing

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.

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:

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 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 4 professional system). A Model EX3DV3 3526-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant.

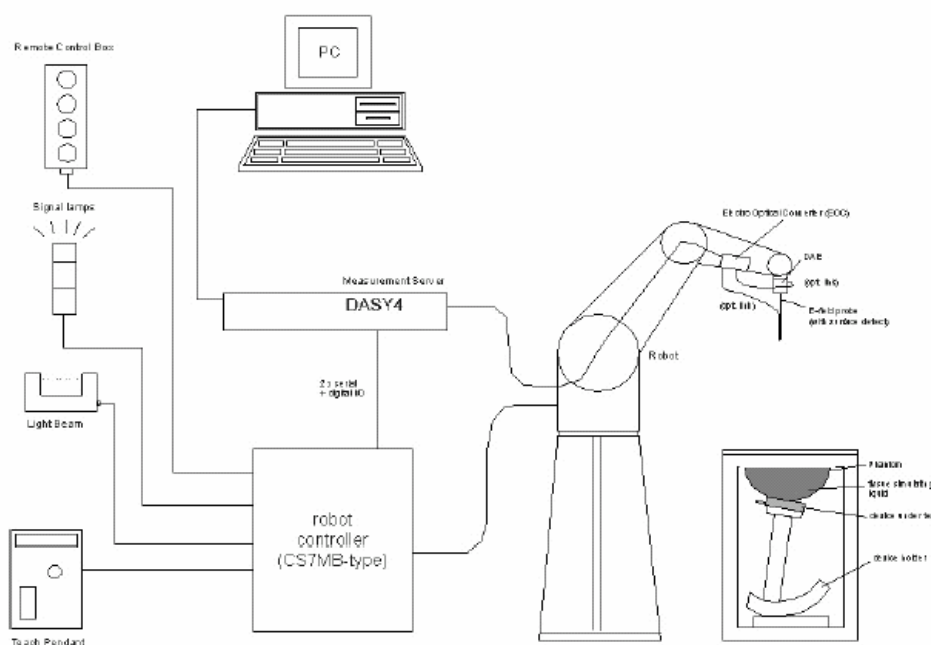


Fig.a The microwave circuit arrangement used for SAR system verification

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

- A standard high precision 6-axis robot (Stabile 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.

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- 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.
 - DASY4 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

EX3DV3 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)	 EX3DV3 E-Field Probe
Calibration:	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL850 Additional CF for other liquids and frequencies upon request	
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 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 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions:	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	
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
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	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: 251 mm; Length: 1000 mm; Width: 500 mm	

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
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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 +/- 5% from the target SAR values. These tests were done at 900 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 & 2. 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.

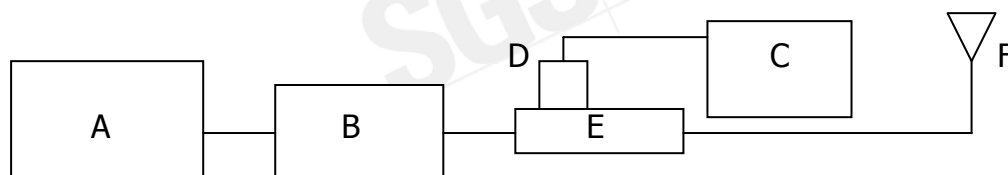
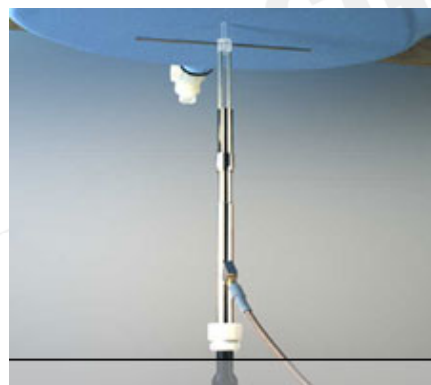


Fig.b The microwave circuit arrangement used for SAR system verification

- 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
D900V2 S/N: 178	900 MHz (Head)	2.66 m W/g	2.53 m W/g	4.88%	2007/10/1
D900V2 S/N: 178	900 MHz (Body)	2.69 m W/g	2.73 m W/g	1.48%	2007/10/3

Table 1. 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 conjunction 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. (Fig .2)

Frequency (MHz)	Tissue type	Measurement date/ Limits	Dielectric Parameters		
			ρ	σ (S/m)	Simulated Tissue Temperature($^{\circ}$ C)
900	Head	Measured, 2007.10.01	40	0.937	21.7
		Recommended Limits	39.4-43.6	0.86-1.03	20-24
900	Body	Measured, 2007.10.03	55.6	1.03	21.7
		Recommended Limits	52.3-58	0.92-1.1	20-24

Table 2. Dielectric Parameters of Tissue Simulant Fluid

Band 850 (Head) Frequency (MHz)	Channel	Target	Permittivity Measurement Date	Variation	Target	Conductivity Measurement Date	Variation
Low(824.2)	128	41.5	40.9	1.44%	0.9	0.868	3.55%
Mid(836.6)	190		40.7	1.92 %		0.888	1.33%
High(848.8)	251		40.6	2.16%		0.889	1.22%
Band 850 (Body) Frequency (MHz)	Channel	Target	Permittivity Measurement Date	Variation	Target	Conductivity Measurement Date	Variation
Low(824.2)	128	55.2	56.3	1.99%	0.97	0.953	1.75%
Mid(836.6)	190		56.2	1.81%		0.965	0.51%
High(848.8)	251		56.1	1.63%		0.977	0.72%

Table 3. Dielectric Parameters of Tissue Simulant Fluid (follow P1528 target value)

The composition of the brain tissue simulating liquid for 900 band:

Ingredient	900MHz(Head)	900Mhz(Body)
DGMBE	X	X
Water	532.98 g	631.68 g
Salt	18.3 g	11.72 g
Preventol D-7	2.4 g	1.2g
Cellulose	3.2 g	X
Sugar	766.0 g	600 g
Total amount	1 L (1.0kg)	1 L (1.0kg)

Table 4. 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

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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 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 5. 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 850 MHZ

Right Head (Cheek Position)

Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.70	23.78 dbm	1.48	22.1	21.7
	384	836.52	23.91 dbm	1.54	22.1	21.7
	777	848.31	23.71 dbm	1.37	22.1	21.7

Left Head (Cheek Position)

Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.70	23.78 dbm	1.55	22.1	21.7
	384	836.52	23.91 dbm	1.56	22.1	21.7
	777	848.31	23.71 dbm	1.32	22.1	21.7

Right Head (15° Tilt Position)

Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.70	23.78 dbm	0.962	22.1	21.7
	384	836.52	23.91 dbm	0.941	22.1	21.7
	777	848.31	23.71 dbm	0.784	22.1	21.7

Left Head (15° Tilt Position)

Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850 MHz	1013	824.70	23.78 dbm	0.938	22.1	21.7
	384	836.52	23.91 dbm	0.822	22.1	21.7
	777	848.31	23.71 dbm	0.773	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	824.70	23.78 dbm	0.718	22.1	21.7
	384	836.52	23.91 dbm	0.676	22.1	21.7
	777	848.31	23.71 dbm	0.550	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]
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850 MHz	1013	824.70	23.78 dbm	0.661	22	21.6
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Note: SAR measurement results for the Mobile Phone at maximum output power.

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3. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration
Schmid & Partner Engineering AG	Dosimetric E-Field Probe	EX3DV3	3526	Aug.29.2007
Schmid & Partner Engineering AG	900 MHz System Validation Dipole	D900V2	178	Feb.19.2007
Schmid & Partner Engineering AG	Data acquisition Electronics	DAE4	679	Apr.21.2007
Schmid & Partner Engineering AG	Software	DASY 4 V4.7 Build 53	N/A	Calibration isn't necessary
Schmid & Partner Engineering AG	Phantom	SAM	N/A	Calibration isn't necessary
Agilent	Network Analyzer	8753D	3410A05547	Nov.16.2006
Agilent	Dielectric Probe Kit	85070D	US01440168	Calibration isn't necessary
Agilent	Dual-directional coupler	778D	50313	Aug.21.2007
Agilent	RF Signal Generator	8648D	3847M00432	May.22.2007
Agilent	Power Sensor	8481H	MY41091361	Jun.04.2007
Agilent	8960 Series 10 Wireless Communication Tester	8960	GB44051912	Nov.28.2006

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4. Measurements

RE Cheek CH1013

Date/Time: 2007/10/2 02:56:22

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 824.7$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.55 mW/g

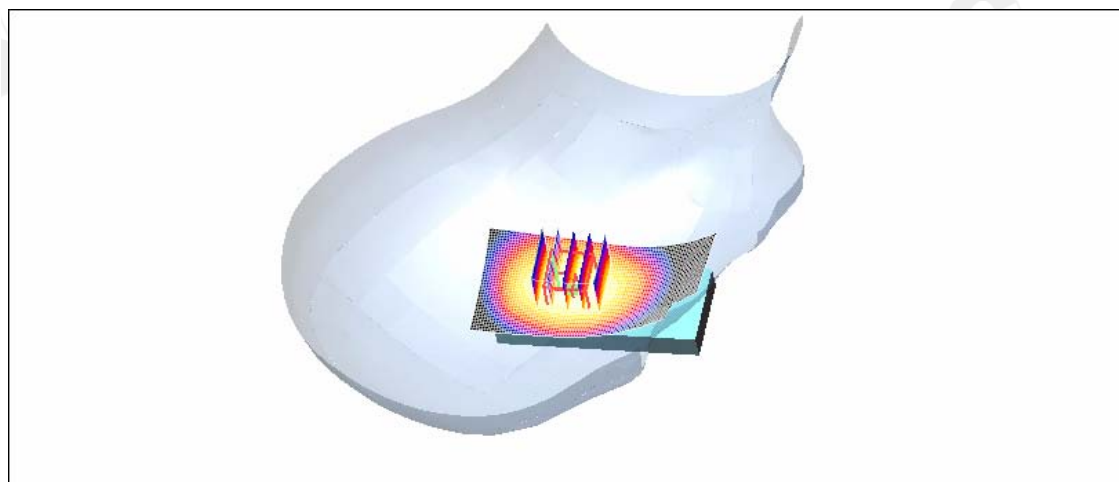
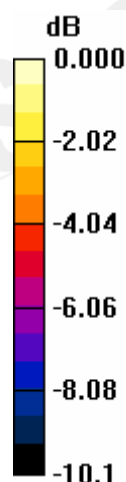
RE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.8 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 2.00 W/kg

SAR(1 g) = 1.48 mW/g; SAR(10 g) = 1.07 mW/g

Maximum value of SAR (measured) = 1.58 mW/g



0 dB = 1.58mW/g

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RE Cheek CH384

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.66 mW/g

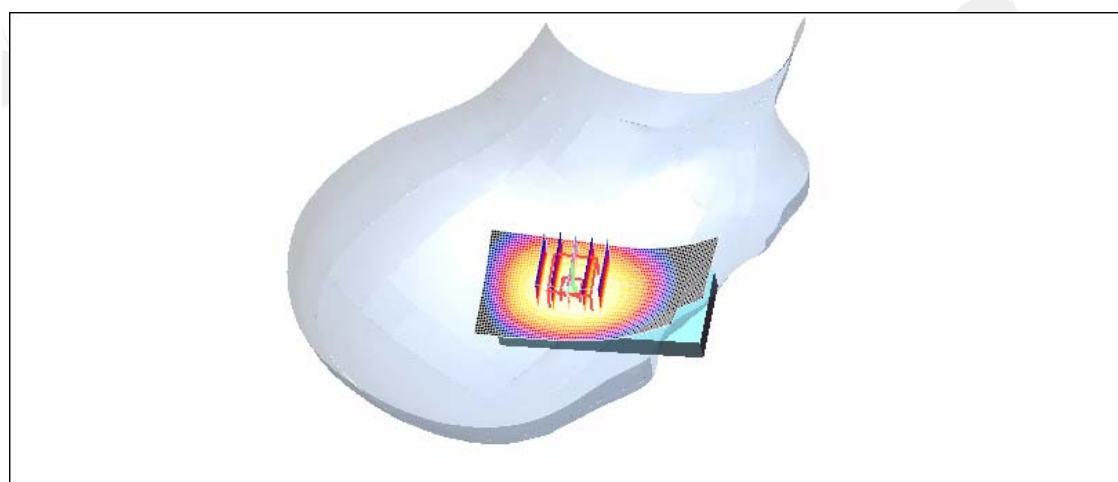
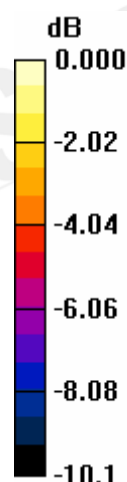
RE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.2 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 2.09 W/kg

SAR(1 g) = 1.54 mW/g; SAR(10 g) = 1.11 mW/g

Maximum value of SAR (measured) = 1.62 mW/g



0 dB = 1.62mW/g

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RE Cheek CH777

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.889$ mho/m;

$\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.45 mW/g

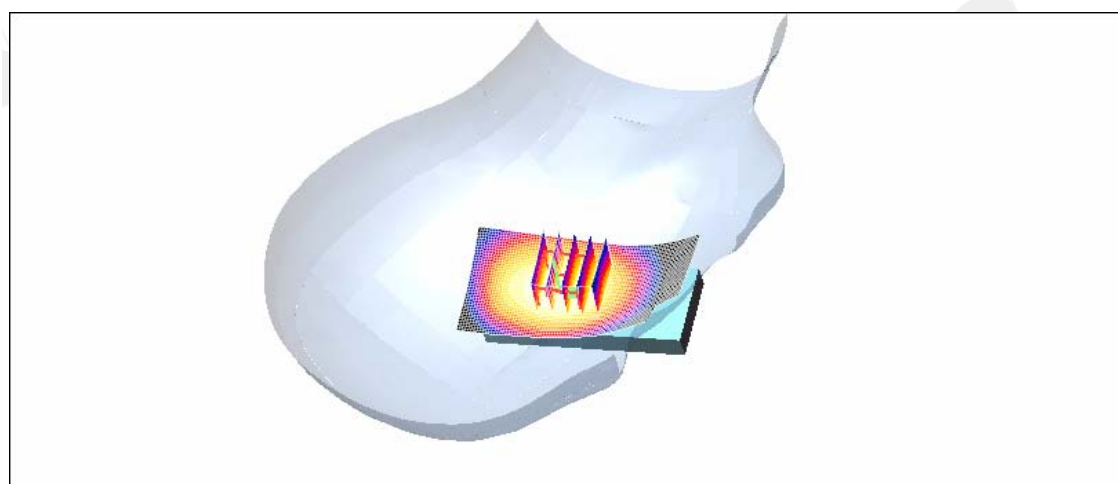
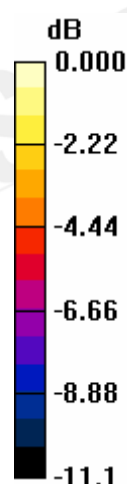
RE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.6 V/m; Power Drift = -0.178 dB

Peak SAR (extrapolated) = 1.92 W/kg

SAR(1 g) = 1.37 mW/g; SAR(10 g) = 0.974 mW/g

Maximum value of SAR (measured) = 1.44 mW/g



0 dB = 1.44mW/g

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LE Cheek CH1013

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 824.7$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.63 mW/g

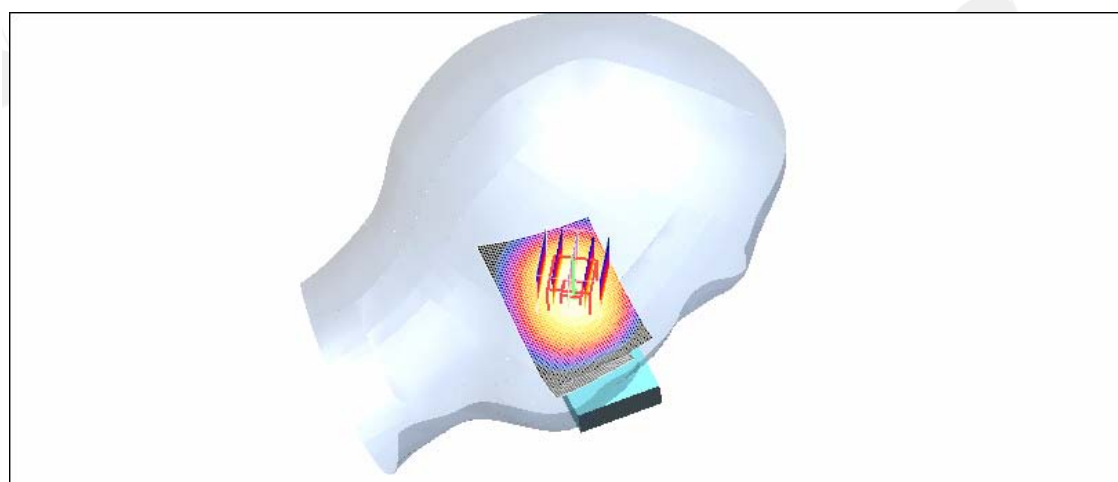
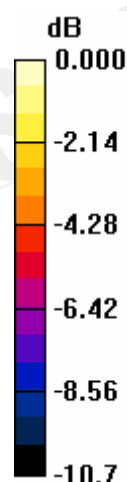
LE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.7 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 2.03 W/kg

SAR(1 g) = 1.55 mW/g; SAR(10 g) = 1.08 mW/g

Maximum value of SAR (measured) = 1.67 mW/g



0 dB = 1.67mW/g

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LE Cheek CH384

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.67 mW/g

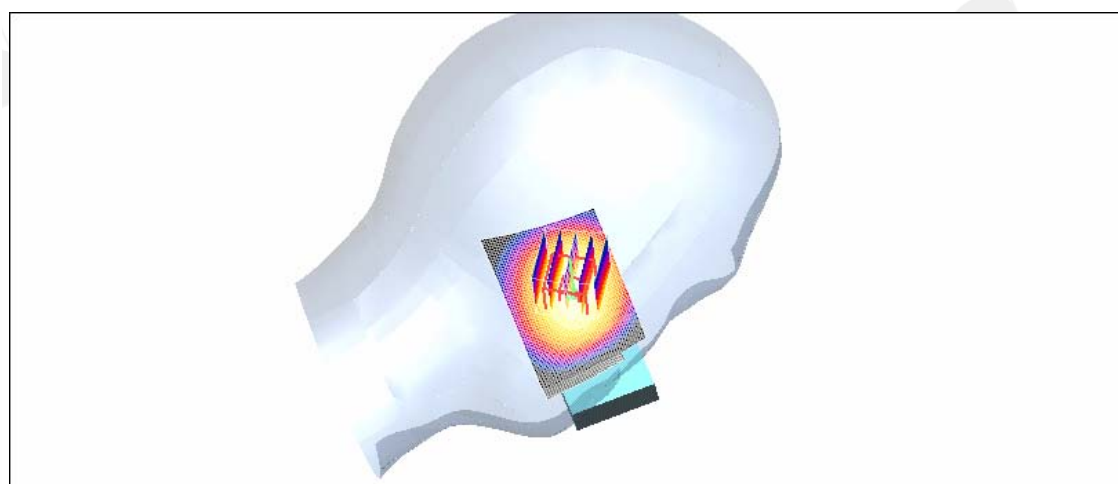
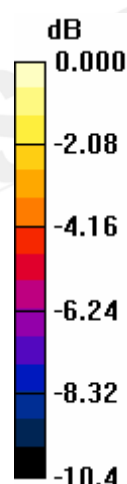
LE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.2 V/m; Power Drift = -0.093 dB

Peak SAR (extrapolated) = 2.22 W/kg

SAR(1 g) = 1.56 mW/g; SAR(10 g) = 1.09 mW/g

Maximum value of SAR (measured) = 1.69 mW/g



0 dB = 1.69mW/g

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LE Cheek CH777

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.889$ mho/m;

$\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Cheek/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.39 mW/g

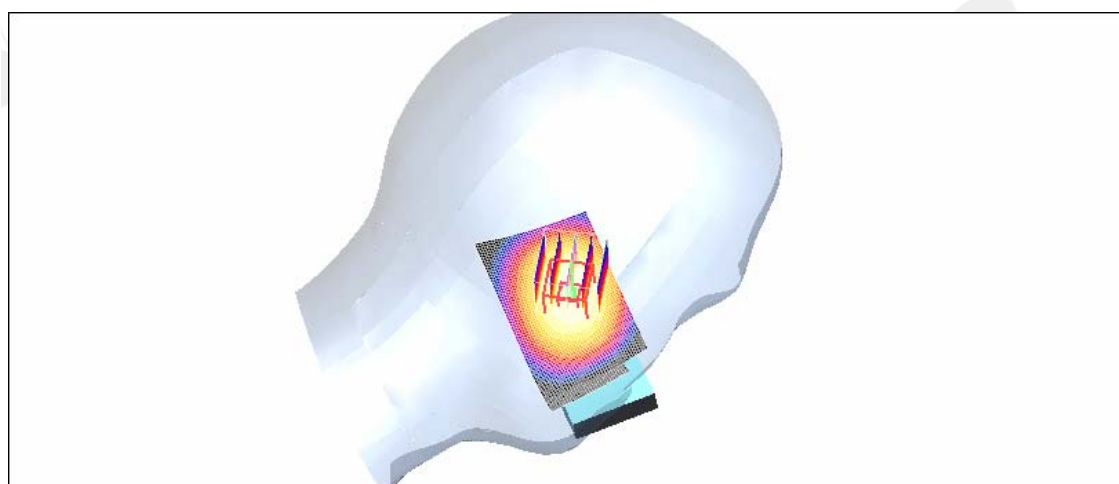
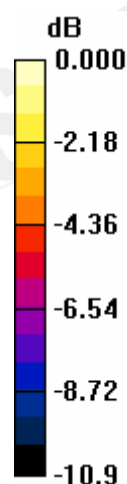
LE_Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.2 V/m; Power Drift = 0.100 dB

Peak SAR (extrapolated) = 1.74 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.925 mW/g

Maximum value of SAR (measured) = 1.39 mW/g



0 dB = 1.39mW/g

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RE Tilt CH1013

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 824.7 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.03 mW/g

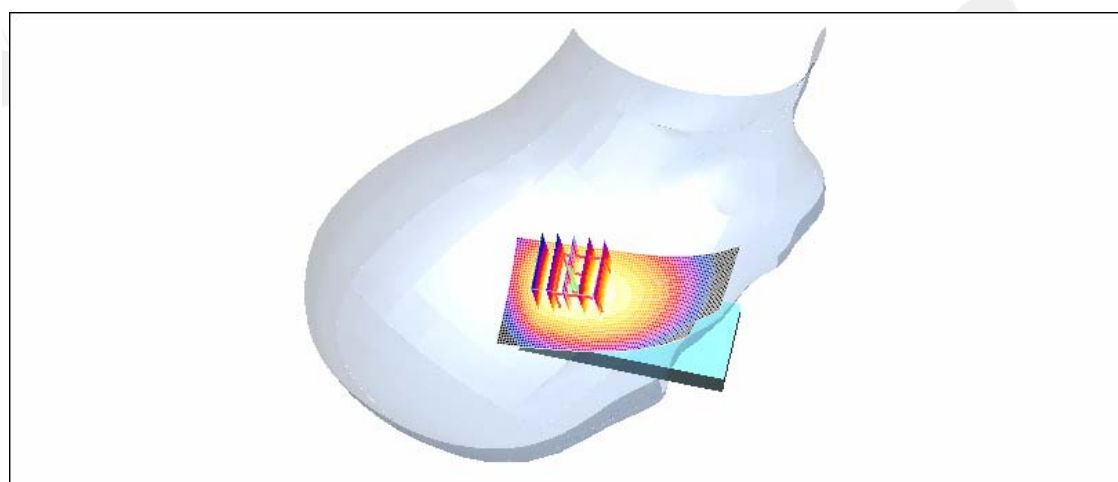
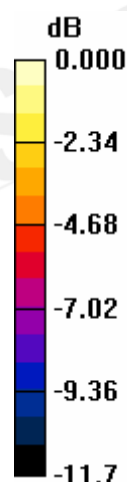
RE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.7 V/m; Power Drift = -0.179 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.687 mW/g

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



0 dB = 1.04mW/g

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RE Tilt CH384

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.999 mW/g

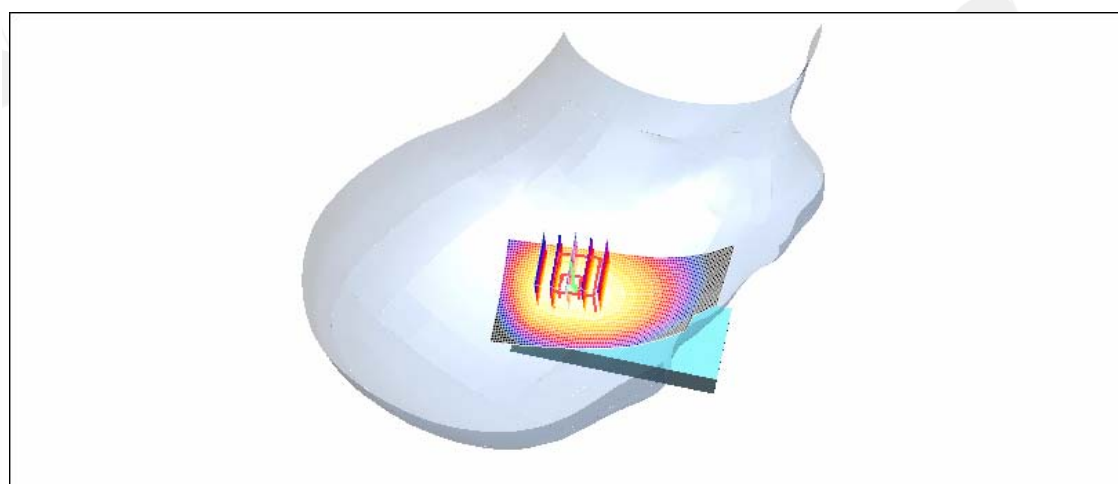
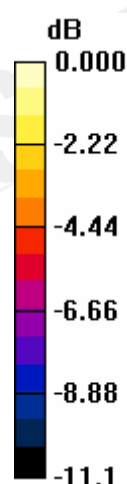
RE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.3 V/m; Power Drift = -0.178 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.941 mW/g; SAR(10 g) = 0.671 mW/g

Maximum value of SAR (measured) = 0.998 mW/g



0 dB = 0.998mW/g

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RE Tilt CH777

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.889$ mho/m;

$\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

RE_Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.821 mW/g

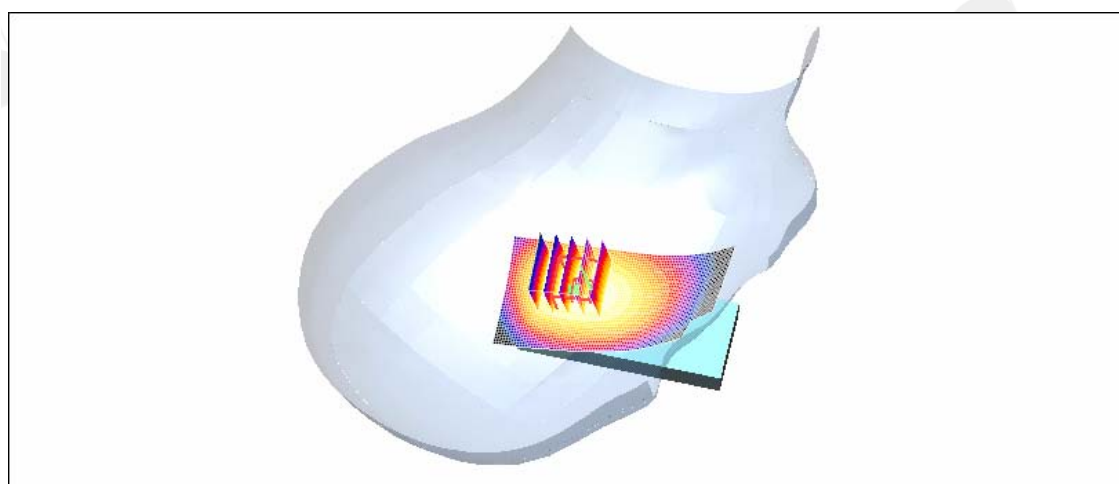
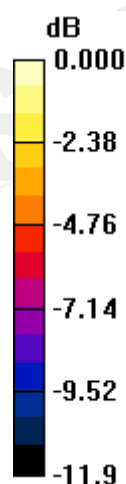
RE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.2 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.784 mW/g; SAR(10 g) = 0.555 mW/g

Maximum value of SAR (measured) = 0.824 mW/g



0 dB = 0.824mW/g

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LE Tilt_CH1013

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 824.7 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.997 mW/g

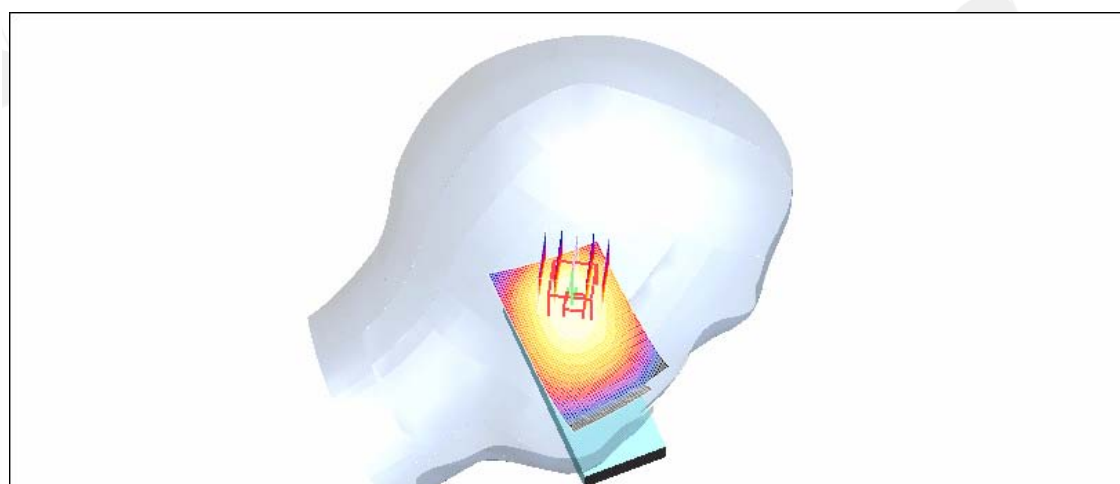
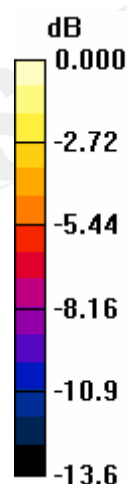
LE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.2 V/m; Power Drift = 0.168 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.938 mW/g; SAR(10 g) = 0.646 mW/g

Maximum value of SAR (measured) = 0.993 mW/g



0 dB = 0.993mW/g

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LE Tilt_CH384

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Tilt/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.846 mW/g

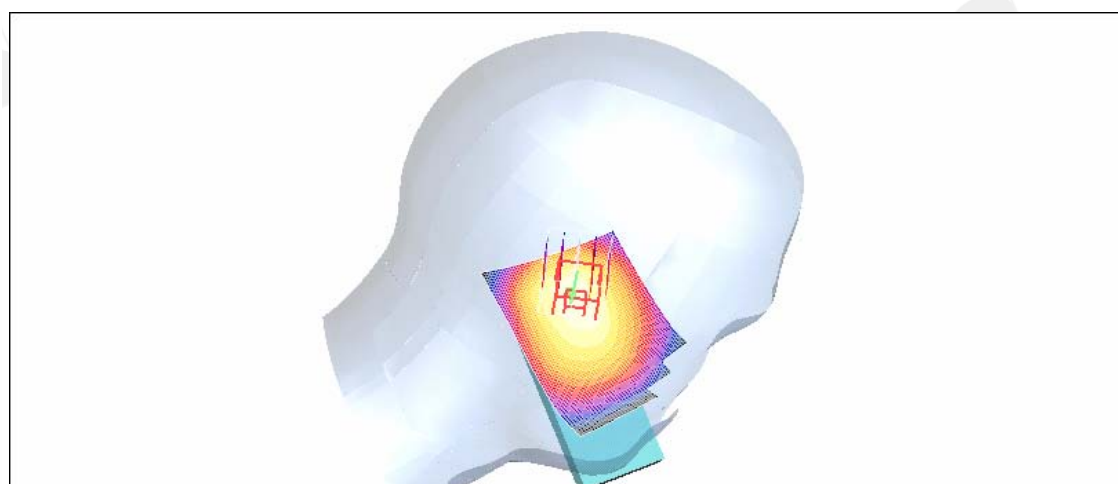
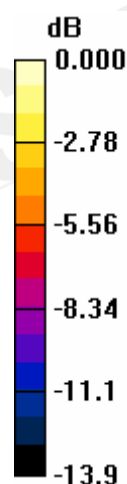
LE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.9 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.822 mW/g; SAR(10 g) = 0.560 mW/g

Maximum value of SAR (measured) = 0.906 mW/g



0 dB = 0.906mW/g

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LE Tilt_CH777

DUT: H520; Type: CDMA;

Communication System: CDMA_850; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.889$ mho/m;

$\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

LE_Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.809 mW/g

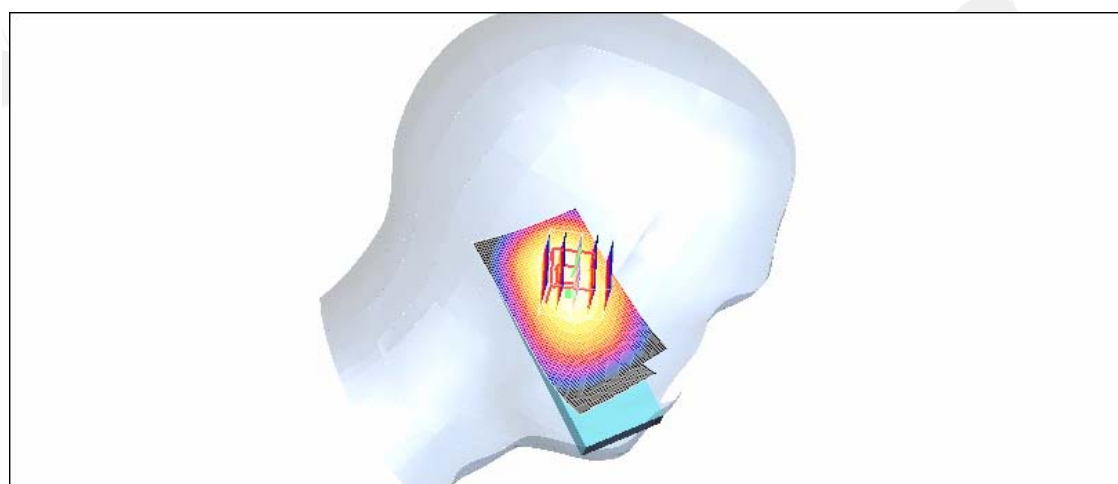
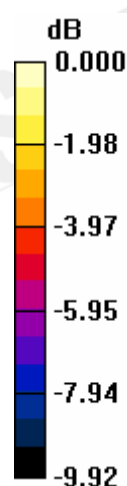
LE_Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.5 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.773 mW/g; SAR(10 g) = 0.543 mW/g

Maximum value of SAR (measured) = 0.820 mW/g



0 dB = 0.820mW/g

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Body CH1013

DUT: H520 ; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.7$ MHz; $\sigma = 0.953$ mho/m;
 $\epsilon_r = 56.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.93, 10.93, 10.93); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

BODY/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.747 mW/g

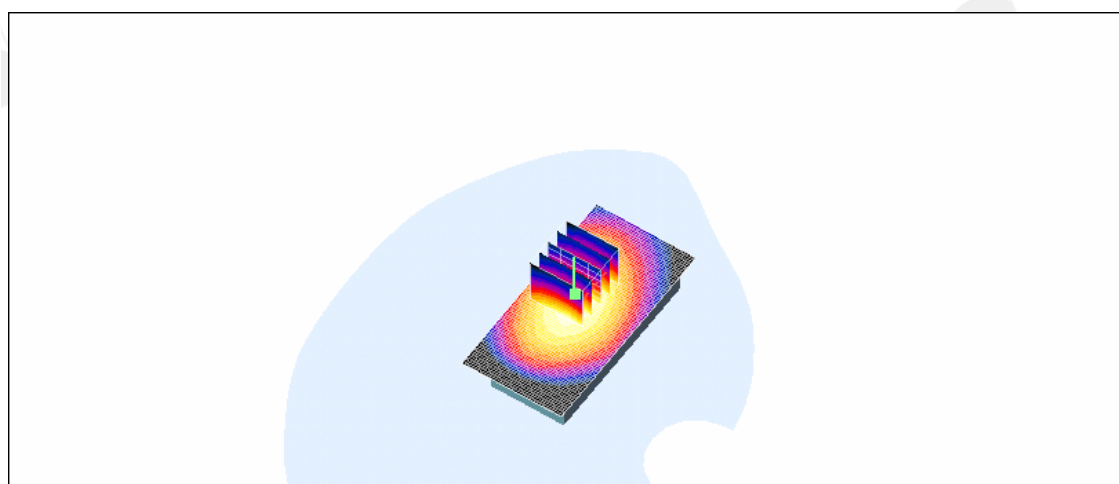
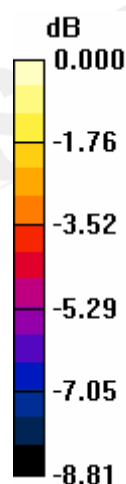
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.9 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.984 W/kg

SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.516 mW/g

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



0 dB = 0.765mW/g

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Body CH384

DUT: H520 ; Type: CDMA;

Communication System: CDMA_850; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.965$ mho/m;

$\epsilon_r = 56.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.93, 10.93, 10.93); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

BODY/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.702 mW/g

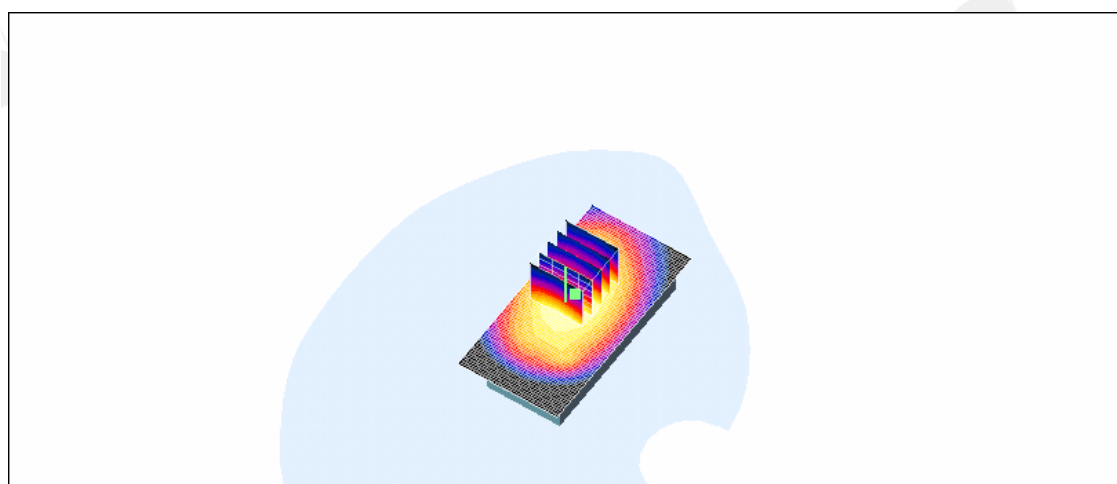
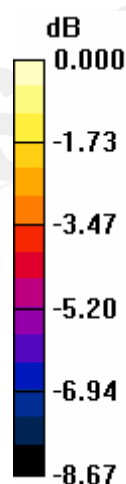
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.0 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 0.906 W/kg

SAR(1 g) = 0.676 mW/g; SAR(10 g) = 0.489 mW/g

Maximum value of SAR (measured) = 0.720 mW/g



0 dB = 0.720mW/g

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Body CH777

DUT: H520 body; Type: CDMA;

Communication System: CDMA_850; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.977$ mho/m;

$\epsilon_r = 56.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.93, 10.93, 10.93); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

BODY/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.639 mW/g

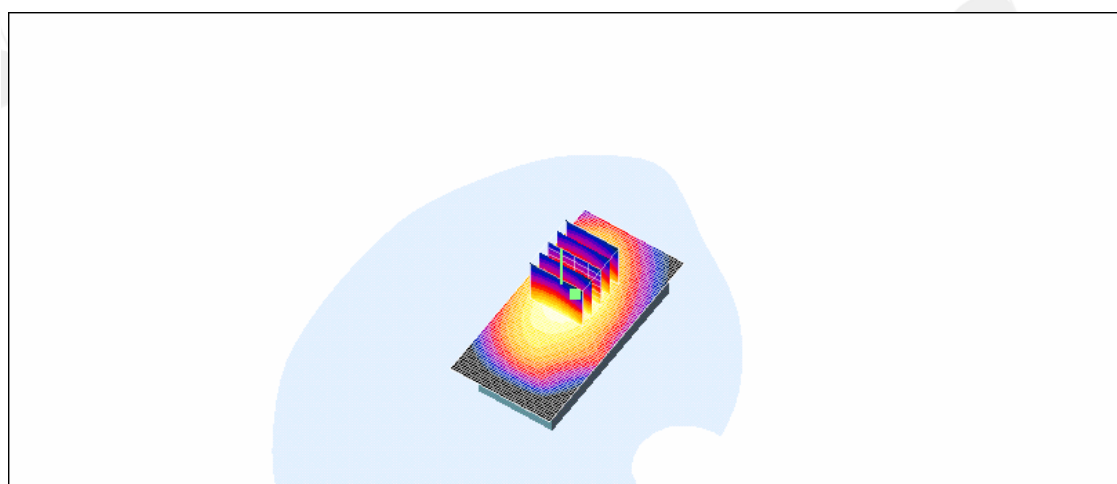
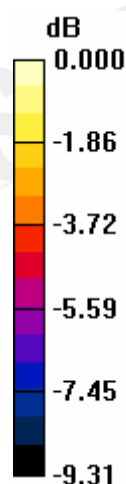
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.5 V/m; Power Drift = -0.179 dB

Peak SAR (extrapolated) = 0.730 W/kg

SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.402 mW/g

Maximum value of SAR (measured) = 0.579 mW/g



0 dB = 0.579mW/g

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Body CH1013 _ repeated in EUT front to Phantom

DUT: H520 body; Type: CDMA;

Communication System: CDMA_850; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.7$ MHz; $\sigma = 0.953$ mho/m;

$\epsilon_r = 56.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.93, 10.93, 10.93); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

BODY/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.734 mW/g

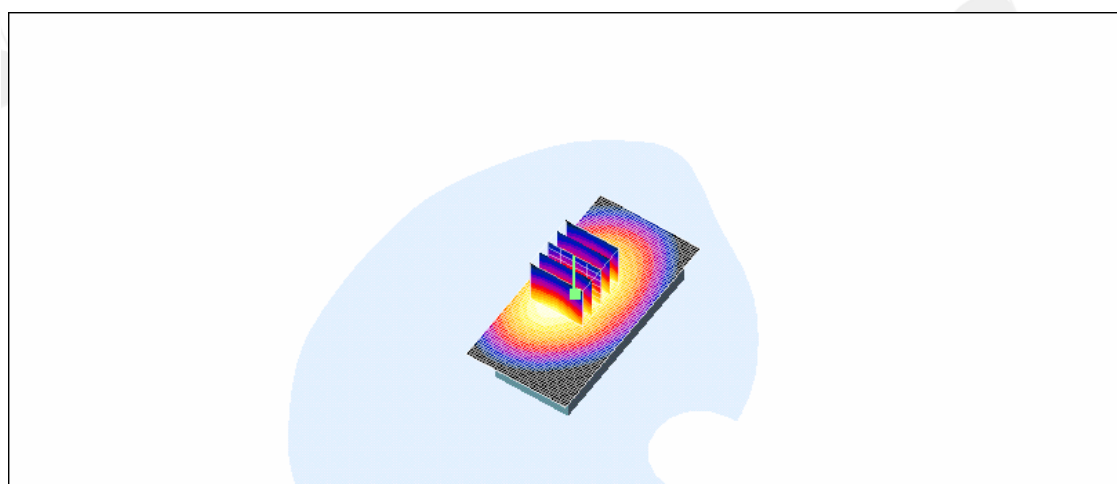
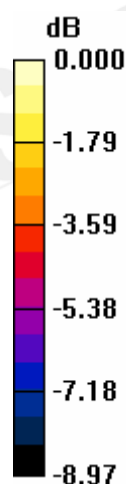
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 0.878 W/kg

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.479 mW/g

Maximum value of SAR (measured) = 0.707 mW/g



0 dB = 0.707mW/g

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SAR System Performance Verification

DUT: Dipole 900 MHz; Type: D900V2; Serial: SN:178

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: Head 900 MHz Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.937 \text{ mho/m}$; $\epsilon_r = 40$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.77 mW/g

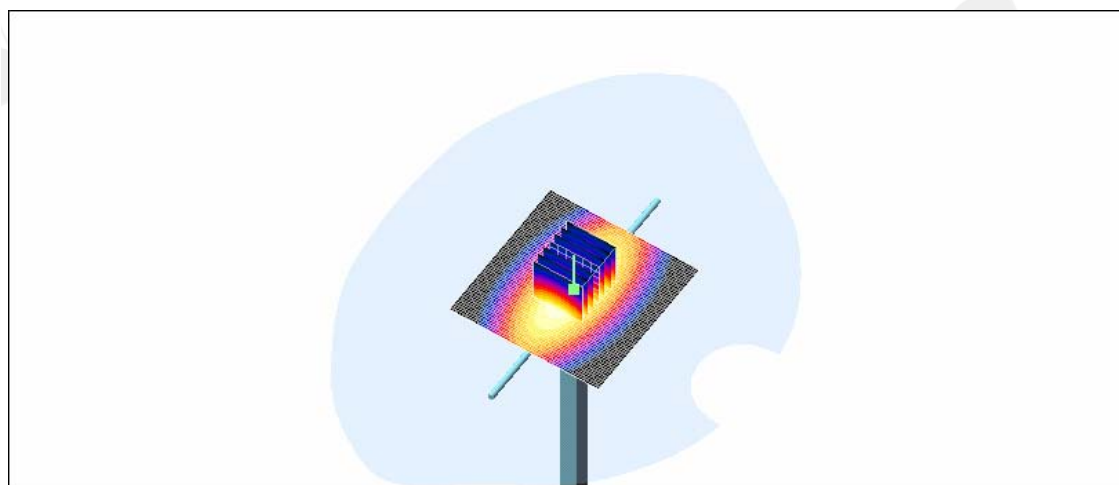
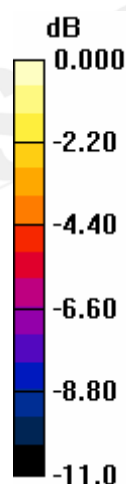
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.4 V/m; Power Drift = -0.054 dB

Peak SAR (extrapolated) = 3.91 W/kg

SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.62 mW/g

Maximum value of SAR (measured) = 2.74 mW/g



0 dB = 2.74mW/g

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SAR System Performance Verification

DUT: Dipole 900 MHz; Type: D900V2; Serial: SN:178

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: Muscle 900 MHz Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 1.03 \text{ mho/m}$; $\epsilon_r = 55.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(11.48, 11.48, 11.48); Calibrated: 2007/8/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2007/4/20
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 3.01 mW/g

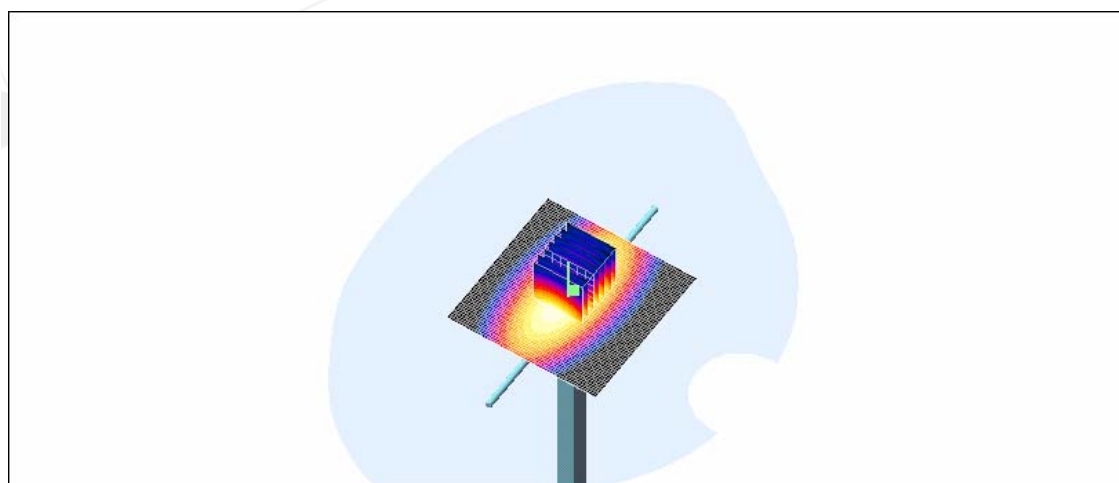
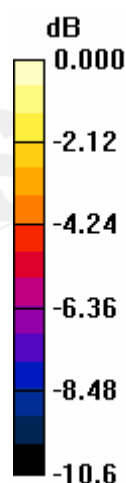
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.0 V/m; Power Drift = -0.054 dB

Peak SAR (extrapolated) = 4.12 W/kg

SAR(1 g) = 2.73 mW/g; SAR(10 g) = 1.78 mW/g

Maximum value of SAR (measured) = 2.95 mW/g



0 dB = 2.95mW/g

5. Appendix

5.1 Photographs of Test Setup

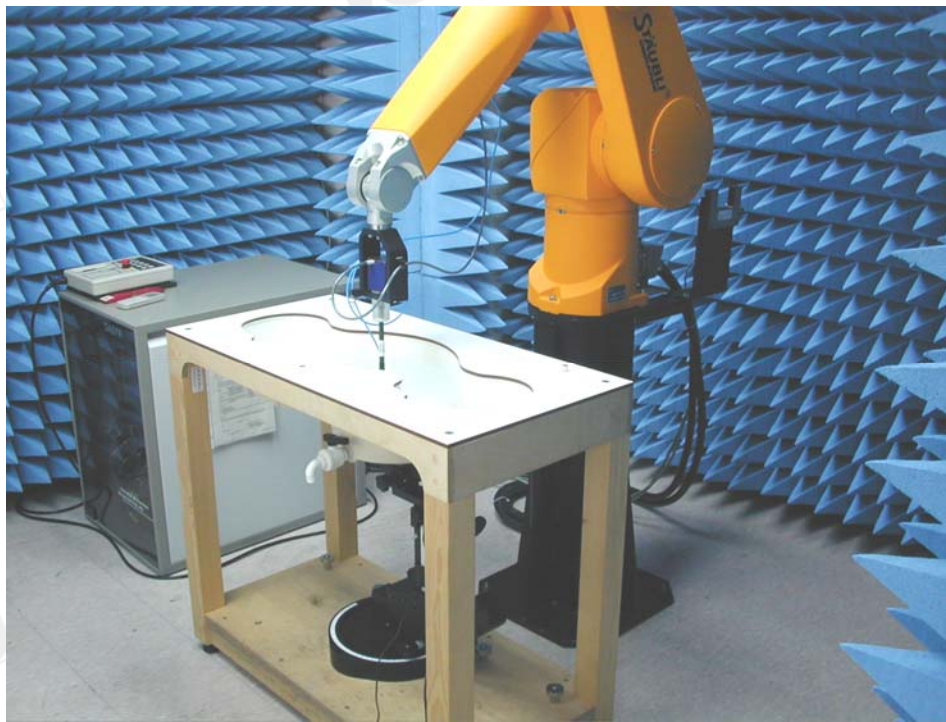


Fig.1 Photograph of the SAR measurement System

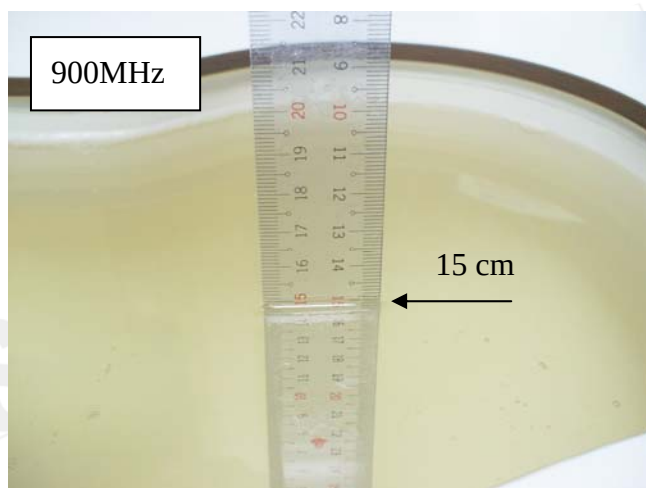


Fig.2.1 Photograph of the Tissue Simulant Fluid liquid depth 15cm for Left-head Side

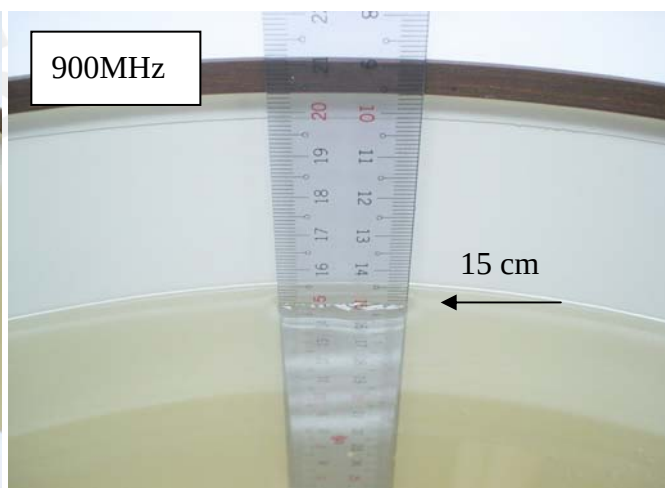


Fig.2.2 Photograph of the Tissue Simulant Fluid liquid depth 15cm for Flat (Body)

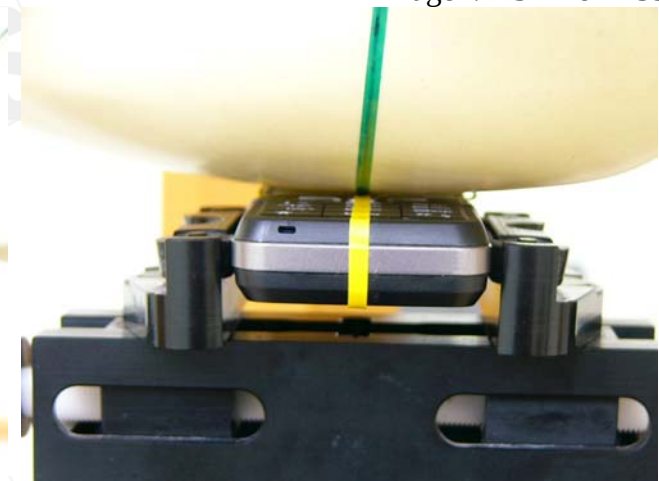
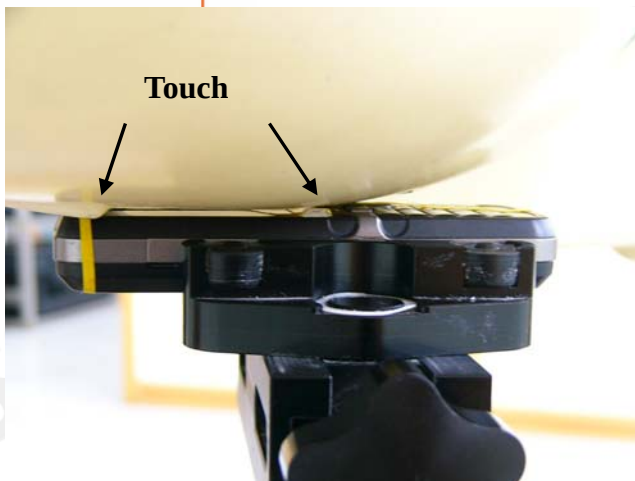


Fig.3 Right Head Section / Cheek-Touch Position

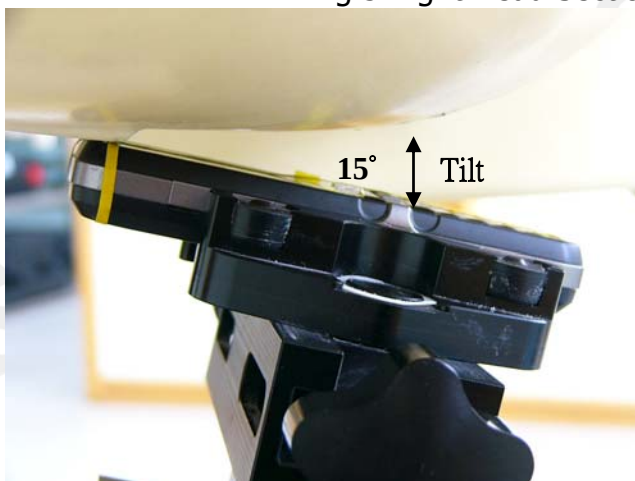


Fig.4 Right Head Section / Ear-Tilt Position(15°)

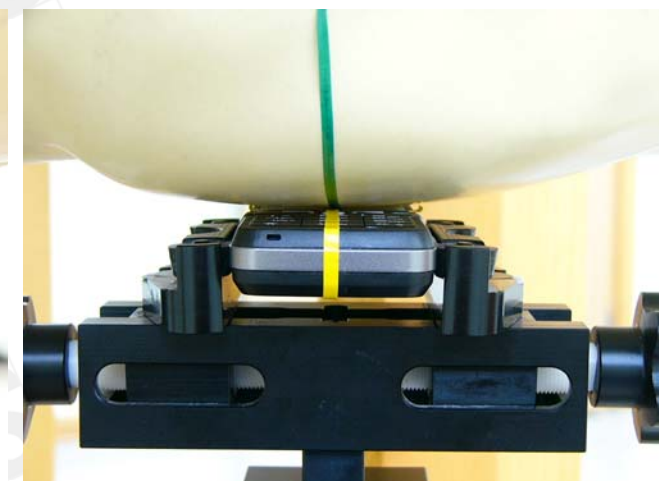
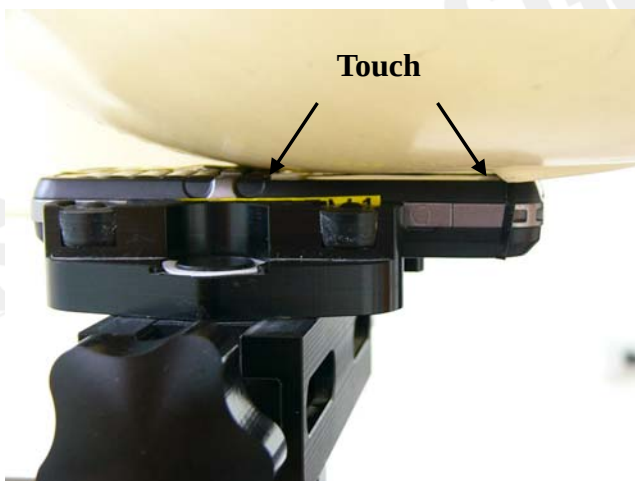


Fig.5 Left Head Section / Cheek-Touch Position

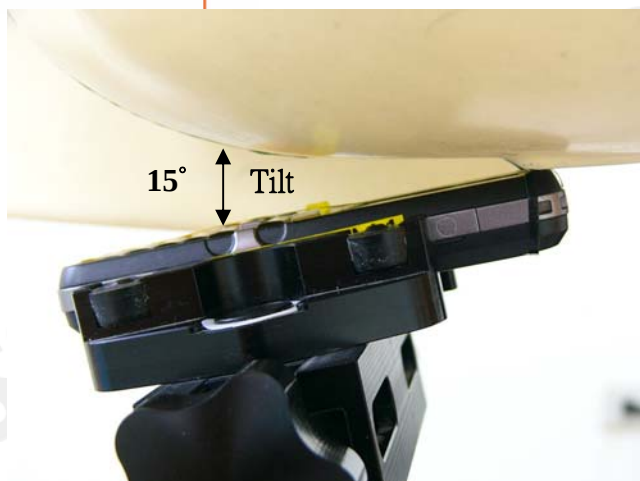


Fig.6 Left Head Section / Ear-Tilt Position(15°)

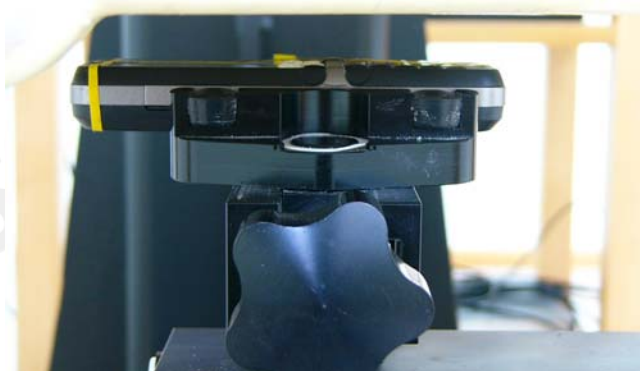
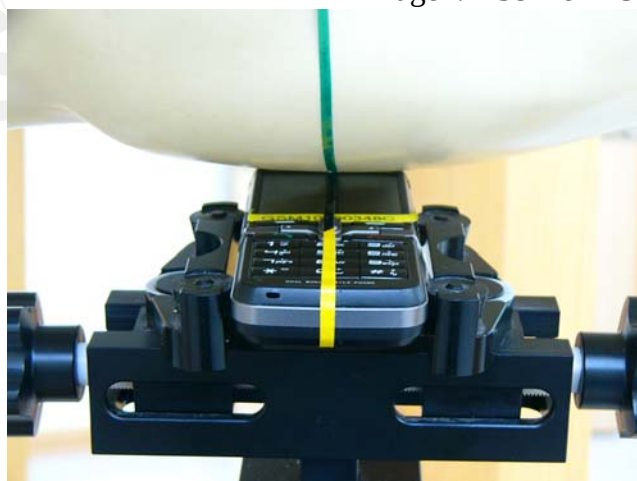


Fig.7 Body worn- EUT front to flat phantom

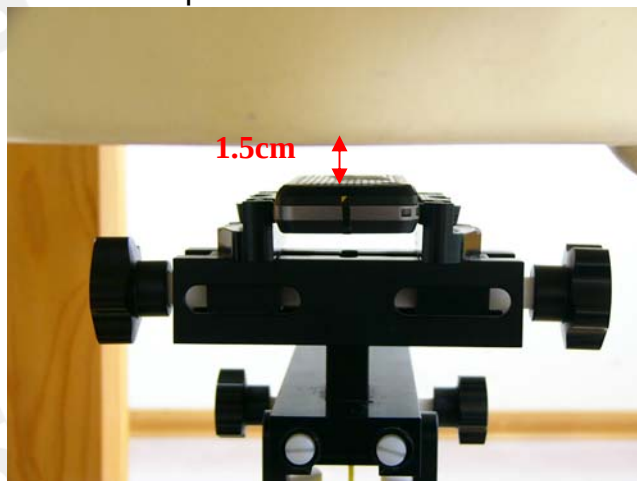


Fig.8 Body worn- EUT back to flat phantom

5.2 Photographs of the EUT



Fig.9 Front view of device



Fig.10 Back view of device

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Fig.11 Left view of device

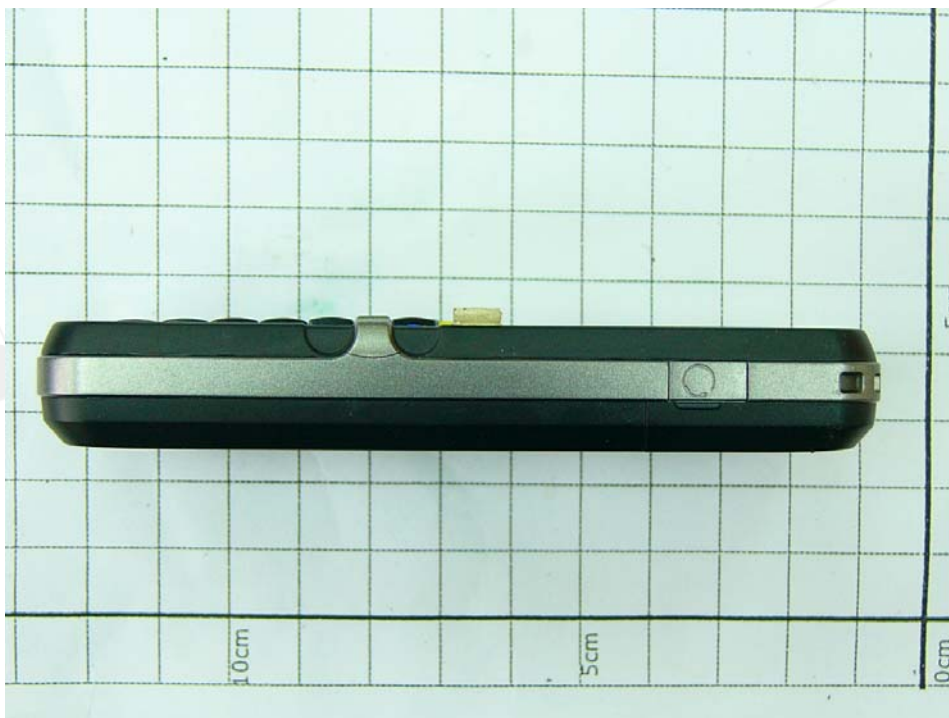


Fig.12 Right view of device

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5.3 Photographs of the Accessories of EUT



Fig.13 Front view of Battery



Fig.14 Back view of Battery



Fig.15 EUT Connected Charger

5.4 DAE & Probe Calibration certificate

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



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C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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

Accreditation No.: SCS 108

Client **Auden**

Certificate No: DAE4-679_Apr07

CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BA - SN: 679**

Calibration procedure(s) **QA CAL-06.v12
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **April 20, 2007**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	13-Oct-06 (Elcal AG, No: 5492)	Oct-07
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-06 (Elcal AG, No: 5478)	Oct-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1002	15-Jun-06 (SPEAG, in house check)	In house check Jun-07

Calibrated by:	Name Eric Hainfeld	Function Technician	Signature
Approved by:	Name Fin Bomholt	Function R&D Director	Signature

Issued: April 20, 2007

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Certificate No: DAE4-679_Apr07

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS (Auden)**

Certificate No: **EX3-3526_Aug07**

CALIBRATION CERTIFICATE

Object **EX3DV3 - SN:3526**

Calibration procedure(s) **QA CAL-01.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **August 29, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

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

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

Issued: August 29, 2007

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Certificate No: EX3-3526_Aug07

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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
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (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 $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

EX3DV3 SN:3526

August 29, 2007

Probe EX3DV3

SN:3526

Manufactured:	March 19, 2004
Last calibrated:	August 25, 2006
Recalibrated:	August 29, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: EX3-3526_Aug07

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EX3DV3 SN:3526

August 29, 2007

DASY - Parameters of Probe: EX3DV3 SN:3526**Sensitivity in Free Space^A****Diode Compression^B**

NormX	0.991 ± 10.1%	$\mu V/(V/m)^2$	DCP X	97 mV
NormY	0.807 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	96 mV
NormZ	0.876 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	97 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	2.0 mm	3.0 mm
SAR _{be} [%] Without Correction Algorithm	1.5	0.5
SAR _{be} [%] With Correction Algorithm	0.3	0.4

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance	2.0 mm	3.0 mm
SAR _{be} [%] Without Correction Algorithm	3.0	1.5
SAR _{be} [%] With Correction Algorithm	0.2	0.1

Sensor OffsetProbe Tip to Sensor Center **1.0 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%.

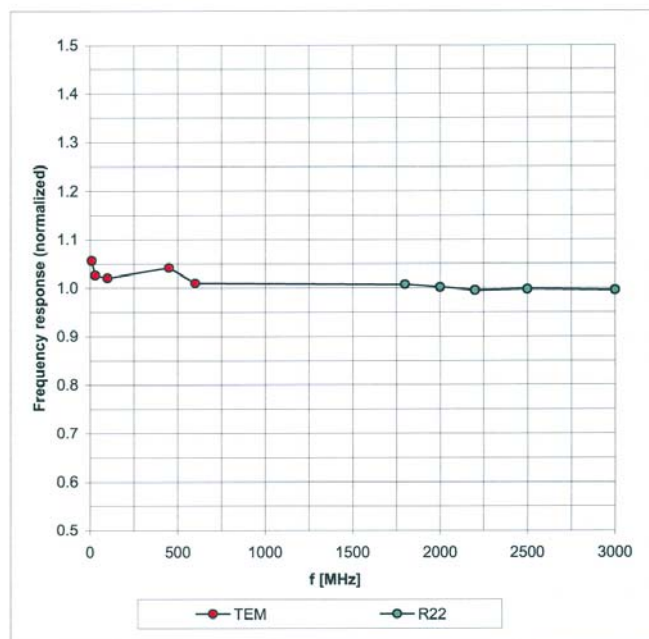
^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).^B Numerical linearization parameter: uncertainty not required.

EX3DV3 SN:3526

August 29, 2007

Frequency Response of E-Field

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



Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Certificate No: EX3-3526_Aug07

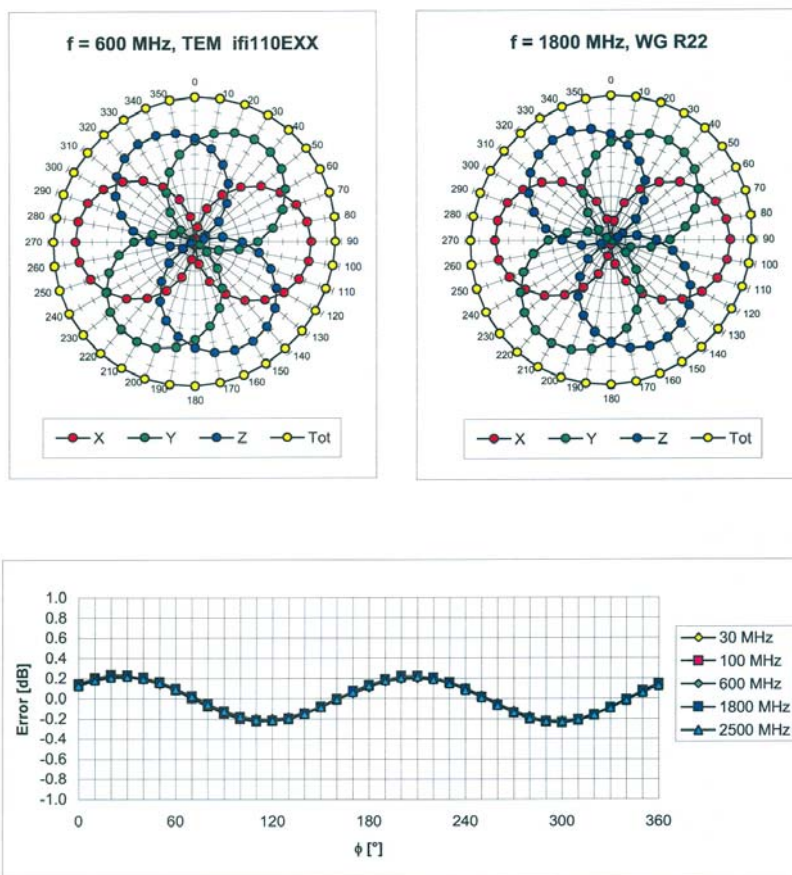
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EX3DV3 SN:3526

August 29, 2007

Receiving Pattern (ϕ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

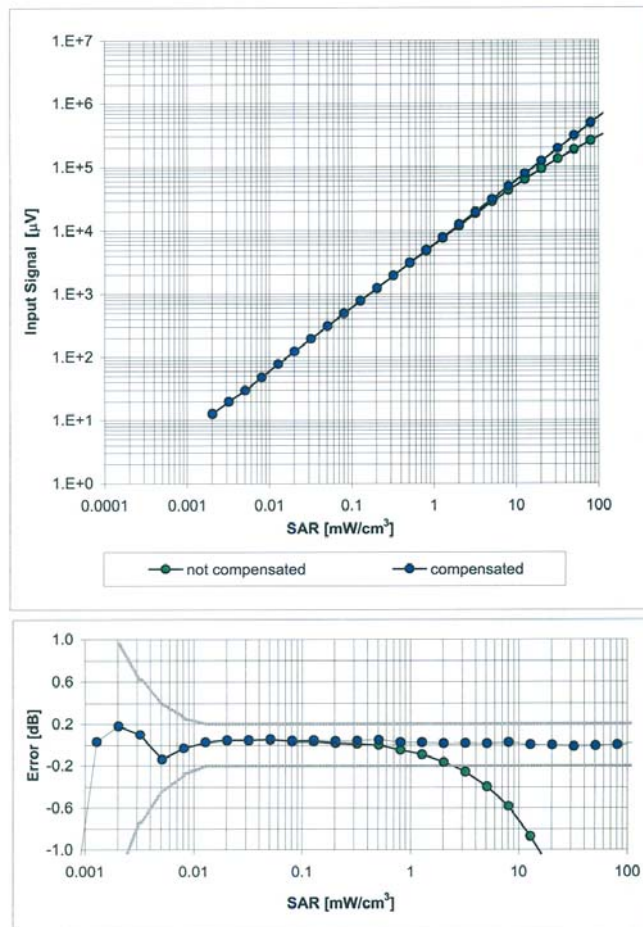
Certificate No: EX3-3526_Aug07

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EX3DV3 SN:3526

August 29, 2007

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$)



Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

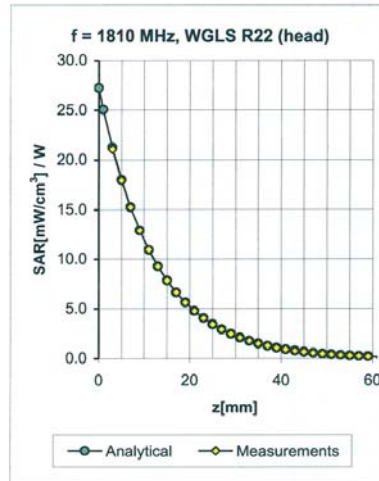
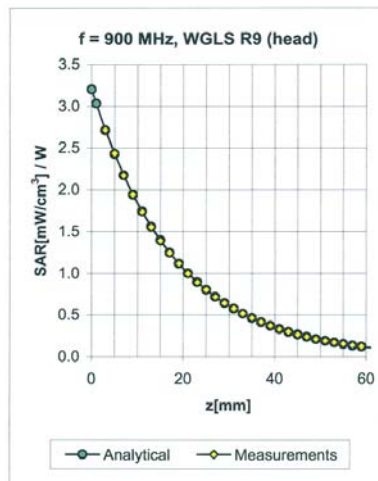
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EX3DV3 SN:3526

August 29, 2007

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%	0.50	0.80	11.48 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.15	1.32	9.30 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.22	1.01	8.91 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.34	1.00	8.42 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.50	0.80	10.93 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.16	1.28	9.04 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.15	1.43	8.67 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.38	1.00	8.08 ± 11.8% (k=2)

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

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5.5 Uncertainty Analysis

DASY4 Uncertainty Budget

According to IEEE P1528 [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	±4.8 %	N	1	1	1	±4.8 %	±4.8 %	∞
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	±1.0 %	N	1	1	1	±1.0 %	±1.0 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Conditions	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	875
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						±10.3 %	±10.0 %	331
Expanded STD Uncertainty						±20.6 %	±20.1 %	

5.6 Phantom Description

Schmid & Partner Engineering AG

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

s p e a g

Signature / Stamp

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 info@speag.com, http://www.speag.com

Doc No 881 – QD 000 P40 C – F

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5.7 System Validation from Original equipment supplier

DASY4 Validation Report for Head TSL

Date/Time: 19.02.2007 15:07:05

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:178

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 900$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.01, 6.01, 6.01); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:

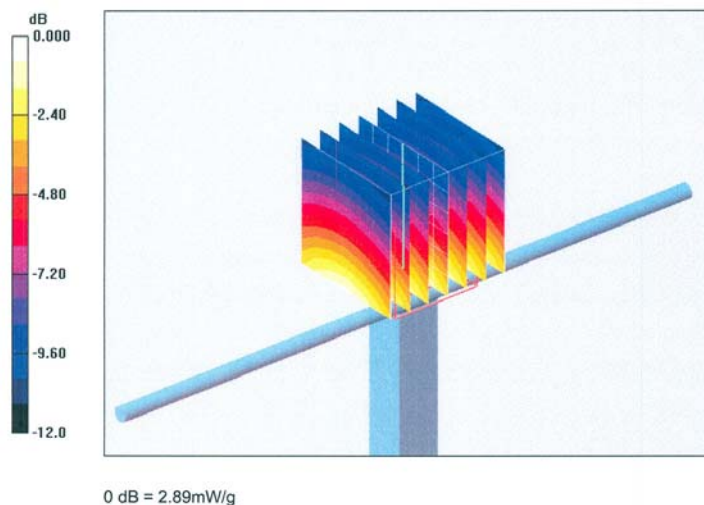
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.3 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 3.93 W/kg

SAR(1 g) = 2.66 mW/g; SAR(10 g) = 1.71 mW/g

Maximum value of SAR (measured) = 2.89 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 12.02.2007 14:24:23

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:178

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: MSL900;

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 1.04 \text{ mho/m}$; $\epsilon_r = 52.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.8, 5.8, 5.8); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

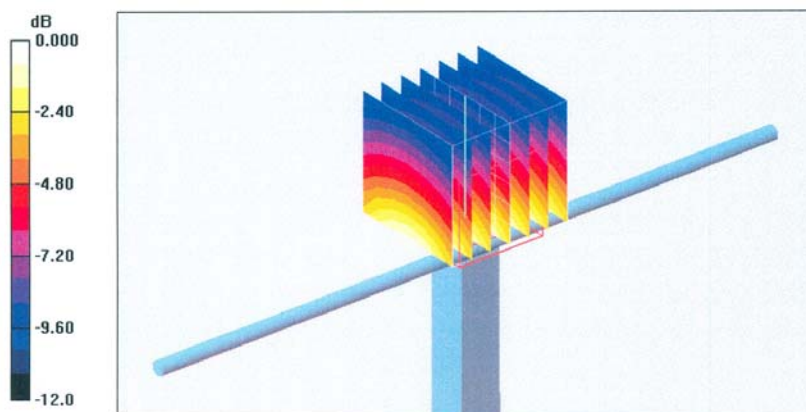
Pin=250mW/Zoom Scan (7x7x7)/Cube 0:Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 55.9 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 3.80 W/kg

SAR(1 g) = 2.69 mW/g; SAR(10 g) = 1.76 mW/g

Maximum value of SAR (measured) = 2.92 mW/g



0 dB = 2.92mW/g

End of Report