SAR TEST REPORT

(Mobile Phone)

REPORT NO.: SA110311C24A-2 R2

MODEL NO.: MC75A6HF

RECEIVED: Mar. 04, 2011

TESTED: Mar. 04 ~ Mar. 16, 2011

ISSUED: Jun. 03, 2011

APPLICANT: Motorola Solutions Inc.

ADDRESS: One Motorola Plaza, Holtsville, NY-11742-1300, U.S.A.

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Mar. 28, 2011
SA110311C24A-2 R1	1. Added conducted power of coding and modulation scheme for GPRS and EGPRS 2. Added mobile station class, multi slot class and DTM capability 3. Added test condition for GPRS and EGPRS	May 31, 2011
SA110311C24A-2 R2	Modified item 2.1 description	Jun. 03, 2011

1. CERTIFICATION

PRODUCT:	Mobile Computer
MODEL:	MC75A6HF
BRAND:	Motorola
APPLICANT:	Motorola Solutions Inc.
TESTED:	Mar. 04 ~ Mar. 16, 2011
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 2 (Section 2.1093)** **FCC OET Bulletin 65, Supplement C (01-01)** **RSS-102 Issue 4 (2010-03)**

The above equipment (model: MC75A6HF) have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE :** Jun. 03, 2011
Pettie Chen / Specialist

APPROVED BY : _____ , **DATE :** Jun. 03, 2011
Gary Chang / Assistant Manager

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	Mobile Computer	
MODEL NO.	MC75A6HF	
FCC ID	UZ7MC75A6HF	
POWER SUPPLY	3.7Vdc (Li-ion battery) 5.4Vdc (Adapter)	
CLASSIFICATION	Portable device, production unit	
MODULATION TYPE	GMSK / 8PSK / BPSK	
FREQUENCY RANGE	Tx Frequency: 824MHz ~ 849MHz 1850MHz ~ 1910MHz Rx Frequency: 869MHz ~ 894MHz 1930MHz ~ 1990MHz	
MOBILE STATION CLASS	Class B	
MULTI SLOT CLASS	GPRS : 10 EGPRS : 10	
DTM	not supported	
CHANNEL FREQUENCIES UNDER TEST AND ITS CONDUCTED OUTPUT POWER	Refer to NOTE as below	
MAX. AVERAGE SAR (1g)	**Head**	**Body**
	1.180 mW/g	0.114 mW/g
ANTENNA TYPE	Monopole antenna	
MAX. ANTENNA GAIN	**850MHz:** 0.94dBi	**1900MHz:** 2.02dBi
DATA CABLE	Refer to NOTE as below	
I/O PORTS	Refer to user's manual	
ACCESSORY DEVICES	Battery	

NOTE:

1. The EUT is a Mobile Computer. The test data are separated into following test reports:

	REFERENCE REPORT
SAR test report-247 2.4G WLAN	SA110311C24A R2
SAR test report-247 5G WLAN	
SAR test report-407 5G WLAN	SA110311C24A-1 R2
SAR test report-GSM 850 / WCDMA 850	SA110311C24A-2 R2
SAR test report-GSM 1900 / WCDMA 1900	
RF Exposure (For Bluetooth)	SA110311C24A-3
SAR collocated report	SA110311C24A-4 R2
RF Exposure (For RFID)	SA110311C24A-5 R1

2. The EUT configuration is as below

BRAND	MODEL	DESCRIPTION
Motorola	MC75A6HF	HSDPA BB Numeric Camera

3. The EUT uses the following Li-ion battery:

BATTERY (1.5X)	
BRAND:	MOTOROLA
PART NUMBER:	82-71364-05
RATING:	3.7Vdc, 3600mAh, 13.3Wh

4. The communicated functions of EUT listed as below:

		850MHz	1900MHz	
2G	GSM	√	√	With 802.11a/b/g + Bluetooth+GPS+RFID
	GPRS	√	√	
	E-GPRS	√	√	
3G	WCDMA	√	√	
	Release 5 HSDPA	√	√	

5. The EUT conducted power listed as below: (unit: dBm)

CH	FREQ.	GSM	GPRS 850							
			TS1 CS1	TS1 CS2	TS1 CS3	TS1 CS4	TS2 CS1	TS2 CS2	TS2 CS3	TS2 CS4
128	824.2MHz	32.53	32.52	32.48	32.46	32.40	31.01	30.95	30.93	30.90
190	836.6MHz	32.58	32.57	32.53	32.52	32.50	31.04	30.96	30.96	30.92
251	848.8MHz	32.52	32.47	32.42	32.40	32.39	30.91	30.85	30.84	30.81

CH	FREQ.	E-GPRS 850								
		TS1 MCS1	TS1 MCS2	TS1 MCS3	TS1 MCS4	TS1 MCS5	TS1 MCS6	TS1 MCS7	TS1 MCS8	TS1 MCS9
128	824.2MHz	27.72	27.71	27.70	27.69	27.68	27.68	27.65	27.63	27.61
190	836.6MHz	27.76	27.75	27.75	27.74	27.73	27.73	27.69	27.68	27.67
251	848.8MHz	27.68	27.66	27.65	27.65	27.64	27.64	27.62	27.61	27.60

CH	FREQ.	E-GPRS 850								
		TS2 MCS1	TS2 MCS2	TS2 MCS3	TS2 MCS4	TS2 MCS5	TS2 MCS6	TS2 MCS7	TS2 MCS8	TS2 MCS9
128	824.2MHz	25.72	25.72	25.71	25.70	25.70	25.69	25.69	25.68	25.67
190	836.6MHz	25.75	27.75	25.74	25.73	25.72	25.72	27.72	25.71	25.70
251	848.8MHz	25.66	25.65	25.65	25.64	25.63	25.63	25.62	25.62	25.61

CH	FREQ.	GSM	GPRS 1900							
			TS1 CS1	TS1 CS2	TS1 CS3	TS1 CS4	TS2 CS1	TS2 CS2	TS2 CS3	TS2 CS4
512	1850.2MHz	29.94	29.88	29.86	29.84	29.82	28.38	28.35	28.32	28.30
661	1880.0MHz	30.06	29.99	29.97	29.96	29.91	28.39	28.36	28.34	28.31
810	1909.8MHz	30.01	29.78	29.75	29.74	29.71	28.02	28.00	28.00	27.99

CH	FREQ.	E-GPRS 1900								
		TS1 MCS1	TS1 MCS2	TS1 MCS3	TS1 MCS4	TS1 MCS5	TS1 MCS6	TS1 MCS7	TS1 MCS8	TS1 MCS9
512	1850.2MHz	26.82	26.81	26.81	26.80	26.77	26.76	26.75	26.74	26.72
661	1880.0MHz	26.91	26.90	26.89	26.88	26.88	26.86	26.84	26.82	26.81
810	1909.8MHz	26.75	26.73	26.73	26.72	26.70	26.69	26.68	26.67	26.66

CH	FREQ.	E-GPRS 1900								
		TS2 MCS1	TS2 MCS2	TS2 MCS3	TS2 MCS4	TS2 MCS5	TS2 MCS6	TS2 MCS7	TS2 MCS8	TS2 MCS9
512	1850.2MHz	24.78	24.76	24.74	24.74	24.73	24.72	24.72	24.71	24.71
661	1880.0MHz	24.81	24.78	24.78	24.77	24.76	24.76	24.75	24.74	24.74
810	1909.8MHz	24.53	24.52	24.52	24.51	24.50	24.48	24.47	24.47	24.46

CH	FREQ.	WCDMA850		HSDPA	CH	FREQ.	WCDMA1900		HSDPA
		RMC	AMR				RMC	AMR	
4132	826.4MHz	23.45	23.36	21.22	9262	1852.4	22.96	22.91	21.64
4182	836.4MHz	23.36	23.18	21.18	9400	1880.0	23.02	22.94	21.99
4233	846.6MHz	23.25	23.08	21.15	9538	1907.6	22.89	22.77	21.43

6. The following accessories are for support units only.

PRODUCT	BRAND	MODEL	DESCRIPTION
RS232 charging cable	Motorola	25-102776-02R	1.2m non-shielded cable with one core
USB charging cable	Motorola	25-102775-02R	1.5m shielded cable with one core
Headset	Motorola	50-11300-050R	VR10 headset 0.8m non-shielded cable with one core
Power Supply Adaptor	Motorola	EADP-16BB A	I/P: 100-240Vac, 50-60Hz, 0.4A O/P: 5.4Vdc, 3A 1.8m non-shielded cable without core
Fabric holster	Motorola	SG-MC7521215-01R	Contain metal
Ridged holster	Motorola	SG-MC7011110-02R	Contain metal

7. Hardware version: EV3.
8. Software version: BSP 23.137.
9. IMEI Code: 35528003023976301.
10. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.2 SAR MEASUREMENT CONDITIONS FOR 3G DEVICE

The following procedures were followed according to FCC "SAR Measurement Procedures 3G Devices", Oct. 2007

Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) should be tabulated in the SAR report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations should be clearly identified.

Head SAR Measurements

SAR for head exposure configurations in voice mode is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 kbps AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel

Body SAR Measurements

SAR for body exposure configurations in voice and data modes is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". SAR for other spreading codes and multiple DPDCHn, when supported by the DUT, are not required when the maximum average output of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel with an applicable RMC configuration for the corresponding spreading code or DPDCHn using the exposure configuration that results in the highest SAR with 12.2 kbps RMC. When more than 2 DPDCHn are supported by the DUT, it may be necessary to configure additional DPDCHn for a DUT using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC

Handsets with Release 5 HSDPA

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit.25 Otherwise, SAR is measured for HSDPA, using the *additional* body SAR procedures in the "Release 5 HSDPA Data Devices" section of this document, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel. Handsets with both HSDPA and HSUPA should be tested according to Release 6 HSPA test procedures.

2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to the specifications of the manufacturer, this product must comply with the requirements of the following standards:

FCC 47 CFR Part 2 (2.1093)

FCC OET Bulletin 65, Supplement C (01- 01)

RSS-102 Issue 4 (2010-03)

IEEE 1528-2003

All test items have been performed and recorded as per the above standards.

2.4 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY52 **(Version 52.6)** consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY52 software defined. The DASY52 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

EX3DV4 ISOTROPIC E-FIELD PROBE

CONSTRUCTION	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
FREQUENCY	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
DIRECTIVITY	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
DYNAMIC RANGE	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
DIMENSIONS	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
APPLICATION	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

NOTE

1. The Probe parameters have been calibrated by the SPEAG. Please reference “APPENDIX D” for the Calibration Certification Report.
2. For frequencies above 800MHz, calibration in a rectangular wave-guide is used, because wave-guide size is manageable.
3. For frequencies below 800MHz, temperature transfer calibration is used because the wave-guide size becomes relatively large.

TWIN SAM V4.0

CONSTRUCTION	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
SHELL THICKNESS	2 ± 0.2 mm
FILLING VOLUME	Approx. 25 liters
DIMENSIONS	Height: 810 mm; Length: 1000 mm; Width: 500 mm

SYSTEM VALIDATION KITS:

CONSTRUCTION	Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor
CALIBRATION	Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions
FREQUENCY	835, 1900
RETURN LOSS	> 20 dB at specified validation position
POWER CAPABILITY	> 100 W (f < 1GHz); > 40 W (f > 1GHz)
OPTIONS	Dipoles for other frequencies or solutions and other calibration conditions upon request

DEVICE HOLDER FOR SAM TWIN PHANTOM

CONSTRUCTION The device holder for the GSM900/DCS1800/PCS1900 GSM/GPRS/CDMA Mobile Phone device is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered. The device holder for the portable device makes up of the polyethylene foam. The dielectric parameters of material close to the dielectric parameters of the air.

DATA ACQUISITION ELECTRONICS

CONSTRUCTION The data acquisition electronics (DAE3) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplex, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe is mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.5 TEST EQUIPMENT

FOR SAR MEASURENENT

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	SAM Phantom	S & P	QD000 P40 CA	TP-1485	NA	NA
2	Signal Generator	Anritsu	68247B	984703	May 31, 2010	May 30, 2011
3	E-Field Probe	S & P	EX3DV4	3650	Jan. 24, 2011	Jan. 23, 2012
4	DAE	S & P	DAE	510	Oct. 04, 2010	Oct. 03, 2011
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D835V2	4d021	Apr. 29, 2010	Apr. 28, 2011
			D1900V2	5d022	Jan. 26, 2011	Jan. 25, 2012
7	Power Meter	Agilent	E4416A	GB41291763	Oct. 22, 2010	Oct. 21, 2011
8	Power Sensor	Agilent	E9327A	US40441181	Oct. 21, 2010	Oct. 20, 2011

NOTE: Before starting the measurement, all test equipment shall be warmed up for 30min.

FOR TISSUE PROPERTY

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	Network Analyzer	Agilent	E5071C	MY46104190	Apr. 06, 2010	Apr. 05, 2011
2	Dielectric Probe	Agilent	85070D	US01440176	NA	NA

NOTE:

1. Before starting, all test equipment shall be warmed up for 30min.
2. The tolerance (k=1) specified by Agilent for general dielectric measurements, deriving from inaccuracies in the calibration data, analyzer drift, and random errors, are usually ±2.5% and ±5% for measured permittivity and conductivity, respectively. However, the tolerances for the conductivity is smaller for material with large loss tangents, i.e., less than ±2.5% (k=1). It can be substantially smaller if more accurate methods are applied.

2.6 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

The DASY52 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the micro-volt 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	dcp_i
Device parameters:	- Frequency	F
	- Crest factor	Cf
Media parameters:	- Conductivity	σ
	- Density	ρ

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:

$$V_i = U_i + U_i^2 \bullet \frac{cf}{dcp_i}$$

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:

$$\text{E-fieldprobes: } E_i = \sqrt{\frac{V_1}{Norm_i \cdot ConvF}}$$

$$\text{H-fieldprobes: } H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

V_i	=compensated signal of channel I	(i = x, y, z)
$Norm_i$	=sensor sensitivity of channel i μV/(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):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

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/cm3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid. The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7 x 7 x 7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30 x 30 x 30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume in a 1mm grid (42875 points). In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

2.7 DESCRIPTION OF SUPPORT UNITS

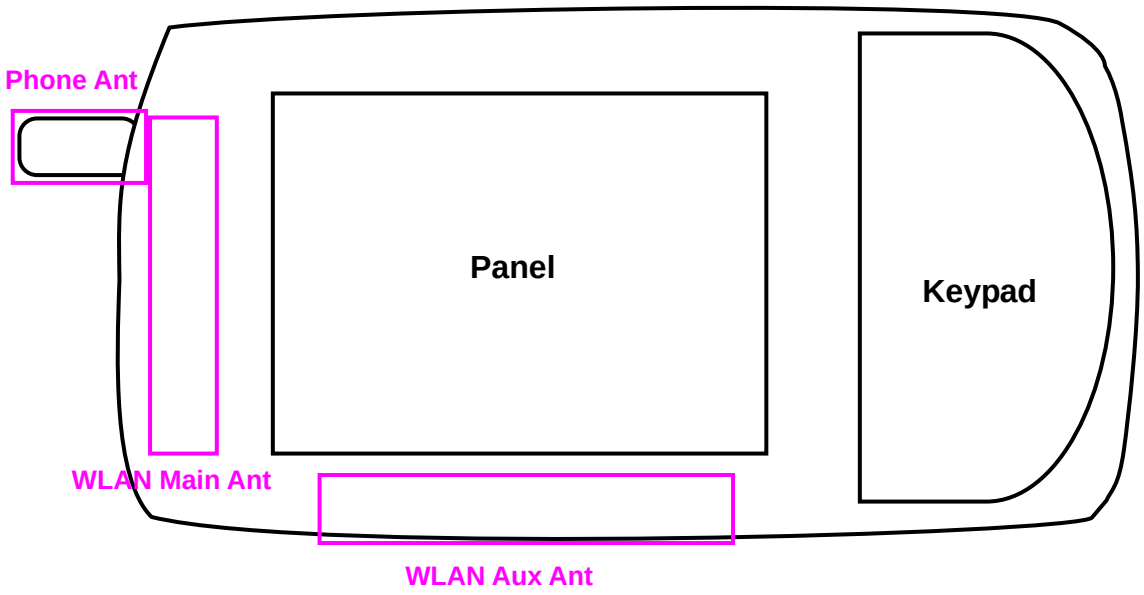
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	Universal Radio Communication Tester	R&S	CMU200	101372

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

3. DESCRIPTION OF ANTENNA LOCATION



4. DESCRIPTION OF TEST POSITION

4.1 DESCRIPTION OF TEST POSITION

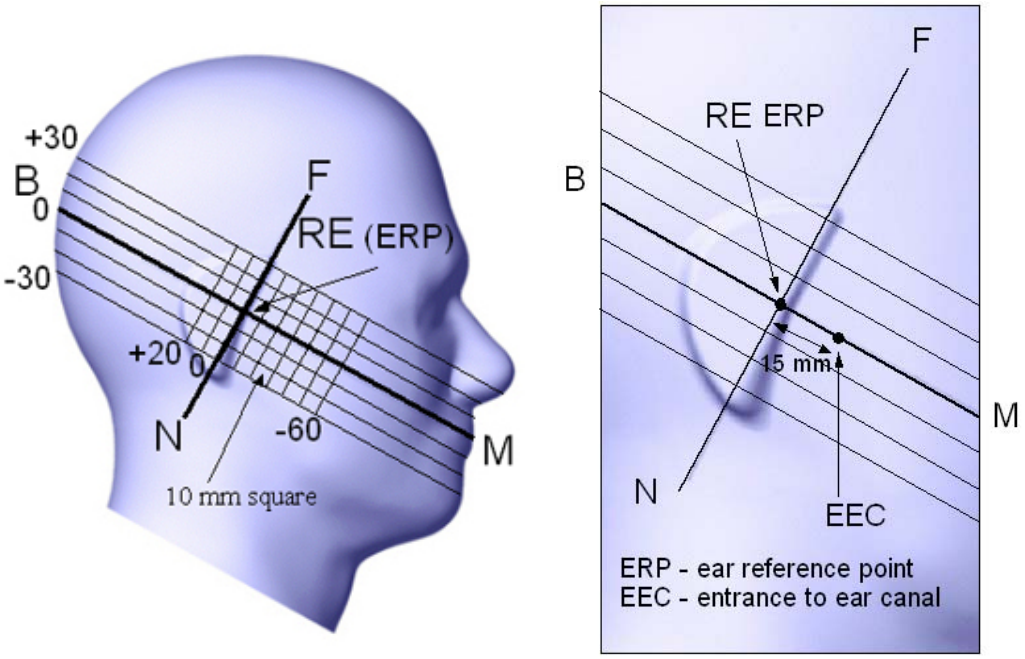


FIGURE 3.1

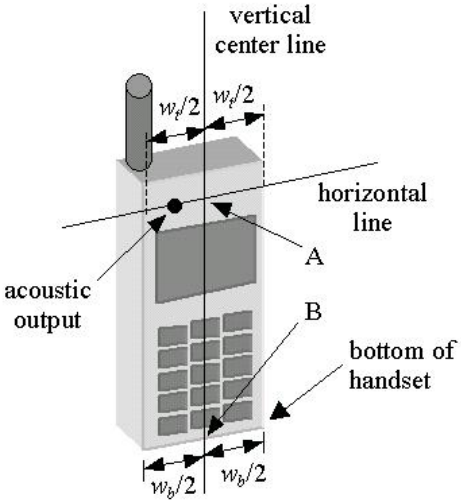


FIGURE 3.1a

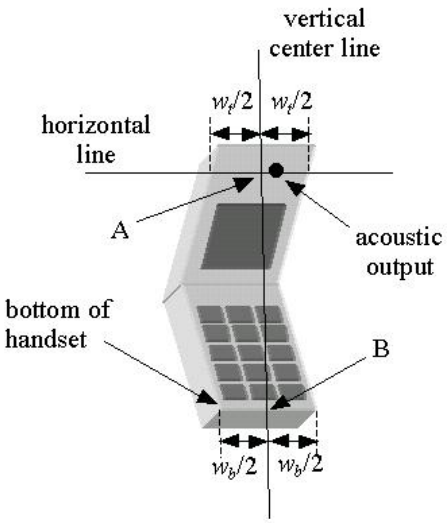
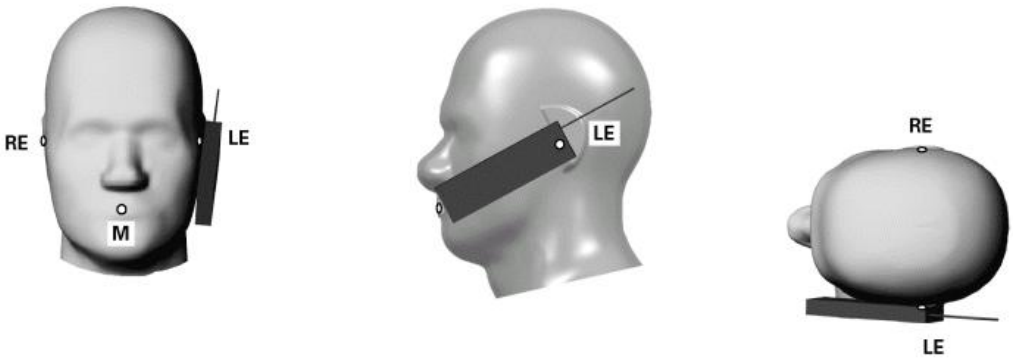


FIGURE 3.1b

4.1.1 TOUCH/CHEEK TEST POSITION

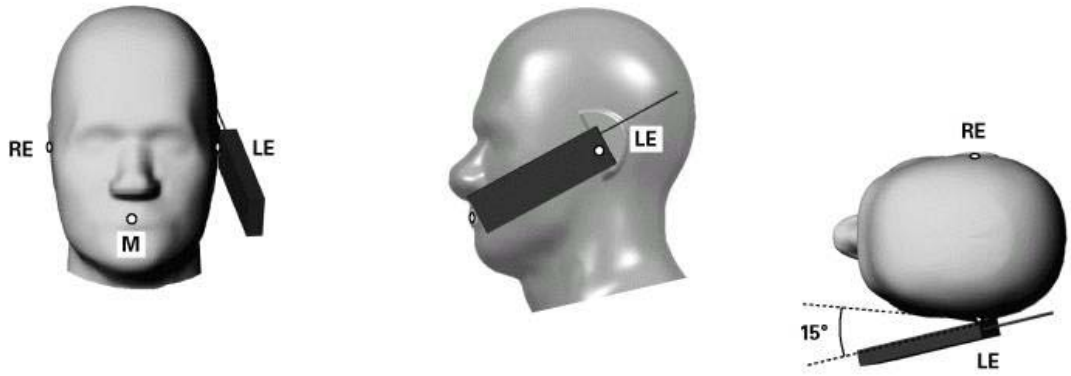
The head position in Figure 3.1, the ear reference points ERP are 15mm above entrance to ear canal along the B-M line. The line N-F (Neck-Front) is perpendicular to the B-M (Back Mouth) line. The handset device in Figure 3.1a and 3.1b,The vertical centerline pass through two points on the front side of handset: the midpoint of the width wt of the handset at the level of the acoustic output (point A) and the midpoint of the width Wb of the bottom of the handset (point B). The vertical centerline is perpendicular to the horizontal line and pass through the center of the acoustic output. The point A touches the ERP and the vertical centerline of the handset is parallel to the B-M line. While maintaining the point A contact with the ear(ERP), rotate the handset about the line NF until any point on handset is in contact with the cheek of the phantom



TOUCH/CHEEK POSITION FIGURE

4.1.2 TILT TEST POSITION

Adjust the device in the cheek position. While maintaining a point of the handset contact in the ear, move the bottom of the handset away from the mouth by an angle of 15 degrees.



TILT POSITION FIGURE

4.1.3 BODY-WORN CONFIGURATION

The handset device attached the belt clip or the holster. The keypad face of the handset is against with the bottom of the flat phantom face and the bottom of the keypad face contact to the bottom of the flat phantom.

When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only accessory that dictates the closest spacing to the body must be tested.

5. RECIPES FOR TISSUE SIMULATING LIQUIDS

For the measurement of the field distribution inside the SAM phantom, the phantom must be filled with 25 litters of tissue simulation liquid.

The following ingredients are used：

- **WATER-** Deionized water (pure H20), resistivity _16 M - as basis for the liquid
- **SUGAR-** Refined sugar in crystals, as available in food shops - to reduce relative permittivity
- **SALT-** Pure NaCl - to increase conductivity
- **CELLULOSE-** Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20_C),

  CAS # 54290 - to increase viscosity and to keep sugar in solution
- **PRESERVATIVE-** Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 - to prevent the spread of bacteria and molds
- **DGMBE-** Diethylenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS # 112-34-5 - to reduce relative permittivity

THE RECIPES FOR 835MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 835MHz (HSL-835)	MUSCLE SIMULATING LIQUID 835MHz (MSL-835)
Water	40.28%	50.07%
Cellulose	02.41%	NA
Salt	01.38%	0.94%
Preventtol D-7	00.18%	0.09%
Sugar	57.97%	48.2%
Dielectric Parameters at 22℃	f = 835MHz ε= 41.5 ± 5% σ= 0.9 ± 5% S/m	f= 835MHz ε= 55.2 ± 5% σ= 0.97 ± 5% S/m

THE RECIPES FOR 1900MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 1900MHz (HSL-1900)	MUSCLE SIMULATING LIQUID 1900MHz (MSL-1900)
Water	55.24%	70.16%
DGMBE	44.45%	29.44%
Salt	0.306%	00.39%
Dielectric Parameters at 22℃	f= 1900MHz ε= 40.0 ± 5% σ= 1.40 ± 5% S/m	f= 1900MHz ε= 53.3 ± 5% σ= 1.52 ± 5% S/m

Testing the liquids using the Agilent Network Analyzer E8358A and Agilent Dielectric Probe Kit 85070D.The testing procedure is following as

1. Turn Network Analyzer on and allow at least 30 min. warm up.
2. Mount dielectric probe kit so that interconnecting cable to Network Analyzer will not be moved during measurements or calibration.
3. Pour de-ionized water and measure water temperature (±1°).
4. Set water temperature in Agilent-Software (Calibration Setup).
5. Perform calibration.
6. Validate calibration with dielectric material of known properties (e.g. polished ceramic slab with >8mm thickness ε'=10.0, ε''=0.0). If measured parameters do not fit within tolerance, repeat calibration (±0.2 for ε': ±0.1 for ε'').
7. Conductivity can be calculated from ε'' by $\sigma = \omega \varepsilon_0 \varepsilon'' = \varepsilon''$ f [GHz] / 18.
8. Measure liquid shortly after calibration. Repeat calibration every hour.
9. Stir the liquid to be measured. Take a sample (~50ml) with a syringe from the center of the liquid container.
10. Pour the liquid into a small glass flask. Hold the syringe at the bottom of the flask to avoid air bubbles.
11. Put the dielectric probe in the glass flask. Check that there are no air bubbles in front of the opening in the dielectric probe kit.
12. Perform measurements.
13. Adjust medium parameters in DASY52 for the frequencies necessary for the measurements (‘Setup Config’, select medium (e.g. Brain 900 MHz) and press ‘Option’-button.

Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900 MHz).

FOR GSM 850 & WCDMA 850 BAND SIMULATING LIQUID

LIQUID TYPE		HSL-835		
SIMULATING LIQUID TEMP.		21.1		
TEST DATE		Mar. 06, 2011		
TESTED BY		Van Lin		
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**
835.0	Permitivity (ε)	41.50	42.97	3.54
836.4		41.50	42.94	3.47
836.6		41.50	42.91	3.40
835.0	Conductivity (σ) S/m	0.90	0.92	2.22
836.4		0.90	0.92	2.22
836.6		0.90	0.92	2.22

LIQUID TYPE		MSL-835		
SIMULATING LIQUID TEMP.		21.0		
TEST DATE		Mar. 15, 2011		
TESTED BY		Van Lin		
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**
835.0	Permitivity (ε)	55.20	56.46	2.28
836.4		55.20	56.43	2.23
836.6		55.20	56.41	2.19
835.0	Conductivity (σ) S/m	0.97	0.98	1.03
836.4		0.97	0.98	1.03
836.6		0.97	0.98	1.03

FOR PCS 1900 & WCDMA 1900 BAND SIMULATING LIQUID

LIQUID TYPE		HSL-1900		
SIMULATING LIQUID TEMP.		21.6		
TEST DATE		Mar. 04, 2011		
TESTED BY		Van Lin		
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**
1852.4	Permitivity (ε)	40.00	41.52	3.80
1880.0		40.00	41.44	3.60
1900.0		40.00	41.32	3.30
1907.6		40.00	41.27	3.18
1852.4	Conductivity (σ) S/m	1.40	1.37	-2.14
1880.0		1.40	1.40	0.00
1900.0		1.40	1.44	2.86
1907.6		1.40	1.45	3.57

LIQUID TYPE		MSL-1900		
SIMULATING LIQUID TEMP.		21.5		
TEST DATE		Mar. 16, 2011		
TESTED BY		Van Lin		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
1880	Permitivity (ε)	53.30	54.76	2.74
1900		53.30	54.65	2.53
1880	Conductivity (σ) S/m	1.52	1.53	0.66
1900		1.52	1.57	3.29

6. SYSTEM VALIDATION

The system validation was performed in the flat phantom with equipment listed in the following table. Since the SAR value is calculated from the measured electric field, dielectric constant and conductivity of the body tissue and the SAR is proportional to the square of the electric field. So, the SAR value will be also proportional to the RF power input to the system validation dipole under the same test environment. In our system validation test, 250mW RF input power was used.

6.1 TEST PROCEDURE

Before you start the system performance check, need only to tell the system with which components (probe, medium, and device) are performing the system performance check; the system will take care of all parameters. The dipole must be placed beneath the flat phantom section of the SAM Twin Phantom with the correct distance holder in place. The distance holder should touch the phantom surface with a light pressure at the reference marking (little cross) and be oriented parallel to the long side of the phantom. Accurate positioning is not necessary, since the system will search for the peak SAR location, except that the dipole arms should be parallel to the surface. The device holder for the EUT can be left in place but should be rotated away from the dipole.

1.The ”Power Reference Measurement” and ”Power Drift Measurement” jobs 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 amplifier output power. If it is too high (above ±0.1 dB), the system performance check should be repeated; some amplifiers have very high drift during warm-up. A stable amplifier gives drift results in the DASY system below ±0.02 dB.

2.The ”Surface Check” job 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). In that case it is better to abort the system performance check and stir the liquid.

3. The ”Area Scan” job measures the SAR above the dipole on a plane parallel to the surface. It is used to locate the approximate location of the peak SAR. The proposed scan uses large grid spacing for faster measurement; due to the symmetric field, the peak detection is reliable. If a finer graphic is desired, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result.

4. The ”Zoom Scan” job measures the field in a volume around the peak SAR value assessed in the previous ”Area Scan” job (for more information see the application note on SAR evaluation).

About the validation dipole positioning uncertainty, the constant and low loss dielectric spacer is used to establish the correct distance between the top surface of the dipole and the bottom surface of the phantom, the error component introduced by the uncertainty of the distance between the liquid (i.e., phantom shell) and the validation dipole in the DASY52 system is less than ±0.1mm.

$$SAR_{tolerance}[\%] = 100 \times (\frac{(a+d)^2}{a^2} - 1)$$

As the closest distance is 10mm, the resulting tolerance $SAR_{tolerance}$[%] is <2%.

6.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	**REQUIRED SAR (mW/g)**	**MEASURED SAR (mW/g)**	**DEVIATION (%)**	**SEPARATION DISTANCE**	**TESTED DATE**
HSL 835	2.37 (1g)	2.41	1.69	15mm	Mar. 06, 2011
MSL 835	2.52 (1g)	2.35	-6.75	15mm	Mar. 15, 2011
HSL 1900	10.40 (1g)	10.42	0.19	10mm	Mar. 04, 2011
MSL 1900	10.40 (1g)	10.20	-1.92	10mm	Mar. 16, 2011
TESTED BY	Van Lin				

NOTE: Please see Appendix for the photo of system validation test.

6.3 SYSTEM VALIDATION UNCERTAINTIES

In the table below, the system validation uncertainty with respect to the analytically assessed SAR value of a dipole source as given in the IEEE 1528 standard is given. This uncertainty is smaller than the expected uncertainty for mobile phone measurements due to the simplified setup and the symmetric field distribution.

Error Description	Tolerance (±%)	Probability Distribution	Divisor	(C_i)		Standard Uncertainty (±%)		(v_i)
				(1g)	(10g)	(1g)	(10g)	
Measurement System								
Probe Calibration	5.50	Normal	1	1	1	5.50	5.50	∞
Axial Isotropy	0.25	Rectangular	√3	0.7	0.7	0.10	0.10	∞
Hemispherical Isotropy	1.30	Rectangular	√3	0.7	0.7	0.53	0.53	∞
Boundary effects	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Linearity	0.30	Rectangular	√3	1	1	0.17	0.17	∞
System Detection Limits	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	√3	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	√3	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	√3	1	1	1.73	1.73	9
RF Ambient Reflections	3.00	Rectangular	√3	1	1	1.73	1.73	9
Probe Positioner	0.40	Rectangular	√3	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	√3	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Test sample related								
Sample positioning	1.90	Normal	1	1	1	1.90	1.90	4
Device holder uncertainty	2.80	Normal	1	1	1	2.80	2.80	4
Output power variation-SAR drift measurement	4.50	Rectangular	√3	1	1	2.60	2.60	1
Dipole Related								
Dipole Axis to Liquid Distance	1.60	Rectangular	√3	1	1	0.92	0.92	4
Input Power Drift	3.99	Rectangular	√3	1	1	2.30	2.30	1
Phantom and Tissue parameters								
Phantom Uncertainty	4.00	Rectangular	√3	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	√3	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	3.57	Normal	1	0.64	0.43	2.28	1.54	9
Liquid Permittivity (target)	5.00	Rectangular	√3	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	3.80	Normal	1	0.6	0.49	2.28	1.86	9
Combined Standard Uncertainty						**9.46**	**9.06**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**18.92**	**18.12**	

7. TEST RESULTS

7.1 TEST PROCEDURES

The EUT (Mobile Computer) makes a phone call to the communication simulator station. Establish the simulation communication configuration rather the actual communication. Then the EUT could continuous the transmission mode. Adjust the PCL of the base station could controlled the EUT to transmitted the maximum output power. The base station also could control the transmission channel. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY52 SAR measurement system manufactured and calibrated by SPEAG.
According to the IEEE 1528 / EN 50361, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- Power reference measurement
- Verification of the power reference measurement
- Area scan
- Zoom scan
- Power reference measurement

The area scan with 15mm x 15mm grid was performed for the highest spatial SAR location. Consist of 11 x 13 points while the scan size is the 150mm x 180mm. The zoom scan was performed for SAR value averaged over 1g and 10g spatial volumes.

In the zoom scan, the distance between the measurement point at the probe sensor location (geometric center behind the probe tip) and the phantom surface is 4.0 mm and maintained at a constant distance of ±1.0 mm during a zoom scan to determine peak SAR locations. The distance is 2mm between the first measurement point and the bottom surface of the phantom.

The measurement time is 0.5 s at each point of the zoom scan. The probe boundary effect compensation shall be applied during the SAR test. Because of the tip of the probe to the Phantom surface separated distances are longer than half a tip probe diameter.

In the area scan, the separation distance is 2mm between the each measurement point and the phantom surface. The scan size shall be included the transmission portion of the EUT. The measurement time is the same as the zoom scan. At last the reference power drift shall be less than ±5%.

7.2 DESCRIPTION OF TEST CONDITION

TEST DATE	TEMPERATURE(°C)		HUMIDITY(%RH)	TESTED BY
	AIMBENT	LIQUID		
Mar. 06, 2011	22.1	21.1	60	Van Lin
Mar. 15, 2011	22.3	21.0	59	Van Lin
Mar. 04, 2011	22.5	21.6	61	Van Lin
Mar. 16, 2011	22.6	21.5	59	Van Lin

7.3 MEASURED SAR RESULTS

HEAD POSITION

Configuration: Barcode reader: BB Imager, 1.5x Battery

Stand-alone SAR (1g)					
HEAD		RIGHT		LEFT	
CHAN.	FREQ. (MHz)	CHEEK	TILT	CHEEK	TILT
GSM 850					
190	836.6	0.393	0.371	0.427	0.427
WCDMA 850					
4182	836.4	0.441	0.437	0.504	0.567
PCS 1900					
661	1880	0.293	0.363	0.461	0.546
WCDMA 1900					
9262	1852.4			0.904	1.13
9400	1880	0.578	0.752	1.09	**1.18**
9538	1907.6			0.824	1.08

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over **1g, 1.6W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. Temperature of Liquid is 22±1°C

BODY POSITION

Configuration:
Front: Barcode reader: BB Imager, 1.5x Battery, Ridged holster, Headset
Bottom: Barcode reader: BB Imager, 1.5x Battery, Fabric holster, Headset

Stand-alone SAR (1g)			
EUT with Holster		Body 0mm	
CHAN.	FREQ. (MHz)	Bottom	Front
GSM 850			
190	836.6	0.055	0.070
GPRS 850 TS1 CS1			
190	836.6	0.052	0.067
GPRS 850 TS2 CS1			
190	836.6	0.074	0.095
E-GPRS 850 TS1 MCS1			
190	836.6	0.025	0.024
E-GPRS 850 TS2 MCS1			
190	836.6	0.049	0.049
PCS 1900			
661	1880	0.033	0.038
GPRS 1900 TS1 CS1			
661	1880	0.032	0.037
GPRS 1900 TS2 CS1			
661	1880	0.046	0.055
E-GPRS 1900 TS1 MCS1			
661	1880	0.023	0.028
E-GPRS 1900 TS2 MCS1			
661	1880	0.045	0.057
WCDMA 850			
4182	836.4	0.081	0.107
WCDMA 1900			
9400	1880	0.097	0.114

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over **1g, 1.6W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. Temperature of Liquid is 22±1°C

7.4 POWER DRIFT TABLE

Test Mode	Test Position	Communication Mode	Test Channel	Test Frequency (MHz)	Power (dBm)		Power Drift (%)
					Begin	After	
1	Right Head Cheek	GSM850	190	836.6	32.58	32.47	-2.50
2	Right Head Tilt	GSM850	190	836.6	32.58	32.46	-2.73
3	Left Head Cheek	GSM850	190	836.6	32.58	32.45	-2.95
4	Left Head Tilt	GSM850	190	836.6	32.58	32.44	-3.17
5	Body Bottom	GSM850	190	836.6	32.58	32.43	-3.39
6	Body Bottom	GPRS850 TS1 CS1	190	836.6	32.57	32.41	-3.62
7	Body Bottom	GPRS850 TS2 CS1	190	836.6	31.04	30.87	-3.84
8	Body Bottom	E-GPRS850 TS1 MCS1	190	836.6	27.76	27.58	-4.06
9	Body Bottom	E-GPRS850 TS2 MCS1	190	836.6	25.75	25.56	-4.28
10	Body Front	GSM850	190	836.6	32.58	32.38	-4.50
11	Body Front	GPRS850 TS1 CS1	190	836.6	32.57	32.55	-0.46
12	Body Front	GPRS850 TS2 CS1	190	836.6	31.04	31.01	-0.69
13	Body Front	E-GPRS850 TS1 MCS1	190	836.6	27.76	27.72	-0.92
14	Body Front	E-GPRS850 TS2 MCS1	190	836.6	25.75	25.70	-1.14
15	Right Head Cheek	PCS1900	661	1880	30.06	30.00	-1.37
16	Right Head Tilt	PCS1900	661	1880	30.06	29.99	-1.60
17	Left Head Cheek	PCS1900	661	1880	30.06	29.98	-1.83
18	Left Head Tilt	PCS1900	661	1880	30.06	29.97	-2.05
19	Body Bottom	PCS1900	661	1880	30.06	29.96	-2.28
20	Body Bottom	GPRS1900 TS1 CS1	661	1880	29.99	29.87	-2.73
21	Body Bottom	GPRS1900 TS2 CS1	661	1880	28.39	28.26	-2.95
22	Body Bottom	E-GPRS1900 TS1 MCS1	661	1880	26.91	26.77	-3.17
23	Body Bottom	E-GPRS1900 TS2 MCS1	661	1880	24.81	24.66	-3.39
24	Body Front	PCS1900	661	1880	30.06	29.90	-3.62
25	Body Front	GPRS1900 TS1 CS1	661	1880	29.99	29.82	-3.84
26	Body Front	GPRS1900 TS2 CS1	661	1880	28.39	28.21	-4.06
27	Body Front	E-GPRS1900 TS1 MCS1	661	1880	26.91	26.72	-4.28
28	Body Front	E-GPRS1900 TS2 MCS1	661	1880	24.81	24.61	-4.50

Test Mode	Test Position	Communication Mode	Test Channel	Test Frequency (MHz)	Power (dBm)		Power Drift (%)
					Begin	After	
29	Right Head Cheek	WCDMA850	4182	836.4	23.36	23.33	-0.69
30	Right Head Tilt	WCDMA850	4182	836.4	23.36	23.32	-0.92
31	Left Head Cheek	WCDMA850	4182	836.4	23.36	23.31	-1.14
32	Left Head Tilt	WCDMA850	4182	836.4	23.36	23.30	-1.37
33	Body Bottom	WCDMA850	4182	836.4	23.36	23.29	-1.60
34	Body Front	WCDMA850	4182	836.4	23.36	23.28	-1.83
35	Right Head Cheek	WCDMA1900	9400	1880	23.02	22.93	-2.05
36	Right Head Tilt	WCDMA1900	9400	1880	23.02	22.92	-2.28
37	Left Head Cheek	WCDMA1900	9262	1852.4	22.98	22.86	-2.73
		WCDMA1900	9400	1880	23.02	22.89	-2.95
		WCDMA1900	9538	1907.6	22.89	22.75	-3.17
38	Left Head Tilt	WCDMA1900	9262	1852.4	22.98	22.83	-3.39
		WCDMA1900	9400	1880	23.02	22.86	-3.62
		WCDMA1900	9538	1907.6	22.89	22.72	-3.84
39	Body Bottom	WCDMA1900	9400	1880	23.02	22.84	-4.06
40	Body Front	WCDMA1900	9400	1880	23.02	22.82	-4.50

7.5 SAR LIMITS

HUMAN EXPOSURE	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / controlled Exposure Environment)
Spatial Average (whole body)	0.08	0.4
Spatial Peak (averaged over 1 g)	**1.6**	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

NOTE: This limits accord to 47 CFR 2.1093 – Safety Limit.

8. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

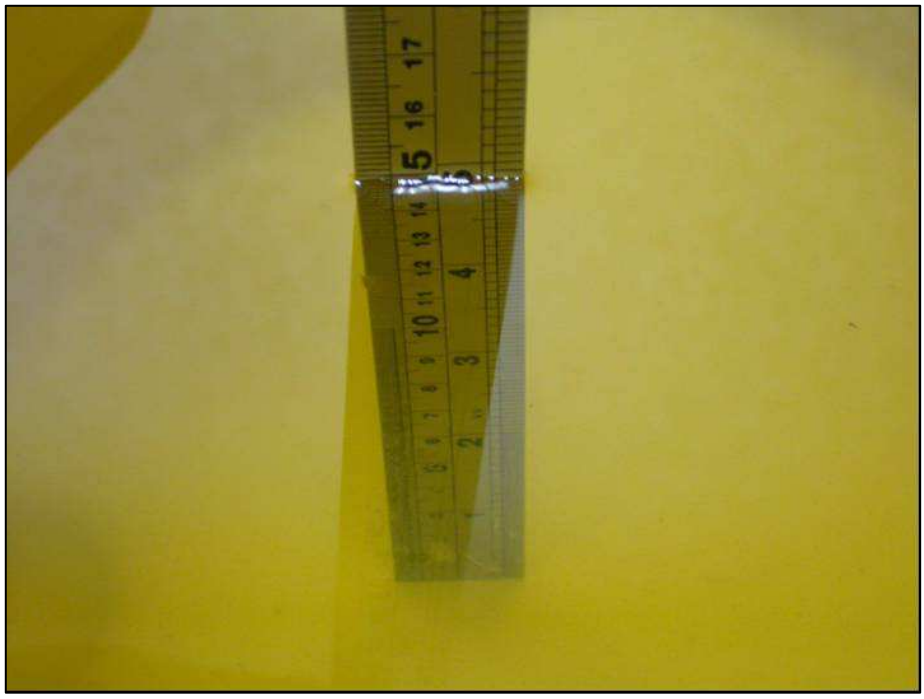
The address and road map of all our labs can be found in our web site also.

APPENDIX A: TEST DATA

Product Name: Mobile Computer; Model Number: MC75A6HF

Liquid Level Photo

Tissue 835MHz D=150mm



Tissue 1900MHz D=150mm

Date/Time: 2011/3/6 12:29:18

M01-Right Head-Cheek-GSM850-Ch190

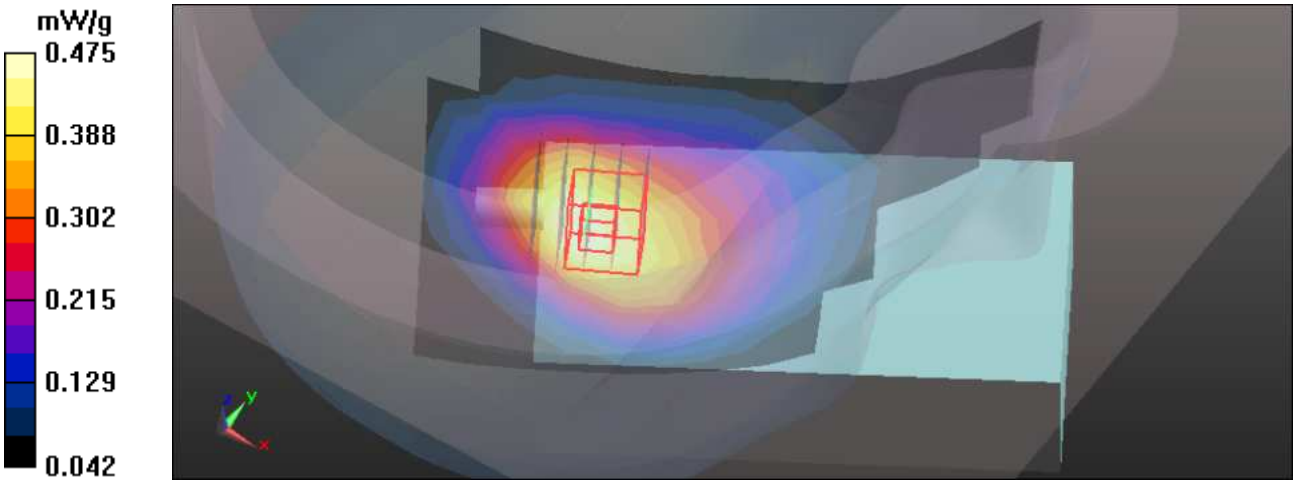
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used: f = 836.6 MHz; σ = 0.92 mho/m; ε_r = 42.91; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.467 mW/g

Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.917 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.552 W/kg
SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.282 mW/g
Maximum value of SAR (measured) = 0.475 mW/g



Date/Time: 2011/3/6 12:48:56

M02-Right Head-Tilt-GSM850-Ch190

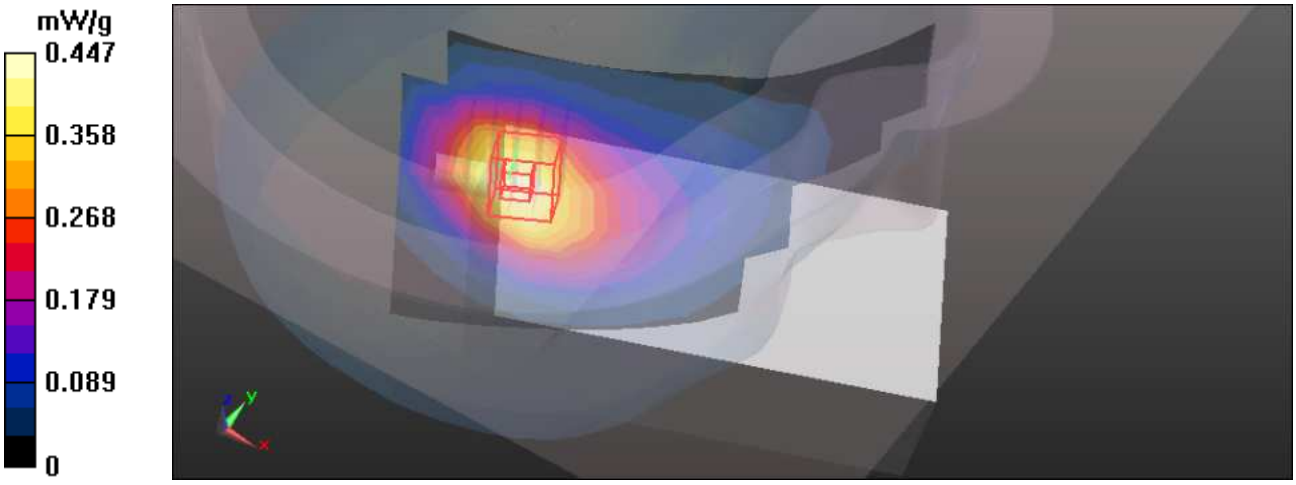
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used: f = 836.6 MHz; σ = 0.92 mho/m; εr = 42.91; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.447 mW/g

Right-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.125 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.547 W/kg
SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.463 mW/g



Date/Time: 2011/3/6 13:10:47

M03-Left Head-Cheek-GSM850-Ch190

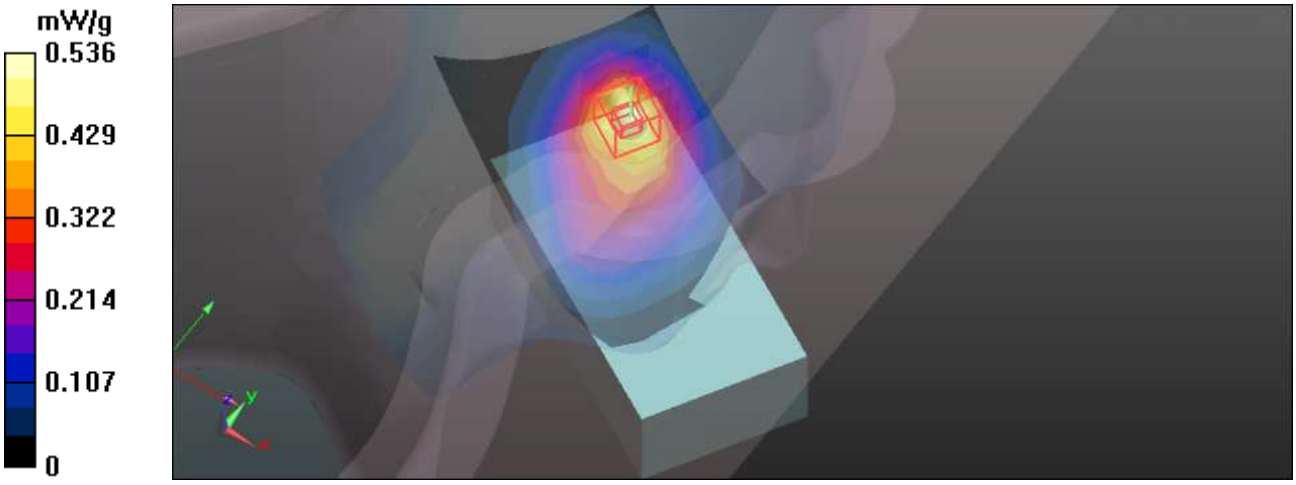
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used: f = 836.6 MHz; σ = 0.92 mho/m; εr = 42.91; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.536 mW/g

Left-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.417 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.663 W/kg
SAR(1 g) = 0.427 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.542 mW/g



Date/Time: 2011/3/6 13:29:49

M04-Left Head-Tilt-GSM850-Ch190

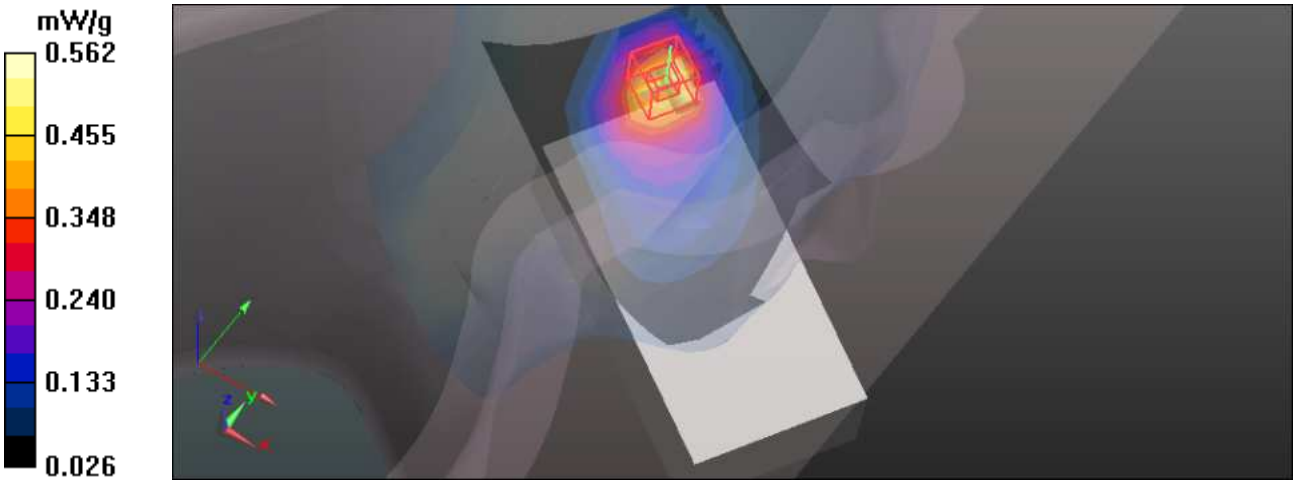
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used: f = 836.6 MHz; σ = 0.92 mho/m; εr = 42.91; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.502 mW/g

Left-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.090 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.683 W/kg
SAR(1 g) = 0.427 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 0.562 mW/g



Date/Time: 2011/3/15 02:51:30

M05-Body-Bottom-GSM850-Ch190

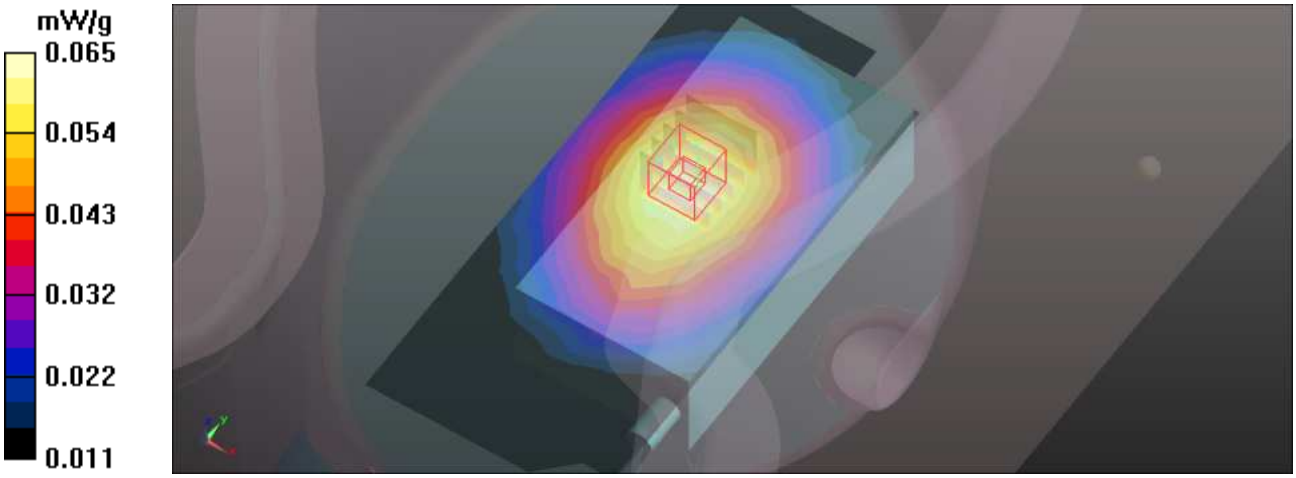
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.063 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.830 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.072 W/kg
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.042 mW/g
Maximum value of SAR (measured) = 0.065 mW/g



Date/Time: 2011/3/15 03:23:11

M06-Body-Bottom-GPRS850 T1-Ch190

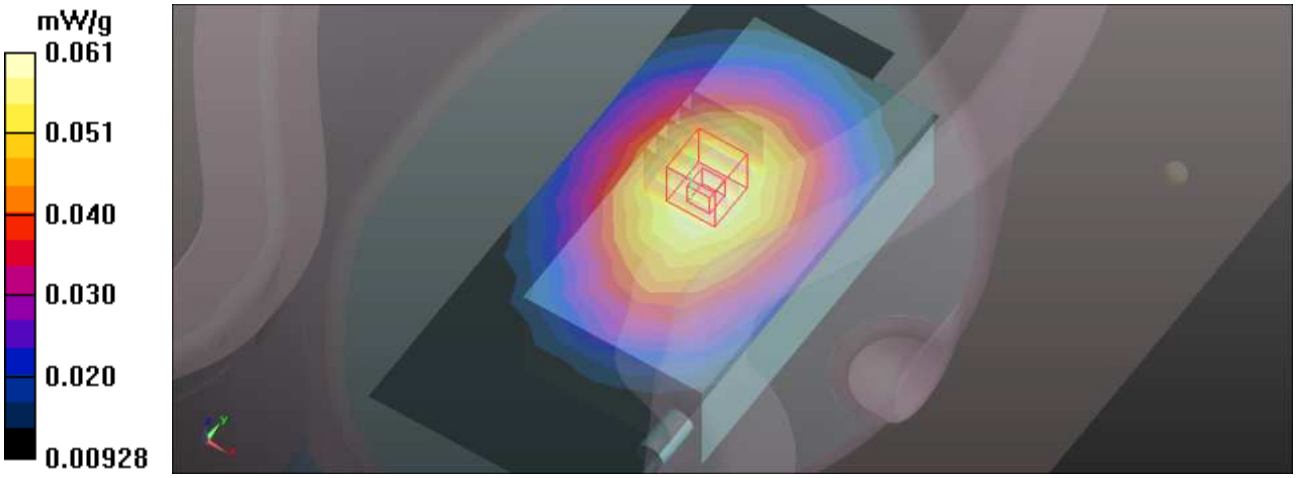
Communication System: GPRS850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK / UL 1 time slot
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.060 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.459 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.068 W/kg
SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.061 mW/g



Date/Time: 2011/3/15 03:56:14

M07-Body-Bottom-GPRS850 T2-Ch190

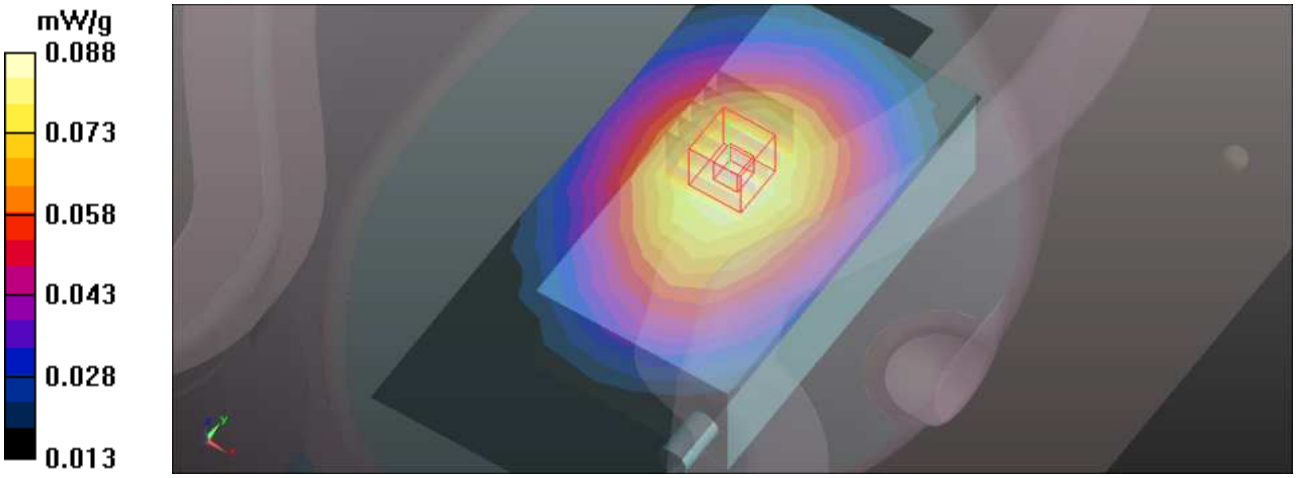
Communication System: GPRS850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.085 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.902 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.099 W/kg
SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.055 mW/g
Maximum value of SAR (measured) = 0.088 mW/g



Date/Time: 2011/3/15 06:42:51

M08-Body-E-GPRS850 T1-Ch190

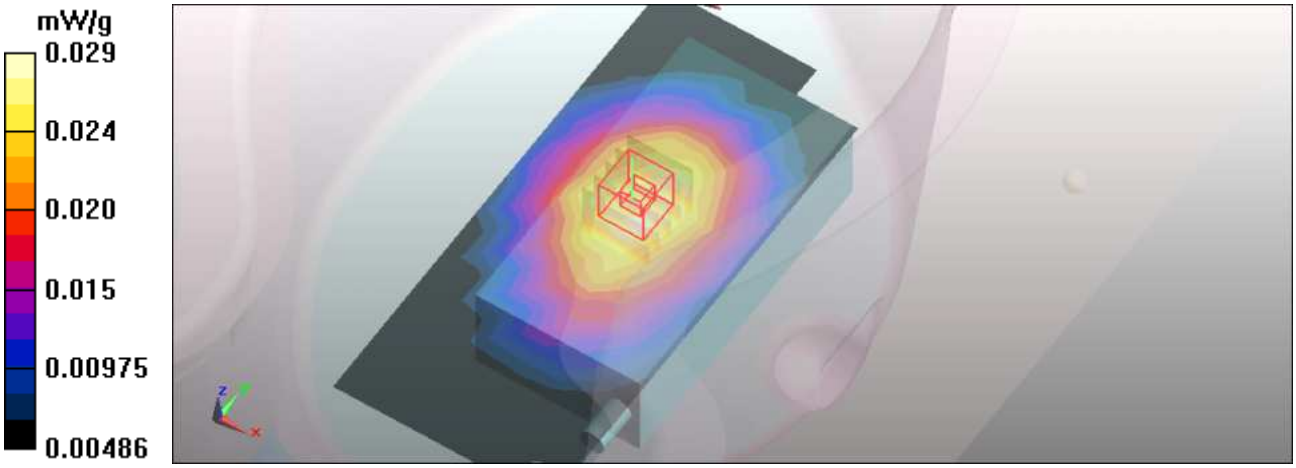
Communication System: E-GPRS850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: 8PSK / UL 1 time slot
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.029 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.17 V/m; Power Drift = 0.00659 dB
Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.019 mW/g



Date/Time: 2011/3/15 07:04:45

M09-Body-E-GPRS850 T2-Ch190

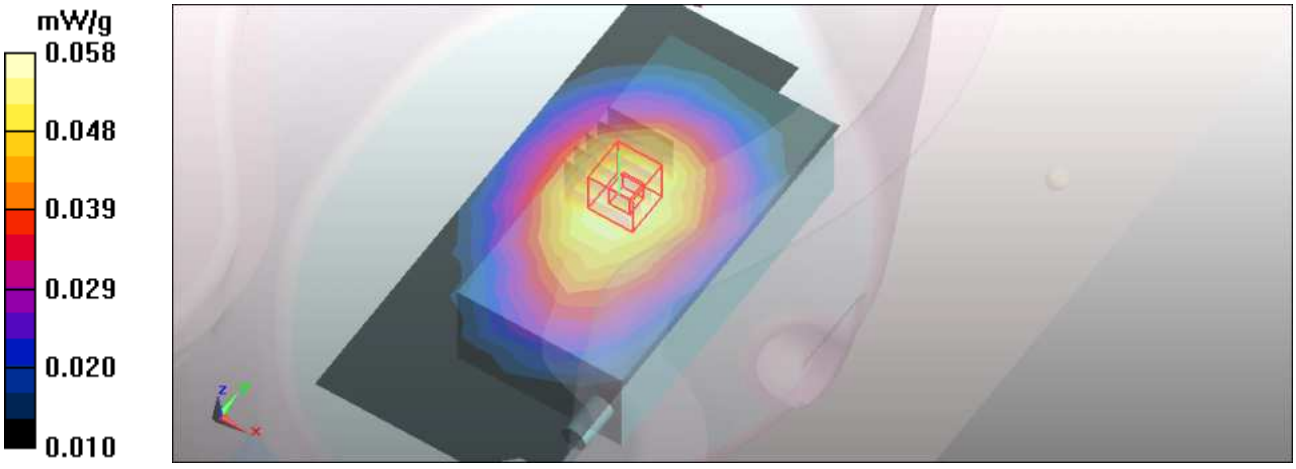
Communication System: E-GPRS 850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:4 ; Modulation type: 8PSK / UL 2 time slots
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.056 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.37 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.065 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.037 mW/g
Maximum value of SAR (measured) = 0.058 mW/g



Date/Time: 2011/3/15 04:24:06

M10-Body-Front-GSM850-Ch190

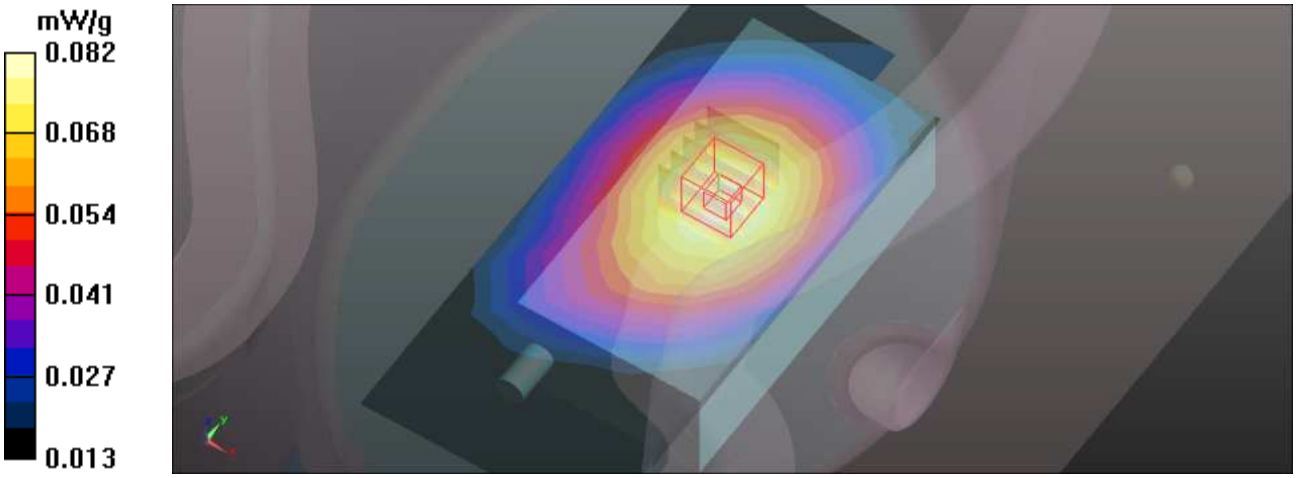
Communication System: GSM850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.080 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.493 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.090 W/kg
SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.053 mW/g
Maximum value of SAR (measured) = 0.082 mW/g



Date/Time: 2011/3/15 04:50:09

M11-Body-Front-GPRS850 T1-Ch190

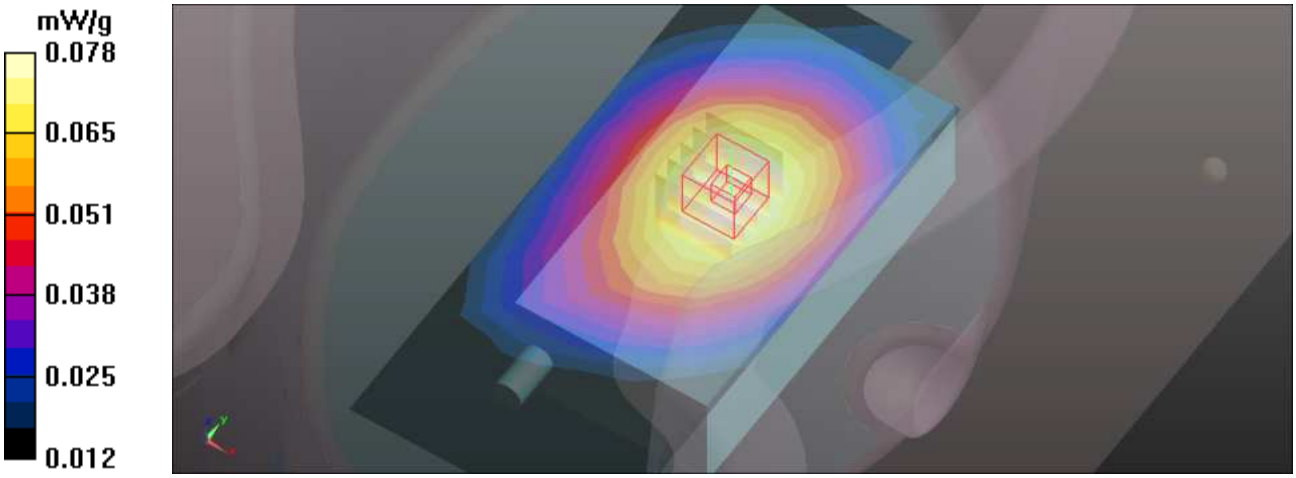
Communication System: GPRS850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK / UL 1 time slot
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.076 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.449 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.087 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.078 mW/g



Date/Time: 2011/3/15 05:14:45

M12-Body-Front-GPRS850 T2-Ch190

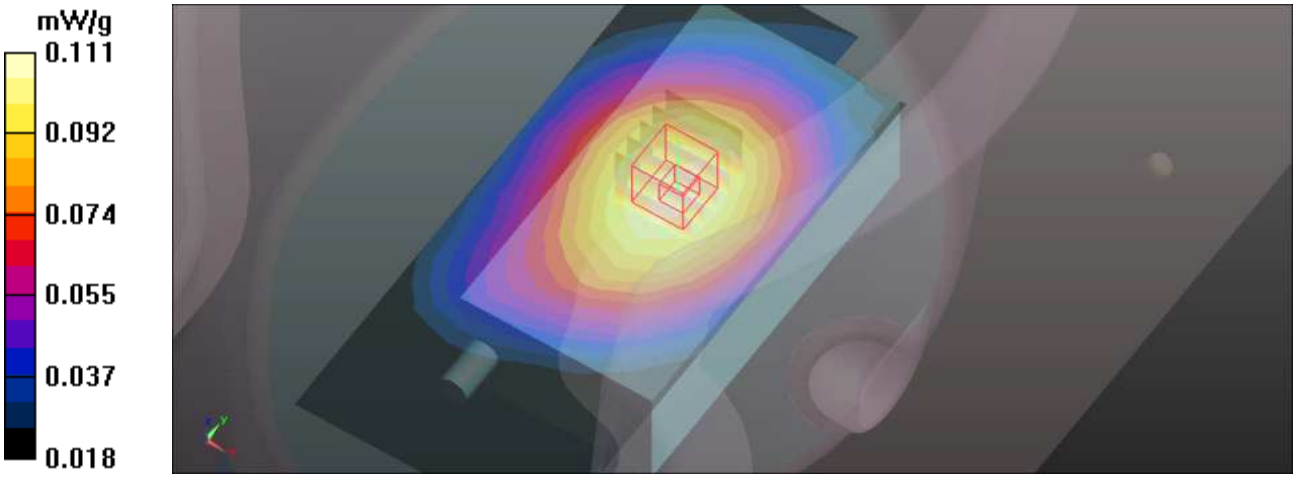
Communication System: GPRS850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.110 mW/g

Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.920 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.123 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.071 mW/g
Maximum value of SAR (measured) = 0.111 mW/g



Date/Time: 2011/3/15 07:36:35

M13-Body-Front-E-GPRS850 T1-Ch190

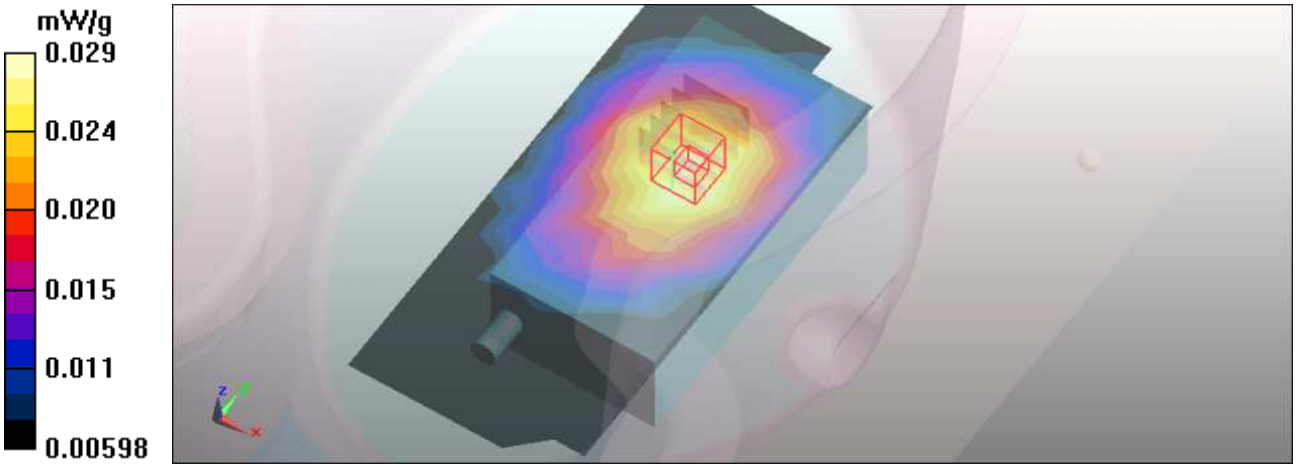
Communication System: E-GPRS 850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: 8PSK / UL 1 time slot
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.029 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.89 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.031 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.019 mW/g



Date/Time: 2011/3/15 07:57:59

M14-Body-Front-E-GPRS850 T2-Ch190

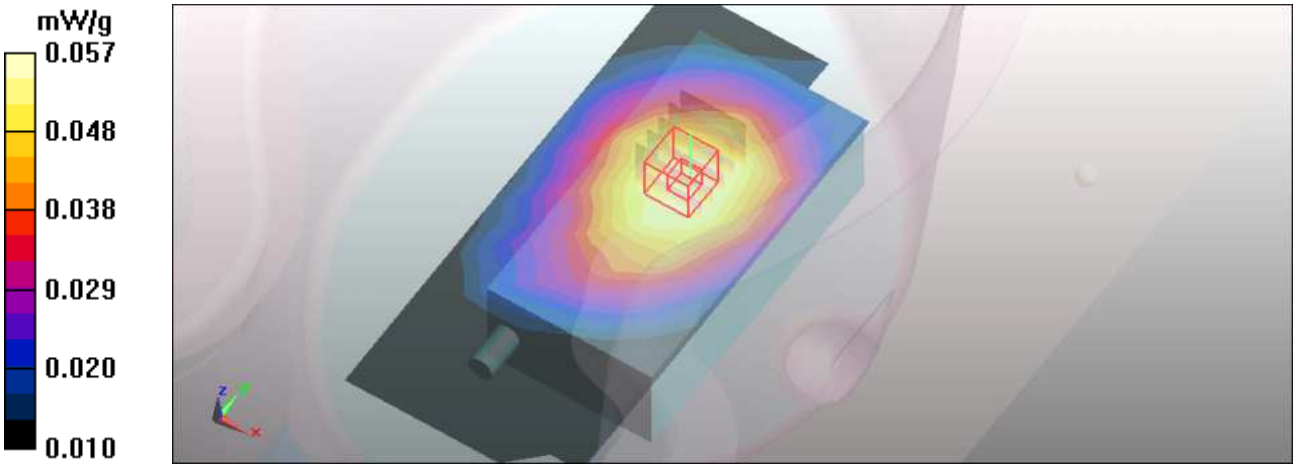
Communication System: E-GPRS 850 ; Frequency: 836.6 MHz ; Duty Cycle: 1:4 ; Modulation type: 8PSK / UL 2 time slots
Medium: MSL850 Medium parameters used: f = 836.6 MHz; σ = 0.98 mho/m; εr = 56.41; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.057 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.98 V/m; Power Drift = -0.096 dB
Peak SAR (extrapolated) = 0.064 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.038 mW/g



Date/Time: 2011/3/4 21:40:28

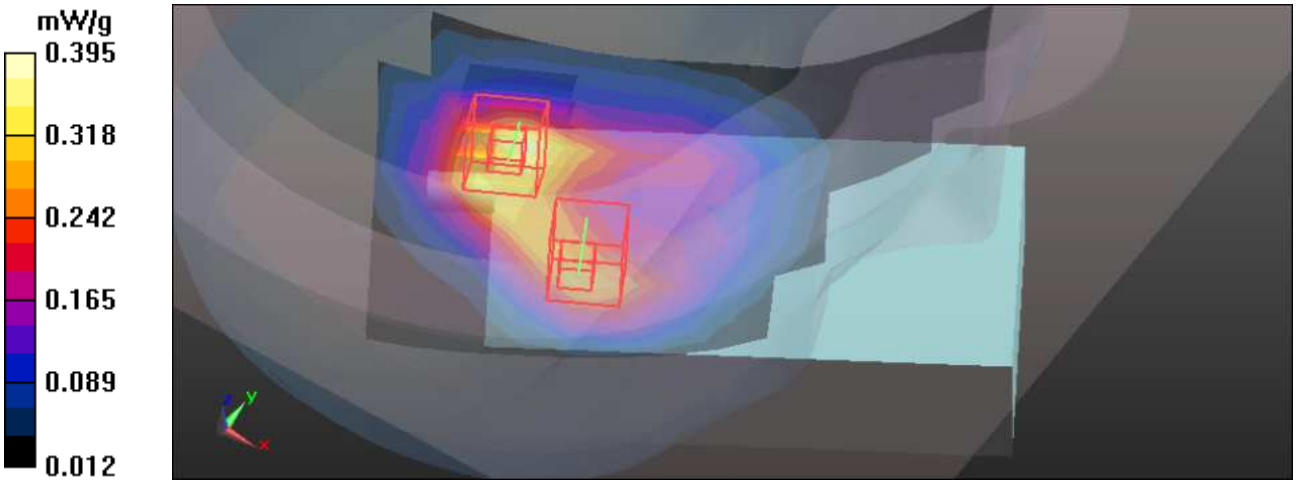
M15-Right Head-Cheek-PCS1900-Ch661

Communication System: PCS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.365 mW/g
Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.295 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.499 W/kg
SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.167 mW/g
Maximum value of SAR (measured) = 0.395 mW/g
Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.295 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.225 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.283 mW/g



Date/Time: 2011/3/4 21:59:00

M16-Right Head-Tilt-PCS1900-Ch661

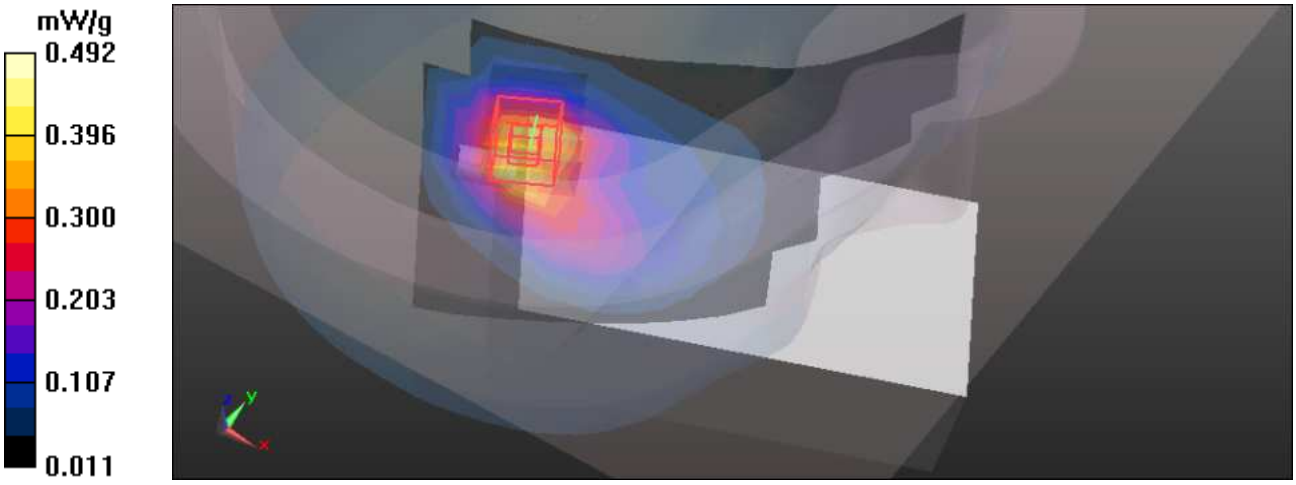
Communication System: PCS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.412 mW/g

Right-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.201 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.614 W/kg
SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.206 mW/g
Maximum value of SAR (measured) = 0.492 mW/g



Date/Time: 2011/3/4 22:20:45

M17-Left Head-Cheek-PCS1900-Ch661

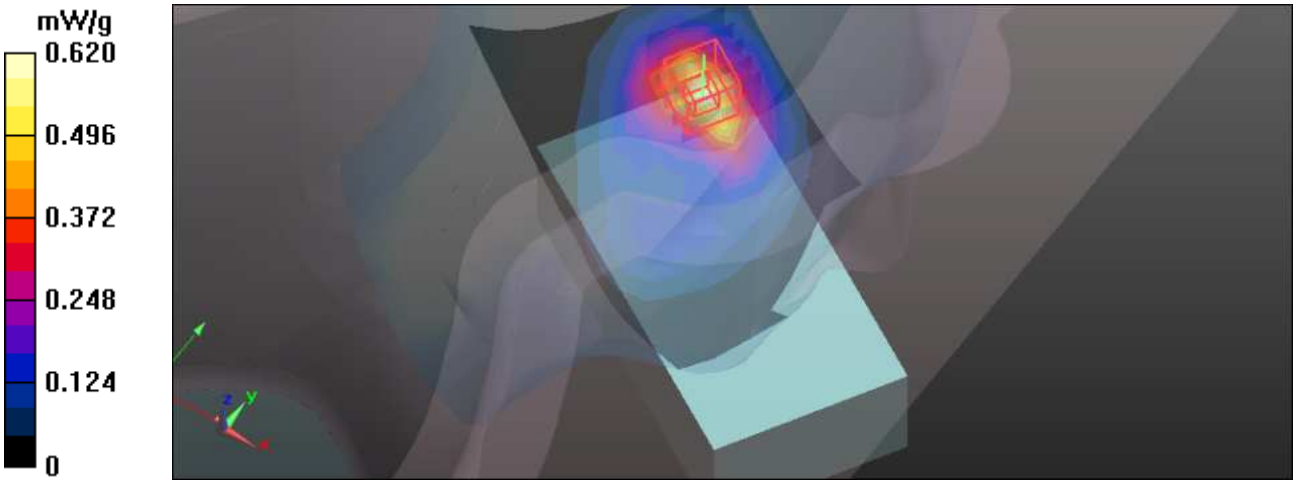
Communication System: PCS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.620 mW/g

Left-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.988 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.780 W/kg
SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.619 mW/g



Date/Time: 2011/3/4 22:39:40

M18-Left Head-Tilt-PCS1900-Ch661

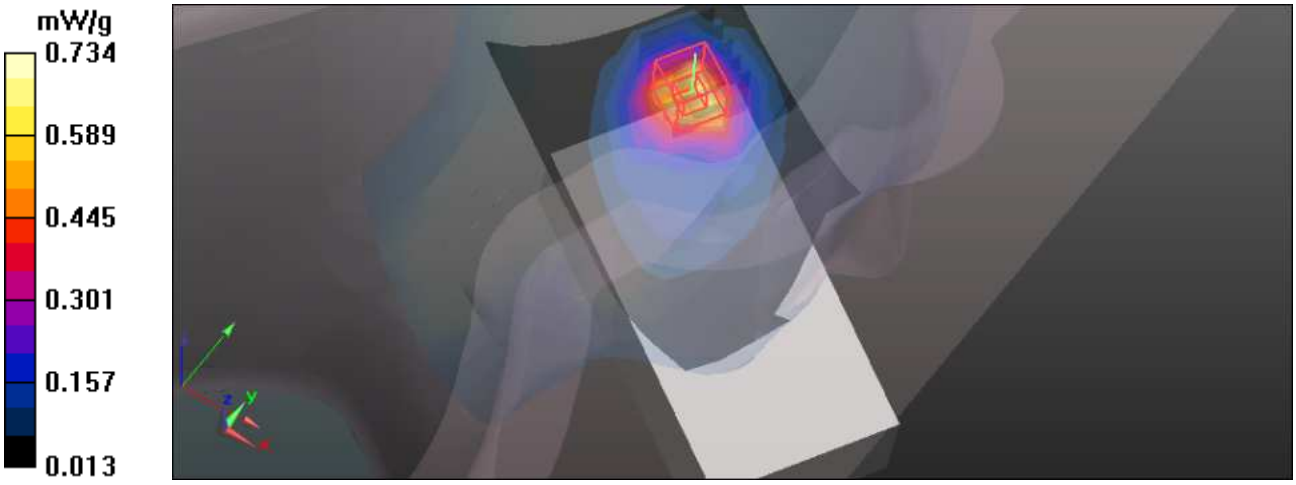
Communication System: PCS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.625 mW/g

Left-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.277 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.938 W/kg
SAR(1 g) = 0.546 mW/g; SAR(10 g) = 0.308 mW/g
Maximum value of SAR (measured) = 0.734 mW/g



Date/Time: 2011/3/16 06:49:38

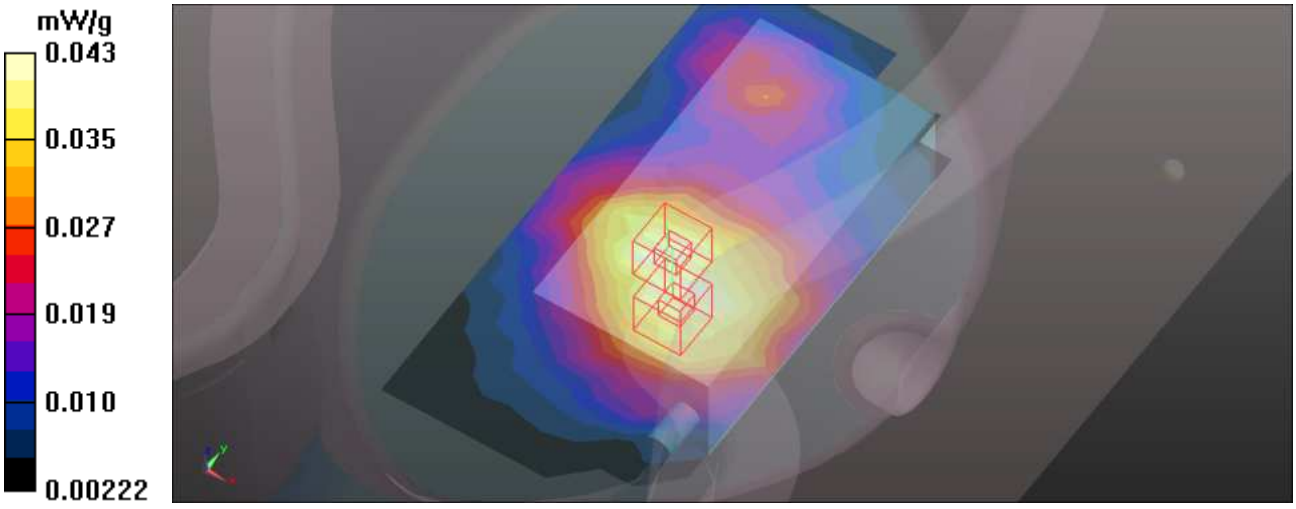
M19-Body-Bottom-PCS1900-Ch661

Communication System: PCS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: GMSK
Separation Distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.041 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.24 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.022 mW/g
Maximum value of SAR (measured) = 0.043 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.24 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.020 mW/g
Maximum value of SAR (measured) = 0.042 mW/g



Date/Time: 2011/3/16 07:20:25

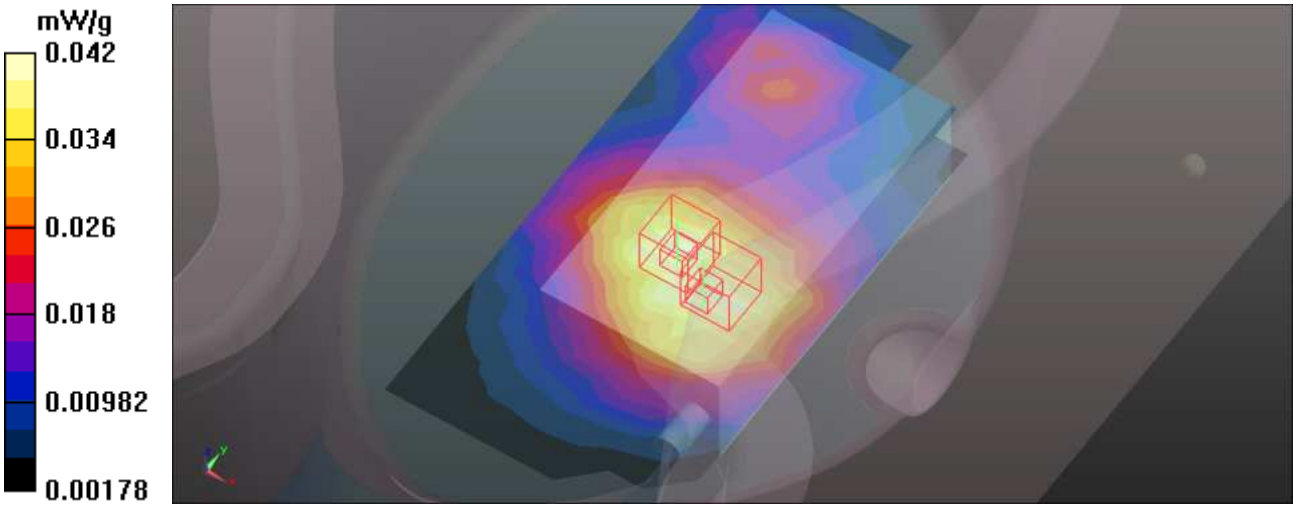
M20-Body-Bottom-GPRS1900 TS1-Ch661

Communication System: GPRS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: GMSK / UL 1 time slot
Separation Distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.040 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.1 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.042 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.1 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.031 mW/g; SAR(10 g) = 0.020 mW/g
Maximum value of SAR (measured) = 0.041 mW/g



Date/Time: 2011/3/16 08:00:50

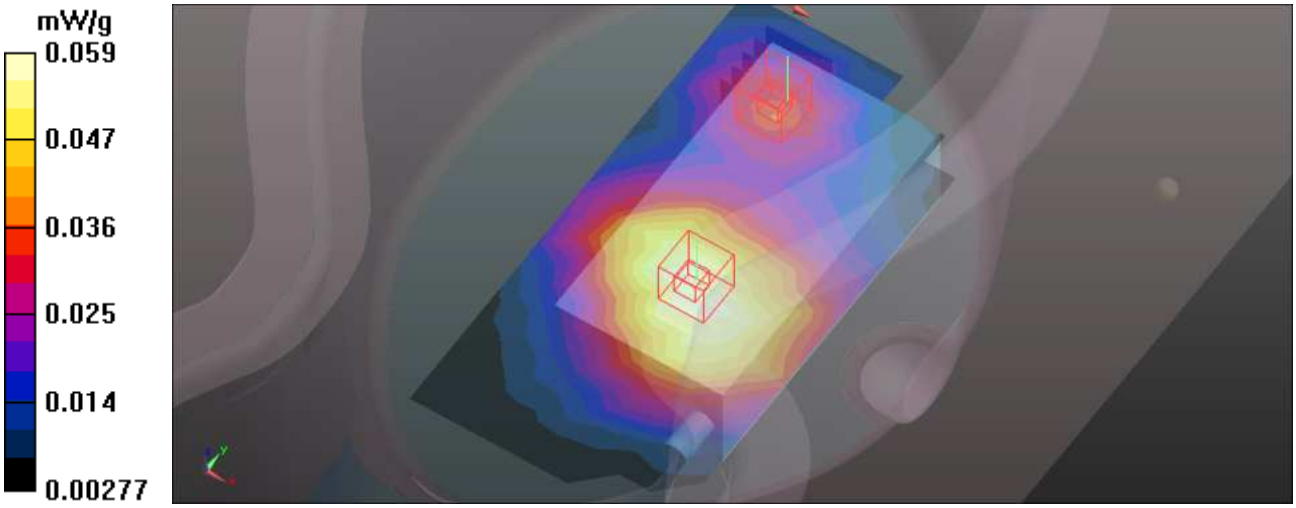
M21-Body-Bottom-GPRS1900 T2-Ch661

Communication System: GPRS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:4
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: GMSK / UL 2 time slots
Separation Distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.057 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.23 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 0.069 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.059 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.23 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 0.043 W/kg
SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.019 mW/g
Maximum value of SAR (measured) = 0.038 mW/g



Date/Time: 2011/3/16 10:43:41

M22-Body-Bottom-E-GPRS1900 T1-Ch661

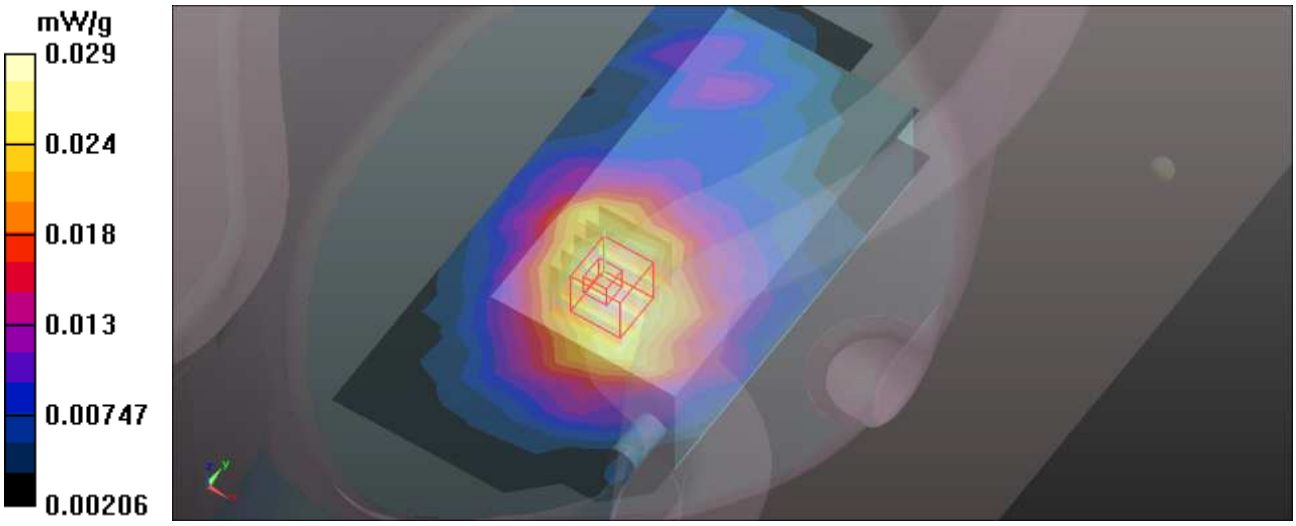
Communication System: E-GPRS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: 8PSK / UL 1 time slot
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY5, Version 5.2 (162); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.029 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.862 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.034 W/kg
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.015 mW/g



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Date/Time: 2011/3/16 11:06:37

M23-Body-Bottom-E-GPRS1900 T2-Ch661

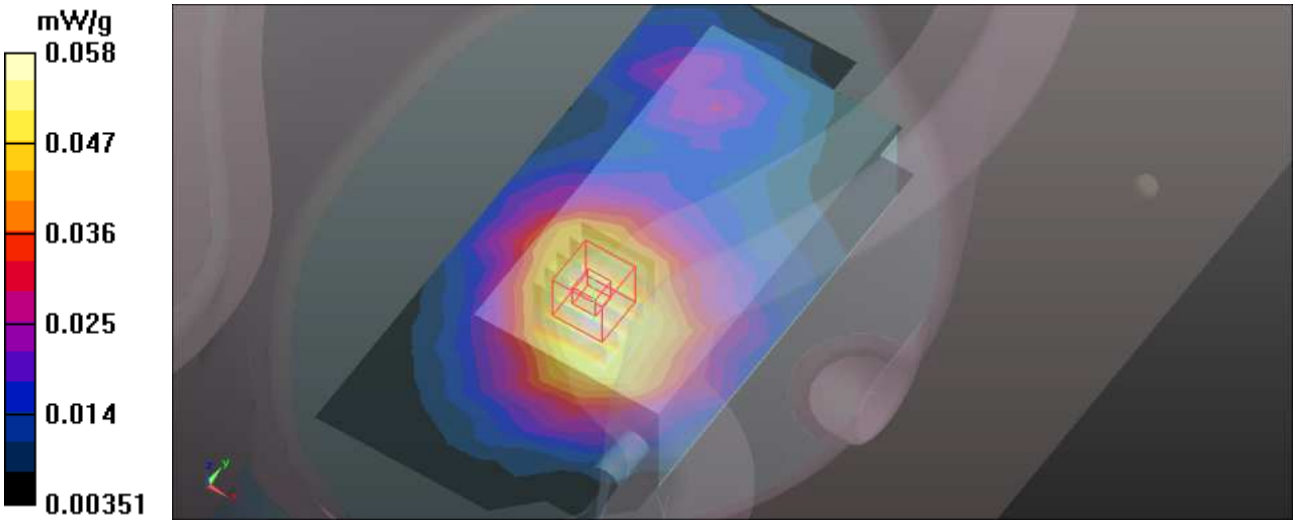
Communication System: E-GPRS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:4 ; Modulation type: 8PSK / UL 2 time slots
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY5, Version 5.2 (162); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.057 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.717 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.068 W/kg
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.029 mW/g
Maximum value of SAR (measured) = 0.058 mW/g



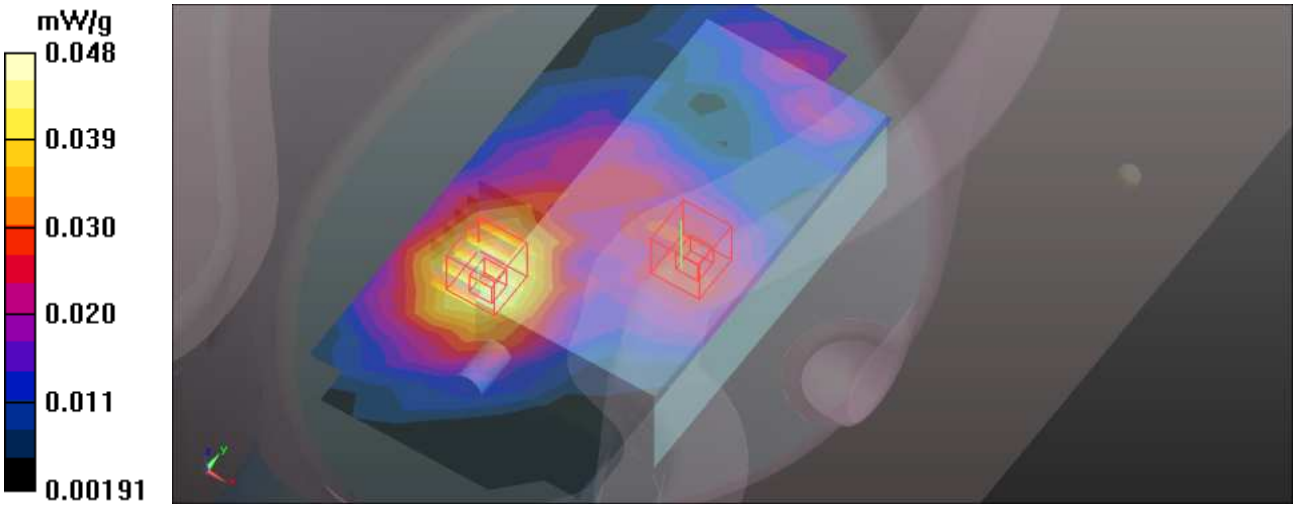
Date/Time: 2011/3/16 08:51:50

M24-Body-Front-PCS1900-Ch661

Communication System: PCS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.046 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.86 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.024 mW/g
Maximum value of SAR (measured) = 0.048 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.86 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.037 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.016 mW/g
Maximum value of SAR (measured) = 0.032 mW/g



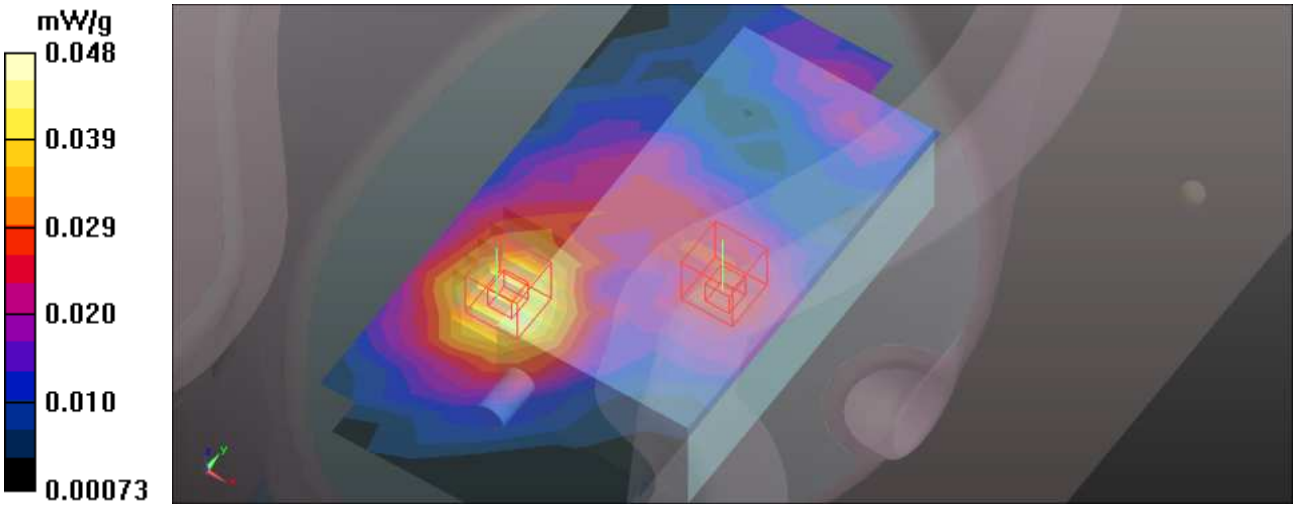
Date/Time: 2011/3/16 09:23:38

M25-Body-Front-GPRS1900 T1-Ch661

Communication System: GPRS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK / UL 1 time slot
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.044 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.66 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.048 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.66 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.035 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.015 mW/g
Maximum value of SAR (measured) = 0.030 mW/g



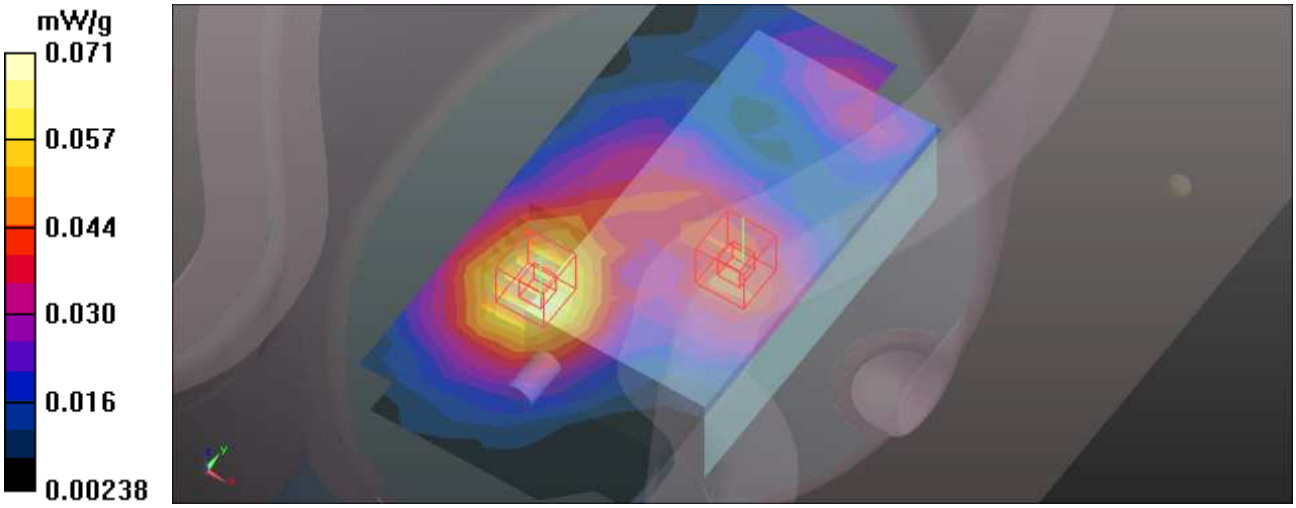
Date/Time: 2011/3/16 10:14:28

M26-Body-Front-GPRS1900 T2-Ch661

Communication System: GPRS1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid /Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.068 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.59 V/m; Power Drift = 0.173 dB
Peak SAR (extrapolated) = 0.085 W/kg
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.035 mW/g
Maximum value of SAR (measured) = 0.071 mW/g
Flat-Section MSL/Flat Section 0mm Mid /Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.59 V/m; Power Drift = 0.173 dB
Peak SAR (extrapolated) = 0.054 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.024 mW/g
Maximum value of SAR (measured) = 0.047 mW/g



Date/Time: 2011/3/16 12:32:25

M27-Body-Front-E-GPRS1900 T1-Ch661

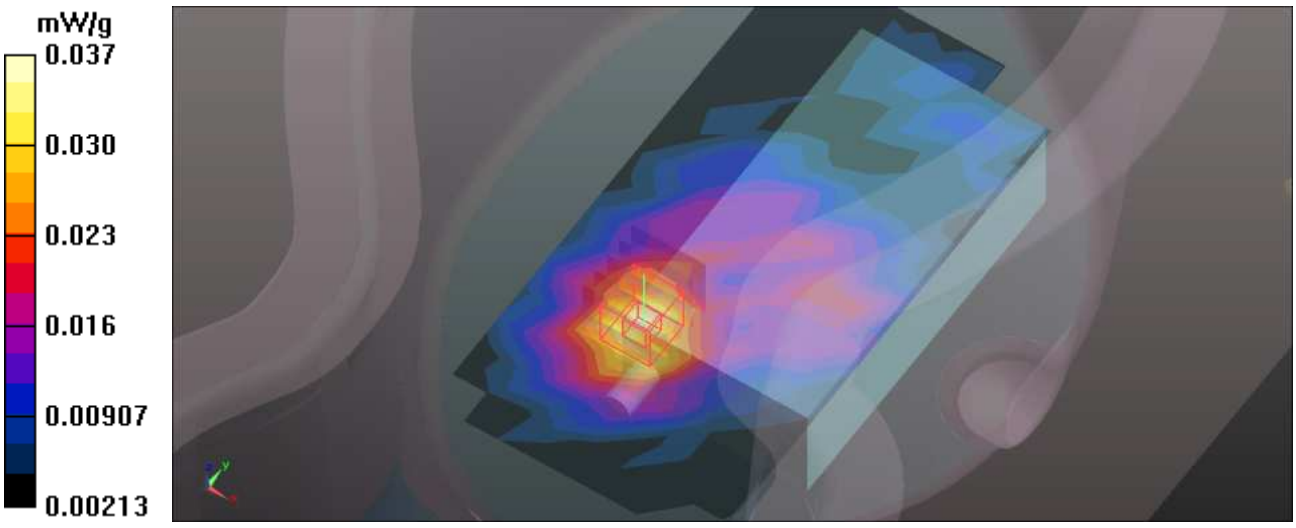
Communication System: E-GPRS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: 8PSK / UL 1 time slot
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY5, Version 5.2 (162); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.036 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.533 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.043 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.018 mW/g
Maximum value of SAR (measured) = 0.037 mW/g



Date/Time: 2011/3/16 12:55:23

M28-Body-Front-E-GPRS1900 T2-Ch661

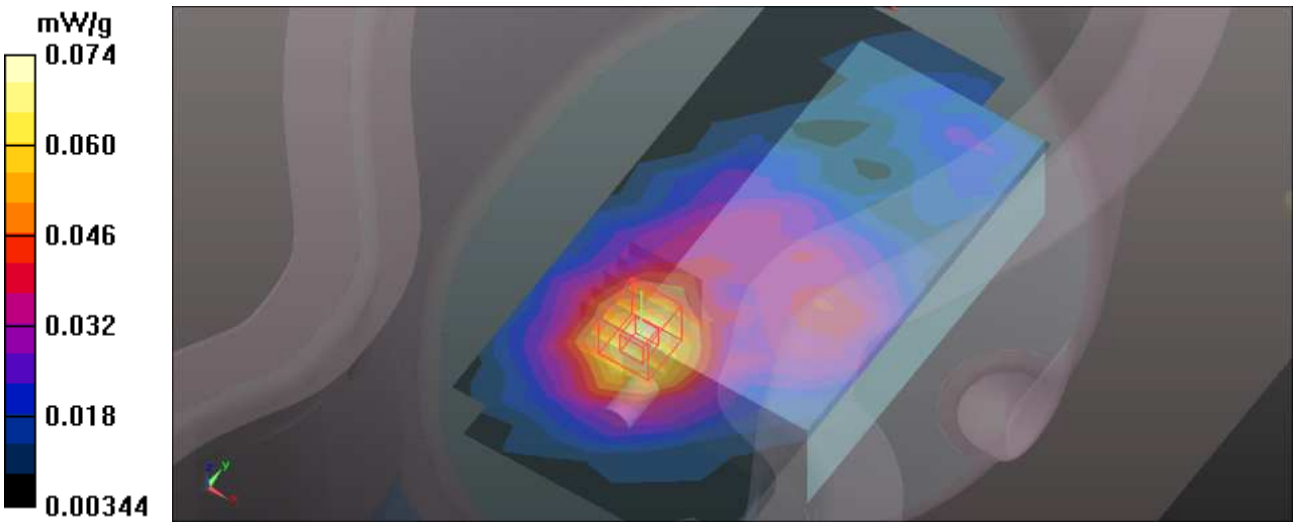
Communication System: E-GPRS 1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:4 ; Modulation type: 8PSK / UL 2 time slots
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY5, Version 5.2 (162); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (9x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.071 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.945 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.087 W/kg
SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.036 mW/g
Maximum value of SAR (measured) = 0.074 mW/g



Date/Time: 2011/3/6 13:53:33

M29-Right Head-Cheek-WCDMA850-Ch4182

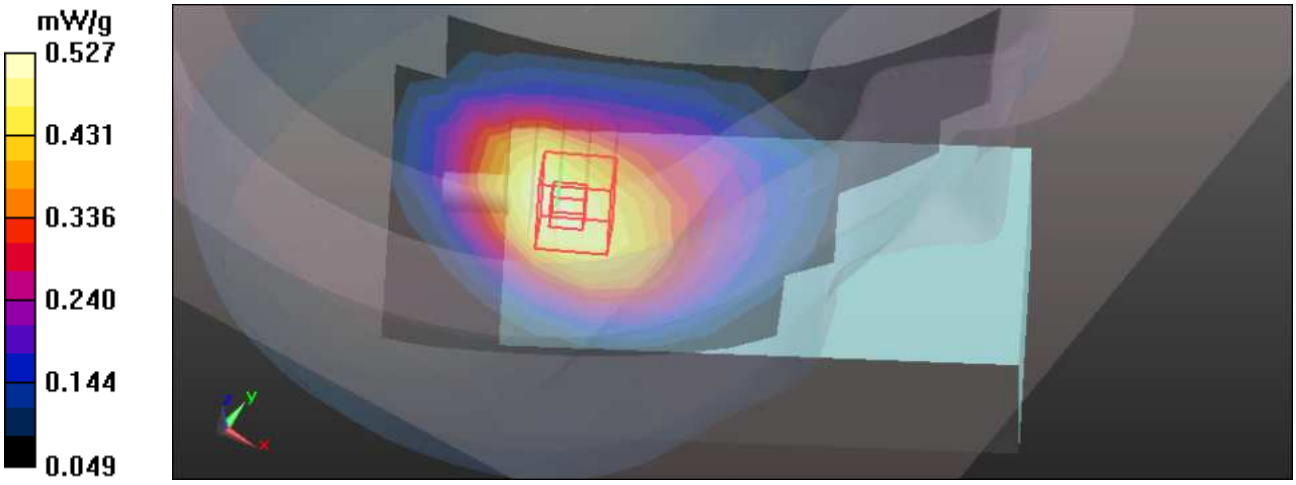
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1
Medium: HSL850 Medium parameters used: f = 836.4 MHz; σ = 0.92 mho/m; εr = 42.94; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.524 mW/g

Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.335 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.617 W/kg
SAR(1 g) = 0.441 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.527 mW/g



Date/Time: 2011/3/6 14:12:32

M30-Right Head-Tilt-WCDMA850-Ch4182

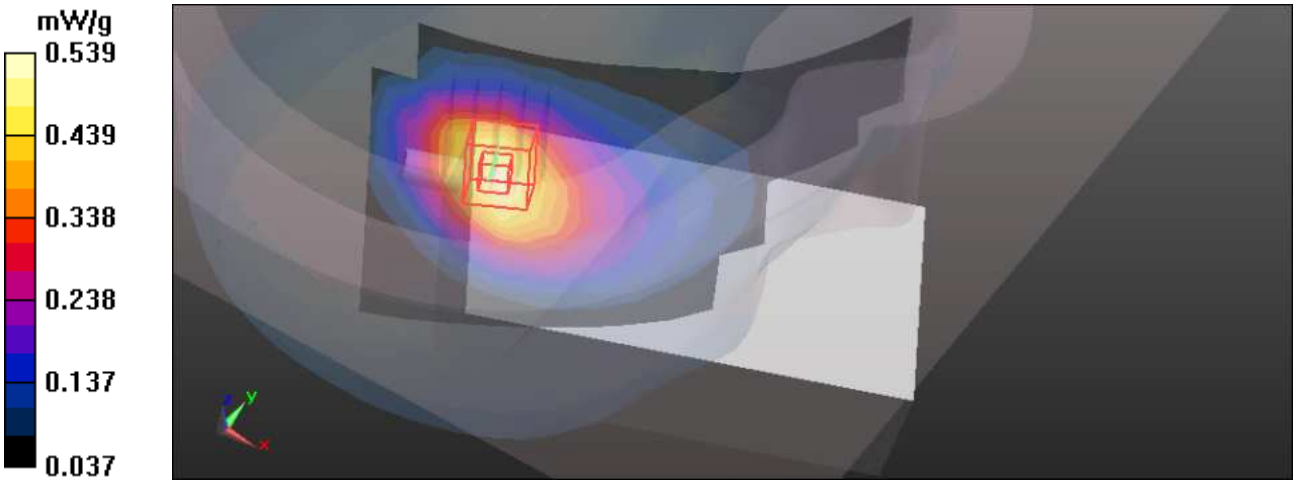
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1
Medium: HSL850 Medium parameters used: f = 836.4 MHz; σ = 0.92 mho/m; εr = 42.94; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.534 mW/g

Right-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.000 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.635 W/kg
SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.297 mW/g
Maximum value of SAR (measured) = 0.539 mW/g



Date/Time: 2011/3/6 14:35:17

M31-Left Head-Cheek-WCDMA850-Ch4182

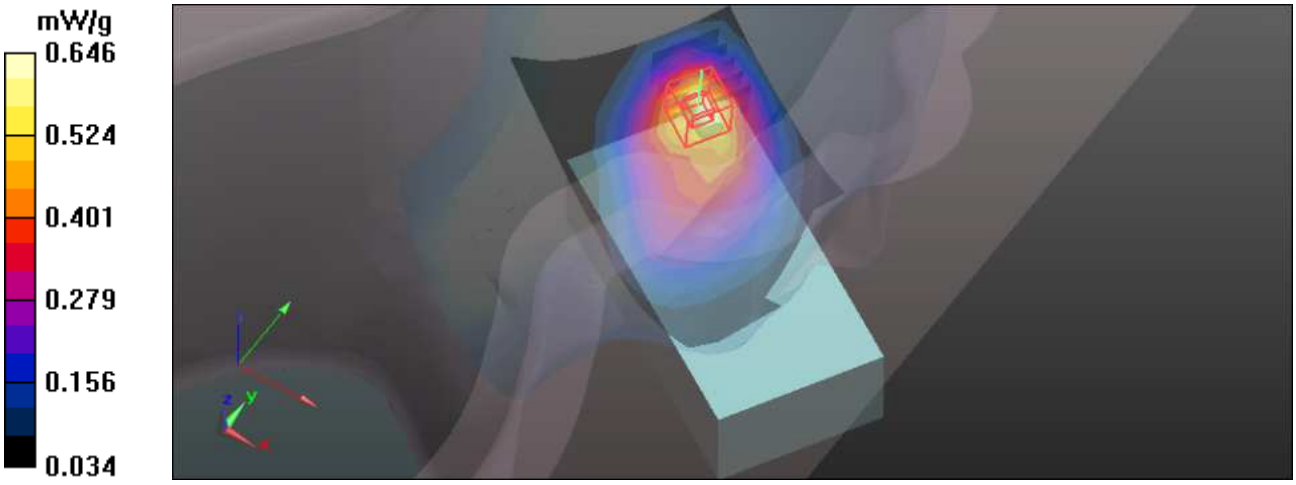
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1
Medium: HSL850 Medium parameters used: f = 836.4 MHz; σ = 0.92 mho/m; εr = 42.94; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.620 mW/g

Left-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.600 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 0.797 W/kg
SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.325 mW/g
Maximum value of SAR (measured) = 0.646 mW/g



Date/Time: 2011/3/6 14:59:40

M32-Left Head-Tilt-WCDMA850-Ch4182

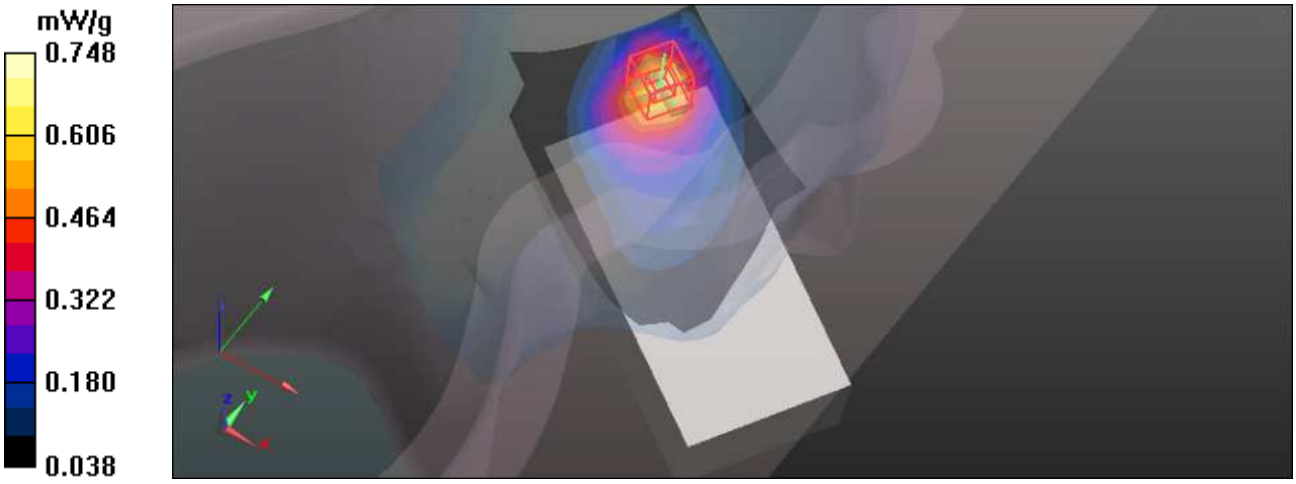
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1
Medium: HSL850 Medium parameters used: f = 836.4 MHz; σ = 0.92 mho/m; ε_r = 42.94; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.748 mW/g

Left-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.670 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.908 W/kg
SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.352 mW/g



Date/Time: 2011/3/15 05:49:26

M33-Body-Bottom-WCDMA850-Ch4182

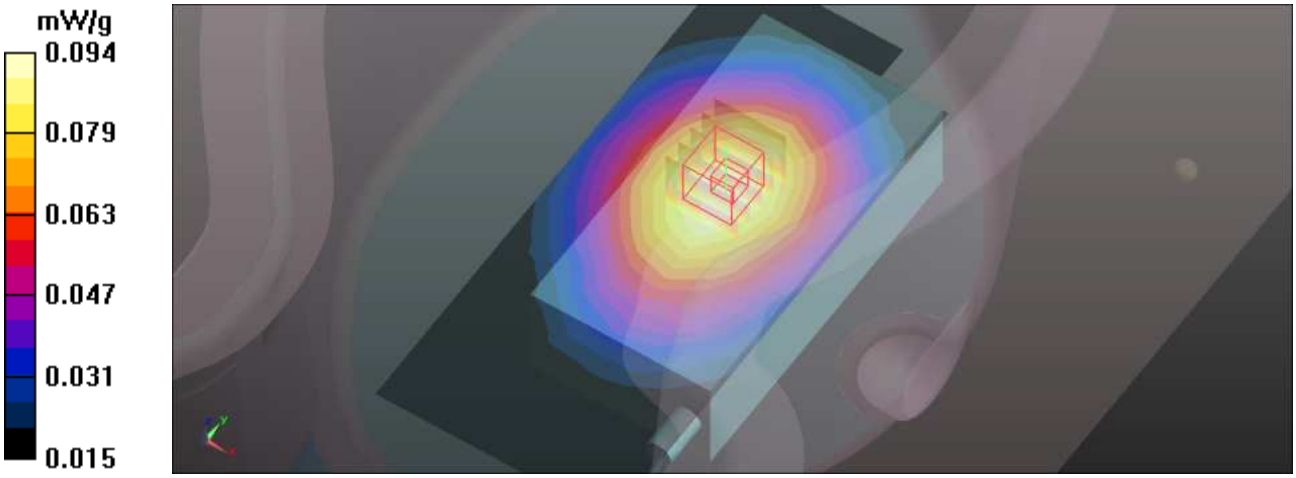
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL850 Medium parameters used: f = 836.4 MHz; σ = 0.98 mho/m; εr = 56.43; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.096 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.107 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.106 W/kg
SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.094 mW/g



Date/Time: 2011/3/15 06:15:14

M34-Body-Front-WCDMA850-Ch4182

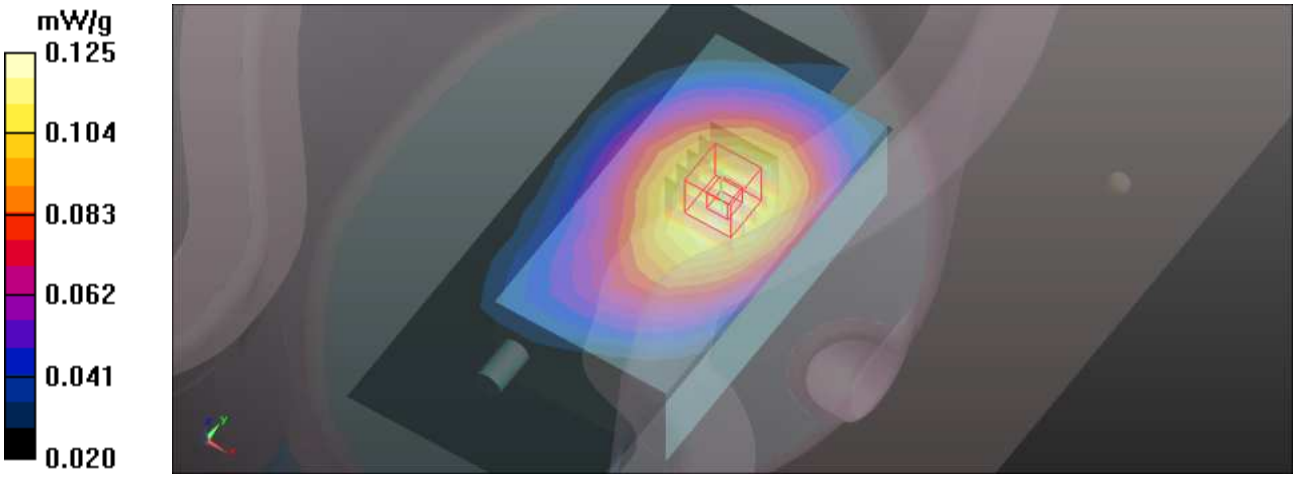
Communication System: WCDMA850 ; Frequency: 836.4 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL850 Medium parameters used: f = 836.4 MHz; σ = 0.98 mho/m; εr = 56.43; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.123 mW/g

Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.513 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.080 mW/g
Maximum value of SAR (measured) = 0.125 mW/g



Date/Time: 2011/3/4 18:33:52

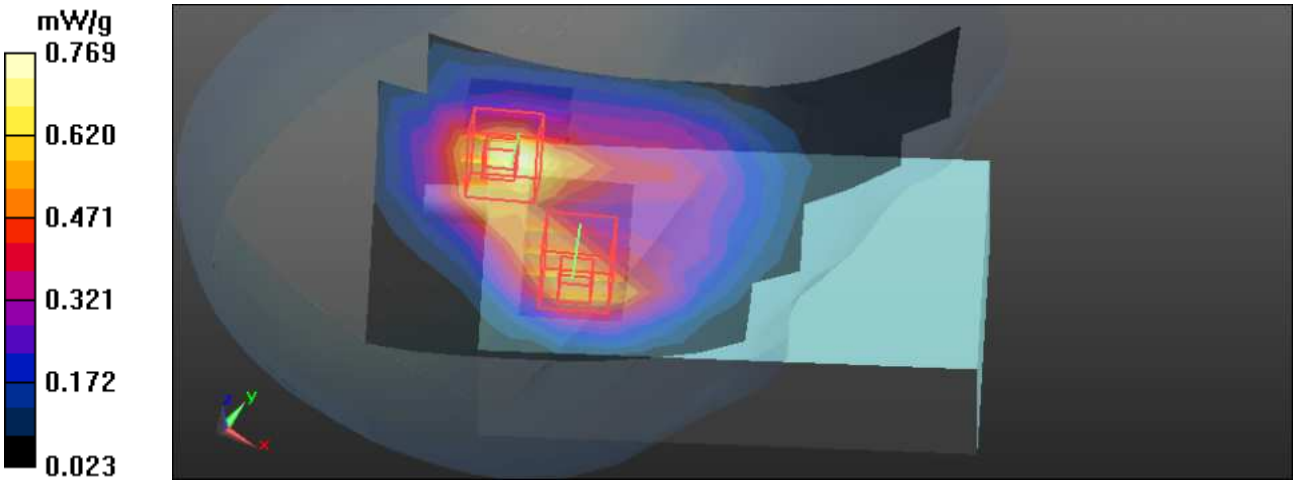
M35-Right Head-Cheek-WCDMA1900-Ch9400

Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.761 mW/g
Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.351 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.979 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.329 mW/g
Maximum value of SAR (measured) = 0.769 mW/g
Right-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.351 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.781 W/kg
SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.316 mW/g
Maximum value of SAR (measured) = 0.626 mW/g



Date/Time: 2011/3/4 18:56:31

M36-Right Head-Tilt-WCDMA1900-Ch9400

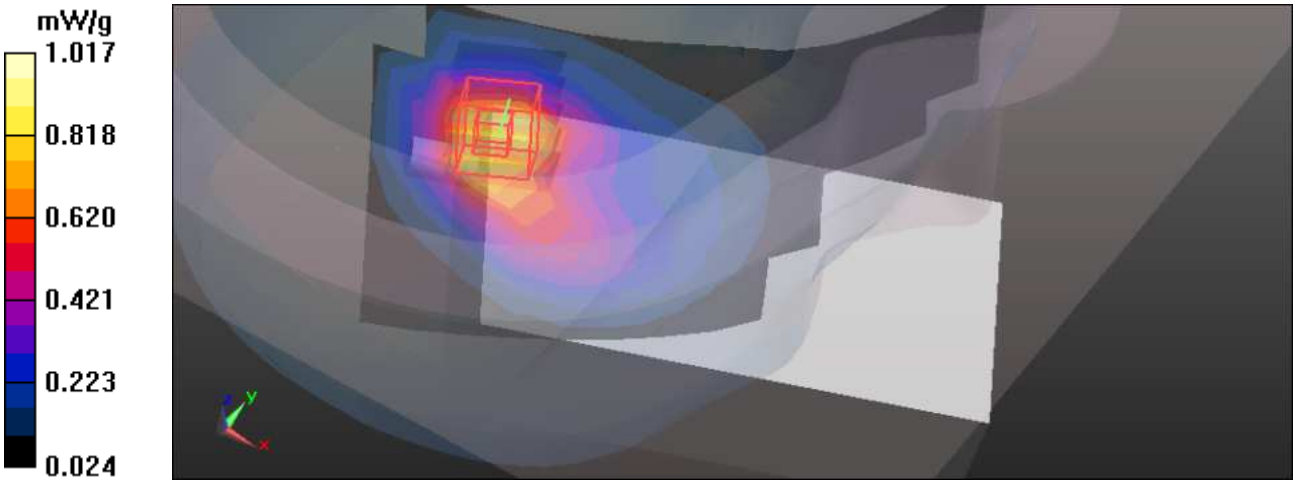
Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Right-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.893 mW/g

Right-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.223 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.264 W/kg
SAR(1 g) = 0.752 mW/g; SAR(10 g) = 0.426 mW/g
Maximum value of SAR (measured) = 1.017 mW/g



Date/Time: 2011/3/4 19:39:10

M37-Left Head-Cheek-WCDMA1900-Ch9262

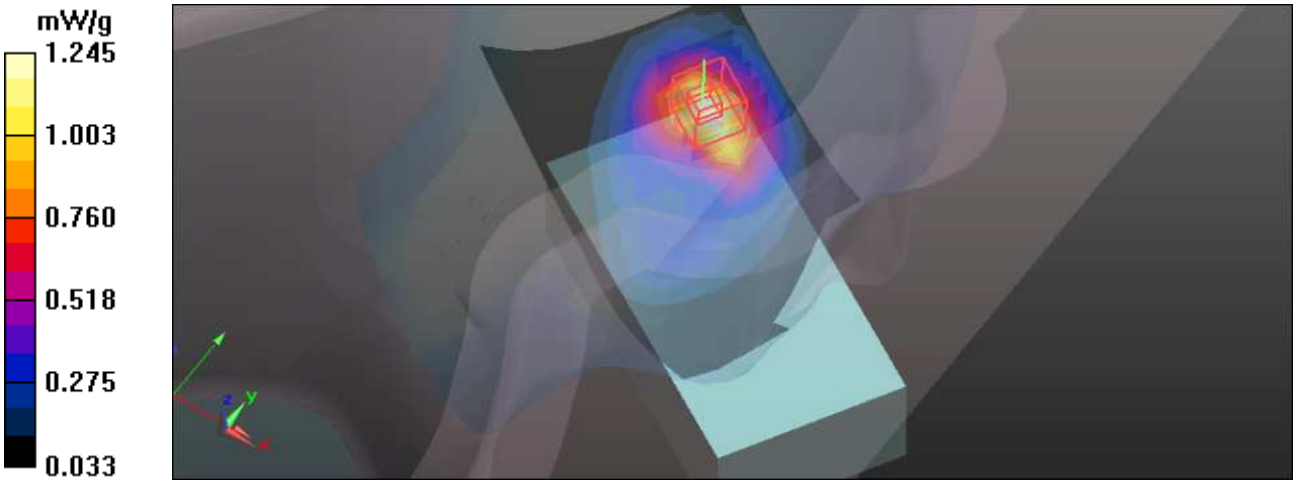
Communication System: WCDMA1900 ; Frequency: 1852.4 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used : f = 1852.4 MHz; σ = 1.37 mho/m; ε_r = 41.52; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - Low/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.373 mW/g

Left-Hand-Side HSL/Touch Position - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.137 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.568 W/kg
SAR(1 g) = 0.904 mW/g; SAR(10 g) = 0.515 mW/g
Maximum value of SAR (measured) = 1.245 mW/g



Date/Time: 2011/3/4 19:19:41

M37-Left Head-Cheek-WCDMA1900-Ch9400

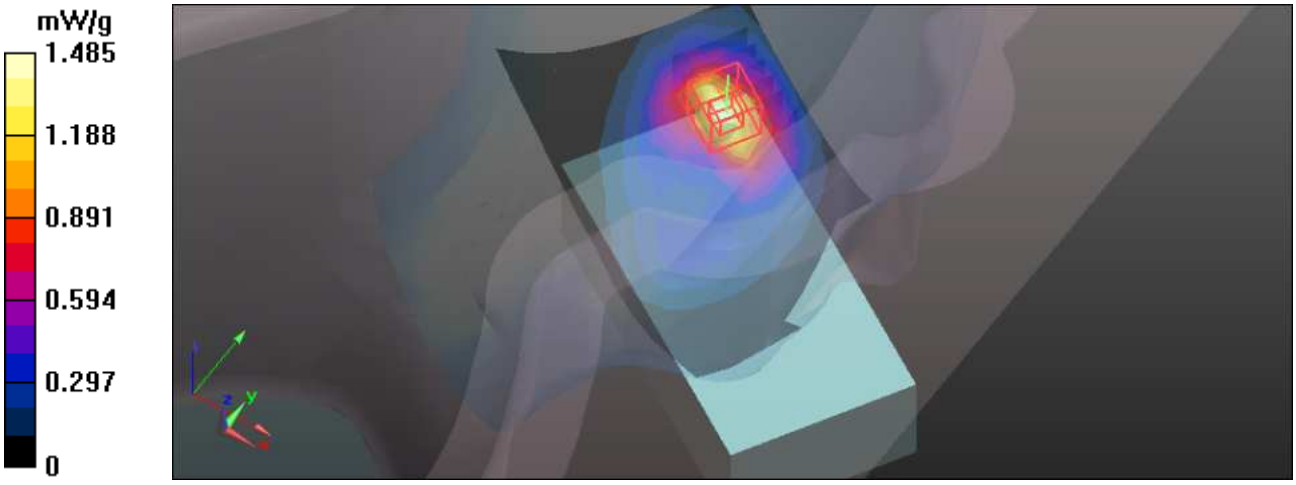
Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.485 mW/g

Left-Hand-Side HSL/Touch Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.479 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.835 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.633 mW/g
Maximum value of SAR (measured) = 1.451 mW/g



Date/Time: 2011/3/4 20:06:04

M37-Left Head-Cheek-WCDMA1900-Ch9538

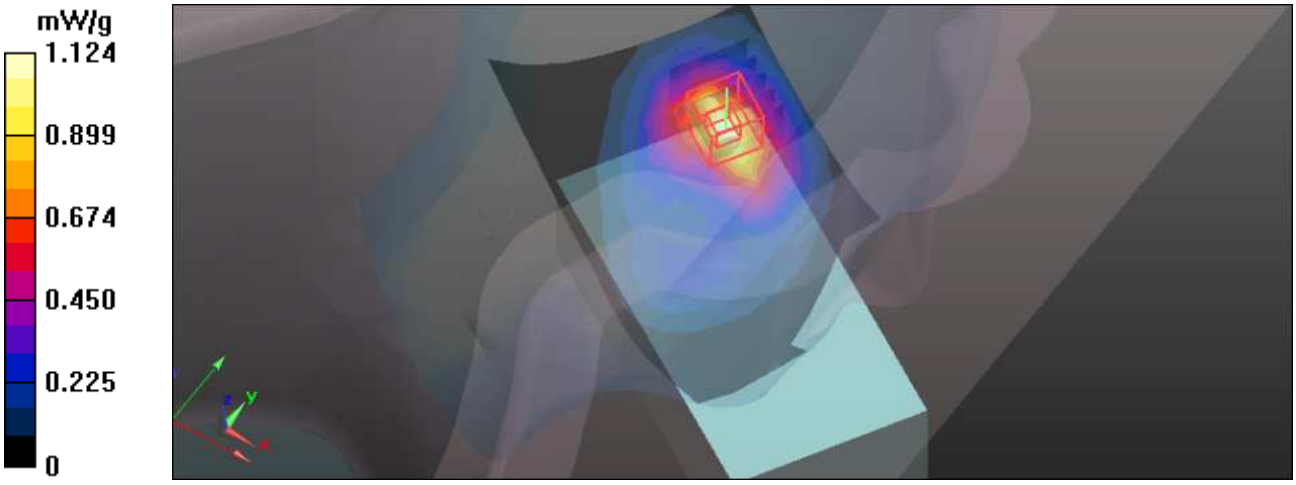
Communication System: WCDMA1900 ; Frequency: 1907.6 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used : f = 1907.6 MHz; σ = 1.45 mho/m; ε_r = 41.27; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Touch Position - High/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.124 mW/g

Left-Hand-Side HSL/Touch Position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.522 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.392 W/kg
SAR(1 g) = 0.824 mW/g; SAR(10 g) = 0.478 mW/g
Maximum value of SAR (measured) = 1.106 mW/g



Date/Time: 2011/3/4 20:25:20

M38-Left Head-Tilt-WCDMA1900-Ch9262

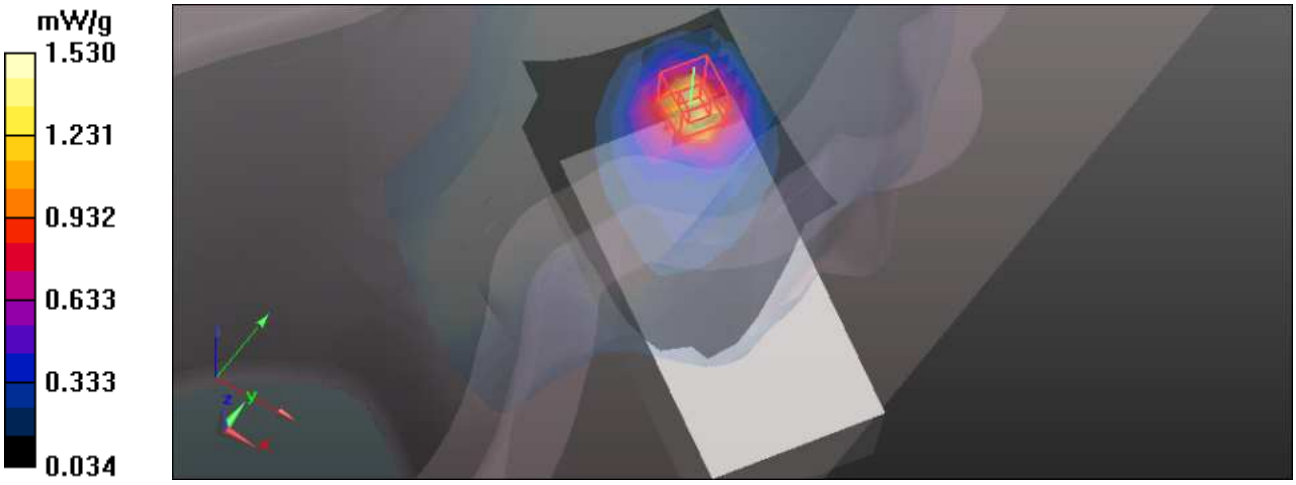
Communication System: WCDMA1900 ; Frequency: 1852.4 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used : f = 1852.4 MHz; σ = 1.37 mho/m; εr = 41.52; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - Low/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.375 mW/g

Left-Hand-Side HSL/Tilt Position - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.715 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.920 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.638 mW/g
Maximum value of SAR (measured) = 1.530 mW/g



Date/Time: 2011/3/4 20:44:02

M38-Left Head-Tilt-WCDMA1900-Ch9400

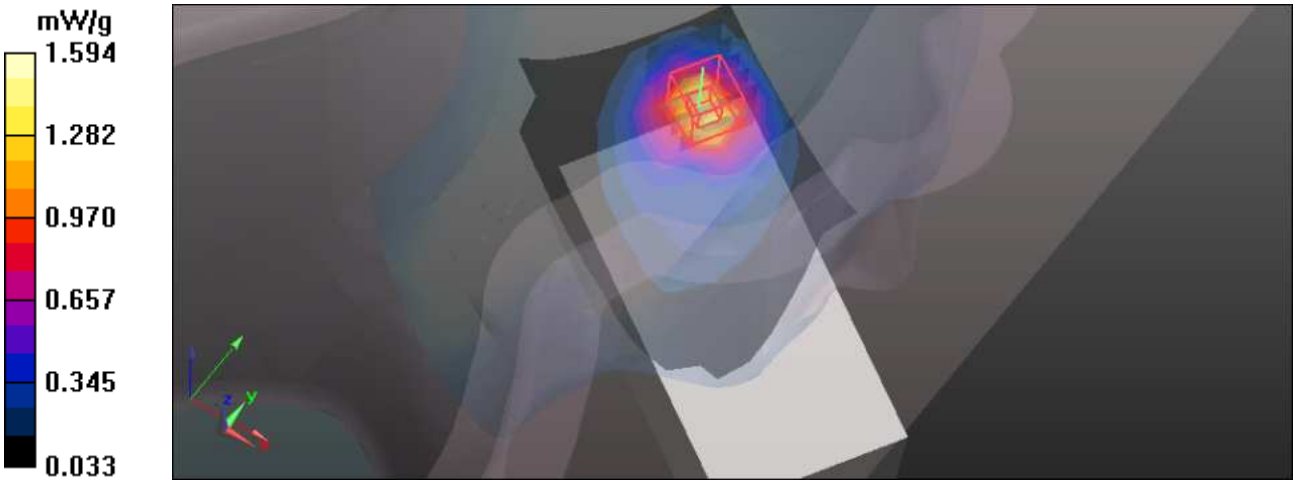
Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; εr = 41.44; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: BPSK

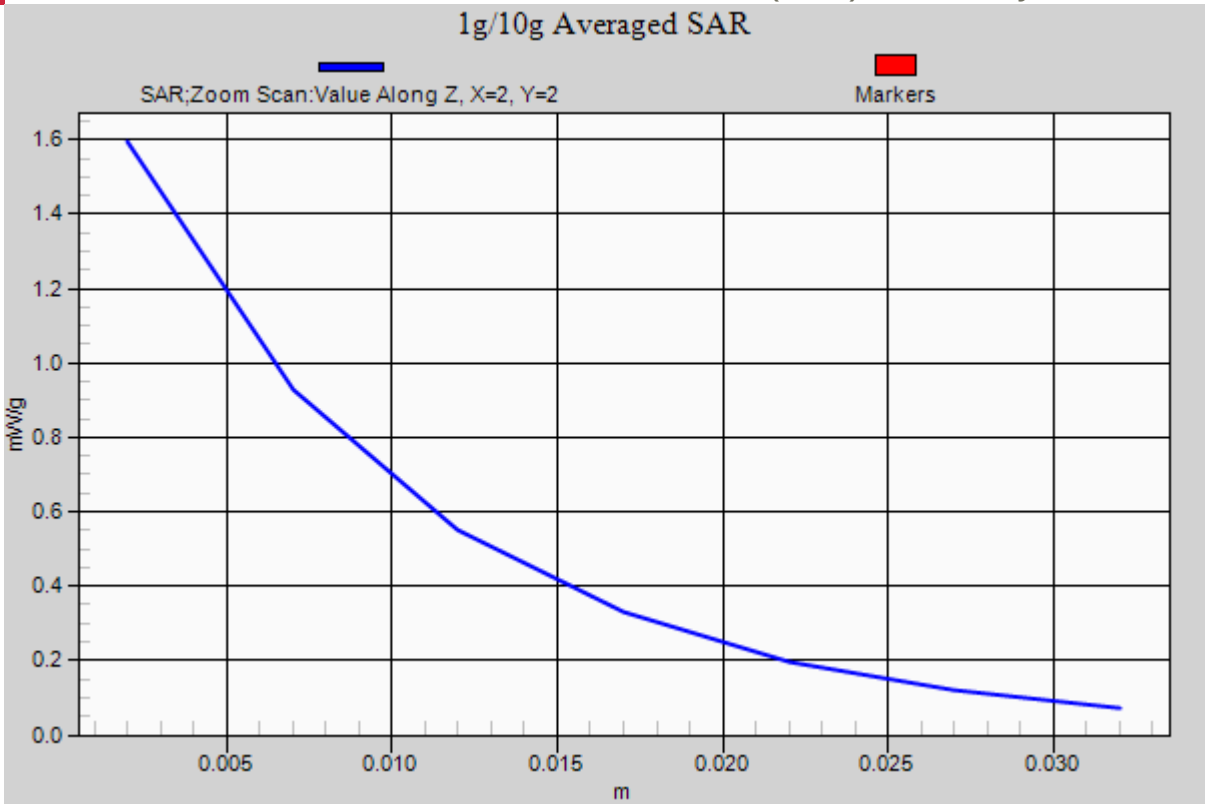
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - Mid/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.440 mW/g

Left-Hand-Side HSL/Tilt Position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.601 V/m; Power Drift = 0.0056 dB
Peak SAR (extrapolated) = 2.025 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.666 mW/g
Maximum value of SAR (measured) = 1.594 mW/g




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.005
0.010
0.015
0.020
0.025
0.030
m

Date/Time: 2011/3/4 21:03:08

M38-Left Head-Tilt-WCDMA1900-Ch9538

Communication System: WCDMA1900 ; Frequency: 1907.6 MHz ; Duty Cycle: 1:1
Medium: HSL1900 Medium parameters used : f = 1907.6 MHz; σ = 1.45 mho/m; ε_r = 41.27; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: BPSK

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Left-Hand-Side HSL/Tilt Position - High/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.340 mW/g

Left-Hand-Side HSL/Tilt Position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.427 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.868 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.607 mW/g
Maximum value of SAR (measured) = 1.474 mW/g

Date/Time: 2011/3/16 11:25:35

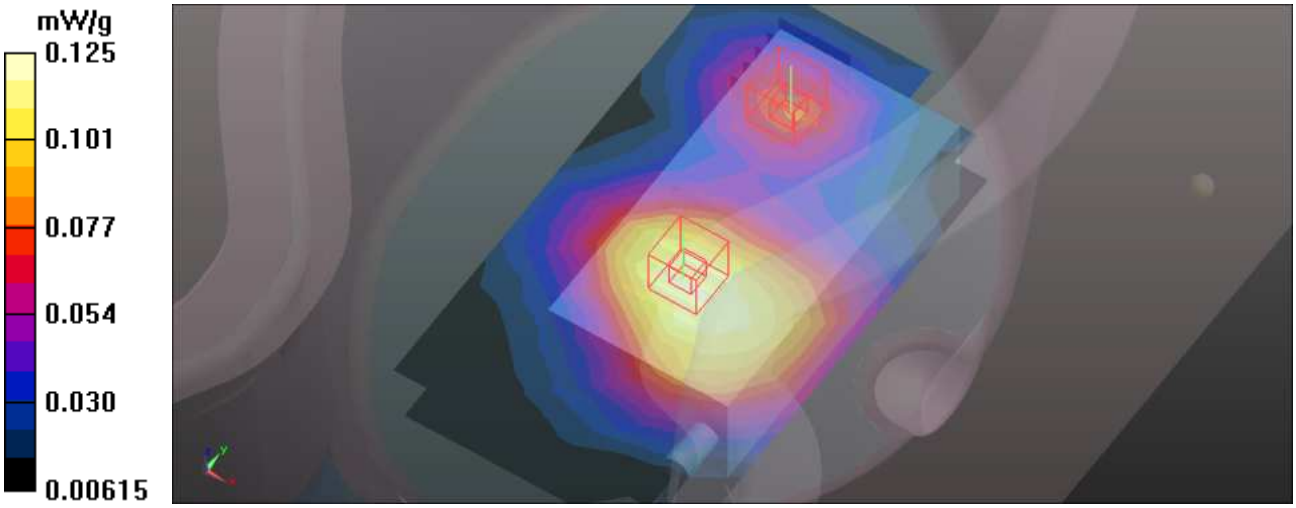
M39-Body-Bottom-WCDMA1900-Ch9400

Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The bottom side of the EUT with leather to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (10x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.119 mW/g
Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.61 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.125 mW/g
Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.61 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.099 W/kg
SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.041 mW/g
Maximum value of SAR (measured) = 0.083 mW/g



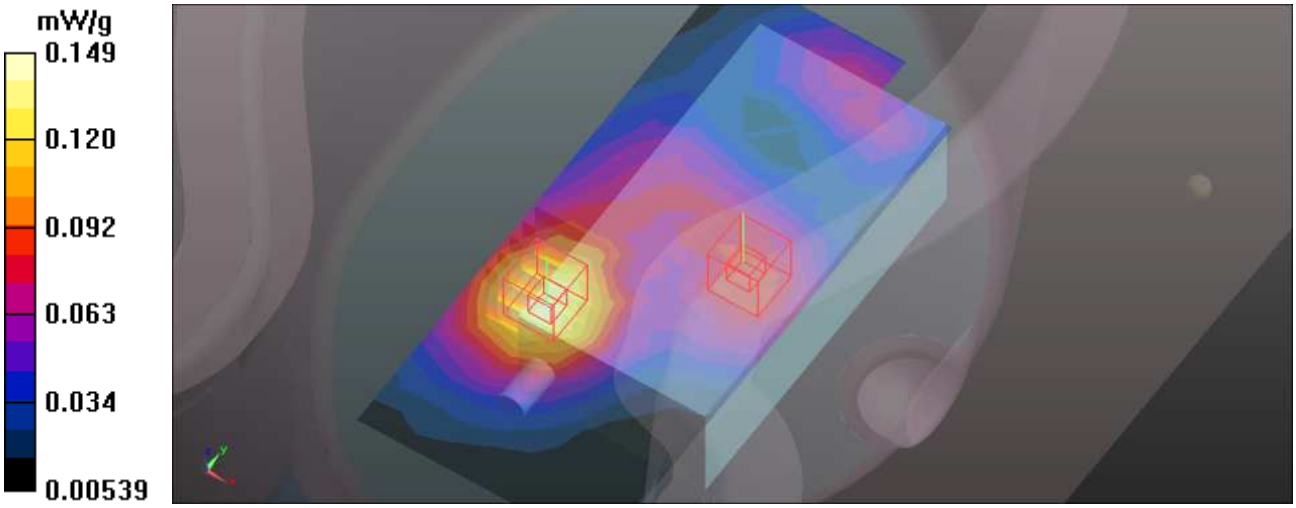
Date/Time: 2011/3/16 12:00:15

M40-Body-Front-WCDMA1900-Ch9400

Communication System: WCDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; εr = 54.76; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The front side of the EUT with holster to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 0mm Mid/Area Scan (8x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.146 mW/g
Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.26 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.179 W/kg
SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.072 mW/g
Maximum value of SAR (measured) = 0.149 mW/g
Flat-Section MSL/Flat Section 0mm Mid/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.26 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.111 W/kg
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.048 mW/g
Maximum value of SAR (measured) = 0.092 mW/g



Date/Time: 2011/3/6 12:00:45

SystemPerformanceCheck-D835V2-HSL835 MHz

DUT: Dipole 835 MHz D835V2 ; Type: D835V2 ; Serial: D835V2 - SN:4d021 ; Test Frequency: 835 MHz

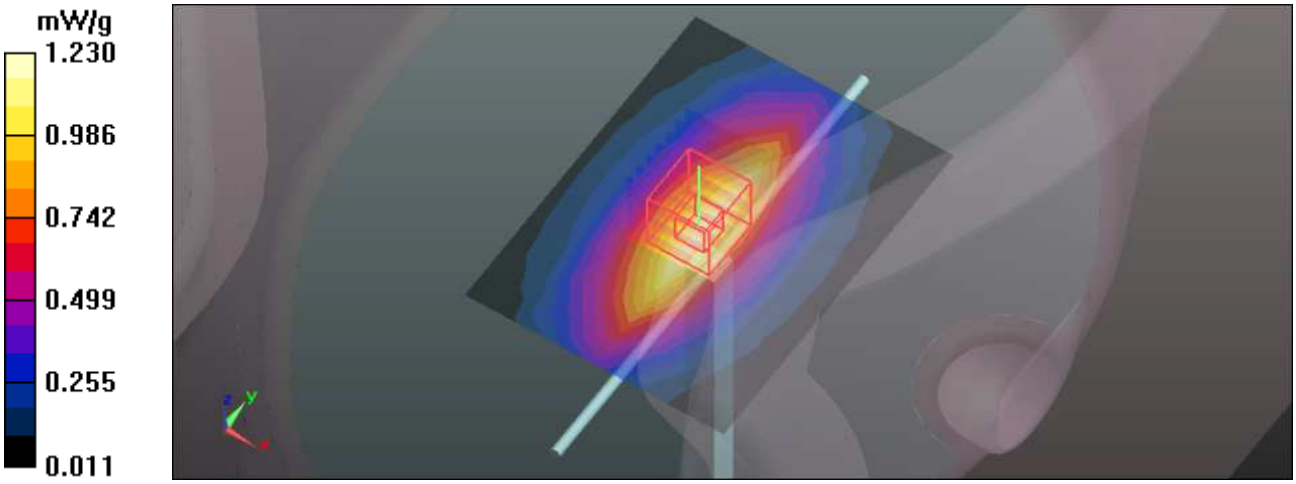
Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL850;Medium parameters used: f = 835 MHz; σ = 0.92 mho/m; ε_r = 42.97; ρ = 1000 kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feet point of the dipole to the Phantom)Air temp. : 22.1 degrees ; Liquid temp. : 21.1 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.95, 8.95, 8.95); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.075 mW/g

System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.911 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.665 W/kg
SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.56 mW/g
Maximum value of SAR (measured) = 2.598 mW/g



Date/Time: 2011/3/15 02:07:25

SystemPerformanceCheck-D835V2-MSL835 MHz

DUT: Dipole 835 MHz D835V2 ; Type: D835V2 ; Serial: D835V2 - SN:4d021 ; Test Frequency: 835 MHz

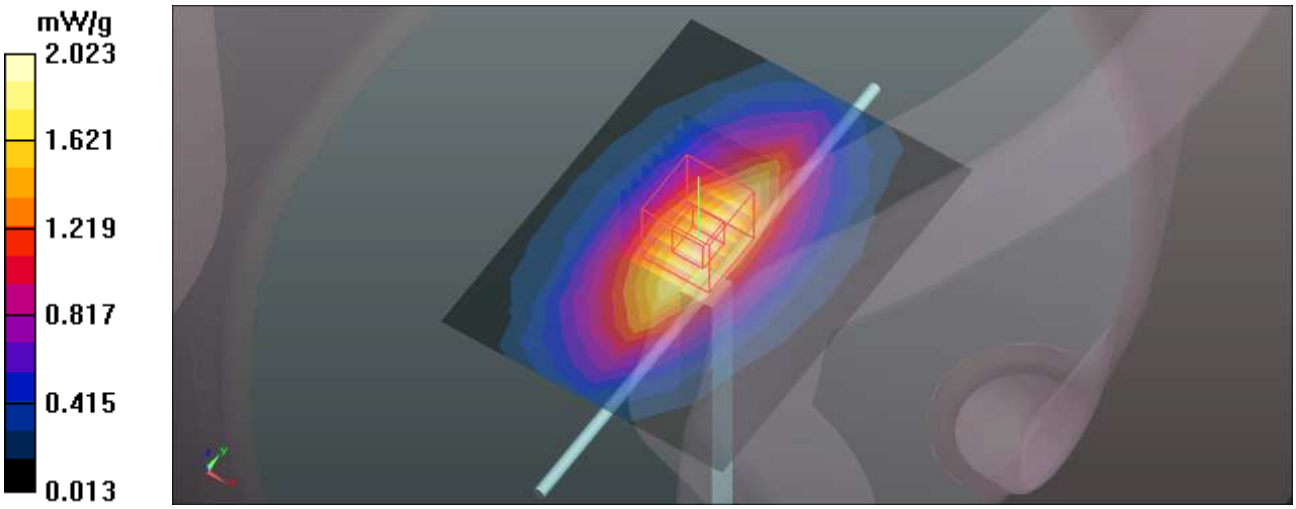
Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL850;Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 56.46; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feet point of the dipole to the Phantom)Air temp. : 22.3 degrees ; Liquid temp. : 21.0 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.993 mW/g

System Performance Check at Frequencies below 1 GHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.302 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.568 W/kg
SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.54 mW/g
Maximum value of SAR (measured) = 2.547 mW/g



Date/Time: 2011/3/4 16:40:19

SystemPerformanceCheck-D1900V2-HSL1900 MHz

DUT: Dipole 1900 MHz D1900V2 ; Type: D1900V2 ; Serial: D1900V2 - SN:5d022 ; Test Frequency: 1900 MHz

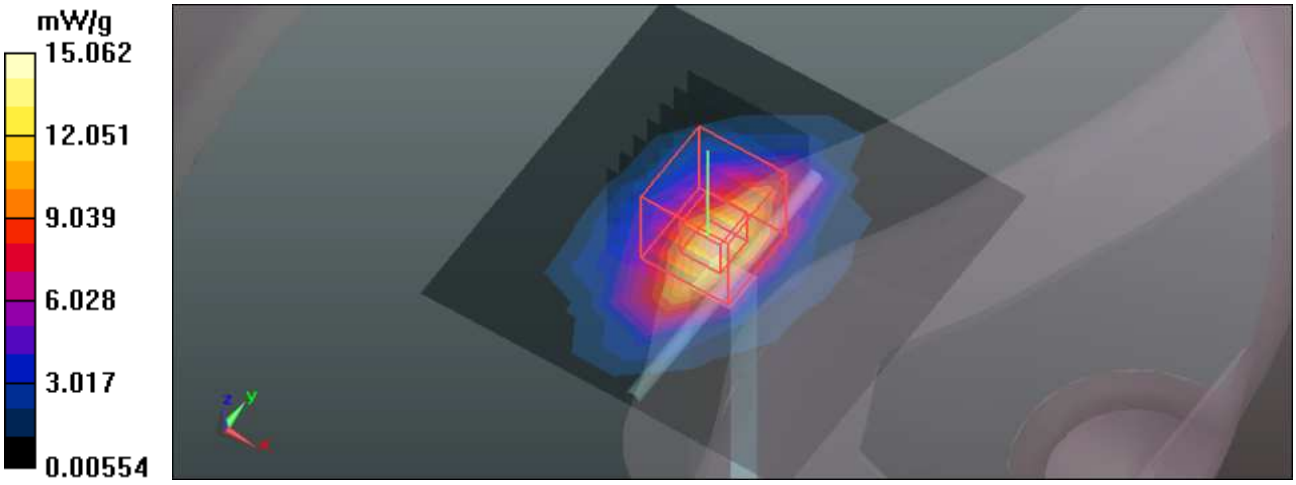
Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL1900;Medium parameters used: f = 1900 MHz; σ = 1.44 mho/m; ε_r = 41.32; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.5 degrees ; Liquid temp. : 21.6 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.57, 7.57, 7.57); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 15.062 mW/g

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.800 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 20.455 W/kg
SAR(1 g) = 10.42 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 11.667 mW/g



Date/Time: 2011/3/16 05:27:01

SystemPerformanceCheck-D1900V2-MSL1900 MHz

DUT: Dipole 1900 MHz D1900V2 ; Type: D1900V2 ; Serial: D1900V2 - SN:5d022 ; Test Frequency: 1900 MHz

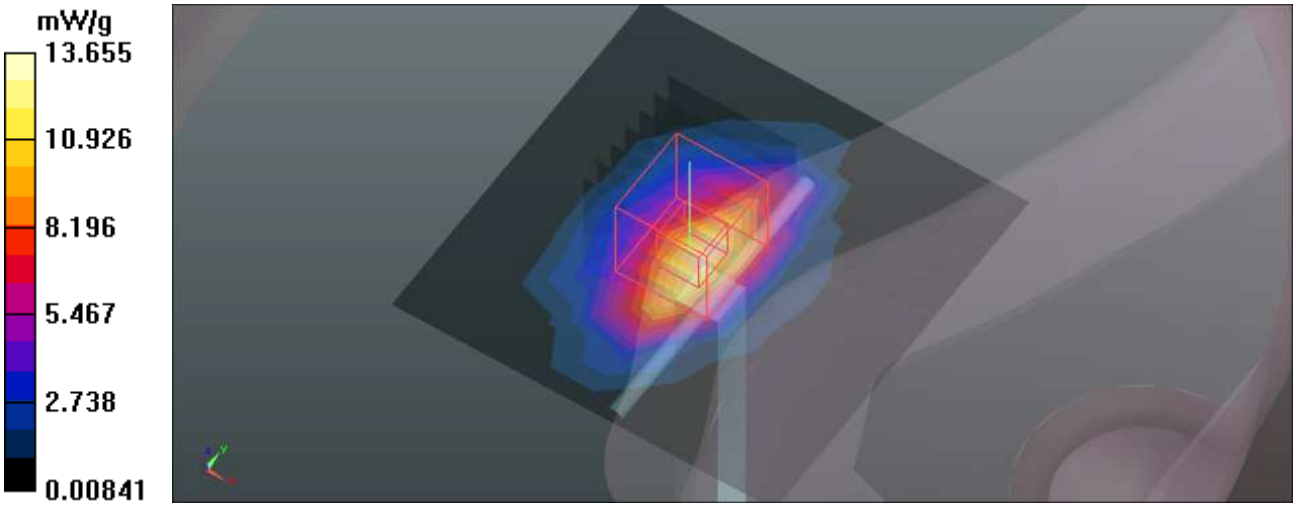
Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL1900;Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 54.65; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.6 degrees ; Liquid temp. : 21.5 degrees

DASY5 Configuration:

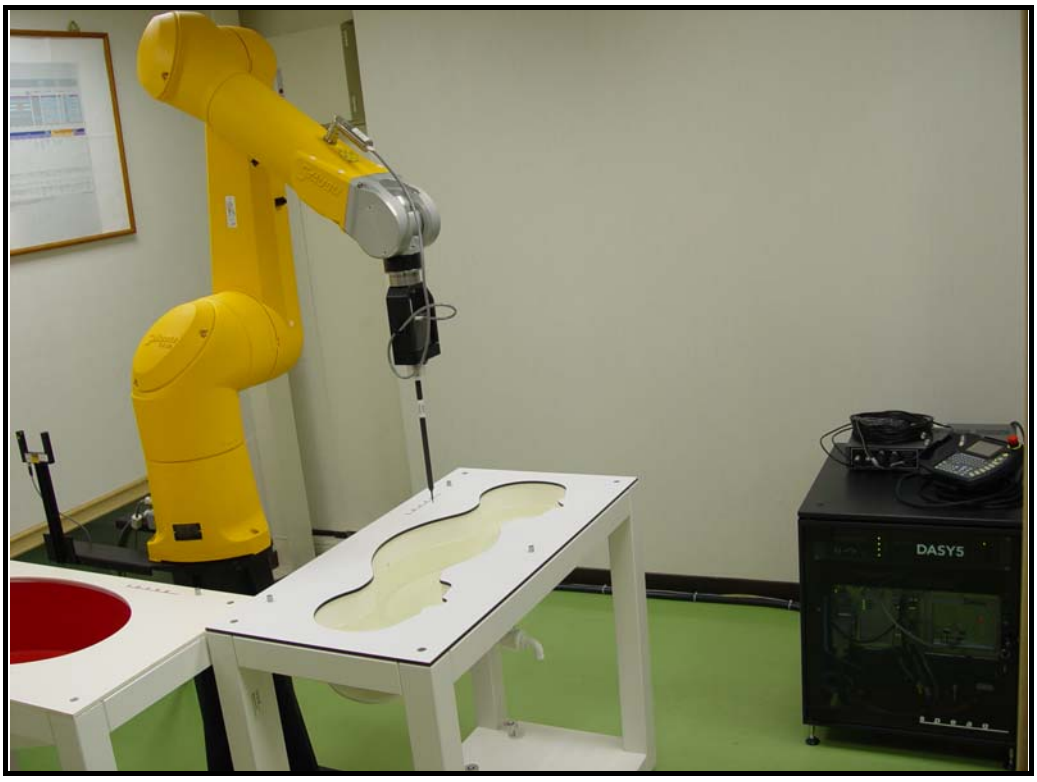
- Probe: EX3DV4 - SN3650; ConvF(7.52, 7.52, 7.52); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.655 mW/g

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.097 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 19.505 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 11.528 mW/g



APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM



APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION

APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION

D1: PHANTOM

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 C
Series No	TP-1150 and higher
Manufacturer	SPEAG Zeughausstrasse 43 CH-8004 Zürich Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.	< 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

Standards

[1] CENELEC EN 50361
[2] IEEE Std 1528-2003
[3] IEC 62209 Part I
[4] FCC OET Bulletin 65, Supplement C, Edition 01-01
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date 07.07.2005

Signature / Stamp

D2: DOSIMETRIC E-FIELD PROBE

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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **B.V. ADT (Auden)**

Certificate No: **EX3-3650_Jan11**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3650
Calibration procedure(s)	QA CAL-01.v7, QA CAL-14.v3, QA CAL-23.v4 and QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 24, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: January 25, 2011

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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3650

Manufactured:	March 18, 2008
Last calibrated:	July 5, 2008
Recalibrated:	January 24, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.45	0.40	0.49	± 10.1%
DCP (mV)[B]	93.4	96.5	95.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	137.0	± 3.4 %
			Y	0.00	0.00	1.00	141.2	
			Z	0.00	0.00	1.00	144.7	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	9.46	9.46	9.46	0.43	0.72	± 11.0%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	8.95	8.95	8.95	0.55	0.67	± 11.0%
1450	± 50 / ± 100	40.5 ± 5%	1.20 ± 5%	8.86	8.86	8.86	0.78	0.64	± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	8.17	8.17	8.17	0.75	0.60	± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.57	7.57	7.57	0.57	0.66	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.10	7.10	7.10	0.36	0.88	± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.93	6.93	6.93	0.38	0.88	± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.69	4.69	4.69	0.40	1.80	± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.33	4.33	4.33	0.45	1.80	± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.42	4.42	4.42	0.45	1.80	± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	3.96	3.96	3.96	0.60	1.80	± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.27	4.27	4.27	0.45	1.80	± 13.1%

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

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

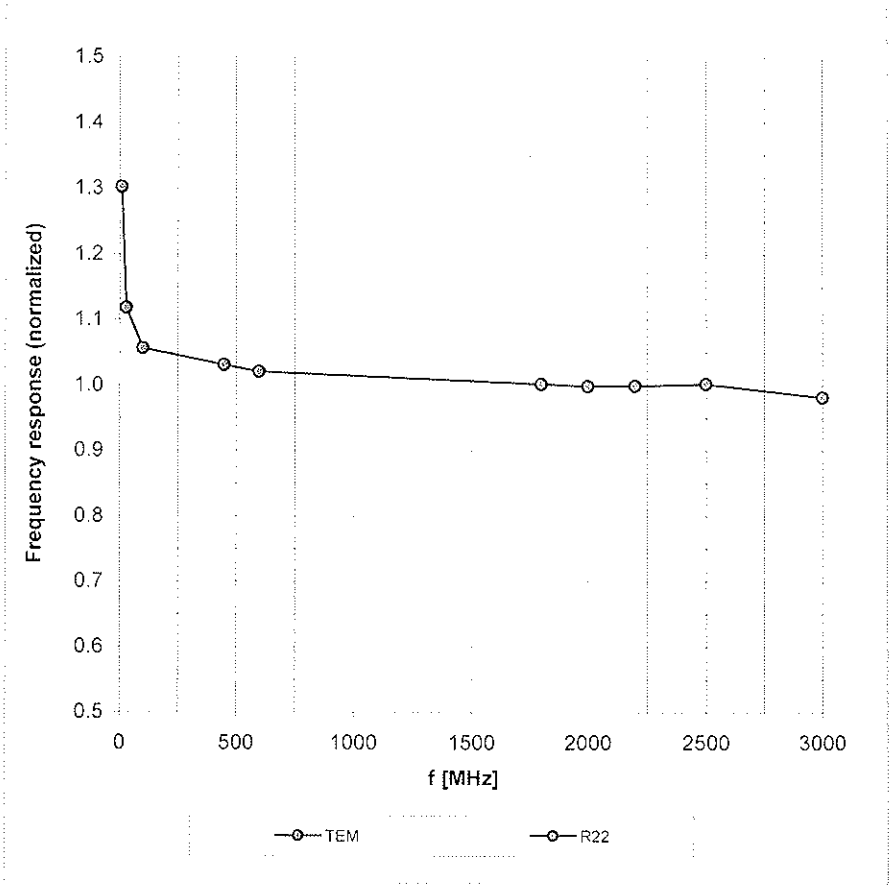
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	9.25	9.25	9.25	0.53	0.71	± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	9.12	9.12	9.12	0.36	0.88	± 11.0%
1450	± 50 / ± 100	54.0 ± 5%	1.30 ± 5%	7.97	7.97	7.97	0.71	0.63	± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	7.46	7.46	7.46	0.78	0.61	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.52	7.52	7.52	0.79	0.59	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.05	7.05	7.05	0.54	0.74	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.92	6.92	6.92	0.45	0.80	± 11.0%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.25	4.25	4.25	0.50	1.90	± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.96	3.96	3.96	0.50	1.90	± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.76	3.76	3.76	0.55	1.90	± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.55	3.55	3.55	0.58	1.90	± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.86	3.86	3.86	0.60	1.90	± 13.1%

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

Frequency Response of E-Field

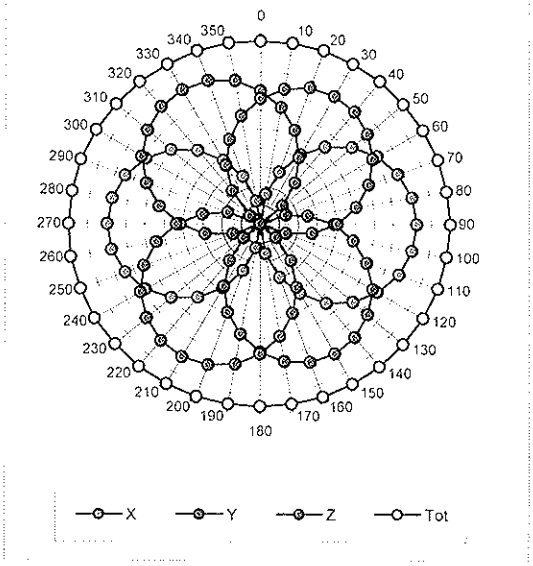
(TEM-Cell:ifi110 EXX, Waveguide: R22)



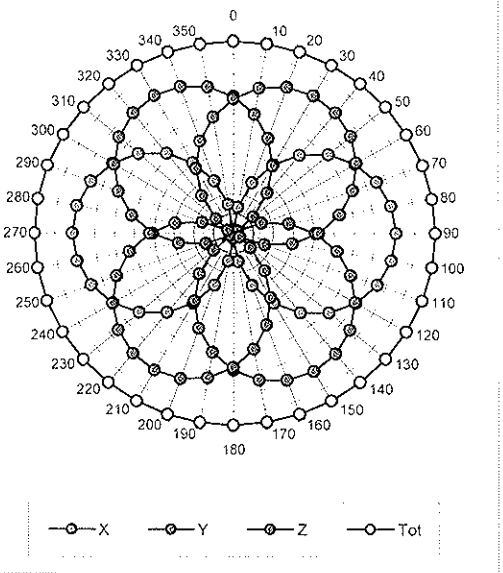
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

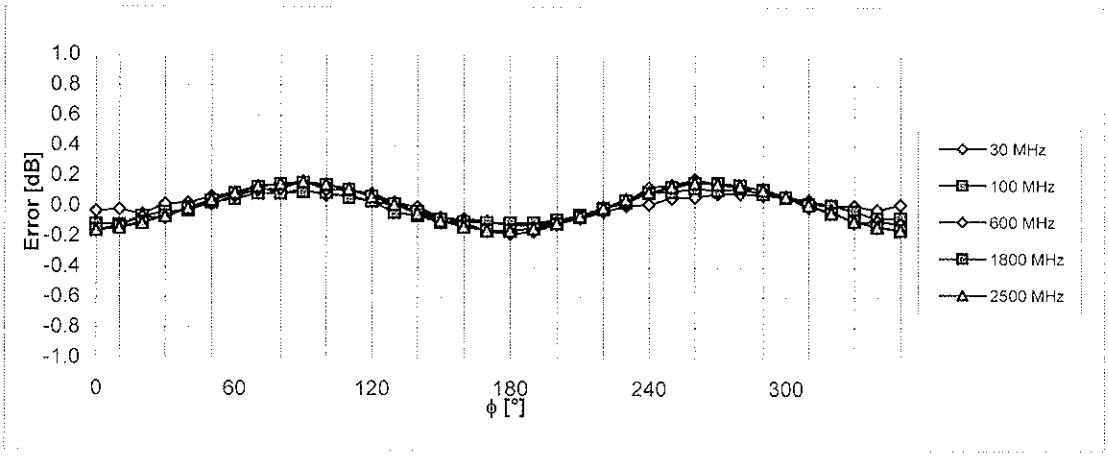
Receiving Pattern (ϕ), ϑ = 0°

f = 600 MHz, TEM ifi110EXX



f = 1800 MHz, WG R22

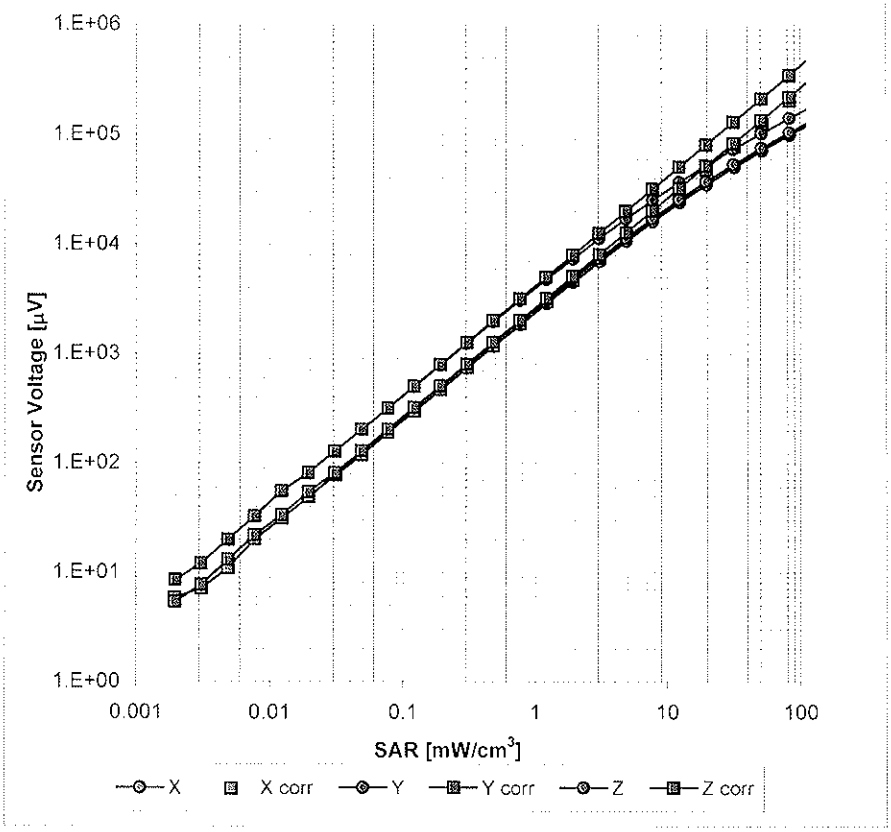


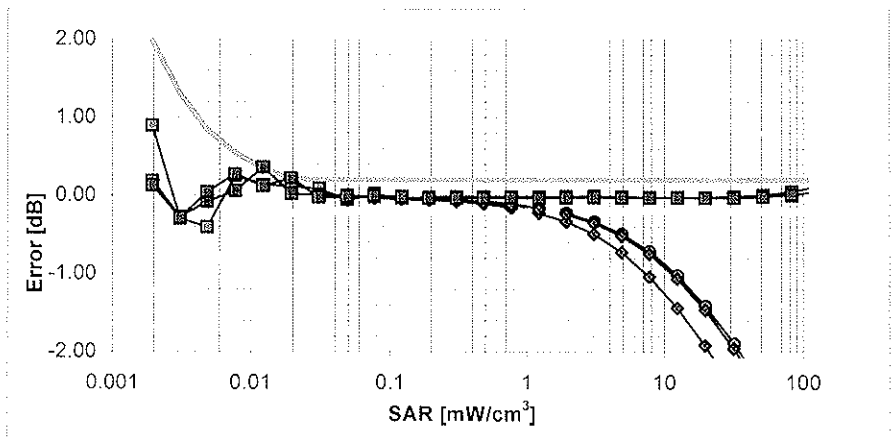


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

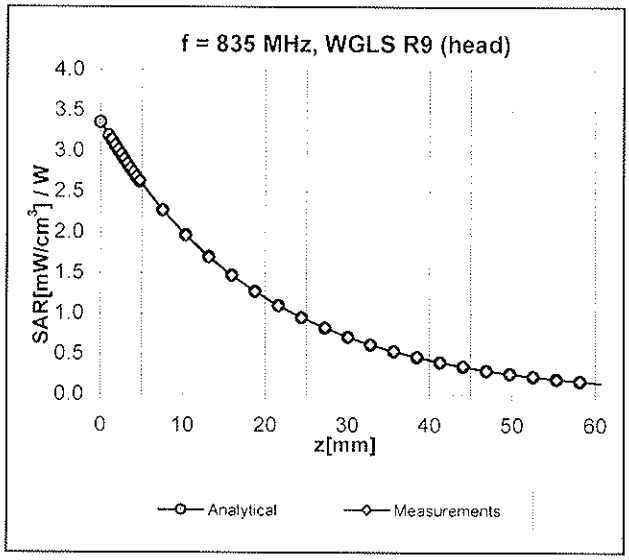
(TEM cell, f = 900 MHz)

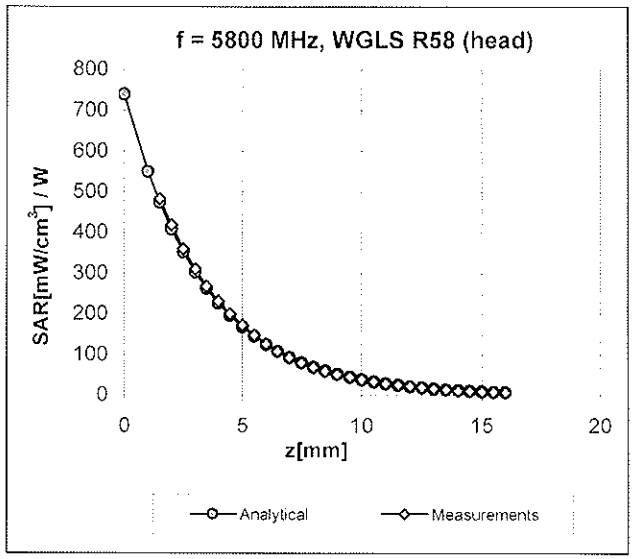




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

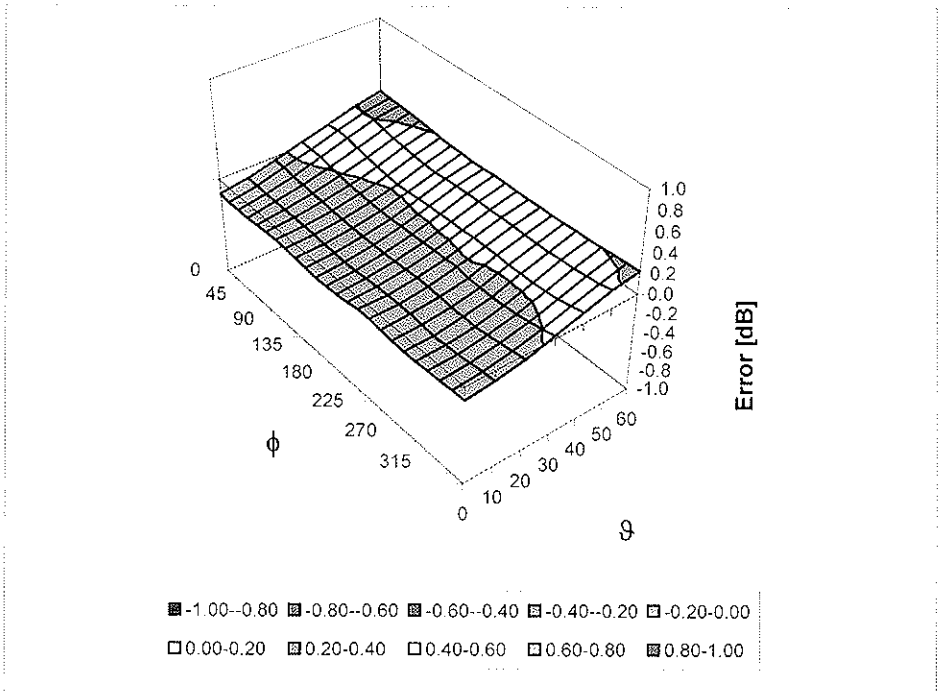
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

D3: DAE

Schmid & Partner Engineering AG

s p e a g

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

IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply outmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration the customer shall remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:
Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:
Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:
To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.

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

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

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

Accreditation No.: SCS 108

Client **ADT (Auden)**

Certificate No: DAE3-510_Oct10

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 510
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	October 4, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: October 4, 2010

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.204 ± 0.1% (k=2)	404.261 ± 0.1% (k=2)	404.619 ± 0.1% (k=2)
Low Range	3.97841 ± 0.7% (k=2)	3.96431 ± 0.7% (k=2)	3.98318 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	280.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200002.6	1.33	0.00
Channel X	+ Input	20001.52	1.72	0.01
Channel X	- Input	-19997.99	1.81	-0.01
Channel Y	+ Input	200010.4	0.89	0.00
Channel Y	+ Input	20000.89	1.39	0.01
Channel Y	- Input	-19998.10	1.60	-0.01
Channel Z	+ Input	200007.2	-1.37	-0.00
Channel Z	+ Input	19998.21	-1.29	-0.01
Channel Z	- Input	-20001.73	-2.13	0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.1	0.23	0.01
Channel X	+ Input	200.27	0.27	0.13
Channel X	- Input	-199.76	0.04	-0.02
Channel Y	+ Input	2000.8	0.66	0.03
Channel Y	+ Input	199.56	-0.44	-0.22
Channel Y	- Input	-200.06	-0.16	0.08
Channel Z	+ Input	1999.4	-0.75	-0.04
Channel Z	+ Input	199.53	-0.57	-0.28
Channel Z	- Input	-201.06	-1.16	0.58

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	17.87	16.44
	- 200	-15.36	-17.11
Channel Y	200	14.99	14.97
	- 200	-16.63	-16.47
Channel Z	200	-8.65	-8.74
	- 200	7.23	7.63

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	4.37	-3.14
Channel Y	200	6.07	-	3.36
Channel Z	200	3.03	-0.24	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15917	15639
Channel Y	16112	16210
Channel Z	16121	16322

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.61	0.06	2.59	0.30
Channel Y	1.72	-0.56	3.01	0.39
Channel Z	-1.94	-2.73	-0.59	0.30

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

D4: SYSTEM VALIDATION DIPOLE

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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client ADT (Auden)

Certificate No: D835V2-4d021_Apr10

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d021

Calibration procedure(s): QA CAL-05.v7
Calibration procedure for dipole validation kits

Calibration date: April 29, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 29, 2010

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.8 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 mW / g
SAR normalized	normalized to 1W	9.48 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.58 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 mW / g
SAR normalized	normalized to 1W	6.20 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.24 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.9 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	-----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.52 mW / g
SAR normalized	normalized to 1W	10.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.91 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.65 mW / g
SAR normalized	normalized to 1W	6.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.52 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.5 Ω - 2.5 jΩ
Return Loss	- 31.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1 Ω - 3.9 jΩ
Return Loss	- 27.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.392 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 22, 2004

DASY5 Validation Report for Head TSL

Date/Time: 21.04.2010 10:38:05

Test Laboratory: SPEAG, Zurich, Switzerland

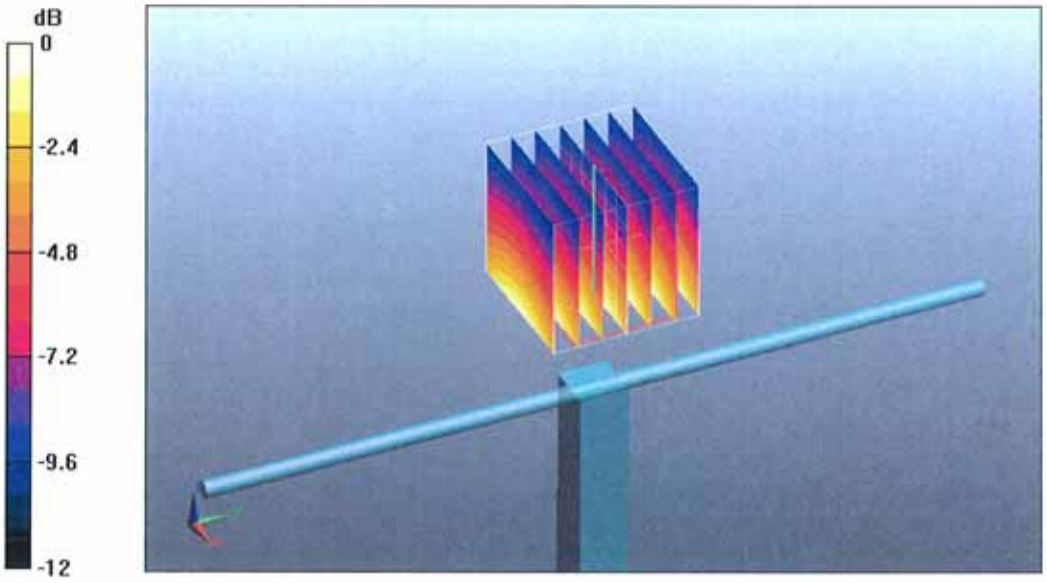
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d021

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

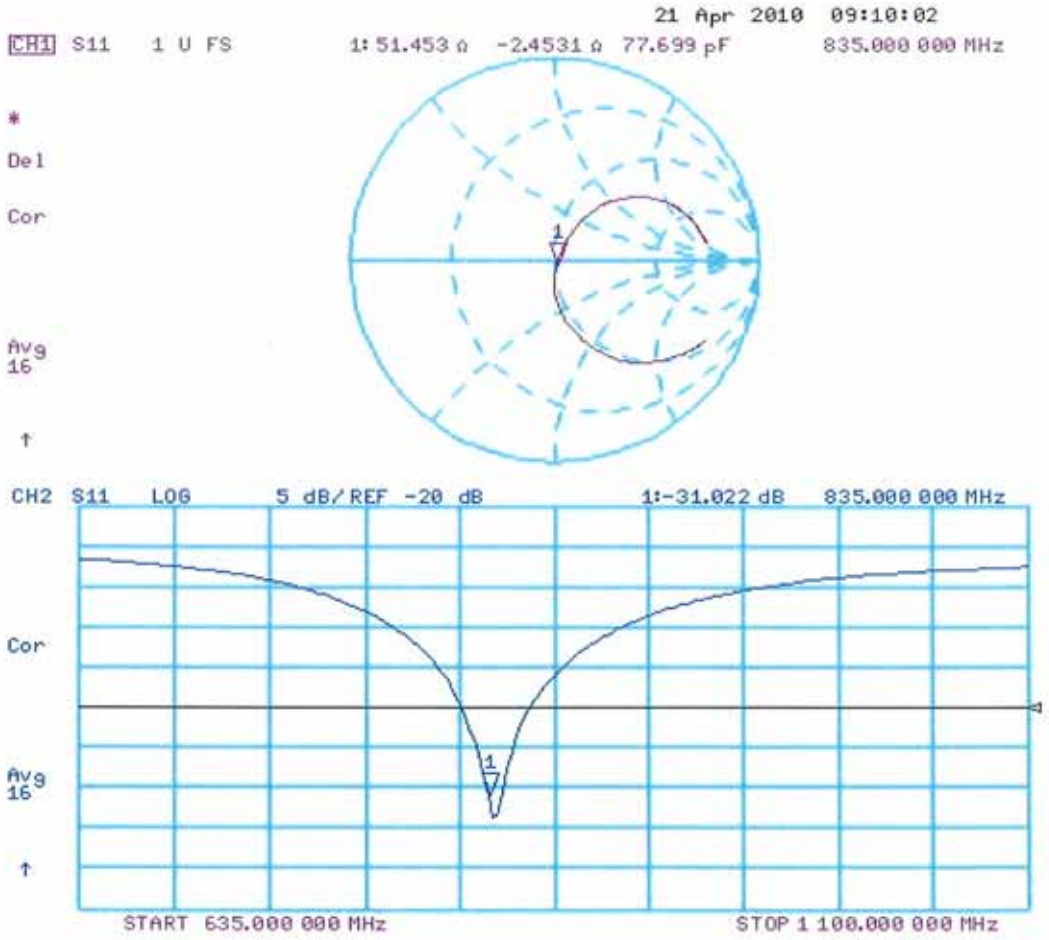
- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 57

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.3 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 2.77 mW/g



0 dB = 2.77mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 29.04.2010 13:27:42

Test Laboratory: SPEAG, Zurich, Switzerland

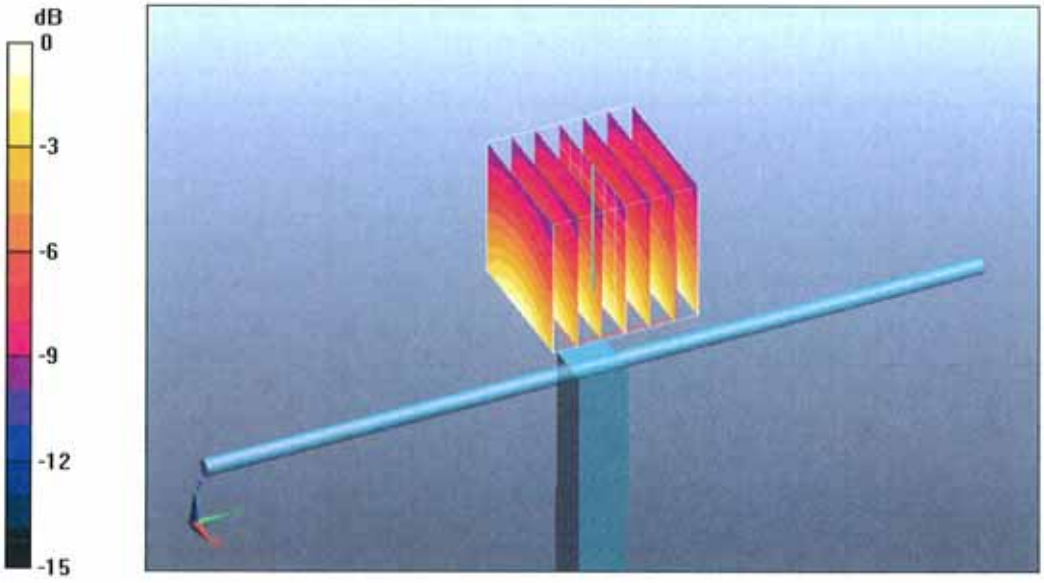
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d021

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

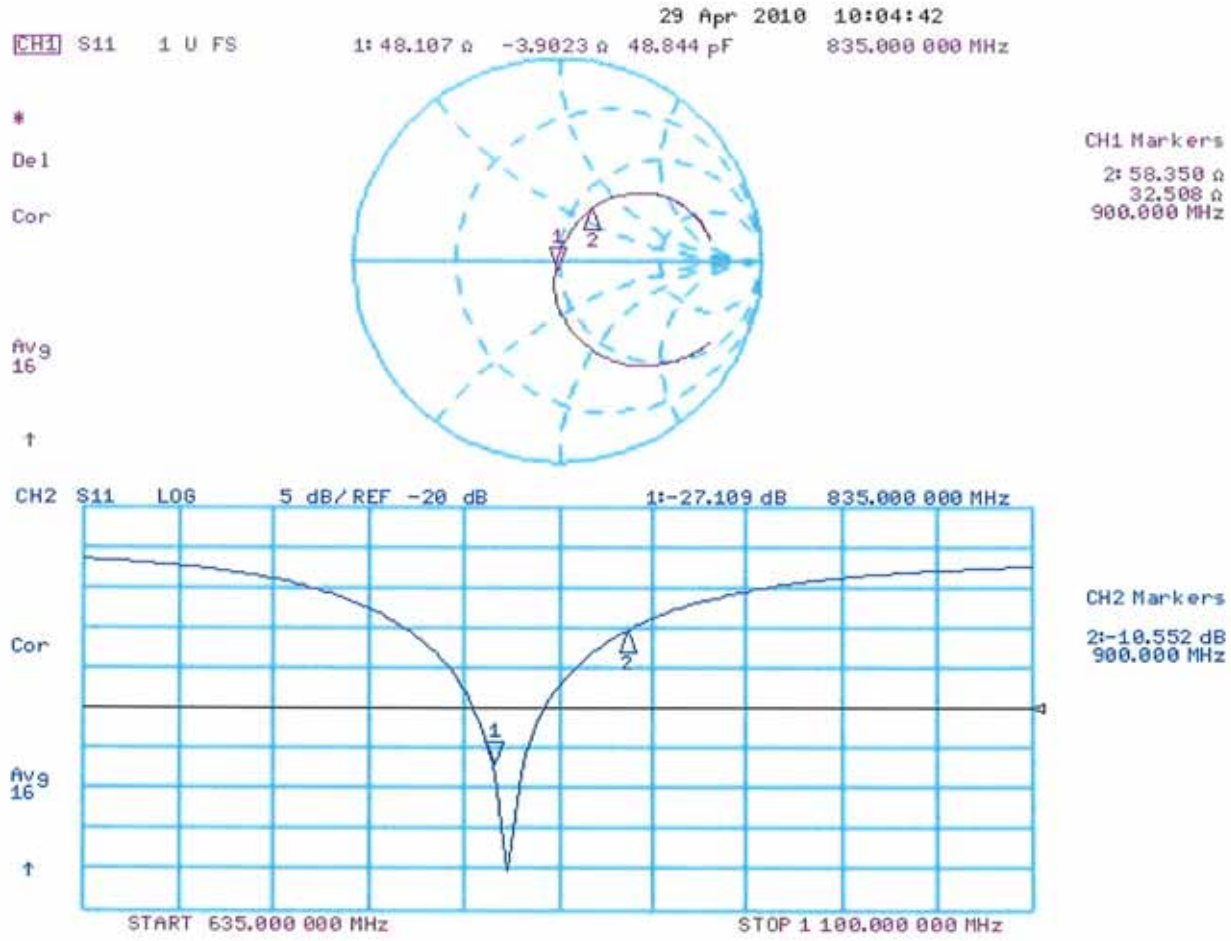
- Probe: ES3DV3 - SN3205; ConvF(5.97, 5.97, 5.97); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 57

Pin250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 3.73 W/kg
SAR(1 g) = 2.52 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 2.93 mW/g



0 dB = 2.93mW/g

Impedance Measurement Plot for Body TSL



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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **B.V. ADT (Auden)**

Certificate No: D1900V2-5d022_Jan11

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d022

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits

Calibration date: January 26, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 27, 2011

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.5 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(20.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.4 mW / g
SAR normalized	normalized to 1W	41.6 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**40.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.37 mW / g
SAR normalized	normalized to 1W	21.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**21.3 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.9 ± 6 %	1.56 mho/m ± 6 %
Body TSL temperature during test	(20.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.4 mW / g
SAR normalized	normalized to 1W	41.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.48 mW / g
SAR normalized	normalized to 1W	21.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.5 Ω + 4.0 jΩ
Return Loss	- 27.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω + 4.0 jΩ
Return Loss	- 24.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.193 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 29, 2002

DASY5 Validation Report for Head TSL

Date/Time: 24.01.2011 11:20:43

Test Laboratory: SPEAG, Zurich, Switzerland

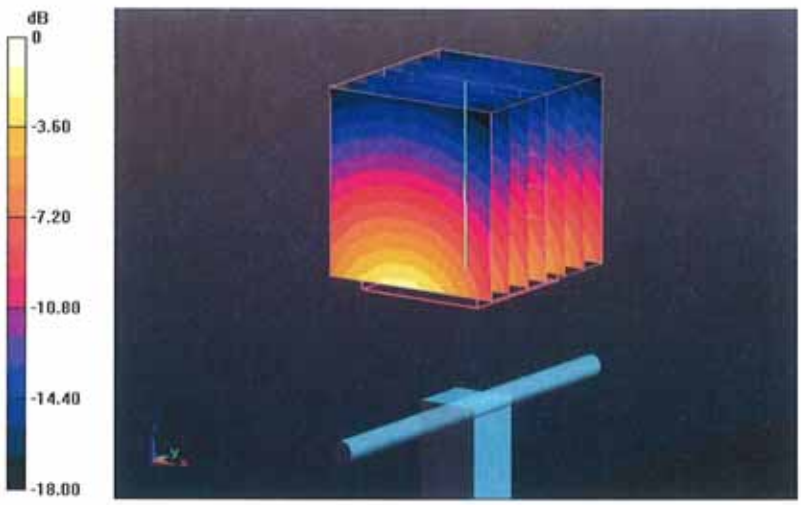
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d022

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.42 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

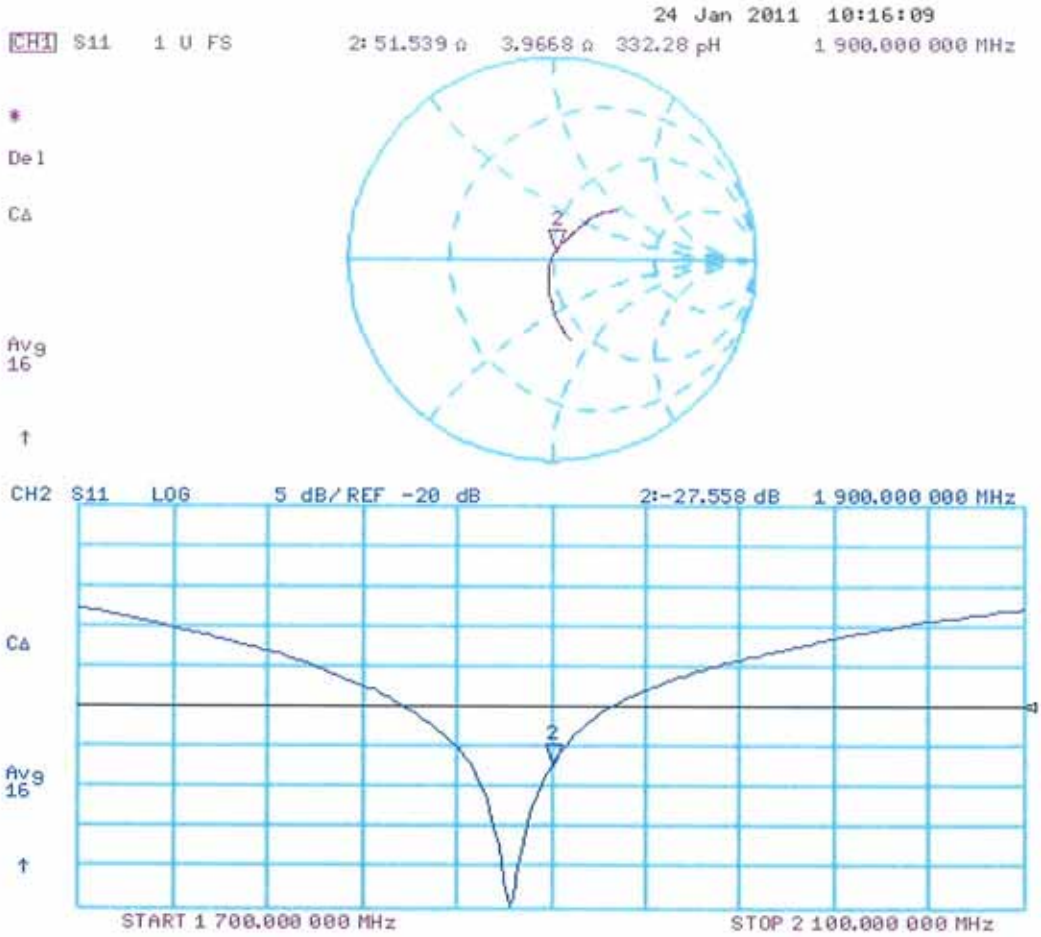
- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.002 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 19.131 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g
Maximum value of SAR (measured) = 12.963 mW/g



0 dB = 12.960mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 26.01.2011 12:06:07

Test Laboratory: SPEAG, Zurich, Switzerland

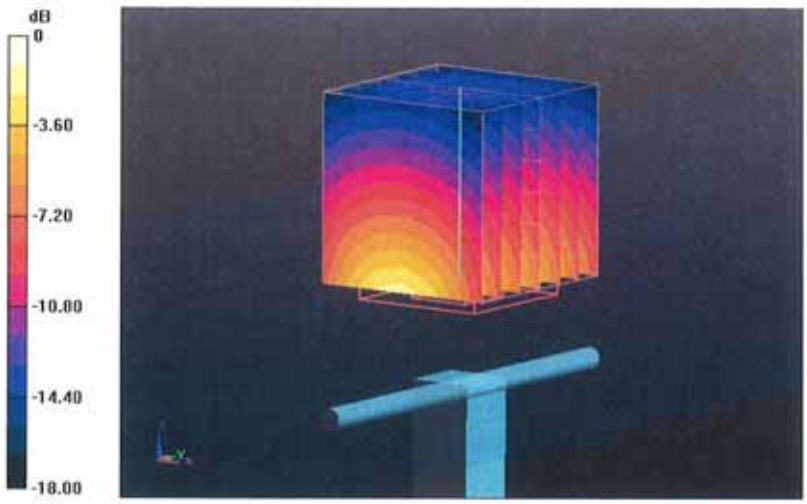
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d022

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.936 V/m; Power Drift = -0.0021 dB
Peak SAR (extrapolated) = 17.774 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.48 mW/g
Maximum value of SAR (measured) = 13.186 mW/g



0 dB = 13.190mW/g

Impedance Measurement Plot for Body TSL