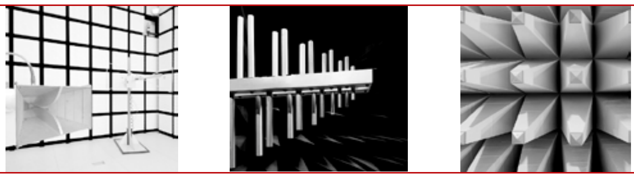

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TEST REPORT

Test Report No.: 1-5831/13-02-02

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

Testing Laboratory

CETECOM ICT Services GmbH
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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

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22188 Lund/SWEDEN

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Manufacturer

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund/SWEDEN

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:	Tablet PC	
Device type:	portable device	
Data storage:	16 GB	32 GB
Model name:	**TS-0000-BV (tested)**	**TS-0000-CV**
FCC-ID:	PY7TS-0000	PY7TS-0000
IC:	4170B-TS0000	4170B-TS0000
Commercial name:	SGP311	SGP312
S/N serial number:	CB5A1N1KP1/ CB5A1N1KX8 (conducted)	
Hardware status:	Pollux Windy AP1	
Software status:	s_atp_pollux_windy_0_0_32_3_g_wlan	
Frequency:	see technical details	
Antenna:	integrated antenna	
Battery option:	Embedded battery	
Accessories:	Stereo headset	
Test sample status:	identical prototype	
Exposure category:	general population / uncontrolled environment	

Test Report authorised:

2013-01-29 Thomas Vogler
Senior Testing Manager

Test performed:

2013-01-29 Oleksandr Hnatovskiy
Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2013-01-10
Date of receipt of test item:	2013-01-18
Start of test:	2013-01-21
End of test:	2013-01-28
Person(s) present during the test:	

2.3 Statement of compliance

The SAR values found for the TS-0000-BV Tablet PC 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.

2.4 Technical details

Band tested for this test report	Technology	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	Test channel low	Test channel middle	Test channel high	Maximum output power/dBm)*
☐	WLAN	2412	2472	2412	2472	CCK OFDM	--	max	1	7	13	11.4
☒	WLAN US	2412	2462	2412	2462	CCK OFDM	--	max	1	6	11	11.4
☒	WLAN	5180	5240	5180	5240	OFDM	--	max	--	44	--	10.6
☒	WLAN	5260	5320	5260	5320	OFDM	--	max	--	60	--	10.7
☒	WLAN	5500	5700	5500	5700	OFDM	--	max	--	--	140	7.6
☒	WLAN	5745	5825	5745	5825	OFDM	--	max	--	--	161	10.4
☐	BT	2402	2480	2402	2480	GFSK	3	max	0	39	78	9.8

)*: measured averaged max. power for WLAN and BT.

3 Test standards/ procedures references

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	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:

KDB 865664D01v01	October 24, 2012	FCC OET SAR measurement requirements 100 MHz to 6 GHz
KDB 865664D02v01	October 24, 2012	RF Exposure Compliance Reporting and Documentation Considerations
KDB 447498D01v05	October 24, 2012	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
KDB 248227D01v01	May, 2007	SAR Measurement Procedures for 802.11 a/b/g Transmitters
KDB 450824D01v01	January, 2007	SAR Probe Calibration and System Verification considerations for measurements from 150 MHz to 3 GHz
KDB 450824D01v01	March 4, 2012	Dipole Requirements for SAR System Validation and Verification
KDB 616217D04v01	October 24, 2012	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers

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 reported for 1g (W/kg)			
	PCE	**DTS**	**UNII**
body 0 mm distance	**---**	**1.267**	**0.737**

4.1 SAR measurement variability and measurement uncertainty analysis

This analysis is required for worst case results larger than 0.8 W/kg.

frequency band	highest measurement result at worst case position	second measurement result at worst case position	ratio
WLAN 2.4 GHz	1.030	1.030	0
WLAN 5 GHz	0.720	---	---

5 Test Environment

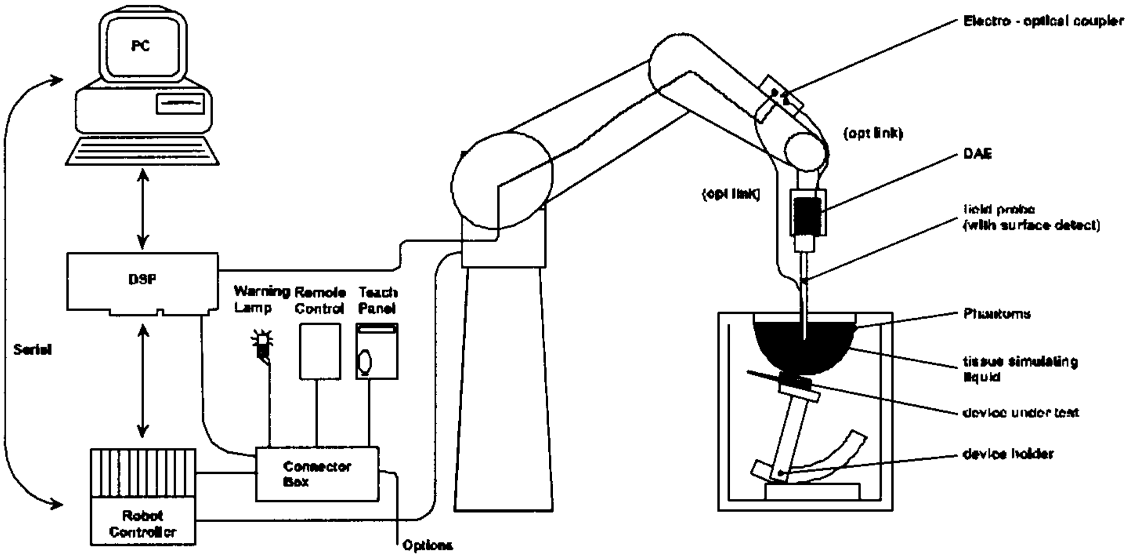
Ambient temperature:	20 – 24 °C
Tissue Simulating liquid:	20 – 24 °C
Relative humidity content:	40 – 50 %
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

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 DASY 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 DASY measurement server.
- The DASY 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 or Windows 7.
- DASY 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 check dipoles allowing to validate the proper functioning of the system.

6.1.2 Test environment

The DASY 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.

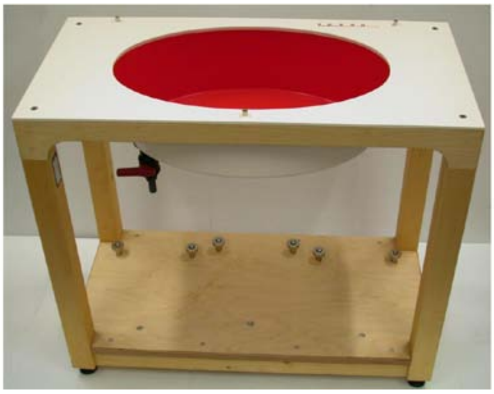
6.1.3 Probe description

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 ELI4 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.



The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI4 is fully compatible with the standard IEC 62209-2 and all known tissue simulating liquids.

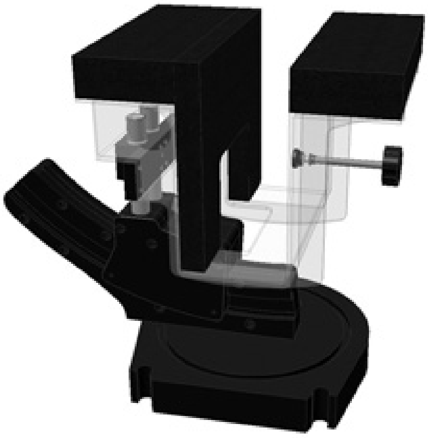
6.1.5 Device holder description

The DASY 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 the device holder without the extension kit described below.

6.1.6 Laptop Extension Kit for Device holder

SPEAG released a simple but effective extension for their Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc).



The extension is lightweight and made of POM, PET-G acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner.

6.1.7 Scanning procedure

- The DASY installation includes predefined files with recommended procedures for measurements and system check. 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 DASY 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. DASY 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.

6.1.8 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 neighbouring volumes are evaluated until no neighbouring 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

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

6.1.9 Data Storage and Evaluation

Data Storage

The DASY 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", ".DA5x". 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 DASY 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

6.1.10 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	☐ 750	☐ 835	☐ 900	☐ 1450	☐ 1800	☐ 1900	☒ 2450	☒ 5000
Tissue Type	Body	Body	Body	Body	Body	Body	Body	Body	Body
Water	51.16	51.7	52.4	56.0	70.97	69.91	69.91	73.2	64 - 78
Salt (NaCl)	1.49	0.9	1.40	0.76	0.43	0.13	0.13	0.04	2 - 3
Sugar	46.78	47.2	45.0	41.76	0.0	0.0	0.0	0.0	0.0
HEC	0.52	0.0	1.0	1.21	0.0	0.0	0.0	0.0	0.0
Bactericide	0.05	0.1	0.1	0.27	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	0.0	0.0	28.60	29.96	29.96	26.7	0.0
Emulsifiers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9 - 15
Mineral Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11 - 18

Table 2: Body tissue dielectric properties

Salt: 99+% Pure Sodium Chloride
Water: De-ionized, 16MΩ+ resistivity
Sugar: 98+% Pure Sucrose
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.

6.1.11 Tissue simulating liquids: parameters

Liquid **MSL**	Freq. (MHz)	Target body tissue		Measurement body tissue				Measurement date
		Permittivity	Conductivity [S/m]	Permittivity	Dif. %	Conductivity [S/m]	Dif. %	
2450	2412	52.7	1.95	51.7	-1.9%	1.96	0.5%	2013-01-22
	2437	52.7	1.95	51.6	-2.1%	1.98	1.5%	2013-01-22
	2450	52.7	1.95	51.5	-2.3%	1.99	2.1%	2013-01-22
	2462	52.7	1.95	51.5	-2.3%	2.01	3.1%	2013-01-22
	2472	52.7	1.95	51.5	-2.3%	2.02	3.6%	2013-01-22
5GHz	5200	49.0	5.30	48.0	-2.0%	5.34	0.8%	2013-01-28
	5220	49.0	5.30	48.0	-2.1%	5.38	1.4%	2013-01-28
	5300	49.0	5.30	47.8	-2.5%	5.46	3.0%	2013-01-28
	5500	48.6	5.65	47.3	-2.7%	5.71	1.1%	2013-01-28
	5700	48.2	6.00	46.9	-2.7%	5.97	-0.5%	2013-01-28
	5805	48.2	6.00	46.7	-3.2%	6.12	2.0%	2013-01-28

Table 3: Parameter of the body tissue simulating liquid
Note: The dielectric properties have been measured using the contact probe method at 22°C.

6.1.12 Measurement uncertainty evaluation for SAR test

Relative DASY5 Uncertainty Budget for SAR Tests								
According to IEEE 1528/2011 and IEC62209/2011 (0.3-3GHz range)								
Error Description	Uncertainty Value	Probability Distribution	Divisor	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 %	∞
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 %	∞
Modulation Response	± 2.4 %	Rectangular	√ 3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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 noise	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 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	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
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	± 6.1 %	Rectangular	√ 3	1	1	± 3.5 %	± 3.5 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√ 3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√ 3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√ 3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√ 3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 11.3 %	± 11.3 %	330
Expanded Std. Uncertainty						± **22.7** %	± **22.5** %	

Table 4: Measurement uncertainties
Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528/2011
and IEC 62209-1/2011 draft standards. The budget is valid for the frequency range 300MHz -3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests								
according to IEEE 1528/2003, IEC 62209-1 for the 3-6 GHz range								
Error Description	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
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 %	∞
Boundary effects	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
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	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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 noise	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
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.)	± 5.0 %	Rectangular	√ 3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid permittivity (target)	± 5.0 %	Rectangular	√ 3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√ 3	0.6	0.49	± 1.7 %	± 1.4 %	∞
Combined Uncertainty						± 12.1 %	± 11.9 %	330
Expanded Std. Uncertainty						± **24.3** %	± **23.8** %	

Table 5: Measurement uncertainties
Worst-Case uncertainty budget for DASY5 valid for 3G communication signals and frequency range 3 - 6 GHz. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests								
According to IEEE 1528/2011 and IEC62209-1/2011 (3-6GHz range)								
Error Description	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
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 %	∞
Boundary effects	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
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 %	∞
Modulation Response	± 2.4 %	Rectangular	√ 3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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 noise	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
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	± 6.6 %	Rectangular	√ 3	1	1	± 3.8 %	± 3.8 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√ 3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√ 3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√ 3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√ 3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 12.4 %	± 12.4 %	330
Expanded Std. Uncertainty						± **24.9** %	± **24.8** %	

Table 6: Measurement uncertainties
Worst-Case uncertainty budget for DASY5 assessed according to IEEE 1528/2011
and IEC 62209-1/2011 draft standards. The budget is valid for the frequency range 3GHz -6GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

Relative DASY5 Uncertainty Budget for SAR Tests								
According to IEC62209-2/2010 (30 MHz - 6 GHz range)								
Error Description	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
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 %	∞
Boundary effects	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
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 %	∞
Modulation Response	± 2.4 %	Rectangular	√ 3	1	1	± 1.4 %	± 1.4 %	∞
Readout electronics	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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 noise	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
RF ambient reflections	± 3.0 %	Rectangular	√ 3	1	1	± 1.7 %	± 1.7 %	∞
Probe positioner	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Post-processing	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
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	± 7.9 %	Rectangular	√ 3	1	1	± 4.6 %	± 4.6 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Rectangular	√ 3	0.78	0.71	± 2.3 %	± 2.0 %	∞
Liquid permittivity (meas.)	± 5.0 %	Rectangular	√ 3	0.26	0.26	± 0.8 %	± 0.8 %	∞
Temp. Unc. - Conductivity	± 3.4 %	Rectangular	√ 3	0.78	0.71	± 1.5 %	± 1.4 %	∞
Temp. Unc. - Permittivity	± 0.4 %	Rectangular	√ 3	0.23	0.26	± 0.1 %	± 0.1 %	∞
Combined Uncertainty						± 12.7 %	± 12.6 %	330
Expanded Std. Uncertainty						± **25.4** %	± **25.3** %	

Table 7: Measurement uncertainties. Worst-Case uncertainty budget for DASY5 assessed according to according to IEC 62209-2/2010 standard. The budget is valid for the frequency range 30MHz - 6 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerable smaller.

6.1.13 Measurement uncertainty evaluation for System Check

Uncertainty of a System Performance Check with DASY5 System for the 0.3 - 3 GHz range								
Source of uncertainty	Uncertainty Value	Probability Distribution	Divisor	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 %	± 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	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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								
Dev. of experimental dipole	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Source to liquid distance	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
Power drift	± 3.4 %	Rectangular	√ 3	1	1	± 2.0 %	± 2.0 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Normal	1	0.78	0.71	± 3.9 %	± 3.6 %	∞
Liquid permittivity (meas.)	± 5.0 %	Normal	1	0.26	0.26	± 1.3 %	± 1.3 %	∞
Temp. unc. - Conductivity	± 1.7 %	Rectangular	√ 3	0.78	0.71	± 0.8 %	± 0.7 %	∞
Temp. unc. - Permittivity	± 0.3 %	Rectangular	√ 3	0.23	0.26	± 0.0 %	± 0.0 %	∞
Combined Uncertainty						± 9.1 %	± 8.9 %	330
Expanded Std. Uncertainty						± **18.2** %	± **17.9** %	

Table 8: Measurement uncertainties of the System Check with DASY5 (0.3-3GHz)

Uncertainty of a System Performance Check with DASY5 System for the 3 - 6 GHz range								
Source of uncertainty	Uncertainty Value	Probability Distribution	Divisor	c_i (1g)	c_i (10g)	Standard Uncertainty ± %, (1g)	Standard Uncertainty ± %, (10g)	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 6.6 %	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
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 %	± 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	± 0.3 %	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
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	± 0.8 %	Rectangular	√ 3	1	1	± 0.5 %	± 0.5 %	∞
Probe positioning	± 6.7 %	Rectangular	√ 3	1	1	± 3.9 %	± 3.9 %	∞
Max. SAR evaluation	± 1.0 %	Rectangular	√ 3	1	1	± 0.6 %	± 0.6 %	∞
Test Sample Related								
Dev. of experimental dipole	± 0.0 %	Rectangular	√ 3	1	1	± 0.0 %	± 0.0 %	∞
Source to liquid distance	± 2.0 %	Rectangular	√ 3	1	1	± 1.2 %	± 1.2 %	∞
Power drift	± 3.4 %	Rectangular	√ 3	1	1	± 2.0 %	± 2.0 %	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0 %	Rectangular	√ 3	1	1	± 2.3 %	± 2.3 %	∞
SAR correction	± 1.9 %	Rectangular	√ 3	1	0.84	± 1.1 %	± 0.9 %	∞
Liquid conductivity (meas.)	± 5.0 %	Normal	1	0.78	0.71	± 3.9 %	± 3.6 %	∞
Liquid permittivity (meas.)	± 5.0 %	Normal	1	0.26	0.26	± 1.3 %	± 1.3 %	∞
Temp. unc. - Conductivity	± 1.7 %	Rectangular	√ 3	0.78	0.71	± 0.8 %	± 0.7 %	∞
Temp. unc. - Permittivity	± 0.3 %	Rectangular	√ 3	0.23	0.26	± 0.0 %	± 0.0 %	∞
Combined Uncertainty						± 10.1 %	± 10.0 %	330
Expanded Std. Uncertainty						± **20.2** %	± **19.9** %	

Table 9: Measurement uncertainties of the System Check with DASY5 (3-6GHz)

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

6.1.14 System check

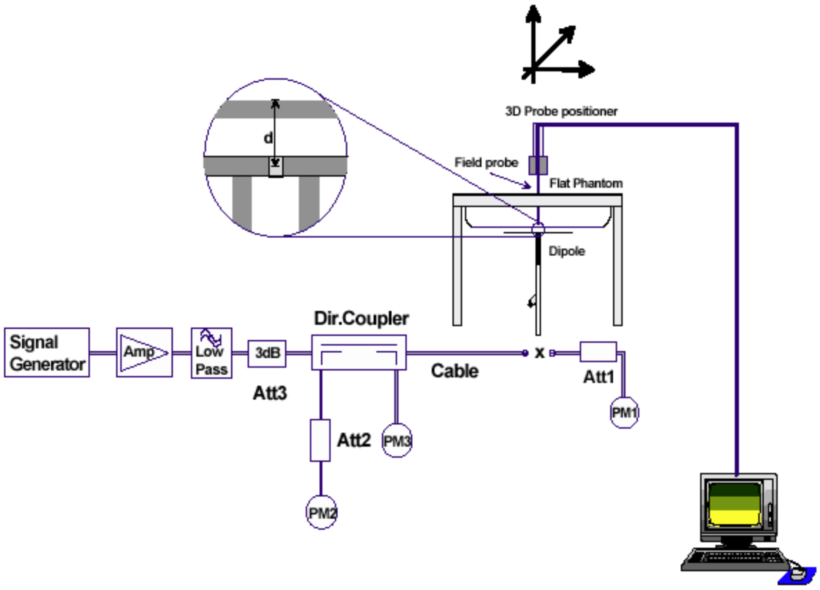
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE 1528. The following table shows system check results for all frequency bands and tissue liquids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

System performance check (1000 mW)								
System validation Kit	Frequency	Target SAR_{1g} (+/- 10%)	Target SAR_{10g} (+/- 10%)	Measured SAR_{1g} mW/g	SAR_{1g} dev. %	Measured SAR_{10g} mW/g	SAR_{10g} dev. %	Measured date
D2450V2 S/N: 710	2450 MHz body	51.2	23.9	54.4	6.3%	23.9	0.0%	2013-01-22
D5GHzV2 S/N: 1055	5200 MHz body	73.4	20.7	74.3	1.2%	21.1	1.9%	2013-01-28
D5GHzV2 S/N: 1055	5500 MHz body	78.4	21.7	78.6	0.3%	22.2	2.3%	2013-01-28
D5GHzV2 S/N: 1055	5800 MHz body	74.0	20.4	73.9	-0.1%	20.8	2.0%	2013-01-28

Table 10: Results system check

6.1.15 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 for frequencies below 2 GHz or 100 mW for frequencies above 2 GHz. 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

For the measurements a Rohde & Schwarz Power Meter NRP 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.

7.1.1 Conducted power measurements WLAN 2.4 GHz

Channel / frequency	modulation	bit rate	time based avg. power
1 / 2412 MHz	CCK	1 MBit/s	**11.1dBm**
6 / 2437 MHz	CCK	1 MBit/s	**11.4dBm**
11 / 2462 MHz	CCK	1 MBit/s	**11.2dBm**
13 / 2472 MHz	CCK	1 MBit/s	**11.0dBm**
1 / 2412 MHz	OFDM	6 MBit/s	10.0dBm
6 / 2437 MHz	OFDM	6 MBit/s	10.5dBm
11 / 2462 MHz	OFDM	6 MBit/s	10.9dBm
13 / 2472 MHz	OFDM	6 MBit/s	10.1dBm
1 / 2412 MHz	OFDM	6.5 MBit/s	10.0dBm
6 / 2437 MHz	OFDM	6.5 MBit/s	9.7dBm
11 / 2462 MHz	OFDM	6.5 MBit/s	9.9dBm
13 / 2472 MHz	OFDM	6.5 MBit/s	10.0dBm

Table 11: Test results conducted power measurement WLAN 2.4 GHz

7.1.2 Conducted power measurements WLAN 5 GHz

Conducted time based avg. power measurement WLAN 5 GHz (dBm)					
Channel	Frequency (MHz)	modulation	6 MBit/s	6.5 MBit/s	13.5 MBit/s
36	5180	OFDM	9.5	9.3	9.3
40	5200	OFDM	9.6	9.4	
44	5220	OFDM	**10.6**	10.5	10.3
48	5240	OFDM	10.2	10.2	
52	5260	OFDM	10.0	9.9	9.9
56	5280	OFDM	9.8	9.7	
60	5300	OFDM	**10.7**	10.3	10.1
64	5320	OFDM	9.7	9.8	
100	5500	OFDM	6.4	6.3	6.1
104	5520	OFDM	5.8	5.9	
108	5540	OFDM	6.5	6.3	6.8
112	5560	OFDM	7.1	7.0	
116	5580	OFDM	6.6	6.5	6.7
120	5600	OFDM	6.8	6.8	
124	5620	OFDM	6.9	6.9	7.0
128	5640	OFDM	7.2	7.0	
132	5660	OFDM	6.8	6.5	7.1
136	5680	OFDM	7.4	7.3	
140	5700	OFDM	**7.6**	7.4	---
149	5745	OFDM	10.1	9.9	9.9
153	5765	OFDM	10.0	10.0	
157	5785	OFDM	10.1	10.1	10.1
161	5805	OFDM	**10.4**	10.3	
165	5825	OFDM	10.1	10.0	---

Table 12: Test results conducted time based avg. power measurement WLAN 5 GHz

7.1.3 Standalone SAR Test Exclusion

Standalone SAR test exclusion considerations					
Communication system	freq. (MHz)	P_{avg}* (dBm)	P_{avg}* (mW)	**threshold$_{1\text{-}g}$ comparison value**	SAR test exclusion
WLAN 2450	2450	12.0	15.8	5.0	no
WLAN 5.2 GHz	5200	11.0	12.6	5.7	no
WLAN 5.3 GHz	5300	11.0	12.6	5.8	no
WLAN 5.6 GHz	5600	7.7	5.9	2.8	yes
WLAN 5.8 GHz	5800	10.5	11.2	5.4	no
Bluetooth 2450	2450	9.80	9.5	3.0	yes

Table 13: Standalone SAR test exclusion considerations

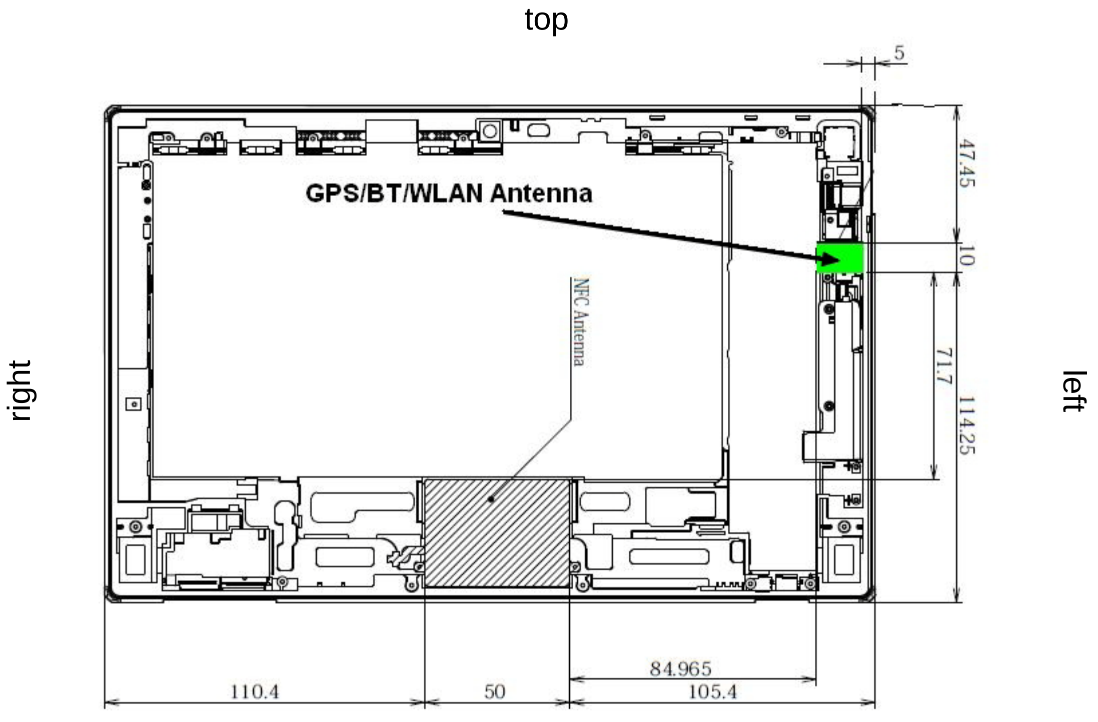
The **1-g SAR test exclusion thresholds** for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ **3.0** for 1-g SAR, where:

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

* - maximum possible output power declared by manufacturer

7.1.4 SAR measurement positions

SAR measurement positions						
mode	front	rear	left edge	right edge	top edge	bottom edge
WLAN 2450	no	yes	yes	no	no	no
WLAN 5.2GHz	no	yes	yes	no	no	no
WLAN 5.3GHz	no	yes	yes	no	no	no
WLAN 5.6GHz	no	yes	yes	no	no	no
WLAN 5.8GHz	no	yes	yes	no	no	no



Note:
The min. 47.45 mm distance of the GPS/WLAN/BT antenna to all adjacent edges SAR test exclusion for adjacent edges is possible according to KDB 447498 D01v05 chapter 4.3.1 2) or Appendix A/B.

Adjacent edge SAR test exclusion considerations						
Communication system	freq. (MHz)	P_{avg}* (dBm)	P_{avg}* (mW)	distance (mm)	**exclusion threshold$_{1g}$ (mW)**	SAR test exclusion
WLAN 2450	2450	11.5	**14.1**	47.5	**90.9**	yes
WLAN 5.2 GHz	5200	9.5	**8.9**	47.5	**62.4**	yes
WLAN 5.3 GHz	5300	9.5	**8.9**	47.5	**61.8**	yes
WLAN 5.6 GHz	5600	9.5	**8.9**	47.5	**60.2**	yes
WLAN 5.8 GHz	5800	9.5	**8.9**	47.5	**59.1**	yes
Bluetooth 2450	2450	9.8	**9.5**	47.5	**91.0**	yes

Table 14: Adjacent edge SAR test exclusion considerations

7.2 SAR test results

7.2.1 Results overview

measured / extrapolated SAR numbers - Body - WLAN 2450 MHz									
Ch.	freq. (MHz)	Test condition	distance (mm)	Position	cond. output power (dBm)		SAR_{1g} results(W/kg)		liquid temp.(°C)
					declared**	measured	measured	extrapolated	
1	2412	1Mbit/s	0	rear	12.0	11.1	1.030	**1.267**	21.3
6	2437	1Mbit/s	0	rear	12.0	11.4	1.020	1.171	21.3
11	2462	1Mbit/s	0	rear	12.0	11.2	0.823	0.989	21.3
6	2437	1Mbit/s	0	left edge	12.0	11.4	0.162	0.186	21.3
1	2412	1Mbit/s	0	rear*	12.0	11.1	1.030	**1.267**	21.3
1	2412	1Mbit/s	0	rear + HS	12.0	11.4	0.949	1.090	21.3

Table 15: Test results body SAR WLAN 2450 MHz

* - repeated at the highest SAR measurement according to the FCC KDB 865664
** - maximum possible output power declared by manufacturer

measured / extrapolated SAR numbers - Body - WLAN 5GHz								
Ch.	frequency (MHz)	distance	Position	cond. output power (dBm)		SAR_{1g} results(W/kg)		liquid temp. (°C)
				declared**	measured	measured	extrapolated	
44	5220	0	rear	11.0	10.6	0.668	0.732	20.1
60	5300	0	rear	11.0	10.7	0.416	0.446	20.1
140	5700	0	rear	7.7	7.6	0.720	**0.737**	20.1
161	5805	0	rear	10.5	10.4	0.669	0.685	20.1
44	5220	0	left edge	11.0	10.6	0.244	0.268	20.1
60	5300	0	left edge	11.0	10.7	0.164	0.176	20.1
140	5700	0	left edge	7.7	7.6	0.077	0.079	20.1
161	5805	0	left edge	10.5	10.4	0.169	0.173	20.1

Table 16: Test results body SAR WLAN 5GHz

** - maximum possible output power declared by manufacturer
Bottom, top and right edge positions are not required according to KDB 447498 D01v05 chapter 4.3.1 2 (see table 14, chapter 7.1.4, page 28)

Estimated SAR					
Communication system	freq. (GHz)	distance (mm)	P_{avg}* (dBm)	P_{avg}* (mW)	$estimated_{1-g}$ (W/kg)
Bluetooth 2450 body	2.45	5	9.8	9.5	0.399

Table 17: Calculated SAR_{max} for **Bluetooth 2450MHz** head and body

* - maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(*max. power of channel, including* ***tune-up tolerance****, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm;
where *x* = 7.5 for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

7.2.2 General description of test procedures

- The DUT is tested using test software to control test channels and maximum output power of the DUT.
- Test positions as described in the tables above are in accordance with the specified test standard.
- According to IEEE 1528 the SAR test shall be performed at middle channel. Testing of top and bottom channel is optional.
- Required WLAN test channels were selected according to KDB 248227
- According to KDB 447498 D01 testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
  - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- The tests were performed in that configuration, which generates the highest time based averaged output power (see conducted power results).
- WLAN was tested in 802.11b mode with 1 MBit/s and in 802.11a mode with 6 MBit/s. According to KDB 248227 the SAR testing for 802.11g/n is not required since the maximum power of 802.11g/n is less ¼ dB higher than maximum power of 802.11a/b.
- Tests in body position were performed with 0 mm air gap 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.

Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
Dosimetric E-Field Probe	ET3DV6	Schmid & Partner Engineering AG	1558	August 24, 2012	12
Dosimetric E-Field Probe	EX3DV4	Schmid & Partner Engineering AG	3566	August 23, 2012	12
2450 MHz System Validation Dipole	D2450V2	Schmid & Partner Engineering AG	710	August 13, 2012	24
5 GHz System Validation Dipole	D5GHzV 2	Schmid & Partner Engineering AG	1055	August 22, 2011	24
Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	477	May 09, 2012	12
Software	DASY52 52.8.2	Schmid & Partner Engineering AG	---	N/A	--
Phantom ELI 4.0	QDOVA0 01BA	Schmid & Partner Engineering AG	1046	N/A	--
Network Analyser 300 kHz to 6 GHz	8753ES	Hewlett Packard)*	US39174436	February 24, 2012	24
Dielectric Probe Kit	85070C	Hewlett Packard	US99360146	N/A	12
Signal Generator	8671B	Hewlett Packard	2823A00656	January 15, 2013	24
Amplifier	25S1G4 (25 Watt)	Amplifier Reasearch	20452	N/A	--
Power Meter	NRP	Rohde & Schwarz	101367	January 15, 2013	24
Power Meter Sensor	NRP Z22	Rohde & Schwarz	100227	January 14, 2013	12
Power Meter Sensor	NRP Z22	Rohde & Schwarz	100234	January 14, 2013	12
Directional Coupler	778D	Hewlett Packard	19171	January 14, 2013	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 check

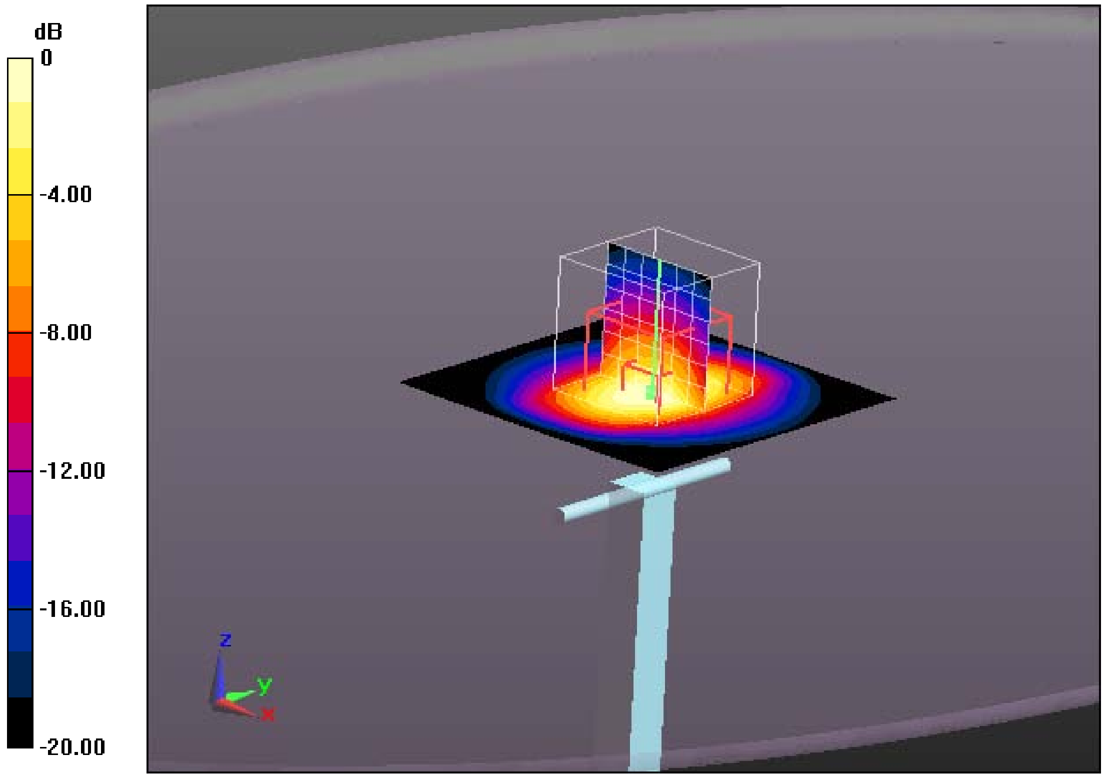
Date/Time: 22.01.2013 16:33:08

SystemPerformanceCheck-D2450 body 2013-01-22

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 710
Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

System Performance Check/d=10mm, Pin=100 mW, dist=4.0mm/Area Scan (51x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.50 W/kg

System Performance Check/d=10mm, Pin=100 mW, dist=4.0mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.362 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 14.984 mW/g
SAR(1 g) = 5.44 mW/g; SAR(10 g) = 2.39 mW/g
Maximum value of SAR (measured) = 5.88 W/kg



0 dB = 5.88 W/kg = 15.39 dB W/kg

Additional information:
ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 28.01.2013 07:04:19

SystemPerformanceCheck-D5GHz-body 2013-01-28

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1055

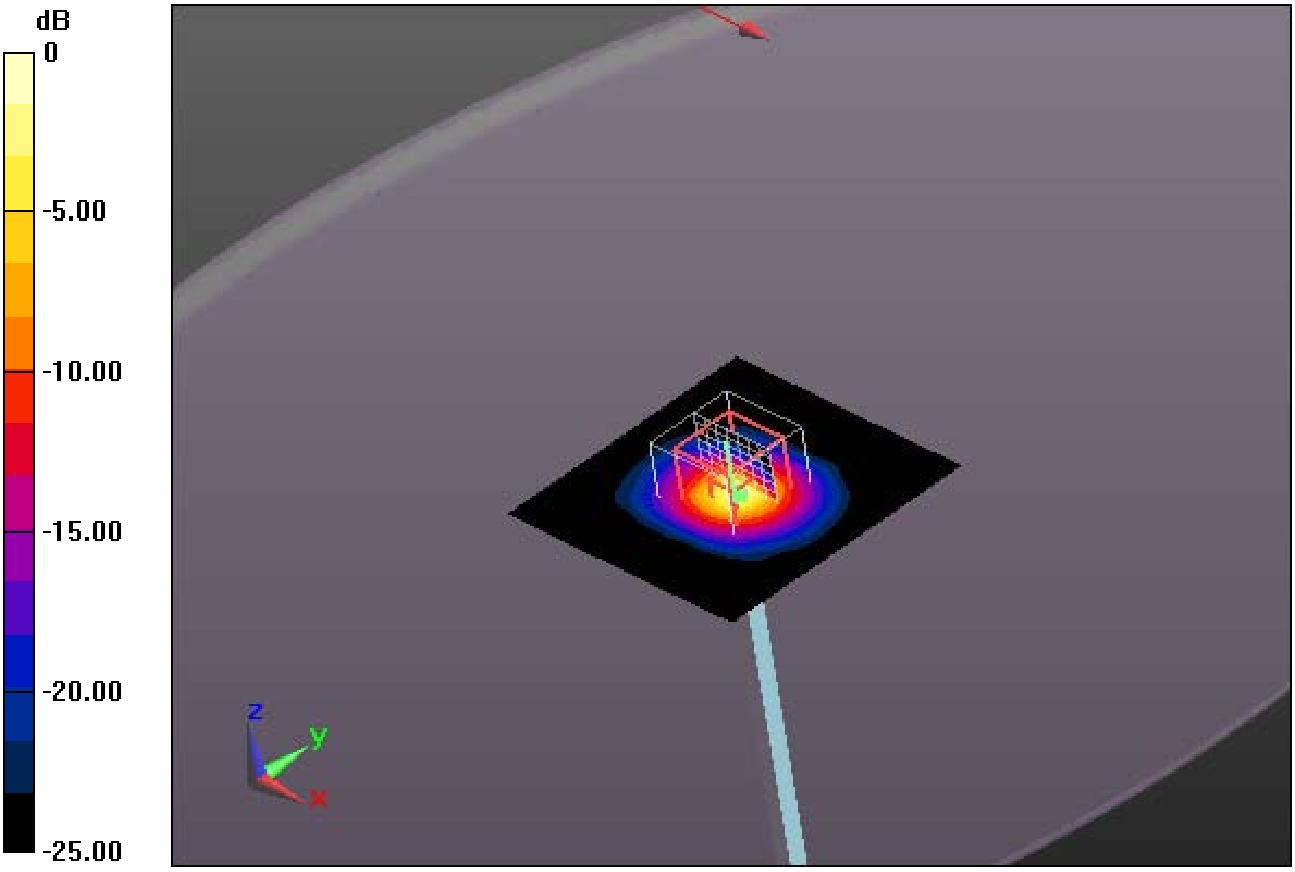
Communication System: CW; Frequency: 5200 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5200 MHz; σ = 5.34 mho/m; ε_r = 48.02; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.5, 3.5, 3.5); Calibrated: 23.08.2012;
- Modulation Compensation:
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 22.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL/d=10mm, Pin=100mW 5.2GHz/Area Scan (91x91x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 9.11 W/kg

MSL/d=10mm, Pin=100mW 5.2GHz/Zoom Scan (8x8x8) (8x8x8)/Cube 0:

Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 41.558 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 27.274 mW/g
SAR(1 g) = 7.43 mW/g; SAR(10 g) = 2.11 mW/g
Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 23.64 dB W/kg

Additional information:
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 07:28:09

SystemPerformanceCheck-D5GHz-body 2013-01-28

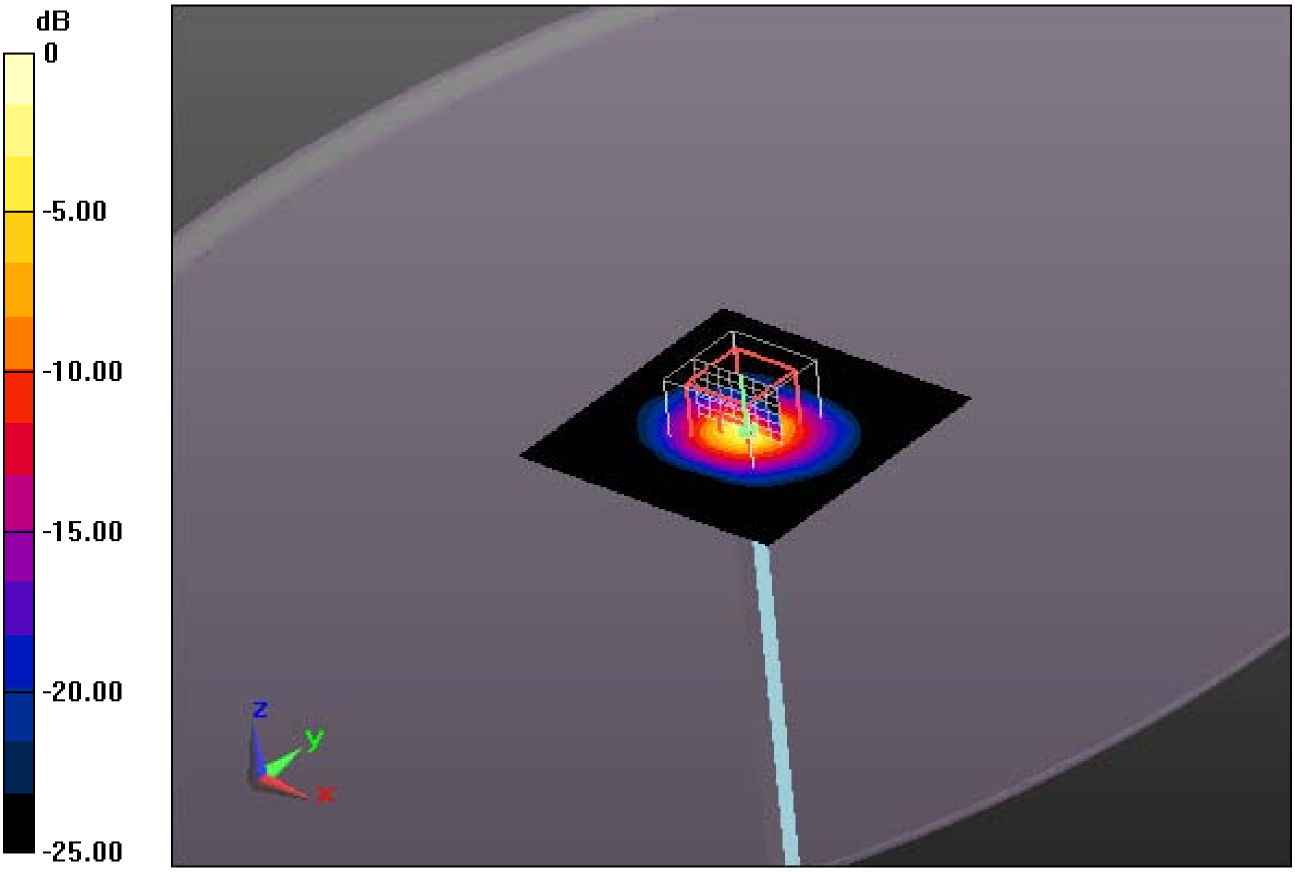
DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1055
Communication System: CW; Frequency: 5500 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5500 MHz; σ = 5.71 mho/m; ε_r = 47.27; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.1, 3.1, 3.1); Calibrated: 23.08.2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 22.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL/d=10mm, Pin=100mW 5.5GHz/Area Scan (91x91x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 9.52 W/kg

MSL/d=10mm, Pin=100mW 5.5GHz/Zoom Scan (8x8x8) (8x8x8)/Cube 0:

Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 41.739 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 29.954 mW/g
SAR(1 g) = 7.86 mW/g; SAR(10 g) = 2.22 mW/g
Maximum value of SAR (measured) = 16.2 W/kg



0 dB = 16.2 W/kg = 24.19 dB W/kg

Additional information:
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 07:59:45

SystemPerformanceCheck-D5GHz-body 2013-01-28

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1055

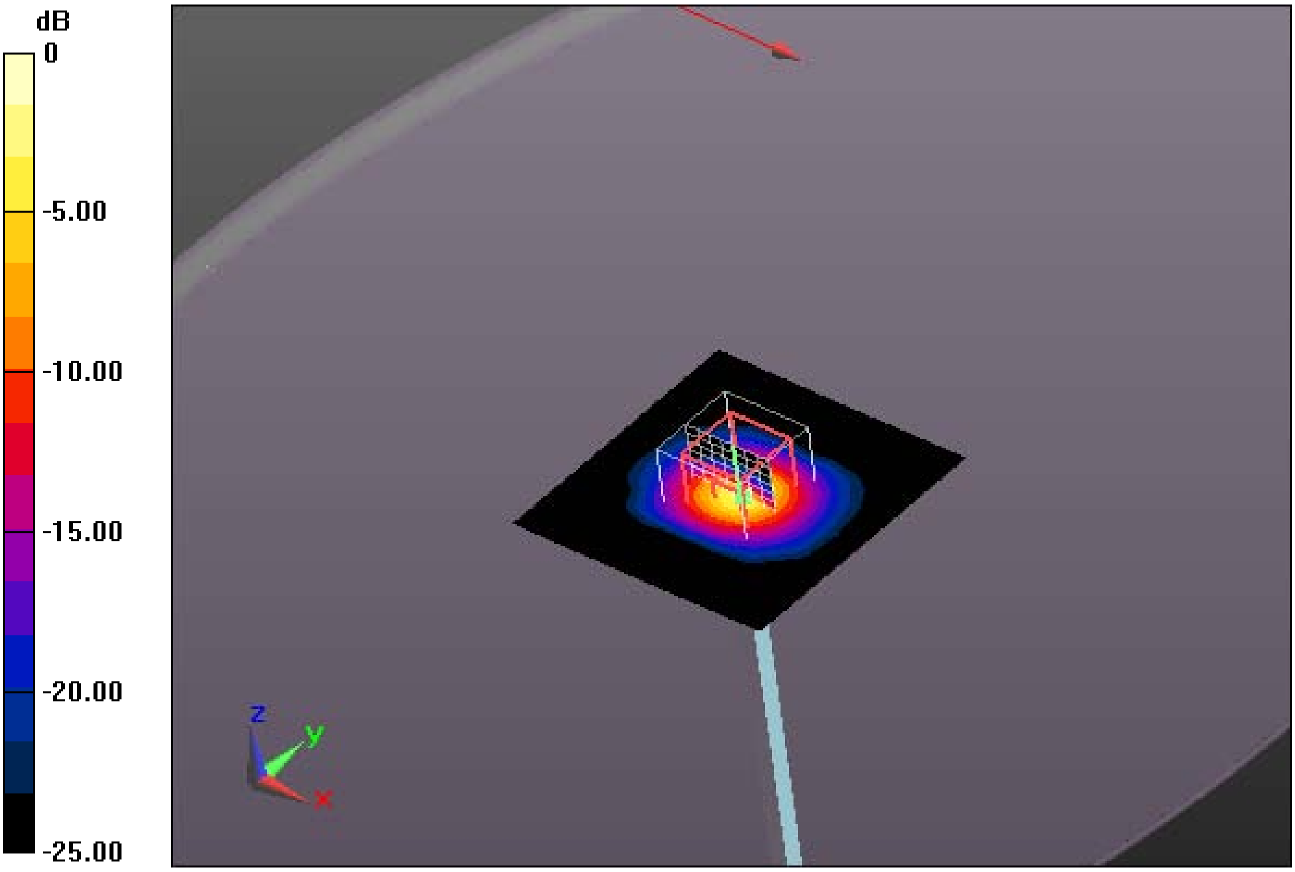
Communication System: CW; Frequency: 5800 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5800 MHz; σ = 6.1 mho/m; ε_r = 46.69; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.12, 3.12, 3.12); Calibrated: 23.08.2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 22.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL/d=10mm, Pin=100mW 5.8GHz/Area Scan (91x91x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 8.48 W/kg

MSL/d=10mm, Pin=100mW 5.8GHz/Zoom Scan (8x8x8) (8x8x8)/Cube 0:

Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 38.284 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 29.148 mW/g
SAR(1 g) = 7.39 mW/g; SAR(10 g) = 2.08 mW/g
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 23.69 dB W/kg

Additional information:
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Annex B: DASY4 measurement results

Annex B.1: WLAN 2.45 GHz

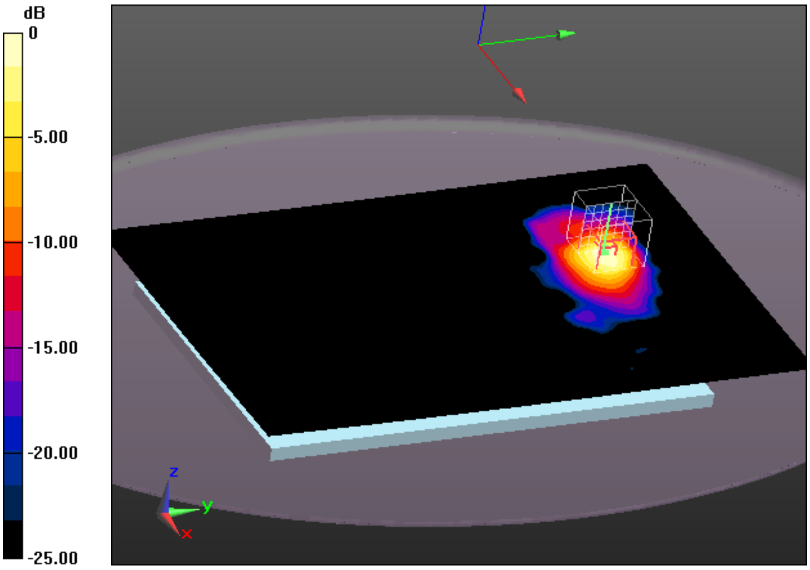
Date/Time: 22.01.2013 12:43:40

OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1
Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2412 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833
Medium parameters used: f = 2412 MHz; σ = 1.96 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Rear Position - Low/Area Scan (211x331x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.11 W/kg

Body MSL/Rear Position - Low/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.798 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.831 mW/g
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.411 mW/g
Maximum value of SAR (measured) = 1.12 W/kg



0 dB = 1.12 W/kg = 0.98 dB W/kg

Additional information:
position or distance of DUT to SAM: 0mm
ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 22.01.2013 11:29:58

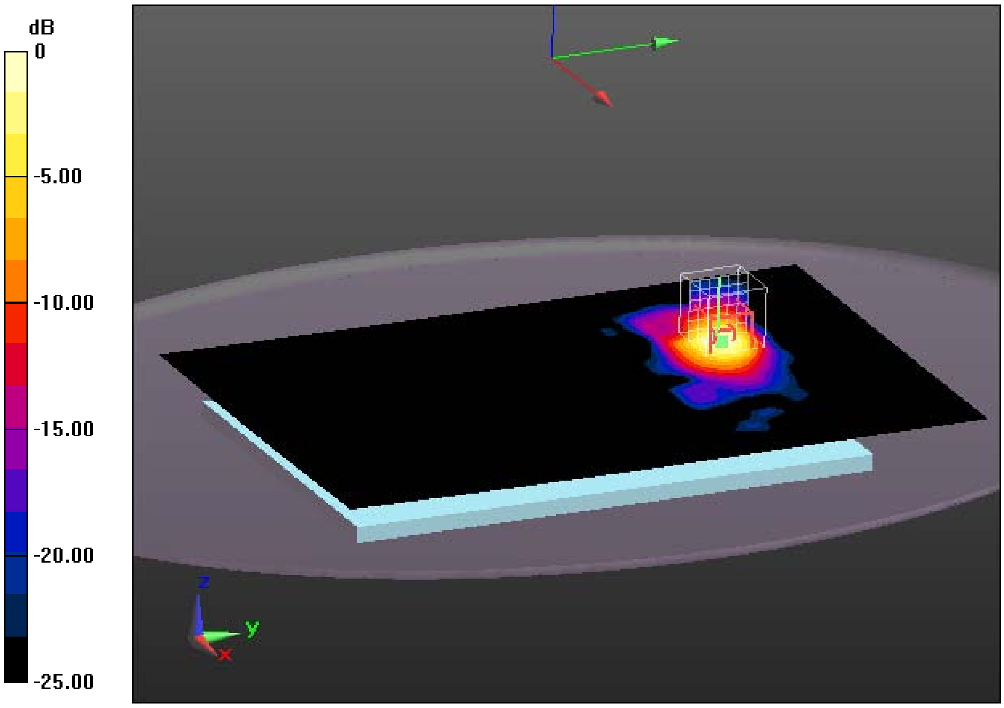
OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2437 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833
Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Rear Position - Middle/Area Scan (211x331x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.27 W/kg

Body MSL/Rear Position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.632 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.849 mW/g
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.418 mW/g
Maximum value of SAR (measured) = 1.13 W/kg



0 dB = 1.13 W/kg = 1.06 dB W/kg

Additional information:
position or distance of DUT to SAM: 0mm
ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 22.01.2013 13:29:18

OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2462 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833

Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Rear Position - Hi/Area Scan (211x331x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.991 W/kg

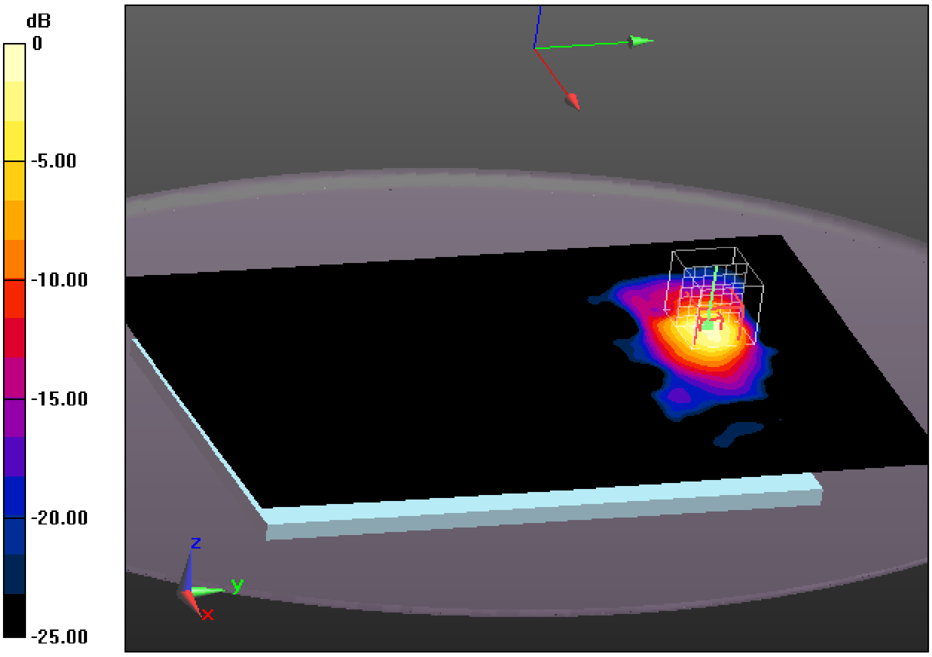
Body MSL/Rear Position - Hi/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.038 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 3.100 mW/g

SAR(1 g) = 0.823 mW/g; SAR(10 g) = 0.332 mW/g

Maximum value of SAR (measured) = 0.936 W/kg



0 dB = 0.936 W/kg = -0.57 dB W/kg

Additional information:

position or distance of DUT to SAM: 0mm

ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 22.01.2013 10:42:48

OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2437 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833

Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Left Side Position - Mid/Area Scan (121x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.174 W/kg

Body MSL/Left Side Position - Mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.186 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.393 mW/g

SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.078 mW/g

Maximum value of SAR (measured) = 0.174 W/kg

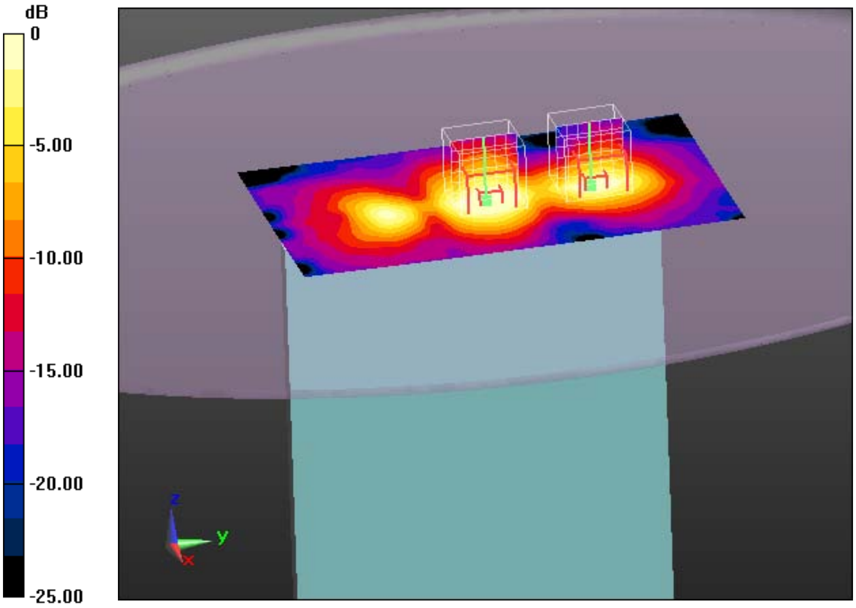
Body MSL/Left Side Position - Mid/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.186 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.310 mW/g

SAR(1 g) = 0.110 mW/g; SAR(10 g) = 0.050 mW/g

Maximum value of SAR (measured) = 0.118 W/kg



0 dB = 0.118 W/kg = -18.56 dB W/kg

Additional information:

position or distance of DUT to SAM: 0mm

ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 22.01.2013 14:17:26

OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

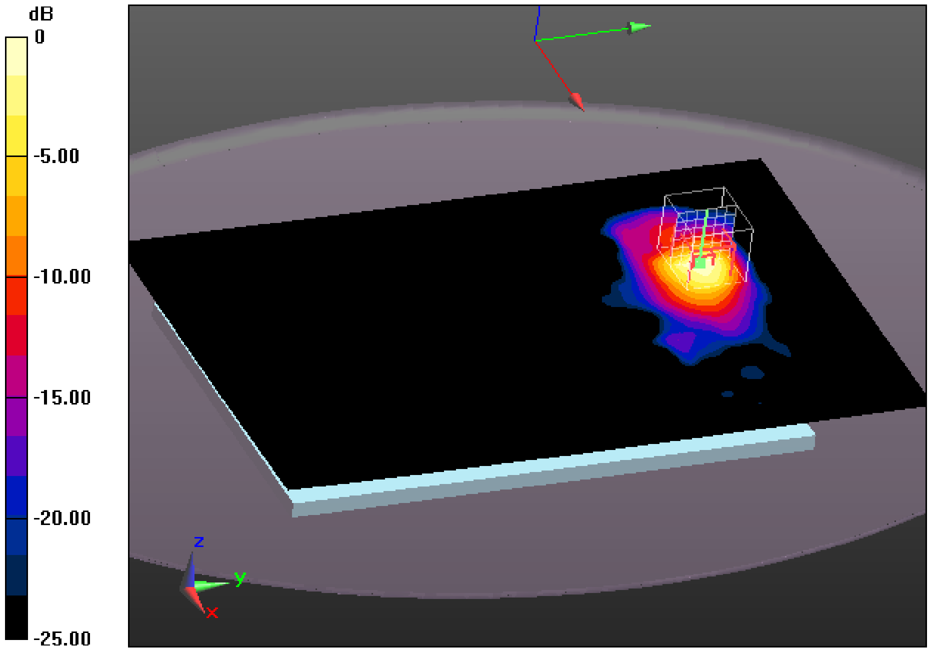
Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2412 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833
Medium parameters used: f = 2412 MHz; σ = 1.96 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Rear Position - Low WC/Area Scan (211x331x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.29 W/kg

Body MSL/Rear Position - Low WC/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.826 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.976 mW/g
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 1.08 W/kg



0 dB = 1.08 W/kg = 0.67 dB W/kg

Additional information:
position or distance of DUT to SAM: 0mm
ambient temperature: 22.4°C; liquid temperature: 21.3°C

Date/Time: 22.01.2013 15:00:57

OET65-WLAN2450-body

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

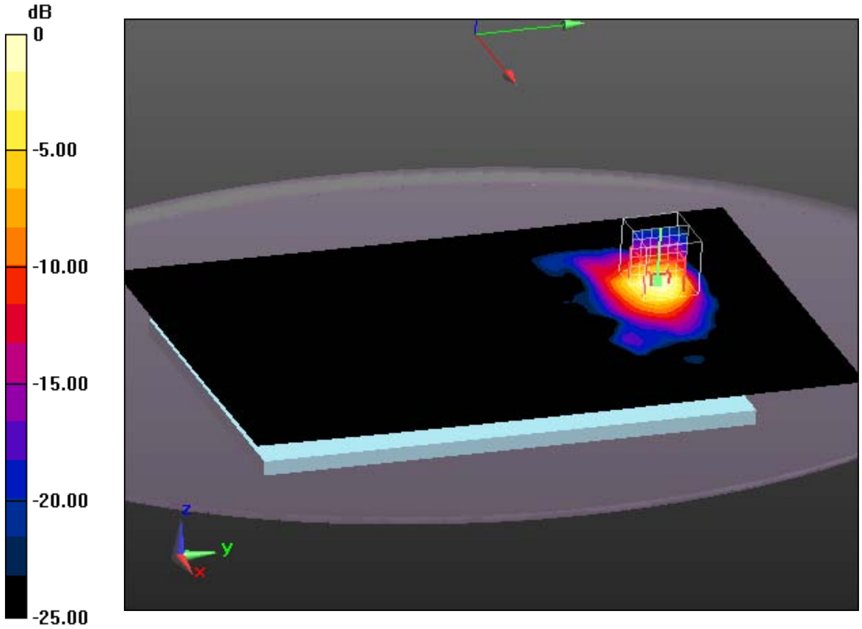
Communication System: IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: ISM 2.4 GHz Band (2400.0 - 2483.5 MHz); Frequency: 2412 MHz; Communication System PAR: 1.87 dB; PMF: 1.04833
Medium parameters used: f = 2412 MHz; σ = 1.96 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: ET3DV6 - SN1558; ConvF(4.06, 4.06, 4.06); Calibrated: 24.08.2012;
- Modulation Compensation: PMR (X: a=2.76, b=67.0, c=18.1, calibrated PAR=1.9 dB / Y: a=2.60, b=66.5, c=17.9, calibrated PAR=1.9 dB / Z: a=2.38, b=64.1, c=16.5, calibrated PAR=1.9 dB); Calibrated: 24.08.2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.7, 32.7
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Body MSL/Rear Position - Low with headset/Area Scan (211x331x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

Body MSL/Rear Position - Low with headset/Zoom Scan (8x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.104 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.448 mW/g
SAR(1 g) = 0.949 mW/g; SAR(10 g) = 0.381 mW/g
Maximum value of SAR (measured) = 1.01 W/kg



0 dB = 1.01 W/kg = 0.09 dB W/kg

Additional information:
position or distance of DUT to SAM: 0mm with headset
ambient temperature: 22.4°C; liquid temperature: 21.3°C

Annex B.2: WLAN 5GHz

Date/Time: 28.01.2013 11:57:34

OET65_EN62209-2-Body-WLAN 5GHz

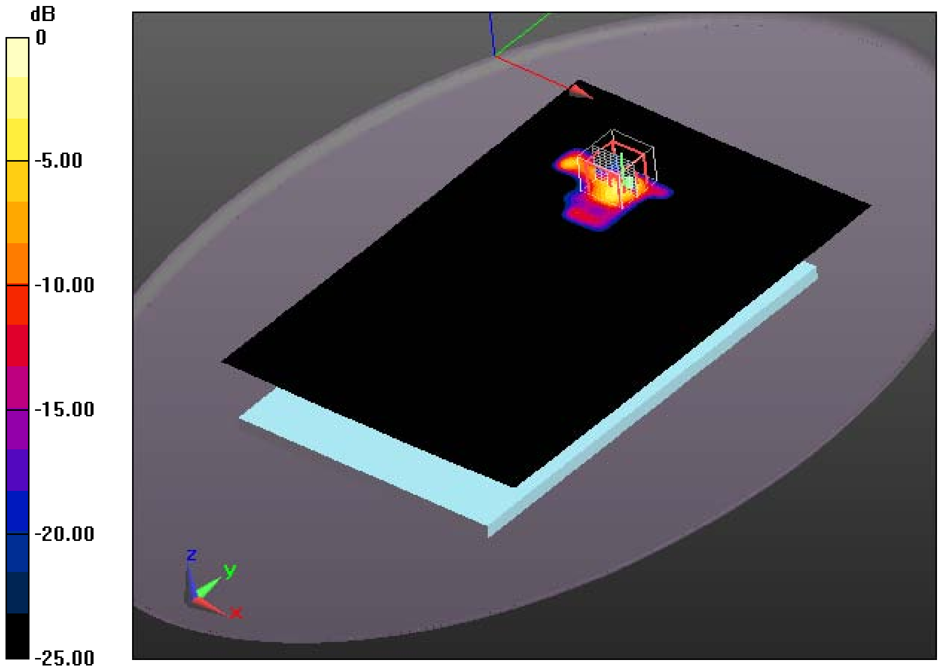
DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1
Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5220 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895
Medium parameters used (interpolated): f = 5220 MHz; σ = 5.375 mho/m; ε_r = 47.96; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.5, 3.5, 3.5); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Rear position - Channel 44/Area Scan (201x291x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.45 W/kg

MSL-5GHz/Rear position - Channel 44/Zoom Scan (8x8x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 12.670 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 3.356 mW/g
SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.165 mW/g
Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kg = 4.35 dB W/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 13:11:01

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

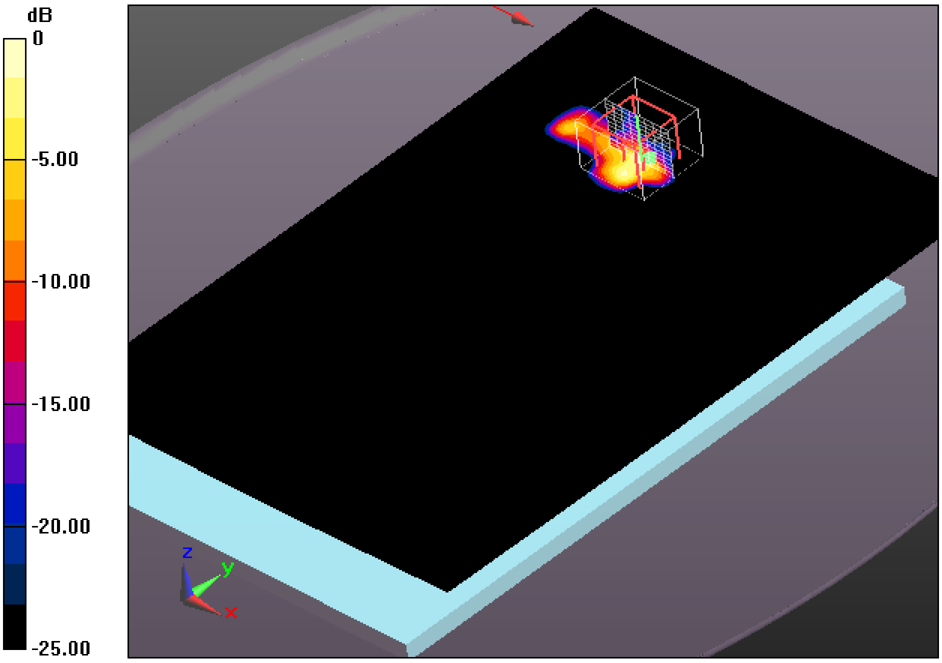
Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5300 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895
Medium parameters used: f = 5300 MHz; σ = 5.46 mho/m; ε_r = 47.79; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.35, 3.35, 3.35); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Rear position - Channel 60/Area Scan (201x291x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.15 W/kg

MSL-5GHz/Rear position - Channel 60/Zoom Scan (9x9x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.903 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 2.913 mW/g
SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.093 mW/g
Maximum value of SAR (measured) = 0.972 W/kg



0 dB = 0.972 W/kg = -0.25 dB W/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 14:03:06

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5700 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895

Medium parameters used: f = 5700 MHz; σ = 5.97 mho/m; ε_r = 46.89; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3566; ConvF(3.12, 3.12, 3.12); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Rear position - Channel 140/Area Scan (201x291x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.76 W/kg

MSL-5GHz/Rear position - Channel 140/Zoom Scan (9x9x12)/Cube 0:

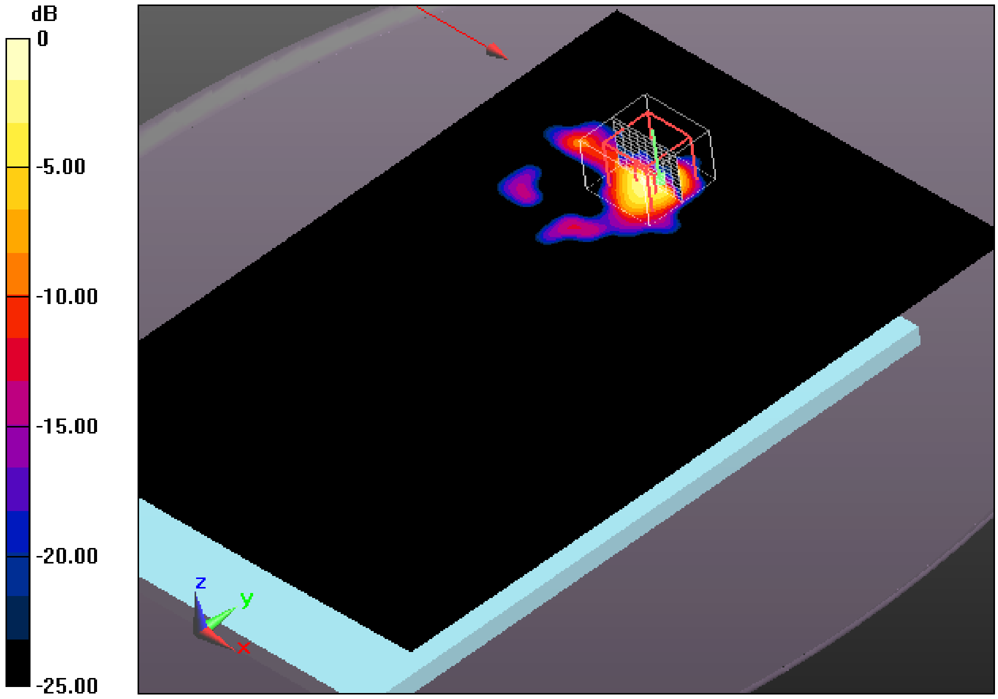
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 13.021 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 4.071 mW/g

SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.159 mW/g

Maximum value of SAR (measured) = 1.61 W/kg



0 dB = 1.61 W/kg = 4.14 dB W/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 14:57:22

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5805 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895

Medium parameters used: f = 5805 MHz; σ = 6.12 mho/m; ε_r = 46.68; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3566; ConvF(3.12, 3.12, 3.12); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Rear position - Channel 161/Area Scan (201x291x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.36 W/kg

MSL-5GHz/Rear position - Channel 161/Zoom Scan (8x8x12)/Cube 0:

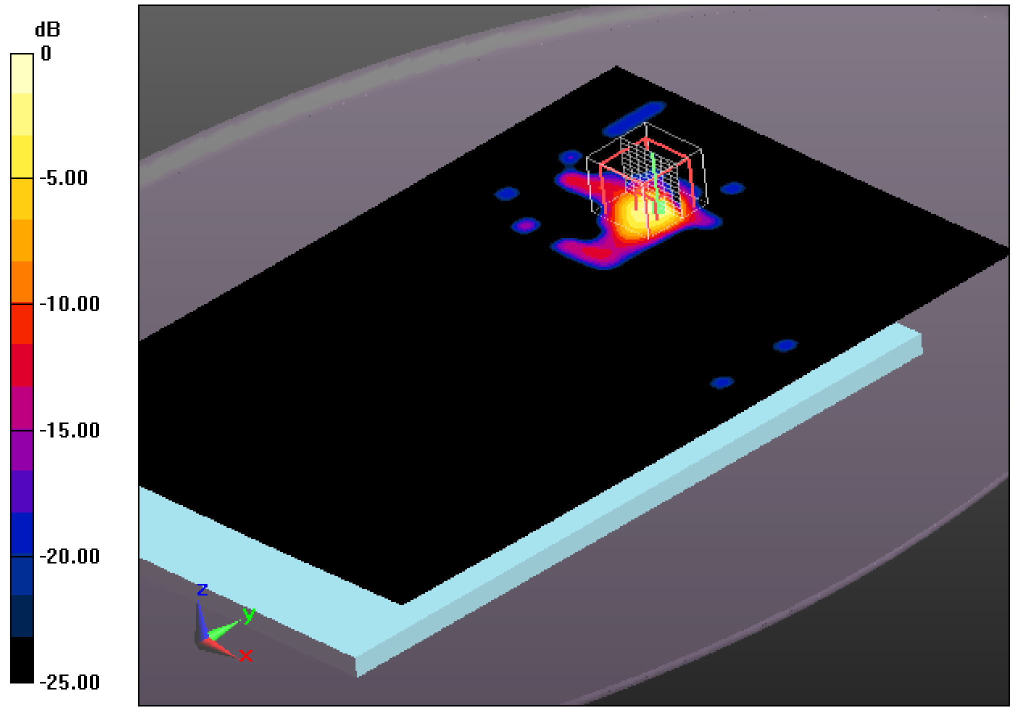
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 13.179 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 7.215 mW/g

SAR(1 g) = 0.669 mW/g; SAR(10 g) = 0.153 mW/g

Maximum value of SAR (measured) = 1.49 W/kg



0 dB = 1.49 W/kg = 3.46 dB W/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 08:39:59

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

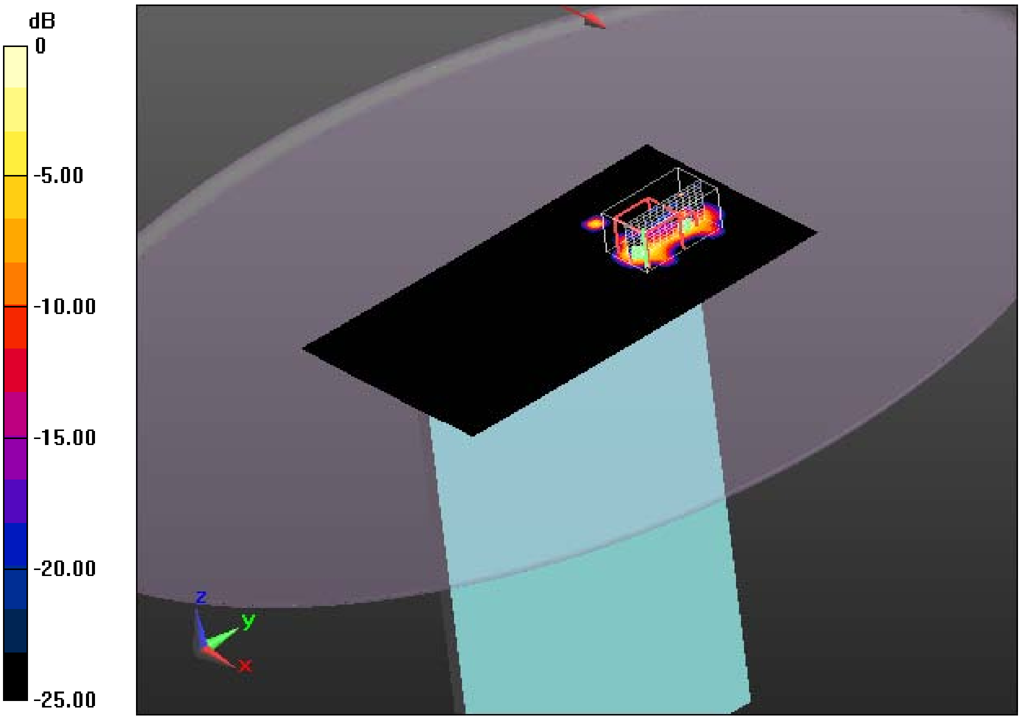
Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5220 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895
Medium parameters used (interpolated): f = 5220 MHz; σ = 5.375 mho/m; ε_r = 47.96; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.5, 3.5, 3.5); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Left Side Position - Channel 44/Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.586 W/kg

MSL-5GHz/Left Side Position - Channel 44/Zoom Scan (8x13x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.321 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 3.407 mW/g
SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.041 mW/g
Maximum value of SAR (measured) = 0.860 W/kg



0 dB = 0.860 W/kg = -1.31 dB W/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 09:43:18

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

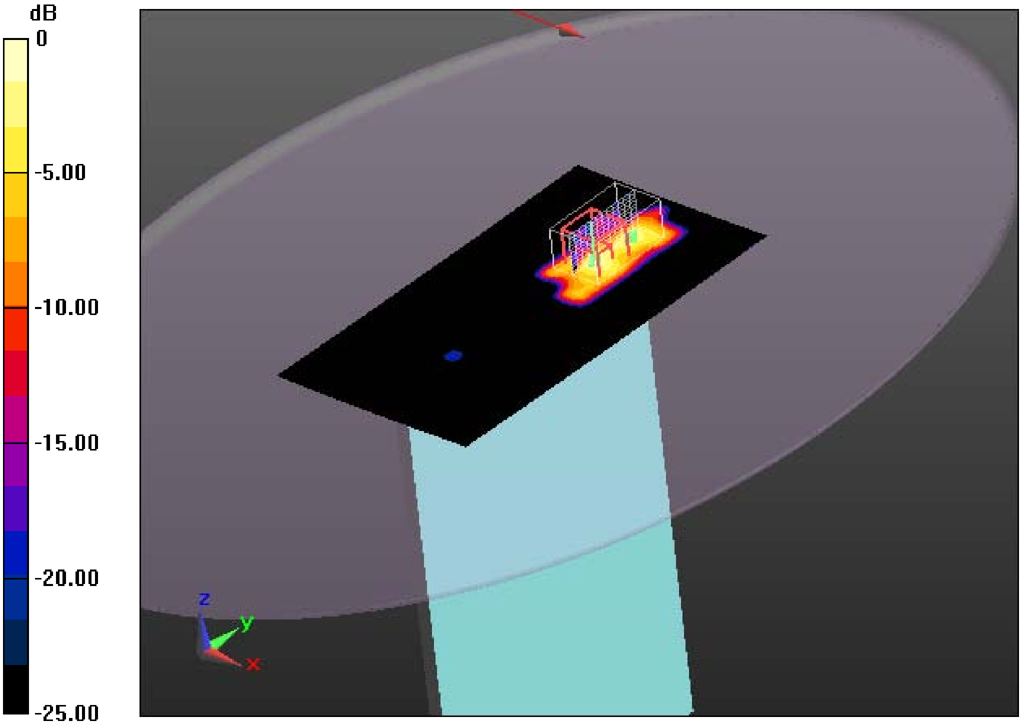
Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5300 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895
Medium parameters used: f = 5300 MHz; σ = 5.46 mho/m; ε_r = 47.79; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.35, 3.35, 3.35); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Left Side Position - Channel 60/Area Scan (121x221x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.297 W/kg

MSL-5GHz/Left Side Position - Channel 60/Zoom Scan (8x13x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.675 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.629 mW/g
SAR(1 g) = 0.164 mW/g; SAR(10 g) = 0.044 mW/g
Maximum value of SAR (measured) = 0.340 W/kg



0 dB = 0.340 W/kg = -9.37 dB W/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 10:31:48

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5700 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895

Medium parameters used: f = 5700 MHz; σ = 5.97 mho/m; ε_r = 46.89; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5

DASY5 Configuration:

- Probe: EX3DV4 - SN3566; ConvF(3.12, 3.12, 3.12); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Left Side Position - Channel 140/Area Scan (121x221x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.166 W/kg

MSL-5GHz/Left Side Position - Channel 140/Zoom Scan (8x11x12)/Cube 0:

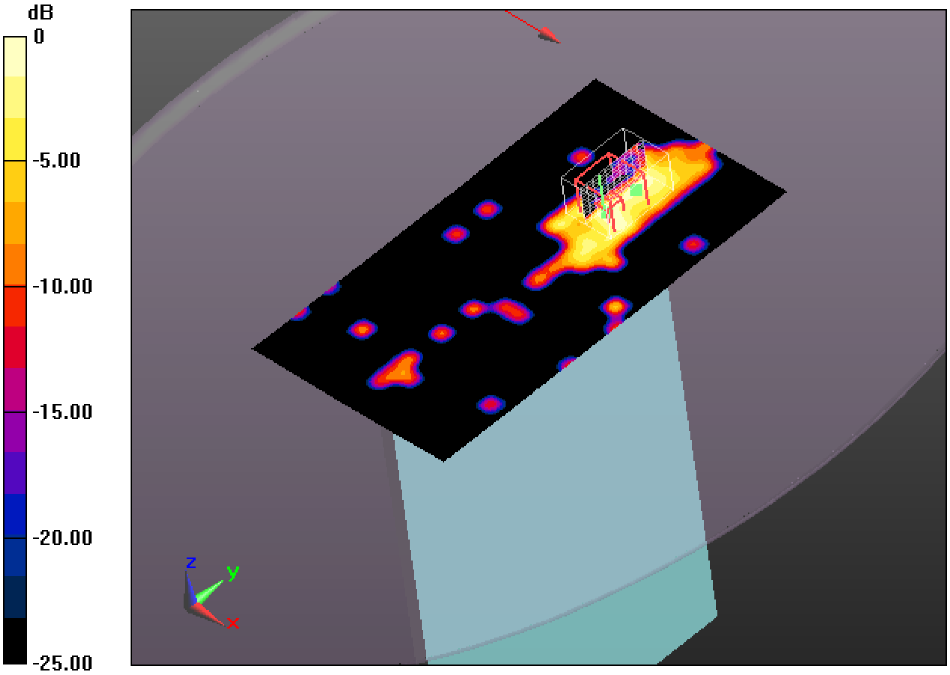
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.419 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.371 mW/g

SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.176 W/kg



0 dB = 0.176 W/kg = -15.09 dB W/kg

Additional information:

position or distance of DUT to SAM: 0 mm

ambient temperature: 21.8°C; liquid temperature: 20.1°C

Date/Time: 28.01.2013 11:13:49

OET65_EN62209-2-Body-WLAN 5GHz

DUT: Sony; Type: TS-0000-BV; Serial: CB5A1N1KP1

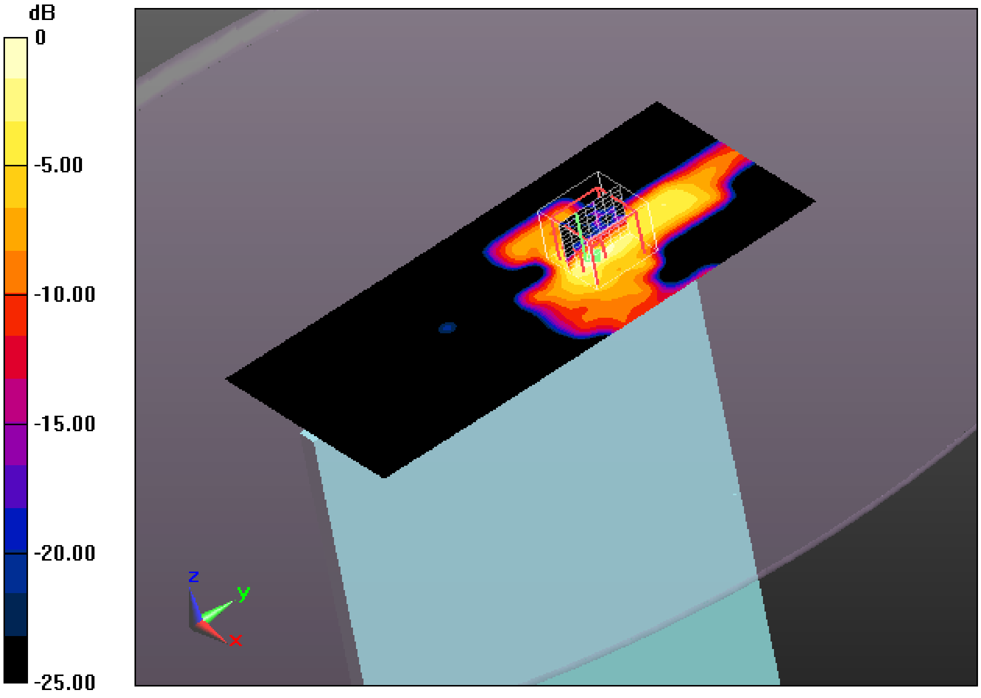
Communication System: IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Communication System Band: 5 GHz Band (5030.0 - 5825.0 MHz); Frequency: 5805 MHz; Communication System PAR: 8.69 dB; PMF: 1.07895
Medium parameters used: f = 5805 MHz; σ = 6.12 mho/m; ε_r = 46.68; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5
DASY5 Configuration:
- Probe: EX3DV4 - SN3566; ConvF(3.12, 3.12, 3.12); Calibrated: 23.08.2012;
- Modulation Compensation: PMR (X: a=10.1, b=68.5, c=21.4, calibrated PAR=8.7 dB / Y: a=9.85, b=67.7, c=21.0, calibrated PAR=8.7 dB / Z: a=9.78, b=67.8, c=21.2, calibrated PAR=8.7 dB); Calibrated: 23.08.2012
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 23.0
- Electronics: DAE3 Sn477; Calibrated: 09.05.2012
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1046
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

MSL-5GHz/Left Side Position - Channel 161/Area Scan (91x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.425 W/kg

MSL-5GHz/Left Side Position - Channel 161/Zoom Scan (8x8x12)/Cube 0:

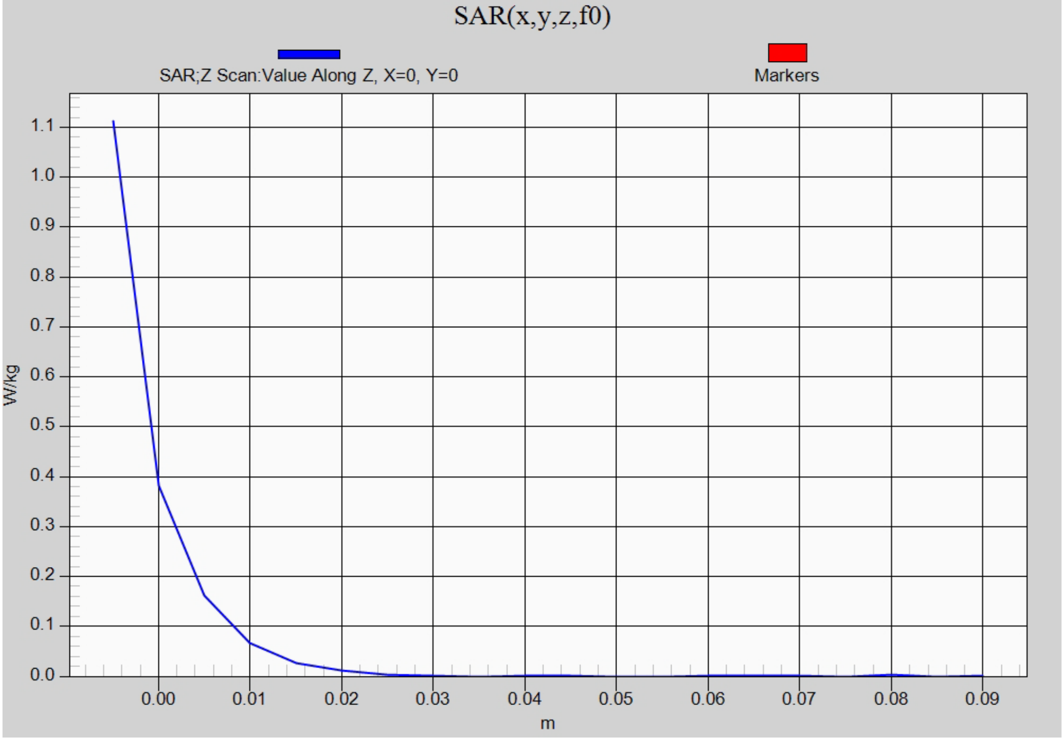
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.599 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.834 mW/g
SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.049 mW/g
Maximum value of SAR (measured) = 0.440 W/kg



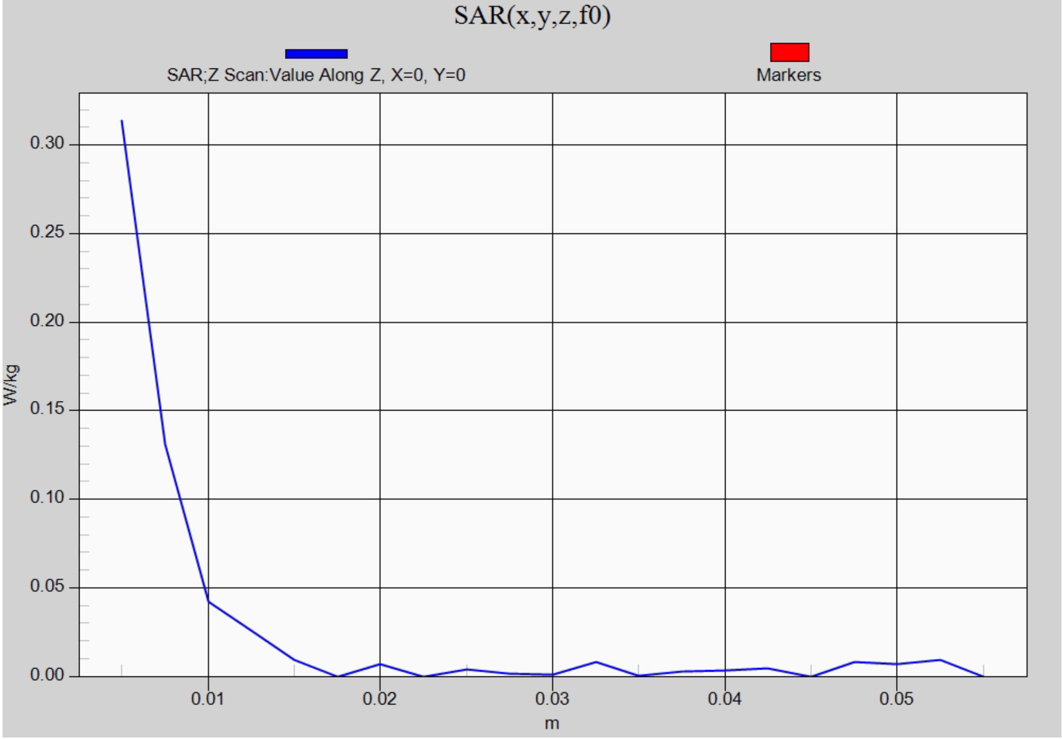
0 dB = 0.440 W/kg = -7.13 dB W/kg

Additional information:
position or distance of DUT to SAM: 0 mm
ambient temperature: 21.8°C; liquid temperature: 20.1°C

Annex B.3: Z-axis scan



2450 body



5GHz body

Annex B.4: Liquid depth

Photo 1: Liquid depth 2450 MHz body simulating liquid

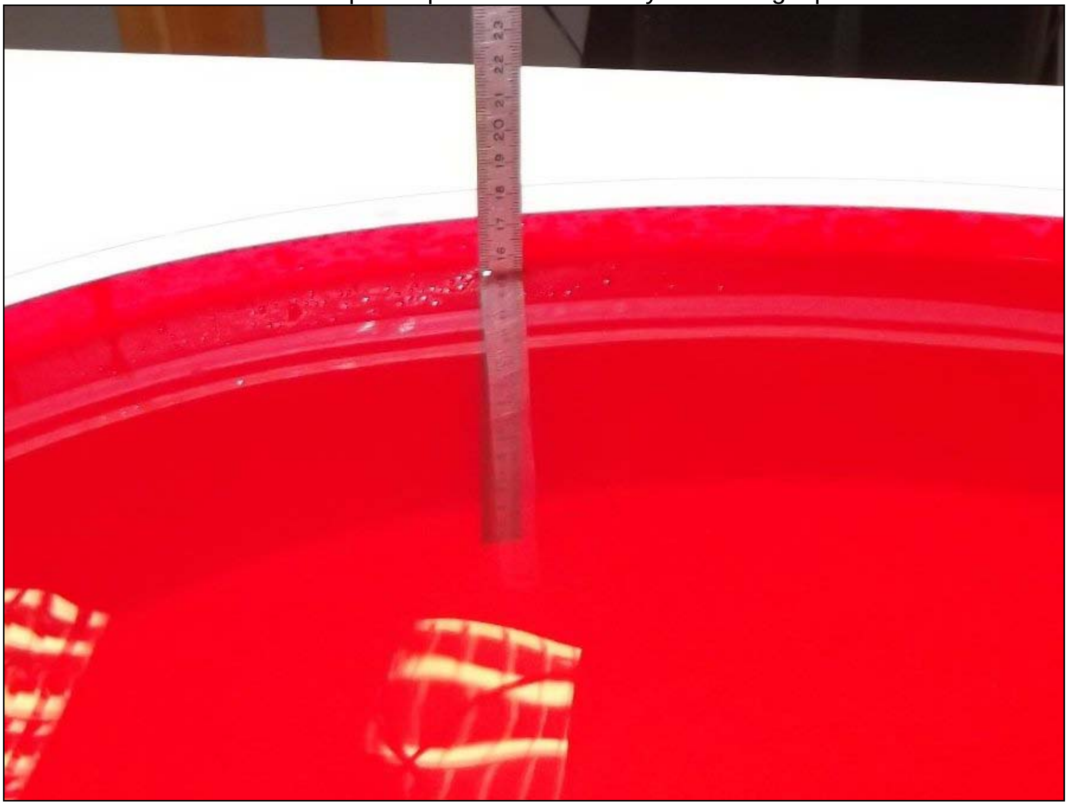
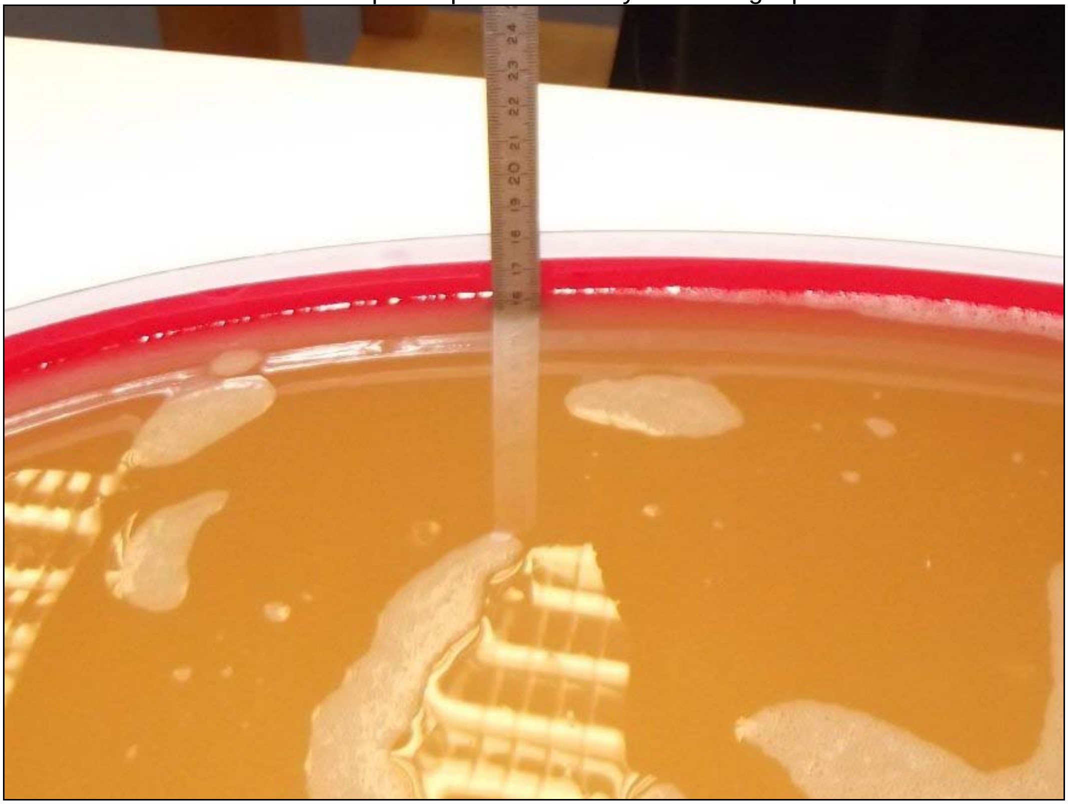


Photo 2: Liquid depth 5 GHz body simulating liquid



Annex C: Photo documentation

Photo documentation is described in the additional document:

Appendix to test report no. 1-5831/13-02-02 Photo documentation

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

1. COMPANY NUMBER: 4170B

2. MODEL NUMBER: TS-0000-BV / TS-0000-CV

3. MANUFACTURER: **Sony Mobile Communications AB**

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: **1.267 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 Vog Date: **2013-01-29**

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. 1-5831/13-02-02
Calibration data, Phantom certificate
and detail information of the DASY System

Annex F: Document History

Version	Applied Changes	Date of Release
	Initial Release	2013-01-29

Annex G: Further Information

Glossary

BW	-	Bandwidth
DTS	-	Distributed Transmission System
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
PCE	-	Personal Consumption Expenditure
OET	-	Office of Engineering and Technology
RB	-	resource block(s)
SAR	-	Specific Absorption Rate
S/N	-	Serial Number
$SPLSR_i$	-	SAR-to-(peak-locations spacing) ratio
SW	-	Software
UNII	-	Unlicensed National Information Infrastructure