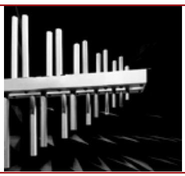
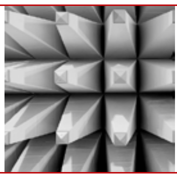




CETECOM™

CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test Report No.: 1-4722/12-07-05-A

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing Laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 – 10
66117 Saarbrücken/Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited Test Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

Aastra Deutschland GmbH
Zeughofstr. 1
10997 Berlin/GERMANY

Phone: +49 30 6104-0

Contact: Gerhard Hofmann
e-mail: gerhard.hofmann@aastra.com
Phone: +49 30 6104-5329
Fax: +49 30 6104-5157

Manufacturer

Aastra Deutschland GmbH
Zeughofstr. 1
10997 Berlin/GERMANY

Test Standard/s

IEEE 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR)in the Human Head from Wireless Communications Devices: Measurement Techniques
OET Bulletin 65 Supplement C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
RSS-102 Issue 4	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	DECT Portable Part
Device type:	portable device
Model name:	**622d**
S/N serial number:	C5810002011E
FCC-ID:	UOU80E00009622
IC:	1884E-80E00009622
Hardware status:	63-001543-82
Software status:	1.01
Frequency:	see technical details
Antenna:	integrated antenna
Battery option:	Li-ion battery 3.7V / 880mAh
Accessories:	---
Test sample status:	production unit
Exposure category:	general population / uncontrolled environment

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:

cn=Thomas Vogler, o=CETECOM ICT Services GmbH, ou=VOG-100727, email=thomas.vogler@cetecom.com, c=DE
2012.07.20 11:23:02 +02'00'

Thomas Vogler
Senior Testing Manager

Test performed:

cn=Oleksandr Hnatovskiy, o=CETECOM ICT, ou=HNA-100728, email=Oleksandr.Hnatovskiy@cetecom.com, c=DE
2012.07.20 10:07:56 +02'00'

Oleksandr Hnatovskiy
Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. 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 CETECOM ICT Services GmbH.
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.
The testing service provided by CETECOM ICT Services GmbH has been rendered under the current "General Terms and Conditions for CETECOM ICT Services GmbH".
CETECOM ICT Services GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.
Under no circumstances does the CETECOM ICT Services GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.
Under no circumstances does the CETECOM ICT Services GmbH test report include or imply any product or service warranties from CETECOM ICT Services GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CETECOM ICT Services GmbH.
All rights and remedies regarding vendor's products and services for which CETECOM ICT Services GmbH has prepared this test report shall be provided by the party offering such products or services and not by CETECOM ICT Services GmbH.
In no case this test report can be considered as a Letter of Approval.

2.2 Application details

Date of receipt of order:	2012-05-29
Date of receipt of test item:	2012-06-11
Start of test:	2012-06-13
End of test:	2012-06-14
Person(s) present during the test:	

2.3 Statement of compliance

The SAR values found for the 622d DECT Portable Part 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 95.1:1992, 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.
For body worn operation, this device has been tested without any distance from DUT to SAM.

2.4 Technical details

Technology:	DECT (UPCS)
Frequency band:	1900 MHz
Lowest transmit/receive frequency/MHz:	1921.536 MHz
Highest transmit/receive frequency/MHz:	1928.448 MHz
Kind of modulation:	GFSK
Test channel low:	4
Test channel middle:	2
Test channel high:	0
Maximum number of timeslots:	24
Maximum number of active timeslots:	1
Nominal peak output power:	250 mW
Maximum output power:	19.7 dBm

3 Test standards/ procedures references

Test Standard	Version	Test Standard Description
IEEE 1528-2003	2003-04	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
OET Bulletin 65 Supplement C	1997-01 2001-01	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
RSS-102 Issue 4	2010-03	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Canada's Safety Code No. 6	99-EHD-237	Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
IEEE Std. C95-3	2002	IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
IEEE Std. C95-1	1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEC 62209-2	2010	Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures. Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

FCC KDBs:

FCC OET SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz – 3 GHz, January, 2007.

FCC OET RF Exposure Procedures for Mobile and Portable Devices, and Equipment Authorization Policies, November, 2009.

FCC OET Dipole Requirements for SAR System Validation and Verification, November, 2009.

3.1 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain and Trunk)	**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).

4 Summary of Measurement Results

☒	**No deviations from the technical specifications ascertained**
☐	Deviations from the technical specifications ascertained
Maximum SAR value measured for head (1g):	**0.021 W/kg**
Maximum SAR value measured for body (1g):	**0.028 W/kg**

5 Test Environment

Ambient temperature: 20 – 24 °C
Tissue Simulating liquid: 20 – 24 °C

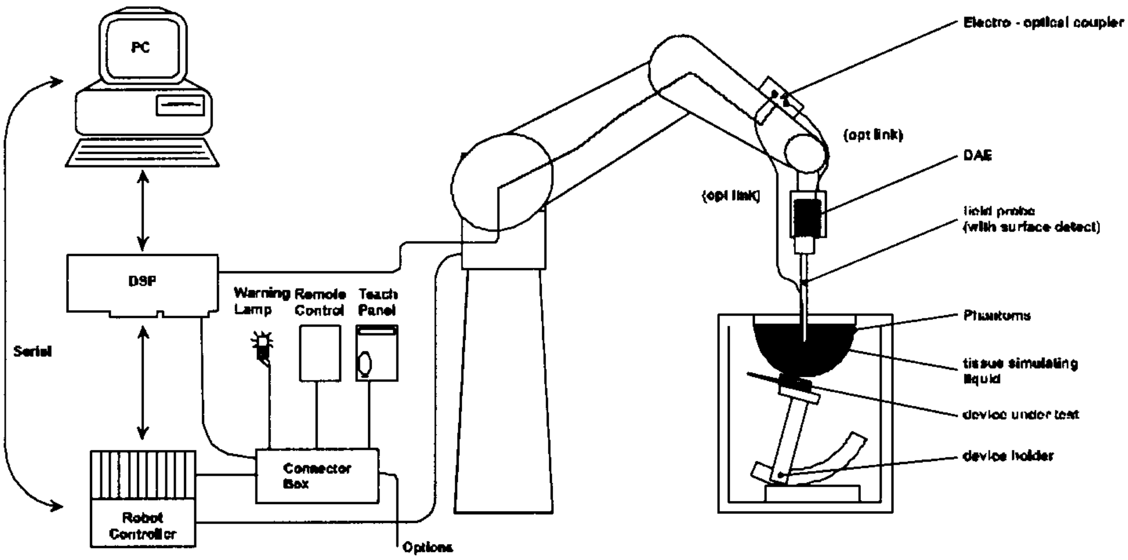
Relative humidity content: 40 – 50 %
Air pressure: not relevant for this kind of testing
Power supply: 230 V / 50 Hz

Exact temperature values for each test are shown in the table(s) under 7.1 and/or on the measurement plots.

6 Test Set-up

6.1 Measurement system

6.1.1 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 XP.
- 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.

6.1.2 Test environment

The DASY4 measurement system is placed at the head end of a room with dimensions:
5 x 2.5 x 3 m^3, 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 m^2 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.

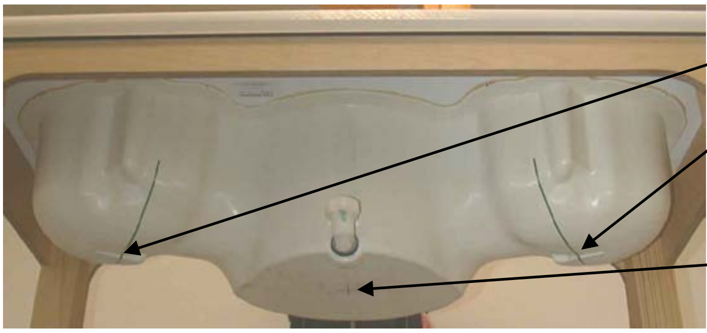
6.1.3 Probe description

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)

6.1.4 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.



6.1.5 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.

6.1.6 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 section 3) are shown in table form in section 7.

- 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.

6.1.7 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.

6.1.8 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.

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

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

6.1.9 Tissue simulating liquids: dielectric properties

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

(Liquids used for tests described in section 7. are marked with ☒) :

Ingredients (% of weight)	**Frequency (MHz)**					
frequency band	☐ 450	☐ 835	☐ 900	☐ 1800	☒ 1900	☐ 2450
Tissue Type	Head	Head	Head	Head	Head	Head
Water	38.56	41.45	40.92	52.64	54.9	62.7
Salt (NaCl)	3.95	1.45	1.48	0.36	0.18	0.5
Sugar	56.32	56.0	56.5	0.0	0.0	0.0
HEC	0.98	1.0	1.0	0.0	0.0	0.0
Bactericide	0.19	0.1	0.1	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	36.8
DGBE	0.0	0.0	0.0	47.0	44.92	0.0

Table 2: Head tissue dielectric properties

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 3: 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

Note: Due to their availability body tissue simulating liquids as defined by FCC OET Bulletin 65 Supplement C are generally used for body worn SAR testing according to European standards.

6.1.10 Tissue simulating liquids: parameters

Liquid	Frequency (MHz)	Target head tissue		Measurement head tissue		Measurement date
		Permittivity	Conductivity[S/m]	Permittivity	Conductivity[S/m]	
HSL 1900	1900	40.0	1.40	39.4	1.38	2012-06-13
	1925	40.0	1.40	39.3	1.41	2012-06-13

Table 4: Parameter of the head tissue simulating liquid

Liquid	Frequency (MHz)	Target body tissue		Measurement body tissue		Measurement date
		Permittivity	Conductivity[S/m]	Permittivity	Conductivity[S/m]	
M 1900	1900	53.3	1.52	52.9	1.51	2012-06-14
	1925	53.3	1.55	52.9	1.53	2012-06-14

Table 5: Parameter of the body tissue simulating liquid

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

6.1.11 Measurement uncertainty evaluation for system check

The overall combined measurement uncertainty of the measurement system is ± 9.6% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 19.2%
This measurement uncertainty budget is suggested by IEEE 1528-2003 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	± 6.0%	Normal	1	1	1	± 6.0%	± 6.0%	∞
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						± 11.5%	± 11.2%	330
Expanded Std. Uncertainty						**± 23.0%**	**± 22.5%**	

Table 6: Measurement uncertainties

Note : Worst case probe calibration uncertainty has been applied for all probes used during the measurements.

6.1.12 Measurement uncertainty evaluation for system validation

The overall combined measurement uncertainty of the measurement system is ± 9.6% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 19.2%
This measurement uncertainty budget is suggested by IEEE 1528-2003 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	± 6.0%	Normal	1	1	1	± 6.0%	± 6.0%	∞
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						**± 9.6%**	**± 9.3%**	
Expanded Std. Uncertainty						**± 19.2%**	**± 18.6%**	

Table 7: Measurement uncertainties

Note : Worst case probe calibration uncertainty has been applied for all probes used during the measurements.

6.1.13 System check

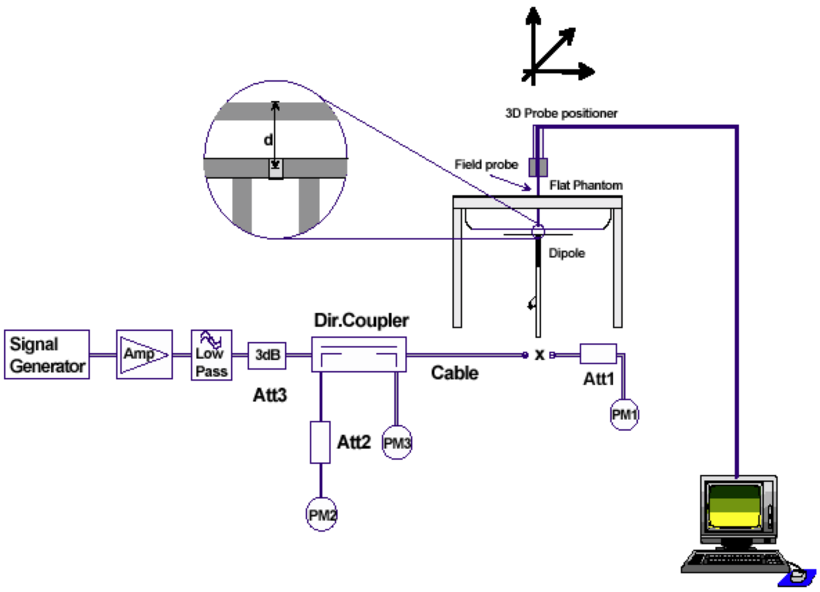
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE 1528. The following table shows system check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

Validation Kit	Frequency	Target Peak SAR (1000 mW) (+/- 10%)	Target SAR_{1g} (1000 mW) (+/- 10%)	Measured Peak SAR (1000 mW)	Measured SAR_{1g} (1000 mW)	Measured date
D1900V2 S/N: 5d009	**1900 MHz head**	73.6 mW/g	40.0 mW/g	67.0 mW/g	37.7 mW/g	2012-06-13
D1900V2 S/N: 5d009	**1900 MHz body**	73.8 mW/g	40.9 mW/g	68.6 mW/g	37.8 mW/g	2012-06-14

Table 8: Results system validation

6.1.14 System check procedure

The system check 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 system check 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).
System check 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.



7 Detailed Test Results

7.1 Conducted power measurements DECT 1925 MHz

Channel / frequency	Maximum conducted output power
4 / 1921.536 MHz	19.7 dBm
2 / 1924.992 MHz	19.6 dBm
0 / 1928.448 MHz	19.7 dBm

Table 9: Test results conducted power measurement DECT 1925 MHz

7.2 SAR test results

7.2.1 Results overview

Head SAR DECT UPCS 1900 MHz (averaged over 1g tissue volume)						
Channel / frequency	Position	Left hand test result	Right hand test result	Limit	Liquid temperature left	right
2 / 1924.992 MHz	cheek	**0.021 W/kg**	0.019 W/kg	1.6 W/kg	21.3 °C	21.3 °C
2 / 1924.992 MHz	tilted 15°	0.017 W/kg	0.017 W/kg	1.6 W/kg	21.3 °C	21.3 °C

Table 10: Test results head SAR DECT UPCS 1900 MHz

Body SAR DECT UPCS 1900 MHz (averaged over 1g tissue volume)					
Channel / frequency	Position	test condition	Body worn test result	Limit	Liquid temperature
2 / 1924.992 MHz	front	--	0.017 W/kg	1.6 W/kg	21.3 °C
2 / 1924.992 MHz	rear	--	**0.028 W/kg**	1.6 W/kg	21.3 °C

Table 11: Test results body SAR DECT UPCS 1900 MHz

7.2.2 General description of test procedures

The DUT is tested using the test mode to control test channels and maximum output power of the DUT. CMU 200 was used for monitoring.
Test positions as described in the tables above are in accordance with the specified test standard.
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.
Tests in body position were performed without any distance between DUT and SAM.

8 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

No	used	Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
1	☐	Dosimetric E-Field Probe	ET3DV6	Schmid & Partner Engineering AG	1558	August 23, 2011	12
2	☒	Dosimetric E-Field Probe	ET3DV6	Schmid & Partner Engineering AG	1559	January 18, 2012	12
3	☐	750 MHz System Validation Dipole	D750V3	Schmid & Partner Engineering AG	1041	August 10, 2011	12
4	☐	900 MHz System Validation Dipole	D900V2	Schmid & Partner Engineering AG	102	August 15, 2011	12
5	☐	1800 MHz System Validation Dipole	D1800V2	Schmid & Partner Engineering AG	287	August 17, 2011	12
6	☒	1900 MHz System Validation Dipole	D1900V2	Schmid & Partner Engineering AG	5d009	August 17, 2011	12
7	☐	2450 MHz System Validation Dipole	D2450V2	Schmid & Partner Engineering AG	710	August 19, 2011	12
8	☐	Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	413	January 12, 2012	12
9	☒	Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	477	May 09, 2012	12
10	☒	Software	DASY 4 V4.5	Schmid & Partner Engineering AG	---	N/A	--
11	☒	Phantom	SAM	Schmid & Partner Engineering AG	---	N/A	--
12	☒	Universal Radio Communication Tester	CMU 200	Rohde & Schwarz	106826	March 06, 2012	12
13	☐	Universal Radio Communication Tester	CMW500	Rohde & Schwarz	102375	January 4, 2011	12
14	☒	Network Analyser 300 kHz to 6 GHz	8753ES	Hewlett Packard)*	US39174436	February 24, 2012	12
15	☒	Dielectric Probe Kit	85070C	Hewlett Packard	US99360146	N/A	12
16	☒	Signal Generator	8665A	Hewlett Packard	2833A00112	January 6, 2012	12
17	☒	Amplifier	25S1G4 (25 Watt)	Amplifier Reasearch	20452	N/A	--
18	☒	Power Meter	NRP	Rohde & Schwarz	101367	January 6, 2011	24
19	☒	Power Meter Sensor	NRP Z22	Rohde & Schwarz	100227	January 9, 2012	12
20	☒	Power Meter Sensor	NRP Z22	Rohde & Schwarz	100234	January 9, 2012	12
21	☒	Directional Coupler	778D	Hewlett Packard	19171	January 8, 2012	12

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

9 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A: System performance verification

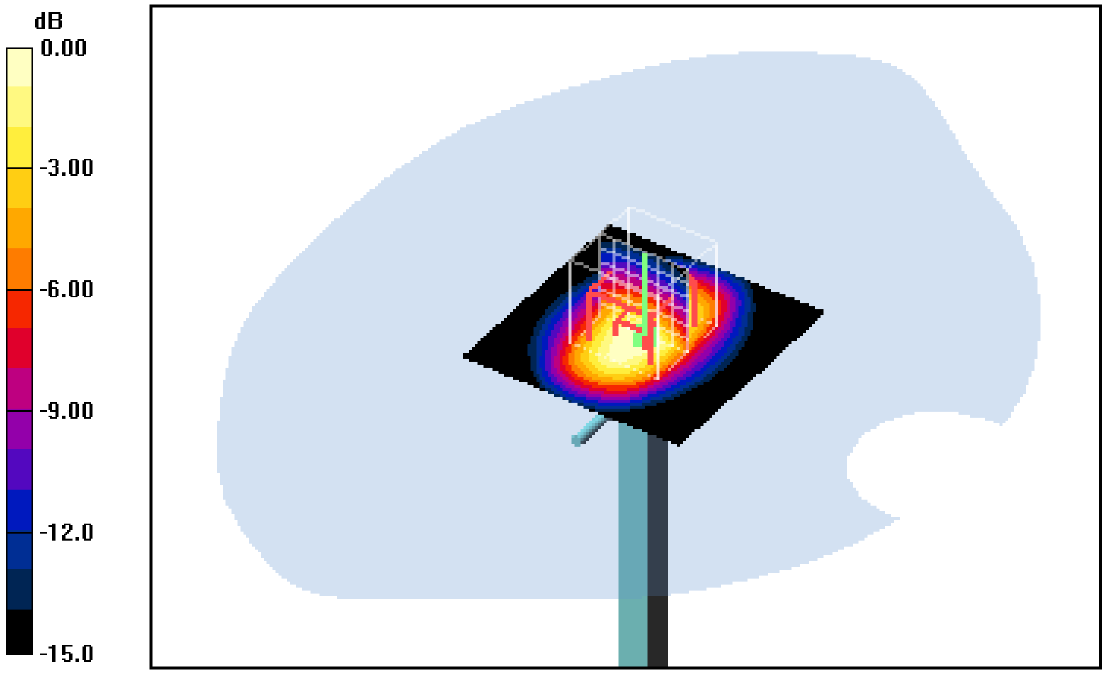
Date/Time: 13.06.2012 10:25:12Date/Time: 13.06.2012 10:28:48

SystemPerformanceCheck-D1900 head 2012-06-13

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d009
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1559; ConvF(5.08, 5.08, 5.08); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

d=10mm, Pin=1000mW/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 51.4 mW/g

d=10mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 186.3 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 67.0 W/kg
SAR(1 g) = 37.7 mW/g; SAR(10 g) = 20.1 mW/g
Maximum value of SAR (measured) = 42.7 mW/g



0 dB = 42.7mW/g

Additional information:
ambient temperature: 21.9°C; liquid temperature: 21.5°C

Date/Time: 14.06.2012 12:14:09Date/Time: 14.06.2012 12:23:01

SystemPerformanceCheck-D1900 body 2012-06-14

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d009

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

Medium: M1900 Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1559; ConvF(4.46, 4.46, 4.46); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

d=10mm, Pin=1000mW/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 53.4 mW/g

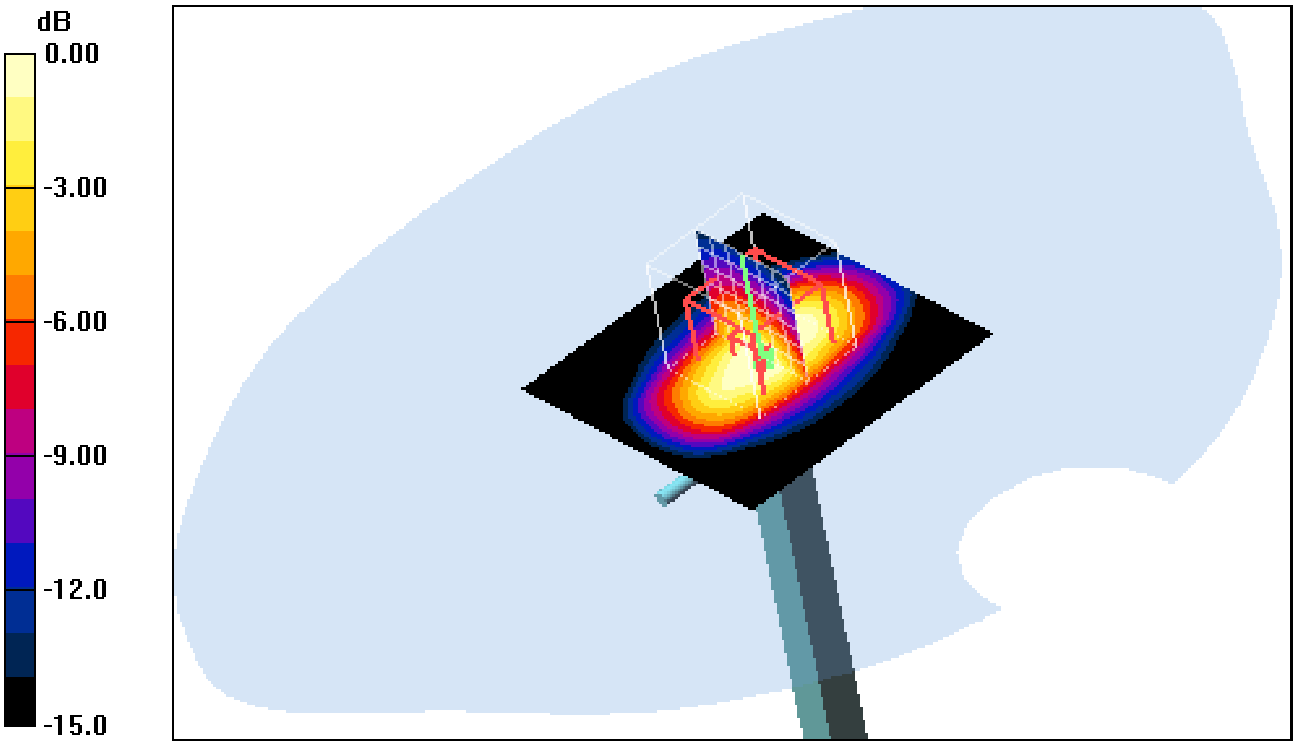
d=10mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 184.6 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 68.6 W/kg

SAR(1 g) = 37.8 mW/g; SAR(10 g) = 20.7 mW/g

Maximum value of SAR (measured) = 43.0 mW/g



0 dB = 43.0mW/g

Additional information:

ambient temperature: 22.3°C; liquid temperature: 21.1°C

Annex B: DASY4 measurement results

Annex B.1: DECT UPCS 1925MHz head

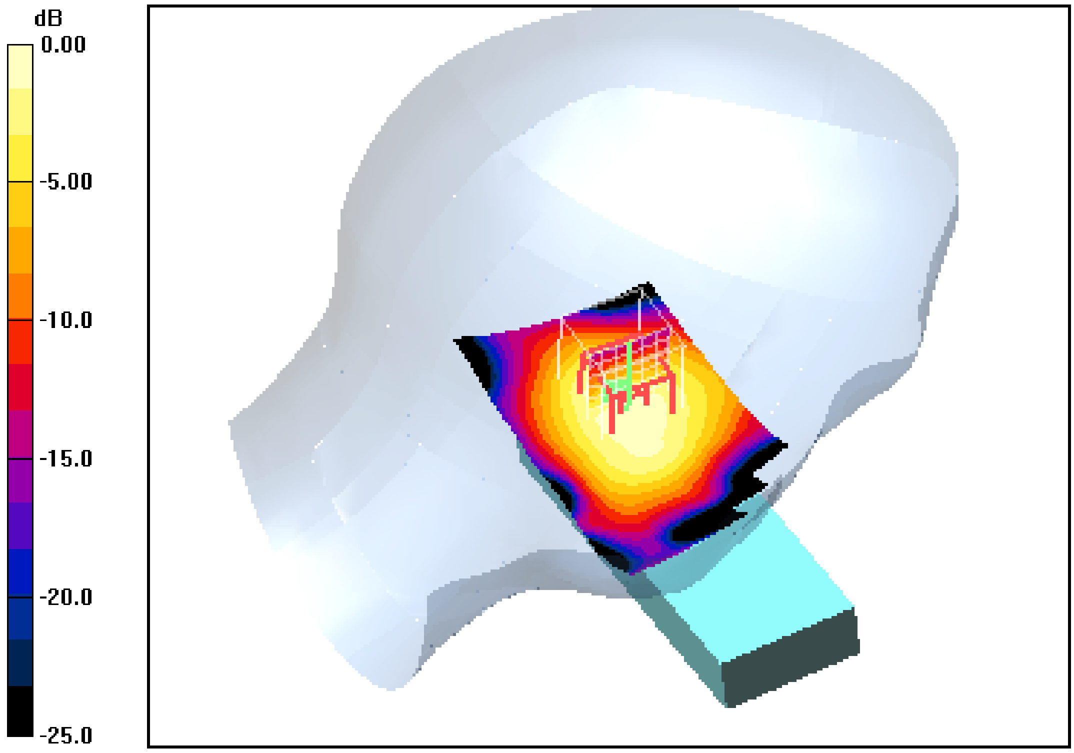
Date/Time: 13.06.2012 13:48:57Date/Time: 13.06.2012 13:57:39

IEEE1528-LeftHandSide-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E
Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24
Medium: HSL1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1559; ConvF(5.08, 5.08, 5.08); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Touch position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.023 mW/g

Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.26 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.021 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.023 mW/g



0 dB = 0.023mW/g

Additional information:
ambient temperature: 22.7°C; liquid temperature: 21.3°C

Date/Time: 13.06.2012 13:19:29Date/Time: 13.06.2012 13:27:01

IEEE1528-LeftHandSide-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E

Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24

Medium: HSL1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1559; ConvF(5.08, 5.08, 5.08); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.020 mW/g

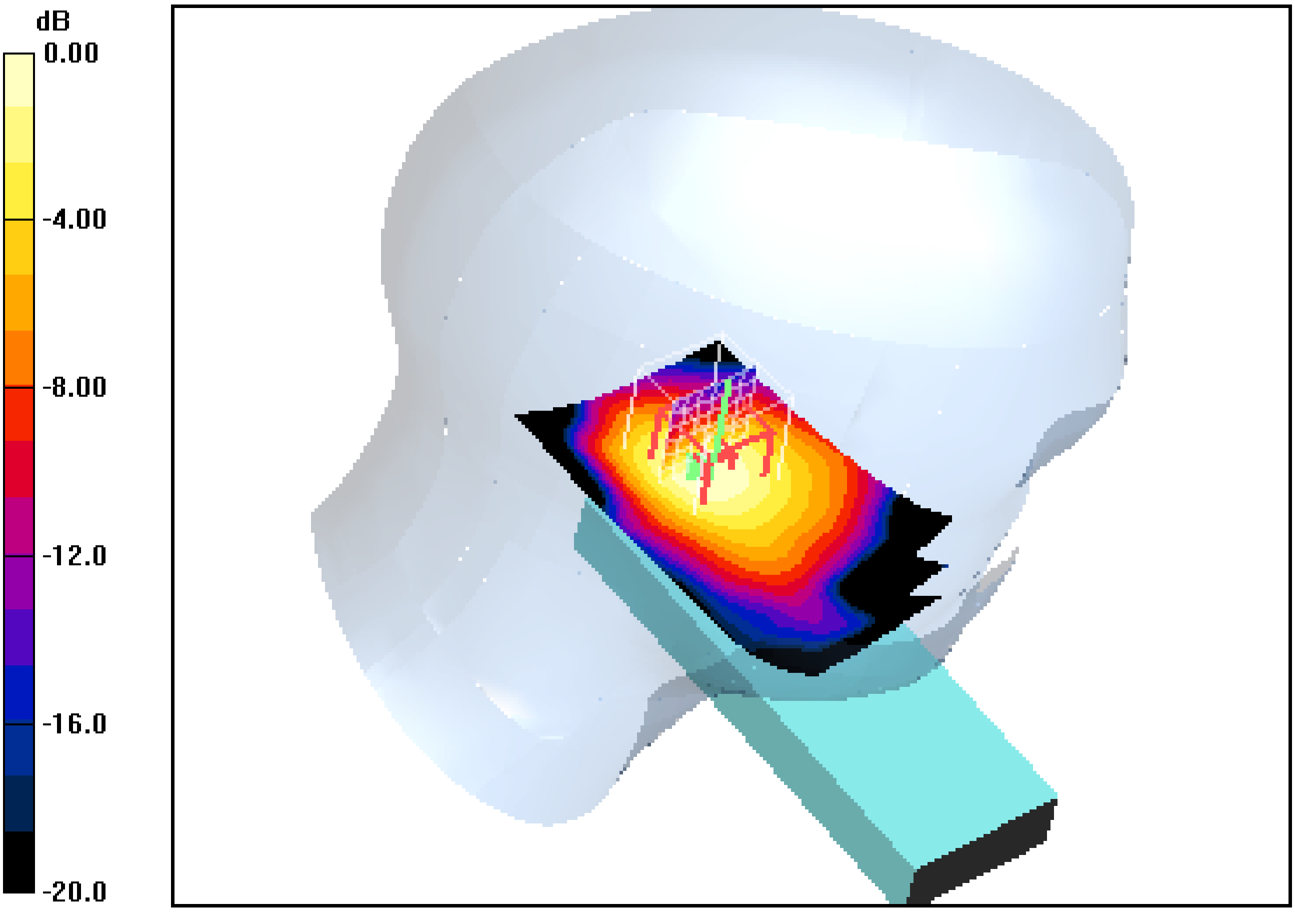
Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.76 V/m; Power Drift = -0.111 dB

Peak SAR (extrapolated) = 0.029 W/kg

SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00994 mW/g

Maximum value of SAR (measured) = 0.019 mW/g



0 dB = 0.019mW/g

Additional information:

ambient temperature: 22.7°C; liquid temperature: 21.3°C

Date/Time: 13.06.2012 12:32:24Date/Time: 13.06.2012 12:40:00

IEEE1528-RightHandSide-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E

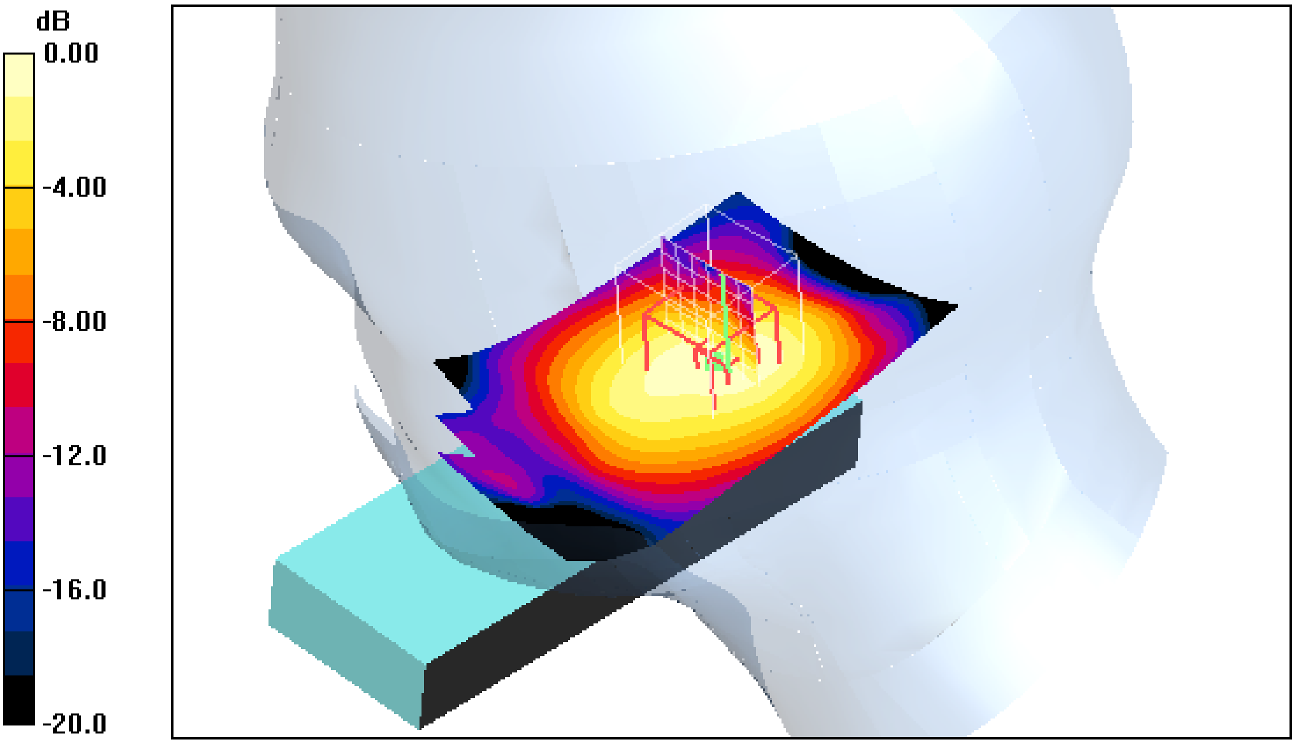
Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24
Medium: HSL1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Right Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1559; ConvF(5.08, 5.08, 5.08); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Touch position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.021 mW/g

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

Reference Value = 4.00 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.029 W/kg
SAR(1 g) = 0.019 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.021 mW/g



0 dB = 0.021mW/g

Additional information:
ambient temperature: 22.7°C; liquid temperature: 21.3°C

Date/Time: 13.06.2012 12:54:30Date/Time: 13.06.2012 13:02:41

IEEE1528-RightHandSide-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E

Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24

Medium: HSL1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1559; ConvF(5.08, 5.08, 5.08); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.020 mW/g

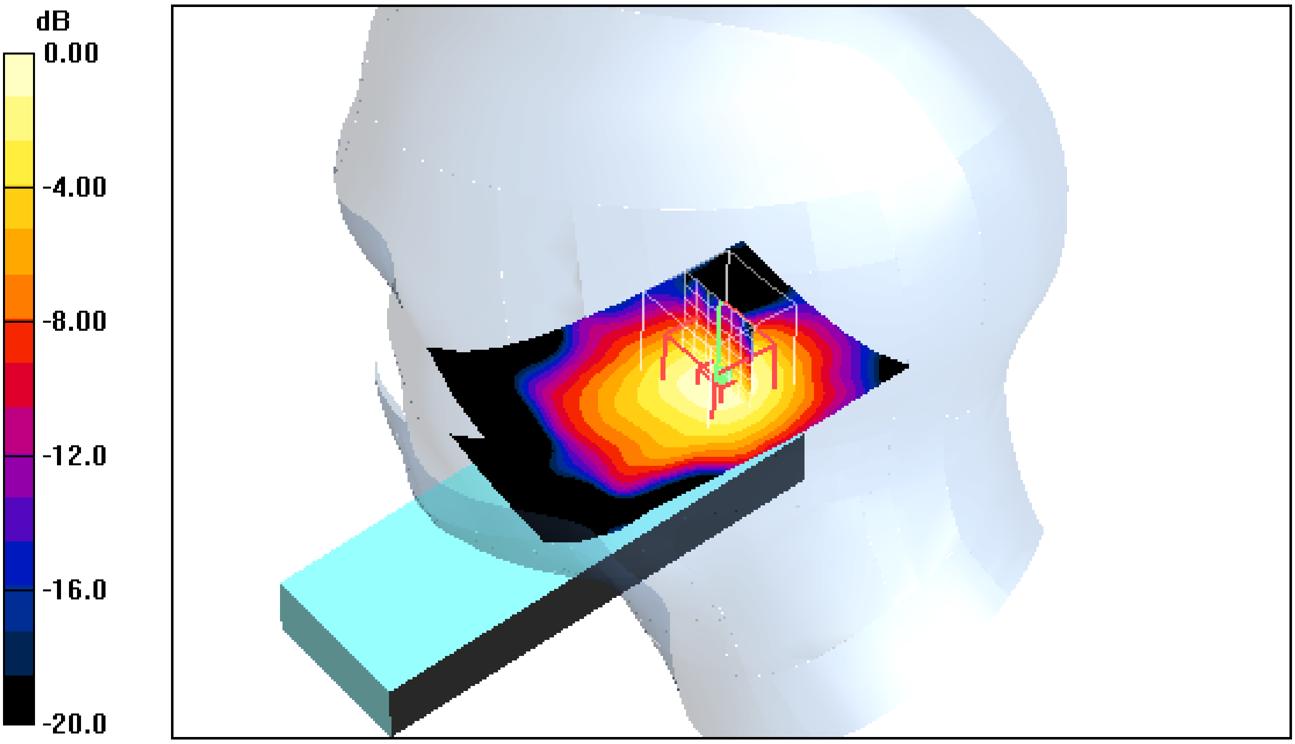
Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.67 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.028 W/kg

SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00951 mW/g

Maximum value of SAR (measured) = 0.019 mW/g



0 dB = 0.019mW/g

Additional information:

ambient temperature: 22.7°C; liquid temperature: 21.3°C

Annex B.2: DECT UPCS 1925MHz body

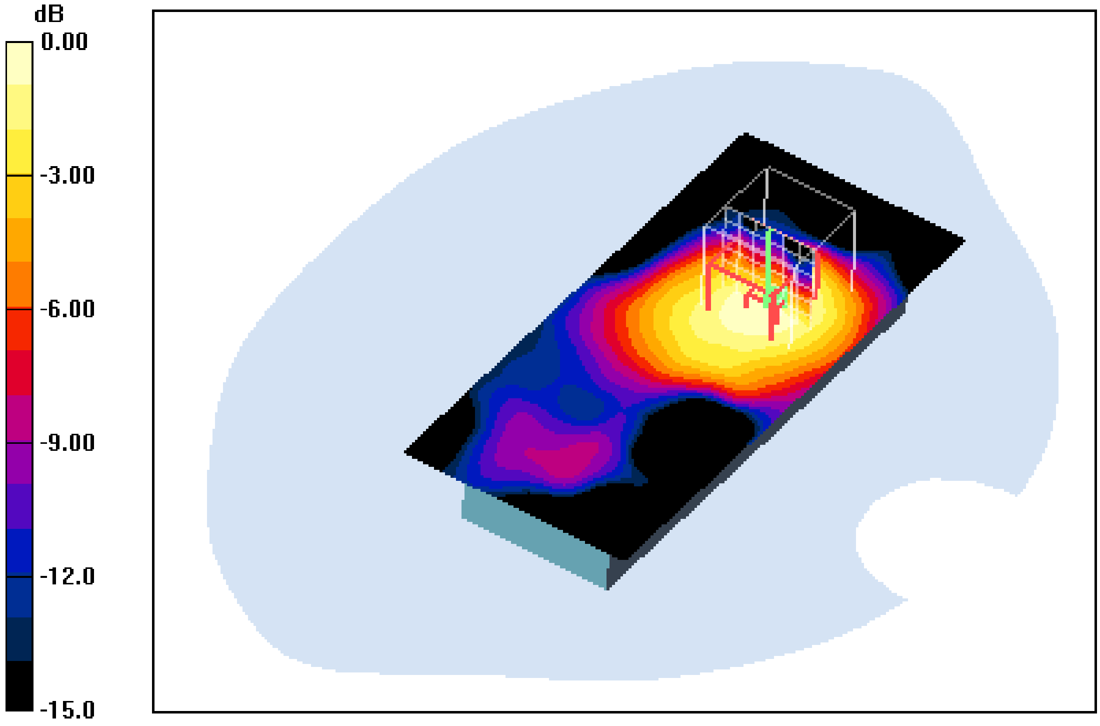
Date/Time: 14.06.2012 14:46:42Date/Time: 14.06.2012 14:54:42

OET65-Body-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E
Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24
Medium: M1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.53 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1559; ConvF(4.46, 4.46, 4.46); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Front position - Middle/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.020 mW/g

Front position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.72 V/m; Power Drift = -0.029 dB
Peak SAR (extrapolated) = 0.024 W/kg
SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.010 mW/g
Maximum value of SAR (measured) = 0.019 mW/g



0 dB = 0.019mW/g

Additional information:
position or distance of DUT to SAM: without any distance
ambient temperature: 23.1°C; liquid temperature: 21.3°C

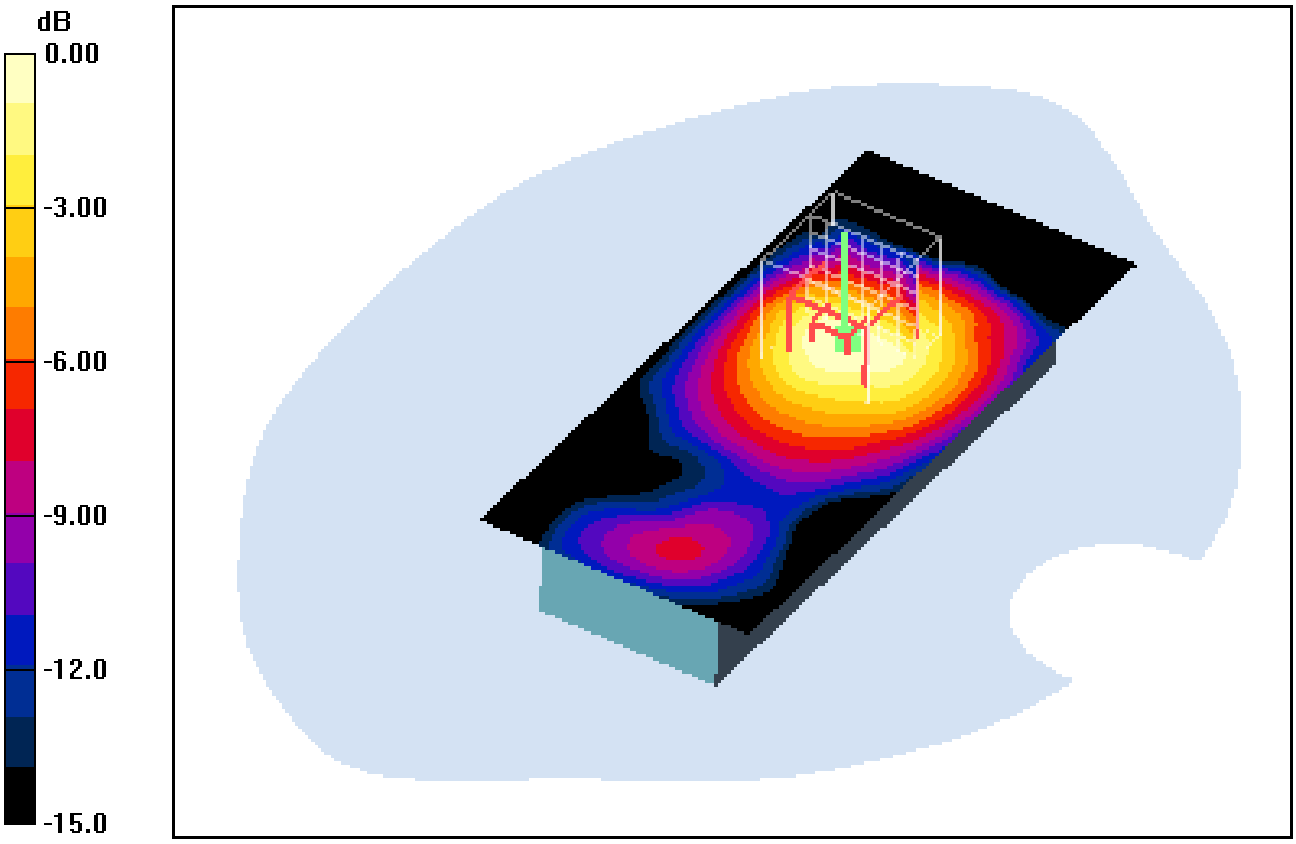
Date/Time: 14.06.2012 15:08:14Date/Time: 14.06.2012 15:20:12

OET65-Body-DECT

DUT: Astra; Type: 622d; Serial: C5810002011E
Communication System: DECT USA; Frequency: 1925 MHz; Duty Cycle: 1:24
Medium: M1900 Medium parameters used (interpolated): f = 1925 MHz; σ = 1.53 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1559; ConvF(4.46, 4.46, 4.46); Calibrated: 18.01.2012
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: SAM left; Type: SAM; Serial: 1041
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 146

Rear position - Middle/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.033 mW/g

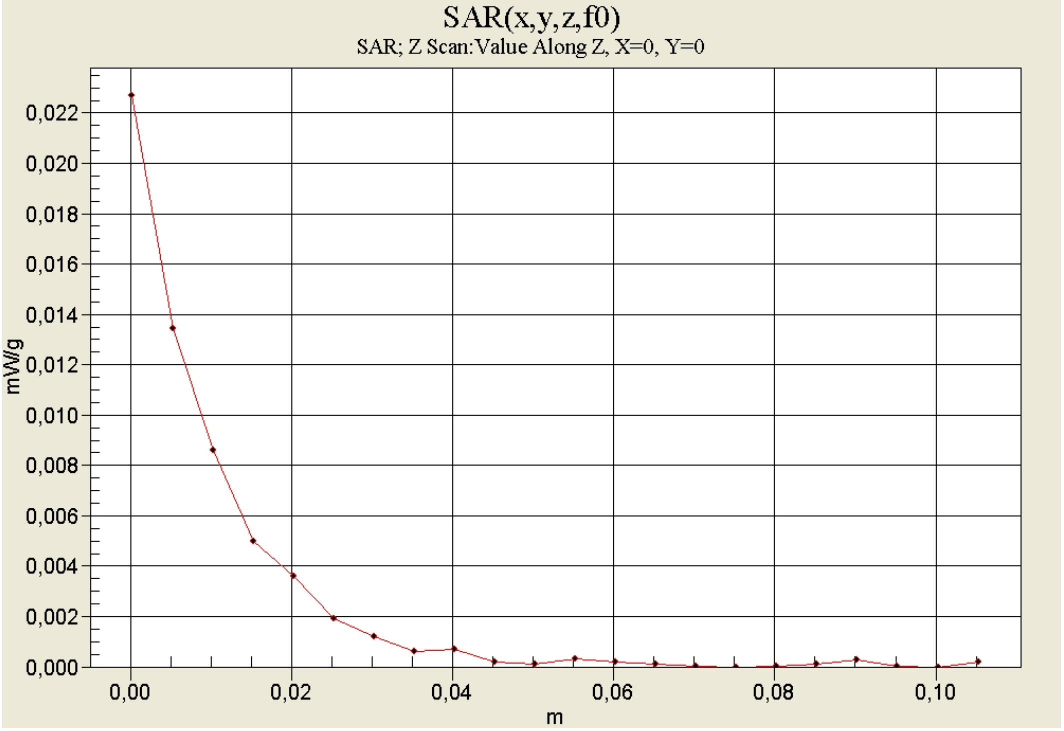
Rear position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.74 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 0.045 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.030 mW/g



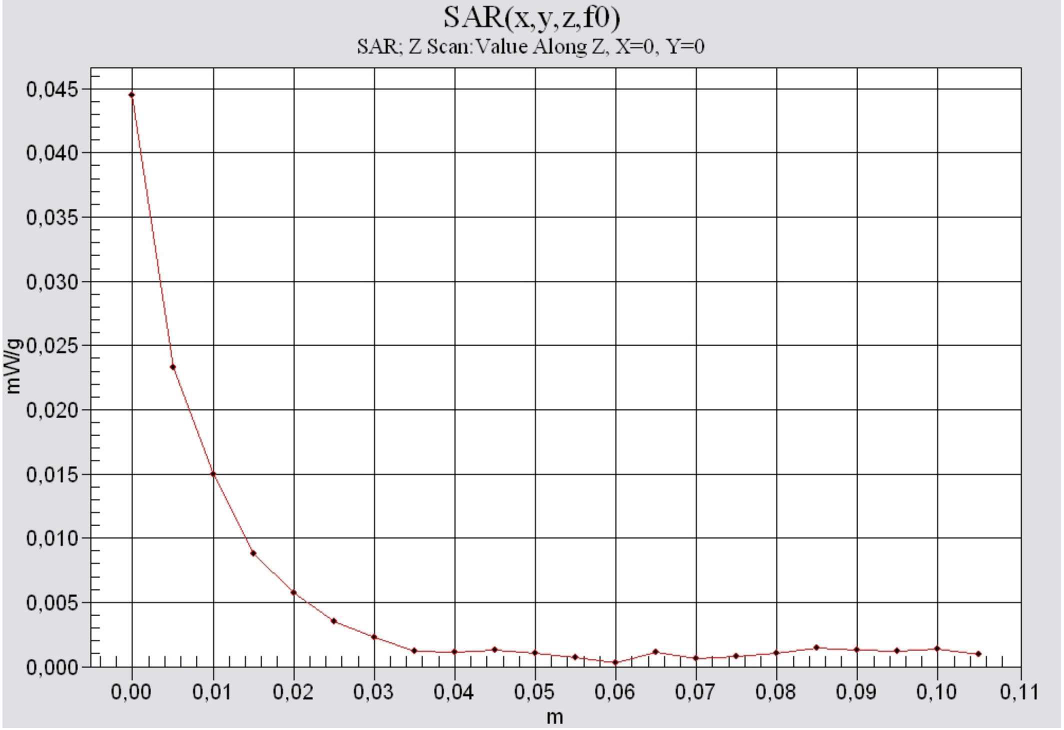
0 dB = 0.030mW/g

Additional information:
position or distance of DUT to SAM: without any distance
ambient temperature: 23.1°C; liquid temperature: 21.3°C

Annex B.3: Z-axis scan



1900 head



1900 body

Annex B.4: Liquid depth

Photo 1: Liquid depth 1900MHz head simulating liquid

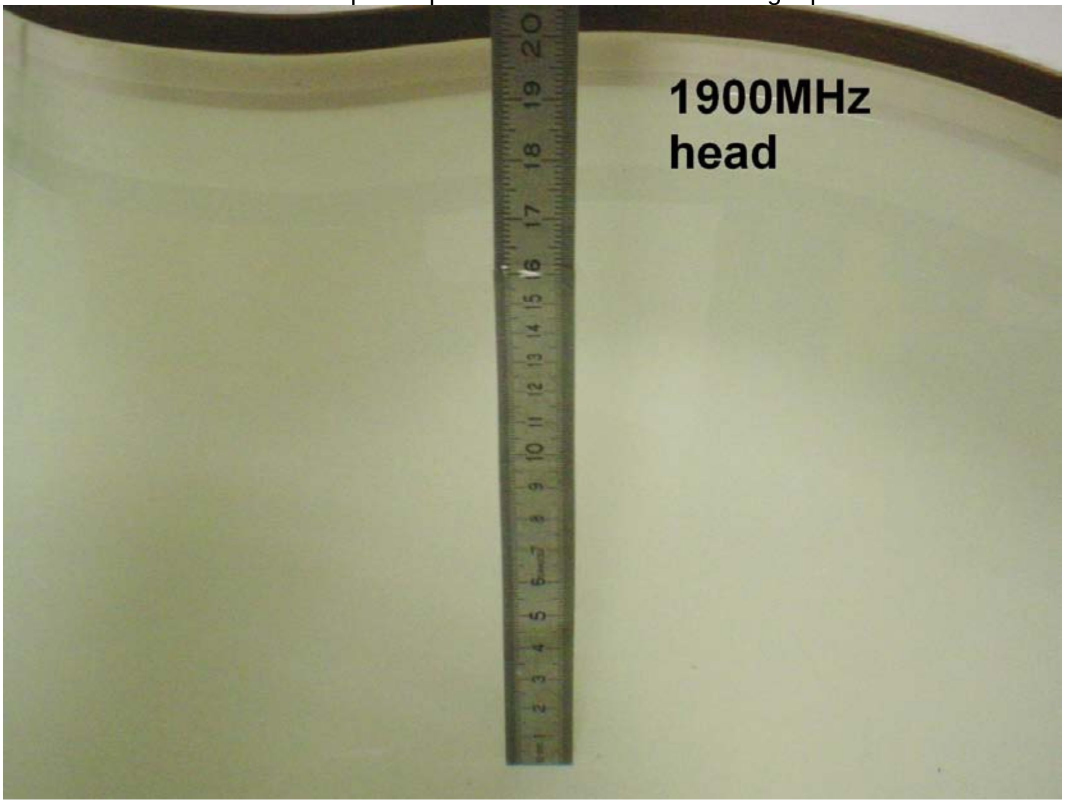
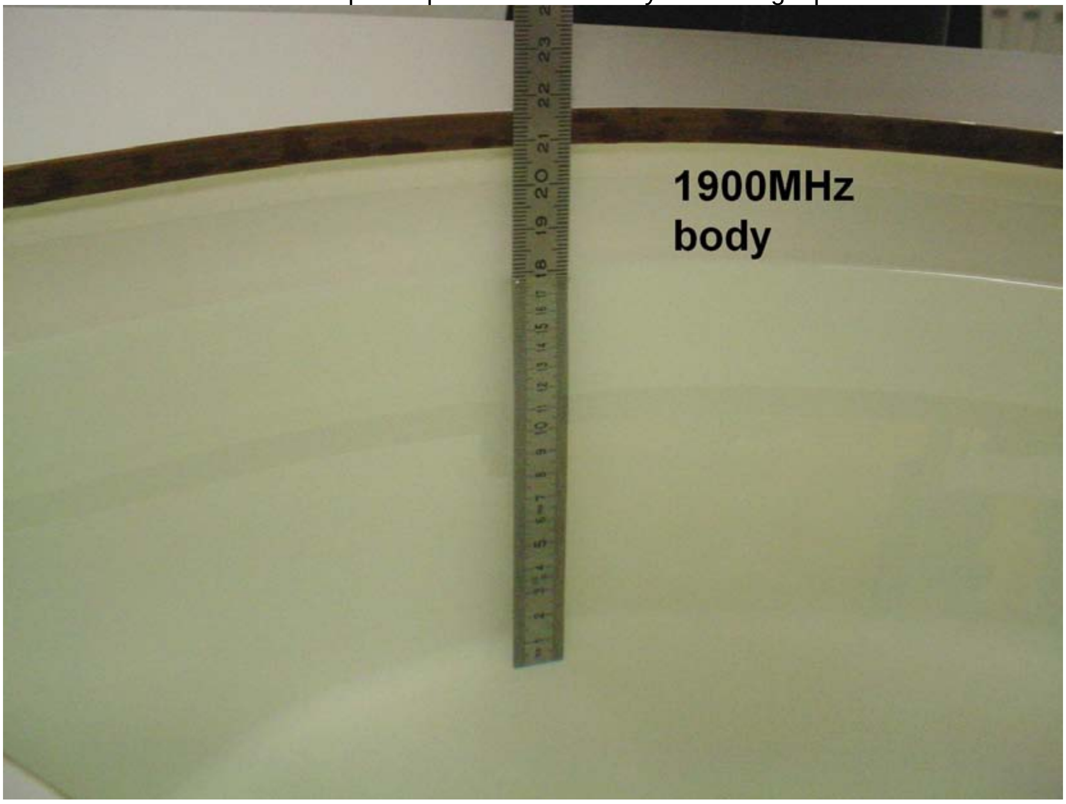


Photo 2: Liquid depth 1900 MHz body simulating liquid



Annex C: Photo documentation

Photo 1: Measurement System DASY 4

Photo 2: DUT - front view

Photo 3: DUT - side view

Photo 4: DUT - rear view

Photo 5: DUT - rear view (open)

Photo 6: DUT - rear view (open) without battery

Photo 7: DUT - rear view (label)

Photo 8: Battery

Photo 9: Test position left hand touched

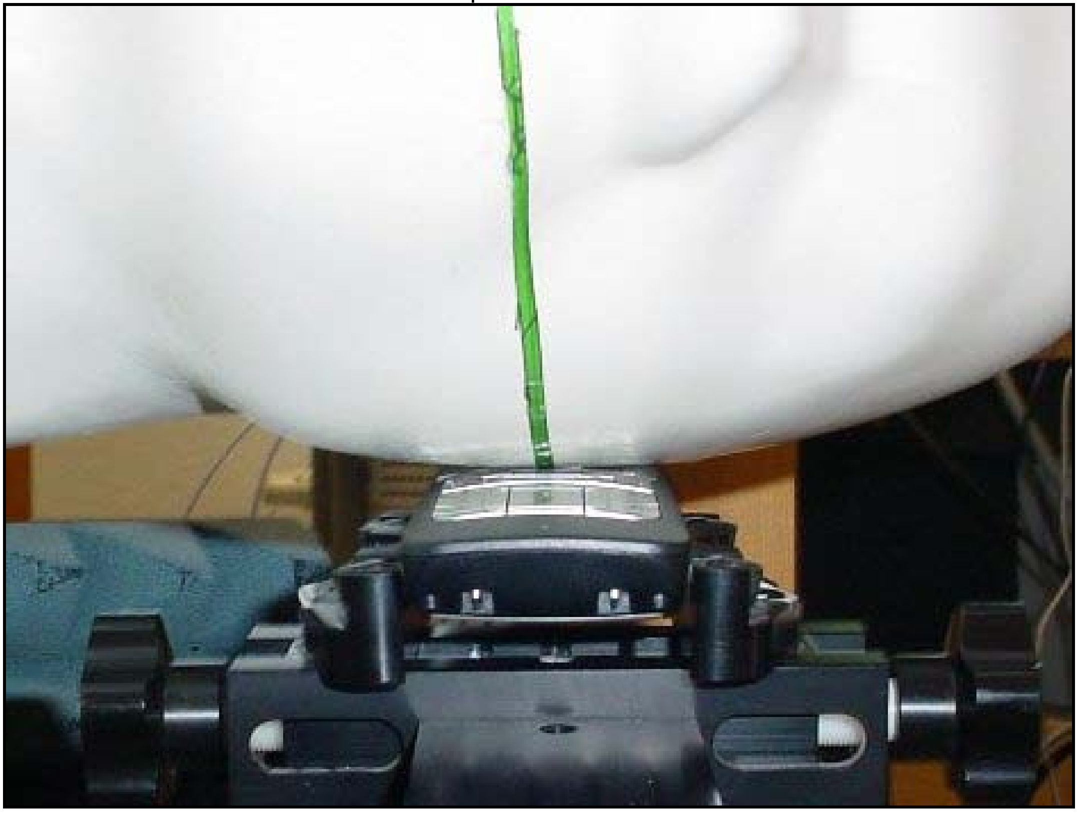


Photo 10: Test position left hand touched

Photo 11: Test position left hand touched

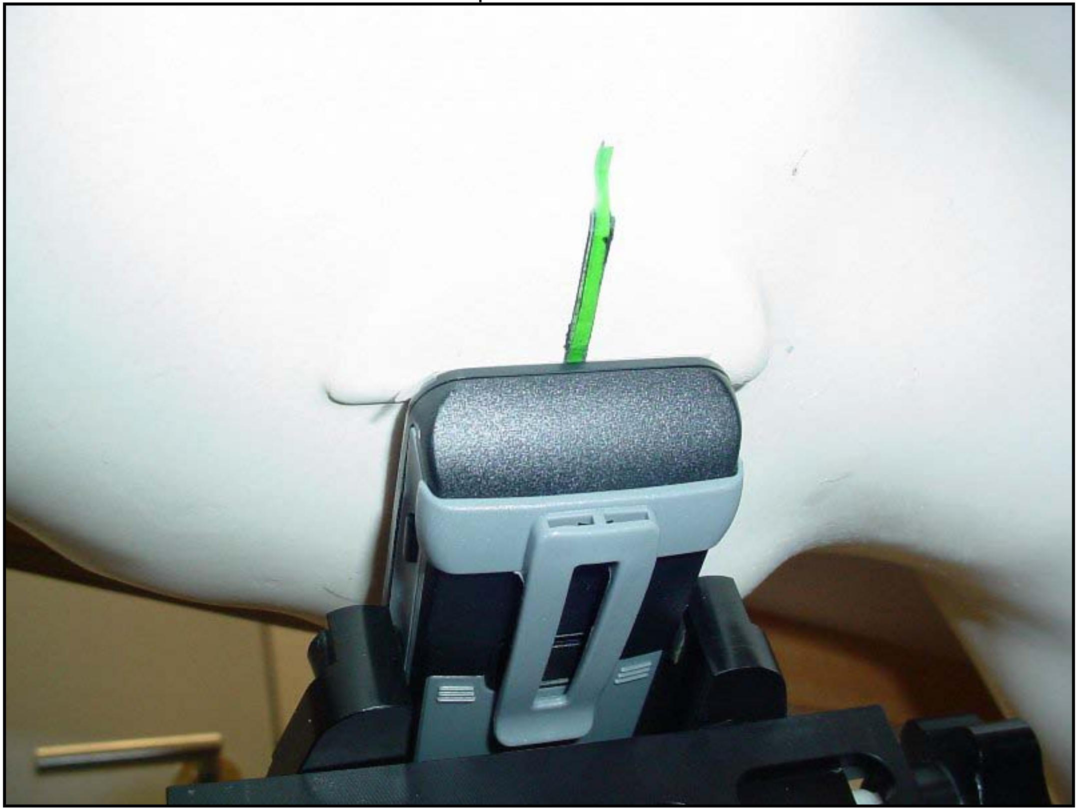


Photo 12: Test position left hand tilted 15°

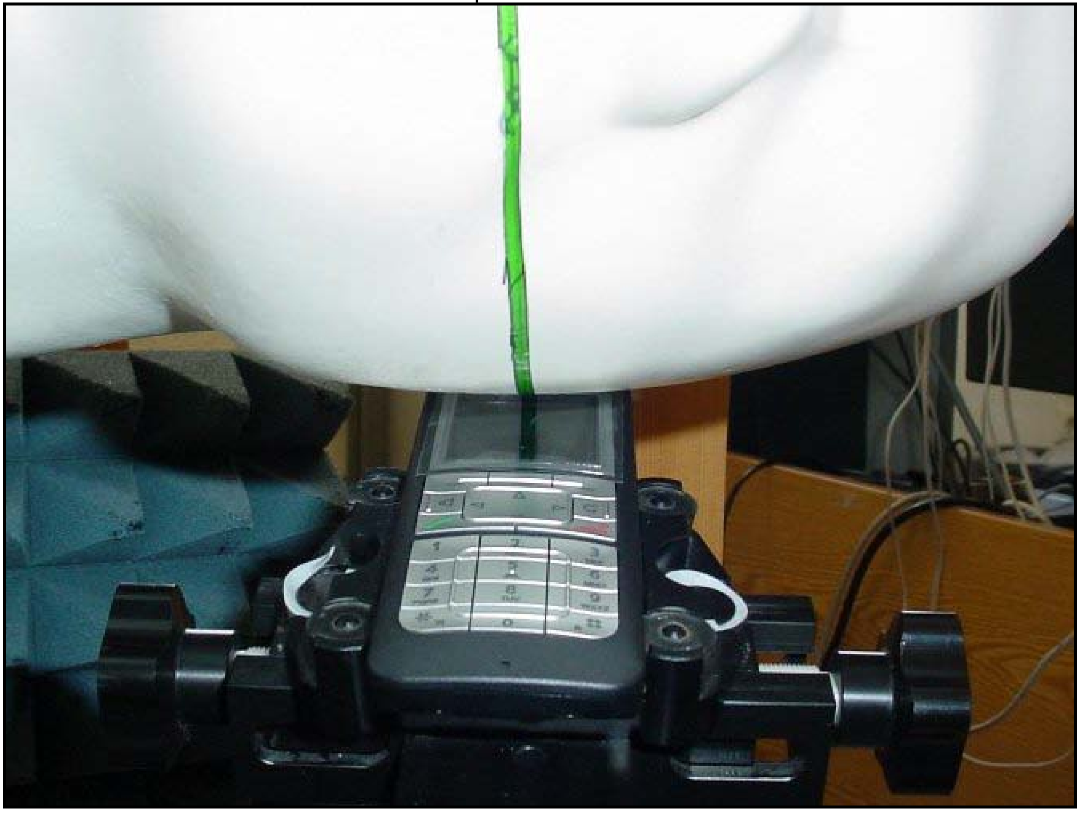


Photo 13: Test position left hand tilted 15°

Photo 14: Test position right hand touched

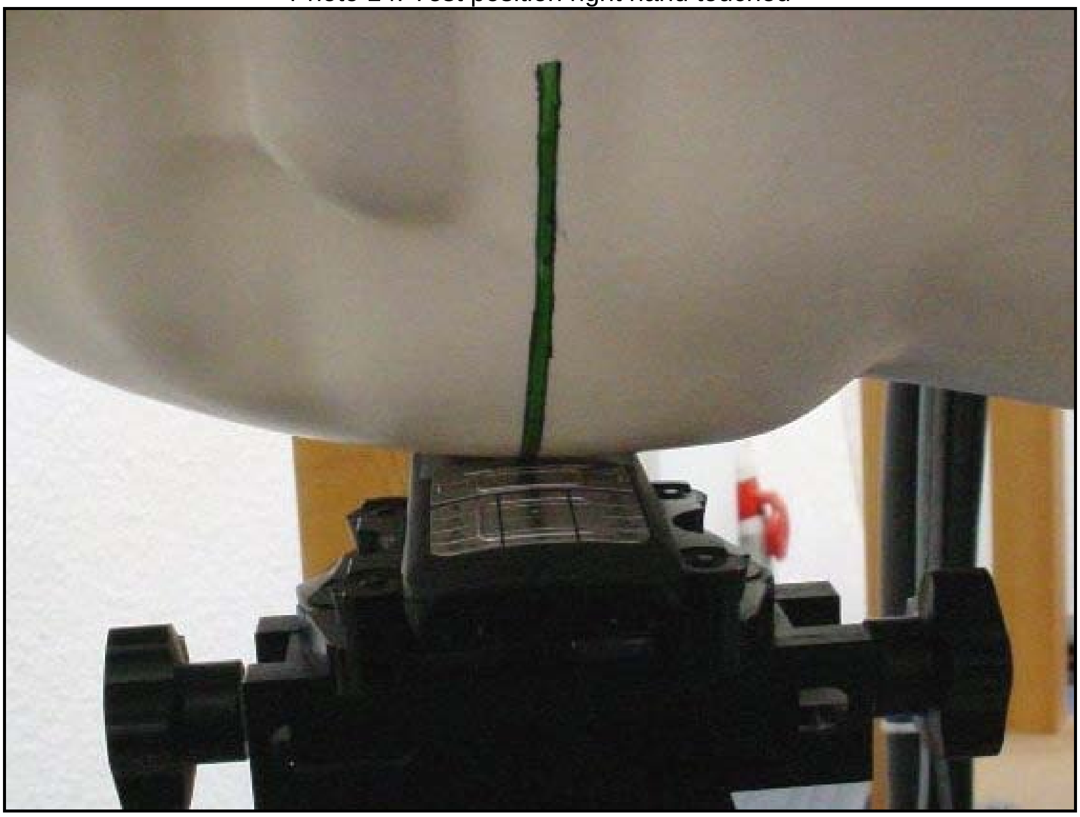


Photo 15: Test position right hand touched

Photo 16: Test position right hand touched

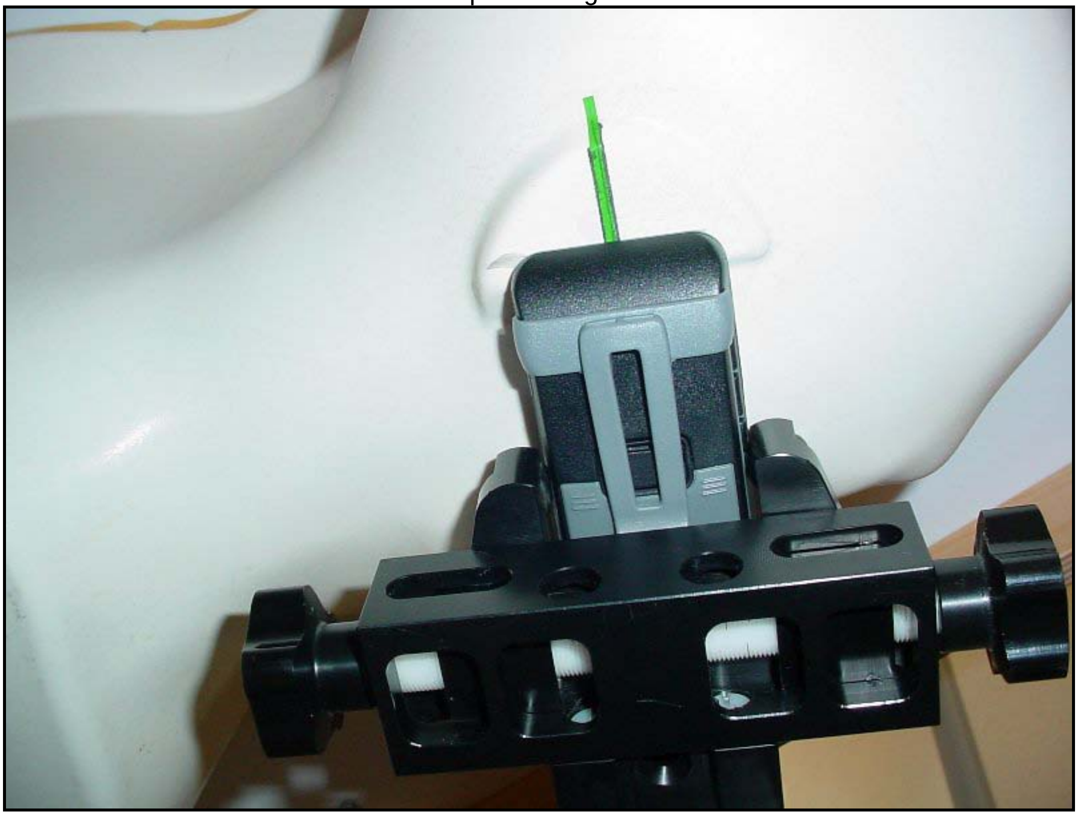


Photo 17: Test position right hand tilted 15°

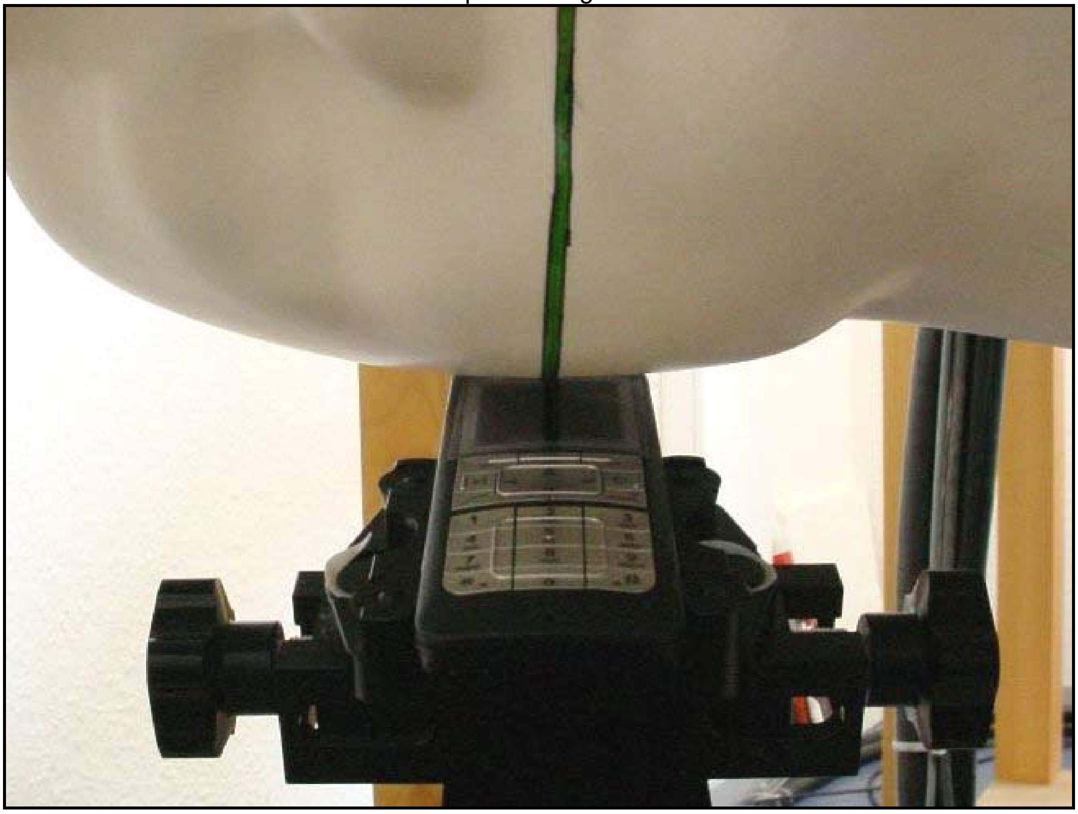


Photo 18: Test position right hand tilted 15°

Photo 19: Test position body worn front side without any distance

Photo 20: Test position body worn rear side without any distance

Annex D: RF Technical Brief Cover Sheet acc. to RSS-102 Annex A

1. COMPANY NUMBER: **1884E**

2. MODEL NUMBER: **80E00009622**

3. MANUFACTURER: **Aastra Deutschland GmbH**

4. TYPE OF EVALUATION:

(a) SAR Evaluation: Device used in the Vicinity of the Human Head

- Multiple transmitters: Yes ☐ No ☒
- Evaluated against exposure limits: General Public Use ☒ Controlled Use ☐
- Duty cycle used in evaluation: 4.1 %
- Standard used for evaluation: RSS-102 Issue 4 (2010-03)
- SAR value: **0.021 W/kg**. Measured ☒ Computed ☐ Calculated ☐

(b) SAR Evaluation: Body-worn Device

- Multiple transmitters: Yes ☐ No ☒
- Evaluated against exposure limits: General Public Use ☒ Controlled Use ☐
- Duty cycle used in evaluation: 4.1 %
- Standard used for evaluation: RSS-102 Issue 4 (2010-03)
- SAR value: **0.028 W/kg**. Measured ☒ Computed ☐ Calculated ☐

Annex D.1: Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in Annex D: is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Signature: Thomas Vogler cn=Thomas Vogler, o=CETECOM ICT Services GmbH, ou=VOG-100727, email=thomas.vogler@cetecom.com, c=DE 2012.07.20 11:22:38 +02'00' Date: 2012-07-20

NAME : **Thomas Vogler**

TITLE : Dipl.-Ing. (FH)

COMPANY : CETECOM ICT Services GmbH

Annex E: Calibration parameters

Calibration parameters are described in the additional document :

Appendix to test report no. 1-4722/12-07-05-A
Calibration data, Phantom certificate
and detail information of the DASY4 System

Annex F: Document History

Version	Applied Changes	Date of Release
	Initial Release	2012-06-20
-A	Corrected duty cycle in Annex D page 42	2012-07-20

Annex G: Further Information

Glossary

BW	-	Bandwidth
DUT	-	Device under Test
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
LTE	-	Long Term Evolution
N/A	-	not applicable
OET	-	Office of Engineering and Technology
RB	-	resource block(s)
SAR	-	Specific Absorption Rate
S/N	-	Serial Number
SW	-	Software