SAR Test Report

Product Name : GPS Locator

Model No. : GL100M

FCC ID : YQD-GL100M

Applicant : Queclink Wireless Solutions Co., Ltd

Address : Room 501, Building 9, No 99, TianZhou Road, Shanghai, China

Date of Receipt : 20/10/2011

Date of Test : 26/10/2011

Issued Date : 28/10/2011

Report No. : 11AS031R-HP-US-P03V01

Report Version : V1.0

Test Report Certification

Issued Date: 28/10/2011
Report No.: 11AS031R-HP-US-P03V01

QuieTek

Product Name	:	GPS Locator
Applicant	:	Queclink Wireless Solutions Co., Ltd
Address	:	Room 501, Building 9, No 99, TianZhou Road, Shanghai, China
Manufacturer	:	Queclink Wireless Solutions Co., Ltd
Address	:	Room 501, Building 9, No 99, TianZhou Road, Shanghai, China
Model No.	:	GL100M
FCC ID	:	YQD-GL100M
Brand Name	:	Queclink
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: 1.45 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

NVLAP Lab Code : 200347-0

Testing Laboratory 1313

LinKou Testing Laboratory :
No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
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NVLAP Lab Code: 200533-0

Testing Laboratory 0914

Suzhou (China) Testing Laboratory :
No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
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NVLAP Lab Code : 200743-0

Testing Laboratory 1596

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1. General Information

1.1. EUT Description

Product Name	GPS Locator
Brand Name	Queclink
Model No.	GL100M
Working Voltage	DC 3.4-4.2V
Hardware Version	1.01
Software Version	MTK 0828
RF Exposure Environment	Uncontrolled
GPS	
Operate Frequency	1575.42MHz
Type of modulation	BPSK
Antenna Type	Internal
Antenna Peak Gain	0dBi
2G	
Support Band	GSM850/PCS1900
Tx Frequency Range	GSM 850: 824MHz to 849MHz PCS 1900: 1850MHz to 1910MHz
Rx Frequency Range	GSM 850: 869MHz to 894MHz PCS 1900: 1930MHz to 1990MHz
GPRS Class	12
GPRS Type	Class B
Type of modulation	GMSK for GSM/GPRS
Antenna Type	Internal
Antenna Peak Gain	GSM850: -3dBi PCS1900: -1dBi
Max. Output Power (Avg. Burst Power)	GSM850 : 32.91 dBm PCS1900 : 29.90 dBm
Max. Output Power (Radiated)	GSM850 Band: 26.05 dBm - ERP PCS1900 Band: 24.07 dBm - EIRP
Battery	Model Name: Li-ion Rated Voltage and Capacitance: 3.7V1300mAh
AC Adapter	M/N: P-051B-050050 Input: 100-240V~50/60Hz 0.5A Output: DC 5V, 0.5A

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.

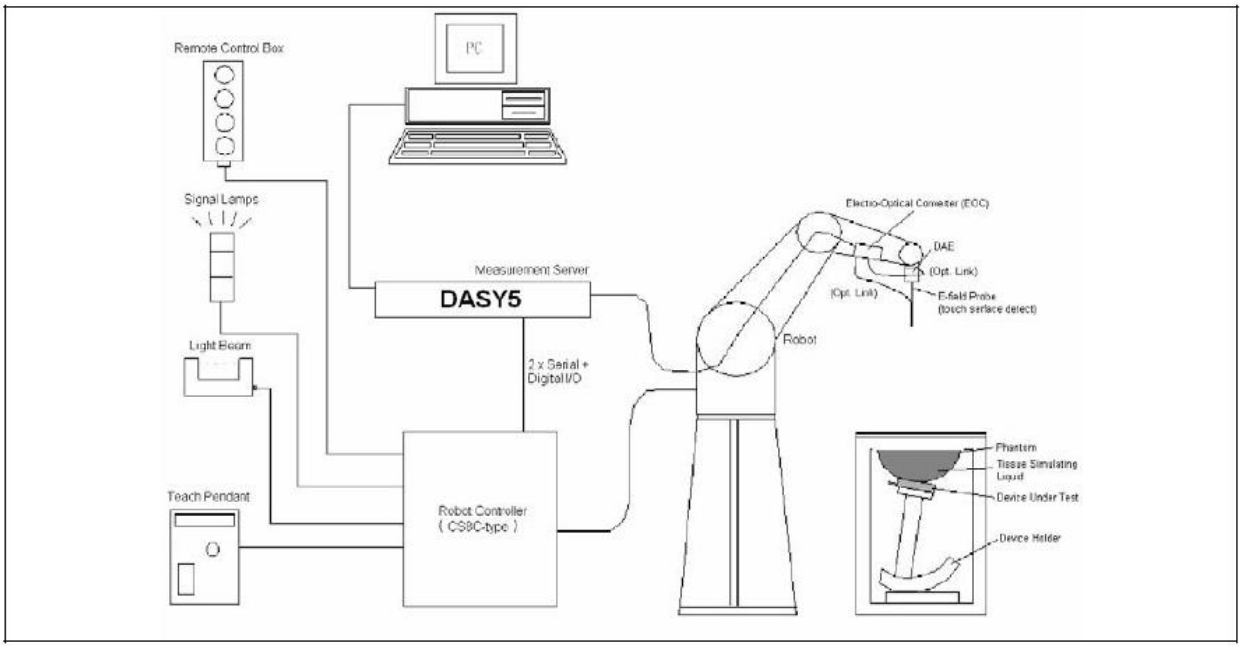
1.3. Test Environment

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 $10mm^2$ 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/m^3 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

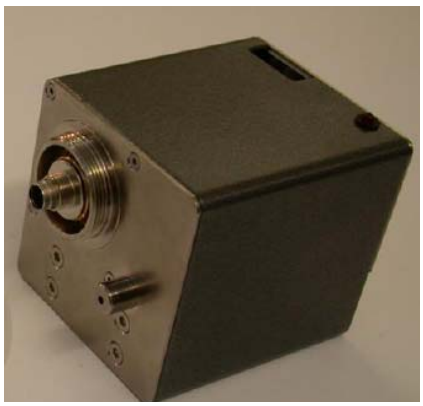
Model	EX3DV4	
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 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%.	

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 εr =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.

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
	26-10-2011	53.72	0.99	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
	26-10-2011	52.49	1.56	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.

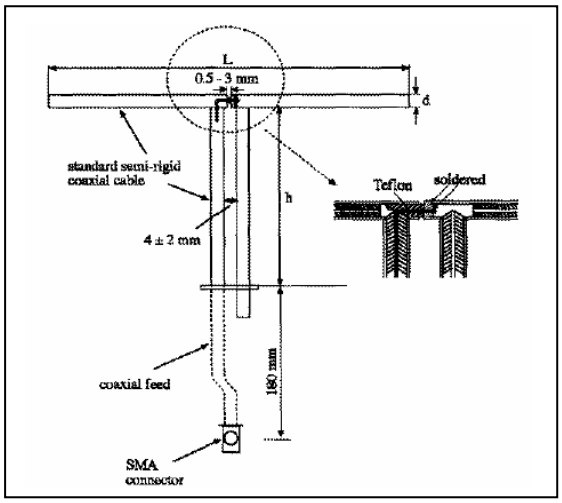
Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	**55.2**	**0.97**
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	**53.3**	**1.52**
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 ρ = 1000 kg/m^3)

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
	26-10-2011	9.88	6.40	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
	26-10-2011	42.80	21.72	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 $1mm^2$) 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 $1mm^3$).

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

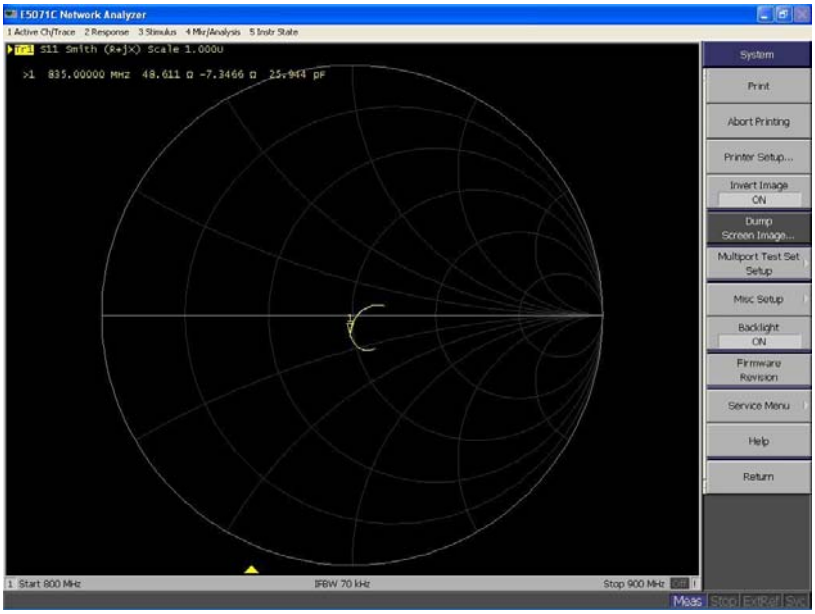
Note: Per KDB 450824 D02 requirements for dipole calibration, QuieTek Lab has adopted two years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

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).

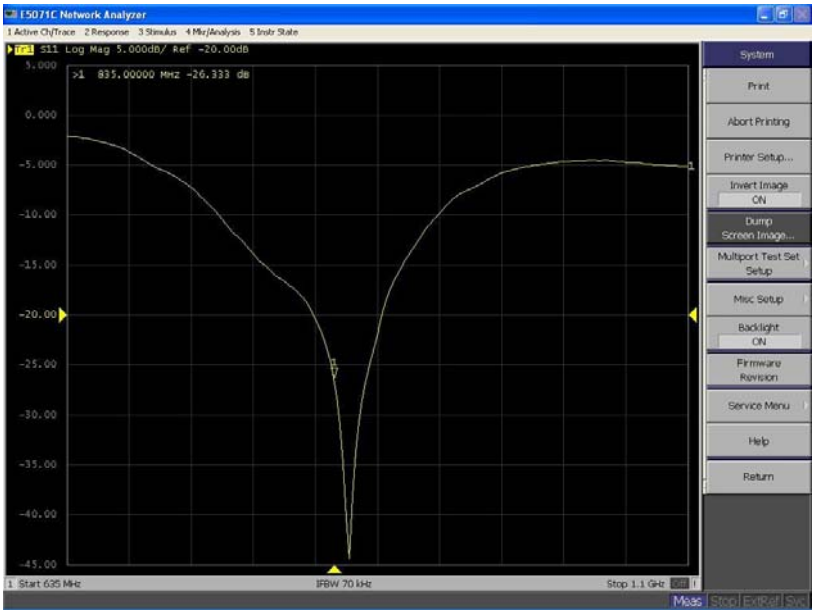
Impedance Plot for D835V2

835 Body

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



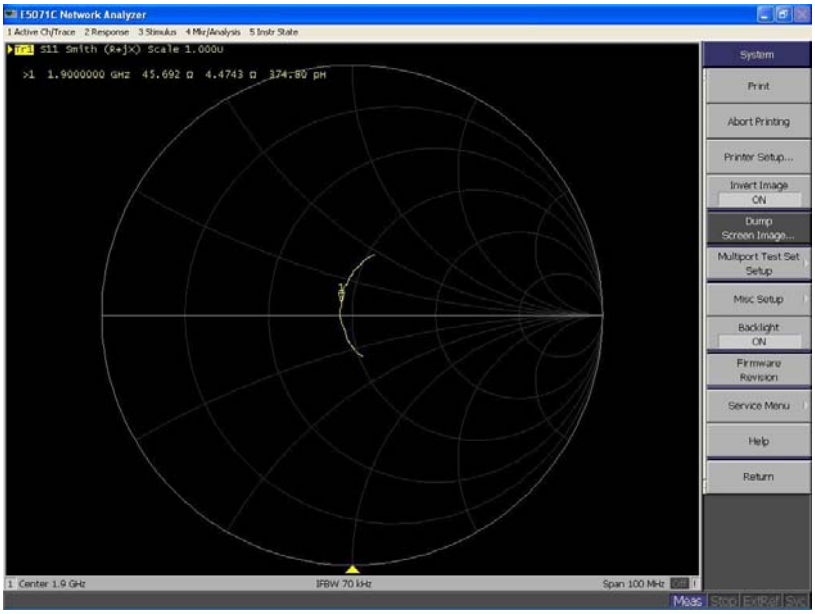
Calibrated return loss: -25.5 dB; Measured impedance: -26.333 dB (within 20%)



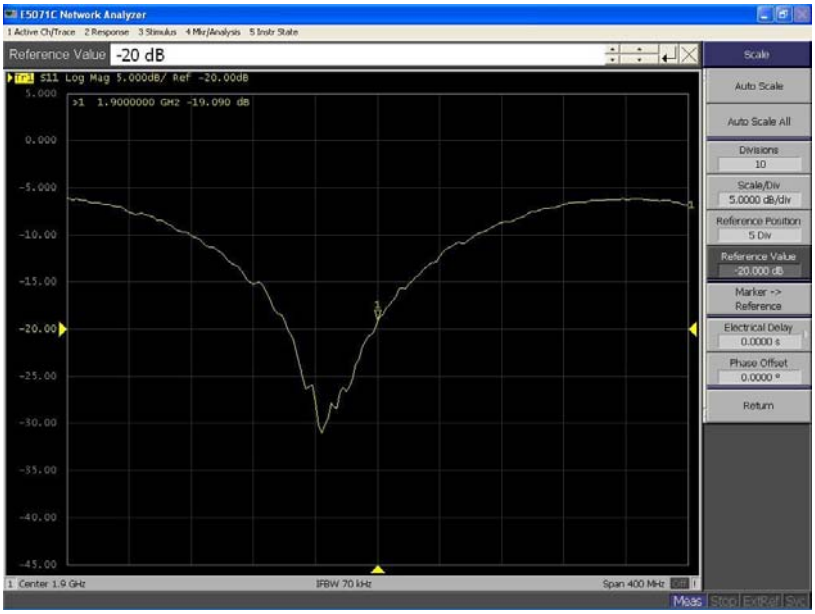
Impedance Plot for D1900V2

1900 Body

Calibrated impedance: 46.1 Ω; Measured impedance: 45.692 Ω (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.								
Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.5%	N	1	1	1	±6.5%	±6.5%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	√3	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	√3	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	√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	√3	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	√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	√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	32.85	-9	23.85
	836.4	32.90	-9	23.90
	848.8	32.91	-9	23.91
GPRS850(2 Slot)	824.2	32.82	-6	26.82
	836.4	32.87	-6	26.87
	848.8	32.90	-6	26.90
GPRS850(3 Slot)	824.2	32.80	-4.25	28.55
	836.4	32.82	-4.25	28.57
	848.8	32.85	-4.25	28.60
GPRS850(4 Slot)	824.2	30.37	-3	27.37
	836.4	30.42	-3	27.42
	848.8	30.47	-3	27.47
GPRS1900(1 Slot)	1850.2	29.86	-9	20.86
	1880.0	29.87	-9	20.87
	1909.8	29.90	-9	20.90
GPRS1900(2 Slot)	1850.2	29.83	-6	23.83
	1880.0	29.85	-6	23.85
	1909.8	29.89	-6	23.89
GPRS1900(3 Slot)	1850.2	29.78	-4.25	25.53
	1880.0	29.82	-4.25	25.57
	1909.8	29.84	-4.25	25.59
GPRS1900(4 Slot)	1850.2	27.46	-3	24.46
	1880.0	27.51	-3	24.51
	1909.8	27.56	-3	24.56

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 0mm from the phantom.

9.1.2. Operation Mode

This is a multislot 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 Position Body	Antenna Position	Frequency		Separation Distance (mm)	Frame Power (dBm)	Power Drift (<±0.2)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz					
Test Mode: GPRS850 1slot								
Body-Front	Fixed	189	836.4	0	23.90	-0.069	0.277	1.6
Test Mode: GPRS850 2slot								
Body-Front	Fixed	189	836.4	0	26.87	-0.123	0.670	1.6
Test Mode: GPRS850 3slot								
Body-Up Tip	Fixed	189	836.4	0	28.57	-0.117	0.059	1.6
Body-Down Tip	Fixed	189	836.4	0	28.57	0.197	0.435	1.6
Body-Left Side	Fixed	189	836.4	0	28.57	0.195	0.463	1.6
Body-Right Side	Fixed	189	836.4	0	28.57	-0.114	0.408	1.6
Body-Front	Fixed	128	824.2	0	28.55	-0.029	1.440	1.6
Body-Front	Fixed	189	836.4	0	28.57	0.107	1.450	1.6
Body-Front	Fixed	251	848.8	0	28.60	-0.086	**1.450**	1.6
Body-Back	Fixed	189	836.4	0	28.57	0.172	0.727	1.6
Test Mode: GPRS850 4slot								
Body-Front	Fixed	189	836.4	0	27.42	0.013	0.919	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)
		Channel	MHz					
Body-Back	Fixed	661	1880.0	0	20.87	-0.142	0.260	1.6
Test Mode: GPRS1900 2slot								
Body-Back	Fixed	661	1880.0	0	23.85	-0.175	0.579	1.6
Test Mode: GPRS1900 3slot								
Body-Up Tip	Fixed	661	1880.0	0	25.57	0.176	0.040	1.6
Body-Down Tip	Fixed	661	1880.0	0	25.57	-0.195	0.841	1.6
Body-Left Side	Fixed	661	1880.0	0	25.57	0.029	0.583	1.6
Body-Right Side	Fixed	661	1880.0	0	25.57	0.100	0.486	1.6
Body-Front	Fixed	661	1880.0	0	25.57	0.079	0.778	1.6
Body-Back	Fixed	512	1850.2	0	25.53	0.106	0.861	1.6
Body-Back	Fixed	661	1880.0	0	25.57	0.161	0.943	1.6
Body-Back	Fixed	810	1909.8	0	25.59	0.084	**1.100**	1.6
Test Mode: GPRS1900 4slot								
Body-Back	Fixed	661	1880.0	0	24.51	0.174	0.746	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: 26-10-2011

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; σ = 0.99 mho/m; εr = 53.7; ρ = 1000 kg/m^3 ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

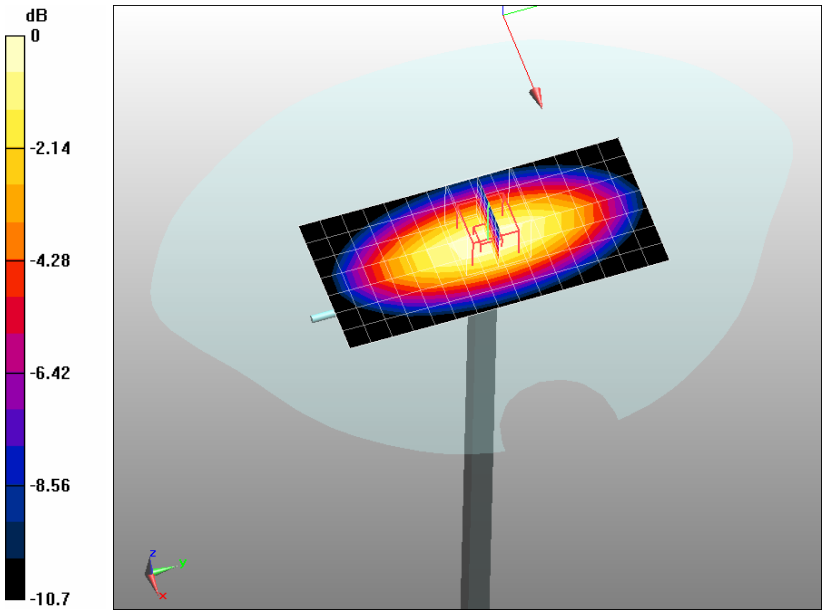
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/System Check GSM835 Body/Area Scan (8x16x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 2.54 mW/g

Configuration/System Check GSM835 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 52.1 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 3.76 W/kg

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.6 mW/g Maximum value of SAR (measured) = 2.67 mW/g



0 dB = 2.67mW/g

Date/Time: 26-10-2011

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; σ = 1.56 mho/m; εr = 52.5; ρ = 1000 kg/m^3 ;

Phantom section: Flat Section ; Input Power=250mW

Ambient temperature (℃): 21.5, Liquid temperature (℃): 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: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

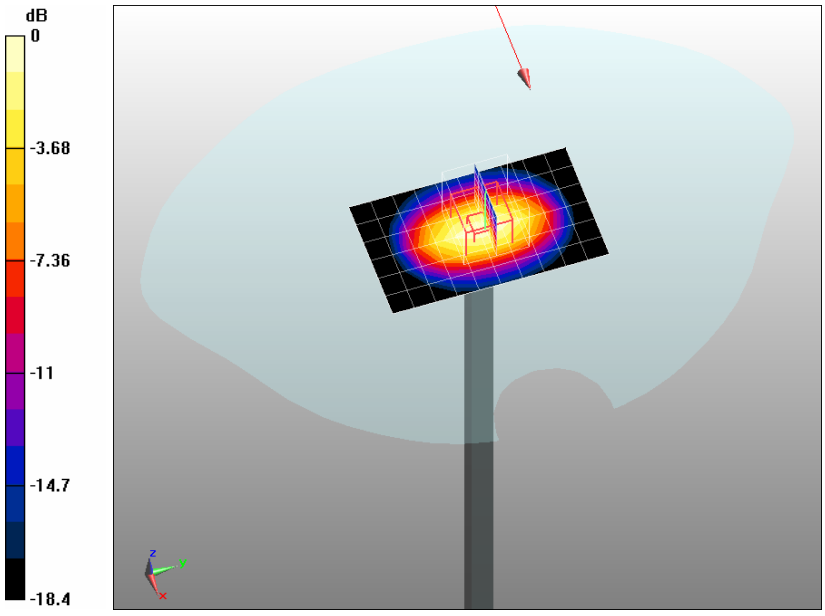
Configuration/System Check PCS1900 Body/Area Scan (7x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 12.1 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) = 19.8 W/kg

SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.43 mW/g Maximum value of SAR (measured) = 12 mW/g



0 dB = 12.1mW/g

Appendix B. SAR measurement Data

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(1up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

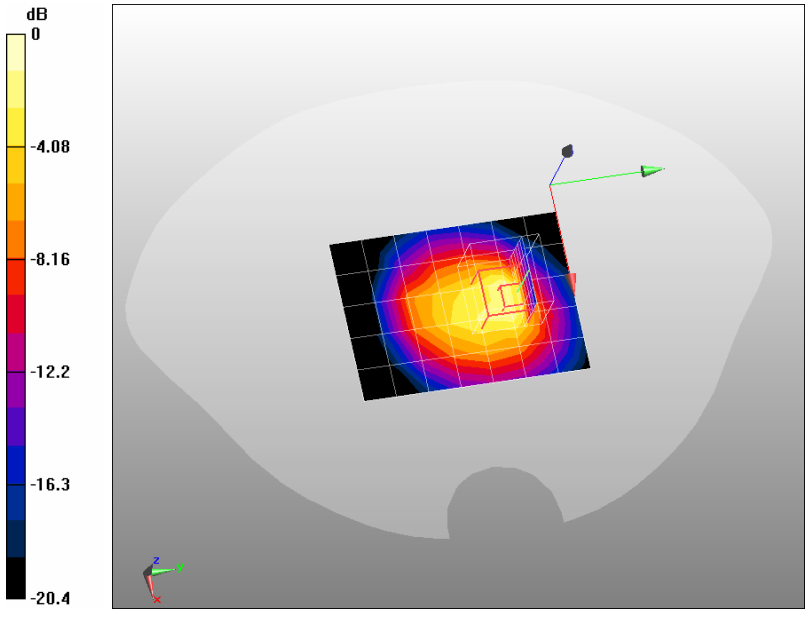
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.220 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 12.6 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.803 W/kg

SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.132 mW/g Maximum value of SAR (measured) = 0.318 mW/g



0 dB = 0.318mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(2up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

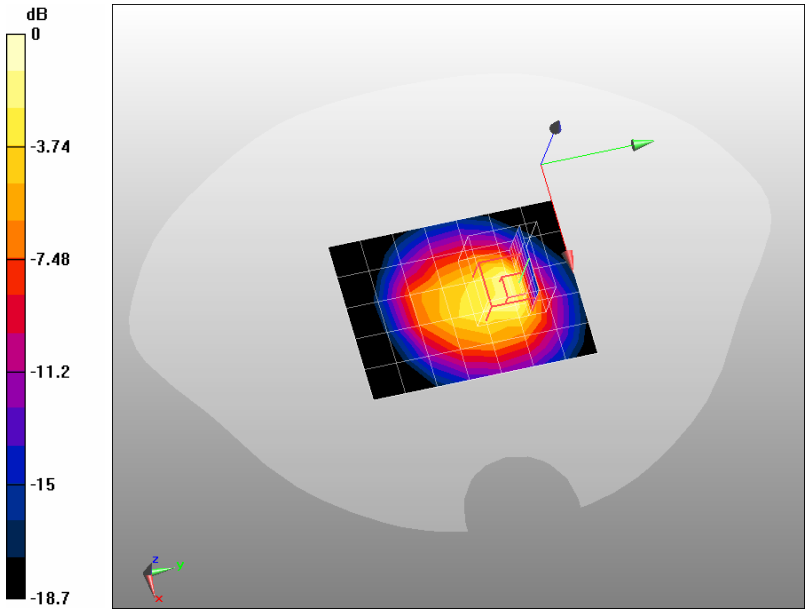
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.537 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 20 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 1.94 W/kg

SAR(1 g) = 0.670 mW/g; SAR(10 g) = 0.320 mW/g Maximum value of SAR (measured) = 0.762 mW/g



0 dB = 0.762mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Up Tip(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

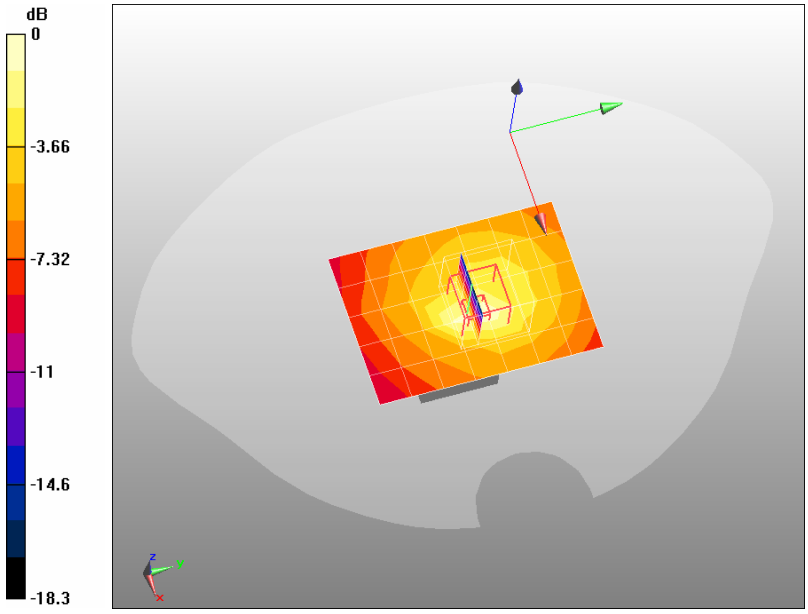
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Up Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.063 mW/g

Configuration/GPRS850 Mid Body-Up Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 7.6 V/m; Power Drift = -0.117 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.059 mW/g; SAR(10 g) = 0.030 mW/g Maximum value of SAR (measured) = 0.065 mW/g



0 dB = 0.065mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Down Tip(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

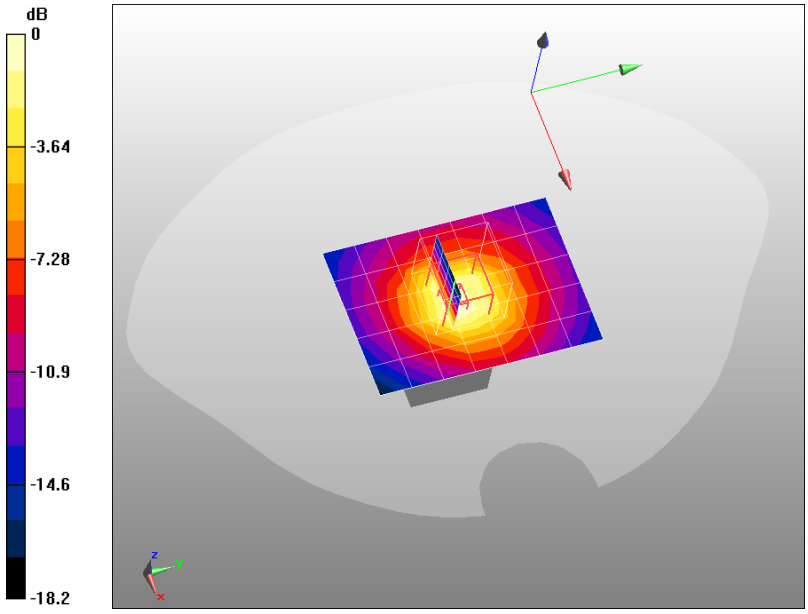
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Down Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.430 mW/g

Configuration/GPRS850 Mid Body-Down Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 19.7 V/m; Power Drift = 0.197 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.220 mW/g Maximum value of SAR (measured) = 0.444 mW/g



0 dB = 0.444mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Left Side(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

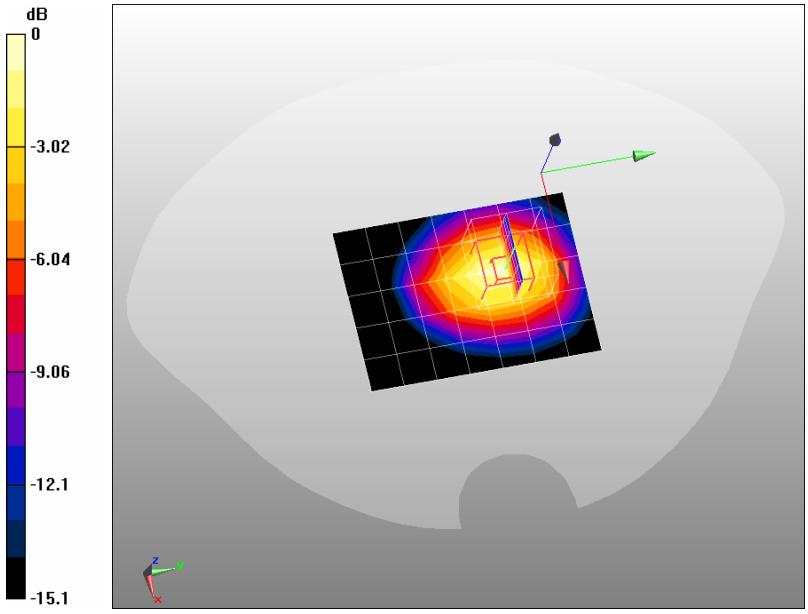
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Left Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.479 mW/g

Configuration/GPRS850 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 17.5 V/m; Power Drift = 0.195 dB

Peak SAR (extrapolated) = 0.822 W/kg

SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.268 mW/g Maximum value of SAR (measured) = 0.508 mW/g



0 dB = 0.508mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Right Side(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

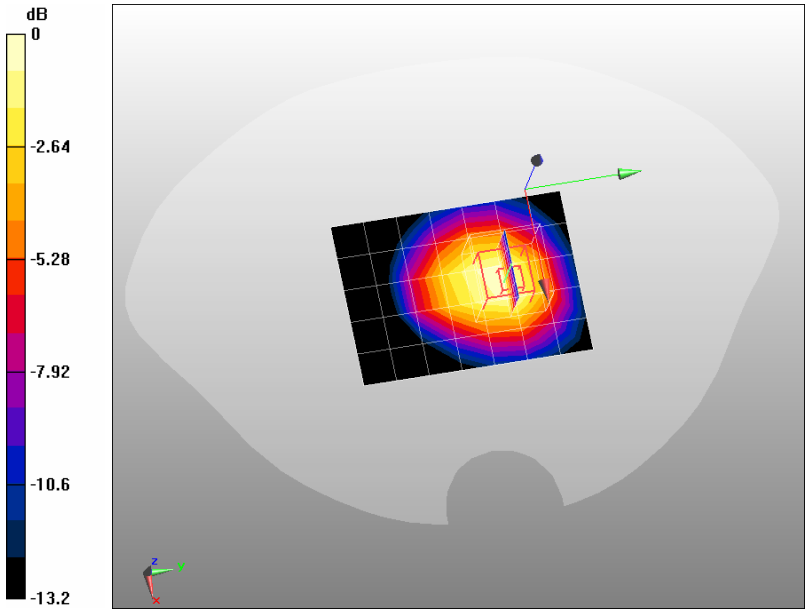
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Right Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.398 mW/g

Configuration/GPRS850 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.2 V/m; Power Drift = -0.114 dB

Peak SAR (extrapolated) = 0.681 W/kg

SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.249 mW/g Maximum value of SAR (measured) = 0.430 mW/g



0 dB = 0.430mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Low Body-Front(3up)

DUT: GPS Locator; Type: GL100M

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.8 ; Frequency: 824.2 MHz; Medium parameters used: f = 824.2 MHz; σ = 0.98 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

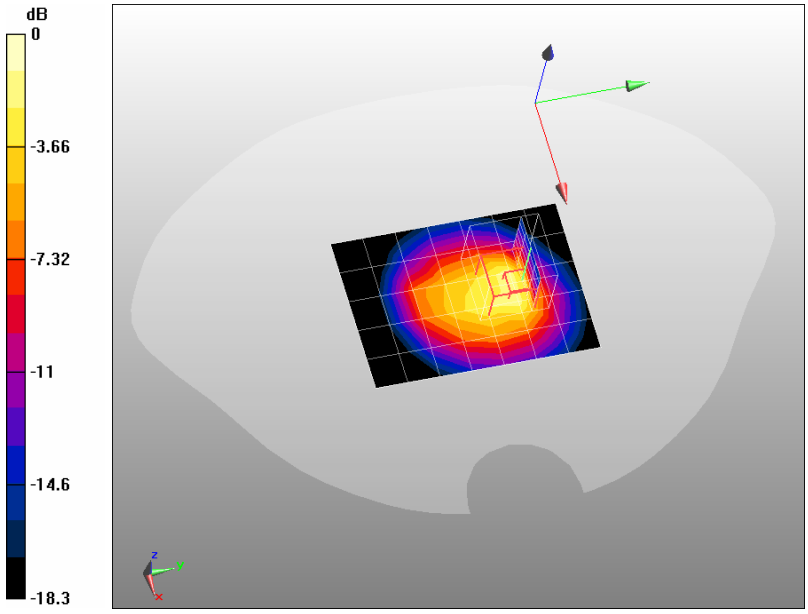
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Low Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.14 mW/g

Configuration/GPRS850 Low Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 28.6 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 4.14 W/kg

SAR(1 g) = 1.44 mW/g; SAR(10 g) = 0.686 mW/g Maximum value of SAR (measured) = 1.64 mW/g



0 dB = 1.64mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 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: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

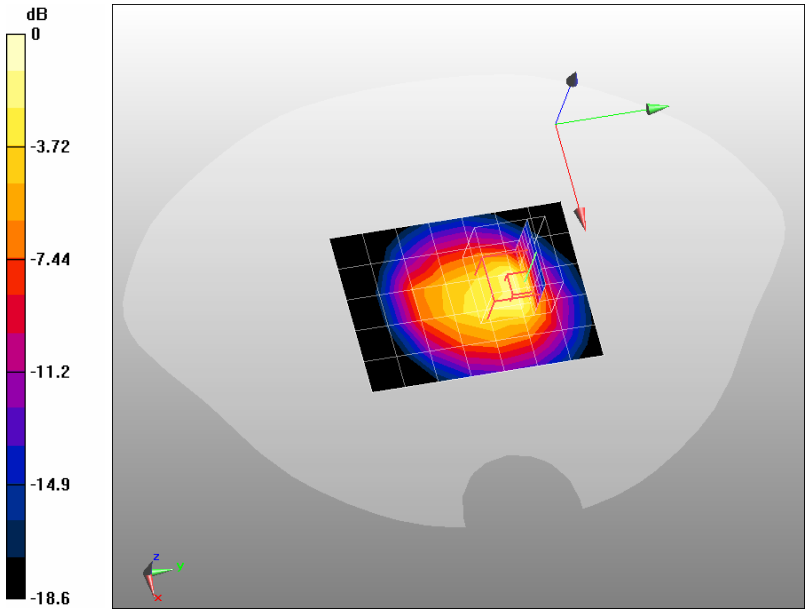
Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.15 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 28.4 V/m; Power Drift = 0.107 dB

Peak SAR (extrapolated) = 4.14 W/kg

SAR(1 g) = 1.45 mW/g; SAR(10 g) = 0.696 mW/g Maximum value of SAR (measured) = 1.65 mW/g



0 dB = 1.65mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 High Body-Front(3up)

DUT: GPS Locator; Type: GL100M

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: GSM 850; Duty Cycle: 1:2.8 ; Frequency: 848.6 MHz; Medium parameters used: f = 848.6 MHz; σ = 1 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

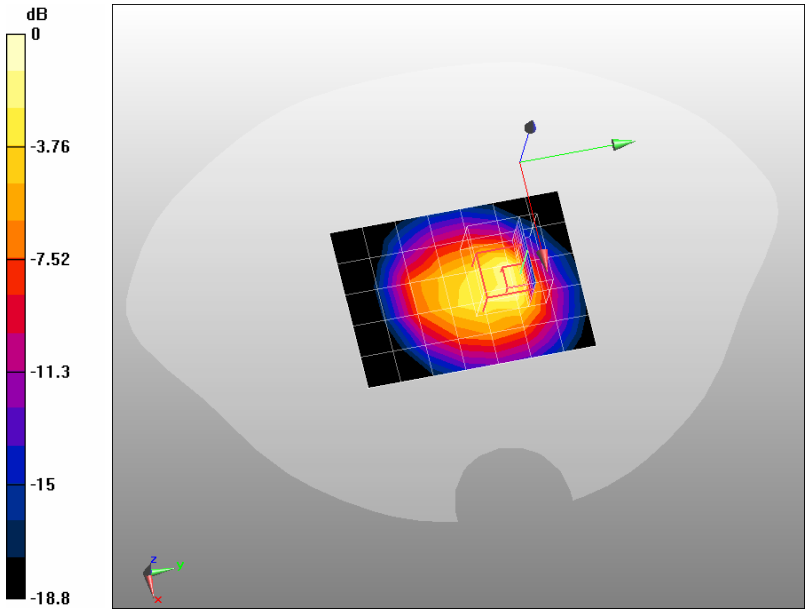
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 High Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.17 mW/g

Configuration/GPRS850 High Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 28.8 V/m; Power Drift = -0.086 dB

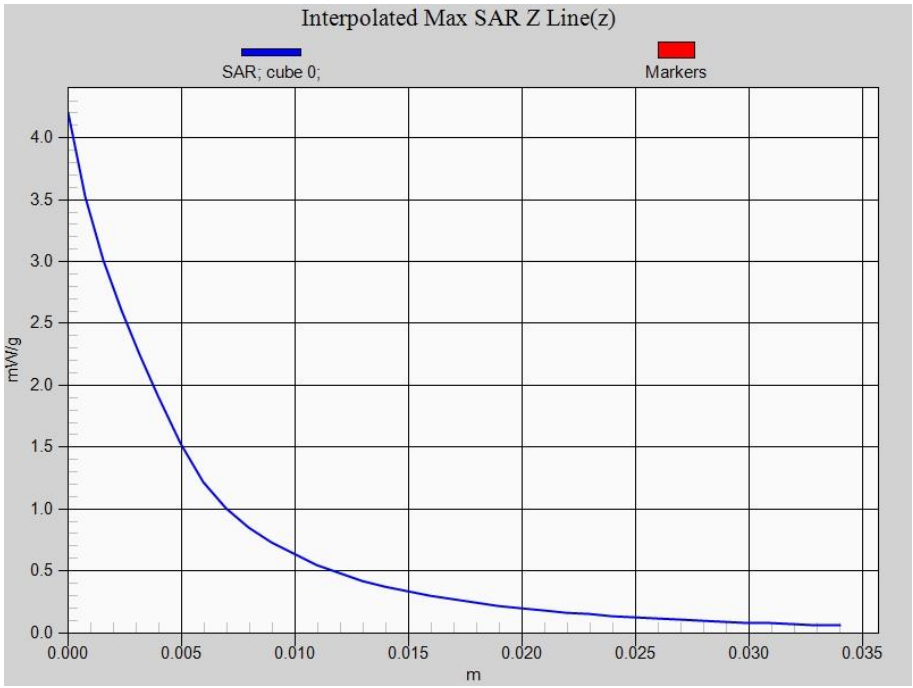
Peak SAR (extrapolated) = 4.2 W/kg

SAR(1 g) = 1.45 mW/g; SAR(10 g) = 0.693 mW/g Maximum value of SAR (measured) = 1.67 mW/g



0 dB = 1.67mW/g

Z-Axis Plot


Interpolated Max SAR Z Line(z)
SAR; cube 0;
Markers
mW/g
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Back(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

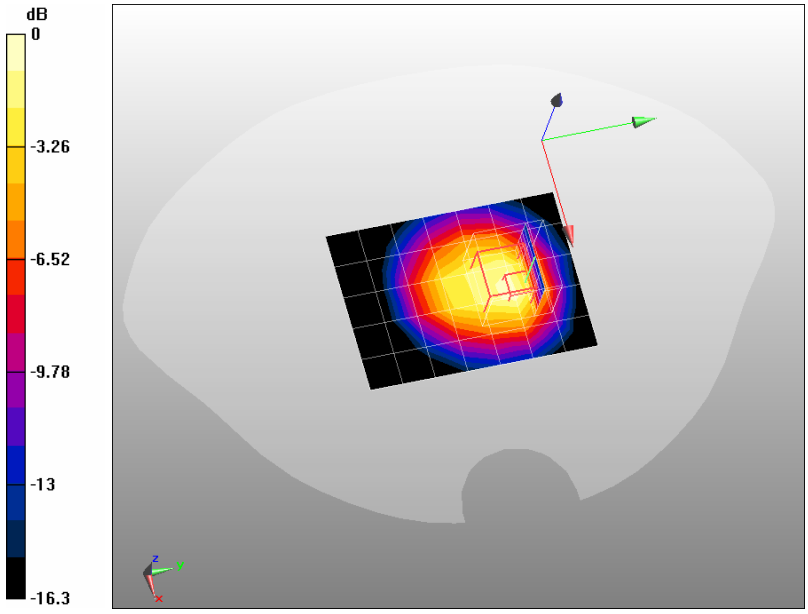
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.673 mW/g

Configuration/GPRS850 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 21.5 V/m; Power Drift = 0.172 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.405 mW/g Maximum value of SAR (measured) = 0.753 mW/g



0 dB = 0.753mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS850 Mid Body-Front(4up)

DUT: GPS Locator; Type: GL100M

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; σ = 0.99 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

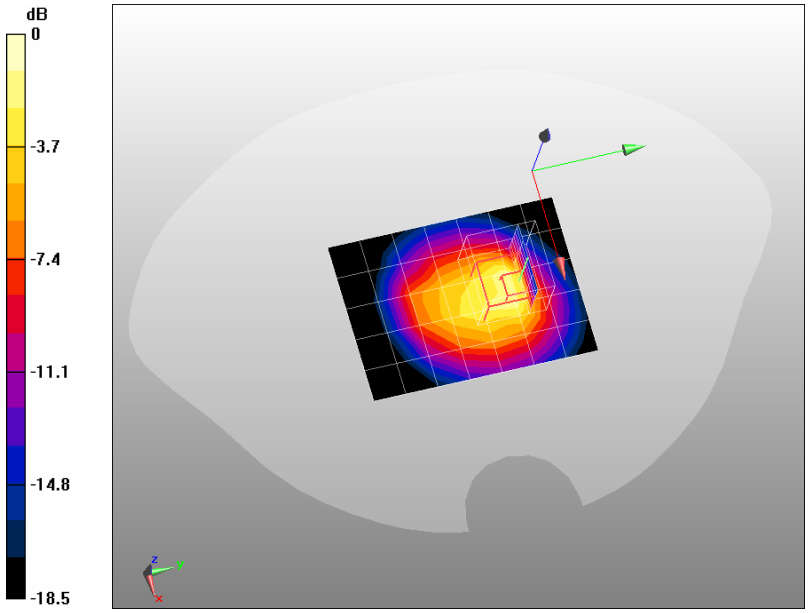
- Probe: EX3DV4 - SN3710; ConvF(4.438, 4.985, 5.123); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM2; Type: SAM; Serial: TP1562
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS850 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.735 mW/g

Configuration/GPRS850 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 22.9 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 2.62 W/kg

SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.441 mW/g Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(1up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

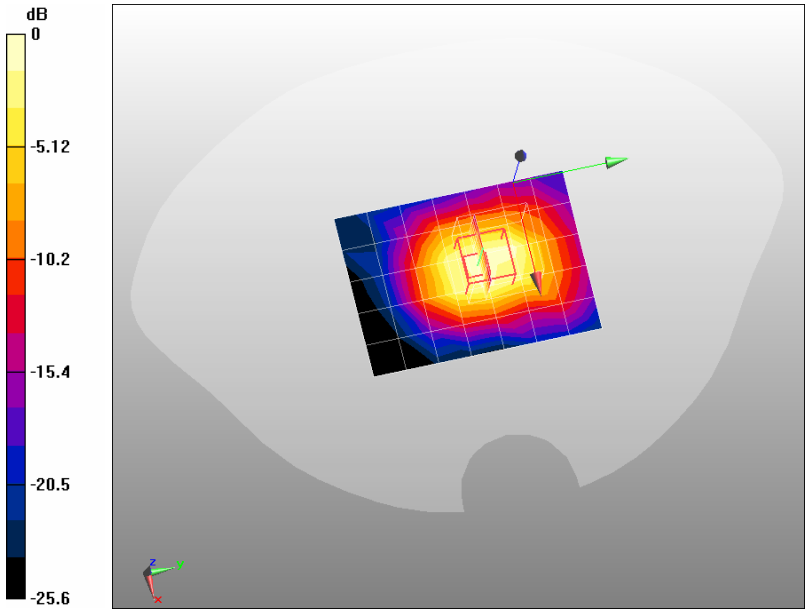
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.243 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 13.7 V/m; Power Drift = -0.142 dB

Peak SAR (extrapolated) = 0.431 W/kg

SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.150 mW/g Maximum value of SAR (measured) = 0.281 mW/g



0 dB = 0.281mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(2up)

DUT: GPS Locator; Type: GL100M

Communication System: GPRS/EGPRS-2 Slot; Communication System Band: PCS1900; Duty Cycle: 1:4.2 ; Frequency: 1880 MHz; Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

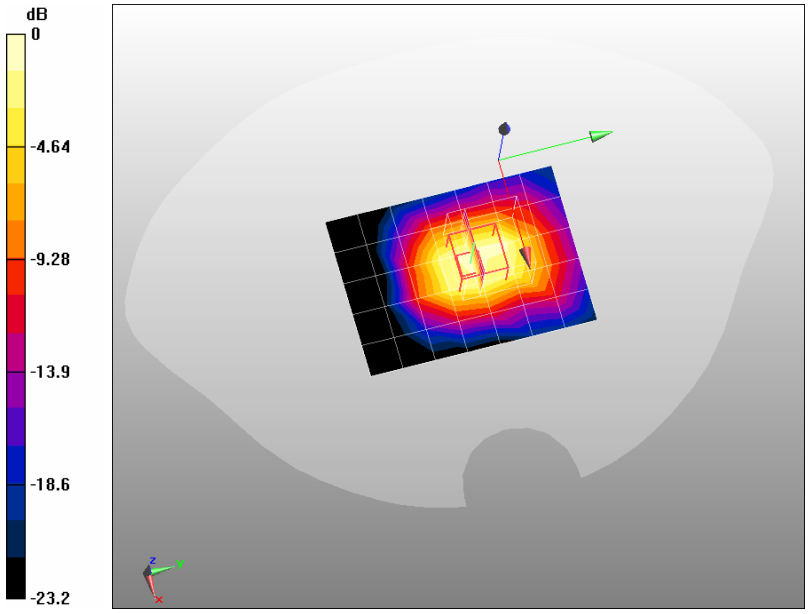
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.537 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 20.5 V/m; Power Drift = -0.175 dB

Peak SAR (extrapolated) = 0.962 W/kg

SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.334 mW/g Maximum value of SAR (measured) = 0.628 mW/g



0 dB = 0.628mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Up Tip(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

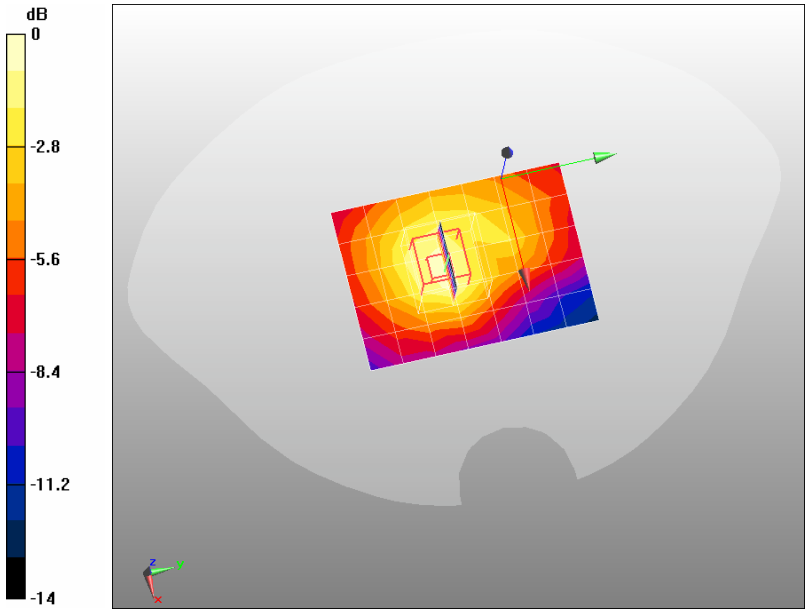
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Up Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.040 mW/g

Configuration/GPRS1900 Mid Body-Up Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 4.67 V/m; Power Drift = 0.176 dB

Peak SAR (extrapolated) = 0.067 W/kg

SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.023 mW/g Maximum value of SAR (measured) = 0.044 mW/g



0 dB = 0.044mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Down Tip(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

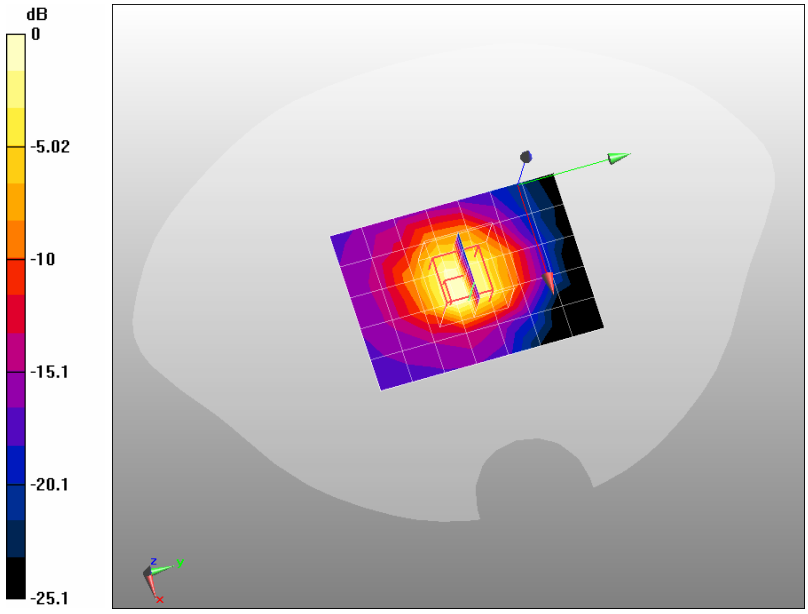
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Down Tip/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.863 mW/g

Configuration/GPRS1900 Mid Body-Down Tip/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 19.6 V/m; Power Drift = -0.195 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.841 mW/g; SAR(10 g) = 0.390 mW/g Maximum value of SAR (measured) = 0.936 mW/g



0 dB = 0.936mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Left Side(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

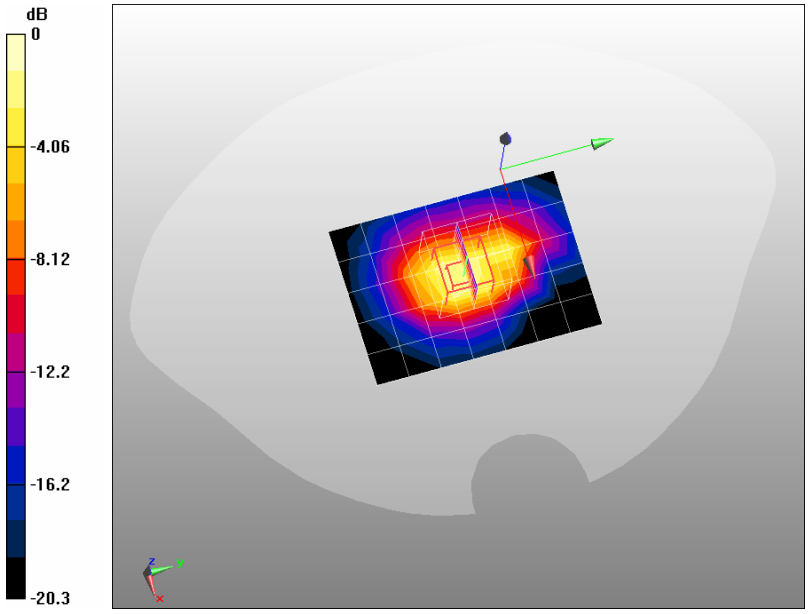
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Left Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.483 mW/g

Configuration/GPRS1900 Mid Body-Left Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 21 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.583 mW/g; SAR(10 g) = 0.298 mW/g Maximum value of SAR (measured) = 0.666 mW/g



0 dB = 0.666mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Right Side(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

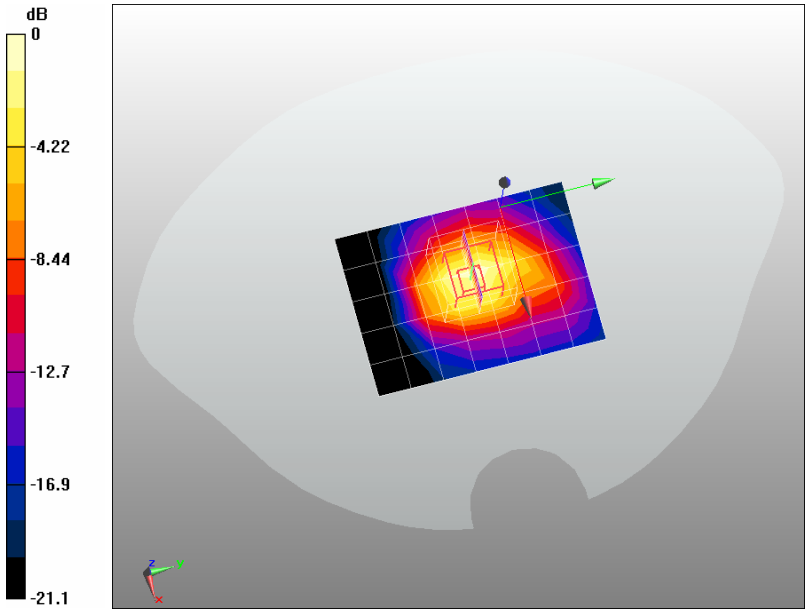
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Right Side/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.469 mW/g

Configuration/GPRS1900 Mid Body-Right Side/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.5 V/m; Power Drift = 0.100 dB

Peak SAR (extrapolated) = 0.828 W/kg

SAR(1 g) = 0.486 mW/g; SAR(10 g) = 0.259 mW/g Maximum value of SAR (measured) = 0.554 mW/g



0 dB = 0.554mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Front(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

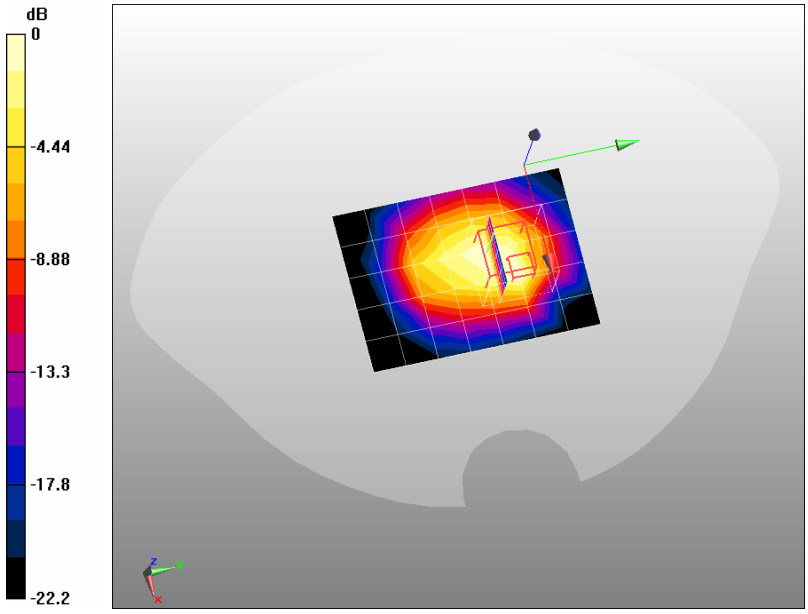
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Front/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.888 mW/g

Configuration/GPRS1900 Mid Body-Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 18.2 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.778 mW/g; SAR(10 g) = 0.406 mW/g Maximum value of SAR (measured) = 0.834 mW/g



0 dB = 0.834mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Low Body-Back(3up)

DUT: GPS Locator; Type: GL100M

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1850.2 MHz; Medium parameters used: f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

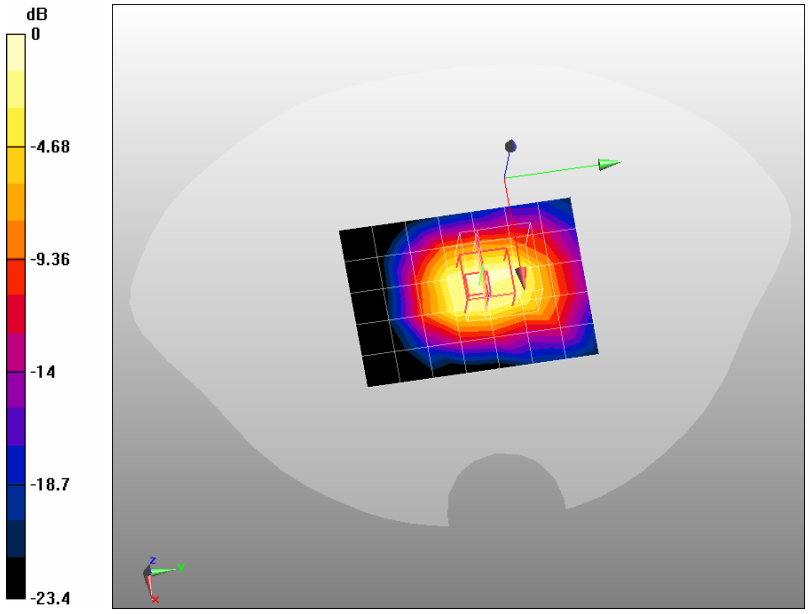
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Low Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.793 mW/g

Configuration/GPRS1900 Low Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 24.3 V/m; Power Drift = 0.106 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.861 mW/g; SAR(10 g) = 0.501 mW/g Maximum value of SAR (measured) = 0.937 mW/g



0 dB = 0.937mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(3up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

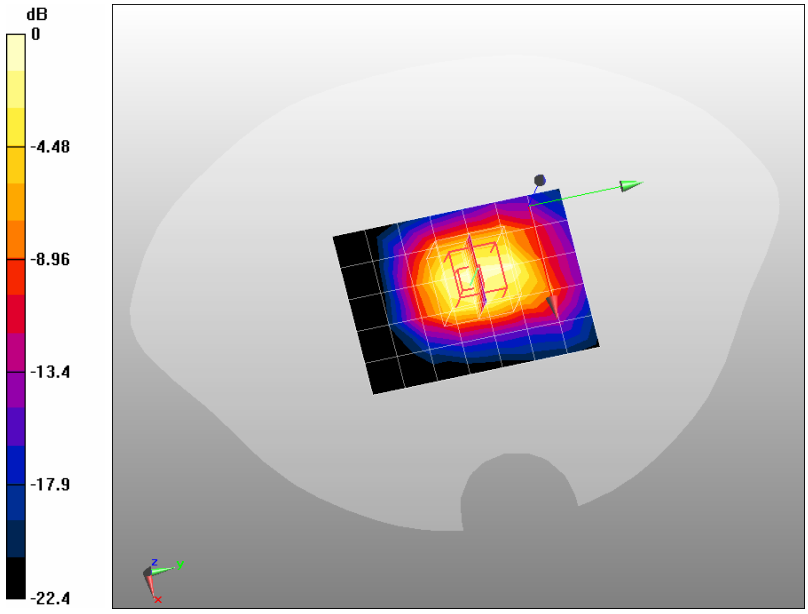
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.921 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 24.3 V/m; Power Drift = 0.161 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.943 mW/g; SAR(10 g) = 0.545 mW/g Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 High Body-Back(3up)

DUT: GPS Locator; Type: GL100M

Communication System: GPRS/EGPRS-3 Slot; Communication System Band: PCS 1900; Duty Cycle: 1:2.8 ; Frequency: 1909.8 MHz; Medium parameters used: f = 1909.8 MHz; σ = 1.57 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

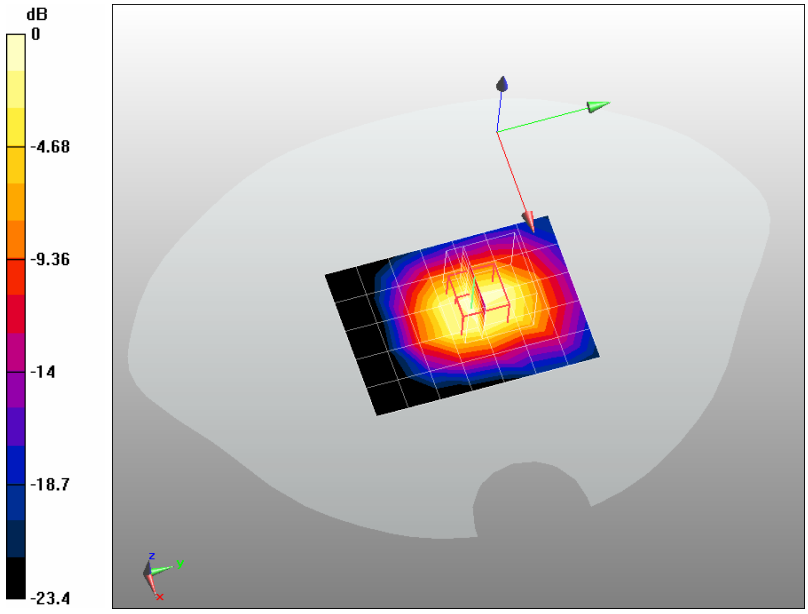
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 High Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1 mW/g

Configuration/GPRS1900 High Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 27.2 V/m; Power Drift = 0.084 dB

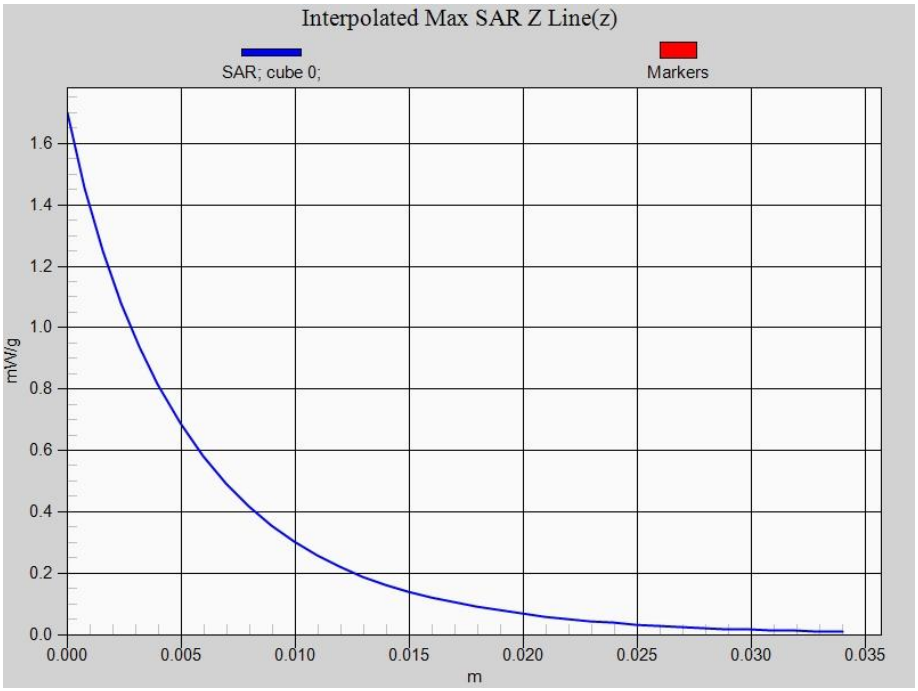
Peak SAR (extrapolated) = 1.7 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.625 mW/g Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

Z-Axis Plot


Interpolated Max SAR Z Line(z)
SAR; cube 0;
Markers
mW/g
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 26-10-2011

Test Laboratory: QuieTek Lab

GPRS1900 Mid Body-Back(4up)

DUT: GPS Locator; Type: GL100M

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; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ; Phantom section: Flat Section

Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.0

DASY5 Configuration:

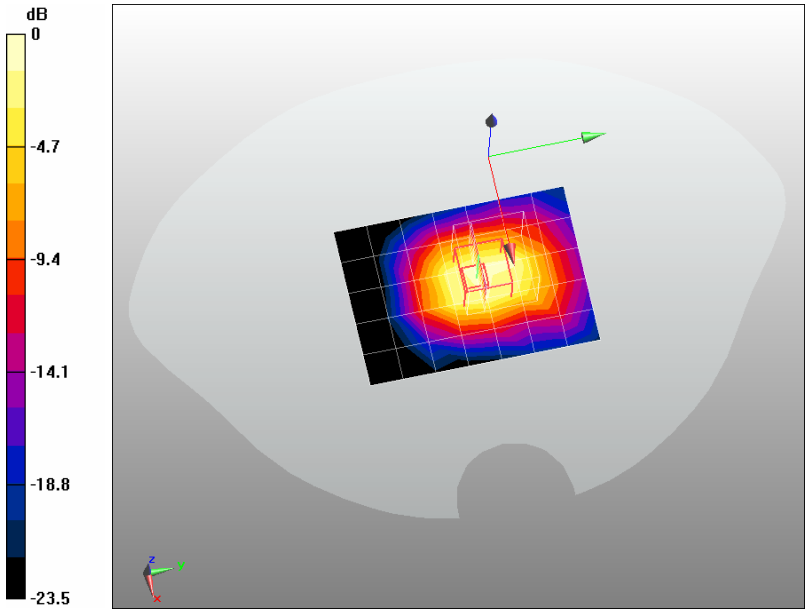
- Probe: EX3DV4 - SN3710; ConvF(4.193, 4.677, 4.833); Calibrated: 25/02/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1220; Calibrated: 03/12/2010
- Phantom: SAM1; Type: SAM; Serial: TP1561
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Configuration/GPRS1900 Mid Body-Back/Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.678 mW/g

Configuration/GPRS1900 Mid Body-Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 22.3 V/m; Power Drift = 0.174 dB

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.433 mW/g Maximum value of SAR (measured) = 0.805 mW/g

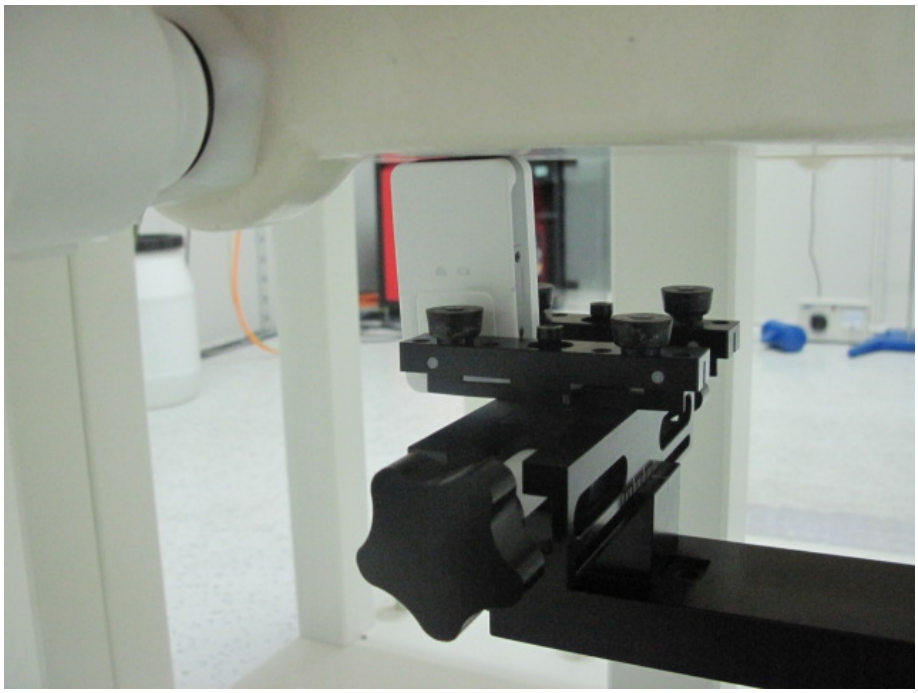


0 dB = 0.805mW/g

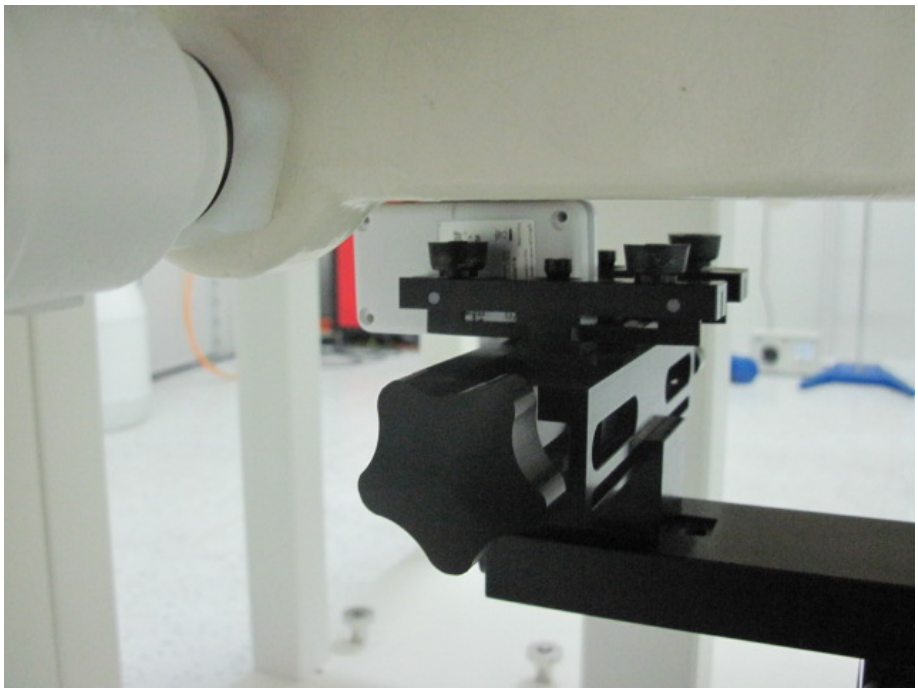
Appendix C. Test Setup Photographs & EUT Photographs

Test Setup Photographs

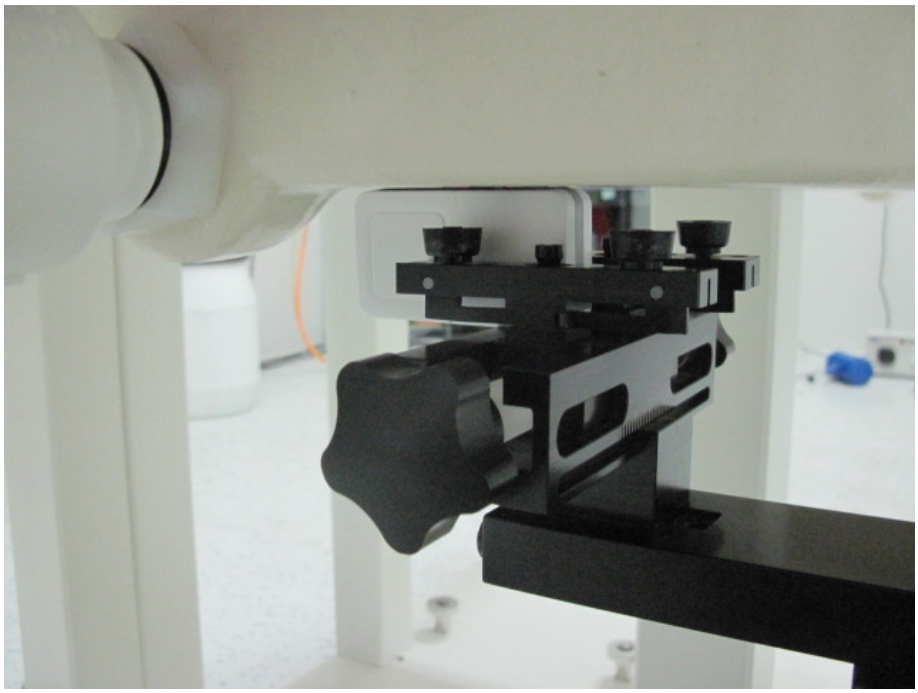
Up Tip



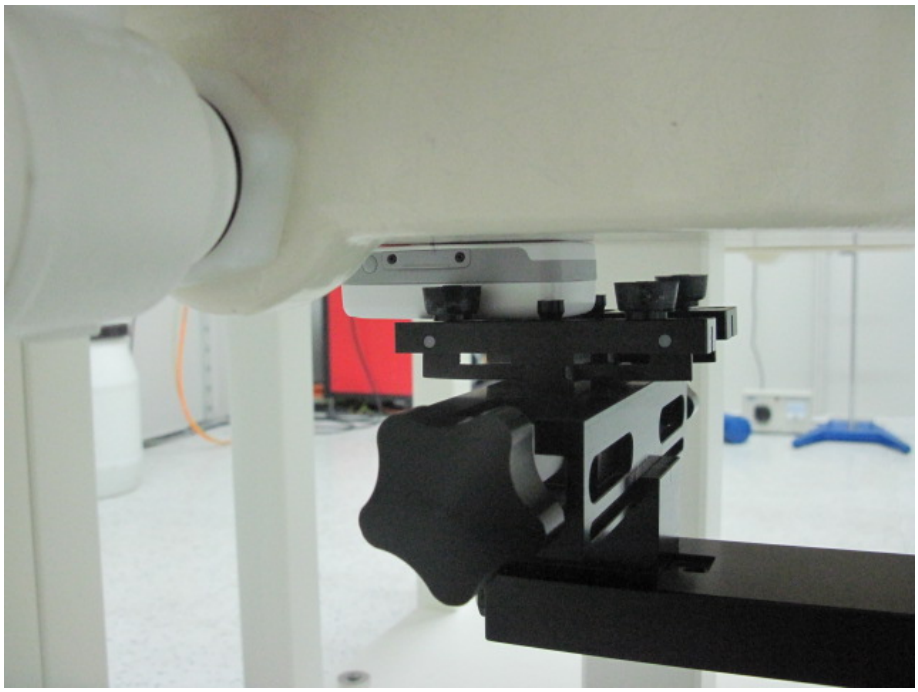
Down Tip



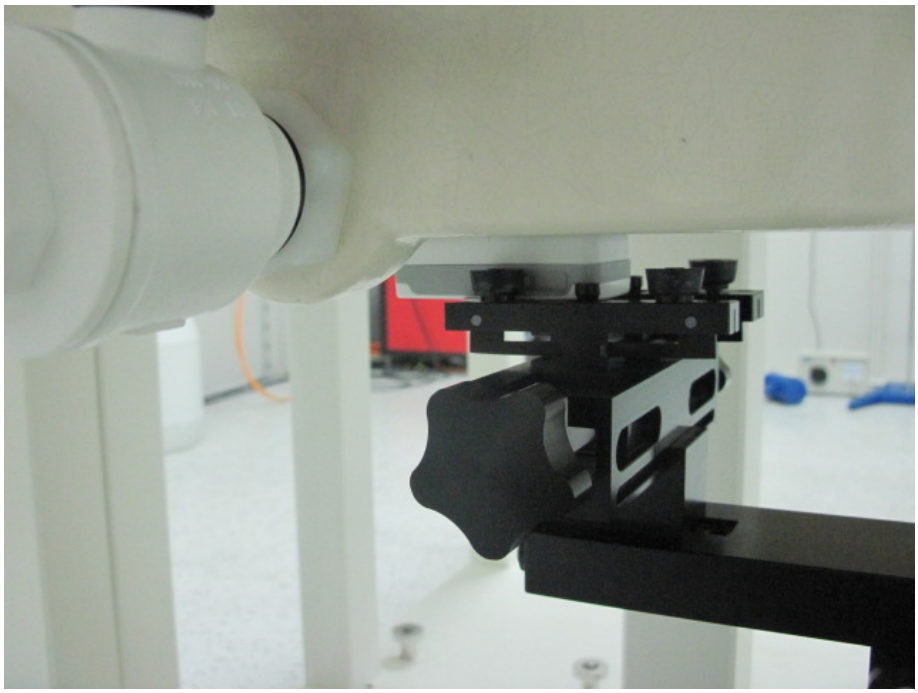
Left Side



Right Side



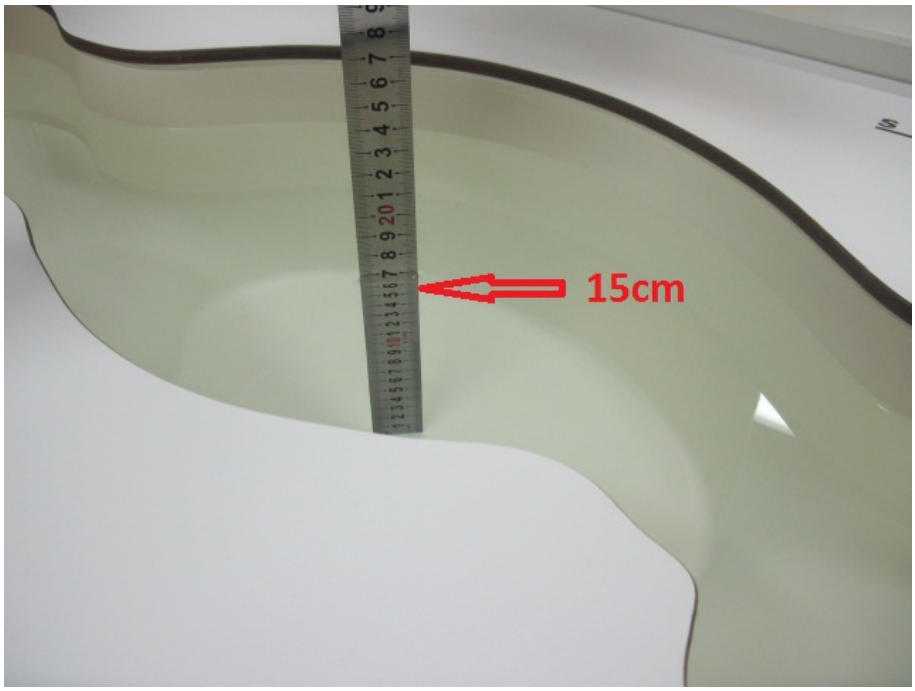
Body SAR Front



Body SAR Back

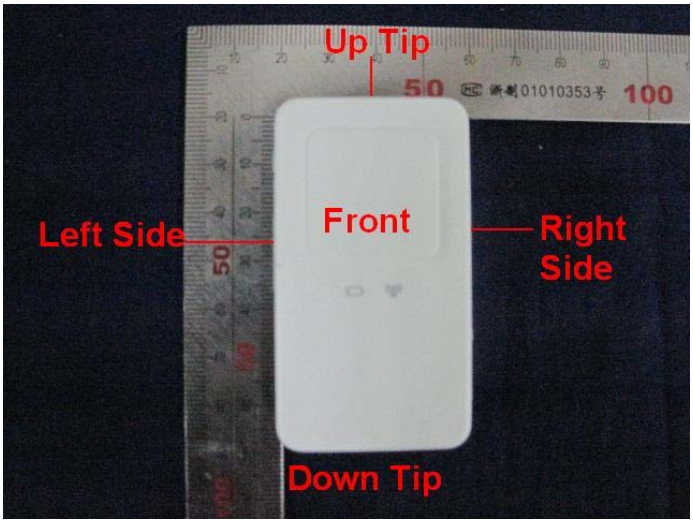
Depth of the liquid in the phantom – Zoom in

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



EUT Photographs

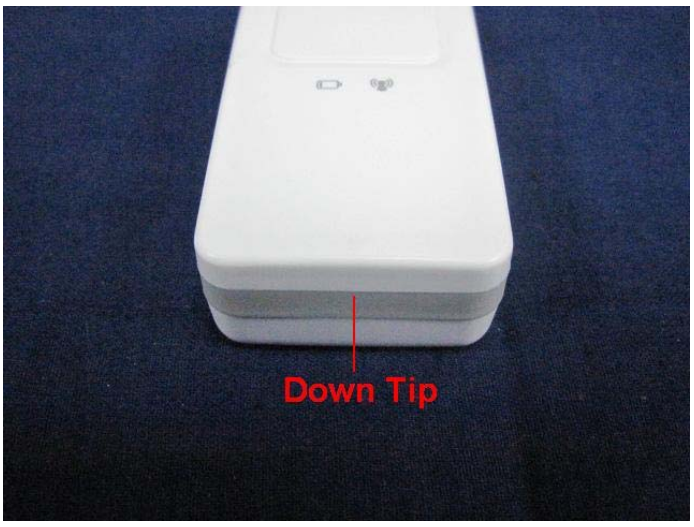
(1) EUT Photo



(2) EUT Photo

(3) EUT Photo

(4) EUT Photo



(5) EUT Photo

(6) EUT Photo

Appendix D. Probe Calibration Data

国家无线电监测中心检测中心
The State Radio_monitoring_center Testing Center

校准证书

Calibration Certificate

CNAS 校准 CNAS L0447

器具名称 Instrument	电场探头 E-Field Probe
型号/规格 Type/Model	EX3DV4
生产厂家 Manufacturer	Schmid & Partner Engineering AG
出厂编号 Serial No	SN:3710
客户名称 Name of Client	快特电波科技（苏州）有限公司
客户地址 Address of Client	苏州工业园区娄葑高新技术开发区宏业路 99 号
校准日期 Calibration Date	2011.2.25

所有的校准工作都是在屏蔽实验室中完成：环境温度 (22±3) ℃ 湿度<70%
All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3) ℃ and humidity<70%

授权签字人：
Approved by

国家无线电监测中心检测中心 校准报告专用章

地址：北京市西城区北礼士路 80 号
Add: No.80 Bei Lishi Road, Xi Cheng District Beijing 100037, P .R .China

电话 Tel：+86-10-68009202 68009203
传真 Fax：+86-10-68009205 68009195

第 1 页 共 7 页 证书编号 Certificate No.SRTC2011-CAL002-001

国家无线电监测中心检测中心
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校准规范 Reference documents of the measurement(Code, Name) SRMC3003-V2.0.0 比吸收率（SAR）测试系统校准规范
校准环境及地点 Place and environmental condition of the measurement 温度 Temperature 23.2℃ 湿度 Humidity 32.5 % 地点 Location SRTC room 226

主要校准设备 Primary Calibration Equipment used	型号 Model/Type	序列号 ID#	校准日期 Cal Date	校准有效期至 Scheduled Calibration
功率计 Power meter	E4417A	SN: MY45101004	2010.8	2011.8
功率传感器 Power sensor	E9300B	SN: MY41496001	2010.8	2011.8
功率传感器 Power sensor	E9300B	SN: MY41496003	2010.8	2011.8
参考 DAE Reference DAE	DAE4	SN: 720	2011.1	2012.1
信号源 Signal generator	SML03	SN:103514	2010.8	2011.8
网络分析仪 Network analyzer	8714ET	SN:US40372083	2010.8	2011.8
次要校准设备 Secondary Calibration Equipment	型号 Model/Type	序列号 ID#		
波导 Waveguide	WGLS R9	SN:1006		
波导 Waveguide	WGLS R14	SN:1003		
波导 Waveguide	WGLS R22	SN:1006		

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注：

1．所使用的校准系统和计量标准可溯源到国家基准或标准。

测量和置信区间的不确定度都是证书的一部分，并将在以下内容中给出。

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).

The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

2. 除非拥有本实验室的书面许可，否则不得复制该校准证书。

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

3. 我中心仅对加盖“国家无线电监测中心检验中心”章的完整证书负责

SRTC is responsible for the whole of certificate only with stamp of SRTC.

4. 本证书的校准结果仅对所校准的计量器具有效

The calibration results would be valid only for the items calibration.

5. 本证书中英文两种语言表达，准确含义以中文为准。

The certification is written by Chinese and English. Exact meaning should be explained only on Chinese version.

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备注
Glossary

TSL	模拟组织液 tissue simulating liquid
NORMx, y, z	自由空间灵敏度 sensitivity in free space
ConvF	模拟组织液中的灵敏度/自由空间的灵敏度 sensitivity in TSL/NORM x, y, z
DCP	二极管压缩点 diode compression point
角度 φ	沿探头轴向旋转 φ φ rotation around probe axis
角度 θ	沿探头法平面中的一个轴旋转 θ，例如 θ=0，代表垂直于探头轴向 θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., θ=0 is normal to probe axis

本校准证书中使用的方法参考如下标准
Calibration is preformed according to the Following Standards

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in Human Head from Wireless Communication Devices: Measurement Techniques", December 2003

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz) ", February 2005

c) Federal Communication Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

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方法及参数介绍
Methods Applied and Interpretation of Parameters

- NORMx, y, z：NORMx, y, z 是中间变量，其不确定度不影响 TSL 中电场强度的不确定性。
  NORM x, y, z are only intermediate valve, i.e., the uncertainties of NORM x, y, z does not effect the E^2-field uncertainty inside TSL (see below ConvF)

- NORM(f)x, y, z= NORMx, y, z*频率响应。在 DASY4.2 以后的版本中，这项工作由软件完成，频率响应的不确定度包含在 ConvF 的不确定度中。
  NORM(f) x, y, z= NORM x, y, z*frequency response (see Frequency Response Chart). This linearization is implemented in DASY4 software version later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.

- DCPx,y,z: DCP 是与探头的线性度相关的参数，其测试是基于功率扫描的方法进行的，另外 DCP 既不依赖于频率也不依赖于介质。
  DCP x, y, z: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.

- ConvF 和边界效应：当频率大于 800MHz 时，利用平坦模型中的电场或是波导中的人工电场进行测试。我们也利用相同的配置来得到边界效应的相关参数（alpha, depth）。DASY 软件的这项功能可以用来补偿测试中发生的边界效应，使在边界附近测试的时候能够更加准确。而 ConvFx,y,z=NORMx, y, z*ConvF。DASY4.4 以后的版本允许的频率扩展范围为±50MHz 到±100MHz。
  ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Stand for f≤800MHz) and inside waveguide using analytical field distributions based on power measurement for f>800MHz .The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given .These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ±50MHz to ±100 MHz.

- 各向同向性：探头暴露在平板天线和一个平面模型产生的电场中，这个电场的梯度较低。
  Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.

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