
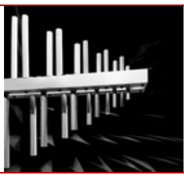
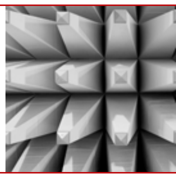

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Deutscher Akkreditierungs Rat
DAR

TEST REPORT

Test Report No.: 1-1928-38-08/10-A

Testing Laboratory

CETECOM ICT Services GmbH
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Accredited Test Laboratory:
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025

DAR registration number: DGA-PL-176/94-D1

Applicant

Yanmar Co., Ltd.
1600-4, Umegahara
Maibara / JAPAN

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Phone: +81-749-52-8408

Manufacturer

Yanmar Co., Ltd.
1600-4, Umegahara
Maibara / JAPAN

Test Standard/s

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:	Telecommunication Controller
Device type:	mobile device
Model name:	**YSCRW01**
S/N serial number:	68
FCC-ID:	Y6YYSCRW01
IC:	9461A-YSCRW01
IMEI-Number:	354114012454865 15
Hardware status:	2nd;B2.12.1
Software status:	CT01;REVISION 02.050
Frequency:	see technical details
Antenna:	external antenna
Power supply:	10 V – 16 V DC
Accessories:	notebook Samsung P55Torrent
Test sample status:	identical prototype
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 performed:

cn=Oleksandr Hnatovskiy, o=CETECOM ICT, ou=HNA-100728, email=Oleksandr.Hnatovskiy@cetecom.com, c=DE
2011.02.22 12:32:38 +01'00'

2011-02-10 Oleksandr Hnatovskiy

Test Report authorised:

cn=Bernd Rebmann, o=CETECOM ICT, ou=REB-100122, email=Bernd.Rebmann@ict.cetecom.de, c=DE
2011.02.22 13:10:56 +01'00'

2011-02-10 Bernd Rebmann

1 Table of contents

2 General information

2.1 Notes

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.

2.2 Application details

Date of receipt of order:	2010-12-08
Date of receipt of test item:	2011-01-24
Start of test:	2011-01-24
End of test:	2011-01-26
Person(s) present during the test:	---

2.3 Statement of compliance

The SAR values found for the YSCRW01 Telecommunication Controller 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.

2.4 Technical details

Band tested for this SAR test report	Technology	Frequency band	Lowest transmit frequency/MHz	Highest transmit frequency/MHz	Lowest receive Frequency/MHz	Highest receive Frequency/MHz	Kind of modulation	Power Class	Tested power control level	GPRS/EGPRS mobile station class	GPRS/EGPRS multislot class	(E)GPRS voice mode or DTM	Test channel low	Test channel middle	Test channel high	Maximum output power/dBm)*
☐	GSM	GSM	880.2	914.8	925.2	959.8	GMSK 8-PSK	4 E2	5	B	10	no	975	37	124	--
☐	GSM	DCS	1710.2	1784.8	1805.2	1879.8	GMSK 8-PSK	1 E2	0	B	10	no	512	698	885	--
☒	GSM	cellular	824.2	848.8	869.2	893.8	GMSK 8-PSK	4 E2	5	B	10	no	128	190	251	31.3
☒	GSM	PCS	1850.2	1909.8	1930.2	1989.8	GMSK 8-PSK	1 E2	0	B	10	no	512	661	810	28.7
☐	UMTS	FDD I	1922.4	1977.6	2112.4	2167.6	QPSK	3	max	--	--	--	9612	9750	9888	--
☒	UMTS	FDD II	1852.4	1907.6	1982.4	1987.6	QPSK	3	max	--	--	--	9262	9400	9538	23.0
☒	UMTS	FDD V	826.4	846.6	871.4	891.6	QPSK	3	max	--	--	--	4132	4182	4233	23.5

)*: slotted peak power for GSM, averaged max. RMS power for UMTS.

3 Test standard/s:

Test Standard	Version	Test Standard Description
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	1991	Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
IEEE Std. C95-1	1999	Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields

3.1 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).

4 Summary of Measurement Results

☒	**No deviations from the technical specifications ascertained**
☐	Deviations from the technical specifications ascertained

5 Test Environment

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

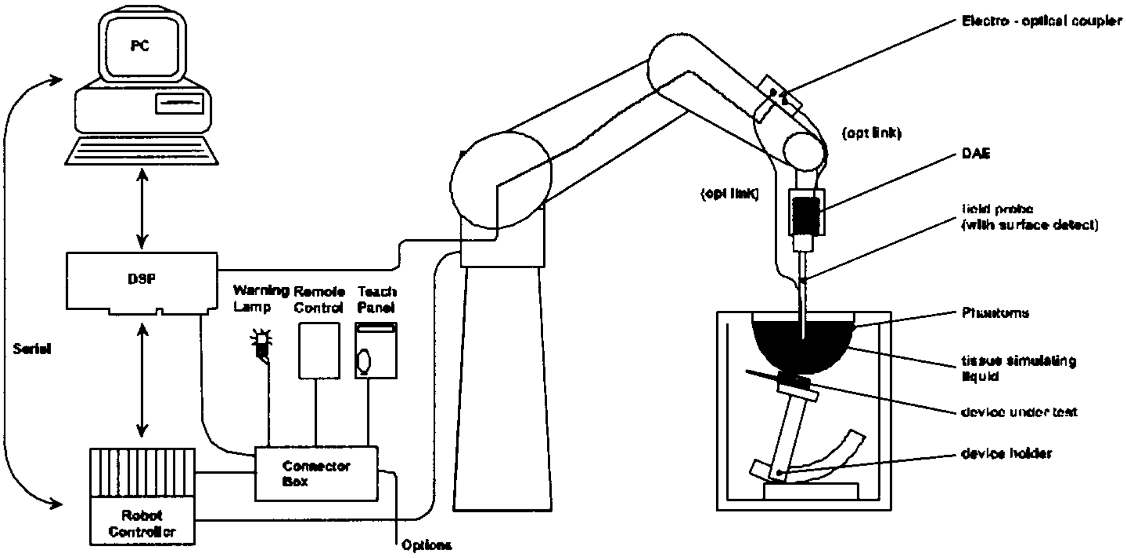
Relative humidity content: 40 – 50 %
Air pressure: not relevant for this kind of testing
Power supply: 230 V / 50 Hz

Exact temperature values for each test are shown in the table(s) under 2.5. 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 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.

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 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.

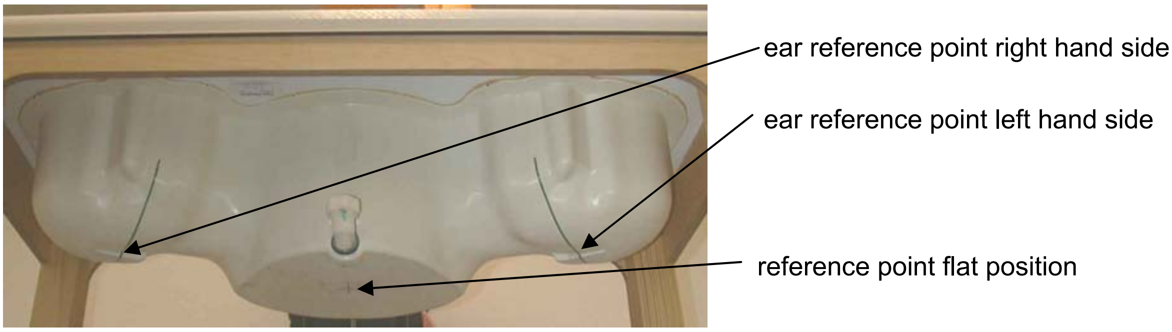
6.1.3 Probe description

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.

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

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

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	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

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

Used Target Frequency [MHz]	Target Body Tissue		Measured Body Tissue		Measured Date
	Permittivity	Conductivity [S/m]	Permittivity	Conductivity [S/m]	
835	55.2	0.97	55.5	0.96	2011-01-25
900	55.0	1.05	54.9	1.02	2011-01-25
1900	53.3	1.52	53.3	1.56	2011-01-24

Table 3: 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 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 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	± 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

6.1.12 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 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	± 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

6.1.13 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 1528. The following table shows validation results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

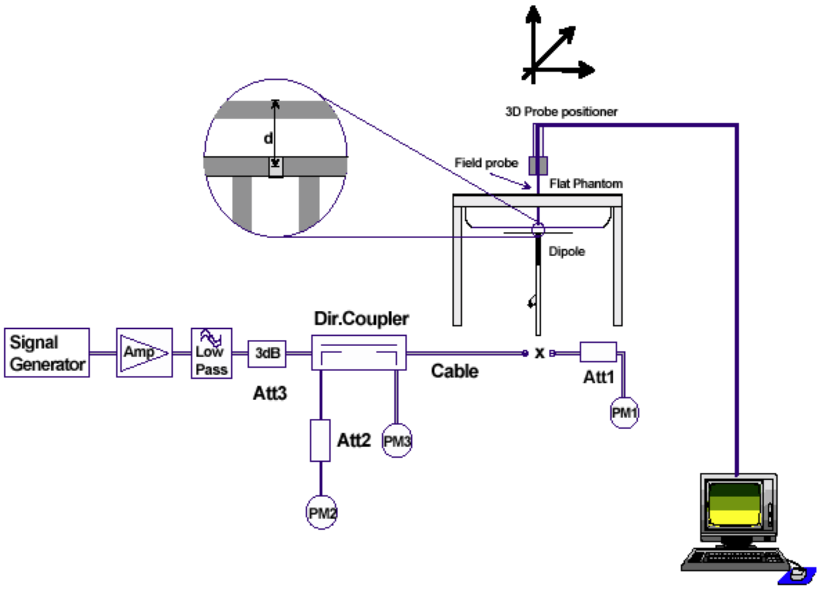
Validation Kit	Frequency	Target Peak SAR (1000 mW) (+/- 10%)	Target SAR_{1g} (1000 mW) (+/- 10%)	Measured Peak SAR (1000 mW)	Measured SAR_{1g} (1000 mW)	Measured date
D900V2 S/N: 102	**900 MHz body**	17.3 mW/g	11.3 mW/g	15.8 mW/g	11.0 mW/g	2011-01-25
D1900V2 S/N: 5d009	**1900 MHz body**	69.6 mW/g	41.8 mW/g	65.8 mW/g	40.9 mW/g	2011-01-24

Table 6: Results system validation

Note : 900 MHz probe/dipole calibration is valid +/-100 MHz and fully covers the 850 MHz band.

6.1.14 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.



7 Detailed Test Results

7.1 Conducted power measurements

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 also checked before and after each SAR measurement. The resulting power values were within a 0.2 dB tolerance of the values shown below.

Note: CMU200 measures GSM peak and average output power for active timeslots.
For SAR the timebased average power is relevant. The difference inbetween depends on the duty cycle of the TDMA signal :

No. of timeslots	***1***	***2***	***3***	***4***
Duty Cycle	1 : 8	1: 4	1 : 2.66	1 : 2
timebased avg. power compared to slotted avg. power	- 9 dB	- 6 dB	- 4.25 dB	- 3 dB

The signalling modes differ as follows :

mode	***coding scheme***	***modulation***
GPRS	CS1 to CS4	GMSK
EGPRS (EDGE)	MCS1 to MCS4	GMSK
EGPRS (EDGE)	MCS5 to MCS9	8PSK

Apart from modulation change (GMSK/8PSK) coding schemes differ in code rate without influence on the RF signal. Therefore one coding scheme per mode was selected for conducted power measurements.

7.1.1 Conducted power measurements GSM 850 MHz

Channel / frequency	modulation	timeslots	slotted avg. power	time based avg. power (calculated)
128 / 824.2 MHz	GMSK	1	31.1dBm	22.1dBm
190 / 836.6 MHz	GMSK	1	31.1dBm	22.1dBm
251 / 848.0 MHz	GMSK	1	31.3dBm	22.3dBm
128 / 824.2 MHz	GMSK	2	29.6dBm	**23.6**dBm
190 / 836.6 MHz	GMSK	2	29.7dBm	**23.7**dBm
251 / 848.0 MHz	GMSK	2	29.8dBm	**23.8**dBm
128 / 824.2 MHz	8PSK	2	24.3dBm	18.3dBm
190 / 836.6 MHz	8PSK	2	24.4dBm	18.4dBm
251 / 848.0 MHz	8PSK	2	24.5dBm	18.5dBm

Table 7: Test results conducted power measurement GSM 850 MHz

7.1.2 Conducted power measurements GSM 1900 MHz

Channel / frequency	modulation	timeslots	slotted avg. power	time based avg. power (calculated)
512 / 1850.2 MHz	GMSK	1	28.4dBm	19.4dBm
661 / 1880.0 MHz	GMSK	1	28.7dBm	19.7dBm
810 / 1909.8 MHz	GMSK	1	28.6dBm	19.6dBm
512 / 1850.2 MHz	GMSK	2	26.9dBm	**20.9**dBm
661 / 1880.0 MHz	GMSK	2	27.2dBm	**21.2**dBm
810 / 1909.8 MHz	GMSK	2	27.1dBm	**21.1**dBm
512 / 1850.2 MHz	8PSK	2	23.2dBm	17.2dBm
661 / 1880.0 MHz	8PSK	2	23.6dBm	17.6dBm
810 / 1909.8 MHz	8PSK	2	23.5dBm	17.5dBm

Table 8: Test results conducted power measurement GSM 1900 MHz

7.1.3 Justification of SAR measurements in GSM mode

SAR measurements were performed in GPRS mode with 2 active timeslots because highest time based averaged output power was calculated for that configuration.
For comparison an additional delta measurement was performed with 1 timeslot in speech mode. In EDGE mode no delta measurement was performed.

7.1.4 Conducted power measurements WCDMA FDD V (850 MHz)

Max. RMS output power 850 MHz (FDD V) / dBm			
	Channel / frequency		
mode	4132 / 826.4 MHz	4182 / 836.6 MHz	4233 / 846.6 MHz
RMC 12.2 kbit/s	**23.5**	23.4	**23.4**
RMC 64 kbit/s	23.4	23.4	23.4
RMC 144 kbit/s	23.4	23.4	23.4
RMC 384 kbit/s	23.4	23.4	23.4
AMR 4,75 kbit/s	**23.5**	23.4	23.5
AMR 5,15 kbit/s	**23.5**	23.4	23.4
AMR 5,9 kbit/s	**23.5**	23.4	23.4
AMR 6,7 kbit/s	**23.5**	23.2	23.4
AMR7,4 kbit/s	**23.5**	23.3	23.4
AMR 7,95 kbit/s	**23.5**	23.3	23.4
AMR 10,2 kbit/s	**23.5**	23.3	23.3
AMR 12,2 kbit/s	**23.5**	23.2	23.4
HSDPA Sub test 1	**23.3**	**23.2**	**23.2**
HSDPA Sub test 2	22.0	21.9	21.9
HSDPA Sub test 3	20.1	20.0	19.9
HSDPA Sub test 4	18.5	18.4	18.4

Table 9: Test results conducted power measurement WCDMA 850

7.1.5 Conducted power measurements WCDMA FDD II (1900 MHz)

Max. RMS output power 1900 MHz (FDD II) / dBm			
	Channel / frequency		
mode	9262 / 1852.4 MHz	9400 / 1880.0 MHz	9538 / 1907.6 MHz
RMC 12.2 kbit/s	**23.0**	**22.9**	**22.7**
RMC 64 kbit/s	22.9	22.7	22.5
RMC 144 kbit/s	22.9	22.7	22.5
RMC 384 kbit/s	23.0	22.7	22.5
AMR 4,75 kbit/s	23.0	22.8	22.5
AMR 5,15 kbit/s	23.0	22.8	22.5
AMR 5,9 kbit/s	22.9	22.8	22.5
AMR 6,7 kbit/s	22.9	22.8	22.6
AMR7,4 kbit/s	22.9	22.8	22.5
AMR 7,95 kbit/s	22.9	22.7	22.4
AMR 10,2 kbit/s	22.9	22.7	22.5
AMR 12,2 kbit/s	22.9	22.7	22.5
HSDPA Sub test 1	**22.8**	**22.6**	**22.4**
HSDPA Sub test 2	21.1	21.1	21.0
HSDPA Sub test 3	19.3	19.2	15.0
HSDPA Sub test 4	17.5	17.3	17.3

Table 10: Test results conducted power measurement WCDMA 1900

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.
Therefore no additional SAR measurements were performed in HSDPA mode.

7.1.6 Test-set-up information for WCDMA / HSDPA

a) RMC

In RMC (reference measurement channel) mode the conducted power at 4 different bit rates was measured. They correspond with the used spreading factors as follows :

Bit rate	***12.2 kbit/s***	***64 kbit/s***	***144 kbit/s***	***384 kbit/s***
Spreading factor (SF)	64	16	8	4

In RMC mode only DPCCH and DPDCH are active. As bit rate changes do not influence the relative power of any code channel the measured RMS output power remains on the same level which is set to maximum by TPC (Transmit power control) pattern type 'All 1'.

b) HSDPA

HSDPA adds the HS-DPCCH in uplink as a control channel for high speed data transfer in downlink.
In HSDPA mode 4 sub-tests are defined by 3GPP 34.121 according to the following table:

Sub-test	β_c	β_d	β_d **(SF)**	β_c/β_d	$\beta_{hs}^{(1)}$	**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 $\Longleftrightarrow$ β_{hs} = 30/15 * β_c
Note 2 : CM = 1 for β_c/β_d = 12/15, β_{hs}/β_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 β_c = 11/15 and β_d = 15/15

Table 11: Sub-tests for UMTS Release 5 HSDPA

The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the above table, β_{hs} for HS-DPCCH is set automatically to the correct value when Δ_{ACK}, Δ_{NACK}, Δ_{CQI} = 8. The variation of the β_c/β_d ratio causes a power reduction at sub-tests 2 - 4.

The measurements were performed with a Fixed Reference Channel(FRC) and H-Set 1 QPSK.

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 12: settings of required H-Set 1 QPSK acc. to 3GPP 34.121

7.2 SAR test results

7.2.1 Results overview

Body SAR GSM 850 MHz (averaged over 1g tissue volume)					
Channel / frequency	Position	test condition	Body worn test result	Limit	Liquid temperature
128 / 824.2 MHz	top	2 time slots	0.038 W/kg	1.6 W/kg	22.3 °C
190 / 836.6 MHz	top	2 time slots	0.057 W/kg	1.6 W/kg	22.3 °C
251 / 848.8 MHz	top	2 time slots	**0.066 W/kg**	1.6 W/kg	22.3 °C
128 / 824.2 MHz	side	2 time slots	--- W/kg	1.6 W/kg	--- °C
190 / 836.6 MHz	side	2 time slots	0.033 W/kg	1.6 W/kg	22.3 °C
251 / 848.8 MHz	side	2 time slots	--- W/kg	1.6 W/kg	--- °C

Table 13: Test results body SAR GSM 850 MHz

Body SAR GSM 1900 MHz (averaged over 1g tissue volume)					
Channel / frequency	Position	test condition	Body worn test result	Limit	Liquid temperature
512 / 1850.2 MHz	top	2 time slots	0.035 W/kg	1.6 W/kg	21.6 °C
661 / 1880.0 MHz	top	2 time slots	0.037 W/kg	1.6 W/kg	21.6 °C
810 / 1909.8 MHz	top	2 time slots	**0.058 W/kg**	1.6 W/kg	21.6 °C
512 / 1850.2 MHz	side	2 time slots	--- W/kg	1.6 W/kg	--- °C
661 / 1880.0 MHz	side	2 time slots	0.028 W/kg	1.6 W/kg	21.6 °C
810 / 1909.8 MHz	side	2 time slots	--- W/kg	1.6 W/kg	--- °C

Table 14: Test results body SAR GSM 1900 MHz

Body SAR UMTS FDD V 850 MHz (averaged over 1g tissue volume)					
Channel / frequency	Position	test condition	Body worn test result	Limit	Liquid temperature
4132 / 826.4 MHz	top	RMC, 12.2 kbit/s	0.048 W/kg	1.6 W/kg	22.1 °C
4182 / 836.4 MHz	top	RMC, 12.2 kbit/s	0.066 W/kg	1.6 W/kg	22.1 °C
4233 / 846.6 MHz	top	RMC, 12.2 kbit/s	**0.071 W/kg**	1.6 W/kg	22.1 °C
4132 / 826.4 MHz	side	RMC, 12.2 kbit/s	--- W/kg	1.6 W/kg	--- °C
4182 / 836.4 MHz	side	RMC, 12.2 kbit/s	0.037 W/kg	1.6 W/kg	22.1 °C
4233 / 846.6 MHz	side	RMC, 12.2 kbit/s	--- W/kg	1.6 W/kg	--- °C

Table 15: Test results body SAR UMTS FDD V 850 MHz

Body SAR UMTS FDD II 1900 MHz (averaged over 1g tissue volume)					
Channel / frequency	Position	test condition	Body worn test result	Limit	Liquid temperature
9262 / 1852.4 MHz	top	RMC, 12.2 kbit/s	**0.076 W/kg**	1.6 W/kg	21.7 °C
9400 / 1880.0 MHz	top	RMC, 12.2 kbit/s	0.056 W/kg	1.6 W/kg	21.7 °C
9538 / 1907.6 MHz	top	RMC, 12.2 kbit/s	0.067 W/kg	1.6 W/kg	21.7 °C
9262 / 1852.4 MHz	side	RMC, 12.2 kbit/s	--- W/kg	1.6 W/kg	--- °C
9400 / 1880.0 MHz	side	RMC, 12.2 kbit/s	0.048 W/kg	1.6 W/kg	21.7 °C
9538 / 1907.6 MHz	side	RMC, 12.2 kbit/s	--- W/kg	1.6 W/kg	--- °C

Table 16: Test results body SAR UMTS 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.
Tests in body position were performed with **20 mm** air gap between DUT and SAM.

7.2.2 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.
Test positions as described in the tables above are in accordance with the specified test standard.
Tests in body position were performed in that configuration, which generates the highest time based averaged output power (see conducted power results).
UMTS was tested in RMC mode with 12.2 kbit/s and TPC bits set to ‘all 1’.

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 11, 2010	12
2	☐	Dosimetric E-Field Probe	ET3DV6	Schmid & Partner Engineering AG	1559	January 20, 2010	12
3	☒	900 MHz System Validation Dipole	D900V2	Schmid & Partner Engineering AG	102	August 16, 2010	12
4	☐	1800 MHz System Validation Dipole	D1800V2	Schmid & Partner Engineering AG	287	August 17, 2010	12
5	☒	1900 MHz System Validation Dipole	D1900V2	Schmid & Partner Engineering AG	531	August 17, 2010	12
6	☐	2450 MHz System Validation Dipole	D2450V2	Schmid & Partner Engineering AG	710	August 19, 2010	12
7	☐	Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	413	January 4, 2010	12
8	☒	Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	477	May 07, 2010	12
9	☒	Software	DASY 4 V4.5	Schmid & Partner Engineering AG	---	N/A	--
10	☒	Phantom	SAM	Schmid & Partner Engineering AG	---	N/A	--
11	☒	Universal Radio Communication Tester	CMU 200	Rohde & Schwarz	106826	January 12, 2011	12
12	☒	Network Analyser 300 kHz to 6 GHz	8753ES	Hewlett Packard)*	US39174436	July 6, 2010	12
13	☒	Dielectric Probe Kit	85070C	Hewlett Packard	US99360146	N/A	12
14	☒	Signal Generator	8665A	Hewlett Packard	2833A00112	January 6, 2011	12
15	☒	Amplifier	25S1G4 (25 Watt)	Amplifier Reasearch	20452	N/A	--
16	☒	Power Meter	NRP	Rohde & Schwarz	101367	January 6, 2011	12
17	☒	Power Meter Sensor	NRP Z22	Rohde & Schwarz	100227	January 6, 2011	12
18	☒	Power Meter Sensor	NRP Z22	Rohde & Schwarz	100234	January 6, 2011	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

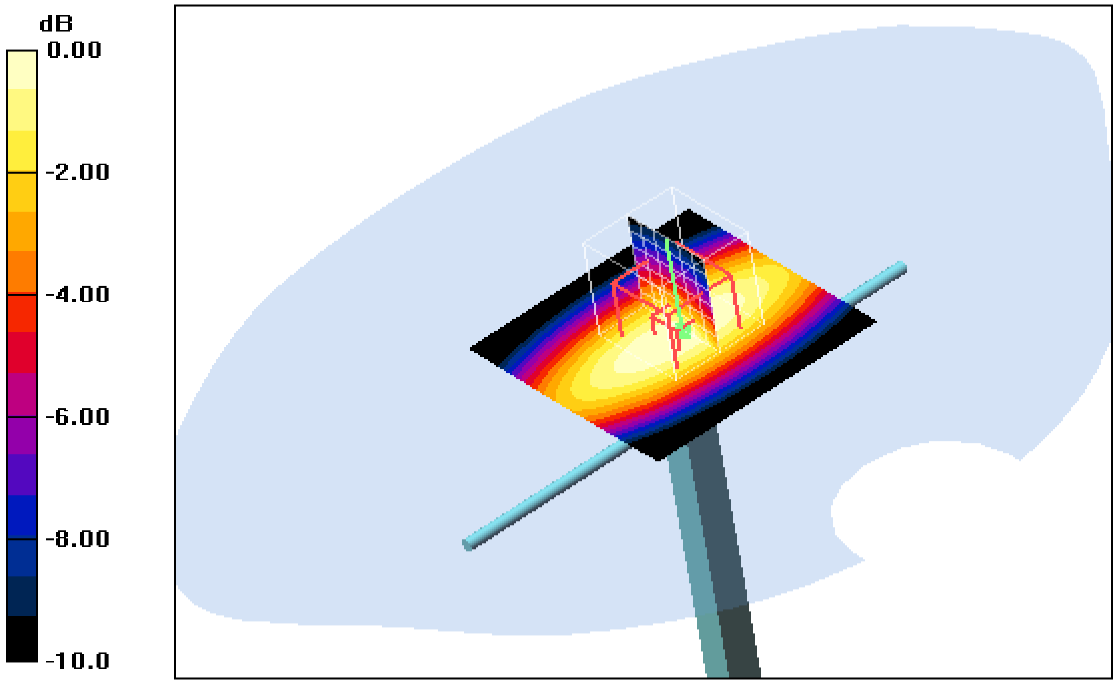
Date/Time: 25.01.2011 12:31:45Date/Time: 25.01.2011 12:35:25

SystemPerformanceCheck-D900 body 2011-01-25

DUT: Dipole 900 MHz; Type: D900V2; Serial: 102
Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium: M900 Medium parameters used: f = 900 MHz; σ = 1.02 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.73, 5.73, 5.73); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- 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 (51x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.8 mW/g

d=15mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 113.5 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 11 mW/g; SAR(10 g) = 7.14 mW/g
Maximum value of SAR (measured) = 11.8 mW/g



0 dB = 11.8mW/g

Additional information:
ambient temperature: 22.5°C; liquid temperature: 22.7°C

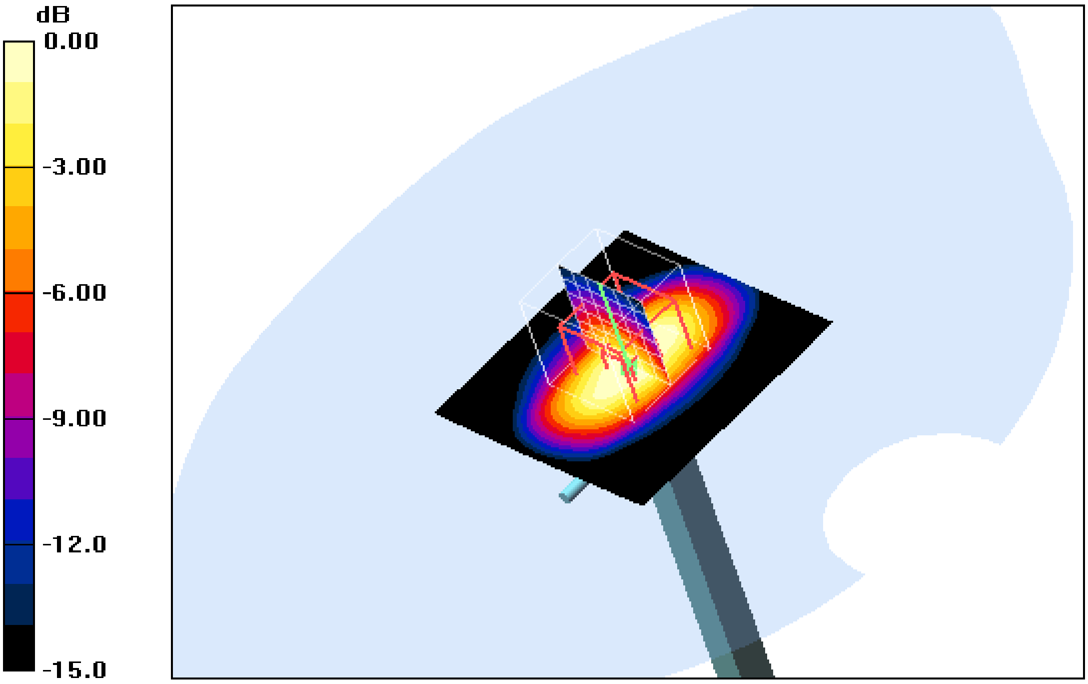
Date/Time: 24.01.2011 09:28:48Date/Time: 24.01.2011 09:32:27

SystemPerformanceCheck-D1900 body 2011-01-24

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 = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- 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 (51x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 58.6 mW/g

d=10mm, Pin=1000mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 187.8 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 65.8 W/kg
SAR(1 g) = 40.9 mW/g; SAR(10 g) = 21.9 mW/g
Maximum value of SAR (measured) = 46.8 mW/g



0 dB = 46.8mW/g

Additional information:
ambient temperature: 22.0°C; liquid temperature: 21.7°C

Annex B: DASY4 measurement results

Annex B.1: GSM 850MHz body

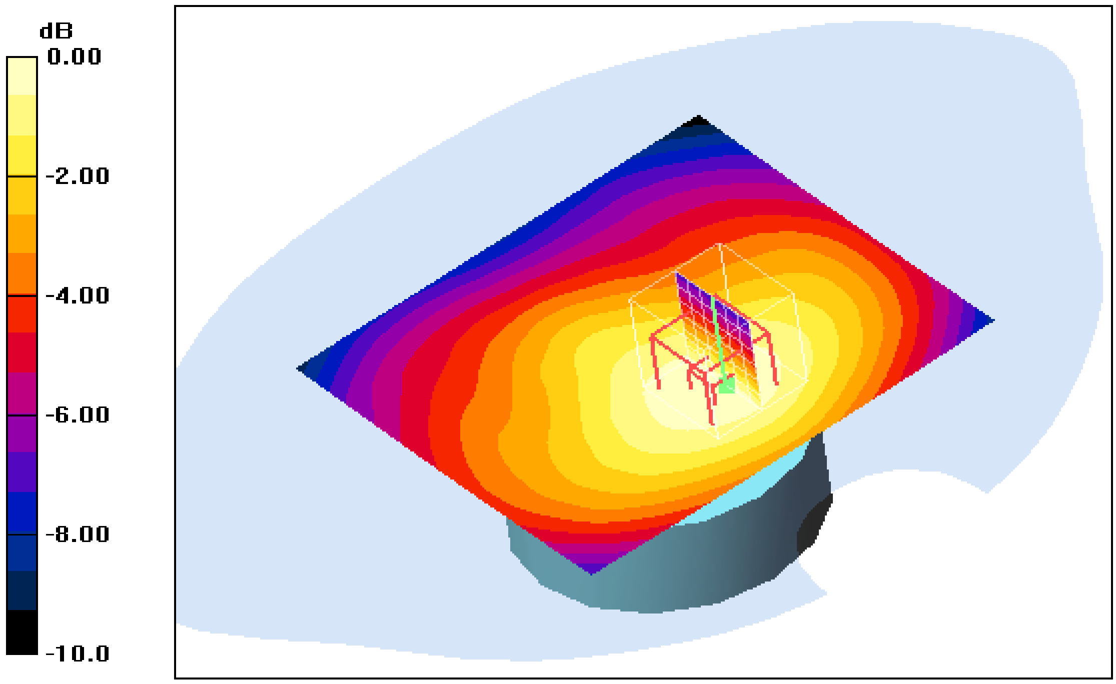
Date/Time: 25.01.2011 15:44:25Date/Time: 25.01.2011 15:53:44

IEEE1528_OET65-Body-GSM850 GPRS 2TS

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: GSM 850 GPRS 2TS; Frequency: 824.2 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 824.2 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Low/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.040 mW/g

Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.62 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.048 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.028 mW/g
Maximum value of SAR (measured) = 0.040 mW/g



0 dB = 0.040mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.3°C

Date/Time: 25.01.2011 15:21:43Date/Time: 25.01.2011 15:31:02

IEEE1528_OET65-Body-GSM850 GPRS 2TS

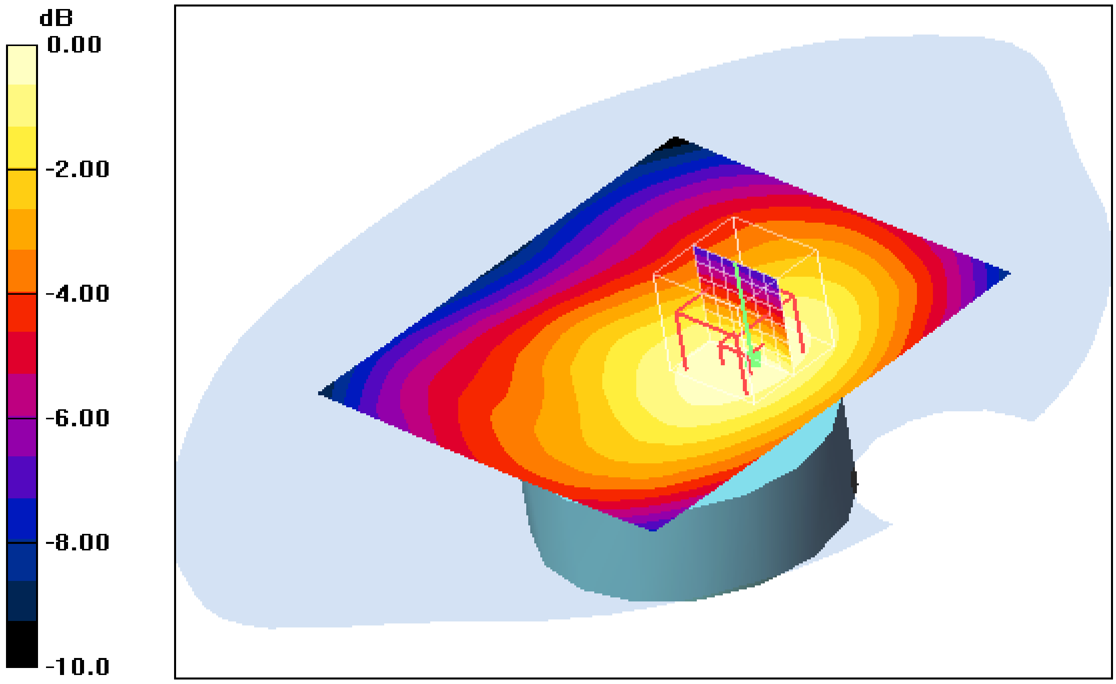
DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 836.6 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Middle/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.060 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.15 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.072 W/kg
SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.042 mW/g
Maximum value of SAR (measured) = 0.060 mW/g



0 dB = 0.060mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.3°C

Date/Time: 25.01.2011 16:07:05Date/Time: 25.01.2011 16:16:26

IEEE1528_OET65-Body-GSM850 GPRS 2TS

DUT: Yanmar; Type: YSCRW01; Serial: 68

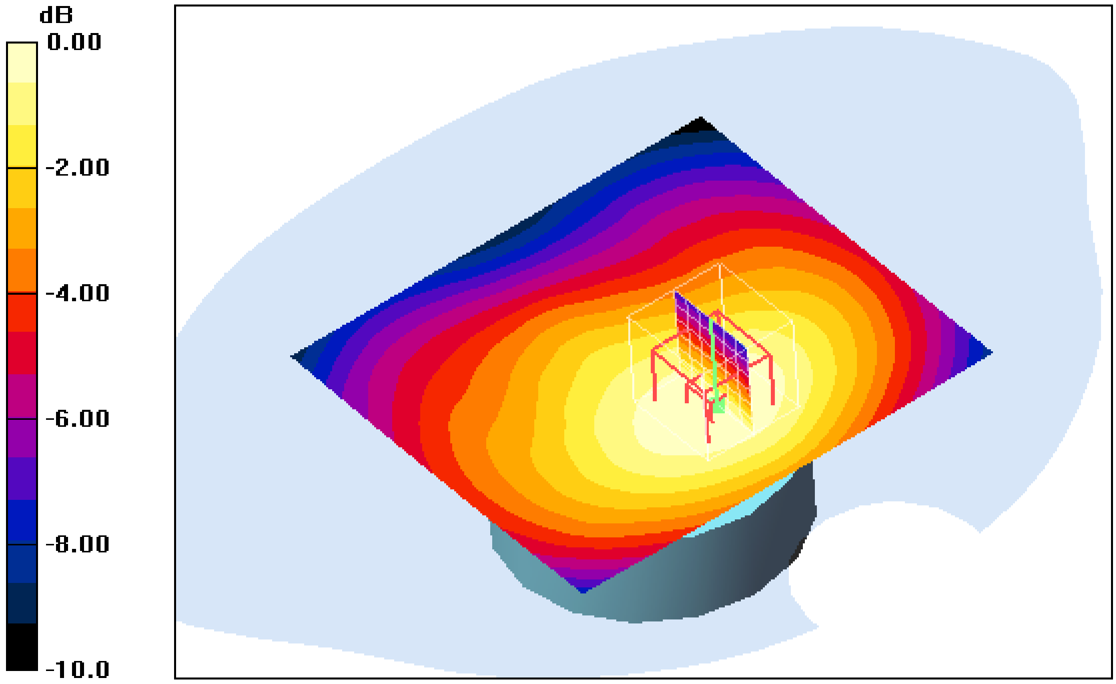
Communication System: GSM 850 GPRS 2TS; Frequency: 848.8 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 848.8 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - High/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.071 mW/g

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

Reference Value = 8.78 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.083 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.049 mW/g
Maximum value of SAR (measured) = 0.070 mW/g



0 dB = 0.070mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.3°C

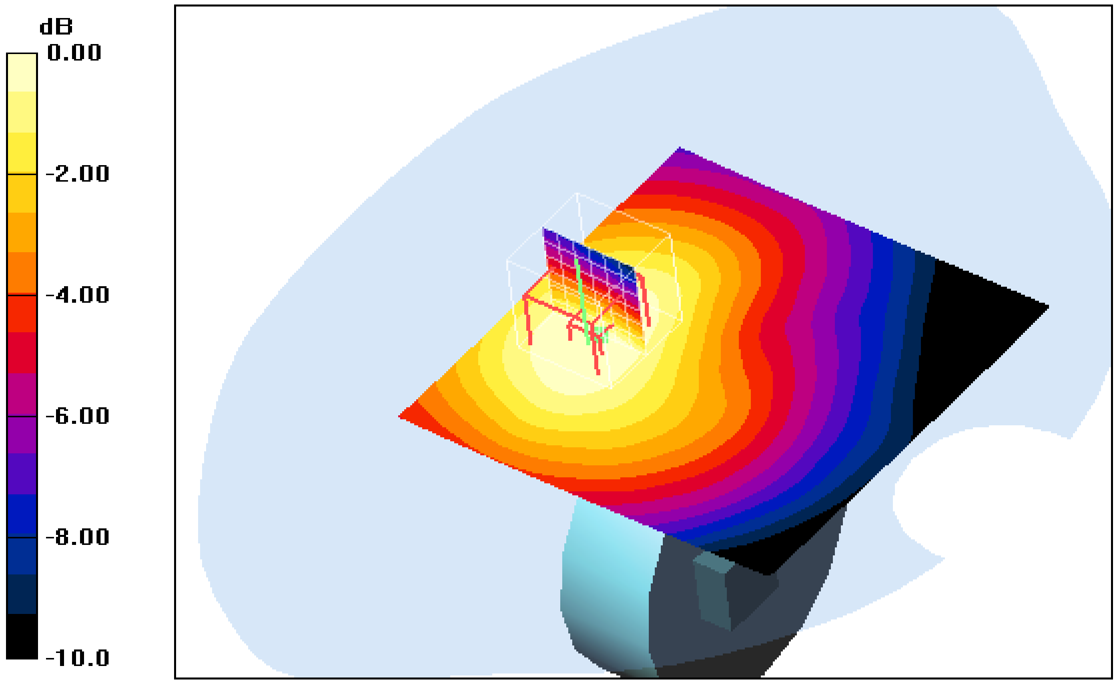
Date/Time: 25.01.2011 12:51:51Date/Time: 25.01.2011 13:00:15

IEEE1528_OET65-Body-GSM850 GPRS 2TS

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Medium: M850 Medium parameters used: f = 836.6 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Side position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.036 mW/g

Side position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.18 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 0.044 W/kg
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.034 mW/g



0 dB = 0.034mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.3°C

Annex B.2: GSM 1900MHz body

Date/Time: 24.01.2011 14:37:05Date/Time: 24.01.2011 14:46:26Date/Time: 24.01.2011 14:58:04

IEEE1528_OET65-Body-GSM1900 GPRS 2TS

DUT: Yanmar; Type: YSCRW01; Serial: 68

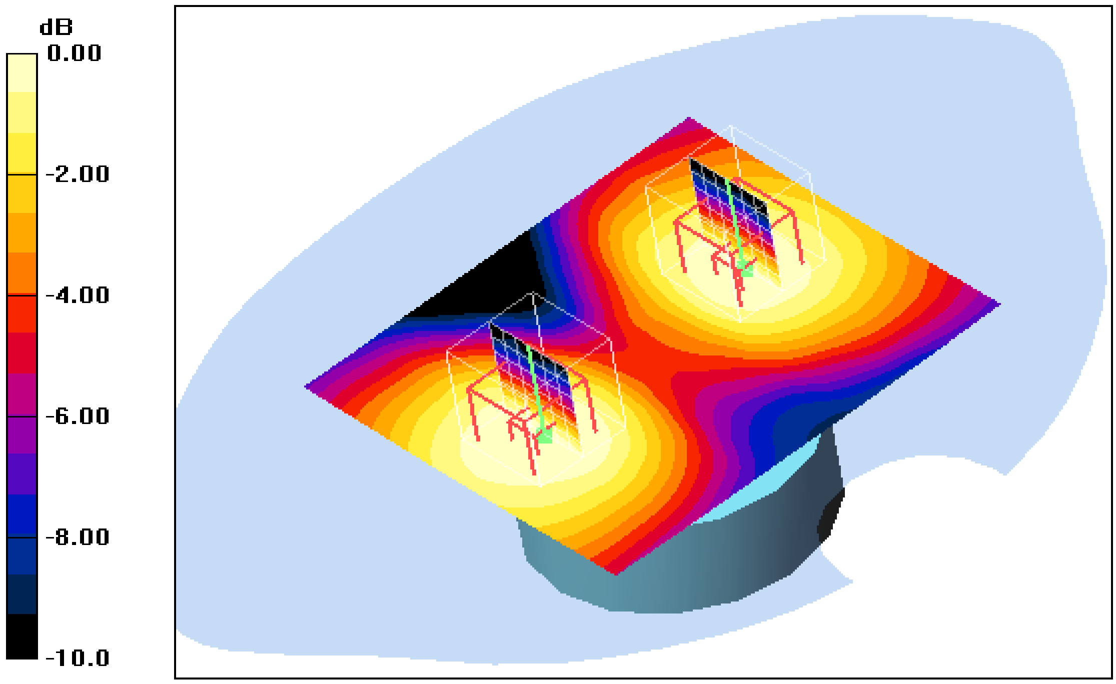
Communication System: GSM 1900 GPRS 2TS; Frequency: 1850.2 MHz; Duty Cycle: 1:4
Medium: M1900 Medium parameters used: f = 1850.2 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Low/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.038 mW/g

Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.30 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.048 W/kg
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.024 mW/g
Maximum value of SAR (measured) = 0.037 mW/g

Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.30 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.044 W/kg
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.022 mW/g
Maximum value of SAR (measured) = 0.035 mW/g



0 dB = 0.035mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.7°C; liquid temperature: 21.6°C

Date/Time: 24.01.2011 14:02:26Date/Time: 24.01.2011 14:11:48Date/Time: 24.01.2011 14:23:37

IEEE1528_OET65-Body-GSM1900 GPRS 2TS

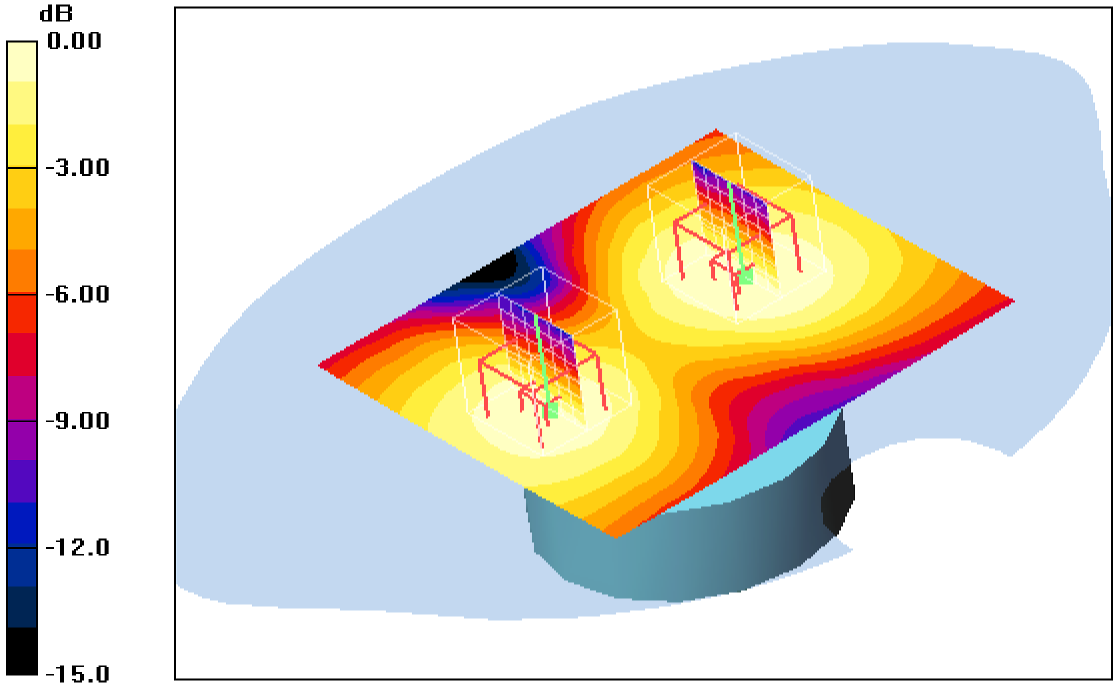
DUT: Yanmar; Type: YSCRW01; Serial: 68

Communication System: GSM 1900 GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Middle/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.040 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.34 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.051 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.039 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.34 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.037 mW/g



0 dB = 0.037mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.7°C; liquid temperature: 21.6°C

Date/Time: 24.01.2011 15:11:19Date/Time: 24.01.2011 15:20:38

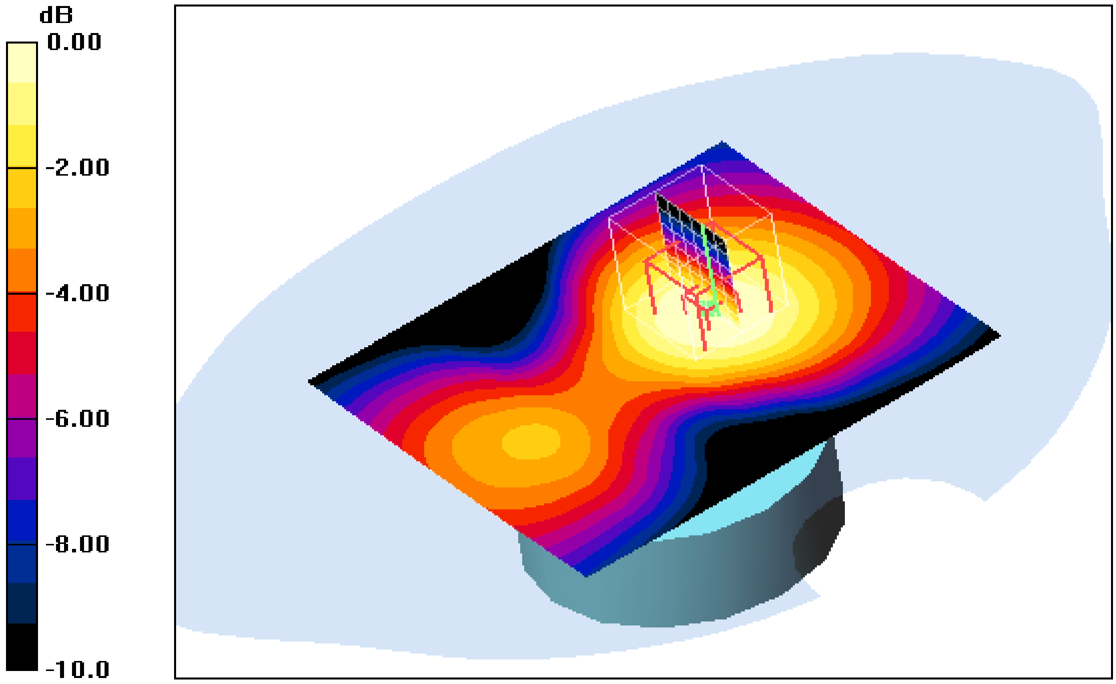
IEEE1528_OET65-Body-GSM1900 GPRS 2TS

DUT: Yanmar; Type: YSCRW01; Serial: 68

Communication System: GSM 1900 GPRS 2TS; Frequency: 1909.8 MHz; Duty Cycle: 1:4
Medium: M1900 Medium parameters used: f = 1909.8 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - High/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.063 mW/g

Top position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.88 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.079 W/kg
SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.062 mW/g



0 dB = 0.062mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.7°C; liquid temperature: 21.6°C

Date/Time: 24.01.2011 15:51:36Date/Time: 24.01.2011 16:00:07

IEEE1528_OET65-Body-GSM1900 GPRS 2TS

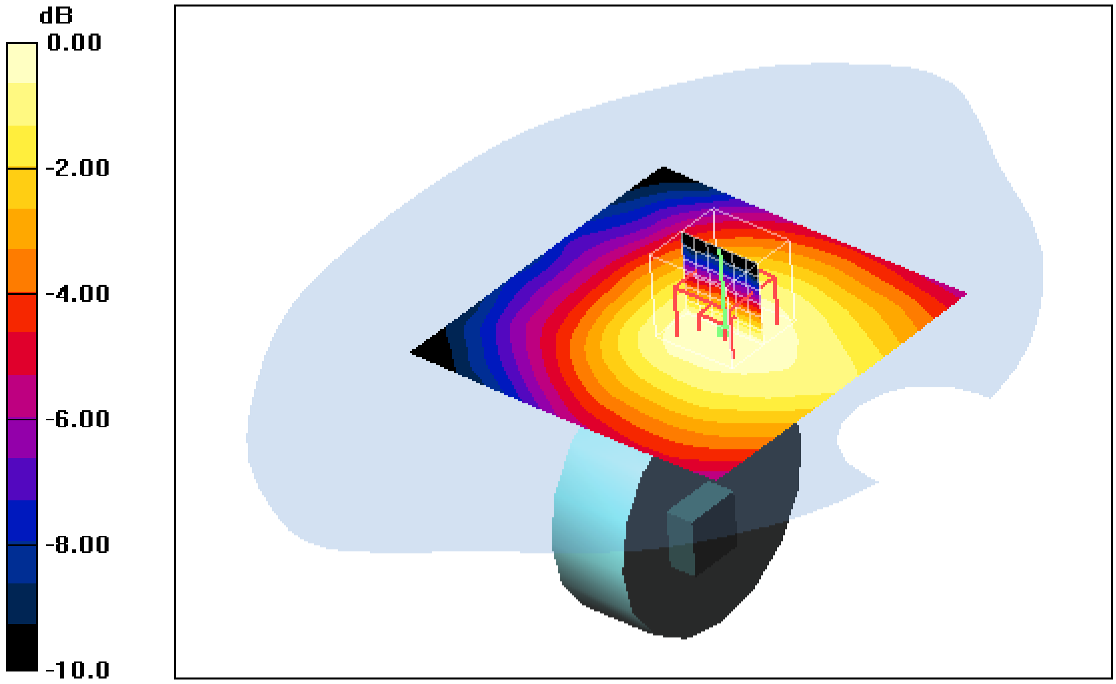
DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: GSM 1900 GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Side position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.030 mW/g

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

Reference Value = 4.76 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 0.038 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.019 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: 20 mm
ambient temperature: 22.7°C; liquid temperature: 21.6°C

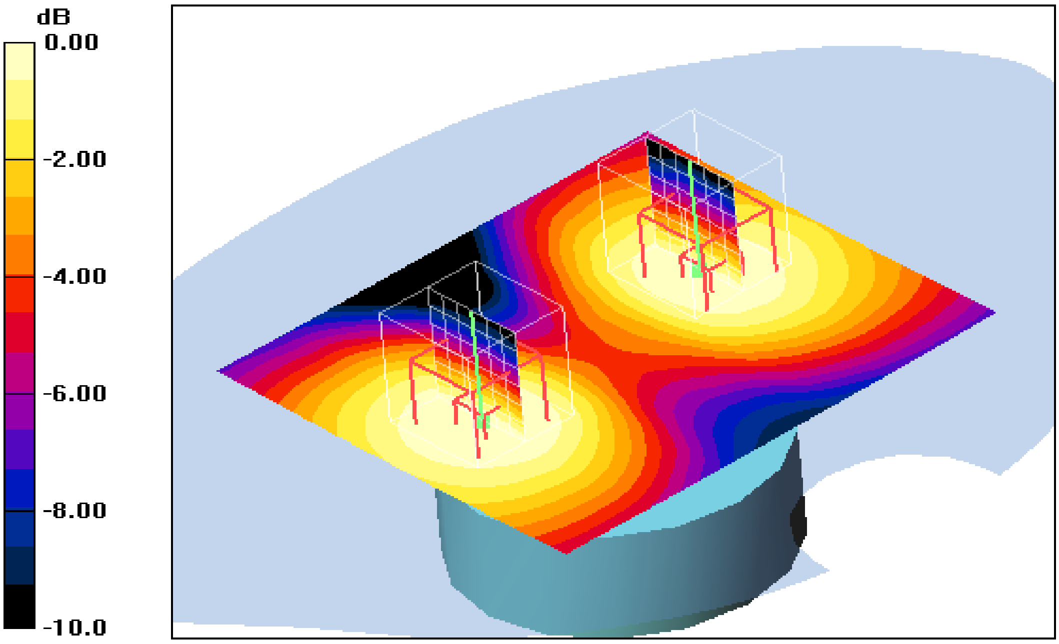
Annex B.3: WCDMA FFD II 1900MHz body

Date/Time: 24.01.2011 11:56:44Date/Time: 24.01.2011 12:06:07Date/Time: 24.01.2011 12:17:37

IEEE1528_OET65-Body-UMTS-FDD-II

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD II; Frequency: 1852.5 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used (interpolated): f = 1852.5 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Low/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.082 mW/g
Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.84 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 0.104 W/kg
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.081 mW/g
Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.84 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 0.095 W/kg
SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.049 mW/g
Maximum value of SAR (measured) = 0.075 mW/g



0 dB = 0.075mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.4°C; liquid temperature: 21.7°C

Date/Time: 24.01.2011 10:18:01Date/Time: 24.01.2011 10:26:27Date/Time: 24.01.2011 10:37:53

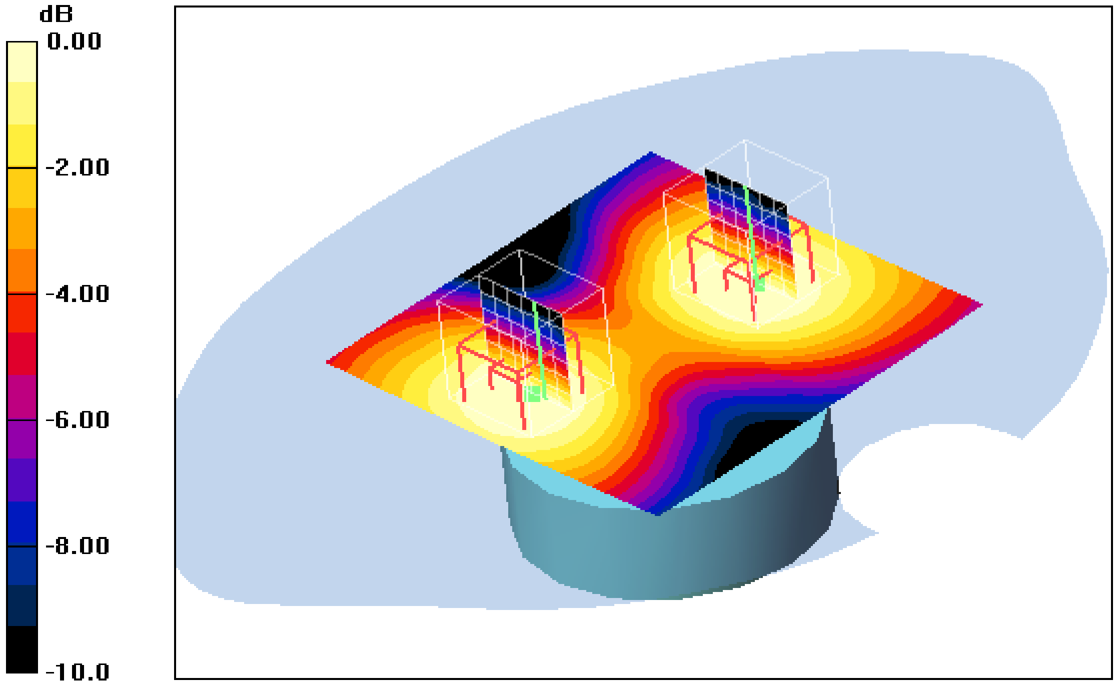
IEEE1528_OET65-Body-UMTS-FDD-II

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD II; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.063 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.84 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 0.078 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.038 mW/g
Maximum value of SAR (measured) = 0.062 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.84 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 0.079 W/kg
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.037 mW/g
Maximum value of SAR (measured) = 0.060 mW/g



0 dB = 0.060mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.4°C; liquid temperature: 21.7°C

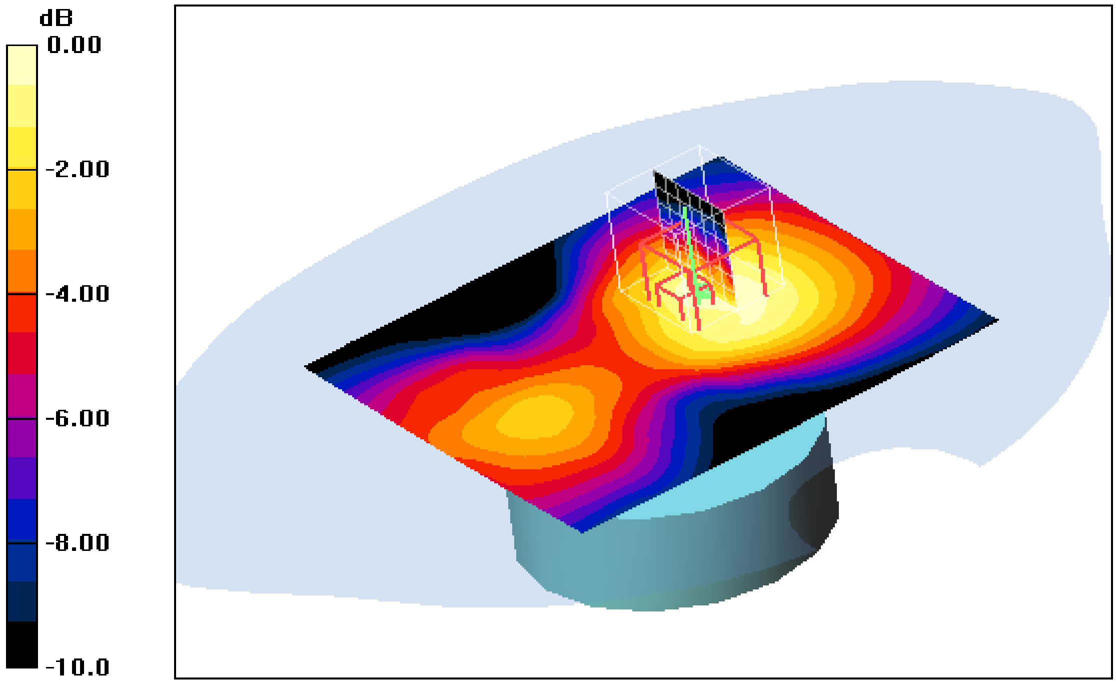
Date/Time: 24.01.2011 12:42:43Date/Time: 24.01.2011 12:52:40

IEEE1528_OET65-Body-UMTS-FDD-II

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD II; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.56 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - High/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.078 mW/g

Top position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.48 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 0.103 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.044 mW/g
Maximum value of SAR (measured) = 0.079 mW/g



0 dB = 0.079mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.4°C; liquid temperature: 21.7°C

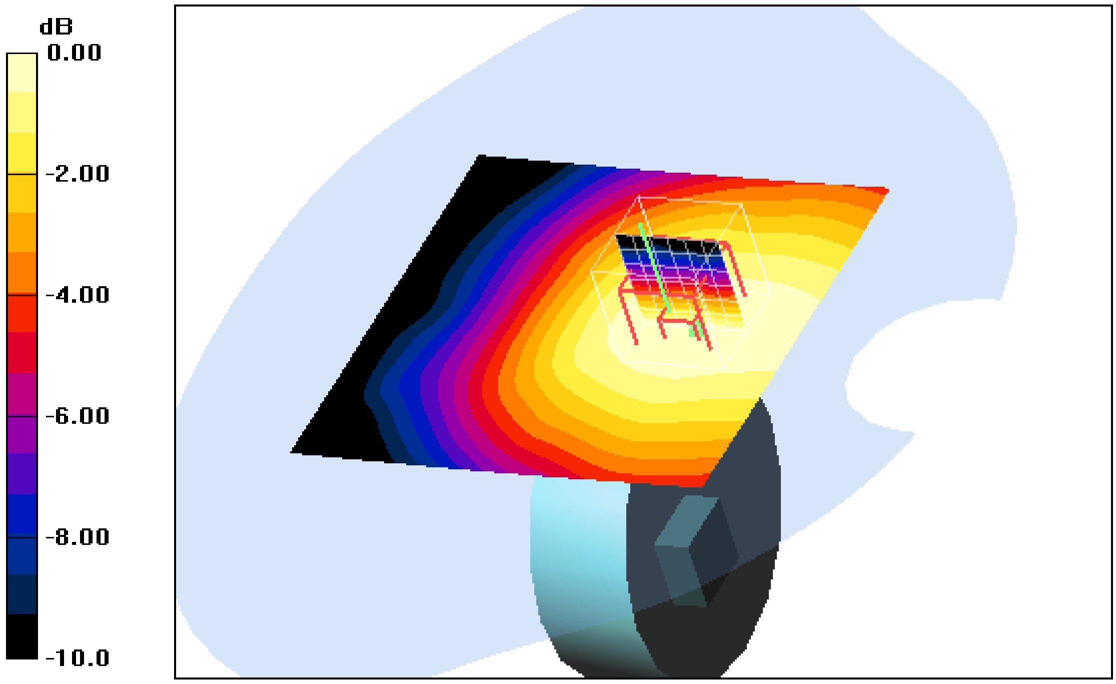
Date/Time: 24.01.2011 11:01:26Date/Time: 24.01.2011 11:09:57

IEEE1528_OET65-Body-UMTS-FDD-II

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD II; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: M1900 Medium parameters used: f = 1880 MHz; $\sigma = 1.56$ mho/m; $\varepsilon_r = 53.3$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.35, 4.35, 4.35); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Side position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.052 mW/g

Side position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.25 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 0.068 W/kg
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.052 mW/g



0 dB = 0.052mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.4°C; liquid temperature: 21.7°C

Annex B.4: WCDMA FDD V 850MHz body

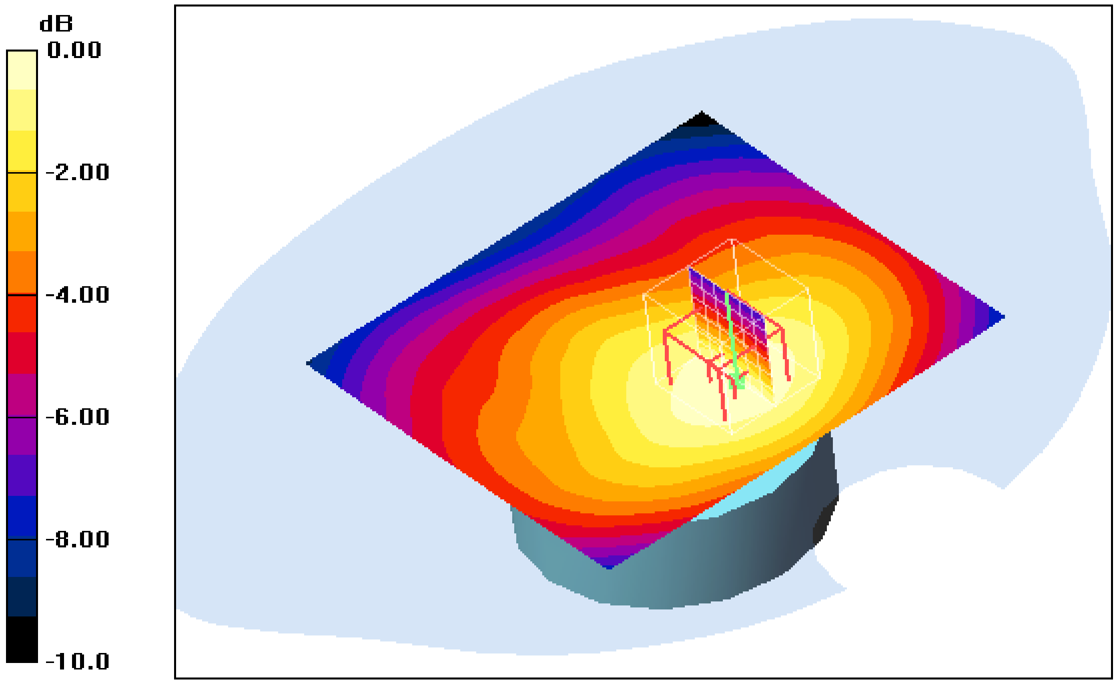
Date/Time: 25.01.2011 17:00:38Date/Time: 25.01.2011 17:09:59

IEEE1528_OET65-Body-UMTS-FDD-V

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD V; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Low/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.051 mW/g

Top position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.48 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 0.062 W/kg
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.035 mW/g
Maximum value of SAR (measured) = 0.051 mW/g



0 dB = 0.051mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.1°C

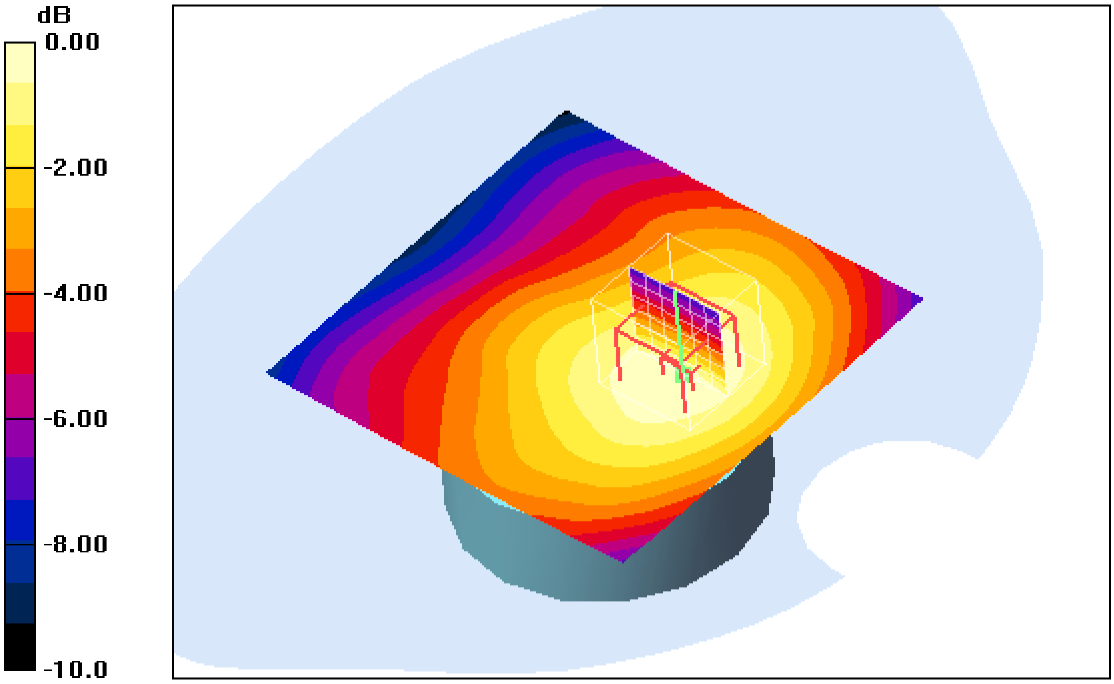
Date/Time: 25.01.2011 16:38:45Date/Time: 25.01.2011 16:47:11

IEEE1528_OET65-Body-UMTS-FDD-V

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD V; Frequency: 836.4 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.070 mW/g

Top position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.80 V/m; Power Drift = 0.052 dB
Peak SAR (extrapolated) = 0.086 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.049 mW/g
Maximum value of SAR (measured) = 0.070 mW/g



0 dB = 0.070mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.1°C

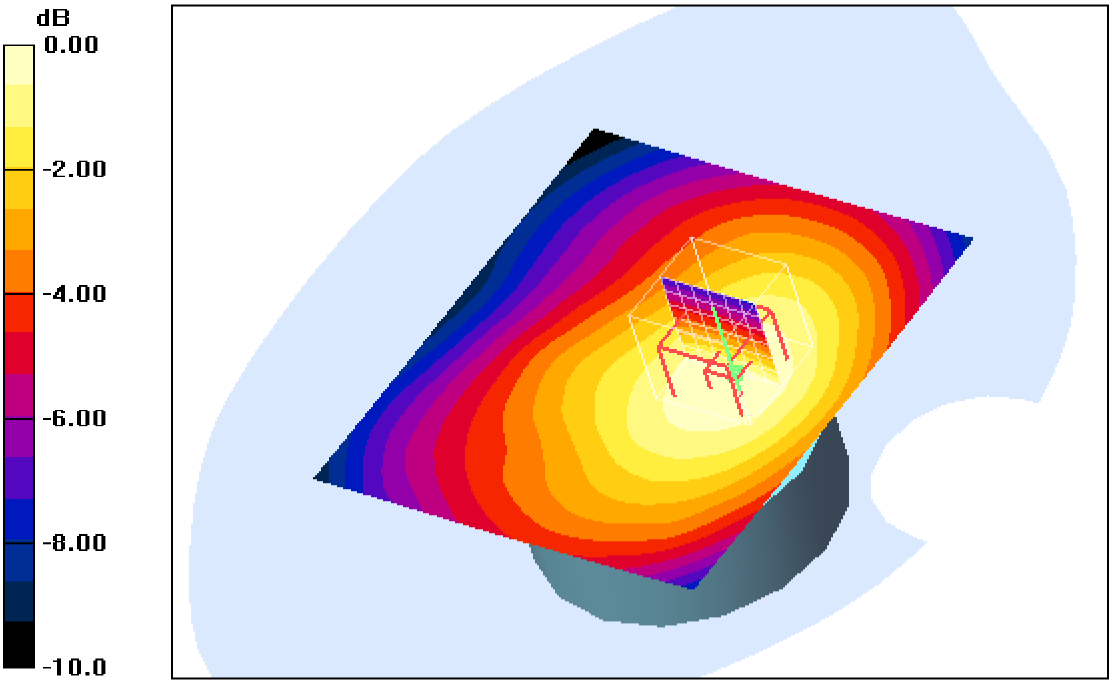
Date/Time: 25.01.2011 17:23:33Date/Time: 25.01.2011 17:32:54

IEEE1528_OET65-Body-UMTS-FDD-V

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD V; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Top position - High/Area Scan (81x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.075 mW/g

Top position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.20 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.090 W/kg
SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.052 mW/g
Maximum value of SAR (measured) = 0.075 mW/g



0 dB = 0.075mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.1°C

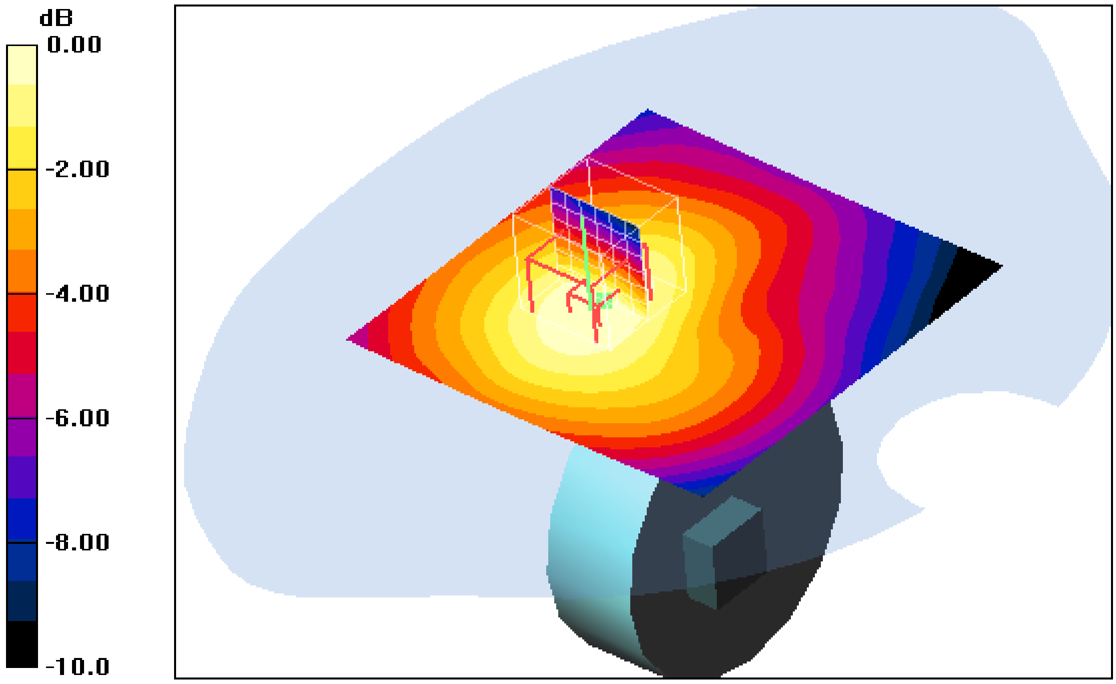
Date/Time: 25.01.2011 17:55:01Date/Time: 25.01.2011 18:03:28

IEEE1528_OET65-Body-UMTS-FDD-V

DUT: Yanmar; Type: YSCRW01; Serial: 68
Communication System: WCDMA FDD V; Frequency: 836.4 MHz; Duty Cycle: 1:1
Medium: M850 Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.96 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(5.85, 5.85, 5.85); Calibrated: 11.08.2010
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn477; Calibrated: 07.05.2010
- Phantom: SAM 12; Type: SAM; Serial: 1043
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Side position - Middle/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.039 mW/g

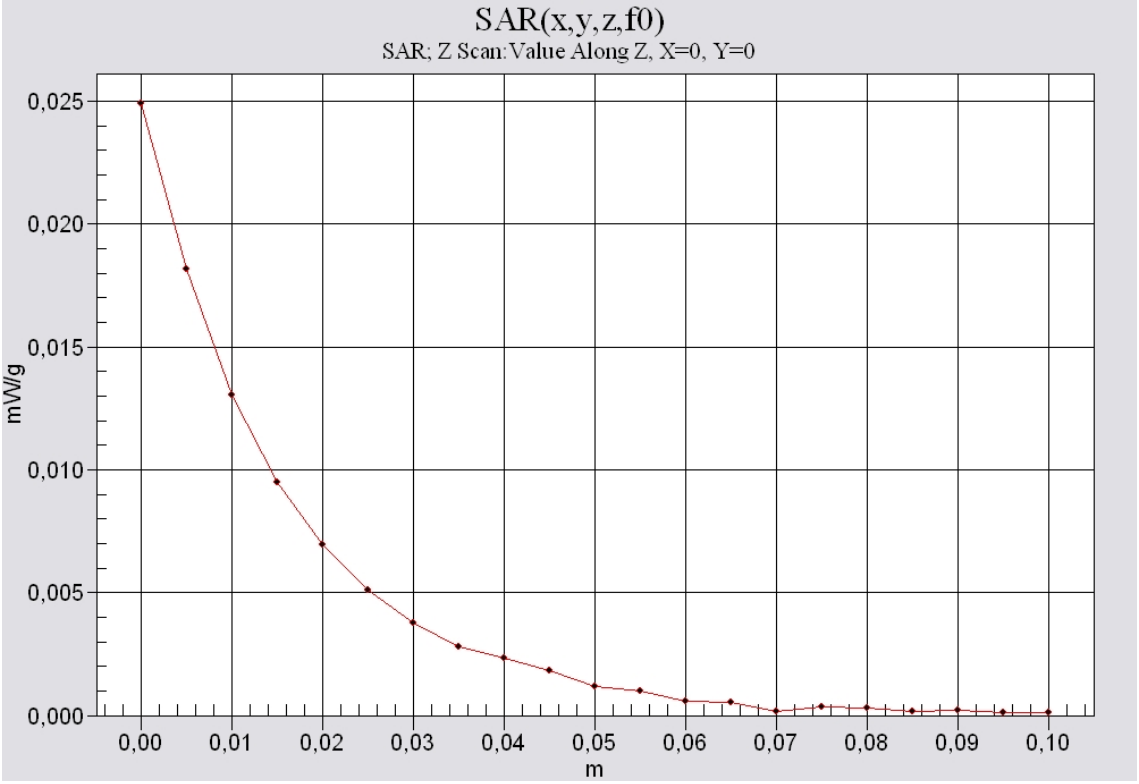
Side position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.70 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 0.050 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.027 mW/g
Maximum value of SAR (measured) = 0.039 mW/g



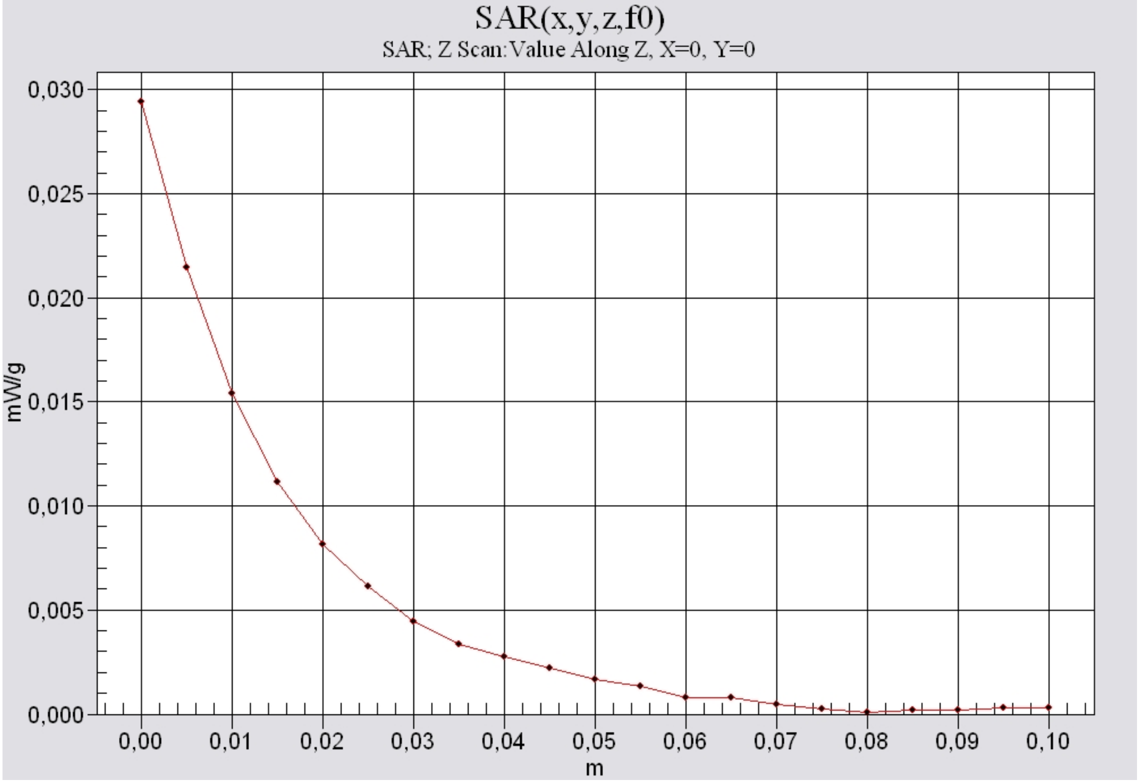
0 dB = 0.039mW/g

Additional information:
position or distance of DUT to SAM: 20 mm
ambient temperature: 22.5°C; liquid temperature: 22.1°C

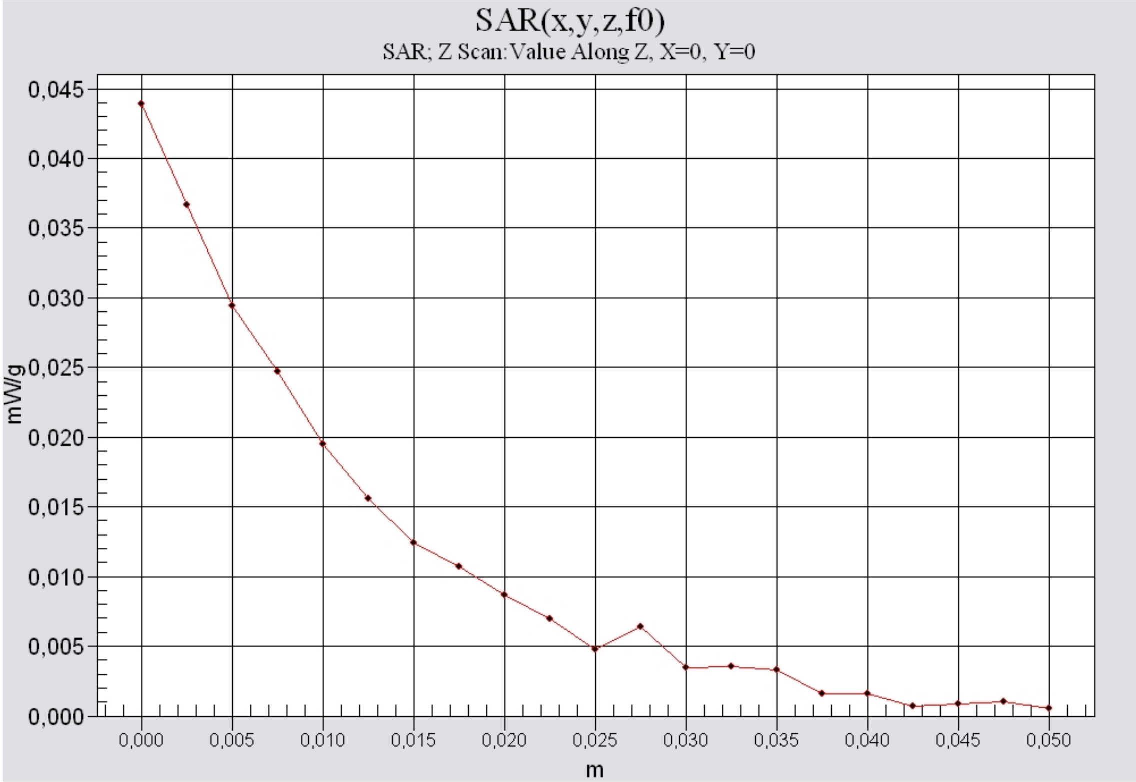
Annex B.5: Z-axis scan



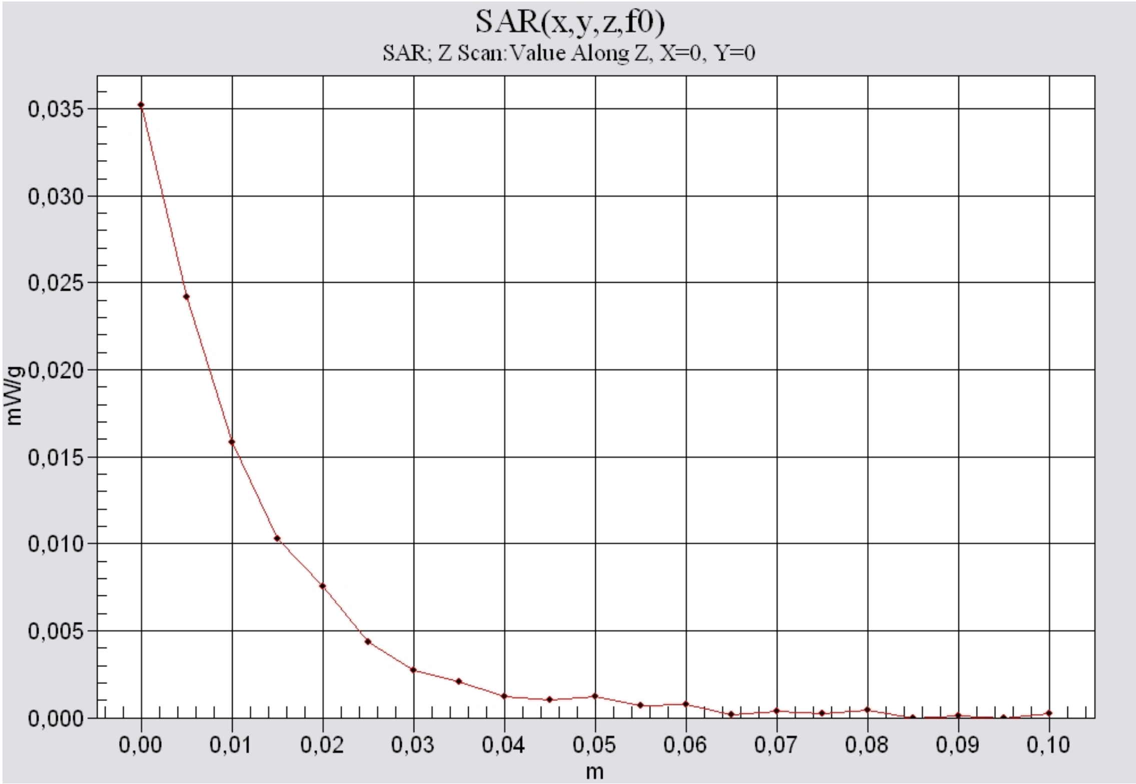
GSM 850 body



WCDMA FDD V 850 body



GSM 1900 body



WCDMA FDD II 1900 body

Annex B.6: Liquid depth

Photo 1: Liquid depth 850 MHz body simulating liquid

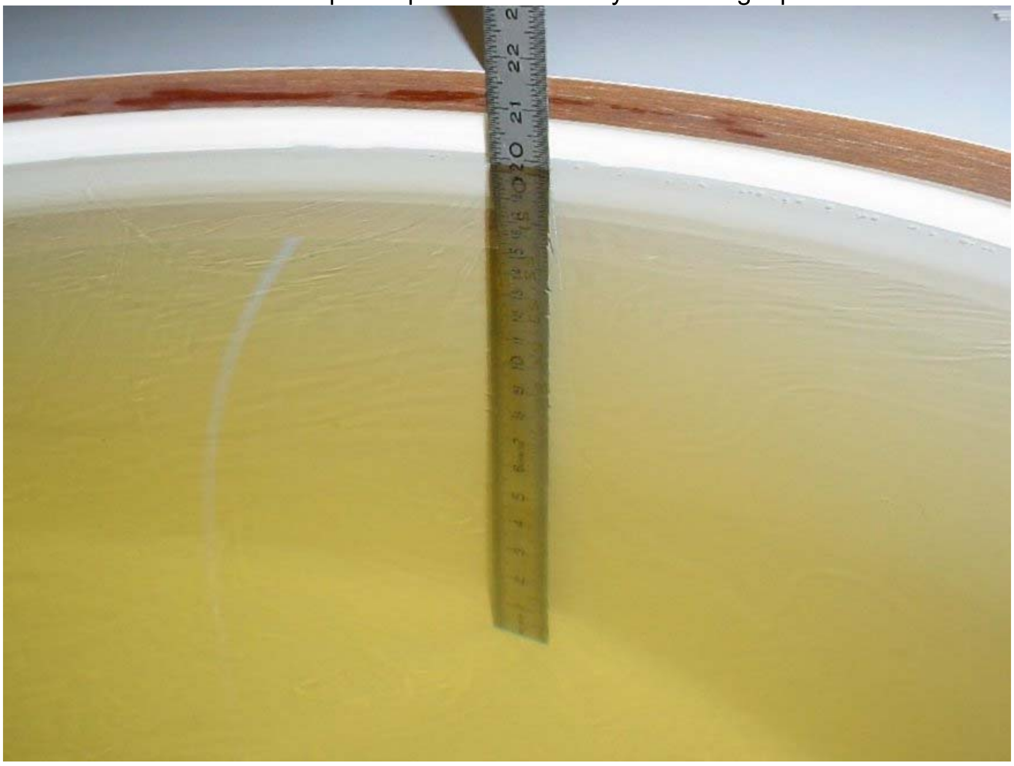
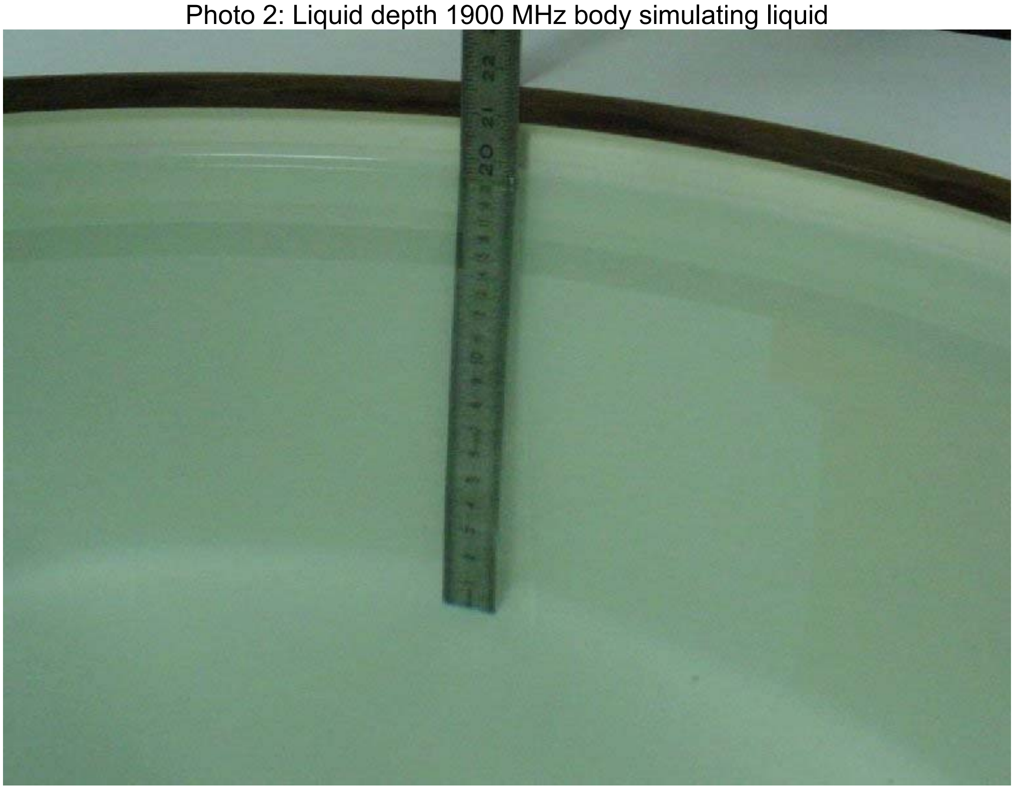


Photo 2: Liquid depth 1900 MHz body simulating liquid



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

1. COMPANY NUMBER: 9461A

2. MODEL NUMBER: YSCRW01

3. MANUFACTURER: **Yanmar Co., Ltd.**

4. TYPE OF EVALUATION:

SAR Evaluation: Body-worn Device

- Multiple transmitters: Yes ☐ No ☒
- Evaluated against exposure limits: General Public Use ☒ Controlled Use ☐
- Duty cycle used in evaluation: 100 %
- Standard used for evaluation: RSS-102 Issue 4 (2010-03)
- SAR value: **0.076 W/kg**. Measured ☒ Computed ☐ Calculated ☐

Annex D.7: 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: Date: **2011-02-10**

NAME : **Bernd Rebmann**

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. 1-1928-38-08/10-A
Calibration data, Phantom certificate
and detail information of the DASY4 System

Annex F: Document History

Version	Applied Changes	Date of Release
	Initial Release	2011-02-10

Annex G: Further Information

Glossary

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
N/A	-	not applicable
SAR	-	Specific Absorption Rate
S/N	-	Serial Number
SW	-	Software