

SAR Test Report

Product Name : GSM Tracker

Model No. : AT Lite

FCC ID : Z24-ATL

Applicant: Shanghai Ulead Technology LTD.

Address : Room 622, Floor 1, Merchant Market Building,
No.2001 North Yanggao Road, Waigaoqiao Free
Trade Zone, Shanghai, China.

Date of Receipt : 27/09/2011

Date of Test : 12/10/2011

Issued Date : 13/10/2011

Report No. : 119S053R-HP-US-P03V01

Report Version : V1.1

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Test Report Certification

Issued Date: 13/10/2011

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Product Name : GSM Tracker
Applicant : Shanghai Ulead Technology LTD.
Address : Room 622, Floor 1, Merchant Market Building, No.2001
North Yanggao Road, Waigaoqiao Free Trade Zone,
Shanghai, China.
Manufacturer : Shanghai Ulead Technology LTD.
Address : Room 622, Floor 1, Merchant Market Building, No.2001
North Yanggao Road, Waigaoqiao Free Trade Zone,
Shanghai, China.
Model No. : AT Lite
FCC ID : Z24-ATL
Brand Name : Prime
EUT Voltage : DC 3.7V
Applicable Standard : FCC Oet65 Supplement C June 2001
IEEE Std. 1528-2003,47CFR § 2.1093
Test Result : Max. SAR Measurement (1g)
Body: **0.770** W/kg
Performed Location : Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park Loufeng
Hi-Tech Development Zone., Suzhou, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392
Documented By : Alice Ni
(Engineering ADM: Alice Ni)
Reviewed By : Robin Wu
(Senior Engineer: Robin Wu)
Approved By : Marlin Chen
(Engineering Supervisor: Marlin Chen)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC, NVLAP
Japan	:	VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com



LinKou Testing Laboratory :

No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com



Suzhou (China) Testing Laboratory :

No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com



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1. General Information

1.1. EUT Description

Product Name	GSM Tracker
Model No.	AT Lite
Hardware Version	Prime_AT_Lite-MB-V2.0
Software Version	Prime_AT_Lite-v02b10
GPS Function	Yes
Tx Frequency Range	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Rx Frequency Range	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Antenna Type	Internal
GPRS Type	Class B
GPRS Class	12
Type of Modulation	GMSK
Device Category	Portable
Peak Antenna Gain	-4.5dBi for GSM850 -1.8dBi for PCS1900
Max. Output Power (Avg. Burst Power)	GSM850 : 32.91 dBm PCS1900 : 29.80 dBm
Battery	Model Name: JLTV Rated Voltage and Capacitance: 3.7V1300mAh
AC Adapter	M/N: A361-0500500U Input: 100-240VAC 50/60Hz 0.2A Output: 5.0VDC 500mA

1.2. Test Procedure

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT communicate with CMU 200, and test them respectively at GSM 850 & PCS1900.

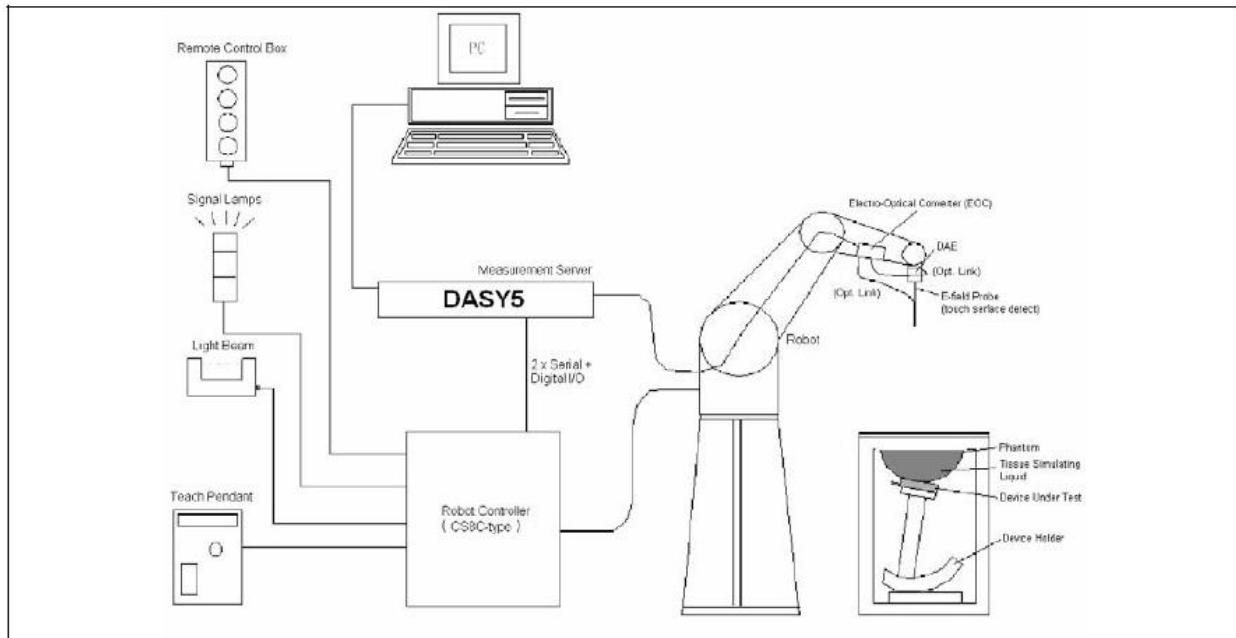
1.3. Test Environment

Ambient conditions in the laboratory:

Items	Required	Actual
Temperature (°C)	18-25	21.5± 2
Humidity (%RH)	30-70	52

2. SAR Measurement System

2.1. DASY5 System Description



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

2.1.1. Applications

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEEE 1528, OET 65, IEC 62209-1, IEC 62209-2, EN 50360, EN 50383 and others.

2.1.2. Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 10mm² step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

2.1.3. Zoom Scan (Cube Scan Averaging)

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of 1000 kg/m³ is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 7x7x7 (5mmx5mmx5mm) providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

2.1.4. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY5 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEEE 1528. The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x, y, z) = Ae^{-\frac{z}{2a}} \cos^2 \left(\frac{\pi}{2} \frac{\sqrt{x'^2 + y'^2}}{5a} \right)$$

$$f_2(x, y, z) = Ae^{-\frac{z}{a}} \frac{a^2}{a^2 + x'^2} \left(3 - e^{-\frac{2z}{a}} \right) \cos^2 \left(\frac{\pi}{2} \frac{y'}{3a} \right)$$

$$f_3(x, y, z) = A \frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2} \left(e^{-\frac{2z}{a}} + \frac{a^2}{2(a + 2z)^2} \right)$$

2.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN 62209-1, IEC 62209, etc.) under ISO 17025. The calibration data are in Appendix D.

2.2.1. Isotropic E-Field Probe Specification

Model	EX3DV4
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 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/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%.



2.3. Boundary Detection Unit and Probe Mounting Device

The DASY5 probes use a precise connector and an additional holder for the probe, consisting of a plastic tube and a flexible silicon ring to center the probe. The connector at the DAE is flexibly mounted and held in the default position with magnets and springs. Two switching systems in the connector mount detect frontal and lateral probe collisions and trigger the necessary software response.

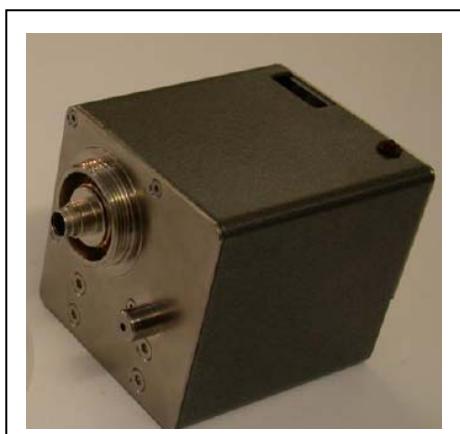


2.4. DATA Acquisition Electronics (DAE) and Measurement Server

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, 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 input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.



The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with the DAE electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.



2.5. Robot

The DASY5 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY5 system, the CS8C robot controller version from Stäubli is used.

The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller



2.6. Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.

The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions.

During probe rotations, the probe tip will keep its actual position.



2.7. Device Holder

The DASY5 device holder 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 center for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon_r = 3$ and loss tangent $\delta = 0.02$. 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.



2.8. SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

3. Tissue Simulating Liquid

3.1. The composition of the tissue simulating liquid

INGREDIENT (% Weight)	835MHz Head	835MHz Body	1900MHz Head	1900MHz Body
Water	40.45	52.4	54.90	40.5
Salt	1.45	1.40	0.18	0.50
Sugar	57.6	45.0	0.00	58.0
HEC	0.40	1.00	0.00	0.50
Preventol	0.10	0.20	0.00	0.50
DGBE	0.00	0.00	44.92	0.00

3.2. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and Agilent Vector Network Analyzer E5071C

Body Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ϵ_r	σ [s/m]	
835 MHz	Reference result ± 5% window	55.2 52.44 to 57.96	0.97 0.92 to 1.02	N/A
	11-10-2011	54.80	1.00	21.0

Body Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ϵ_r	σ [s/m]	
1900 MHz	Reference result ± 5% window	53.3 50.64 to 55.97	1.52 1.44 to 1.60	N/A
	11-10-2011	52.70	1.58	21.0

3.3. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

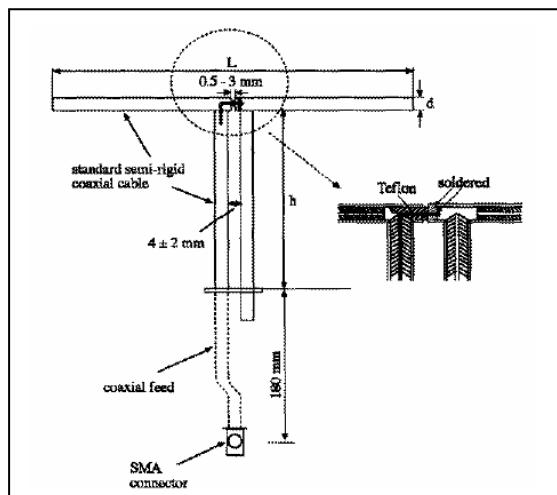
Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000$ kg/m³)

4. SAR Measurement Procedure

4.1. SAR System Validation

4.1.1. Validation Dipoles



The dipoles used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
835MHz	161.0	89.8	3.6
1900MHz	68.0	39.5	3.6

4.1.2. Validation Result

System Performance Check at 835MHz &1900MHz for Body**Validation Kit: D835V2-SN 4d094**

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
835 MHz	Reference result ± 10% window	9.90 8.91 to 10.89	6.53 5.88 to 7.18	N/A
	11-10-2011	9.80	6.32	21.0

Validation Kit: D1900V2-SN 5d121

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
1900 MHz	Reference result ± 10% window	41.4 37.26 to 45.54	22.3 20.07 to 24.53	N/A
	11-10-2011	43.20	22.00	21.0

Note: All SAR values are normalized to 1W forward power.

4.2. SAR Measurement Procedure

The DASY5 calculates SAR using the following equation,

$$SAR = \frac{\sigma |E|^2}{\rho}$$

σ : represents the simulated tissue conductivity

ρ : represents the tissue density

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at 1mm²) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at 1mm³).

5. SAR Exposure Limits

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 "Uncontrolled Environments" limits. These limits apply to a location which is deemed as "Uncontrolled Environment" which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for brain or body)	1.60 W/kg
Spatial Average SAR (whole body)	0.08 W/kg
Spatial Peak SAR (10g for hands, feet, ankles and wrist)	4.00 W/kg

6. Test Equipment List

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Stäubli Robot TX60L	Stäubli	TX60L	F10/5C90A1/A/01	only once
Controller	Stäubli	SP1	S-0034	only once
Dipole Validation Kits	Speag	D835V2	4d094	2012.03.15
Dipole Validation Kits	Speag	D1900V2	5d121	2012.03.23
SAM Twin Phantom	Speag	SAM	TP-1561/1562	N/A
Device Holder	Speag	SD 000 H01 HA	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	1220	2012.12.03
E-Field Probe	Speag	EX3DV4	3710	2012.02.25
SAR Software	Speag	DASY5	V5.2 Build 162	N/A
Power Amplifier	Mini-Circuit	ZVA-183-S+	N657400950	N/A
Directional Coupler	Agilent	778D	20160	N/A
Universal Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Vector Network	Agilent	E5071C	MY48367267	2012.04.10
Signal Generator	Agilent	E4438C	MY49070163	2012.04.23
Power Meter	Anritsu	ML2495A	0905006	2012.01.12
Wide Bandwidth Sensor	Anritsu	MA2411B	0846014	2012.01.12

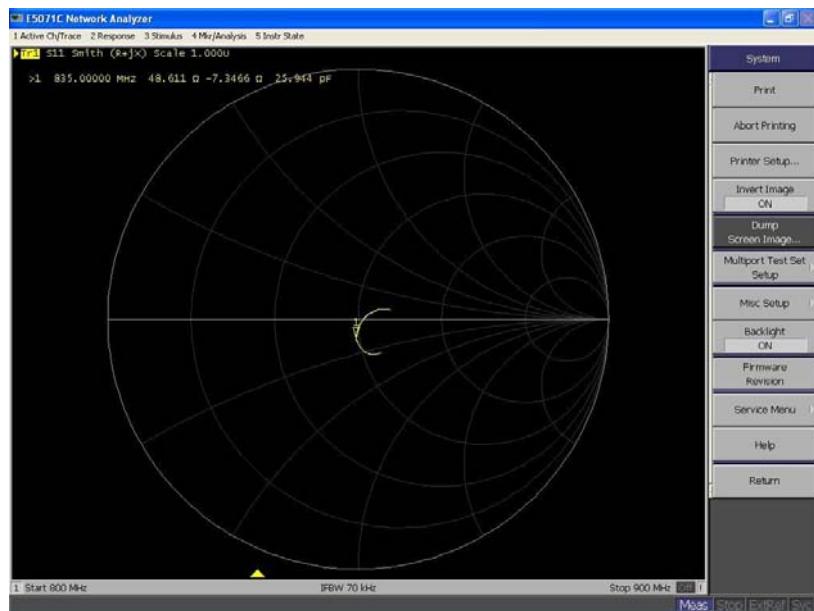
Note: Per KDB 450824 D02 requirements for dipole calibration, QuieTek Lab has adopted two years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement (Show below);
4. Impedance is within 5Ω of calibrated measurement (Show below).

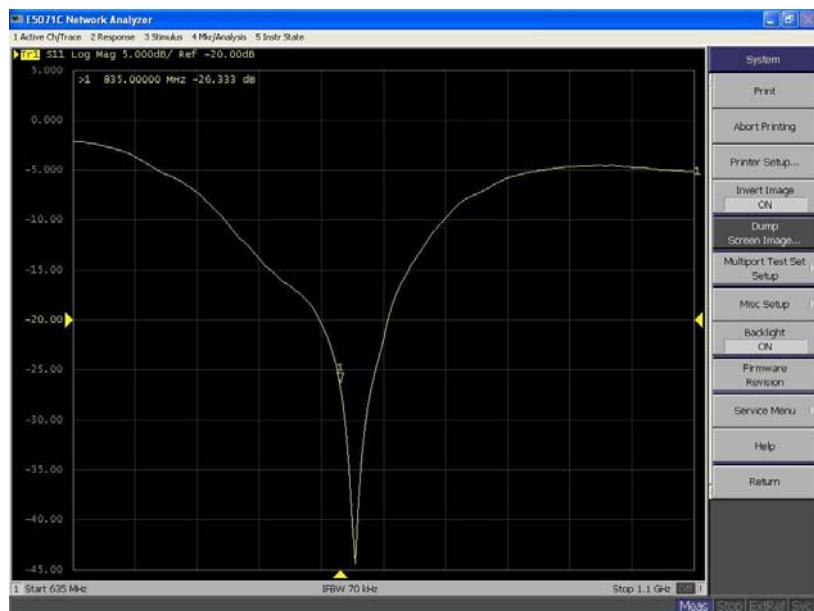
Impedance Plot for D835V2

835 Body

Calibrated impedance: 48.0 Ω ; Measured impedance: 48.611 Ω (within 5 Ω)

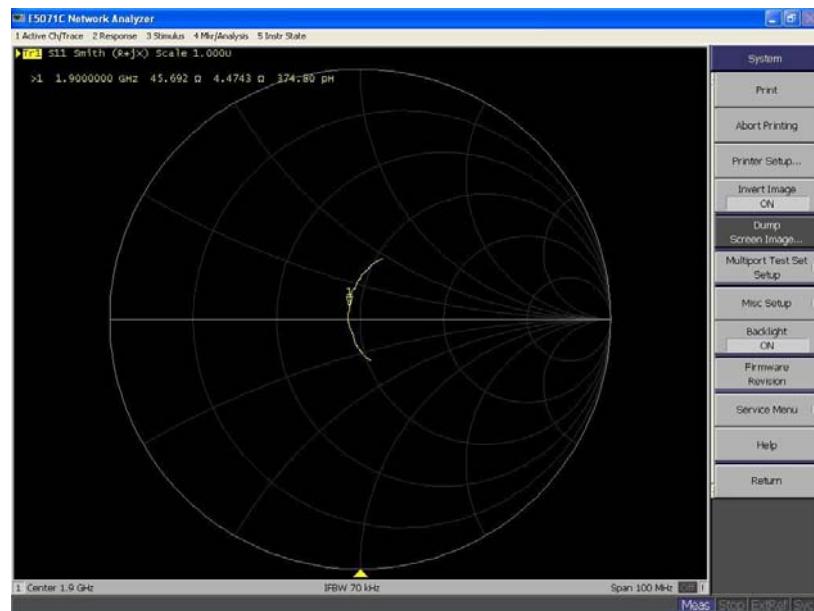


Calibrated return loss: -25.5 dB; Measured impedance: -26.333 dB (within 20%)

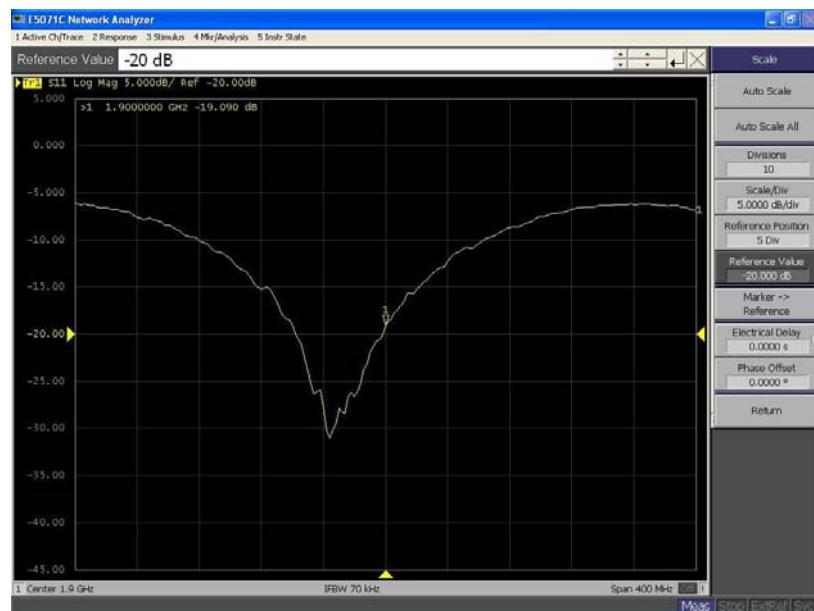


Impedance Plot for D1900V2**1900 Body**

Calibrated impedance: 46.1Ω ; Measured impedance: 45.692Ω (within 5Ω)



Calibrated return loss: -21.5 dB; Measured impedance: -19.090 dB (within 20%)



7. Measurement Uncertainty

DASY5 Uncertainty								
Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram.								
Measurement System	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) veff
Probe Calibration	±6.5%	N	1	1	1	±6.5%	±6.5%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	$\sqrt{3}$	0.64	0.43	±1.8%	±1.2%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid Permittivity (target)	±5.0%	R	$\sqrt{3}$	0.6	0.49	±1.7%	±1.4%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.6	0.49	±1.5%	±1.2%	∞
Combined Std. Uncertainty						±11.3%	±11.0%	387
Expanded STD Uncertainty						±22.5%	±22.1%	

8. Conducted Power Measurement

Mode	Frequency (MHz)	Avg. Burst Power (dBm)	Duty Cycle Factor (dB)	Frame Power (dBm)
Maximum Power				
GPRS850(1slot)	824.2	32.90	-9	23.90
	836.4	32.91	-9	23.91
	848.8	32.88	-9	23.88
GPRS850(2 Slot)	824.2	31.58	-6	25.58
	836.4	31.61	-6	25.61
	848.8	31.61	-6	25.61
GPRS850(3 Slot)	824.2	29.51	-4.25	25.26
	836.4	29.48	-4.25	25.23
	848.8	29.47	-4.25	25.22
GPRS850(4 Slot)	824.2	29.37	-3	26.37
	836.4	29.40	-3	26.40
	848.8	29.39	-3	26.39
GPRS1900(1 Slot)	1850.2	29.75	-9	20.75
	1880.0	29.79	-9	20.79
	1909.8	29.80	-9	20.80
GPRS1900(2 Slot)	1850.2	28.47	-6	22.47
	1880.0	28.50	-6	22.50
	1909.8	28.51	-6	22.51
GPRS1900(3 Slot)	1850.2	28.41	-4.25	24.16
	1880.0	28.43	-4.25	24.18
	1909.8	28.45	-4.25	24.20
GPRS1900(4 Slot)	1850.2	26.15	-3	23.15
	1880.0	26.21	-3	23.21
	1909.8	26.32	-3	23.32

9. Test Results

9.1. SAR Test Results Summary

9.1.1. Test position and configuration

Head SAR was performed with the device configured in the positions according to IEEE1528, and Body SAR was performed with the device 15mm from the phantom.

9.1.2. Operation Mode

This is a multislots class 12 device capable of 4 uplink timeslots. During the head SAR test, the device was transmitting with 1 uplink timeslot; during the body SAR test, it was transmitting with 2/3/4 uplink timeslots. Additionally, this device doesn't support dual transfer mode (DTM).

9.1.3. Reference document

Reference document: KDB 447498 and KDB 941225.

9.1.4. Test Result

SAR MEASUREMENT												
Ambient Temperature (°C) : 21.5 ±2					Relative Humidity (%): 52							
Liquid Temperature (°C) : 21.0 ±2					Depth of Liquid (cm):>15							
Product: GSM Tracker												
Test Mode: GPRS850 1slot												
Test Position	Antenna Position	Frequency		Separation Distance (mm)	Frame Power (dBm)	Power Drift (<±0.2)	SAR 1g (W/kg)	Limit (W/kg)				
Body	Body	Channel	MHz									
Body-Front	Fixed	189	836.4	15	23.91	0.071	0.397	1.6				
Test Mode: GPRS850 2slot												
Body-Front	Fixed	189	836.4	15	25.61	0.071	0.638	1.6				
Test Mode: GPRS850 3slot												
Body-Front	Fixed	189	836.4	15	25.23	0.083	0.626	1.6				
Test Mode: GPRS850 4slot												
Body-Up Tip	Fixed	189	836.4	15	26.40	0.065	0.032	1.6				
Body-Down Tip	Fixed	189	836.4	15	26.40	-0.004	0.159	1.6				
Body-Left Side	Fixed	189	836.4	15	26.40	0.131	0.450	1.6				
Body-Right Side	Fixed	189	836.4	15	26.40	0.086	0.375	1.6				
Body-Front	Fixed	128	824.2	15	26.37	--	--	1.6				
Body-Front	Fixed	189	836.4	15	26.40	0.039	0.716	1.6				
Body-Front	Fixed	251	848.8	15	26.39	--	--	1.6				
Body-Back	Fixed	189	836.4	15	26.40	-0.187	0.357	1.6				
Note: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 941225.												

SAR MEASUREMENT												
Ambient Temperature (°C) : 21.5 ±2					Relative Humidity (%): 52							
Liquid Temperature (°C) : 21.0 ±2					Depth of Liquid (cm):>15							
Product: GSM Tracker												
Test Mode: GPRS1900 1slot												
Test Position Body	Antenna Position	Frequency		Separation Distance (mm)	Frame Power (dBm)	Power Drift (<±0.2)	SAR 1g (W/kg)	Limit (W/kg)				
Body-Back	Fixed	661	MHz	15	20.79	-0.008	0.346	1.6				
Test Mode: GPRS1900 2slot												
Body-Back	Fixed	661	1880.0	15	22.50	0.022	0.528	1.6				
Test Mode: GPRS1900 3slot												
Body-Up Tip	Fixed	661	1880.0	15	24.18	-0.137	0.086	1.6				
Body-Down Tip	Fixed	661	1880.0	15	24.18	-0.040	0.145	1.6				
Body-Left Side	Fixed	661	1880.0	15	24.18	0.118	0.347	1.6				
Body-Right Side	Fixed	661	1880.0	15	24.18	0.033	0.471	1.6				
Body-Front	Fixed	661	1880.0	15	24.18	-0.081	0.571	1.6				
Body-Back	Fixed	512	1850.2	15	24.16	--	--	1.6				
Body-Back	Fixed	661	1880.0	15	24.18	-0.085	0.770	1.6				
Body-Back	Fixed	810	1909.8	15	24.20	--	--	1.6				
Test Mode: GPRS1900 4slot												
Body-Back	Fixed	661	1880.0	15	23.21	0.049	0.654	1.6				
Note: when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 941225.												

Appendix A. SAR System Validation Data

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

System Check Body 835MHz

DUT: Dipole 835 MHz D835V2; Type: D835V2

Communication System: CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;

Frequency: 835 MHz; Medium parameters used: $f = 835$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

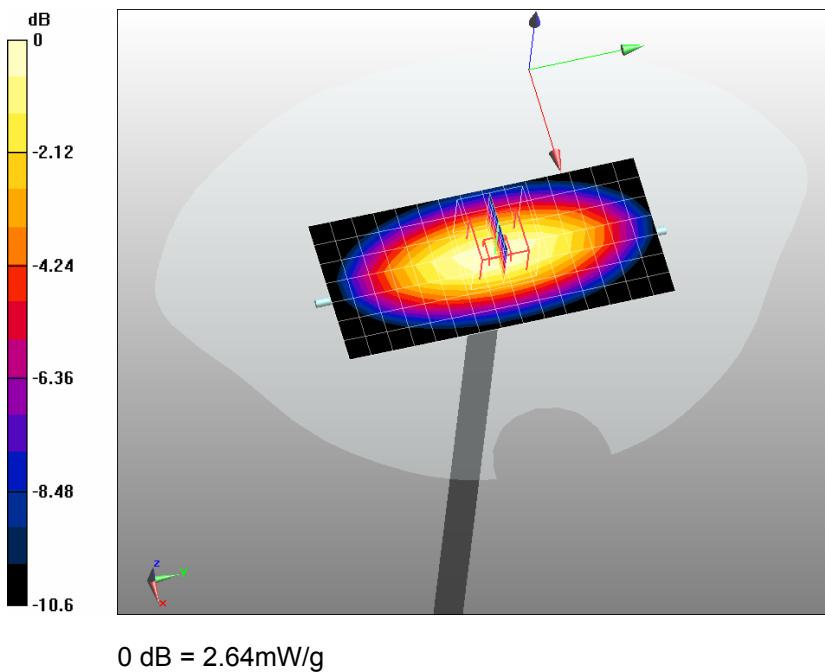
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/System Check GSM835 Body/Area Scan (8x16x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 2.58 mW/g

Configuration/System Check GSM835 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 51.8 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 3.72 W/kg

SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.58 mW/g Maximum value of SAR (measured) = 2.64 mW/g



Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

System Check Body 1900MHz

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle: 1:1;

Frequency: 1900 MHz; Medium parameters used: $f = 1900$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

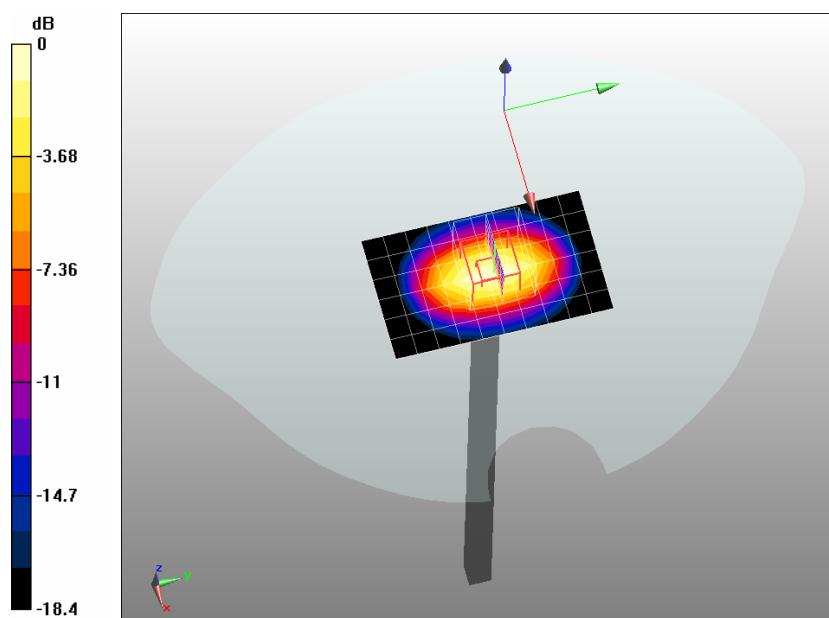
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/System Check PCS1900 Body/Area Scan (7x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 12.3 mW/g

Configuration/System Check PCS1900 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 88.6 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 20.1 W/kg

SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.5 mW/g Maximum value of SAR (measured) = 12.2 mW/g

Appendix B. SAR measurement Data

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(1up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-1 Slot; Communication System Band: GSM 850; Duty Cycle: 1:8.3;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$

kg/m³; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

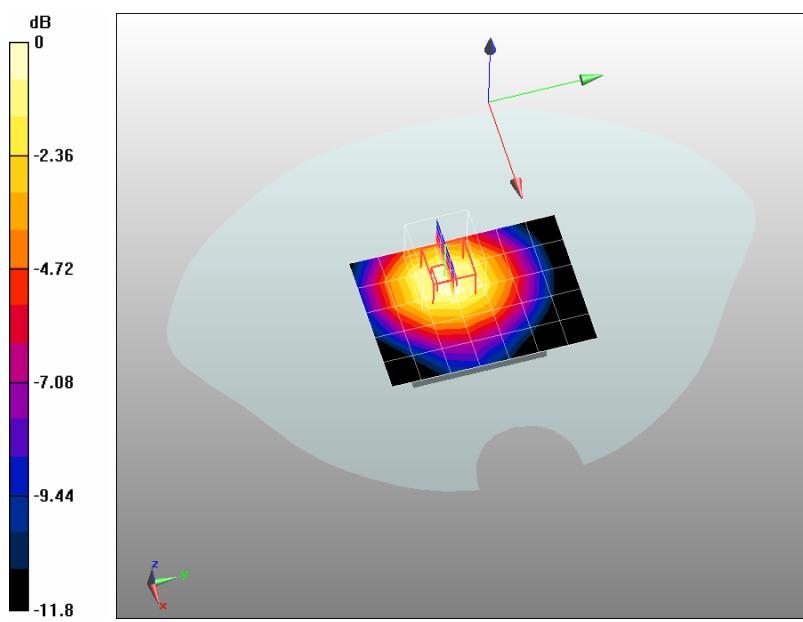
Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.386 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 17.7 V/m; Power Drift = 0.071 dB

Peak SAR (extrapolated) = 0.615 W/kg

SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.260 mW/g Maximum value of SAR (measured) = 0.423 mW/g



Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(2up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: GSM850; Duty Cycle: 1:4.2 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

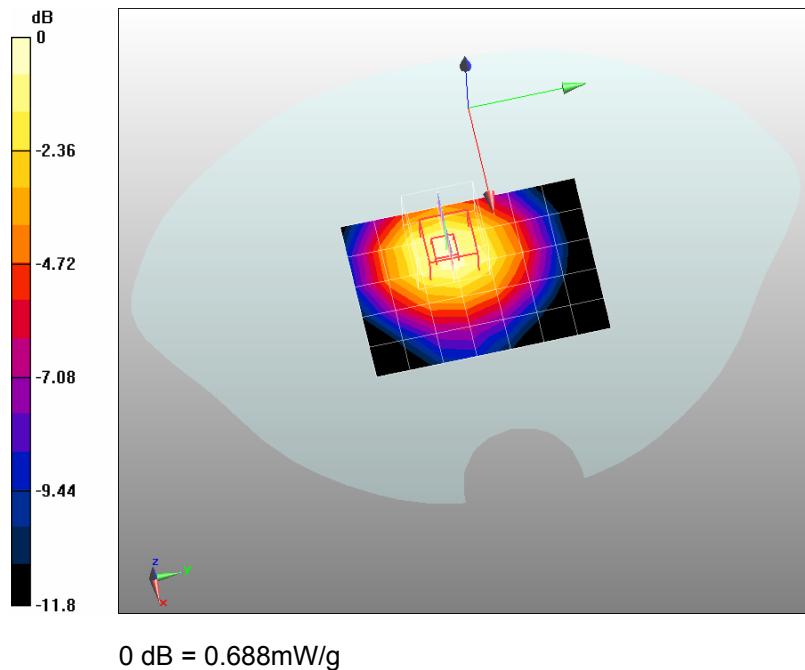
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.626 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 22.7 V/m; Power Drift = 0.071 dB

Peak SAR (extrapolated) = 0.951 W/kg

SAR(1 g) = 0.638 mW/g; SAR(10 g) = 0.419 mW/g Maximum value of SAR (measured) = 0.688 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.8 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

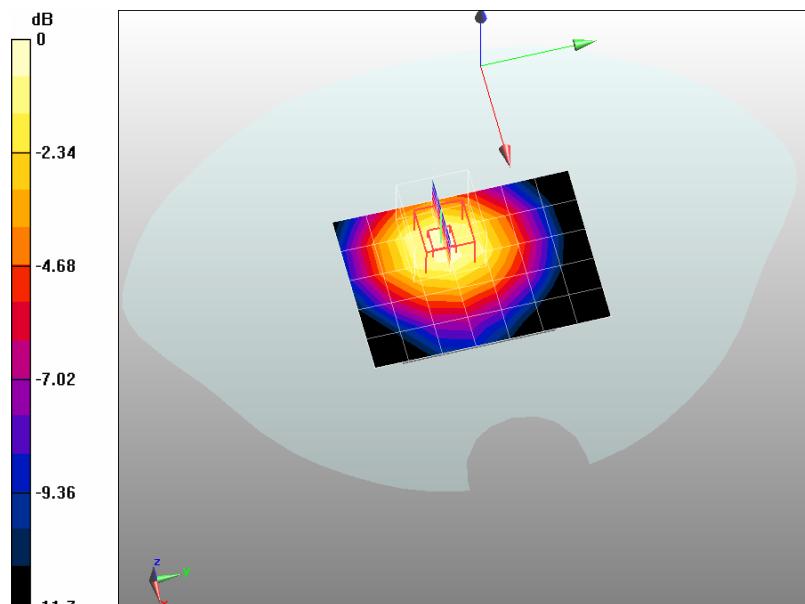
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.616 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 22.5 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 0.916 W/kg

SAR(1 g) = 0.626 mW/g; SAR(10 g) = 0.412 mW/g Maximum value of SAR (measured) = 0.673 mW/g

0 dB = 0.673mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Up Tip(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

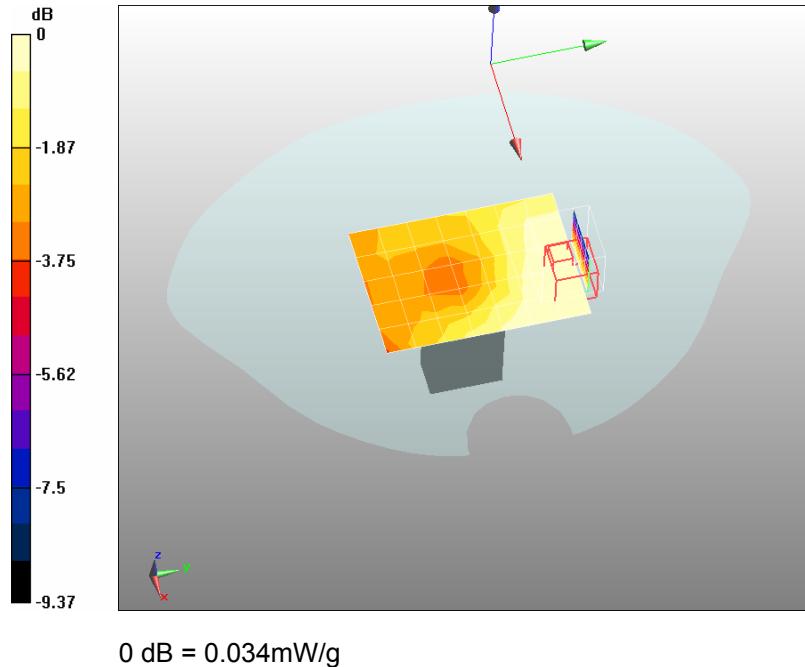
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Up Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.035 mW/g

Configuration/GPRS850 Mid Body-Up Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 3.8 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.047 W/kg

SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.023 mW/g Maximum value of SAR (measured) = 0.034 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Down Tip(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

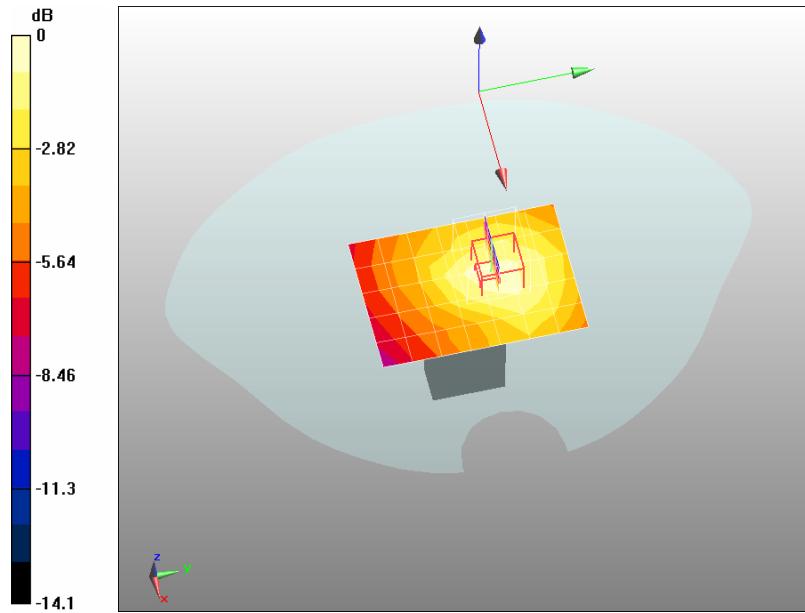
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Down Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.159 mW/g

Configuration/GPRS850 Mid Body-Down Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.5 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.159 mW/g; SAR(10 g) = 0.101 mW/g Maximum value of SAR (measured) = 0.168 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Left Side(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

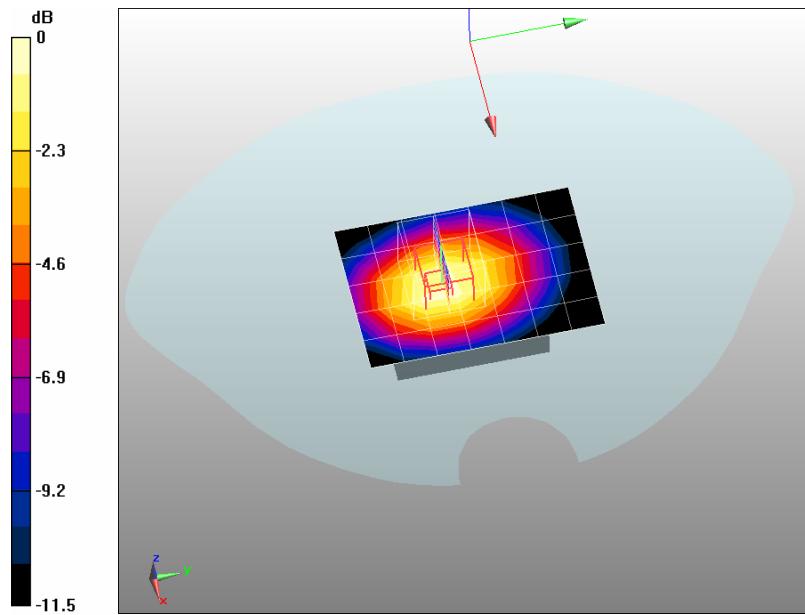
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Left Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.437 mW/g

Configuration/GPRS850 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 20.2 V/m; Power Drift = 0.131 dB

Peak SAR (extrapolated) = 0.686 W/kg

SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.292 mW/g Maximum value of SAR (measured) = 0.482 mW/g

0 dB = 0.482mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Right Side(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

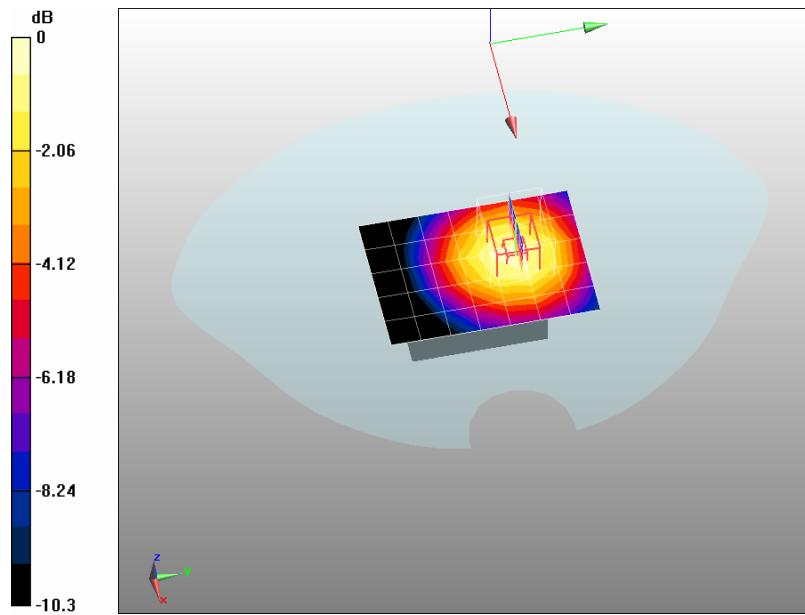
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Right Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.372 mW/g

Configuration/GPRS850 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 17.2 V/m; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 0.526 W/kg

SAR(1 g) = 0.375 mW/g; SAR(10 g) = 0.258 mW/g Maximum value of SAR (measured) = 0.398 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

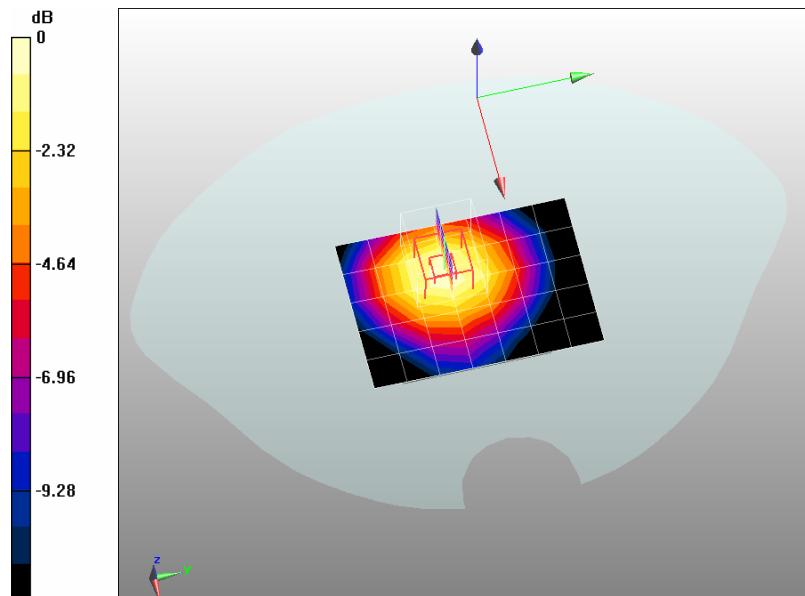
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.733 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 24.6 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.716 mW/g; SAR(10 g) = 0.470 mW/g Maximum value of SAR (measured) = 0.766 mW/g

Z-Axis Plot

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(4up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.1 ;

Frequency: 836.4 MHz; Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

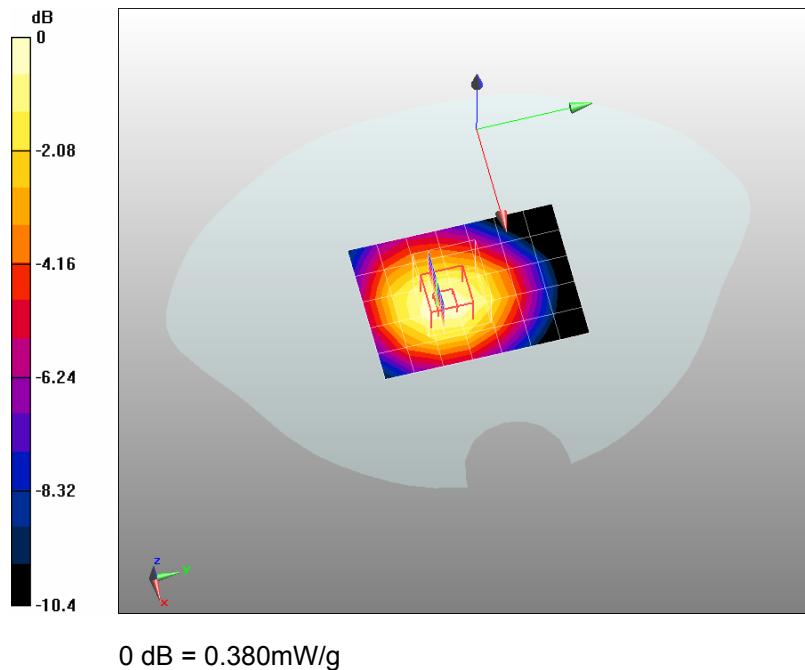
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.389 mW/g

Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.6 V/m; Power Drift = -0.187 dB

Peak SAR (extrapolated) = 0.496 W/kg

SAR(1 g) = 0.357 mW/g; SAR(10 g) = 0.245 mW/g Maximum value of SAR (measured) = 0.380 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(1up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-1 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:8.3;

Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

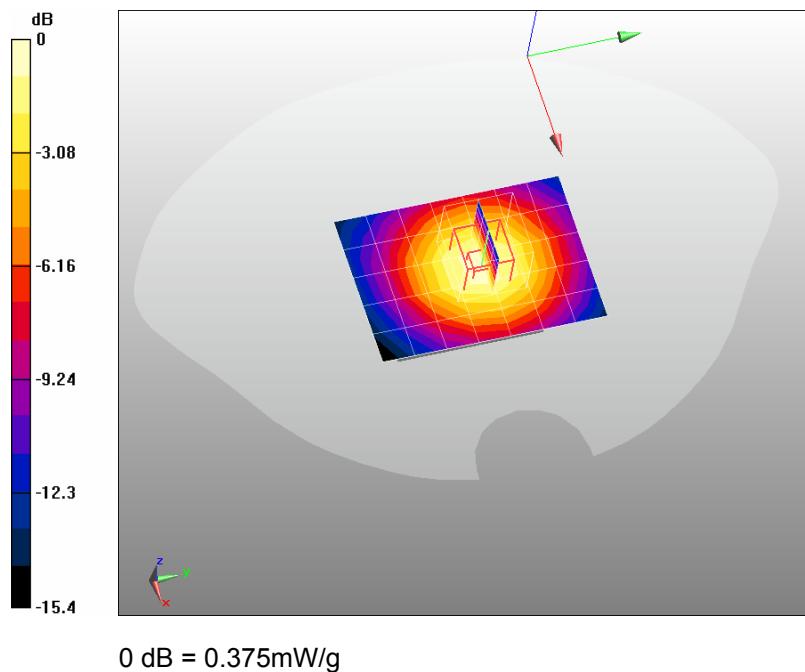
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.341 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 15.4 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.539 W/kg

SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.213 mW/g Maximum value of SAR (measured) = 0.375 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(2up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: PCS1900; Duty Cycle: 1:4.2 ;

Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

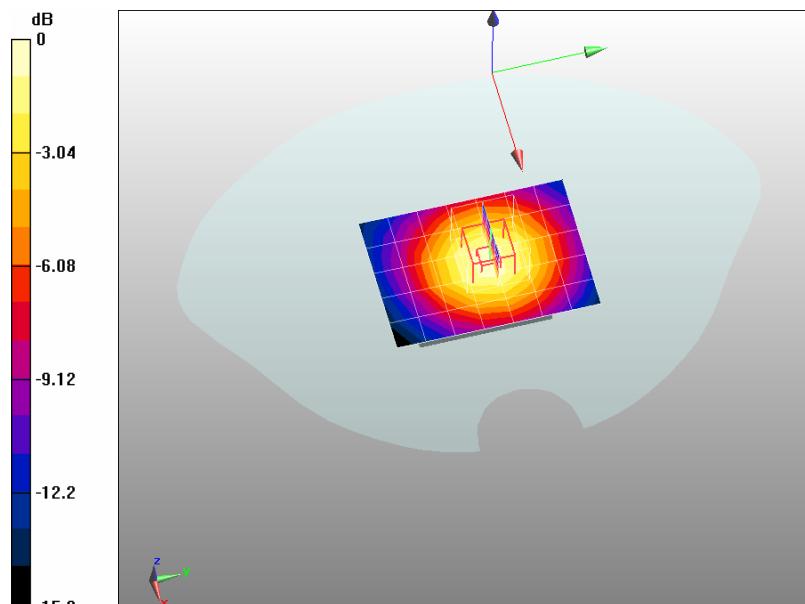
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.520 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.9 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.815 W/kg

SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.325 mW/g Maximum value of SAR (measured) = 0.572 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Up Tip(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

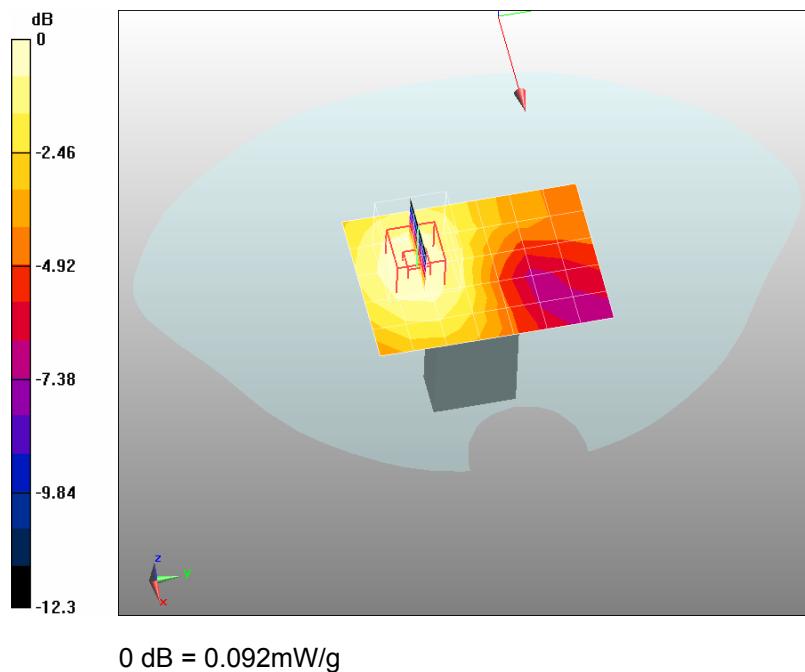
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Up Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.092 mW/g

Configuration/GPRS1900 Mid Body-Up Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 5.72 V/m; Power Drift = -0.137 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.086 mW/g; SAR(10 g) = 0.055 mW/g Maximum value of SAR (measured) = 0.092 mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Down Tip(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

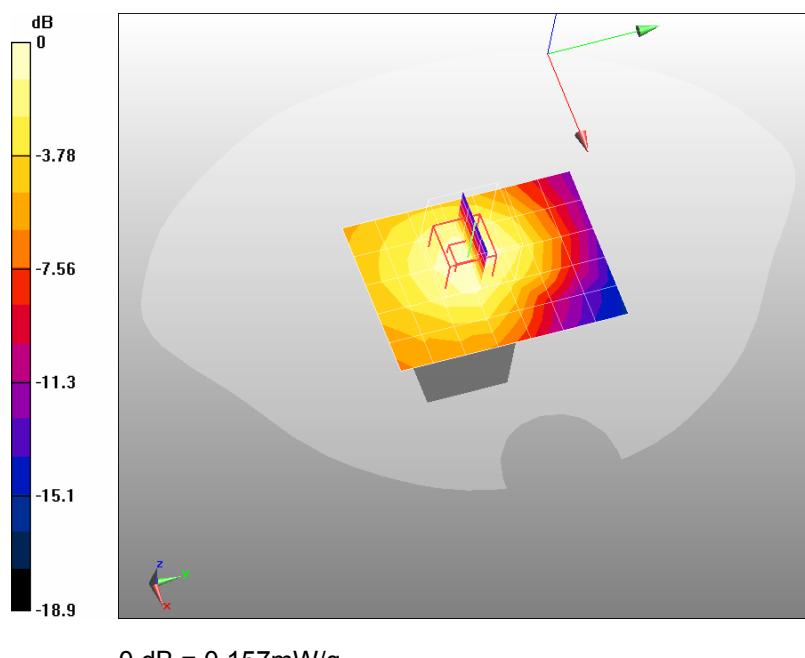
Configuration/GPRS1900 Mid Body-Down Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.158 mW/g

Configuration/GPRS1900 Mid Body-Down Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 9.03 V/m; Power Drift = -0.040 dB

Peak SAR (extrapolated) = 0.252 W/kg

SAR(1 g) = 0.145 mW/g; SAR(10 g) = 0.085 mW/g Maximum value of SAR (measured) = 0.157 mW/g



0 dB = 0.157mW/g

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Left Side(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

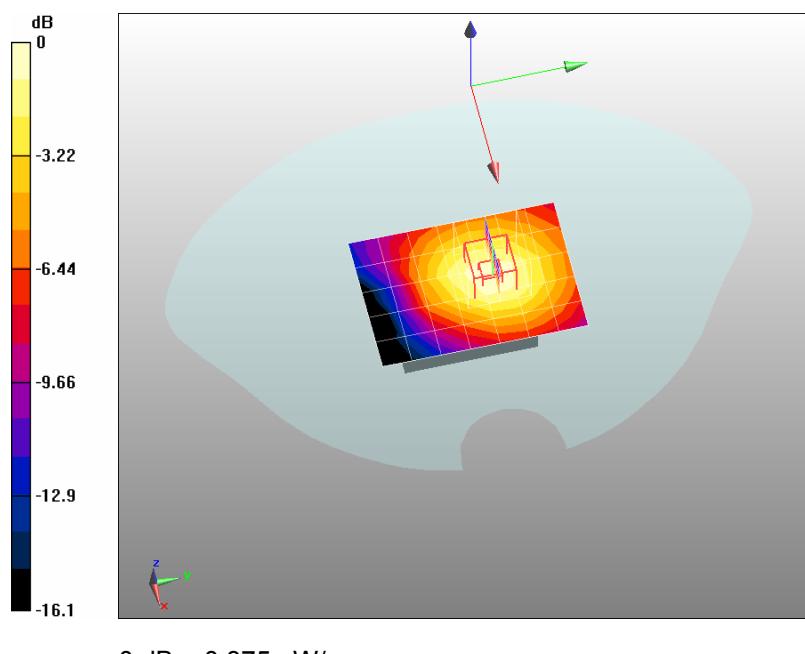
Configuration/GPRS1900 Mid Body-Left Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.353 mW/g

Configuration/GPRS1900 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 14.3 V/m; Power Drift = 0.118 dB

Peak SAR (extrapolated) = 0.543 W/kg

SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.213 mW/g Maximum value of SAR (measured) = 0.375 mW/g



Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Right Side(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Right Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

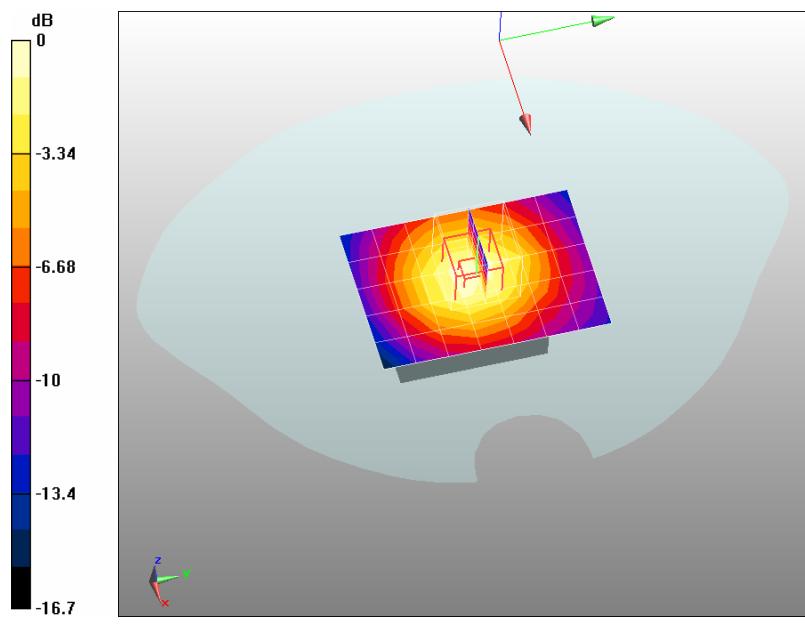
Maximum value of SAR (measured) = 0.449 mW/g

Configuration/GPRS1900 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.3 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.743 W/kg

SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.284 mW/g Maximum value of SAR (measured) = 0.512 mW/g



Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Front(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

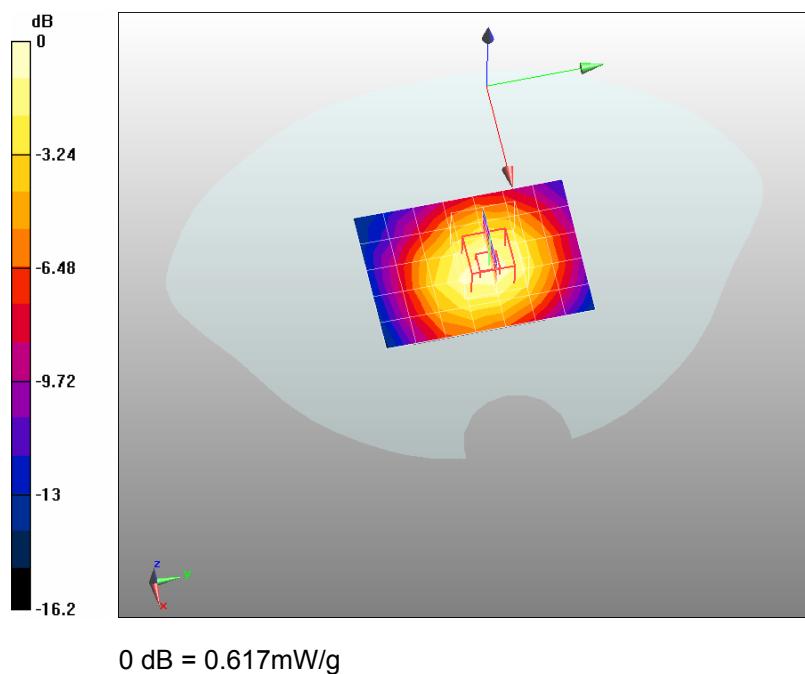
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.598 mW/g

Configuration/GPRS1900 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 19 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.885 W/kg

SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.354 mW/g Maximum value of SAR (measured) = 0.617 mW/g



Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(3up)

DUT: GPS Tracker; Type: AT Lite

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

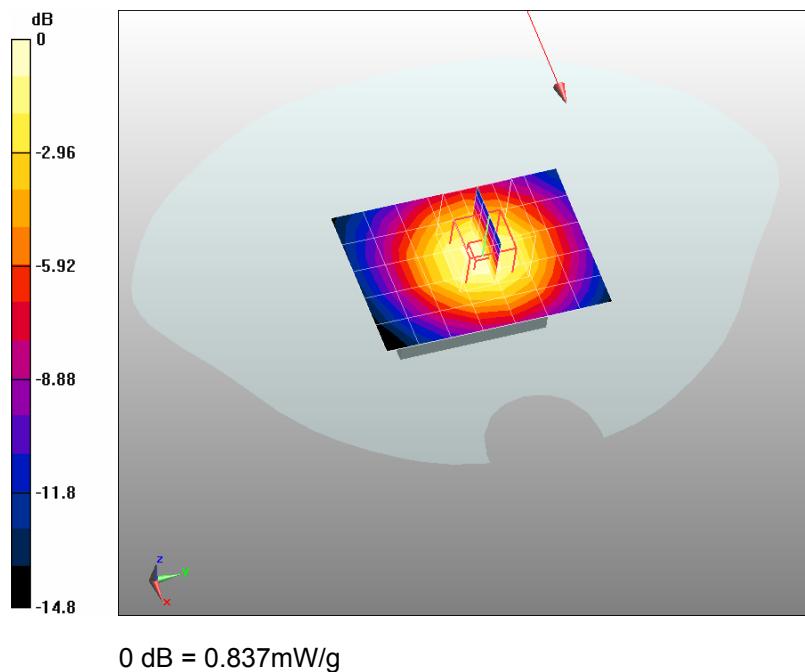
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.769 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 23.3 V/m; Power Drift = -0.085 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.770 mW/g; SAR(10 g) = 0.475 mW/g Maximum value of SAR (measured) = 0.837 mW/g

Z-Axis Plot

Date/Time: 11-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(4up)

DUT: GSM Mobile Phone; Type: Not Specified

Communication System: GPRS/EGPRS-4 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.1 ; Frequency: 1880 MHz; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³ ; Phantom section: Flat Section

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

DASY5 Configuration:

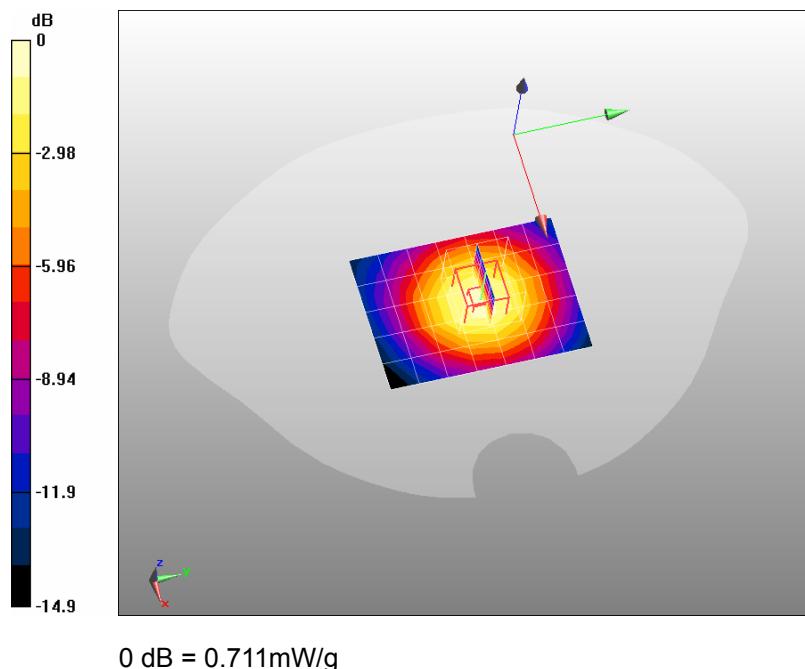
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.647 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 21.1 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.654 mW/g; SAR(10 g) = 0.403 mW/g Maximum value of SAR (measured) = 0.711 mW/g

Appendix C. Test Setup Photographs & EUT Photographs

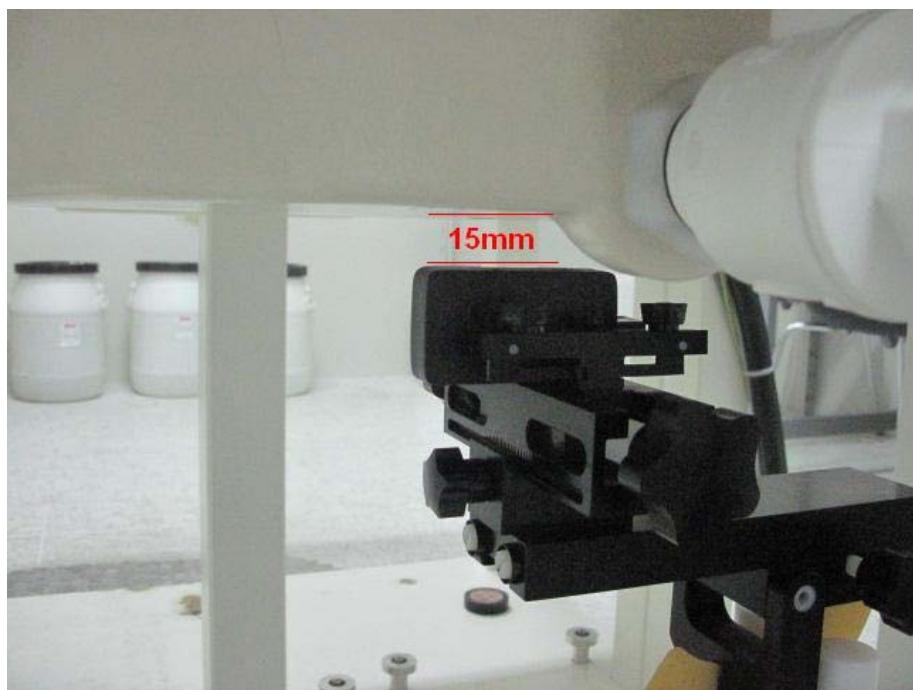
Test Setup Photographs



Up Tip



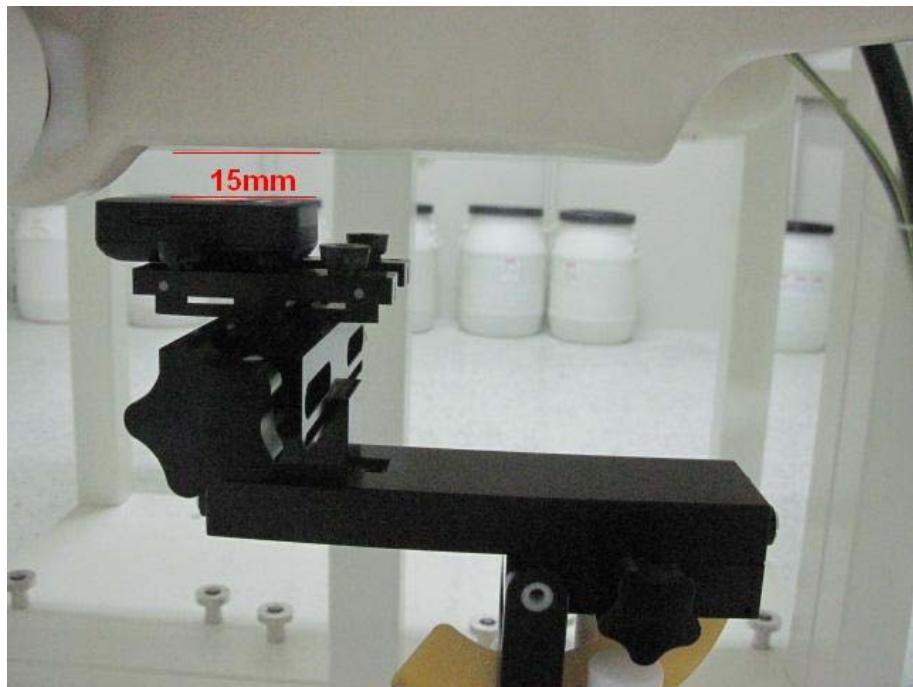
Down Tip



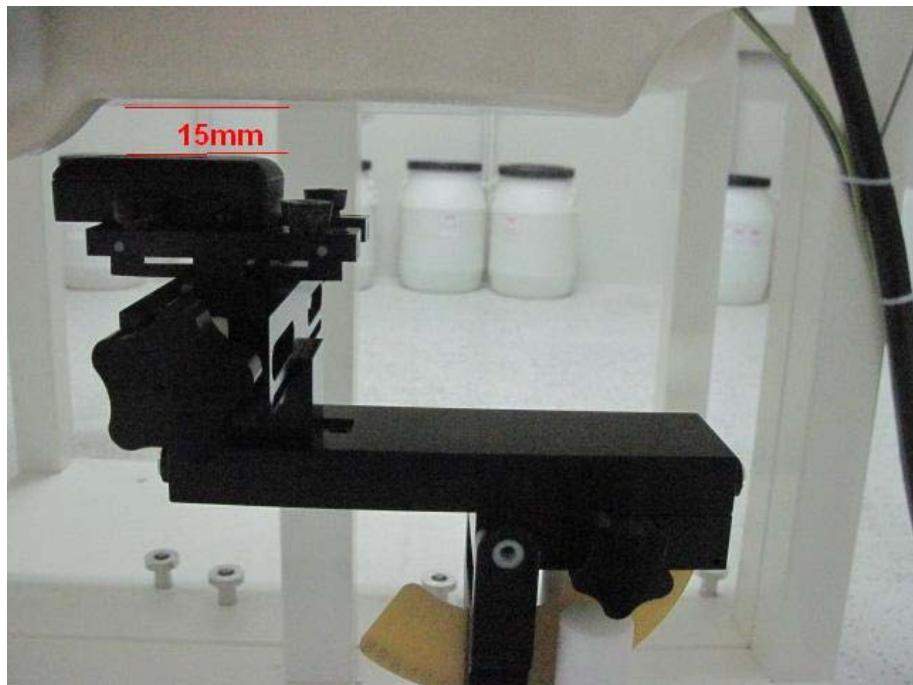
Left Side



Right Side



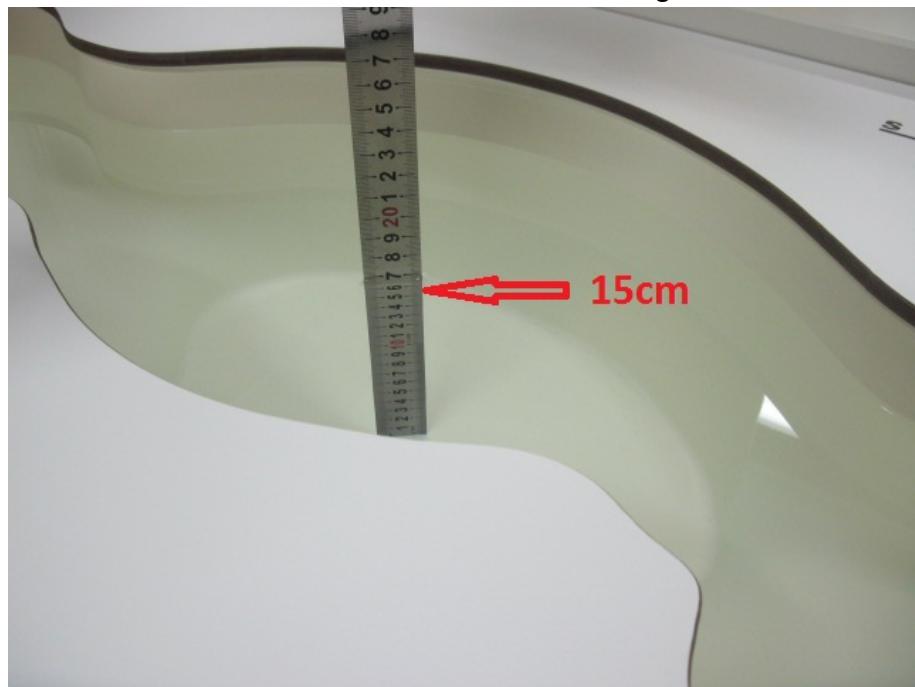
Body SAR Front



Body SAR Back

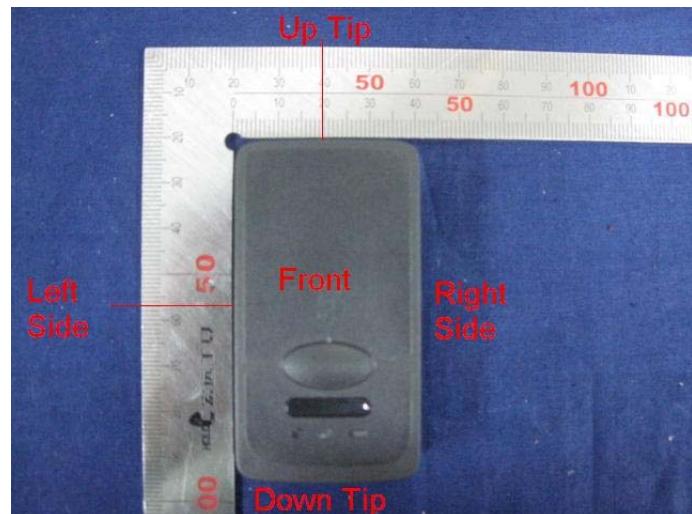
Depth of the liquid in the phantom – Zoom in

Note: The position used in the measurements were according to IEEE 1528 - 2003



EUT Photographs

(1) EUT Photo



(2) EUT Photo



(3) EUT Photo



(4) EUT Photo



(5) EUT Photo



(6) EUT Photo

