SAR TEST REPORT

REPORT NO.:	SA990507C09-1
MODEL NO.:	TR-206
FCC ID:	RIDTR-206
RECEIVED:	May 07, 2010
TESTED:	Jul. 18 ~ Jul. 19, 2010
ISSUED:	Jul. 30, 2010

APPLICANT:	Globalsat Technology Corporation.
ADDRESS:	16F., No. 186, Jian-Yi Road, Chung-Ho City, Taipei Hsien 235, Taiwan

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.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

TABLE OF CONTENTS

1. CERTIFICATION

PRODUCT:	GPS Tracker
MODEL NO.:	TR-206
BRAND:	GS.TRAQ
APPLICANT:	Globalsat Technology Corporation.
TESTED:	Jul. 18 ~ Jul. 19, 2010
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 2 (Section 2.1093)**
	FCC OET Bulletin 65, Supplement C (01-01)
	RSS-102

The above equipment (model: TR-206) has 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 : Polly Chien , **DATE :** Jul. 30, 2010
Polly Chien / Specialist

TECHNICAL ACCEPTANCE : Mason Chang , **DATE :** Jul. 30, 2010
Responsible for RF
Mason Chang / Engineer

APPROVED BY : Gary Chang , **DATE :** Jul. 30, 2010
Gary Chang / Assistant Manager

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	GPS Tracker				
MODEL NO.	TR-206				
FCC ID	RIDTR-206				
POWER SUPPLY	3.7Vdc (Li-ion battery) 5.0Vdc (adapter & host equipment)				
MODULATION TYPE	GMSK, GPRS				
FREQUENCY RANGE	824MHz ~ 849MHz (GSM 850) 1850MHz ~ 1910MHz (PCS 1900)				
CHANNEL FREQUENCIES UNDER TEST AND ITS CONDUCTED OUTPUT POWER	**CH**	**FREQ.**	**GSM850**	**GPRS850**	
				TS1	**TS2**
	190	836.6MHz	32.25dBm	32.23dBm	32.17dBm
	CH	**FREQ.**	**PCS1900**	**GPRS1900**	
				TS1	**TS2**
	661	1880.0MHz	29.26dBm	29.24dBm	29.23dBm
MAX. AVERAGE SAR (1g)	**HEAD**		**BODY**		
	0.724W/kg (GSM850)		0.275W/kg (GSM850)		
	0.463W/kg (PCS1900)		0.115W/kg (PCS1900)		
ANTENNA TYPE	PIFA				
ANTENNA GAIN	GSM850 BAND: 4dBi PCS1900 BAND: 0dBi				
ANTENNA CONNECTOR	NA				
DATA CABLE	1m shielded USB cable without core				
I/O PORTS	Refer to user's manual				
ACCESSORY DEVICES	Adapter, Li-ion battery				

NOTE:

1. The EUT uses the following adapter and li-ion battery.

ADAPTER	
BRAND	Touch Electronic Co., Ltd.
MODEL	SA01-6USG05R-A
INPUT POWER	100-240Vac, 0.2A, 50/60Hz
OUTPUT POWER	5Vdc, 1.2A (6W MAX)
POWER LINE	1.8m non-shielded cable without core

LI-ION BATTERY	
MODEL	BL-5C
RATING	3.7Vdc, 1100mAh

2. The communicated functions of EUT listed as below:

		850MHz	1900MHz
2G	GSM	√	√
	GPRS	√	√

3. IMEI Code: 357938020314076.
4. Software vision: F-0TR-206STD-10061052.
5. Hardware vision: GS-EB-TR206-V1.1.
6. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 2 (2.1093)

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

RSS-102

IEEE 1528-2003

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

2.3 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY5 **(Software 5.2 Build 162)** 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 DASY5 software defined. The DASY5 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.

EX3DV3 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, EN 62209-1 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 ± 0.2mm
FILLING VOLUME	Approx. 25liters
DIMENSIONS	Height: 810mm; Length: 1000mm; Width: 500mm

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, 1900MHz
RETURN LOSS	> 20dB at specified validation position
POWER CAPABILITY	> 100W (f < 1GHz); > 40W (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 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.

2.4 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	Agilent	E8257C	MY43320668	Feb. 23, 2010	Feb. 22, 2011
3	E-Field Probe	S & P	EX3DV3	3504	Jan. 26, 2010	Jan. 25, 2011
4	DAE	S & P	DAE 3	510	Dec. 16, 2009	Dec. 15, 2010
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D835V2	4d021	Apr. 29, 2010	Apr. 28, 2011
7	Validation Dipole	S & P	D1900V2	5d036	Feb. 23, 2010	Feb. 22, 2011

NOTE: Before starting, 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	E8257C	MY43320668	Feb. 23, 2010	Feb. 22, 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

2.5 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

The DASY5 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 1g and 10g 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 1g and 10g.

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.

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.

3. DESCRIPTION OF SUPPORT UNITS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	Universal Radio Communication Tester	R&S	CMU200	117260

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).

4. 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 are some common ingredients：

- **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 (75-125mPa.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= 0.97 ± 5% S/m	f= 835MHz ε= 55.0 ± 5% σ= 1.05 ± 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 30min. 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 DASY5 for the frequencies necessary for the measurements (‘Setup Config’, select medium (e.g. Brain 900MHz) and press ‘Option’-button.
14. Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900MHz).

FOR GSM850 BAND SIMULATING LIQUID

LIQUID TYPE		HSL-835			
SIMULATING LIQUID TEMP.		21.7			
TEST DATE		Jul. 18, 2010			
TESTED BY		Sam Onn			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
835.0	Permitivity (ε)	41.50	42.90	3.37	±5
836.6		41.50	42.90	3.37	
835.0	Conductivity (σ) S/m	0.90	0.87	-3.33	
836.6		0.90	0.87	-3.33	

LIQUID TYPE		MSL-835			
SIMULATING LIQUID TEMP.		22.2			
TEST DATE		Jul. 18, 2010			
TESTED BY		Sam Onn			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
835.0	Permitivity (ε)	55.20	55.50	0.54	±5
836.6		55.20	55.50	0.54	
835.0	Conductivity (σ) S/m	0.97	0.98	1.03	
836.6		0.97	0.99	2.06	

FOR CDMA1900 BAND SIMULATING LIQUID

LIQUID TYPE		HSL-1900			
SIMULATING LIQUID TEMP.		21.2			
TEST DATE		Jul. 19, 2010			
TESTED BY		Sam Onn			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
1880	Permitivity	40.00	39.70	-0.75	±5
1900	(ε)	40.00	39.60	-1.00	
1880	Conductivity	1.40	1.43	2.14	
1900	(σ) S/m	1.40	1.45	3.57	

LIQUID TYPE		MSL-1900			
SIMULATING LIQUID TEMP.		21.7			
TEST DATE		Jul. 19, 2010			
TESTED BY		Sam Onn			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
1880	Permitivity	53.30	53.30	0.00	±5
1900	(ε)	53.30	53.10	-0.38	
1880	Conductivity	1.52	1.54	1.32	
1900	(σ) S/m	1.52	1.56	2.63	

5. 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.

5.1 TEST PROCEDURE

Before the system performance check, we need only to tell the system which components (probe, medium, and device) are used for the system performance check; the system will take care of all parameters. The dipole must be placed beneath the flat 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 mobile phones 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 ±0.02dB.

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 DASY5 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%.

5.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	**REQUIRED SAR (mW/g)**	**MEASURED SAR (mW/g)**	**DEVIATION (%)**	**SEPARATION DISTANCE**	**TESTED DATE**
HSL835	2.37 (1g)	2.26	-4.64	15mm	Jul. 18, 2010
MSL835	2.52 (1g)	2.39	-5.16	15mm	Jul. 18, 2010
HSL1900	10.00 (1g)	9.31	-6.90	10mm	Jul. 19, 2010
MSL1900	10.30 (1g)	9.72	-5.63	10mm	Jul. 19, 2010
TESTED BY	Sam Onn				

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

5.3 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	0.50	Rectangular	√3	0.7	0.7	0.20	0.20	∞
Hemispherical Isotropy	9.60	Rectangular	√3	0.7	0.7	3.88	3.88	∞
Boundary effects	2.00	Rectangular	√3	1	1	1.15	1.15	∞
Linearity	0.60	Rectangular	√3	1	1	0.35	0.35	∞
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	∞
RF Ambient Reflections	3.00	Rectangular	√3	1	1	1.73	1.73	∞
Probe Positioner	0.80	Rectangular	√3	1	1	0.46	0.46	∞
Probe Positioning	9.90	Rectangular	√3	1	1	5.72	5.72	∞
Max. SAR Eval.	4.00	Rectangular	√3	1	1	2.31	2.31	∞
Dipole Related								
Dipole Axis to Liquid Distance	2.00	Rectangular	√3	1	1	1.15	1.15	145
Input Power Drift	5.00	Rectangular	√3	1	1	2.89	2.89	∞
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)	4.10	Normal	1	0.64	0.43	2.62	1.76	∞
Liquid Permittivity (target)	5.00	Rectangular	√3	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	3.93	Normal	1	0.6	0.49	2.36	1.93	∞
Combined Standard Uncertainty						**11.30**	**10.92**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**22.61**	**21.84**	

NOTE: About the system validation uncertainty assessment, please reference the section 7.

6. TEST RESULTS

6.1 TEST PROCEDURES

The EUT 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 DASY5 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 / EN 62209-1, 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 was performed for the highest spatial SAR location. The zoom scan with 30mm x 30mm x 30mm volume 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 3mm and maintained at a constant distance of ±0.5mm during a zoom scan to determine peak SAR locations. The distance is 3mm between the first measurement point and the bottom surface of the phantom. The secondary measurement point to the bottom surface of the phantom is with 8mm separation distance. The cube size is 7 x 7 x 7 points consists of 343 points and the grid space is 5mm.

The measurement time is 0.5s 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 3mm 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%.

6.2 DESCRIPTION OF TEST CONDITION

TEST DATE	TISSUE TYPE / FREQ.	TEST MODE	TEMPERATURE (°C)		HUMIDITY (%RH)	TESTED BY
			AIMBENT	LIQUID		
Jul. 18, 2010	HSL835	1 ~ 4	22.6	21.7	60	Sam Onn
Jul. 19, 2010	HSL1900	5 ~ 8	22.4	21.2	62	Sam Onn
Jul. 18, 2010	MSL835	9 ~ 12	23.0	22.2	60	Sam Onn
Jul. 19, 2010	MSL1900	13 ~ 16	22.8	21.7	62	Sam Onn

6.3 MEASURED SAR RESULT

SAR (1g)						
HEAD			RIGHT		LEFT	
MODE	CHAN.	FREQ. (MHz)	CHEEK	TILT	CHEEK	TILT
GSM 850	190	836.6 (Middle)	**0.724**	0.469	0.610	0.314
PCS 1900	661	1880.0 (Middle)	0.356	0.372	**0.463**	0.449

SAR (1 g)				
BODY				
MODE	CHAN.	FREQ. (MHz)	FRONT	BOTTOM
GSM 850	190	836.6 (Middle)	-	0.158
GPRS 850 TS1	190	836.6 (Middle)	-	0.143
GPRS 850 TS2	190	836.6 (Middle)	0.241	**0.275**
PCS 1900	661	1880.0 (Middle)	-	0.060
GPRS 1900 TS1	661	1880.0 (Middle)	-	0.049
GPRS 1900 TS2	661	1880.0 (Middle)	0.098	**0.115**

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over 1g, 1.6 W/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. Per KDB 447498, when 1-g SAR for the highest output channel is less than 0.8 W/kg, testing for the other channels is not required

6.4 POWER DRIFT TABLE

Test Mode	Modulation Mode	Test Position	Test Channel	Test Frequency	Power (dBm)		Power drift (%)
					Begin	After	
1	GSM 850	Right Head Cheek	190	836.6	32.26	32.19	-1.60
2	GSM 850	Right Head Tilt	190	836.6	32.24	32.18	-1.37
3	GSM 850	Left Head Cheek	190	836.6	32.21	32.13	-1.83
4	GSM 850	Left Head Tilt	190	836.6	32.25	32.15	-2.28
5	PCS 1900	Right Head Cheek	661	1880.0	29.26	29.13	-2.95
6	PCS 1900	Right Head Tilt	661	1880.0	29.24	29.16	-1.83
7	PCS 1900	Left Head Cheek	661	1880.0	29.21	29.08	-2.95
8	PCS 1900	Left Head Tilt	661	1880.0	29.25	29.11	-3.17
9	GSM 850	Body Back	190	836.6	32.21	32.11	-2.28
10	GPRS 850 TS1	Body Back	190	836.6	32.19	32.09	-2.28
11	GPRS 850 TS2	Body Back	190	836.6	32.18	32.08	-2.28
12	GPRS 850 TS2	Body Front	190	836.6	32.20	32.07	-2.95
13	PCS 1900	Body Back	661	1880.0	29.24	29.12	-2.73
14	GPRS 1900 TS1	Body Back	661	1880.0	29.24	29.08	-3.62
15	GPRS 1900 TS2	Body Back	661	1880.0	29.22	29.11	-2.50
16	GPRS 1900 TS2	Body Front	661	1880.0	29.21	29.12	-2.05

6.5 SAR LIMITS

HUMAN EXPOSURE	SAR (W/kg)	
	(GENERAL POPULATION / UNCONTROLLED EXPOSURE ENVIRONMENT)	(OCCUPATIONAL / CONTROLLED EXPOSURE ENVIRONMENT)
Spatial Peak (averaged over 1 g)	**1.6**	8.0

NOTE:

1. This limits accord to 47 CFR 2.1093 – Safety Limit.
2. The EUT property been complied with the partial body exposure limit under the general population environment.

7. 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

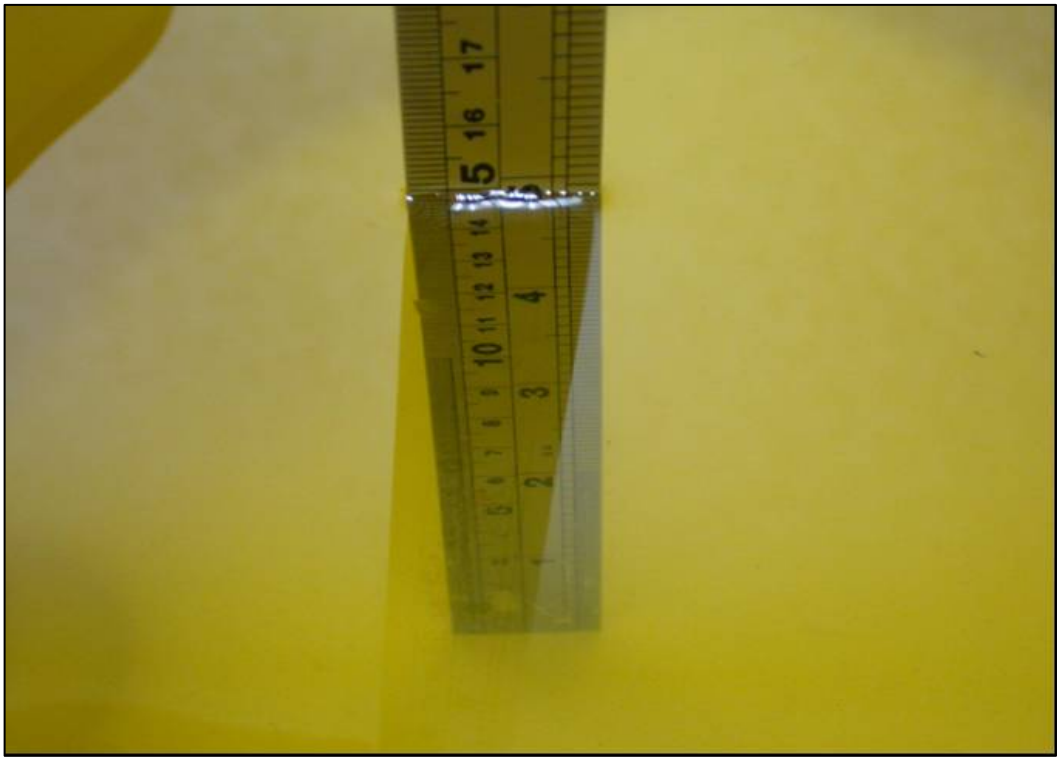
The address and road map of all our labs can be found in our web site also.

---END---

APPENDIX A: TEST DATA

Liquid Level Photo

Tissue 835MHz D=150mm



Tissue 1900MHz D=150mm

Date/Time: 2010/7/18 08:29:49

Test Laboratory: Bureau Veritas ADT

M01-Right Head-Cheek-GSM850-Ch190

DUT: GPS Tracker ; Type: TR-206

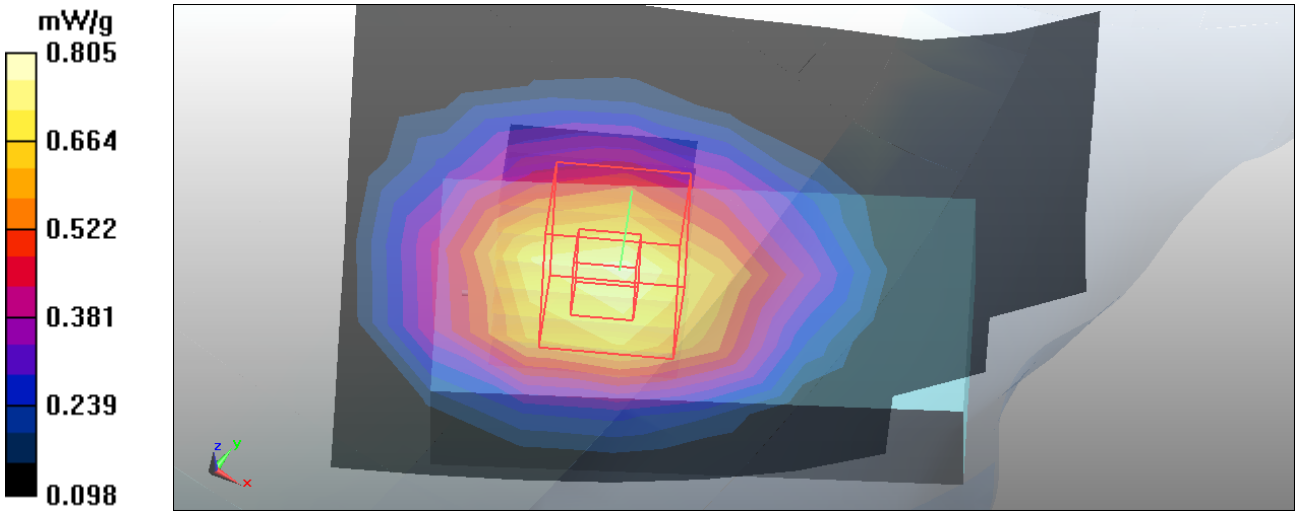
Communication System: Generic GSM ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used : f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.8, 9.8, 9.8); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Touch Position - Mid Channel 190/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.778 mW/g

Touch Position - Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 25 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 0.936 W/kg
SAR(1 g) = 0.724 mW/g; SAR(10 g) = 0.512 mW/g
Maximum value of SAR (measured) = 0.805 mW/g



Date/Time: 2010/7/18 09:12:42

Test Laboratory: Bureau Veritas ADT

M02-Right Head-Tilt-GSM850-Ch190

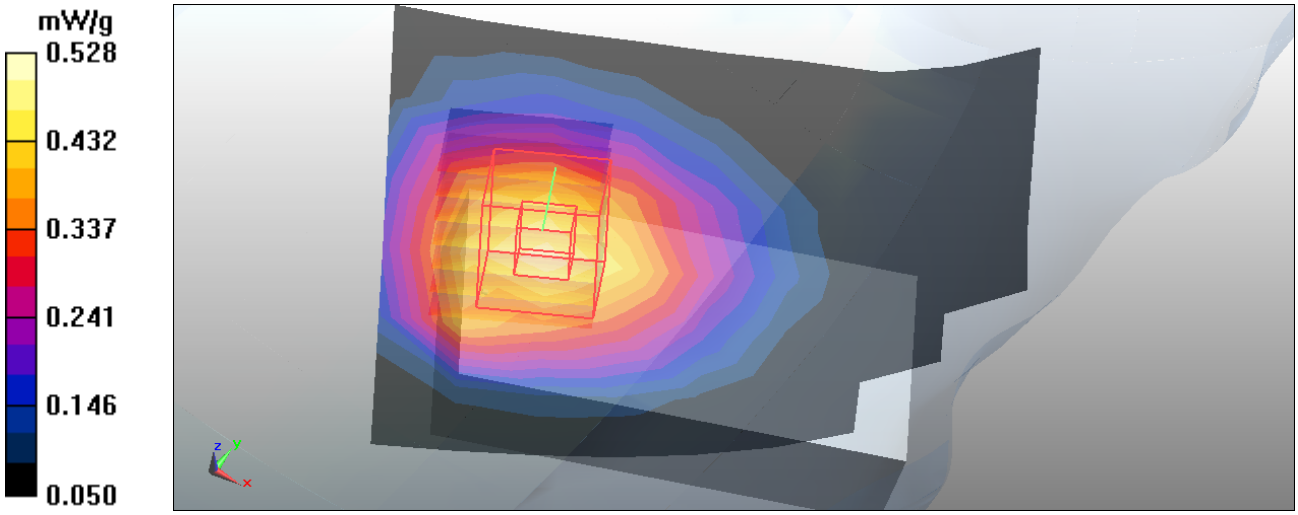
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used : f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.8, 9.8, 9.8); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Tilt Position - Mid Channel 190/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.522 mW/g

Tilt Position - Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 23.8 V/m; Power Drift = -0.120 dB
Peak SAR (extrapolated) = 0.635 W/kg
SAR(1 g) = 0.469 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.528 mW/g



Date/Time: 2010/7/18 09:53:43

Test Laboratory: Bureau Veritas ADT

M03-Left Head-Cheek-GSM850-Ch190

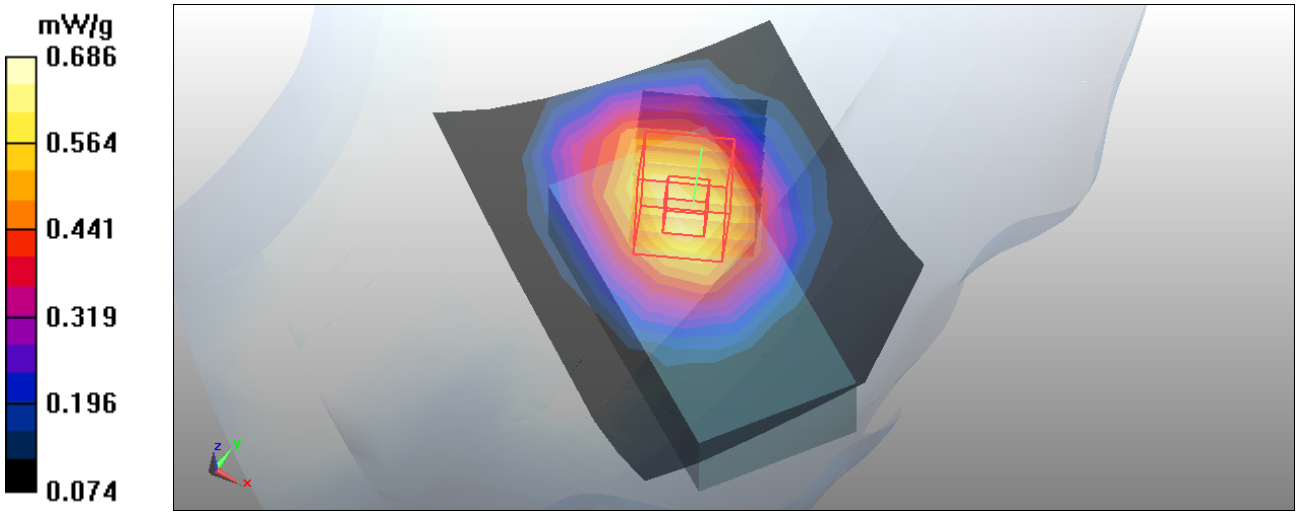
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used : f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.8, 9.8, 9.8); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Touch Position - Mid Channel 190/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.653 mW/g

Touch Position - Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 24.6 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.827 W/kg
SAR(1 g) = 0.610 mW/g; SAR(10 g) = 0.431 mW/g
Maximum value of SAR (measured) = 0.686 mW/g



Date/Time: 2010/7/18 10:35:25

Test Laboratory: Bureau Veritas ADT

M04-Left Head-Tilt-GSM850-Ch190

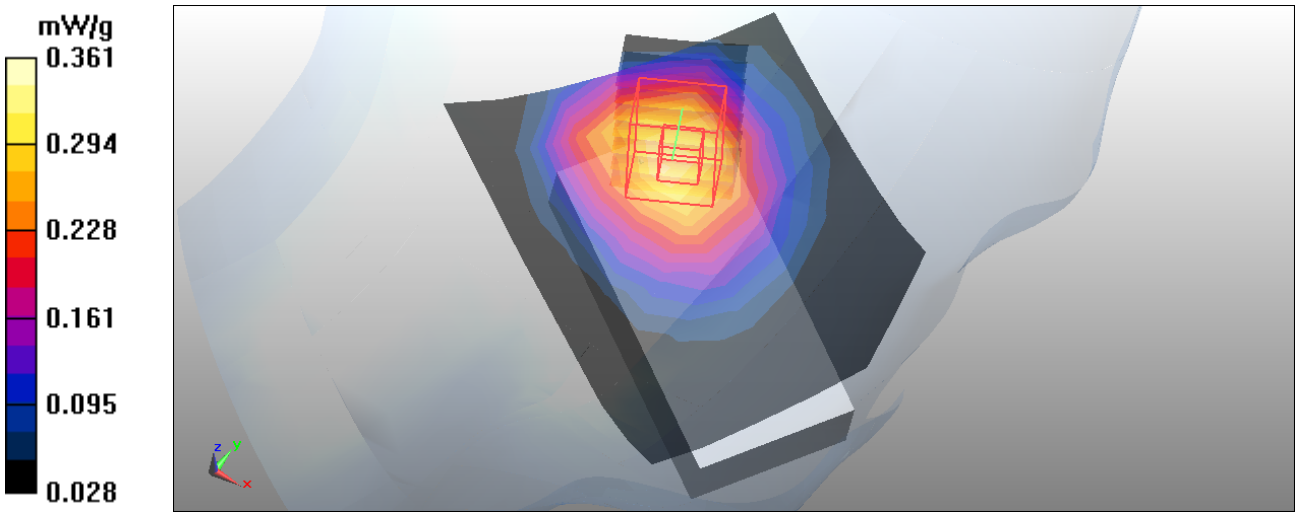
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3
Medium: HSL850 Medium parameters used : f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.8, 9.8, 9.8); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Tilt Position - Mid Channel 190/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.346 mW/g

Tilt Position - Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 19.4 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.468 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.361 mW/g



Date/Time: 2010/7/19 01:44:34

Test Laboratory: Bureau Veritas ADT

M05-Right Head-Cheek-PCS1900-Ch661

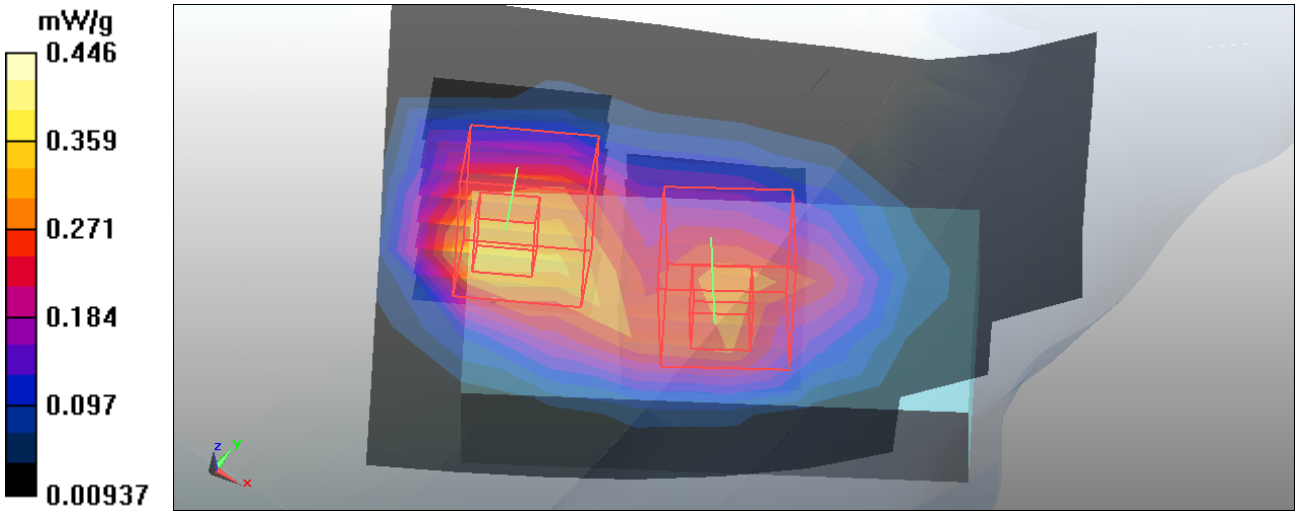
DUT: GPS Tracker ; Type: TR-206

Communication System: Generic GSM ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Touch Position - Mid Channel 661/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.357 mW/g
Touch Position - Mid Channel 661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.8 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 0.671 W/kg
SAR(1 g) = 0.356 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 0.446 mW/g
Touch Position - Mid Channel 661/Zoom Scan (7x7x9)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.8 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 0.458 W/kg
SAR(1 g) = 0.302 mW/g; SAR(10 g) = 0.185 mW/g
Maximum value of SAR (measured) = 0.365 mW/g



Date/Time: 2010/7/19 02:25:42

Test Laboratory: Bureau Veritas ADT

M06-Right Head-Tilt-PCS1900-Ch661

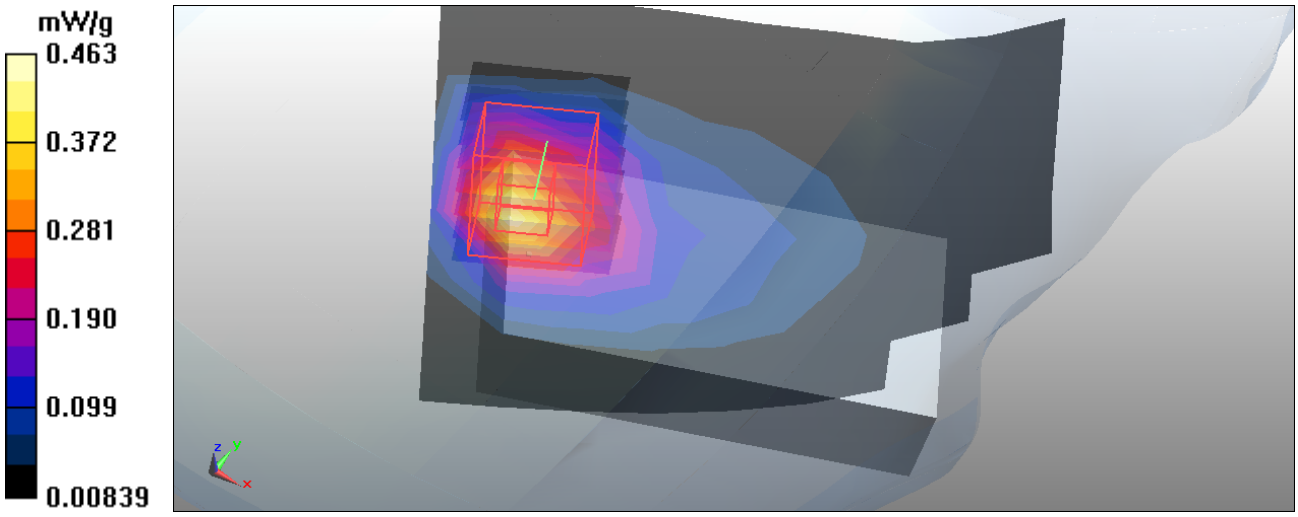
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Tilt Position - Mid Channel 661/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.440 mW/g

Tilt Position - Mid Channel 661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 17.4 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.463 mW/g



Date/Time: 2010/7/19 03:08:21

Test Laboratory: Bureau Veritas ADT

M07-Left Head-Cheek-PCS1900-Ch661

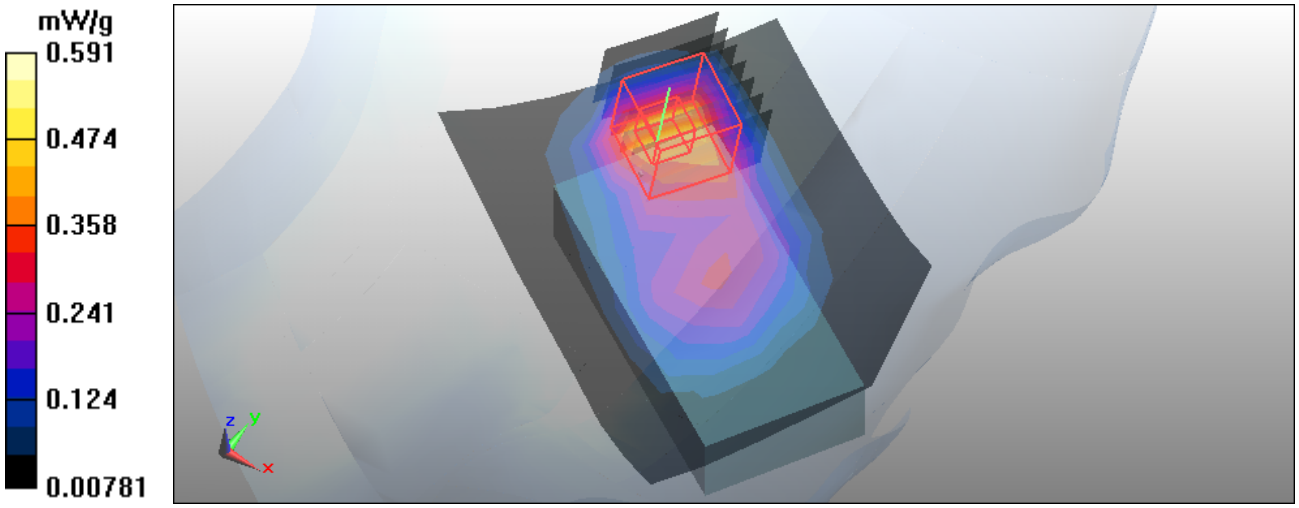
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Touch Position - Mid Channel 661/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.441 mW/g

Touch Position - Mid Channel 661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 18.7 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 0.958 W/kg
SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.231 mW/g
Maximum value of SAR (measured) = 0.591 mW/g



Date/Time: 2010/7/19 03:55:04

Test Laboratory: Bureau Veritas ADT

M08-Left Head-Tilt-PCS1900-Ch661

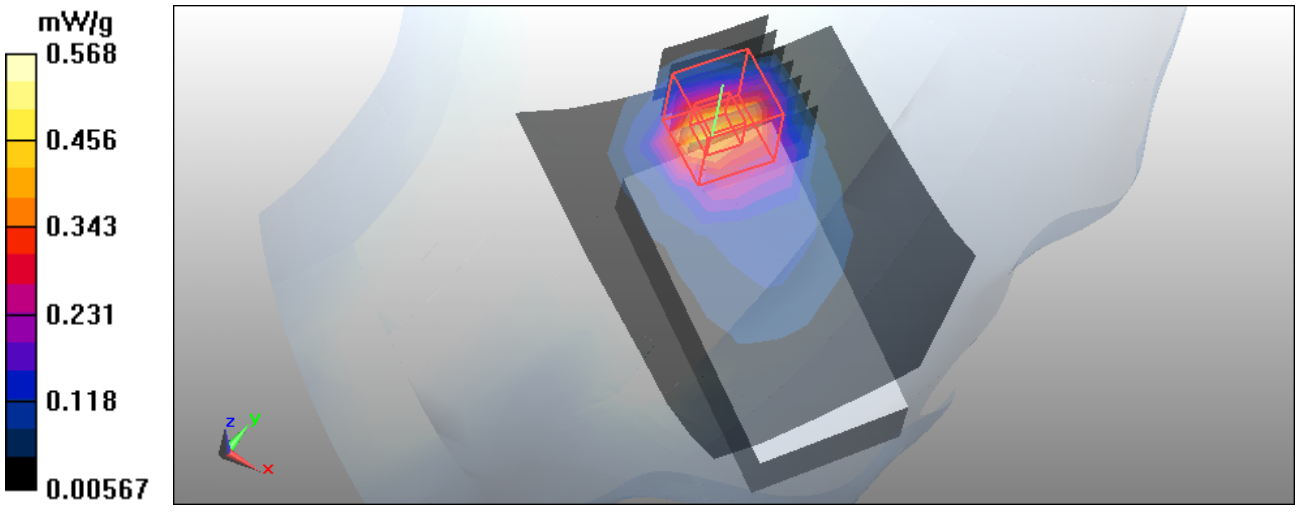
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: GMSK

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Tilt Position - Mid Channel 661/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.503 mW/g

Tilt Position - Mid Channel 661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 18.7 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.888 W/kg
SAR(1 g) = 0.449 mW/g; SAR(10 g) = 0.223 mW/g
Maximum value of SAR (measured) = 0.568 mW/g



Date/Time: 2010/7/18 13:43:50

Test Laboratory: Bureau Veritas ADT

M09-Body-GSM850-Ch190 / LCD Down

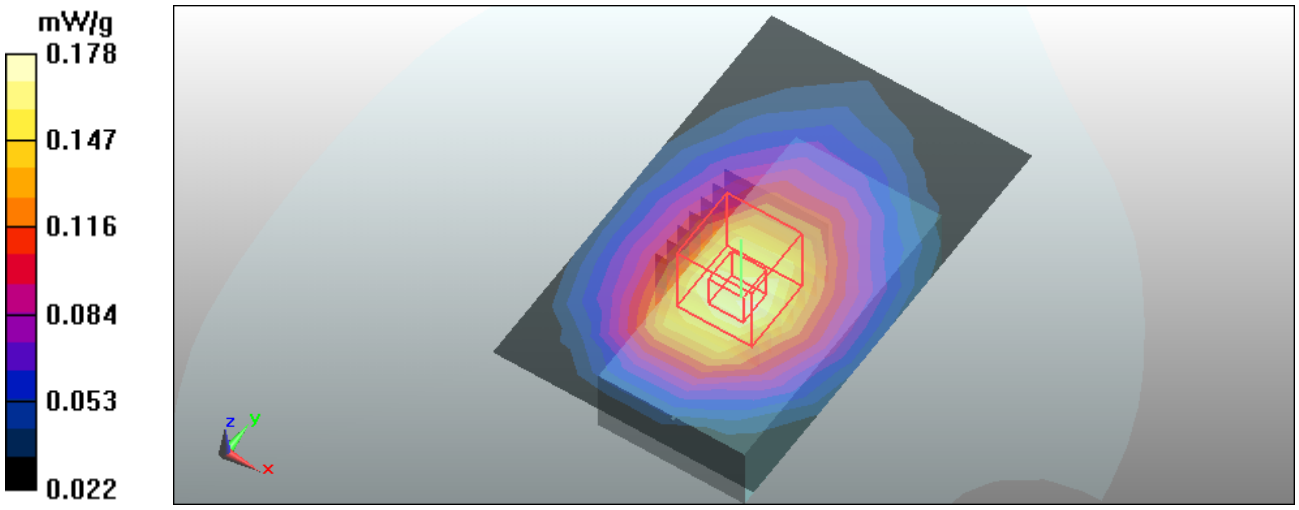
DUT: GPS Tracker ; Type: TR-206
Communication System: Generic GSM ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK
Medium: MSL850 Medium parameters used : f = 836.6 MHz; σ = 0.99 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.83, 9.83, 9.83); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid Channel 190/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.171 mW/g

Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.3 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.158 mW/g; SAR(10 g) = 0.111 mW/g
Maximum value of SAR (measured) = 0.178 mW/g



Date/Time: 2010/7/18 14:23:47

Test Laboratory: Bureau Veritas ADT

M10-Body-GPRS850 TS1-Ch190 / LCD Down

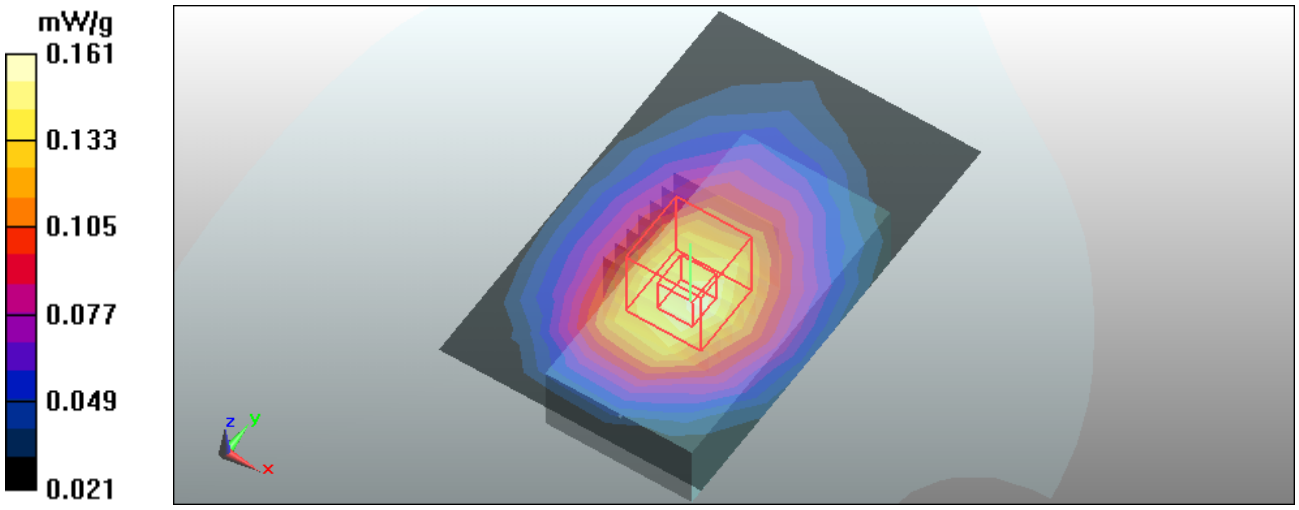
DUT: GPS Tracker ; Type: TR-206
Communication System: GPRS850 TS1 ; Frequency: 836.6 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK / UL 1 time slot
Medium: MSL850 Medium parameters used : f = 836.6 MHz; σ = 0.99 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.83, 9.83, 9.83); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid Channel 190/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.157 mW/g

Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.198 W/kg
SAR(1 g) = 0.143 mW/g; SAR(10 g) = 0.100 mW/g
Maximum value of SAR (measured) = 0.161 mW/g



Date/Time: 2010/7/18 15:07:23

Test Laboratory: Bureau Veritas ADT

M11-Body-GPRS850 TS2-Ch190 / LCD Down

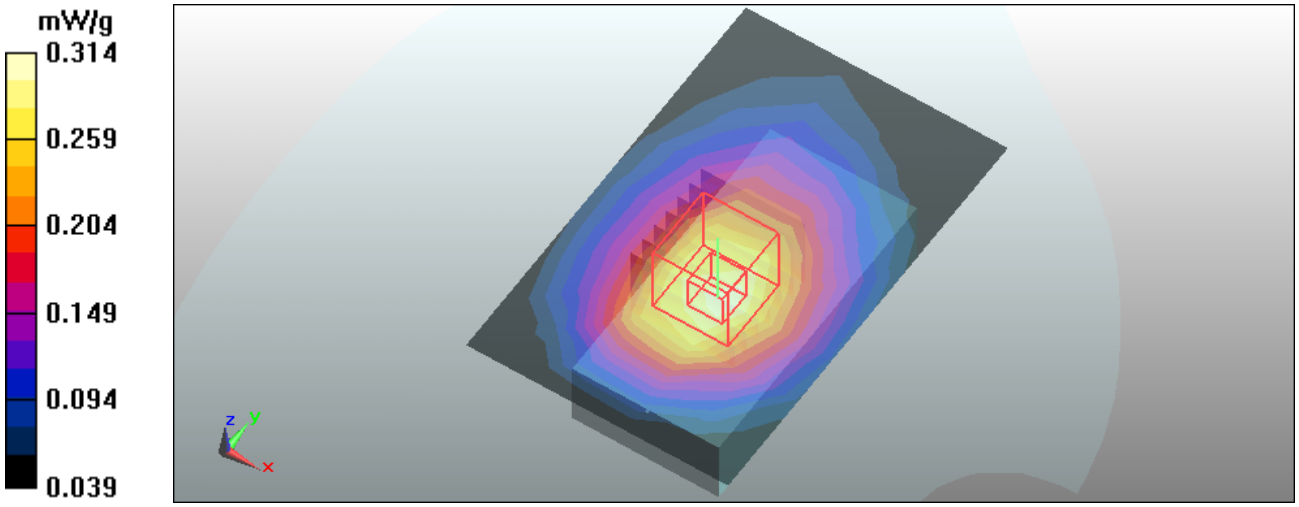
DUT: GPS Tracker ; Type: TR-206
Communication System: GPRS850 TS2 ; Frequency: 836.6 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots
Medium: MSL850 Medium parameters used : f = 836.6 MHz; σ = 0.99 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.83, 9.83, 9.83); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid Channel 190/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.308 mW/g

Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 14.2 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.381 W/kg
SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.314 mW/g



Date/Time: 2010/7/18 15:48:15

Test Laboratory: Bureau Veritas ADT

M12-Body-GPRS850 TS2-Ch190 / LCD Up

DUT: GPS Tracker ; Type: TR-206

Communication System: GPRS850 TS2 ; 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 = 0.99 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 15 mm (The front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.83, 9.83, 9.83); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid Channel 190/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.269 mW/g

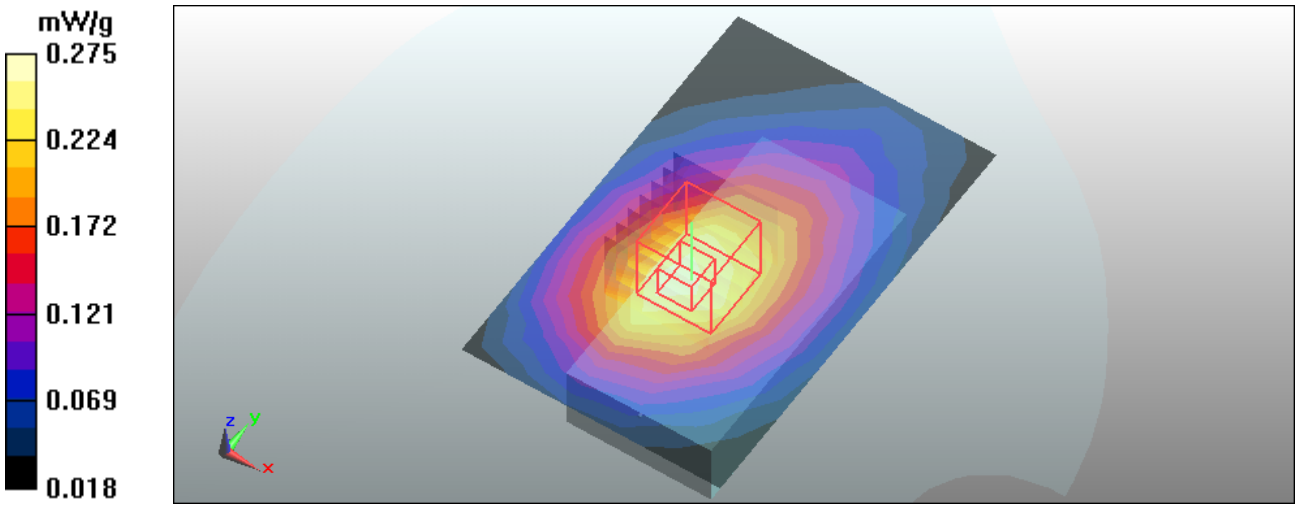
Mid Channel 190/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 12.5 V/m; Power Drift = -0.108 dB

Peak SAR (extrapolated) = 0.337 W/kg

SAR(1 g) = 0.241 mW/g; SAR(10 g) = 0.169 mW/g

Maximum value of SAR (measured) = 0.275 mW/g



Date/Time: 2010/7/19 05:52:12

Test Laboratory: Bureau Veritas ADT

M13-Body-PCS1900-Ch661 / LCD Down

DUT: GPS Tracker ; Type: TR-206

Communication System: Generic GSM ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK

Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.52, 8.52, 8.52); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid. Ch661/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

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

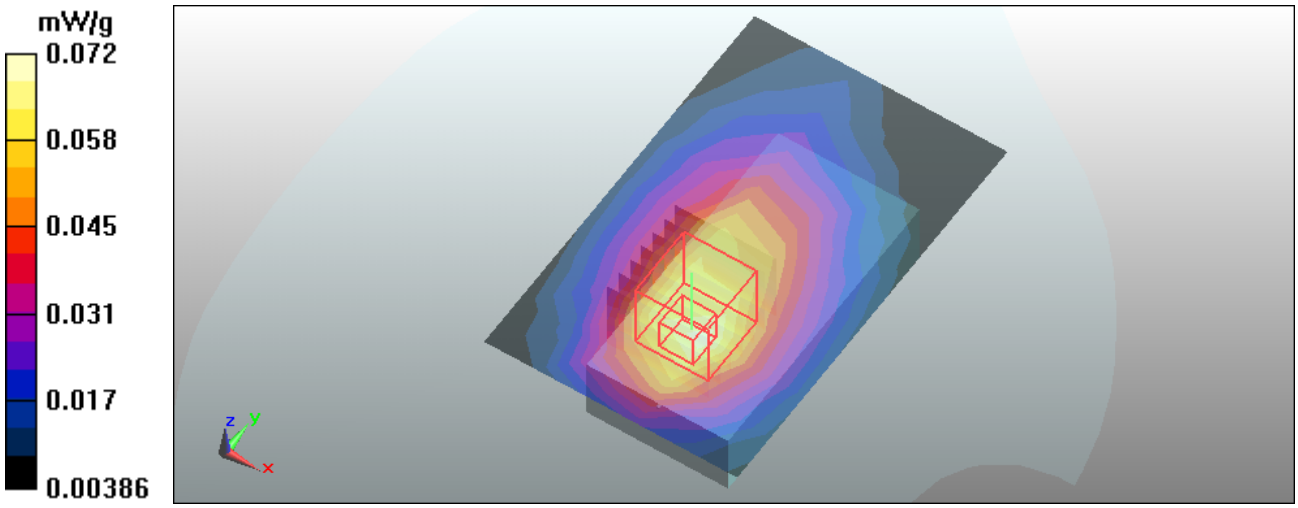
Mid. Ch661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 6.44 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 0.098 W/kg

SAR(1 g) = 0.060 mW/g; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.072 mW/g



Date/Time: 2010/7/19 06:35:18

Test Laboratory: Bureau Veritas ADT

M14-Body-GPRS1900 TS1-Ch661 / LCD Down

DUT: GPS Tracker ; Type: TR-206

Communication System: GPRS1900 TS1 ; Frequency: 1880 MHz ; Duty Cycle: 1:8.3 ; Modulation type: GMSK / UL 1 time slot

Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.52, 8.52, 8.52); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid. Ch661/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.056 mW/g

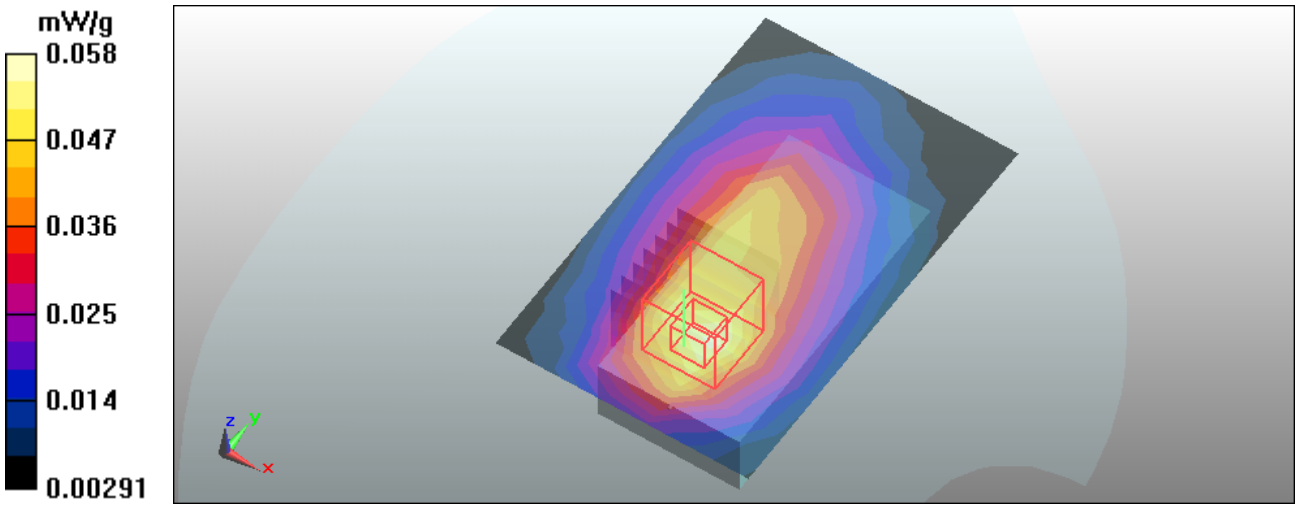
Mid. Ch661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 5.88 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 0.082 W/kg

SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.030 mW/g

Maximum value of SAR (measured) = 0.058 mW/g



Date/Time: 2010/7/19 07:11:56

Test Laboratory: Bureau Veritas ADT

M15-Body-GPRS1900 TS2-Ch661 / LCD Down

DUT: GPS Tracker ; Type: TR-206

Communication System: GPRS1900 TS2 ; Frequency: 1880 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots

Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 15 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.52, 8.52, 8.52); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid. Ch661/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.137 mW/g

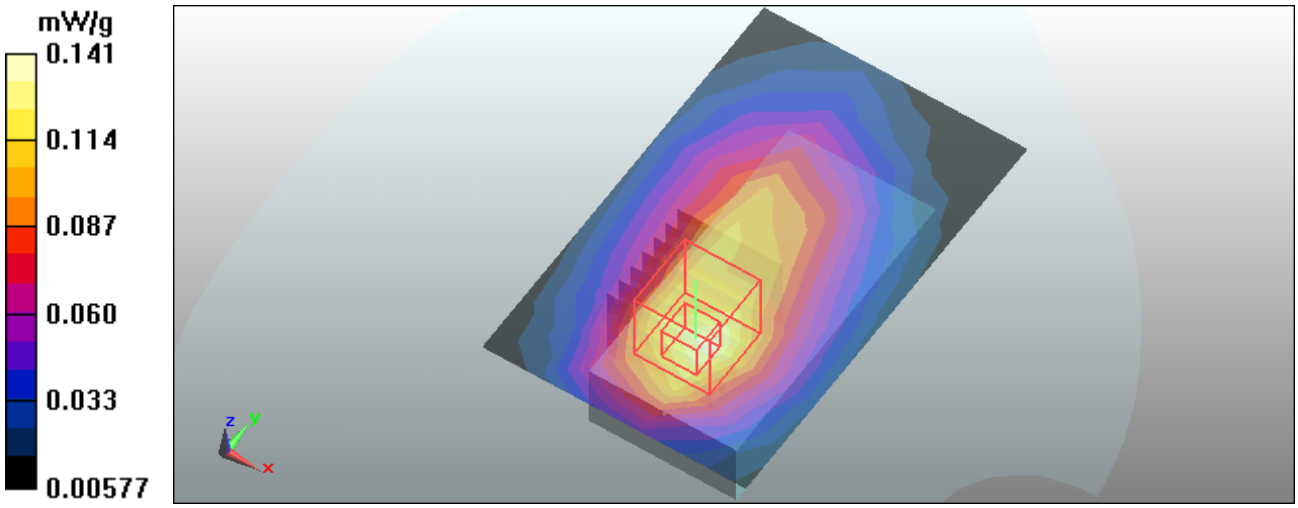
Mid. Ch661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 9.71 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.198 W/kg

SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.066 mW/g

Maximum value of SAR (measured) = 0.141 mW/g



Date/Time: 2010/7/19 07:54:41

Test Laboratory: Bureau Veritas ADT

M16-Body-GPRS1900 TS2-Ch661 / LCD Up

DUT: GPS Tracker ; Type: TR-206
Communication System: GPRS1900 TS2 ; Frequency: 1880 MHz ; Duty Cycle: 1:4 ; Modulation type: GMSK / UL 2 time slots
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 15 mm (The front side of the EUT to the Phantom)

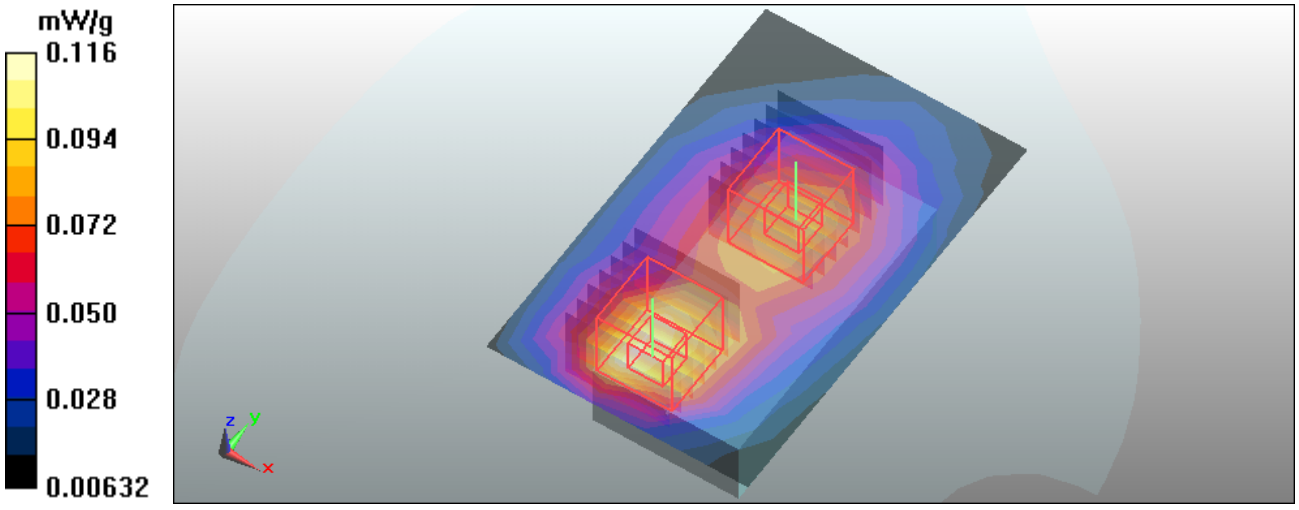
DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.52, 8.52, 8.52); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Mid. Ch661/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.114W/g

Mid. Ch661/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 8.31 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.155 W/kg
SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.059 mW/g
Maximum value of SAR (measured) = 0.116 mW/g

Mid. Ch661/Zoom Scan (7x7x9)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 8.31 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.124 W/kg
SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.053 mW/g
Maximum value of SAR (measured) = 0.096 mW/g



Date/Time: 2010/7/18 07:24:06

Test Laboratory: Bureau Veritas ADT

System Performance Check-HSL835 MHz

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

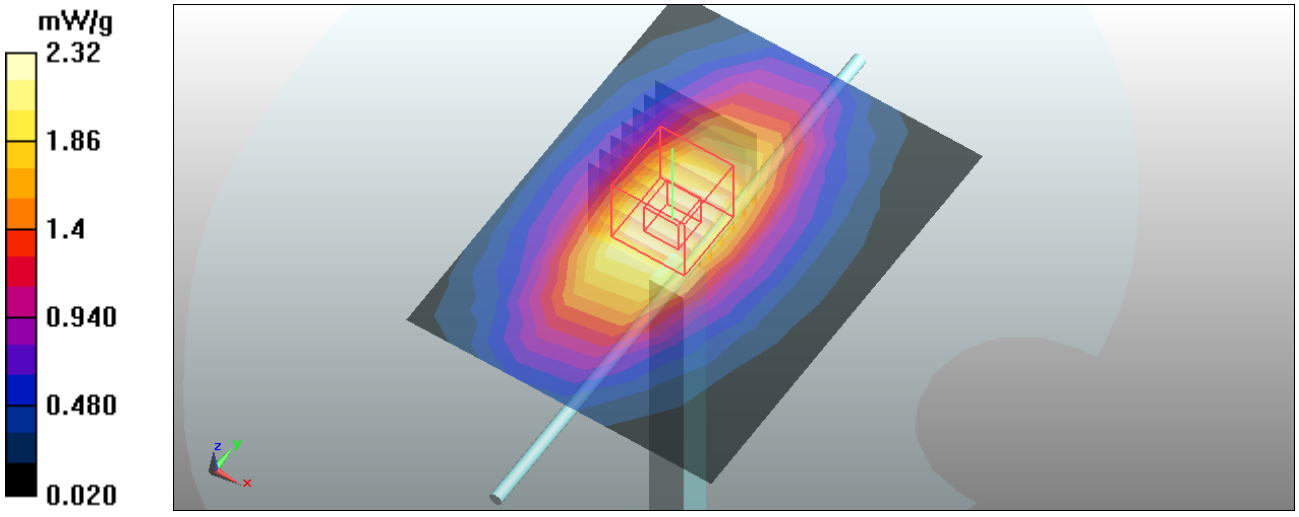
Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL850;Medium parameters used: f = 835 MHz; σ = 0.87 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.6 degrees ; Liquid temp. : 21.7 degrees

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.8, 9.8, 9.8); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.32 mW/g

d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.2 V/m; Power Drift = -0.081 dB
Peak SAR (extrapolated) = 3.42 W/kg
SAR(1 g) = 2.26 mW/g; SAR(10 g) = 1.47 mW/g
Maximum value of SAR (measured) = 2.64 mW/g



Date/Time: 2010/7/19 00:41:58

Test Laboratory: Bureau Veritas ADT

SystemPerformanceCheck-HSL1900 MHz

DUT: Dipole 1900 MHz ; Type: D1900V2 ; Serial: 5d036 ; Test Frequency: 1900 MHz

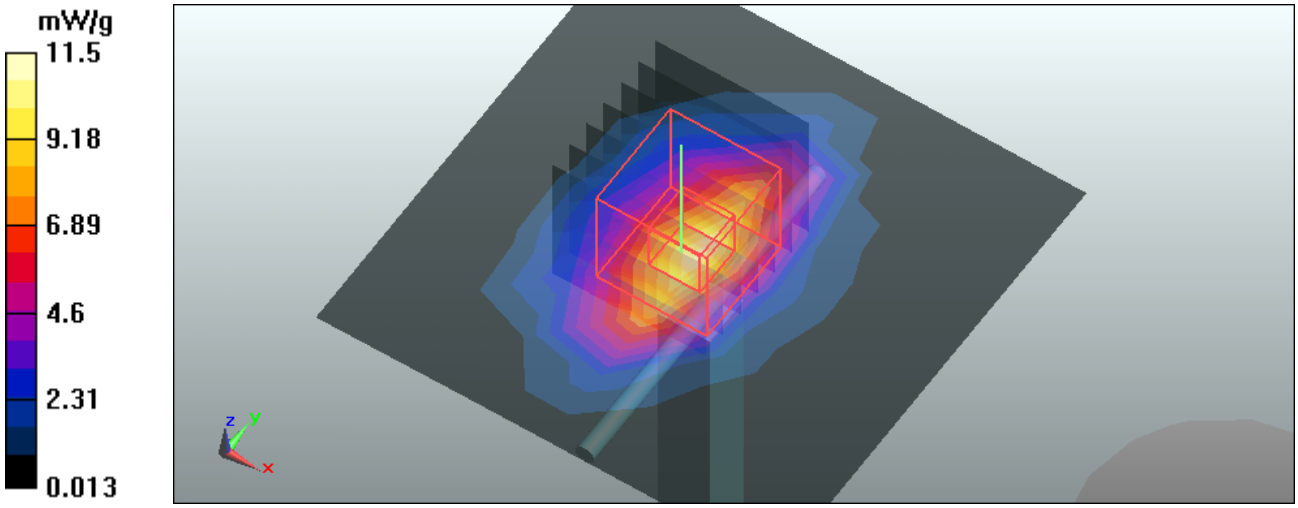
Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL1900;Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.4 degrees ; Liquid temp. : 21.2 degrees

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(8.2, 8.2, 8.2); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.5 mW/g

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.5 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 9.31 mW/g; SAR(10 g) = 4.84 mW/g
Maximum value of SAR (measured) = 11.8 mW/g



Date/Time: 2010/7/18 12:03:58

Test Laboratory: Bureau Veritas ADT

System Performance Check-MSL835 MHz

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

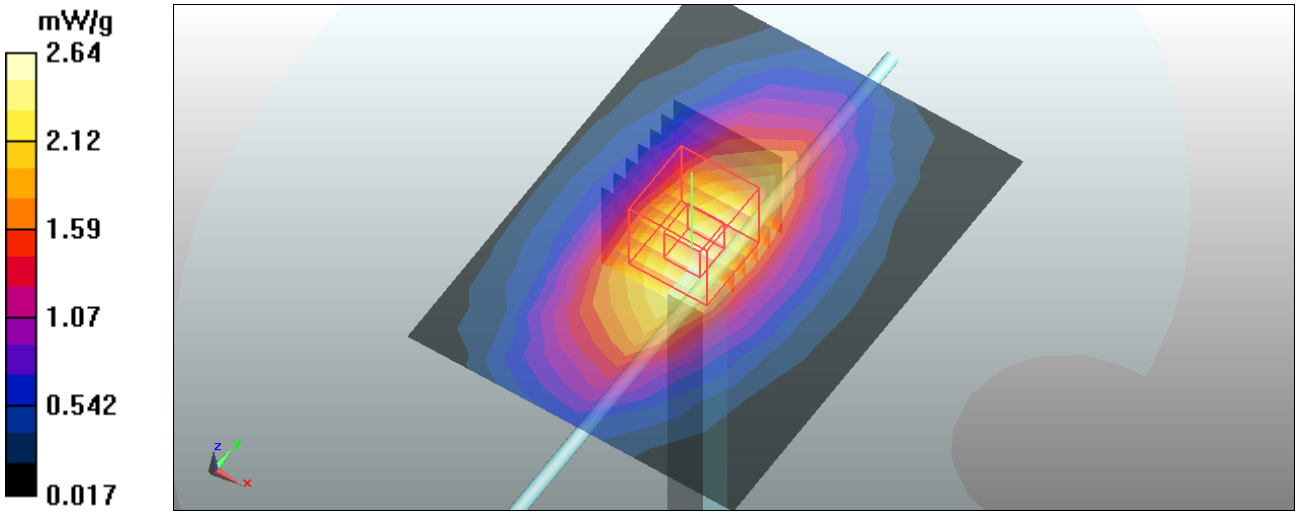
Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL850;Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feetpoint of the dipole to the Phantom)Air temp. : 23.0 degrees ; Liquid temp. : 22.2 degrees

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(9.83, 9.83, 9.83); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.64 mW/g

d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.2 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 2.80 mW/g



Date/Time: 2010/7/19 05:04:23

Test Laboratory: Bureau Veritas ADT

System Performance Check-MSL1900 MHz

DUT: Dipole 1900 MHz ; Type: D1900V2 ; Serial: 5d036 ; Test Frequency: 1900 MHz

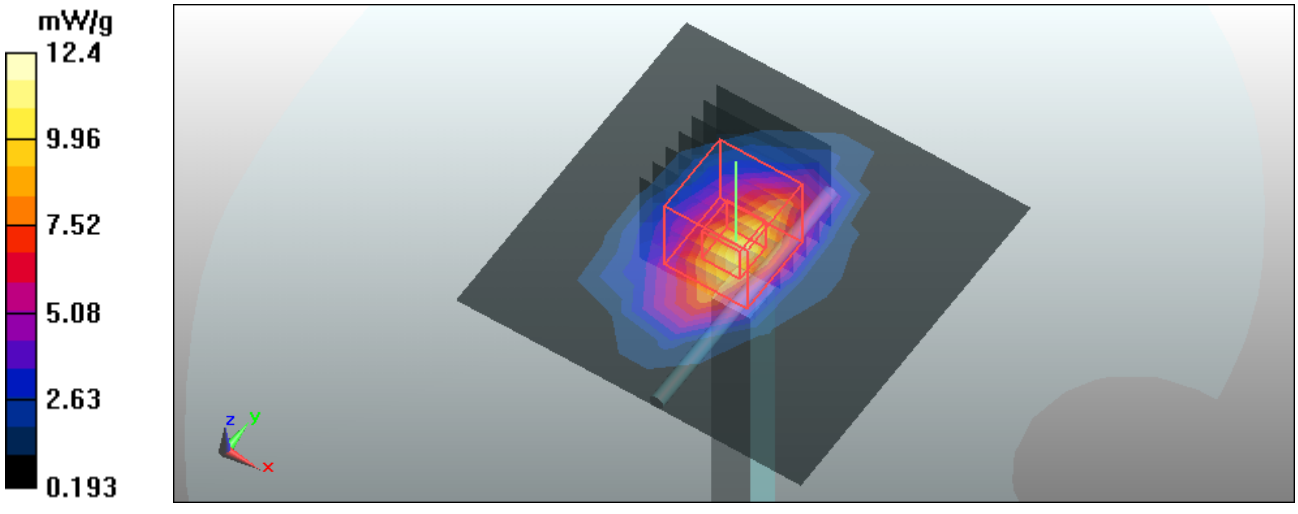
Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL1900;Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.8 degrees ; Liquid temp. : 21.7 degrees

DASY5 Configuration:

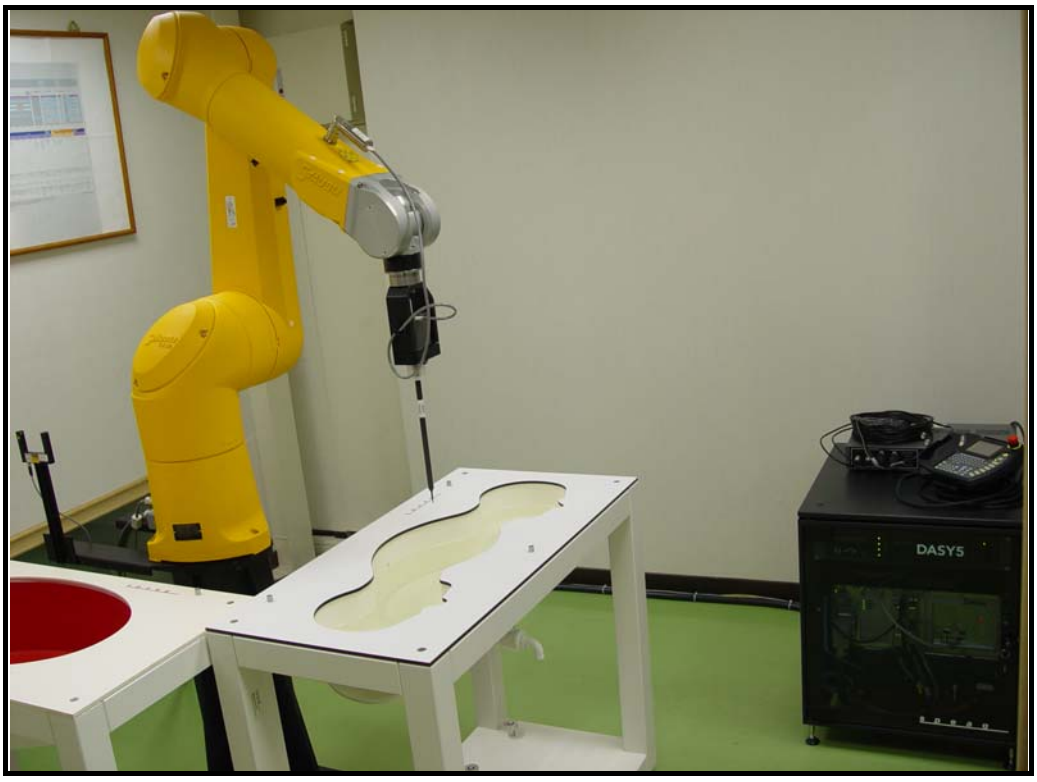
- Probe: EX3DV3 - SN3504; ConvF(8.52, 8.52, 8.52); Calibrated: 2010/1/26
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2009/12/16
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.5 mW/g

d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.2 V/m; Power Drift = 0.046 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 9.72 mW/g; SAR(10 g) = 5.05 mW/g
Maximum value of SAR (measured) = 12.4 mW/g



APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM



APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION