Accredited testing laboratory

DAR registration number: DAT-P-176/94-D1

Test report no.	**: 4-3049-01-05/08**
Type identification	**: EC400 / EC400g**
Test specification	**: IEEE P1528/D1.2**
FCC-ID	**: PY7F3232012**
IC-ID	**: 4170B-F3232012**

Table of Contents

1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.1.1 Statement of Compliance

The SAR values found for the EC400 / EC400g Express Card 34 are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1 g tissue according to the FCC rule §2.1093, the ANSI/IEEE C 95.1:1999, the NCRP Report Number 86 for uncontrolled environment, according to the Health Canada's Safety Code 6 and the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, when used in a notebook host that offers at least 9 mm distance to the body.
The measurement together with the test system set-up is described in chapter 2.3 of this test report. A detailed description of the equipment under test can be found in chapter 1.5.

Test engineer:

2008-05-23	**Oleksandr Hnatovskiy**	
Date	Name	Signature

Technical responsibility for area of testing:

2008-07-03	**Thomas Vogler**	
Date	Name	Signature

Document version information :

2008-05-23	Original issue
2008-07-03	HSPA category information (ch. 1.5) and MPR information (ch. 2.6.2) added. Mimimum distance to DUT added to statement of compliance.

1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Straße 6-10,
66117 Saarbruecken
Germany
Telephone: + 49 681 598 - 0
Fax: + 49 681 598 - 8475

e-mail: info@ict.cetecom.de
Internet: http://www.cetecom-ict.de

State of accreditation: The Test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025. DAR registration number: DAT-P-176/94-D1

Test location, if different from CETECOM ICT Services GmbH

Name: ---
Street: ---
Town: ---
Country: ---
Phone: ---
Fax: ---

1.3 Details of applicant

Name: Sony Ericsson Mobile Computing

Street: 7001 Development Drive
Town: Research Triangle Park, NC 27709
Country: USA

Contact: Mr. Louis Le
Telephone: +1-919-472-1431

1.4 Application details

Date of receipt of application:	2008-05-13
Date of receipt of test item:	2008-05-14
Start/Date of test:	2008-05-14
End of test:	2008-05-19

Person(s) present during the test: ---

1.5 Test item

Description of the test item: Express Card 34
Type identification: EC400 / EC400g
FCC-ID : PY7F3232012
IC-ID : 4170B-F3232012
Serial number: RE2483W07E

Manufacturer:
Name: Sony Ericsson Mobile Communications AB
Street: Nya Vattentornet
Town: 22188 Lund
Country: Sweden

additional information on the DUT:		
device type :	portable device	
IMEI No :	004401071829986	
exposure category:	uncontrolled environment / general population	
test device production information	identical prototype	
device operating configurations :		
operating mode(s)	GSM, DCS, PCS, UMTS/WCDMA	
modulation	GMSK, 8-PSK, QPSK(dl), 2*BPSK/HPSK(ul)	
GPRS mobile station class :	B	
GPRS multislot class :	10	voice mode : ---
EGPRS multislot class	10	voice mode : ---
maximum no. of timeslots in uplink:	2	
HSPA device category	HSDPA : 8	HSUPA : 5
operating frequency range(s)	transmitter frequency range	receiver frequency range
PCS 1900 (tested):	1850.2 MHz ~ 1909.8 MHz	1930.2 MHz ~ 1989.8 MHz
PCS 850 (tested):	824.2 MHz ~ 848.8 MHz	869.2 MHz ~ 893.8 MHz
DCS 1800	1710 MHz ~ 1785 MHz	1805 MHz ~ 1880 MHz
GSM 900	880 MHz ~ 915 MHz	925 MHz ~ 960 MHz
FDD I	1922.4 MHz ~ 1977.6 MHz	2112.4 MHz ~ 2167.6 MHz
FDD II (tested)	1852.4 MHz ~ 1907.6 MHz	1932.4 MHz ~ 1987.6 MHz
FDD V (tested)	826.4 MHz ~ 846.6 MHz	871.4 MHz ~ 891.6 MHz
Power class :	1, tested with power level 0 (1900 MHz band) 4, tested with power level 5 (850 MHz band) 3; (FDD II band); 3 (FDD V)	
measured peak output power (conducted):	850 MHz band: 32.5 dBm (GMSK); 30.3 dBm (8-PSK) 1900 MHz band: 30.3 dBm (GMSK); 29.4 dBm (8-PSK) FDD II band: 23.35 dBm; FDD V: 23.1 dBm (average max.)	
test channels (low-mid-high) :	128-190-251 (850 MHz band) 512-661-810 (1900 MHz band) 9262-9400-9538 (FDD II band) 4132-4182-4233 (FDD V band)	
hardware version :	2.0	
software version :	1.2.0.0	
antenna type :	Integrated antenna	
body-worn configurations:	Laptop – Gateway W350A	

1.6 Test specification(s)

Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01)

IEEE P1528/D1.2 (April 21, 2003)

RSS-102: Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 2 of November 2005)

Canada's Safety Code 6: Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz (99-EHD-237)

IEEE Std C95.3 – 1991, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave.

IEEE Std C95.1 – 1999, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.

1.6.1 RF exposure limits

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

Table 1: RF exposure limits

The limit applied in this test report is shown in **bold** letters

Notes:

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

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

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

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

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

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.	☒
The deviations as specified in 2.5 were ascertained in the course of the tests performed.	☐

2.2 Test environment

General Environment conditions in the test area are as follows:

Ambient temperature: 20°C – 24°C
Tissue simulating liquid: 20°C – 24°C
Humidity: 40% – 50%

Exact temperature values for each test are shown in the table(s) under 2.5. and/or on the measurement plots.

2.3 Measurement and test set-up

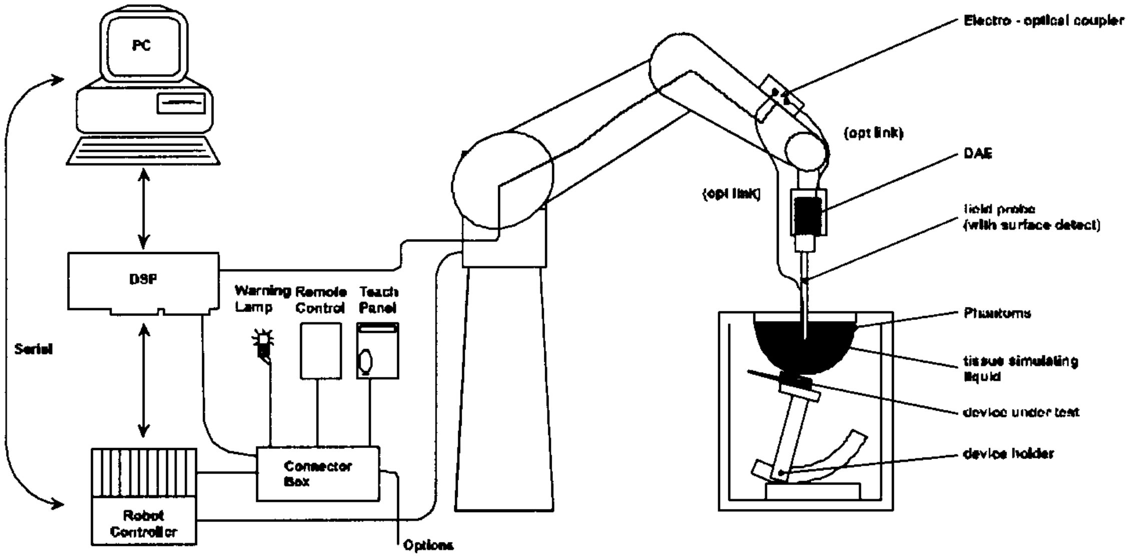
The measurement system is described in chapter 2.4.

The test setup for the system validation can be found in chapter 2.4.14.

A description of positioning and test signal control can be found in chapter 2.5 together with the test results.

2.4 Measurement system

2.4.1 System Description



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

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension 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 electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY4 measurement server.
- The DASY4 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2000
- DASY4 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

2.4.2 Test environment

The DASY4 measurement system is placed at the head end of a room with dimensions:
5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling.
Picture 1 of the photo documentation shows a complete view of the test environment.
The system allows the measurement of SAR values larger than 0.005 mW/g.

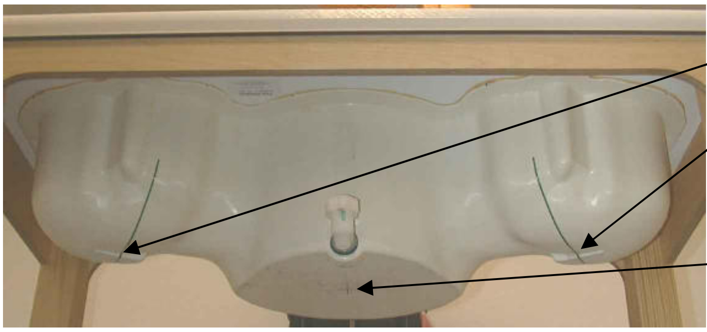
2.4.3 Probe description

Isotropic E-Field Probe ET3DV6 for Dosimetric Measurements

Technical data according to manufacturer information	
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration	In air from 10 MHz to 2.5 GHz In head tissue simulating liquid (HSL) at 900 (800-1000) MHz and 1.8 GHz (1700-1910 MHz) (accuracy ± 9.5%; k=2) Calibration for other liquids and frequencies upon request
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces (ET3DV6 only)
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (ET3DV6)

2.4.4 Phantom description

The used SAM Phantom meets the requirements specified in Edition 01-01 of Supplement C to OET Bulletin 65 for Specific Absorption Rate (SAR) measurements.
The phantom consists of a fibreglass shell integrated in a wooden table. It allows left-hand and right-hand head as well as body-worn measurements with a maximum liquid depth of 18 cm in head position and 22 cm in planar position (body measurements). The thickness of the Phantom shell is 2 mm +/- 0.1 mm.



2.4.5 Device holder description

The DASY4 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.

Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values.
Therefore those devices are normally only tested at the flat part of the SAM.

2.4.6 Scanning procedure

The DASY4 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The „reference“ and „drift“ measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. +/- 5 %.

- The „surface check“ measurement tests the optical surface detection system of the DASY4 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- The „area scan“ measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strenth is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension. If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.
  Results of this coarse scan are shown in annex 2.

- A „7x7x7 zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous „coarse“ scan. This is a fine 7x7 grid where the robot additionally moves the probe in 7 steps along the z-axis away from the bottom of the Phantom. Grid spacing for the cube measurement is 5 mm in x and y-direction and 5 mm in z-direction. DASY4 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in annex 2. Test results relevant for the specified standard (see chapter 1.6.) are shown in table form in chapter 2.5.

- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in annex 2.

2.4.7 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 7 x 7 x 7 points. The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.

- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.

- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY4 uses the advanced extrapolation option which is able to compansate boundary effects on E-field probes.

2.4.8 Data Storage and Evaluation

Data Storage

The DASY4 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation by SEMCAD

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

Probe parameters:	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY4 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf/dcp_i$$

with	V_i	= compensated signal of channel i	(i = x, y, z)
	U_i	= input signal of channel i	(i = x, y, z)
	cf	= crest factor of exciting field	(DASY parameter)
	dcp_i	= diode compression point	(DASY parameter)

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

E-field probes: $$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes: $$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2)/f$$

with	V_i	= compensated signal of channel i	(i = x, y, z)
	$Norm_i$	= sensor sensitivity of channel i [mV/(V/m)^2] for E-field Probes	(i = x, y, z)
	ConvF	= sensitivity enhancement in solution	
	a_{ij}	= sensor sensitivity factors for H-field probes	
	f	= carrier frequency [GHz]	
	E_i	= electric field strength of channel i in V/m	
	H_i	= magnetic field strength of channel i in A/m	

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

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

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

$$SAR = (E_{tot}^2 \cdot \sigma) / (\rho \cdot 1000)$$

with	SAR	= local specific absorption rate in mW/g
	E_{tot}	= total field strength in V/m
	σ	= conductivity in [mho/m] or [Siemens/m]
	ρ	= equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.The power flow density is calculated assuming the excitation field to be a free space field.

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

with	P_{pwe}	= equivalent power density of a plane wave in mW/cm^2
	E_{tot}	= total electric field strength in V/m
	H_{tot}	= total magnetic field strength in A/m

2.4.9 Test equipment utilized

This table gives a complete overview of the SAR measurement equipment

Devices used during the test described in chapter 2.5. are marked ☒

	Manufacturer	Device	Type	Serial number	Date of last calibration)*
☒	Schmid & Partner Engineering AG	Dosimetric E-Field Probe	ET3DV6	1558	August 23, 2007
☐	Schmid & Partner Engineering AG	Dosimetric E-Field Probe	ET3DV6	1559	January 23, 2008
☒	Schmid & Partner Engineering AG	900 MHz System Validation Dipole	D900V2	102	August 23, 2007
☐	Schmid & Partner Engineering AG	1800 MHz System Validation Dipole	D1800V2	287	August 21, 2007
☒	Schmid & Partner Engineering AG	1900 MHz System Validation Dipole	D1900V2	5d009	August 21, 2007
☐	Schmid & Partner Engineering AG	2450 MHz System Validation Dipole	D2450V2	710	August 20, 2007
☒	Schmid & Partner Engineering AG	Data acquisition electronics	DAE3V1	413	January 18, 2008
☒	Schmid & Partner Engineering AG	Software	DASY 4 V4.5	---	N/A
☒	Schmid & Partner Engineering AG	Phantom	SAM	---	N/A
☒	Rohde & Schwarz	Universal Radio Communication Tester	CMU 200	832221/055	March 20, 2008
☒	Hewlett Packard)*	Network Analyser 300 kHz to 6 GHz	8753C	2937U00269	March 13, 2007
☒	Hewlett Packard)*	Network Analyser 300 kHz to 6 GHz	85047A	2936A00872	March 13, 2007
☒	Hewlett Packard	Dielectric Probe Kit	85070C	US99360146	N/A
☒	Hewlett Packard	Signal Generator	8665A	2833A00112	November 12, 2007
☒	Amplifier Reasearch	Amplifier	25S1G4 (25 Watt)	20452	N/A
☒	Rohde & Schwarz	Power Meter	NRP	101367	January 9, 2008
☒	Rohde & Schwarz	Power Meter Sensor	NRP Z22	100227	January 9, 2008
☒	Rohde & Schwarz	Power Meter Sensor	NRP Z22	100234	January 9, 2008

)* : Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

2.4.10 Tissue simulating liquids: dielectric properties

The following materials are used for producing the tissue-equivalent materials.

(liquids used for tests described in chapter 2.5. are marked with ☒) :

Ingredients (% of weight)	Frequency (MHz)					
frequency band	☐ 450	☒ 835	☐ 900	☐ 1800	☒ 1900	☐ 2450
Tissue Type	Body	Body	Body	Body	Body	Body
Water	51.16	52.4	56.0	69.91	69.91	73.2
Salt (NaCl)	1.49	1.40	0.76	0.13	0.13	0.04
Sugar	46.78	45.0	41.76	0.0	0.0	0.0
HEC	0.52	1.0	1.21	0.0	0.0	0.0
Bactericide	0.05	0.1	0.27	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	0.0	29.96	29.96	26.7

Table 2: Body tissue dielectric properties

Salt: 99+% Pure Sodium Chloride
Sugar: 98+% Pure Sucrose
Water: De-ionized, 16MΩ+ resistivity
HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

2.4.11 Tissue simulating liquids: parameters

Used Target Frequency	Target Body Tissue		Measured Body Tissue		Measured Date
[MHz]	Permittivity	Conductivity [S/m]	Permittivity	Conductivity [S/m]	
835	55.2	0.97	55.0	0.98	2008-05-14
900	55.0	1.05	54.0	1.05	2008-05-14
1900	53.3	1.52	53.4	1.51	2008-05-15
1900	53.3	1.52	53.4	1.51	2008-05-16

Table 3: Parameter of the body tissue simulating liquid

Note: The dielectric properties have been measured using the contact probe method at 22°C.

2.4.12 Measurement uncertainty evaluation for SAR test

The overall combined measurement uncertainty of the measurement system is ± 10,3% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 20.6%
This measurement uncertainty budget is suggested by IEEE P1528 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Error Sources	Uncertainty Value	Probability Distribution	Divi-sor	c_i 1g	c_i 10g	Standard Uncertainty 1g	Standard Uncertainty 10g	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 4.8%	Normal	1	1	1	± 4.8%	± 4.8%	∞
Axial isotropy	± 4.7%	Rectangular	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical isotropy	± 9.6%	Rectangular	√3	0.7	0.7	± 3.9%	± 3.9%	∞
Spatial resolution	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
Boundary effects	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Probe linearity	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
System detection limits	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Readout electronics	± 1.0%	Normal	1	1	1	± 1.0%	± 1.0%	∞
Response time	± 0.8%	Rectangular	√3	1	1	± 0.5%	± 0.5%	∞
Integration time	± 2.6%	Rectangular	√3	1	1	± 1.5%	± 1.5%	∞
RF ambient conditions	± 3.0%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Probe positioner	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%	∞
Probe positioning	± 2.9%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Max. SAR evaluation	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Test Sample Related								
Device positioning	± 2.9%	Normal	1	1	1	± 2.9%	± 2.9%	145
Device holder uncertainty	± 3.6%	Normal	1	1	1	± 3.6%	± 3.6%	5
Power drift	± 5.0%	Rectangular	√3	1	1	± 2.9%	± 2.9%	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0%	Rectangular	√3	1	1	± 2.3%	± 2.3%	∞
Liquid conductivity (target)	± 5.0%	Rectangular	√3	0.64	0.43	± 1.8%	± 1.2%	∞
Liquid conductivity (meas.)	± 2.5%	Normal	1	0.64	0.43	± 1.6%	± 1.1%	∞
Liquid permittivity (target)	± 5.0%	Rectangular	√3	0.6	0.49	± 1.7%	± 1.4%	∞
Liquid permittivity (meas.)	± 2.5%	Normal	1	0.6	0.49	± 1.5%	± 1.2%	∞
Combined Uncertainty						± 10.3%	± 10.0%	330
Expanded Std. Uncertainty						**± 20.6%**	**± 20.1%**	

Table 4: Measurement uncertainties

2.4.13 Measurement uncertainty evaluation for system validation

The overall combined measurement uncertainty of the measurement system is ± 8.4% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 16.8%
This measurement uncertainty budget is suggested by IEEE P1528 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Error Sources	Uncertainty Value	Probability Distribution	Divi-sor	c_i 1g	c_i 10g	Standard Uncertainty 1g	Standard Uncertainty 10g	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 4.8%	Normal	1	1	1	± 4.8%	± 4.8%	∞
Axial isotropy	± 4.7%	Rectangular	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical isotropy	± 0.0%	Rectangular	√3	0.7	0.7	± 0.0%	± 3.9%	∞
Boundary effects	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Probe linearity	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
System detection limits	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Readout electronics	± 1.0%	Normal	1	1	1	± 1.0%	± 1.0%	∞
Response time	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
Integration time	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
RF ambient conditions	± 3.0%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Probe positioner	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%	∞
Probe positioning	± 2.9%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Max. SAR evaluation	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Test Sample Related								
Dipole axis to liquid distance	± 2.0%	Normal	1	1	1	± 1.2%	± 1.2%	∞
Power drift	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0%	Rectangular	√3	1	1	± 2.3%	± 2.3%	∞
Liquid conductivity (target)	± 5.0%	Rectangular	√3	0.64	0.43	± 1.8%	± 1.2%	∞
Liquid conductivity (meas.)	± 2.5%	Normal	1	0.64	0.43	± 1.6%	± 1.1%	∞
Liquid permittivity (target)	± 5.0%	Rectangular	√3	0.6	0.49	± 1.7%	± 1.4%	∞
Liquid permittivity (meas.)	± 2.5%	Normal	1	0.6	0.49	± 1.5%	± 1.2%	∞
Combined Uncertainty						**± 8.4%**	**± 8.1%**	
Expanded Std. Uncertainty						**± 16.8%**	**± 16.2%**	

Table 5: Measurement uncertainties

2.4.14 System validation

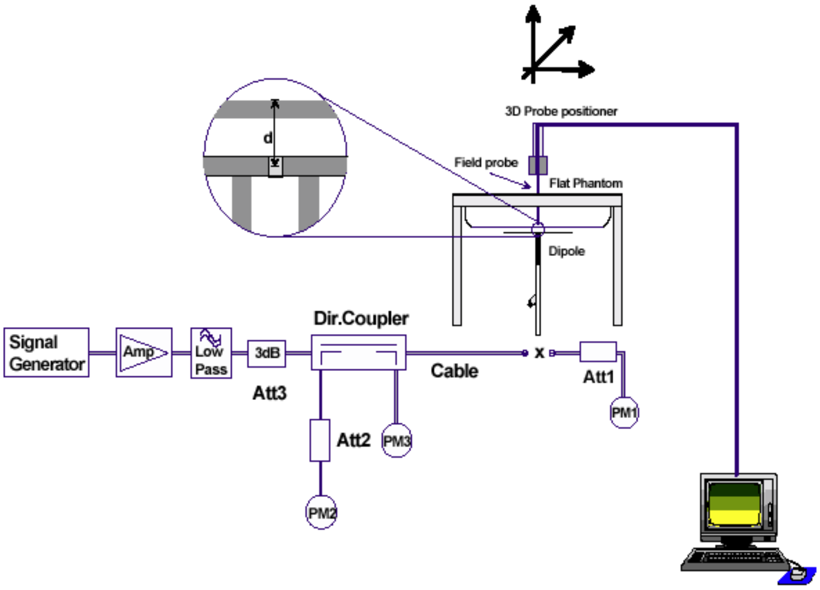
The system validation is performed for verifying the accuracy of the complete measurement system and performance of the software. The system validation is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows validation results for all frequency bands and tissue liquids used during the tests of the test item described in chapter 1.5.
(graphic plot(s) see annex 1).

Validation Kit	Frequency	Target Peak SAR (1000 mW) (+/- 10%)	Target SAR_{1g} (1000 mW) (+/- 10%)	Measured Peak SAR	Measured SAR_{1g}	Measured date
D900V2 S/N: 102	**900 MHz body**	**15.2 mW/g**	**10.6 mW/g**	**16.0 mW/g**	**11.0 mW/g**	**2008-05-14**
D1900V2 S/N: 5d009	**1900 MHz body**	**63.2 mW/g**	**37.7 mW/g**	**68.5 mW/g**	**39.9 mW/g**	**2008-05-15**
D1900V2 S/N: 5d009	**1900 MHz body**	**63.2 mW/g**	**37.7 mW/g**	**66.9 mW/g**	**39.7 mW/g**	**2008-05-16**

Table 6: Results system validation

2.4.15 Validation procedure

The validation is performed by using a validation dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 1000 mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the validation to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).
Validation results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



2.5 Test results (Body SAR)

The table contains the measured SAR values averaged over a mass of 1 g					
Channel / frequency	Number of TS (ul)	Position	Body worn	Limit	Liquid temperature
190 / 836.6 MHz	1	underside / close	0.718 W/kg	1.6 W/kg	22.4°C
190 / 836.6 MHz	2	underside / close	0.761 W/kg	1.6 W/kg	22.4°C
190 / 836.6 MHz	2	underside / open	0.849 W/kg	1.6 W/kg	22.4°C
128 / 824.2 MHz	2	underside / open	0.715 W/kg	1.6 W/kg	22.4°C
251 / 848.8 MHz	2	underside / open	**0.972 W/kg**	1.6 W/kg	22.4°C
251 / 848.8 MHz	2 (EGPRS)	underside / open	0.582 W/kg	1.6 W/kg	22.4°C

Table 7: Test results (Body SAR 850 MHz)

Note: The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.

The table contains the measured SAR values averaged over a mass of 1 g					
Channel / frequency	Number of TS (ul)	Position	Body worn	Limit	Liquid temperature
661 / 1880.0 MHz	2	underside / open	0.639 W/kg	1.6 W/kg	21.5°C
661 / 1880.0 MHz	1	underside / close	0.464 W/kg	1.6 W/kg	21.5°C
661 / 1880.0 MHz	1	underside / open	**0.791 W/kg**	1.6 W/kg	21.5°C
661 / 1880.0 MHz	1 (EGPRS)	underside / open	0.300 W/kg	1.6 W/kg	21.5°C

Table 8: Test results (Body SAR 1900 MHz)

Note: The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.

The table contains the measured SAR values averaged over a mass of 1 g					
Channel / frequency	Mode	Position	Body worn	Limit	Liquid temperature
9400 / 1880.0 MHz	RMC	underside / close	0.685 W/kg	1.6 W/kg	22.7°C
9400 / 1880.0 MHz	RMC	underside / open	**0.959 W/kg**	1.6 W/kg	22.7°C
9262 / 1852.5 MHz	RMC	underside / open	0.900 W/kg	1.6 W/kg	22.6°C
9538 / 1907.6 MHz	RMC	underside / open	0.816 W/kg	1.6 W/kg	22.5°C

Table 9: Test results (Body SAR FDD II 1900 MHz)

Note: The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.

The table contains the measured SAR values averaged over a mass of 1 g					
Channel / frequency	Mode	Position	Body worn	Limit	Liquid temperature
4182 / 836.6 MHz	RMC	underside / close	0.582 W/kg	1.6 W/kg	22.2°C
4182 / 836.6 MHz	RMC	underside / open	0.968 W/kg	1.6 W/kg	22.2°C
4132 / 824.2 MHz	RMC	underside / open	0.875 W/kg	1.6 W/kg	22.2°C
4233 / 848.8 MHz	RMC	underside / open	**1.090 W/kg**	1.6 W/kg	22.2°C

Table 10: Test results (Body SAR FDD V 850 MHz)

Note: The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.
At highest SAR configuration peak SAR delta checks were performed with increased distance in 5 mm steps. Due to decreased peak SAR values with rising distance no additional SAR measurements were performed.

2.5.1 General description of test procedures

The DUT is tested using a CMU 200 communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power.
The used notebook offered the distances 9 mm between DUT and SAM phantom when positioned in direct contact to the flat part of the phantom.
Test positions as described in the tables above are in accordance with the specified test standard.
Tests with GPRS in body position are performed with different number of timeslots in uplink on worst case position. On further test positions the timeslot configuration found with highest SAR was used. UMTS mode was tested with Reference Measurement Channel and power control bits set to 'All 1' to get maximum output power.
Conducted output power was measured using an integrated RF connector and attached RF cable.

2.6 Test results (conducted power measurement)

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200 was used.
The output power was measured using an integrated RF connector and attached RF cable.
The conducted output power was measured before and after each SAR measurement. The resulting power values were within a 0.2 dB tolerance of the values shown below.

GSM 850			
Channel / frequency	GSM/GPRS	EDGE peak	EDGE avg.
128 / 824.2 MHz	32.5 dBm	30.3 dBm	27.0 dBm
190 / 836.6 MHz	32.4 dBm	30.2 dBm	27.0 dBm
251 / 848.0 MHz	32.5 dBm	30.3 dBm	27.0 dBm
GSM 1900			
Channel / frequency	GSM/GPRS	EDGE peak	EDGE avg.
512 / 1850.2 MHz	30.3 dBm	29.0 dBm	25.8 dBm
661 / 1880.0 MHz	30.3 dBm	29.3 dBm	26.0 dBm
810 / 1909.8 MHz	30.2 dBm	29.4 dBm	26.0 dBm

Table 11: Test results conducted peak power measurement GSM

WCDMA 850 (RMC 12.2 kBit/s)		
Channel / frequency	Max. RMS	Peak
4132 / 826.4 MHz	**23.08** dBm	25.79 dBm
4182 / 836.6 MHz	**23.09** dBm	25.90 dBm
4233 / 846.6 MHz	**23.10** dBm	25.67 dBm

Table 12: Test results conducted peak power measurement WCDMA

WCDMA + HSDPA 850			
Channel / frequency	sub-test	Max. RMS	Peak
4132 / 826.4 MHz	1	23.18 dBm	25.65 dBm
4182 / 836.6 MHz	1	23.14 dBm	25.81 dBm
4233 / 846.6 MHz	1	23.14 dBm	25.53 dBm
4132 / 826.4 MHz	2	21.45 dBm	25.33 dBm
4182 / 836.6 MHz	2	21.17 dBm	25.75 dBm
4233 / 846.6 MHz	2	21.10 dBm	25.91 dBm
4132 / 826.4 MHz	3	20.95 dBm	25.61 dBm
4182 / 836.6 MHz	3	20.61 dBm	25.73 dBm
4233 / 846.6 MHz	3	20.06 dBm	24.94 dBm
4132 / 826.4 MHz	4	20.37 dBm	24.71 dBm
4182 / 836.6 MHz	4	20.46 dBm	24.92 dBm
4233 / 846.6 MHz	4	20.00 dBm	24.73 dBm

Table 13: Test results conducted peak power measurement WCDMA + HSDPA

WCDMA + HSDPA + HSUPA 850			
Channel / frequency	Sub-test	Max. RMS	Peak
4132 / 826.4 MHz	1	21.37 dBm	25.51 dBm
4182 / 836.6 MHz	1	21.33 dBm	25.62 dBm
4233 / 846.6 MHz	1	21.24 dBm	25.23 dBm
4132 / 826.4 MHz	2	21.46 dBm	26.41 dBm
4182 / 836.6 MHz	2	21.61 dBm	24.82 dBm
4233 / 846.6 MHz	2	21.02 dBm	25.62 dBm
4132 / 826.4 MHz	3	21.42 dBm	26.12 dBm
4182 / 836.6 MHz	3	21.37 dBm	26.23 dBm
4233 / 846.6 MHz	3	21.27 dBm	25.04 dBm
4132 / 826.4 MHz	4	20.74 dBm	25.74 dBm
4182 / 836.6 MHz	4	19.78 dBm	25.24 dBm
4233 / 846.6 MHz	4	20.47 dBm	25.35 dBm
4132 / 826.4 MHz	5	21.89 dBm	25.74 dBm
4182 / 836.6 MHz	5	21.73 dBm	25.81 dBm
4233 / 846.6 MHz	5	21.63 dBm	25.42 dBm

Table 14: Test results conducted peak power measurement WCDMA + HSDPA + HSUPA

WCDMA 1900 (RMC 12.2 kBit/s)		
Channel / frequency	Max. RMS	Peak
9262 / 1852.4 MHz	**23.35** dBm	26.21 dBm
9400 / 1880.0 MHz	**23.25** dBm	26.23 dBm
9538 / 1907.6 MHz	**23.20** dBm	25.88 dBm

Table 15: Test results conducted peak power measurement WCDMA

WCDMA + HSDPA 1900			
Channel / frequency	sub-test	Max. RMS	Peak
9262 / 1852.4 MHz	1	23.58 dBm	26.36 dBm
9400 / 1880.0 MHz	1	23.48 dBm	26.30 dBm
9538 / 1907.6 MHz	1	23.38 dBm	25.89 dBm
9262 / 1852.4 MHz	2	21.77 dBm	25.93 dBm
9400 / 1880.0 MHz	2	21.46 dBm	25.91 dBm
9538 / 1907.6 MHz	2	21.88 dBm	25.74 dBm
9262 / 1852.4 MHz	3	20.83 dBm	25.56 dBm
9400 / 1880.0 MHz	3	20.56 dBm	25.90 dBm
9538 / 1907.6 MHz	3	20.59 dBm	25.63 dBm
9262 / 1852.4 MHz	4	20.56 dBm	25.33 dBm
9400 / 1880.0 MHz	4	20.38 dBm	25.52 dBm
9538 / 1907.6 MHz	4	20.37 dBm	25.87 dBm

Table 16: Test results conducted peak power measurement WCDMA + HSDPA

WCDMA + HSDPA + HSUPA 1900			
Channel / frequency	Sub-test	Max. RMS	Peak
9262 / 1852.4 MHz	1	21.86 dBm	26.56 dBm
9400 / 1880.0 MHz	1	21.89 dBm	26.41 dBm
9538 / 1907.6 MHz	1	21.88 dBm	26.19 dBm
9262 / 1852.4 MHz	2	21.26 dBm	26.84 dBm
9400 / 1880.0 MHz	2	21.23 dBm	26.76 dBm
9538 / 1907.6 MHz	2	21.24 dBm	26.49 dBm
9262 / 1852.4 MHz	3	21.82 dBm	26.78 dBm
9400 / 1880.0 MHz	3	21.65 dBm	26.70 dBm
9538 / 1907.6 MHz	3	21.73 dBm	26.46 dBm
9262 / 1852.4 MHz	4	21.01 dBm	26.41 dBm
9400 / 1880.0 MHz	4	21.00 dBm	26.49 dBm
9538 / 1907.6 MHz	4	21.03 dBm	26.08 dBm
9262 / 1852.4 MHz	5	22.18 dBm	26.32 dBm
9400 / 1880.0 MHz	5	22.10 dBm	26.23 dBm
9538 / 1907.6 MHz	5	22.06 dBm	25.82 dBm

Table 17: Test results conducted peak power measurement WCDMA + HSDPA + HSUPA

Remark : None of the HSDPA/HSUPA settings leads to conducted power values exceeding the conducted power in RMC mode by more than 0.25 dB, so SAR testing was performed in RMC mode.

2.6.1 Test set-up requirements according to 3GPP 34.121

The following HSDPA sub-tests are defined by 3GPP 34.121 (table C.10.1.4)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM(dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK}, Δ_{CQI} = 8 $\Longleftrightarrow$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\Longleftrightarrow$ $\beta_{hs} = 30/15 * \beta_c$
Note 2 : CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$
Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Table 18: Subtests for UMTS Release 5 HSDPA

They were tested using the following settings for HSDPA FRC + H-Set 1 QPSK (see table C.8.1.1 of 3GPP 34.121

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI's
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 19: settings of required H-Set 1 QPSK in HSDPA mode

The following HSUPA sub-tests are defined by 3GPP 34.121 (table C.11.1.3)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ec} (SF)	β_{ed} (code)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK}, $\Delta_{CQI} = 8 \Longleftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Longleftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2 : CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference
Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$
Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$
Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g
Note 6 : β_{ed} can not be set directly; it is set by Absolute Grant Value

Table 20: Subtests for UMTS Release 6 HSUPA

Some HSUPA sub test settings of parameters defined in the table above cannot be set directly. Instead $\Delta_{E\text{-}DPCCH}$, Reference E-TFCI and Reference E-TFCI Power Offset were set according to table 5.2B.2 of 3GPP 34.121, and CMU200 operating manual instructions of firmware V4.52 were followed to reach a test condition with maximum output power and one E-TFCI.

2.6.2 Information on Maximum Power Reduction

According to the subtest settings shown in table 20 a Maximum Power Reduction of up to 2 dB can be expected in HSUPA subtest 2 – 4. The measurement results in tables 14 and 17 only show a maximum reduction of 1 dB in subtests 2 and 4.

The following statement submitted by the manufacturer confirms that maximum power reduction in HSUPA subtests 2 – 4 is not exhausted :

The M365 platform implements the MPR allowance to reduce power in order to maintain ACLR and other parametric performance margin in high peak to average signal conditions. The values predicted by the cubic metric allow the designers to back-off the maximum power by up to the maximum power reduction value. The power amplifier solution used in the M365 HSPA platform is optimized to require up to the MPR value for all physical channel combinations. Generally the power reduction actually implemented is less than the MPR allowed. This implementation is on the order of a 1 dB reduction.

Annex 1 System performance verification

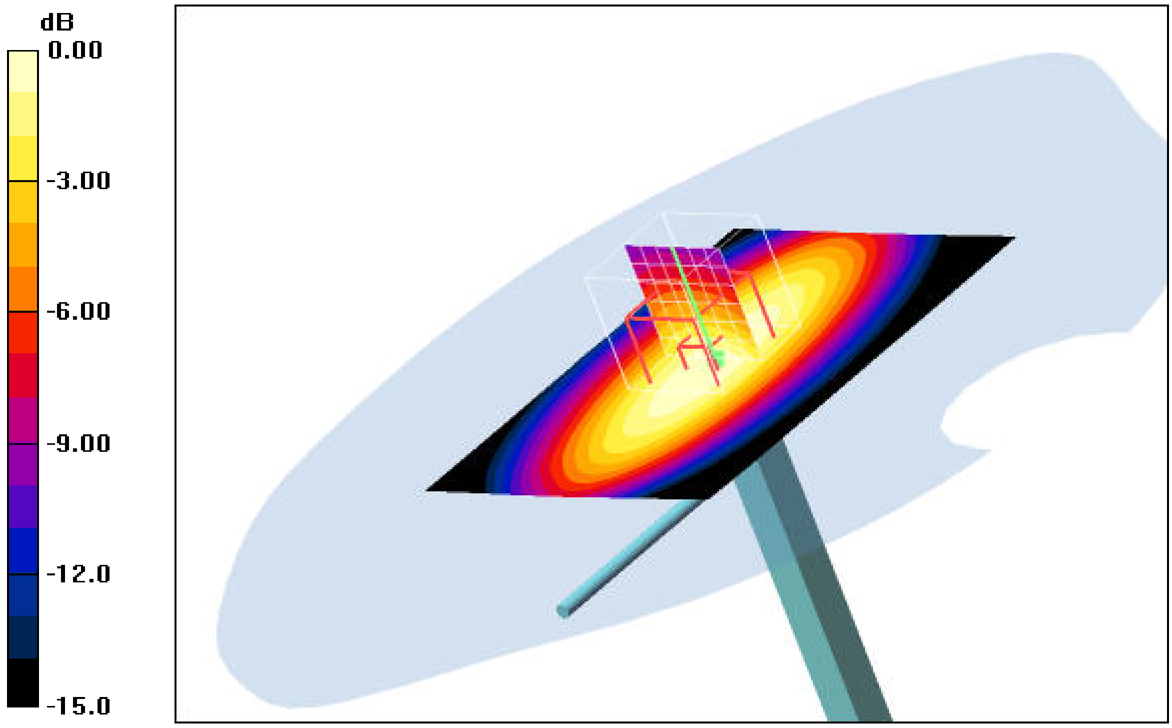
Date/Time: 2008-05-14 09:17:10Date/Time: 2008-05-14 09:23:27

SystemPerformanceCheck-D900-850 body 2008-05-14

DUT: Dipole 900 MHz; Type: D900V2; Serial: 102
Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used: f = 900 MHz; σ = 1.05 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.92, 5.92, 5.92); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

d=15mm, Pin=1000mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.1 mW/g

d=15mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.7 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 11 mW/g; SAR(10 g) = 7.17 mW/g
Maximum value of SAR (measured) = 12.0 mW/g



0 dB = 12.0mW/g

Additional information:
position or distance of DUT to SAM (if not standard head positions) :
ambient temperature: 23.2°C; liquid temperature: 23.1°C

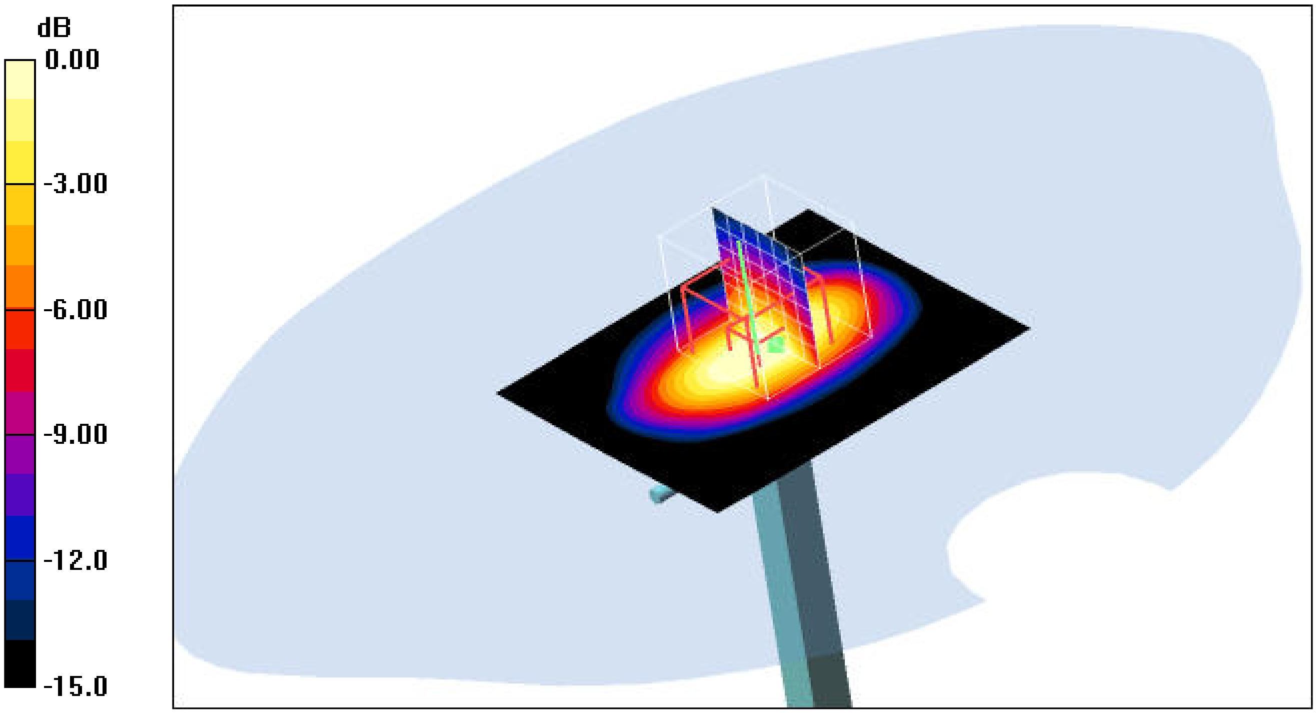
Date/Time: 2008-05-15 14:41:23Date/Time: 2008-05-15 14:45:37

SystemPerformanceCheck-D1900 body 2008-05-15

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d009
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used (interpolated): f = 1900 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

d=10mm, Pin=1000mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 51.5 mW/g

d=10mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 176.9 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 68.5 W/kg
SAR(1 g) = 39.9 mW/g; SAR(10 g) = 21.3 mW/g
Maximum value of SAR (measured) = 44.5 mW/g



0 dB = 44.5mW/g

Additional information:
position or distance of DUT to SAM (if not standard head positions) :
ambient temperature: 23.4°C; liquid temperature: 21.4°C

Date/Time: 2008-05-16 09:11:25Date/Time: 2008-05-16 09:15:38

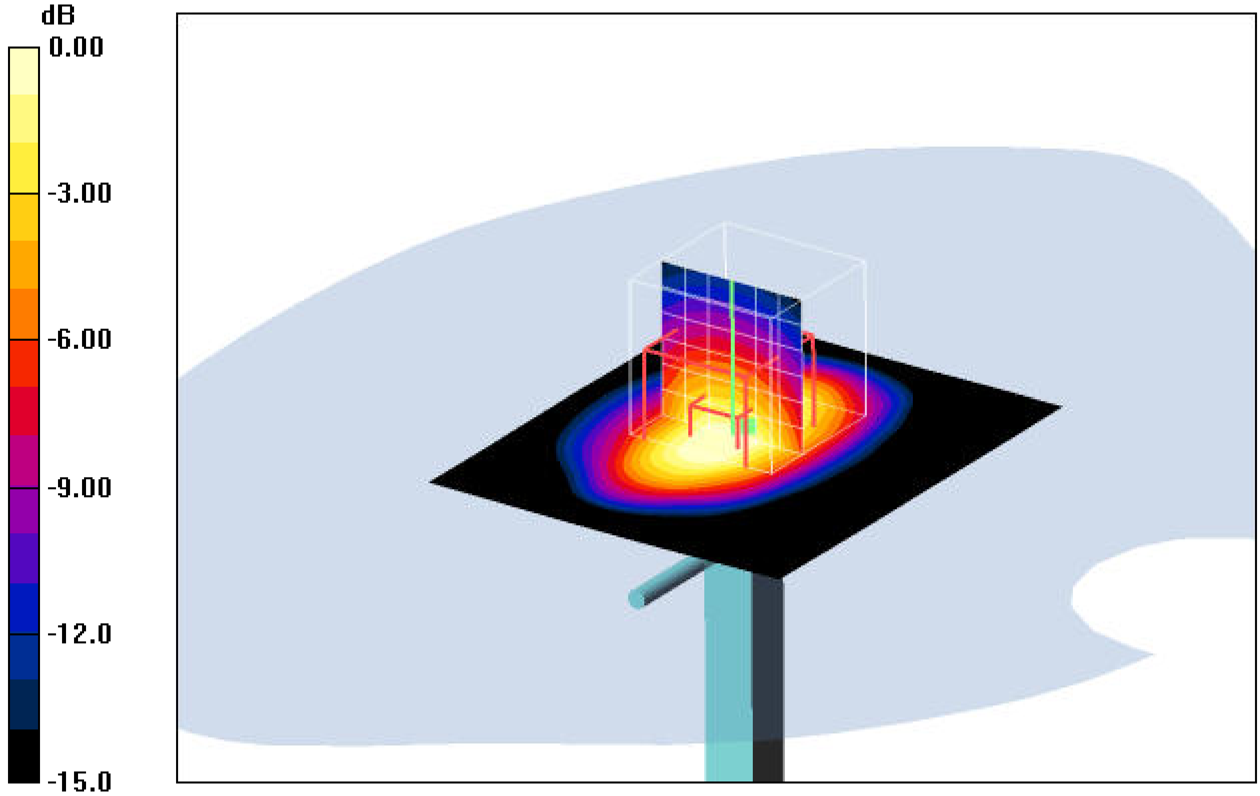
SystemPerformanceCheck-D1900 body 2008-05-16

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d009
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used (interpolated): f = 1900 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

d=10mm, Pin=1000mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 50.5 mW/g

d=10mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 171.4 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 66.9 W/kg
SAR(1 g) = 39.7 mW/g; SAR(10 g) = 21.3 mW/g
Maximum value of SAR (measured) = 44.9 mW/g



0 dB = 44.9mW/g

Additional information:
position or distance of DUT to SAM (if not standard head positions) :
ambient temperature: 23.3°C; liquid temperature: 22.2°C

Annex 2 Measurement results (printout from DASY TM)

Remark: results of conducted power measurements: see chapter 2.5/2.6 (if applicable)

Annex 2.1 PCS 850 MHz body

Date/Time: 2008-05-14 13:06:54Date/Time: 2008-05-14 13:14:53

P1528_OET65-Body-GSM-850 GPRS class10

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 850 GPRS class 10; Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium: M850 Medium parameters used: f = 836.6 MHz; $\sigma = 0.98$ mho/m; $\varepsilon_r = 55$; $\rho = 1000$ kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.738 mW/g

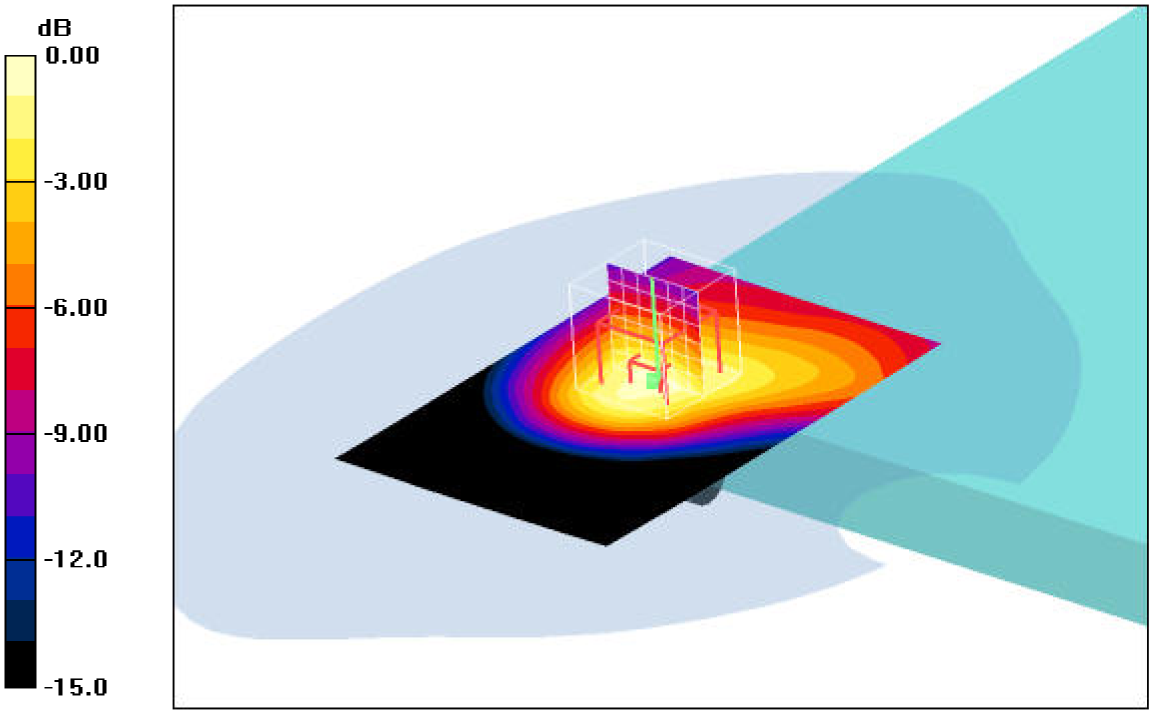
Rear position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.4 V/m; Power Drift = 0.142 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.488 mW/g

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



0 dB = 0.824mW/g

Additional information:

position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)

ambient temperature: 23.4°C; liquid temperature: 22.4°C

Date/Time: 2008-05-14 14:32:36Date/Time: 2008-05-14 14:40:02

P1528_OET65-Body-GSM-850 GPRS class10

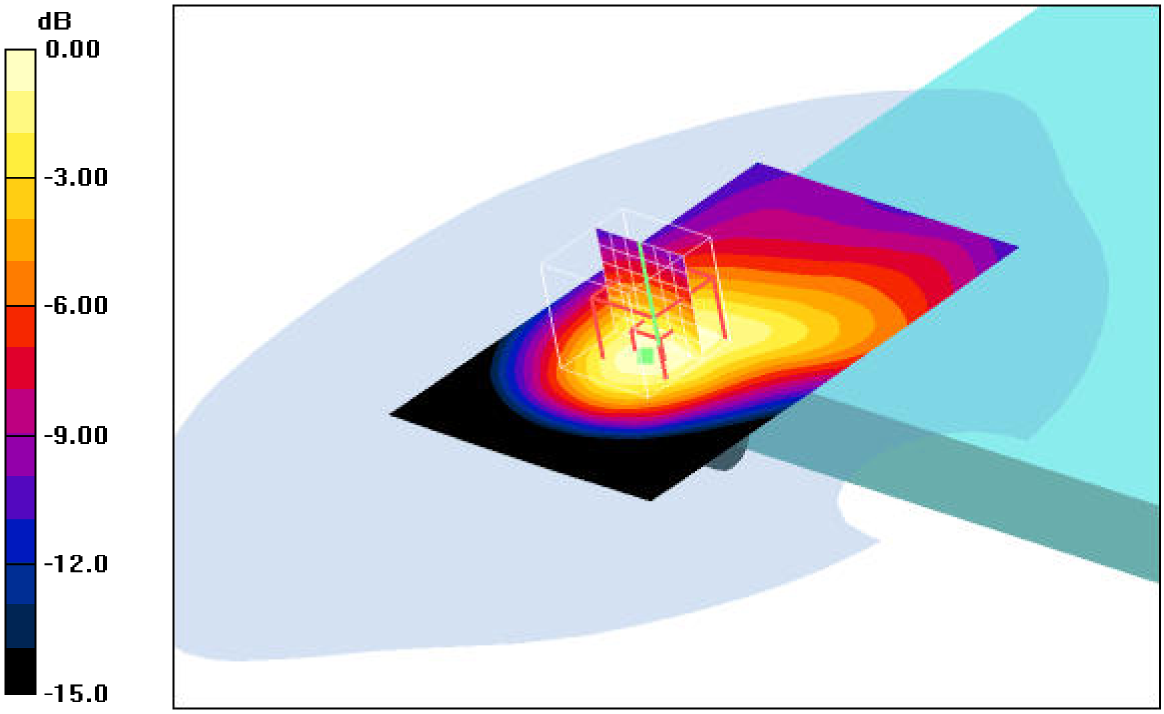
DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 850 GPRS class 10; Frequency: 824.2 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 824.2 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Low open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.751 mW/g

Rear position - Low open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.4 V/m; Power Drift = 0.156 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.715 mW/g; SAR(10 g) = 0.460 mW/g

Maximum value of SAR (measured) = 0.772 mW/g



0 dB = 0.772mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.4°C

Date/Time: 2008-05-14 14:06:10Date/Time: 2008-05-14 14:13:40

P1528_OET65-Body-GSM-850 GPRS class10

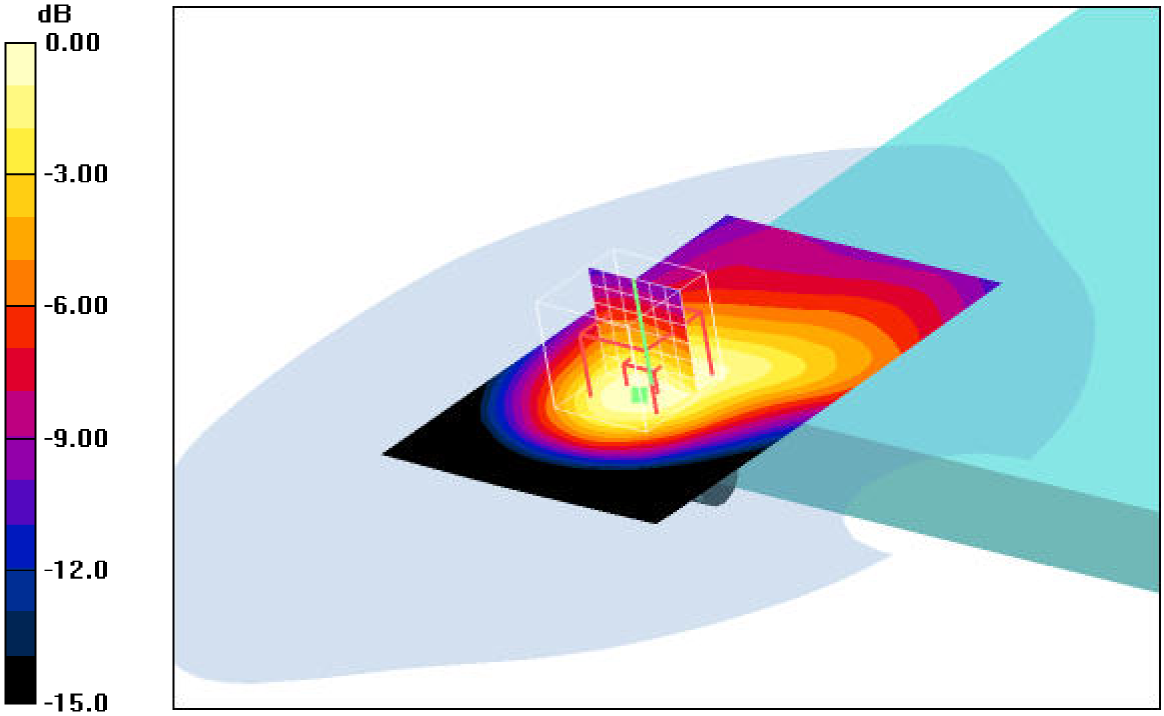
DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 850 GPRS class 10; Frequency: 836.6 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.963 mW/g

Rear position - Middle open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.2 V/m; Power Drift = 0.165 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.849 mW/g; SAR(10 g) = 0.537 mW/g

Maximum value of SAR (measured) = 0.920 mW/g



0 dB = 0.920mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.4°C

Date/Time: 2008-05-14 14:55:09Date/Time: 2008-05-14 15:02:47

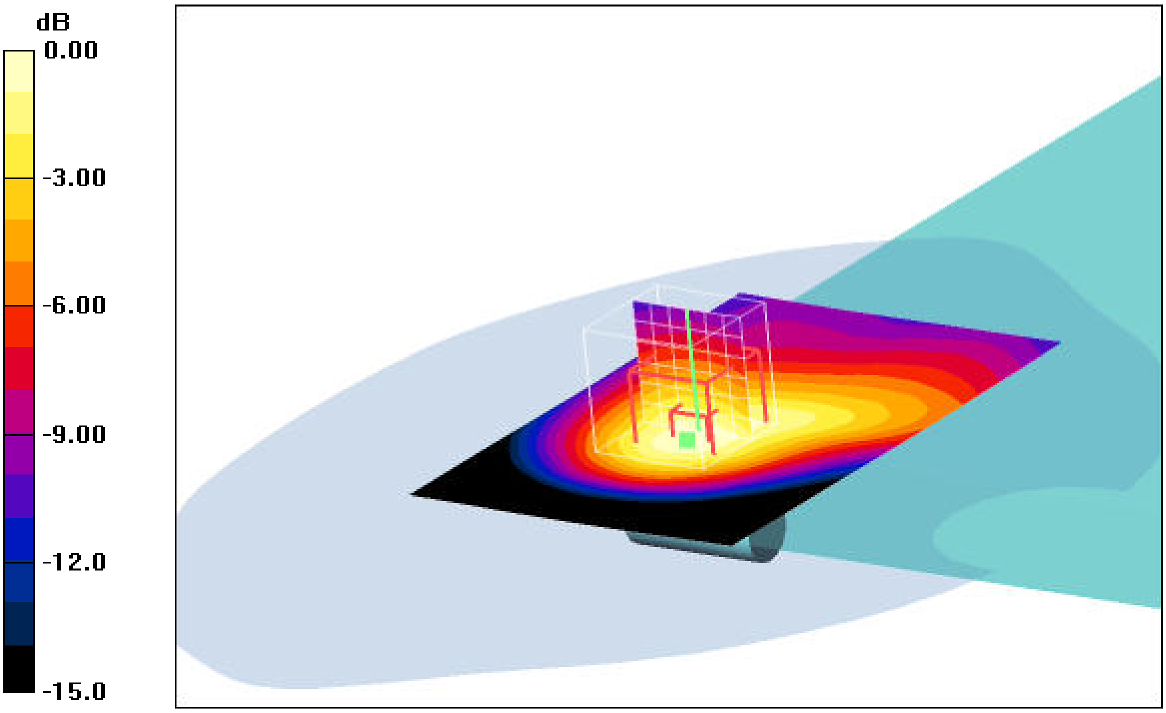
P1528_OET65-Body-GSM-850 GPRS class10

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 850 GPRS class 10; Frequency: 848.8 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 848.8 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - High open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.991 mW/g

Underside position - High open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.5 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.972 mW/g; SAR(10 g) = 0.624 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.4°C

Date/Time: 2008-05-14 13:38:45Date/Time: 2008-05-14 13:46:21

P1528_OET65-Body-GSM-850 GPRS class8

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

Medium: M850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.793 mW/g

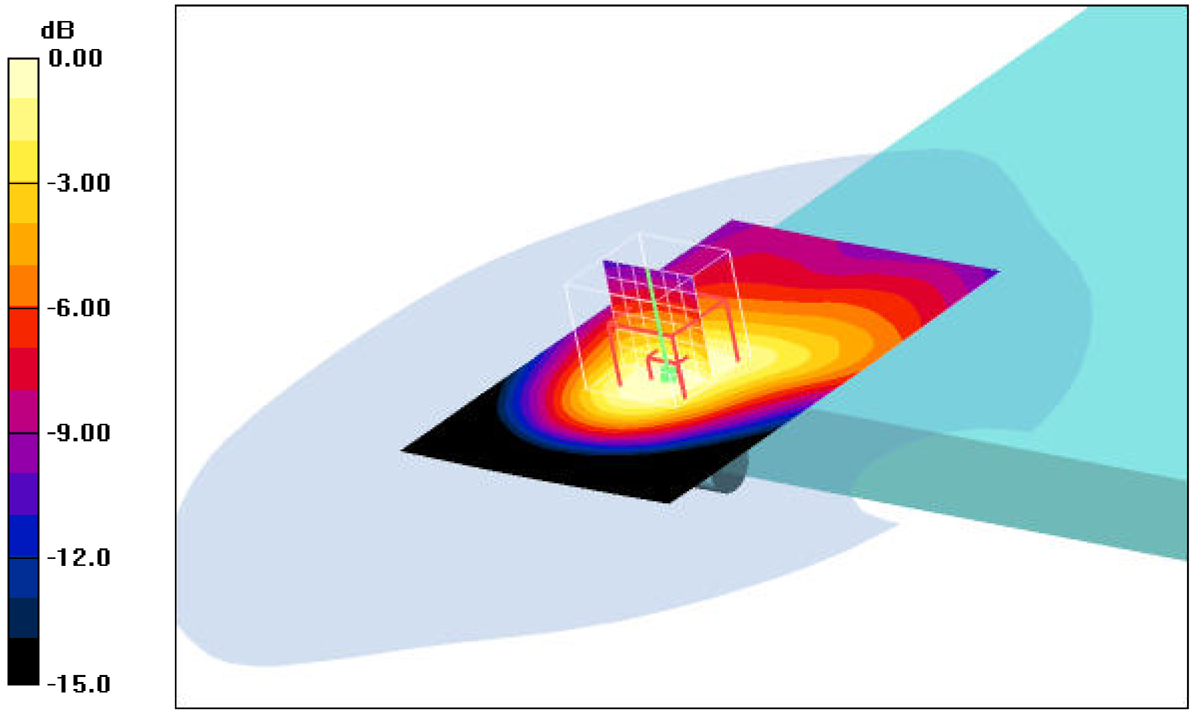
Rear position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.4 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.462 mW/g

Maximum value of SAR (measured) = 0.773 mW/g



0 dB = 0.773mW/g

Additional information:

position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)

ambient temperature: 23.4°C; liquid temperature: 22.4°C

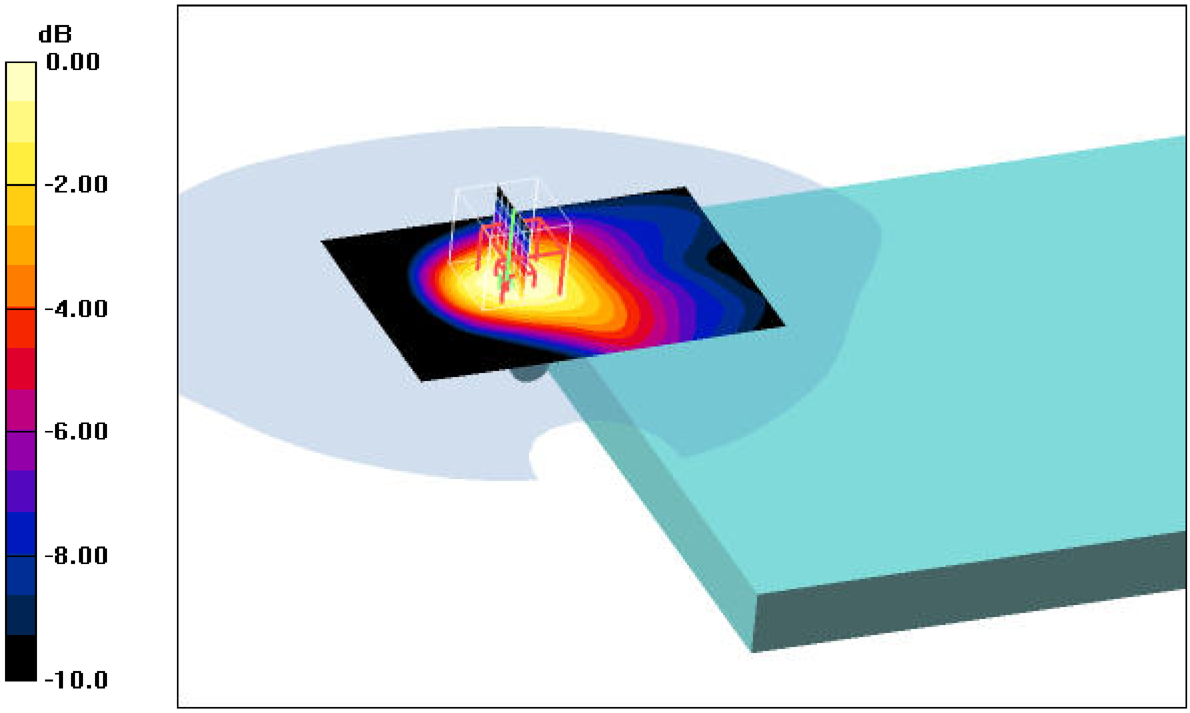
Date/Time: 2008-05-14 15:27:28Date/Time: 2008-05-14 15:35:21

P1528_OET65-Body-GSM-850 EGPRS class10

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: PCS 850 EGPRS class 10; Frequency: 848.8 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 848.8 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - High open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.657 mW/g

Underside position - High open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.1 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 0.847 W/kg
SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.380 mW/g
Maximum value of SAR (measured) = 0.621 mW/g



0 dB = 0.621mW/g

Additional information:
position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.4°C

Annex 2.2 PCS 1900 MHz body

Date/Time: 2008-05-15 16:28:29Date/Time: 2008-05-15 16:35:48

P1528_OET65-Body-GSM1900 GPRS class 10

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: PCS 1900 GPRS class 10; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position – Middle open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.696 mW/g

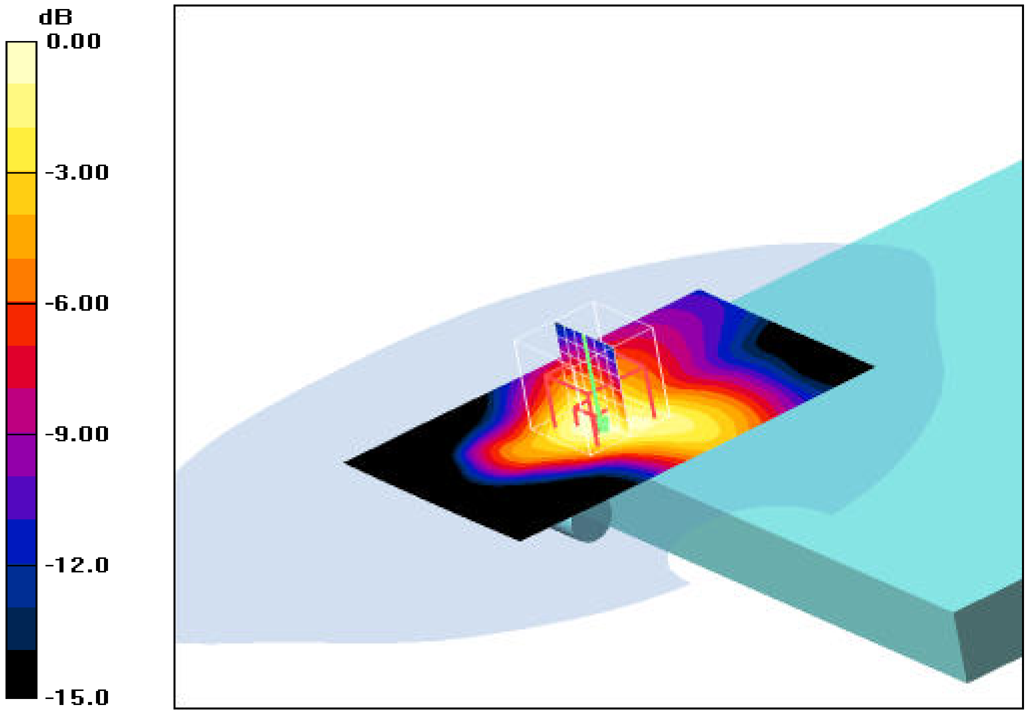
Underside position – Middle open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.6 V/m; Power Drift = 0.096 dB

Peak SAR (extrapolated) = 0.970 W/kg

SAR(1 g) = 0.639 mW/g; SAR(10 g) = 0.392 mW/g

Maximum value of SAR (measured) = 0.704 mW/g



0 dB = 0.704mW/g

Additional information:

position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)

ambient temperature: 23.7°C; liquid temperature: 21.5°C

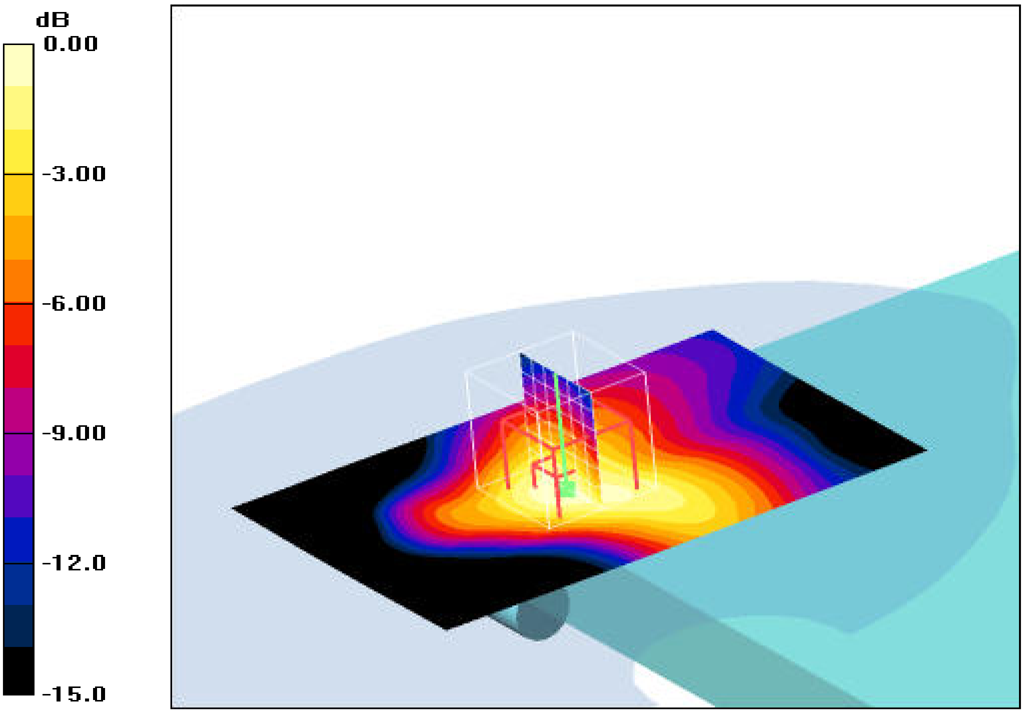
Date/Time: 2008-05-15 15:32:21Date/Time: 2008-05-15 15:39:56

P1528_OET65-Body-GSM1900 GPRS class 8

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: PCS 1900 GPRS; Frequency: 1880 MHz; Duty Cycle: 1:8
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Middle open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.853 mW/g

Underside position - Middle open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.791 mW/g; SAR(10 g) = 0.481 mW/g
Maximum value of SAR (measured) = 0.864 mW/g



0 dB = 0.864mW/g

Additional information:
position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)
ambient temperature: 23.7°C; liquid temperature: 21.5°C

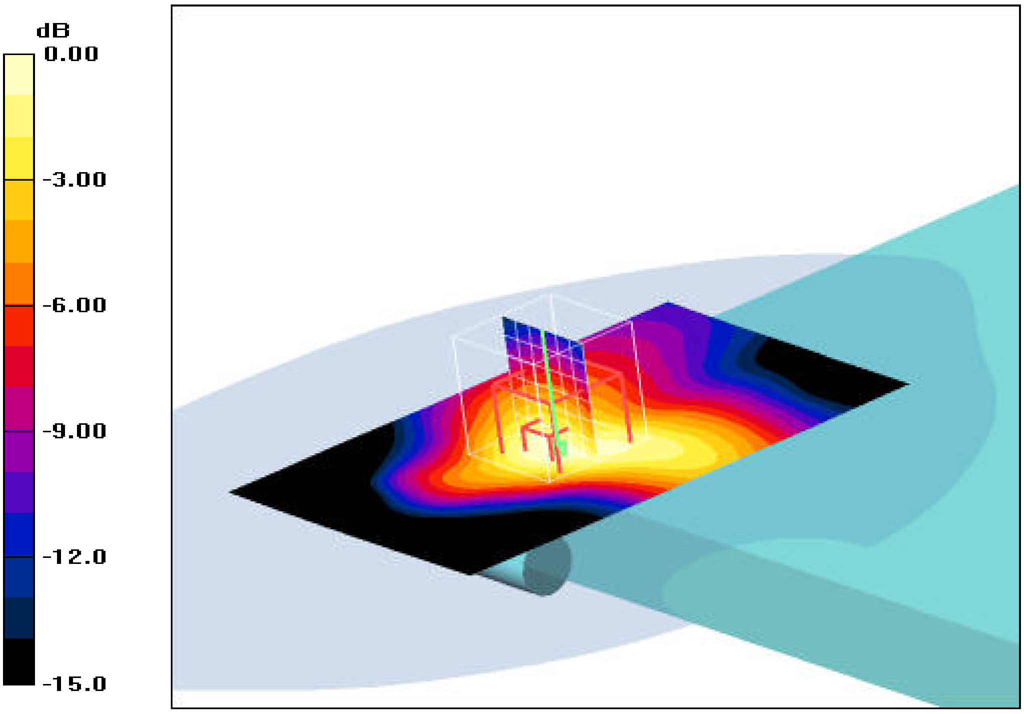
Date/Time: 2008-05-15 15:55:07Date/Time: 2008-05-15 16:02:33

P1528_OET65-Body-GSM1900 GPRS class 8

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: PCS 1900 GPRS; Frequency: 1880 MHz; Duty Cycle: 1:8
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.511 mW/g

Underside position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.464 mW/g; SAR(10 g) = 0.284 mW/g
Maximum value of SAR (measured) = 0.506 mW/g



0 dB = 0.506mW/g

Additional information:
position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)
ambient temperature: 23.7°C; liquid temperature: 21.5°C

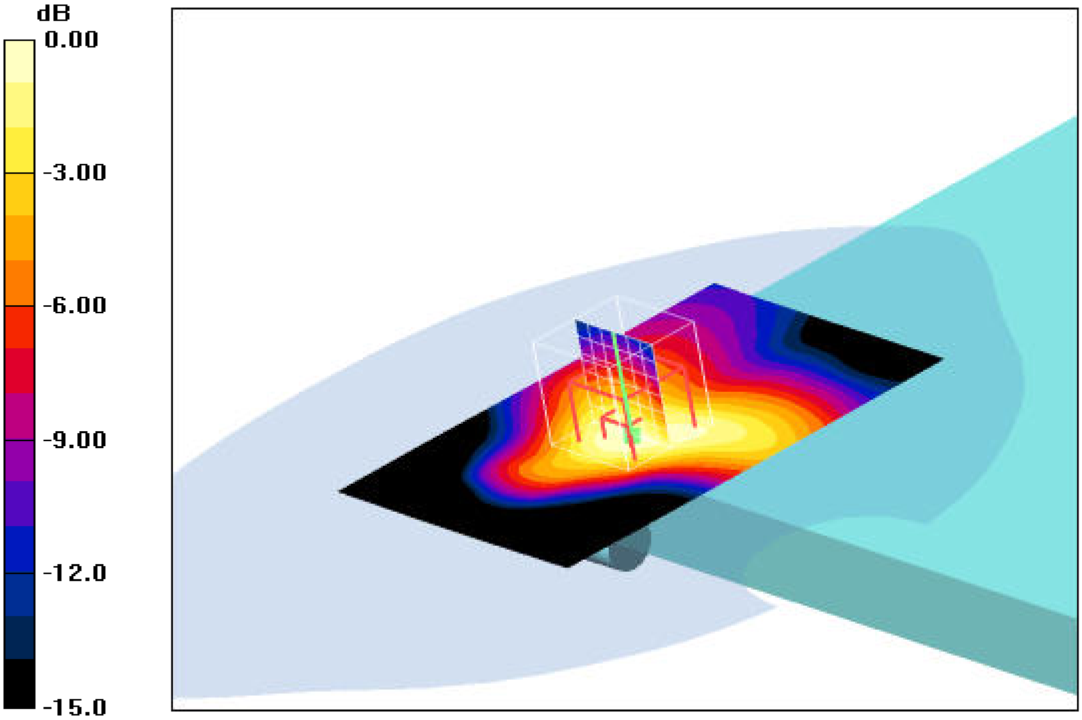
Date/Time: 2008-05-15 16:53:56Date/Time: 2008-05-15 17:01:42

P1528_OET65-Body-GSM1900 EGPRS class 8

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: PCS 1900 EGPRS; Frequency: 1880 MHz; Duty Cycle: 1:8
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Middle open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.340 mW/g

Underside position - Middle open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.184 mW/g
Maximum value of SAR (measured) = 0.329 mW/g



0 dB = 0.329mW/g

Additional information:
position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)
ambient temperature: 23.7°C; liquid temperature: 21.5°C

Annex 2.3 FDD II body

Date/Time: 2008-05-16 14:04:21Date/Time: 2008-05-16 14:11:36

P1528_OET65-Body-FDD II

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: WCDMA US; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.741 mW/g

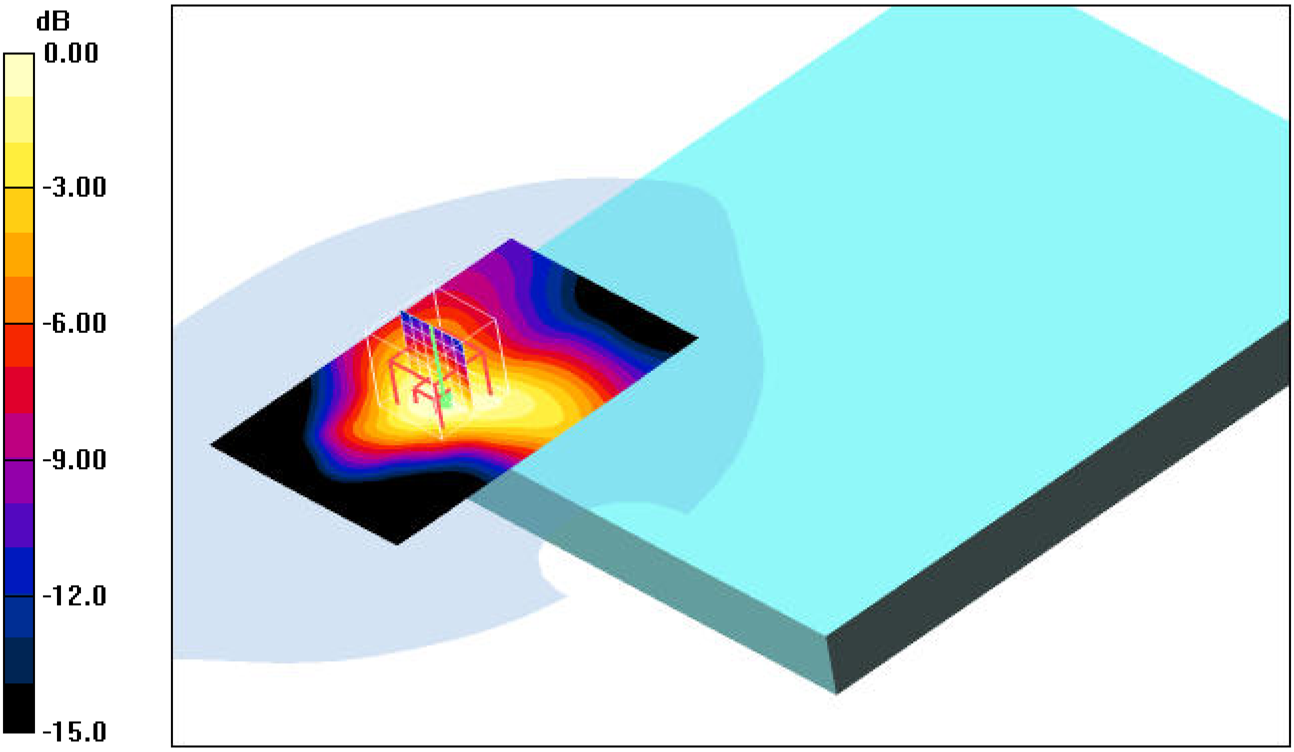
Underside position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.8 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.685 mW/g; SAR(10 g) = 0.424 mW/g

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



0 dB = 0.734mW/g

Additional information:

position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)

ambient temperature: 23.7°C; liquid temperature: 22.7°C

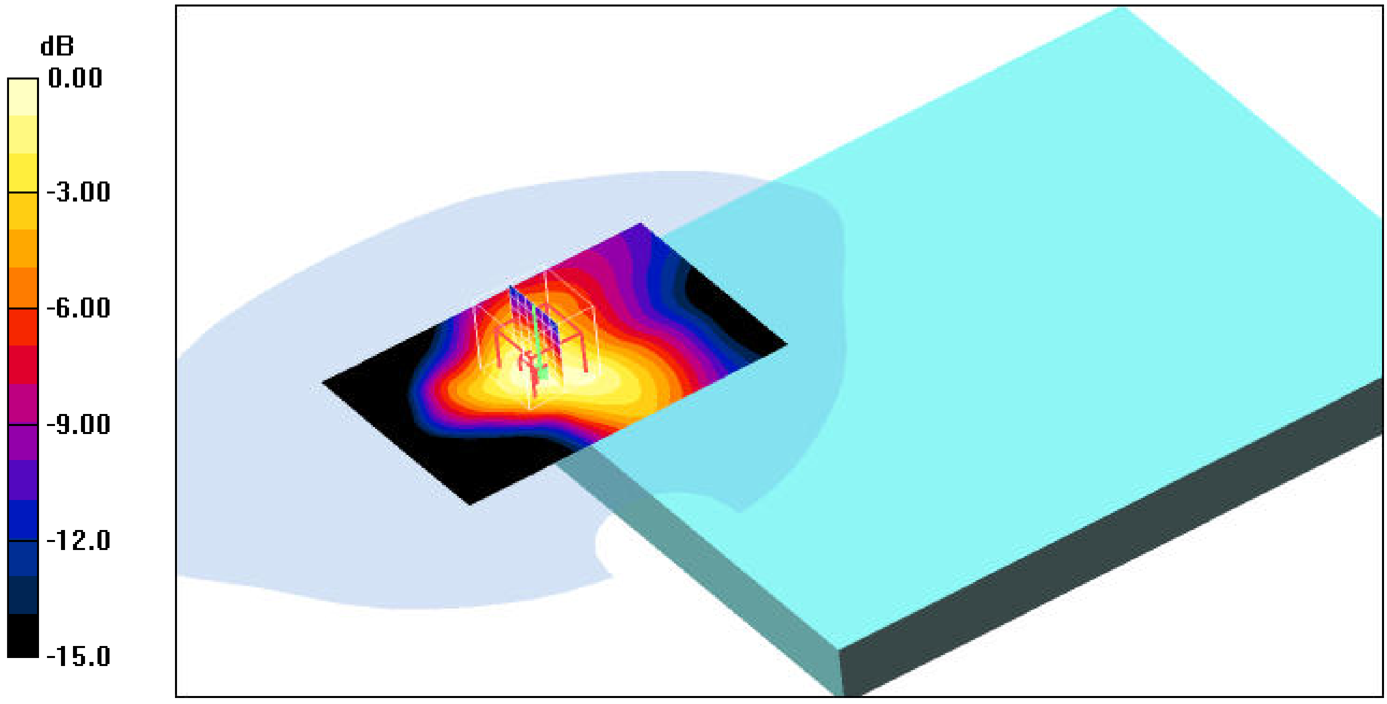
Date/Time: 2008-05-16 14:26:38Date/Time: 2008-05-16 14:34:05

P1528_OET65-Body-FDD II

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: WCDMA US; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Middle open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Underside position - Middle open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.959 mW/g; SAR(10 g) = 0.603 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Additional information:
position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)
ambient temperature: 23.8°C; liquid temperature: 22.7°C

Date/Time: 2008-05-16 14:50:27Date/Time: 2008-05-16 14:58:13

P1528_OET65-Body-FDD II

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: WCDMA US; Frequency: 1852.5 MHz; Duty Cycle: 1:1

Medium: M1900 Medium parameters used (interpolated): f = 1852.5 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - Low open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.969 mW/g

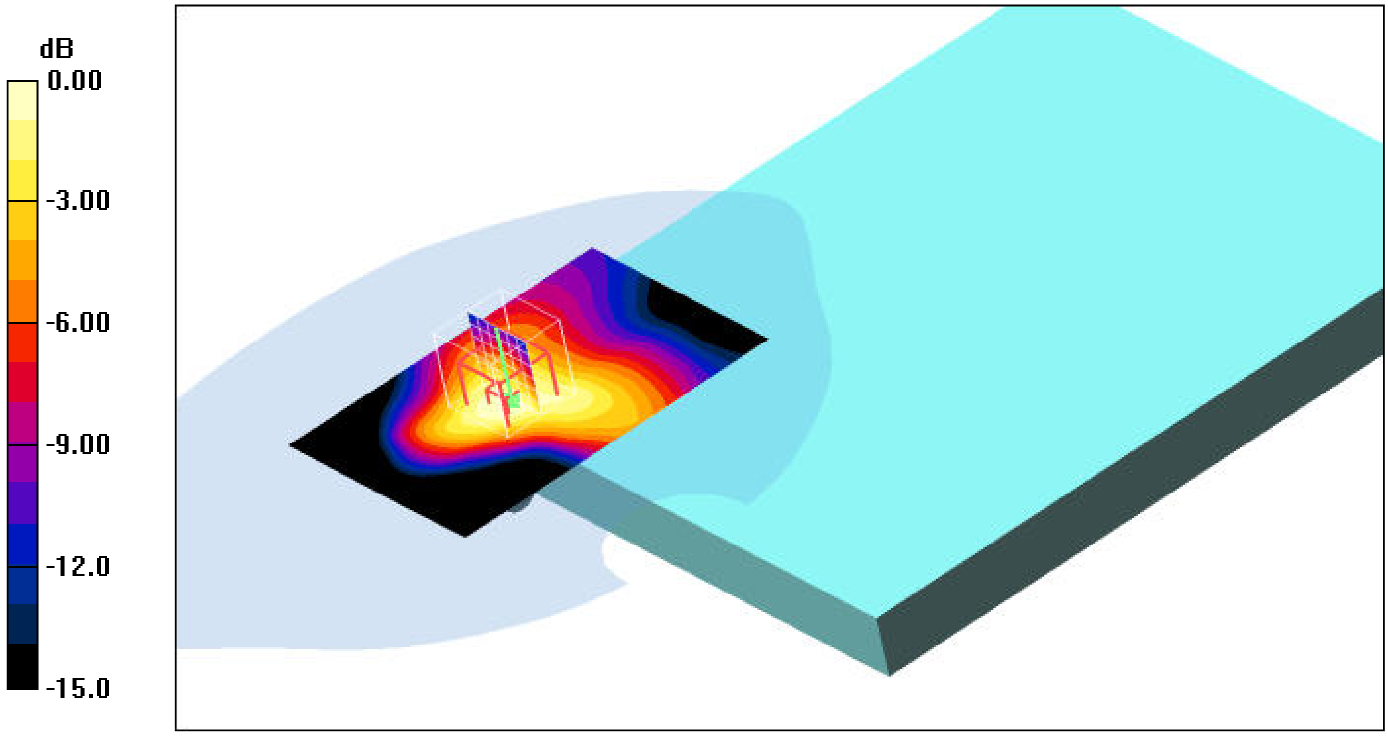
Underside position - Low open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.9 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.900 mW/g; SAR(10 g) = 0.570 mW/g

Maximum value of SAR (measured) = 0.982 mW/g



0 dB = 0.982mW/g

Additional information:

position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)

ambient temperature: 23.8°C; liquid temperature: 22.6°C

Date/Time: 2008-05-16 15:12:54Date/Time: 2008-05-16 15:40:31

P1528_OET65-Body-FDD II

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: WCDMA US; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: M1900 Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.51 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.46, 4.46, 4.46); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Underside position - High open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.985 mW/g

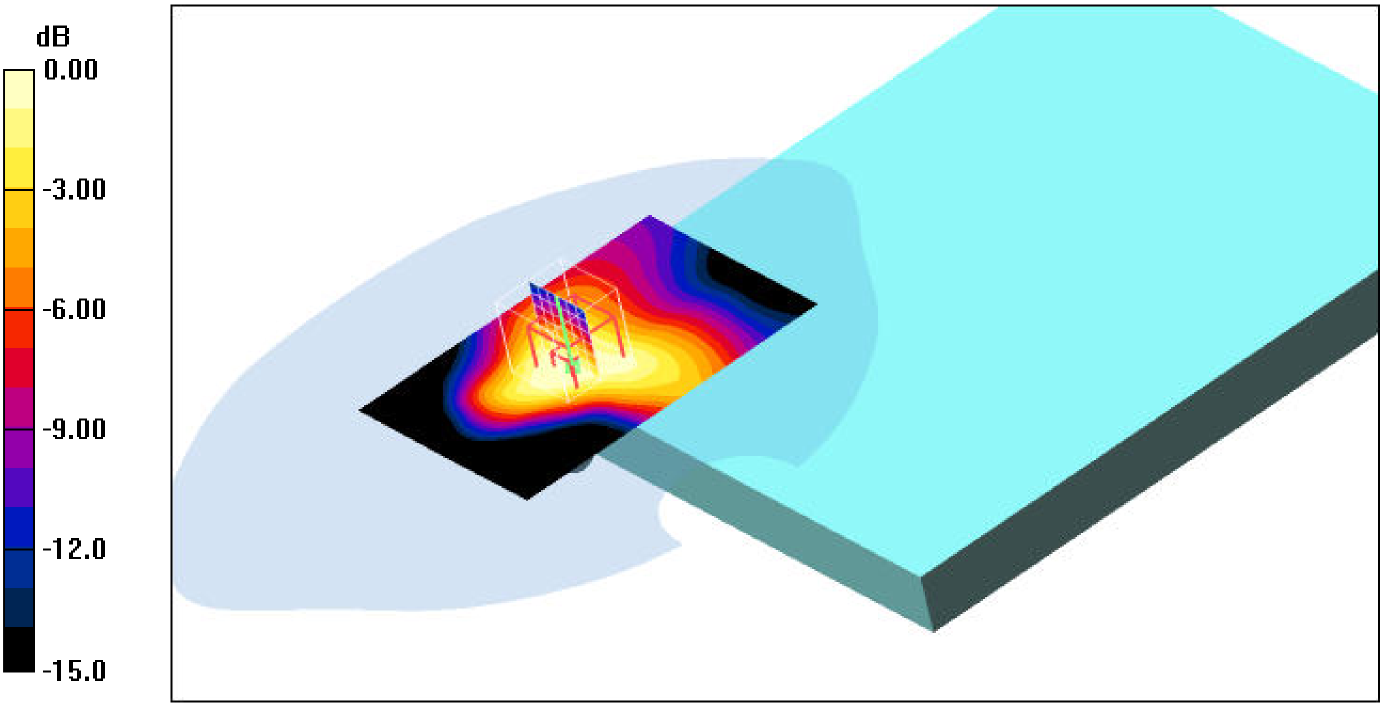
Underside position - High open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.6 V/m; Power Drift = 0.158 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.505 mW/g

Maximum value of SAR (measured) = 0.892 mW/g



0 dB = 0.892mW/g

Additional information:

position or distance of DUT to SAM : 9 mm (without any distance of the laptop to SAM)

ambient temperature: 23.8°C; liquid temperature: 22.7°C

Annex 2.4 FDD V body

Date/Time: 2008-05-14 15:29:51Date/Time: 2008-05-14 15:38:00

P1528_OET65-Body-UMTS-850

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986

Communication System: UMTS band V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: M850 Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.621 mW/g

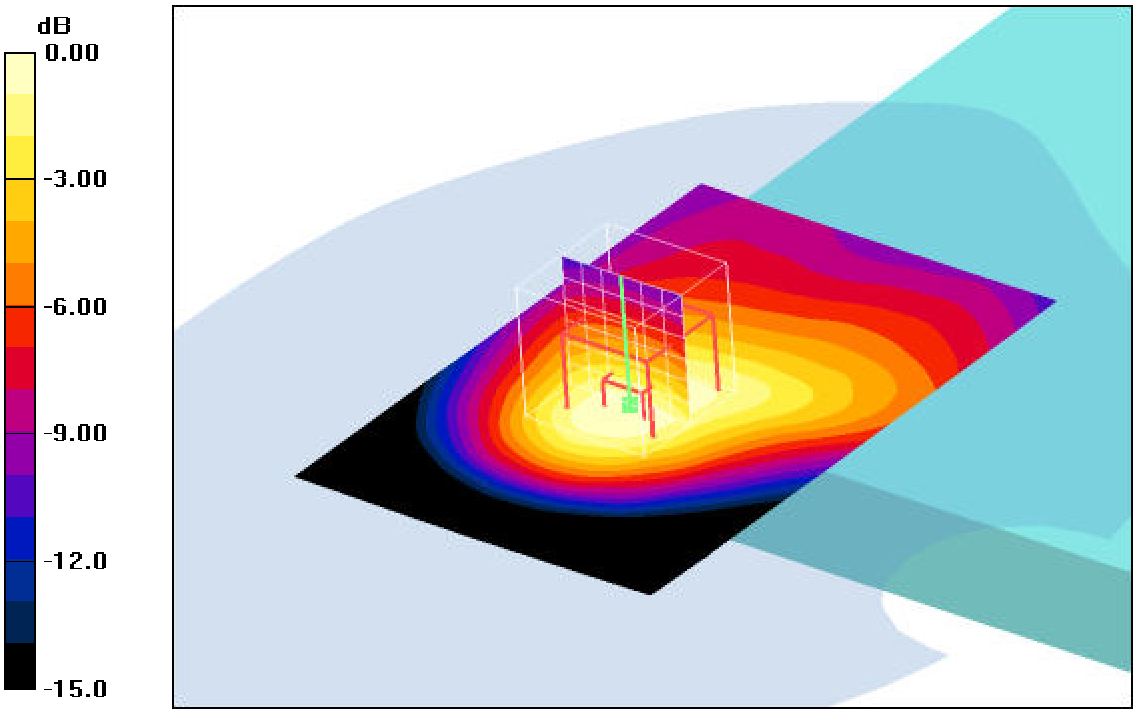
Rear position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.9 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.877 W/kg

SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.372 mW/g

Maximum value of SAR (measured) = 0.629 mW/g



0 dB = 0.629mW/g

Additional information:

position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)

ambient temperature: 23.4°C; liquid temperature: 22.2°C

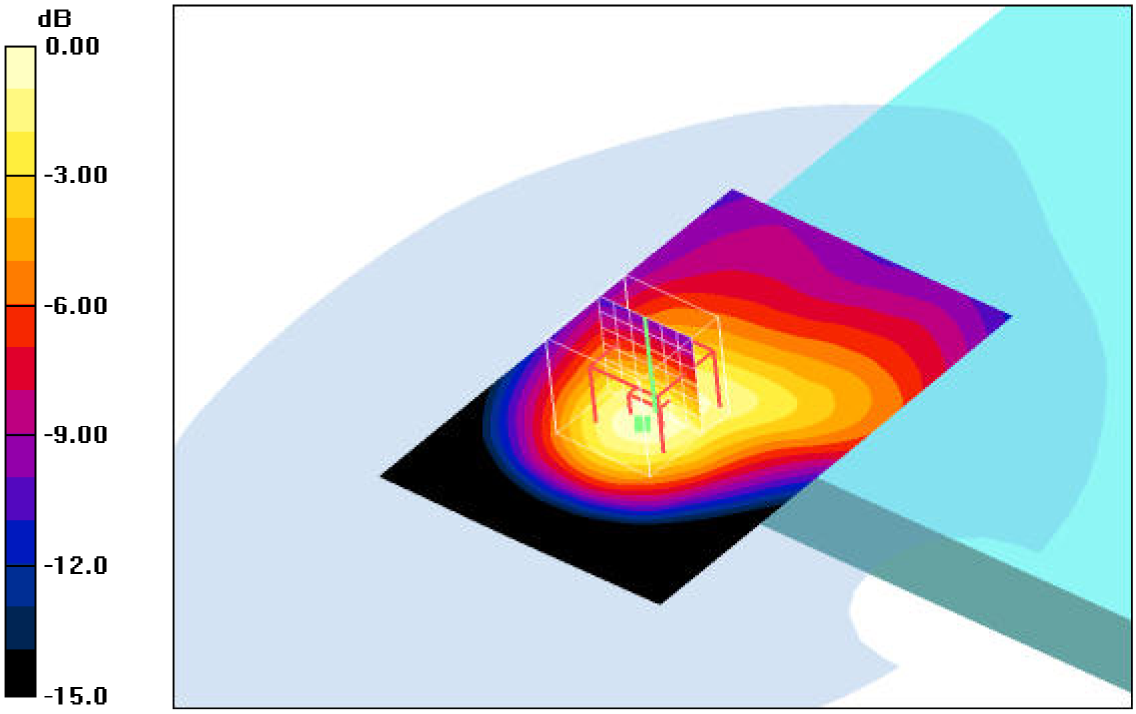
Date/Time: 2008-05-14 15:53:45Date/Time: 2008-05-14 16:01:20

P1528_OET65-Body-UMTS-850

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: UMTS band V; Frequency: 836.4 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle Open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.989 mW/g

Rear position - Middle Open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.8 V/m; Power Drift = 0.158 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.968 mW/g; SAR(10 g) = 0.617 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.2°C

Date/Time: 2008-05-14 16:21:08Date/Time: 2008-05-14 16:28:34

P1528_OET65-Body-UMTS-850

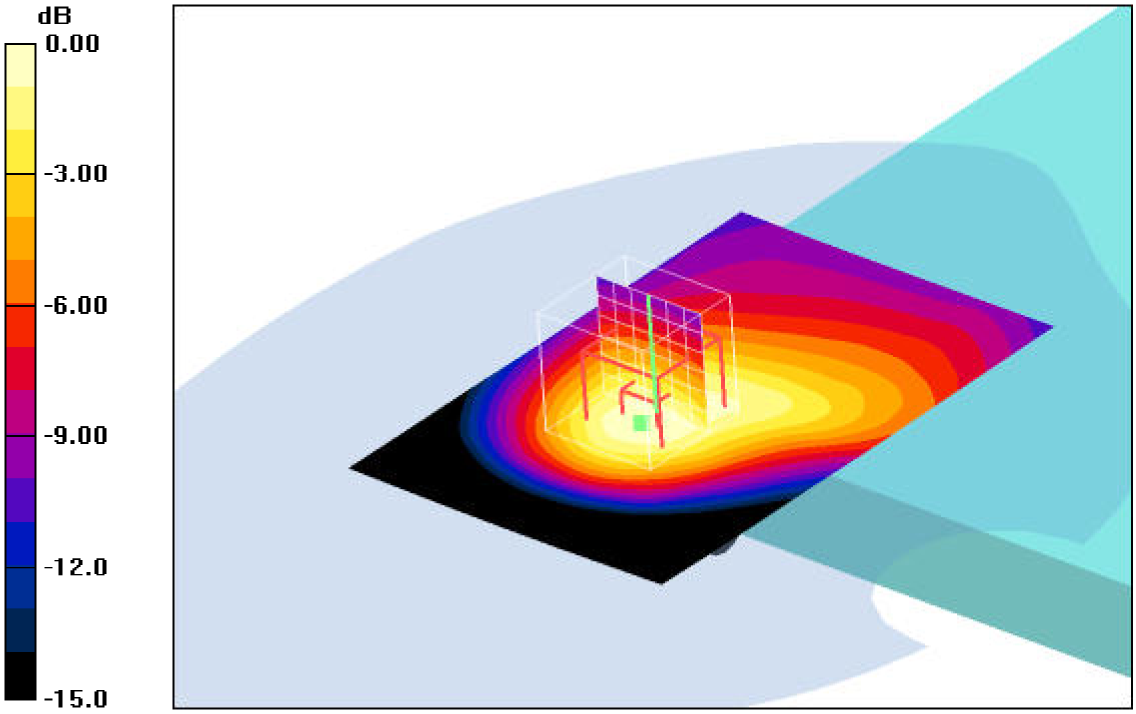
DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: UMTS band V; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Low Open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.934 mW/g

Rear position - Low Open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.2 V/m; Power Drift = 0.152dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.875 mW/g; SAR(10 g) = 0.564 mW/g
Maximum value of SAR (measured) = 0.940 mW/g



0 dB = 0.940mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.2°C

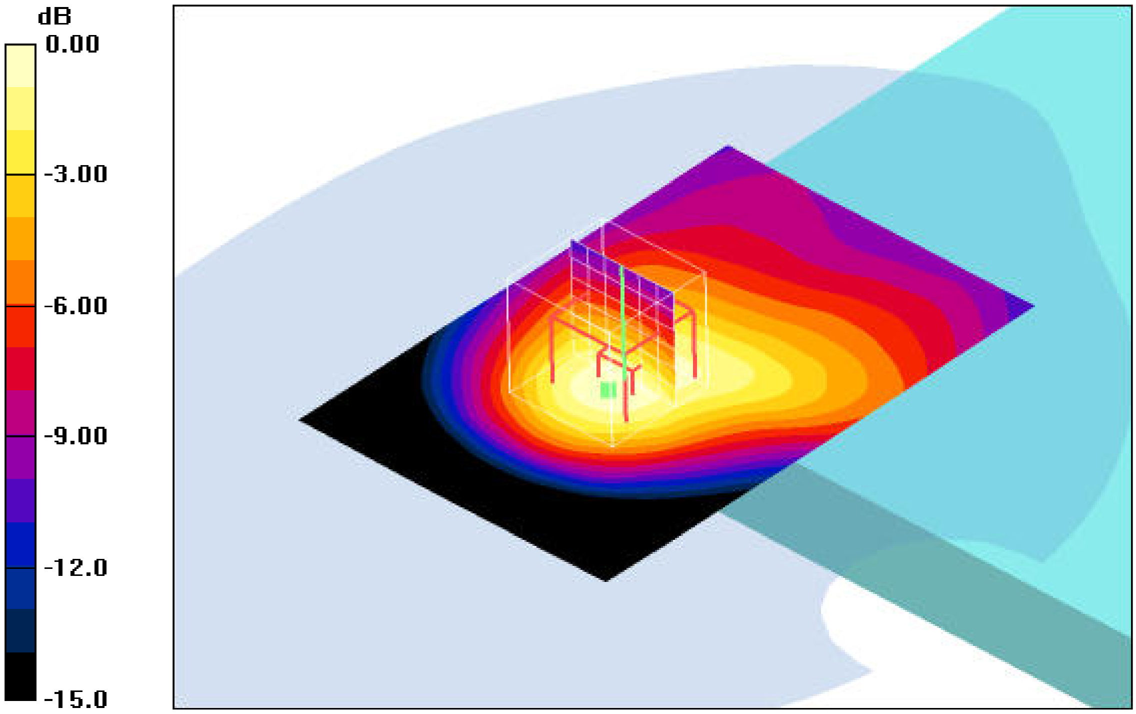
Date/Time: 2008-05-14 16:55:39Date/Time: 2008-05-14 17:03:09

P1528_OET65-Body-UMTS-850

DUT: Sony Ericsson; Type: EC400; Serial: 004401071829986
Communication System: UMTS band V; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(6.17, 6.17, 6.17); Calibrated: 2007-08-23
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn413; Calibrated: 2008-01-18
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - High Open/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

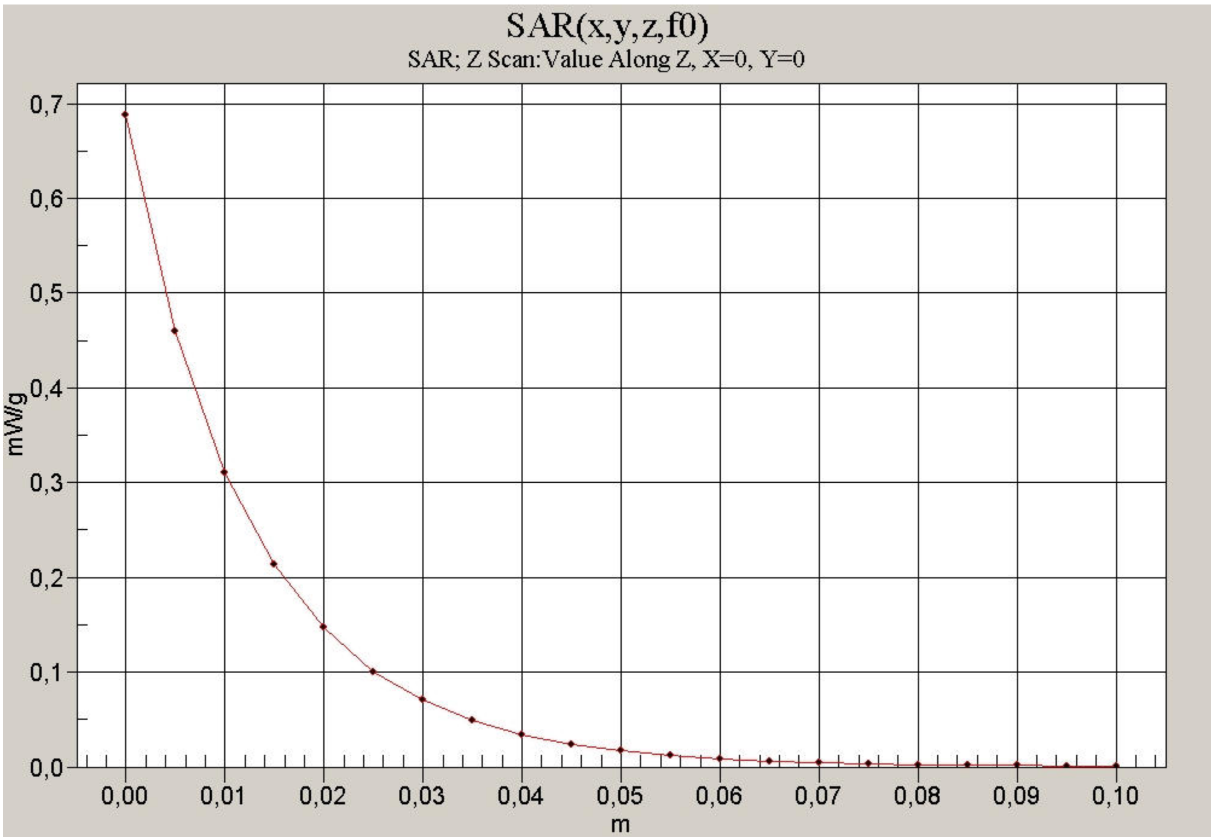
Rear position - High Open/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.5 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.691 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



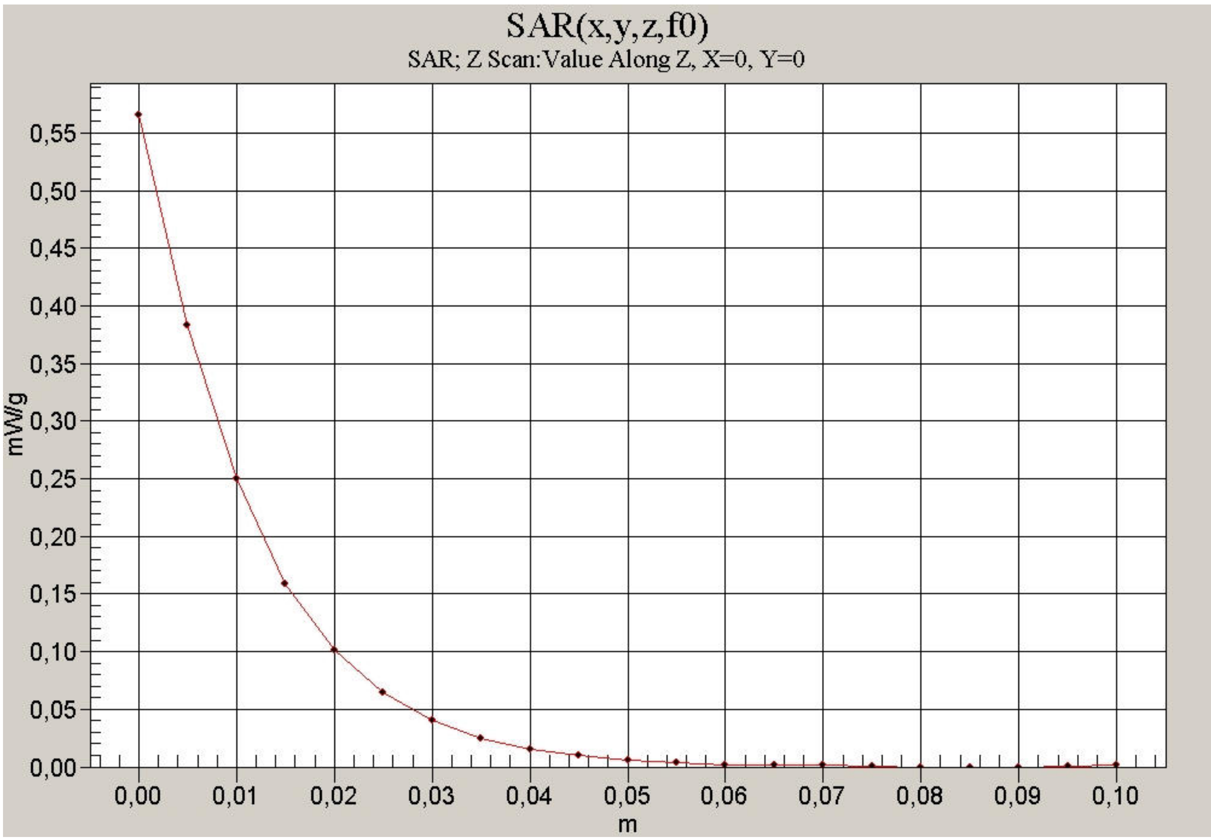
0 dB = 1.18mW/g

Additional information:
position or distance of DUT to SAM : 9mm (without any distance of the laptop to SAM)
ambient temperature: 23.4°C; liquid temperature: 22.2°C

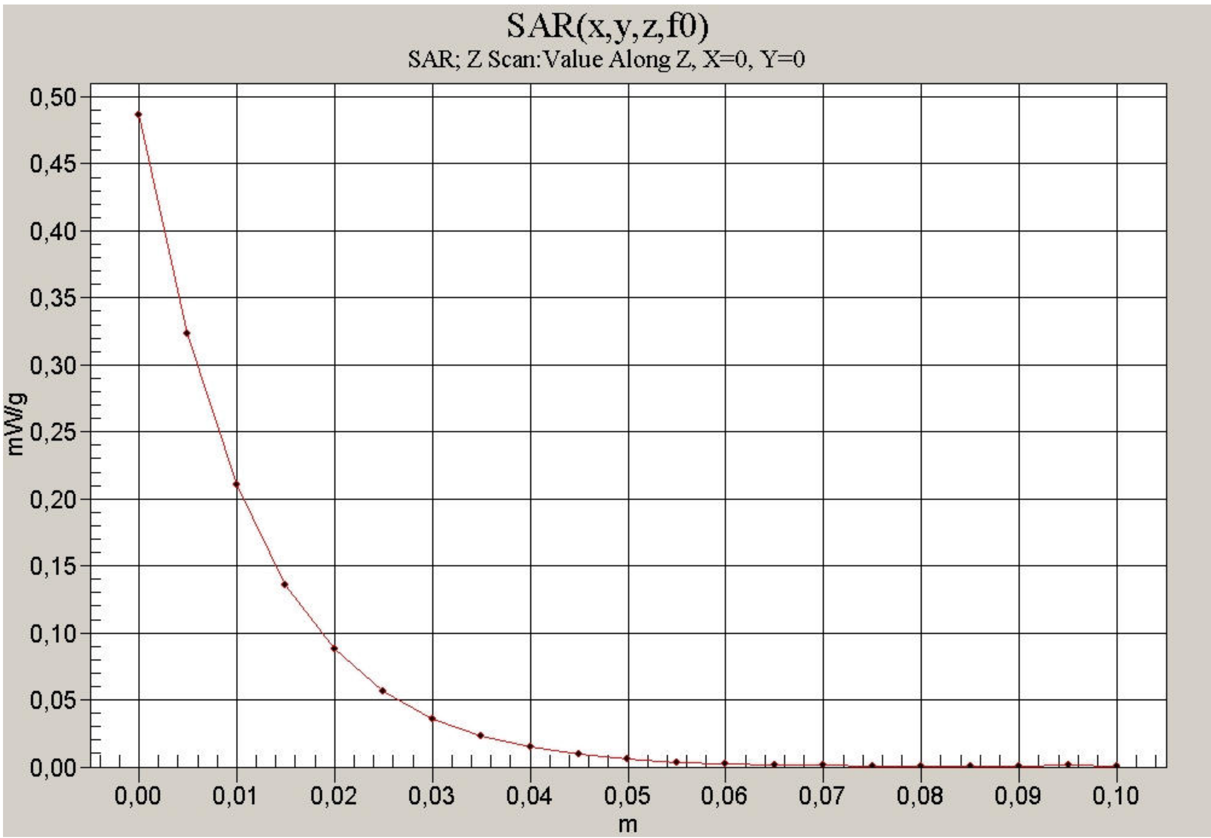
Annex 2.5 Z-axis scans



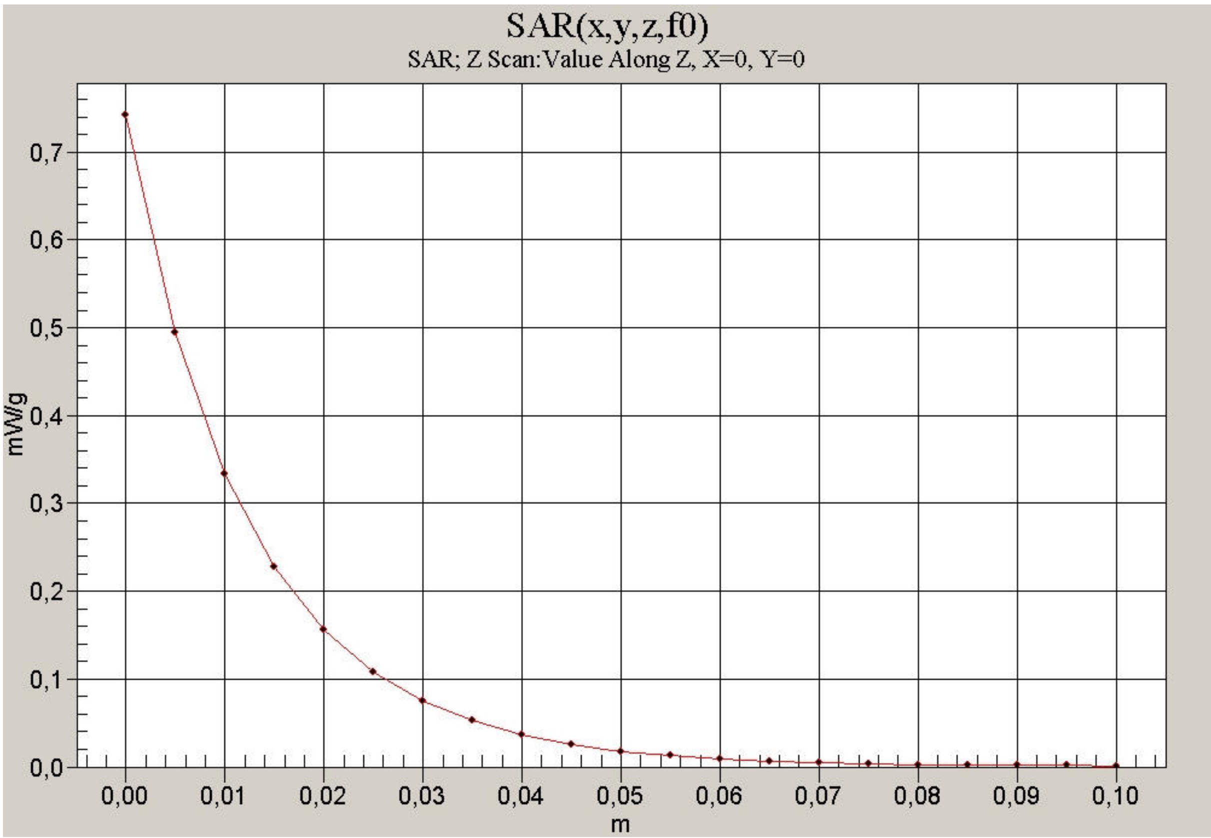
Z-scan 850 MHz body



Z-scan 1900 MHz body



Z-scan FDD II 1900 MHz body



Z-scan FDD V 850 MHz body