RF EXPOSURE EVALUATION

SPECIFIC ABSORPTION RATE

SAR TEST REPORT

FOR

TRISQUARE COMMUNICATIONS INC.

900 MHz PORTABLE FHSS XRS PTT RADIO TRANSCEIVER

MODEL(S): TSX300, TSX200, TSX100

IDENTIFIER(S)	FCC ID: O9GTSX300	IC: 3823A-300
Test Standard(s) and Procedure(s)	FCC OET Bulletin 65, Supplement C (01-01)	
	Industry Canada RSS-102 Issue 2	

Test Report Serial No.

012207O9G-T813-S15U

Test Report Revision No.

Revision 1.0 (Initial Release)

Test Lab and Location

Celltech Compliance Testing & Engineering Lab
(Celltech Labs Inc.)
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ilac-MRA A2LA ACCREDITED

Certificate No. 2470.01

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DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab and Location

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Company Information

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United States

FCC IDENTIFIER:	**O9GTSX300**
IC IDENTIFIER:	**3823A-300**
Device Model(s):	**TSX300, TSX200, TSX100**
Test Requirement(s):	**FCC 47 CFR §2.1093; Health Canada Safety Code 6**
Test Procedure(s):	**FCC OET Bulletin 65, Supplement C (Edition 01-01)** **Industry Canada RSS-102 Issue 2**
Device Description:	**900 MHz Portable XRS PTT Radio Transceiver**
Mode of Operation:	**Frequency Hopping Spread Spectrum (FHSS)**
Transmit Frequency Range(s):	**906.275 - 923.750 MHz (ISM Band)**
Max. RF Output Power Tested:	**0.945 Watts (29.8 dBm) ERP (923.750 MHz)**
Antenna Type(s) Tested:	**External Fixed Stubby**
Battery Type(s) Tested:	**NiMH 4.8 V, 750 mAh Battery Pack (Model: TSX-BP)** **Alkaline 1.5 V, 2850 mAh (Duracell Procell) AA (x3)**
Body-Worn Accessories Tested:	**Plastic Belt-Clip with Metal Spring (P/N: TR000020-008)**
Audio Accessories Tested:	**Generic Ear-Microphone**
Max. SAR Level(s) Evaluated:	**Face-held: 1.10 W/kg (1g) - 50% duty cycle** **Body-worn: 0.800 W/kg (1g) - 50% duty cycle**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) and Industry Canada RSS-102 Issue 2 for the General Population / Uncontrolled Exposure environment. All measurements were performed in accordance with the SAR system manufacturer recommendations.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test Report Approved By:
Sean Johnston
SAR Lab Manager
Celltech Labs Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION

This measurement report demonstrates compliance of the TriSquare Communications Inc. Model(s): TSX300, TSX200, TSX100 900 MHz Portable FHSS XRS PTT Radio Transceiver FCC ID: O9GTSX300 with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) for the General Population / Uncontrolled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C (Edition 01-01) (see reference [3]) and IC RSS-102 Issue 2 (see reference [4]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the provisions of the rules are included within this test report.

2.0 DESCRIPTION OF DEVICE UNDER TEST (DUT)

Test Requirement(s)	FCC Rule Part 47 CFR §2.1093				
	Health Canada Safety Code 6				
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (01-01)				
	Industry Canada RSS-102 Issue 2				
Device Description	900 MHz Portable FHSS XRS PTT Radio Transceiver				
RF Exposure Category	General Population / Uncontrolled Environment				
FCC IDENTIFIER	O9GTSX300				
IC IDENTIFIER	3823A-300				
Device Model(s)	TSX300, TSX200, TSX100				
Test Sample Serial No.	None		Identical Prototype		
Mode of Operation	Frequency Hopping Spread Spectrum				
Transmit Frequency Range(s)	906.275 - 923.750 MHz		ISM Band		
Max. RF Output Power Tested	906.275 MHz	0.938 Watts	29.7 dBm	ERP	
	915.000 MHz	0.850 Watts	29.3 dBm	ERP	
	923.750 MHz	0.945 Watts	29.8 dBm	ERP	
Antenna Type(s) Tested	External Fixed Stubby				
Battery Type(s) Tested	NiMH	4.8 V	750 mAh	Model: TSX-BP	Battery Pack
	Alkaline	1.5 V	2850 mAh	Duracell Procell	AA (x3)
Body-worn Accessories Tested	Plastic Belt-Clip with Metal Spring		1.5 cm spacing	P/N: TR000020-008	
Audio Accessories Tested	Generic Ear-Microphone		P/N: None		

3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain and/or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the DASY4 measurement server. The DAE4 utilizes 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 DASY4 measurement server is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

DASY4 Measurement System with SAM Phantom and device holder

DASY4 Measurement System with SAM Phantom and validation dipole

4.0 MEASUREMENT SUMMARY

SAR EVALUATION RESULTS

Test Type	Freq.	Chan.	Test Mode	Battery Type	Accessories		DUT Position to Planar Phantom	Start Power (ERP)	Measured SAR 1g (W/kg)		SAR Drift During Test	Scaled SAR with droop 1g (W/kg)	
					Body-worn	Spacing			Duty Cycle			Duty Cycle	
	MHz				Audio	cm		Watts	100%	50%	dB	100%	50%
Face	915.000	Mid	Modulated Fixed Freq.	NiMH	--	2.5	Front Side	0.850	1.59	0.795	-1.42	2.20	**1.10**
Face	906.275	Low	Modulated Fixed Freq.	NiMH	--	2.5	Front Side	0.938	1.41	0.705	-1.23	1.87	0.936
Face	923.750	High	Modulated Fixed Freq.	NiMH	--	2.5	Front Side	0.945	1.47	0.735	-1.23	1.95	0.976
Face	915.000	Mid	Modulated Fixed Freq.	Alkaline	--	2.5	Front Side	0.850	0.958	0.479	-0.619	1.10	0.552
Body	915.000	Mid	Modulated Fixed Freq.	NiMH	Belt-Clip Ear-Mic	1.5	Back Side	0.850	1.18	0.590	-1.32	1.60	**0.800**
Body	906.275	Low	Modulated Fixed Freq.	NiMH	Belt-Clip Ear-Mic	1.5	Back Side	0.938	1.16	0.580	-1.18	1.52	0.761
Body	923.750	High	Modulated Fixed Freq.	NiMH	Belt-Clip Ear-Mic	1.5	Back Side	0.945	1.08	0.540	-1.11	1.39	0.697
Body	915.000	Mid	Modulated Fixed Freq.	Alkaline	Belt-Clip Ear-Mic	1.5	Back Side	0.850	0.782	0.391	-0.680	0.915	0.457

ANSI / IEEE C95.1 2005 - SAFETY LIMIT	BRAIN / BODY: 1.6 W/kg (averaged over 1 gram)	Spatial Peak Uncontrolled Exposure / General Population

Test Date(s)	January 24, 2007				January 24, 2007				Measured Fluid Type	Brain	Body	Unit
Dielectric Constant ε_r	900 MHz Brain				900 MHz Body				Atmospheric Pressure	102.2	102.2	kPa
	IEEE Target		Meas.	Dev.	IEEE Target		Meas.	Dev.	Relative Humidity	36	36	%
	41.5	± 5%	42.2	+1.7%	55.0	± 5%	54.1	-1.6%	Ambient Temperature	23.4	23.4	°C
Conductivity σ (mho/m)	900 MHz Brain				900 MHz Body				Fluid Temperature	22.5	22.5	°C
	IEEE Target		Meas.	Dev.	IEEE Target		Meas.	Dev.	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.94	-3.1%	1.05	± 5%	1.02	-2.9%	ρ (Kg/m^3)	1000		

Note(s)		
	1.	The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
	2.	If the scaled SAR levels evaluated at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
	3.	The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the batteries were replaced with fully charged batteries prior to the zoom scan evaluation.
	4.	The power droops measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the above test data table. A SAR-versus-Time power droop evaluation was also performed in the maximum SAR level configuration and the evaluation plot is shown in Appendix A (SAR Test Plots).
	5.	The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.
	6.	The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C).
	7.	The SAR evaluations were performed within 24 hours of the system performance check.

5.0 DETAILS OF SAR EVALUATION

The TriSquare Communications Inc. Model(s): TSX300, TSX200, TSX100 900 MHz Portable FHSS XRS PTT Radio Transceiver FCC ID: O9GTSX300 was compliant for localized Specific Absorption Rate (General Population / Uncontrolled Exposure environment) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix D.

1. The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the SAM phantom (planar section). A 2.5 cm spacing was maintained between the front of the DUT and the outer surface of the SAM phantom (planar section).
2. The DUT was tested in a body-worn configuration with the back of the radio placed parallel to the outer surface of the SAM phantom (planar section). The attached belt-clip accessory was touching the SAM phantom (planar section) and provided a 1.5 cm spacing from the back of the DUT to the outer surface of the SAM phantom (planar section). The DUT was evaluated for body-worn SAR with a generic ear-microphone audio accessory connected to the audio port.
3. The RF conducted output power of the DUT could not be measured due to a non-detachable antenna. The DUT was evaluated for SAR at the maximum conducted output power level preset by the manufacturer.
4. The DUT was evaluated for SAR at the maximum ERP levels measured by Timco Engineering prior to the SAR evaluations (radiated power measurements using the signal substitution method).
5. The power drift of the DUT during the SAR evaluations was measured by the DASY4 system.
6. The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
7. The DUT was tested in continuous transmit operation at maximum power with a modulated signal on a fixed frequency (frequency hopping disabled) at 100% duty cycle with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
8. The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.
9. The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C).

6.0 EVALUATION PROCEDURES

a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.
(ii) For body-worn and face-held devices a planar phantom was used.

b. The SAR was determined by a pre-defined procedure within the DASY4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.

An area scan was determined as follows:

c. Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.

d. A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.

A 1g and 10g spatial peak SAR was determined as follows:

e. Extrapolation is used to find the points between the dipole center of the probe and the surface of the phantom. This data cannot be measured, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.4 mm (see probe calibration document in Appendix F). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.

f. Interpolated data is used to calculate the average SAR over 1g and 10g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).

g. A zoom scan volume of 32 mm x 32 mm x 30 mm (5 x 5 x 7 points) centered at the peak SAR location determined from the area scan is used for all zoom scans for devices with a transmit frequency < 800 MHz. Zoom scans for frequencies ≥ 800 MHz are determined with a scan volume of 30 mm x 30 mm x 30 mm (7 x 7 x 7) to ensure complete capture of the peak spatial-average SAR.

7.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations a system check was performed at the planar section of the SAM phantom with a 900MHz dipole (see Appendix E for system validation procedures). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using an ALS-PR-DIEL Dielectric Probe Kit and HP 8753ET Network Analyzer (see Appendix C). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of ±10% (see Appendix B for system performance check test plot).

SYSTEM PERFORMANCE CHECK EVALUATION

Test Date	Equiv. Tissue	SAR 1g (W/kg)			Dielectric Constant ε_r			Conductivity σ (mho/m)			ρ (Kg/m^3)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
	Freq. MHz	IEEE Target	Meas.	Dev.	IEEE Target	Meas.	Dev.	IEEE Target	Meas.	Dev.						
Jan 24	Brain 900	2.70 ±10%	2.58	-4.4%	41.5 ±5%	42.2	+1.7%	0.97 ±5%	0.94	-3.1%	1000	23.4	22.5	≥ 15	36	102.2
Note(s)	1. The fluid temperature was measured prior to and after the SAR evaluation to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.															
	2. The SAR evaluations were performed within 24 hours of the system performance check.															

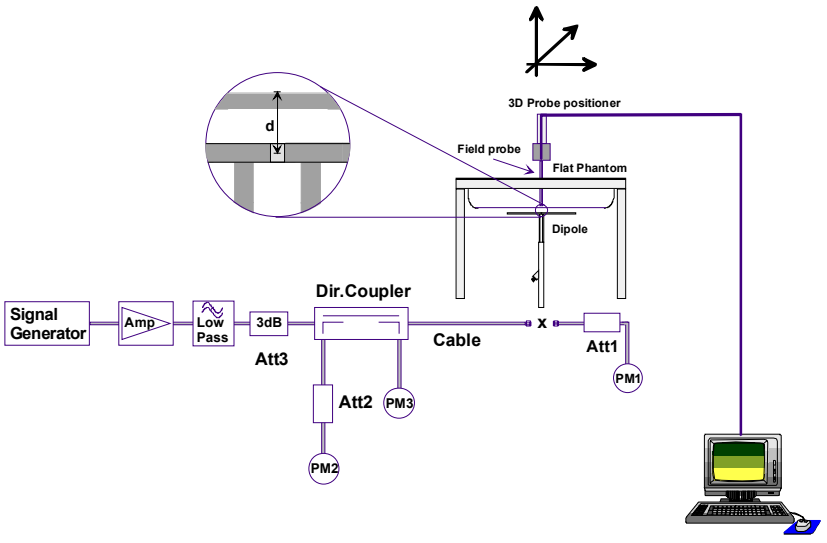


Figure 1. System Performance Check Setup Diagram

900 MHz Dipole Setup

8.0 SIMULATED EQUIVALENT TISSUES

The 900MHz simulated tissue mixtures consisted of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide was added and visual inspection was made to ensure air bubbles were not trapped during the mixing process. The fluids were prepared according to standardized procedures and measured for dielectric parameters (permittivity and conductivity).

900 MHz TISSUE MIXTURES		
INGREDIENT	**900 MHz Brain**	**900 MHz Body**
Water	40.71 %	53.79 %
Sugar	56.63 %	45.13 %
Salt	1.48 %	0.98 %
Bactericide	0.19 %	0.10 %
HEC	0.99 %	-

9.0 SAR SAFETY LIMITS

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0
The Spatial Average value of the SAR averaged over the whole body.		
The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.		
The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.		
Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.		
Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.		

10.0 ROBOT SYSTEM SPECIFICATIONS

Specifications	
Positioner	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability	0.02 mm
No. of axis	6
Data Acquisition Electronic (DAE) System	
Cell Controller	
Processor	AMD Athlon XP 2400+
Clock Speed	2.0 GHz
Operating System	Windows XP Professional
Data Converter	
Features	Signal Amplifier, multiplexer, A/D converter, and control logic
Software	Measurement Software: DASY4, V4.7 Build 44
	Postprocessing Software: SEMCAD, V1.8 Build 171
Connecting Lines	Optical downlink for data and status info.; Optical uplink for commands and clock
DASY4 Measurement Server	
Function	Real-time data evaluation for field measurements and surface detection
Hardware	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
Connections	COM1, COM2, DAE, Robot, Ethernet, Service Interface
E-Field Probe	
Model	ET3DV6
Serial No.	1387
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
Phantom(s)	
Type	SAM V4.0C
Shell Material	Fiberglass
Bottom Thickness	2.0 ±0.1 mm
Outer Dimensions	Approx. 25 liters

11.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, glycol)
Calibration:	In air from 10 MHz to 2.5 GHz In brain simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy ± 8%)
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity:	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal to probe axis)
Dynamic Range:	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Surface Detect:	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions:	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application:	General dosimetry up to 3 GHz Compliance tests of mobile phone

ET3DV6 E-Field Probe

12.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm (+/-0.2 mm) shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections (see Appendix G for specifications of the SAM phantom V4.0C).

SAM Phantom V4.0C

13.0 DEVICE HOLDER

The DASY4 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

Device Holder

14.0 TEST EQUIPMENT LIST

TEST EQUIPMENT			ASSET NO.	SERIAL NO.	DATE CALIBRATED		CALIBRATION DUE DATE
USED	DESCRIPTION						
x	Schmid & Partner DASY4 System		-	-	-		-
x	-DASY4 Measurement Server		00158	1078	N/A		N/A
x	-Robot		00046	599396-01	N/A		N/A
x	-DAE4		00019	353	21Jun06		21Jun07
	-DAE3		00018	370	08Feb06		08Feb07
x	-ET3DV6 E-Field Probe		00016	1387	16Mar06		16Mar07
	-EX3DV4 E-Field Probe		00125	3547	14Feb06		14Feb07
	-300MHz Validation Dipole		00023	135	23Oct06		23Oct07
	-450MHz Validation Dipole		00024	136	07Dec06		07Dec07
	-835MHz Validation Dipole		00022	411	**Brain**	28Mar06	28Mar07
					Body	27Mar06	27Mar07
x	-900MHz Validation Dipole		00020	054	**Brain**	06Jun06	06Jun07
					Body	06Jun06	06Jun07
	-1640MHz Validation Dipole		00211	0180	**Brain**	07Aug06	07Aug07
	-1800MHz Validation Dipole		00021	247	**Brain**	08Jun06	08Jun07
					Body	09Jun06	09Jun07
	-1900MHz Validation Dipole		00032	151	**Brain**	09Jun06	09Jun07
					Body	12Jun06	12Jun07
	-2450MHz Validation Dipole		00025	150	**Body**	24Apr06	24Apr07
	5GHz Validation Dipole	-5200MHz	00126	1031	**Body**	18Jul06	18Jul07
		-5500MHz			**Body**	14Nov06	14Nov07
		-5800MHz			**Brain**	15Mar06	15Mar07
					Body	18Jul06	18Jul07
x	-SAM Phantom V4.0C		00154	1033	N/A		N/A
	-Barski Planar Phantom		00155	03-01	N/A		N/A
	-Plexiglas Side Planar Phantom		00156	161	N/A		N/A
	-Plexiglas Validation Planar Phantom		00157	137	N/A		N/A
x	ALS-PR-DIEL Dielectric Probe Kit		00160	260-00953	N/A		N/A
x	Gigatronics 8652A Power Meter		00110	1835801	12Apr06		12Apr07
	Gigatronics 8652A Power Meter		00007	1835272	03Feb06		03Feb07
x	Gigatronics 80701A Power Sensor		00011	1833542	03Feb06		03Feb07
x	Gigatronics 80701A Power Sensor		00013	1833713	03Feb06		03Feb07
x	HP 8753ET Network Analyzer		00134	US39170292	18Apr06		18Apr07
x	HP 8648D Signal Generator		00005	3847A00611	N/A		N/A
	Rohde & Schwarz SMR40 Signal Generator		00006	100104	06Apr06		06Apr07
x	Amplifier Research 5S1G4 Power Amplifier		00106	26235	N/A		N/A

15.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**ci 1g**	**Uncertainty Value ±% (1g)**	**V_i or V_{eff}**
Measurement System						
Probe calibration (900 MHz)	5.5	Normal	1	1	5.5	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	0.7	1.9	∞
Spherical isotropy of the probe	9.6	Rectangular	1.732050808	0.7	3.9	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	1	Rectangular	1.732050808	1	0.6	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0.8	Rectangular	1.732050808	1	0.5	∞
Integration time	2.6	Rectangular	1.732050808	1	1.5	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Test Sample Related						
Device positioning	2.9	Normal	1	1	2.9	12
Device holder uncertainty	3.6	Normal	1	1	3.6	8
Power drift	5	Rectangular	1.732050808	1	2.9	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	5	Normal	1	0.64	3.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	5	Normal	1	0.6	3.0	∞
Combined Standard Uncertainty					**11.24**	
Expanded Uncertainty (k=2)					**22.48**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

MEASUREMENT UNCERTAINTIES (Cont.)

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**ci 1g**	**Uncertainty Value ±% (1g)**	**V_i or V_{eff}**
Measurement System						
Probe calibration (900 MHz)	5.5	Normal	1	1	5.5	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	1	2.7	∞
Spherical isotropy of the probe	0	Rectangular	1.732050808	1	0.0	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	1	Rectangular	1.732050808	1	0.6	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	5	Normal	1	0.64	3.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	5	Normal	1	0.6	3.0	∞
Combined Standard Uncertainty					**9.57**	
Expanded Uncertainty (k=2)					**19.14**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

16.0 REFERENCES

[1] Federal Communications Commission - “Radiofrequency radiation exposure evaluation: portable devices”, Rule Part 47 CFR §2.1093: 1999.

[2] Health Canada - “Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz”, Safety Code 6: 1999.

[3] Federal Communications Commission - “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.

[4] Industry Canada - “Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)”, Radio Standards Specification RSS-102 Issue 2: November 2005.

[5] IEEE Standard 1528-2003 - “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”: December 2003.

[6] ANSI/IEEE C95.1-2005 - “American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz”, New York: IEEE, April 2006.

APPENDIX A - SAR MEASUREMENT DATA

Date Tested: 01/24/2007

Face-Held SAR - NiMH Battery Pack - 915.000 MHz - Mid Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

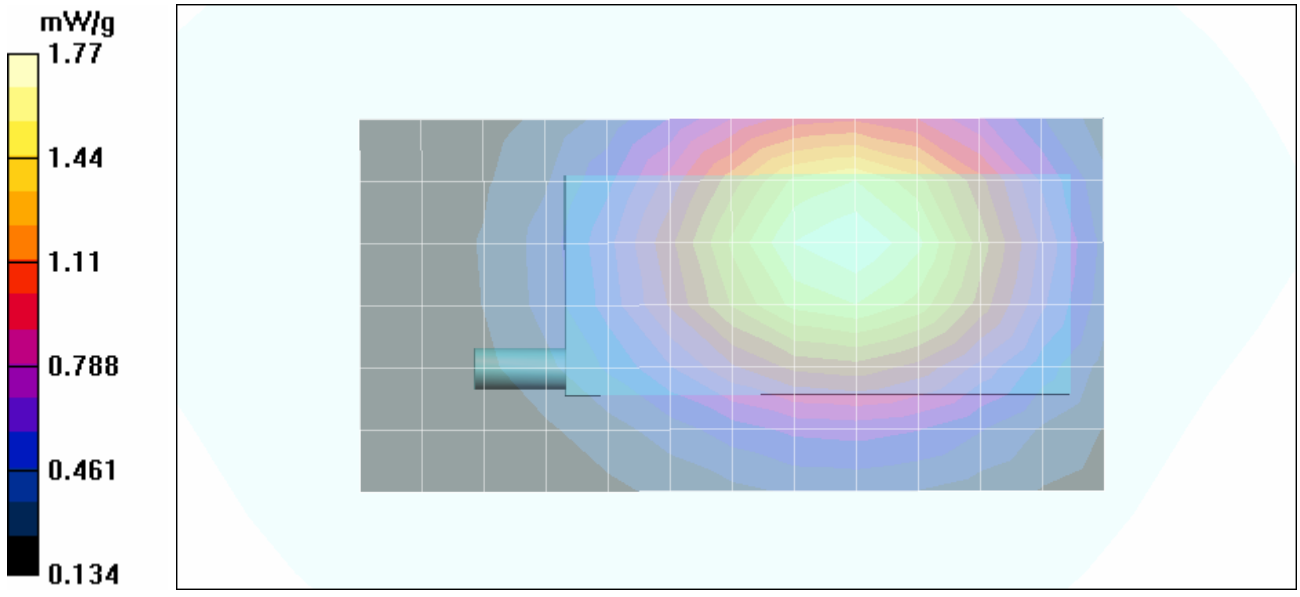
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.850 Watts (ERP)
Frequency: 915.000 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: HSL900 Medium parameters used: f = 915 MHz; σ = 0.94 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

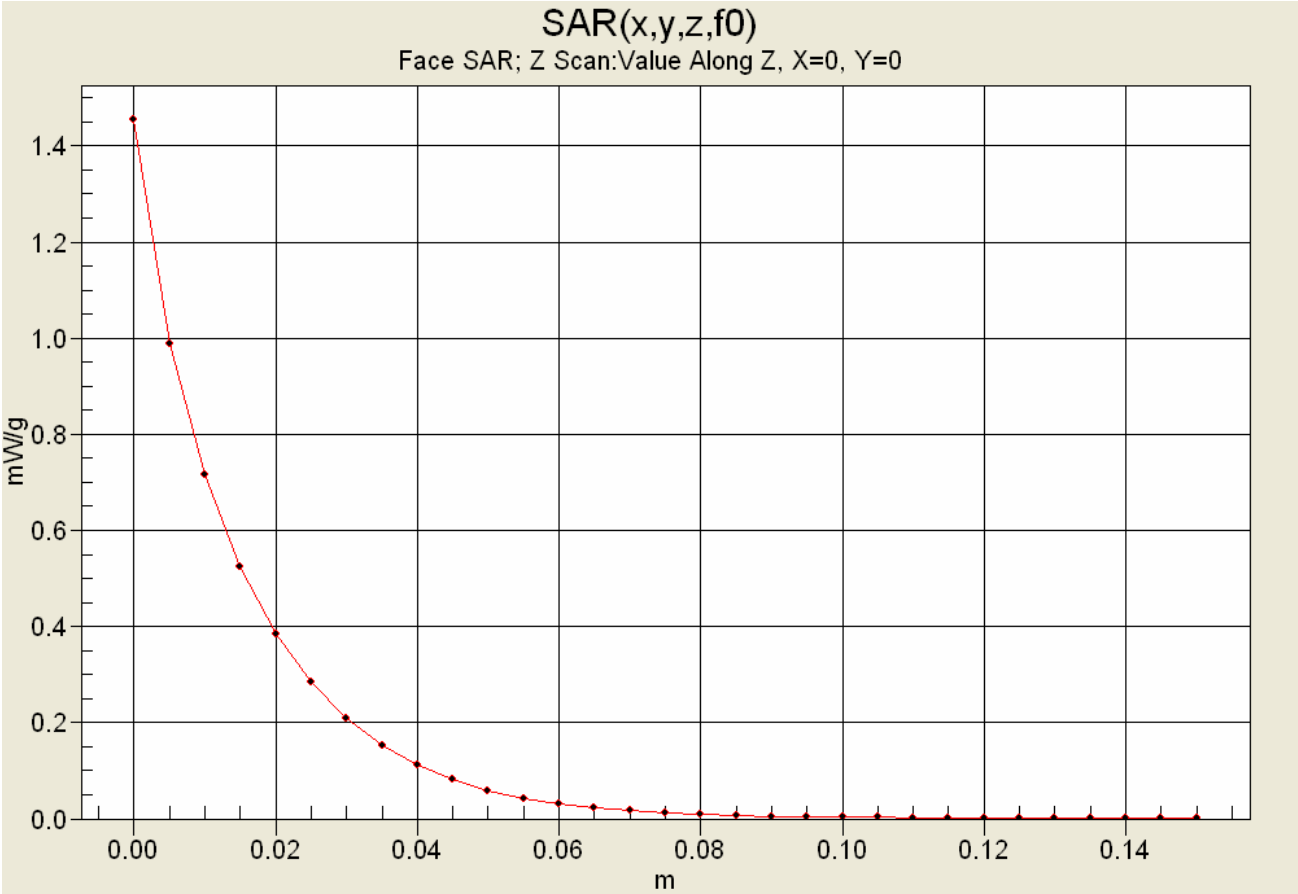
- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.2 V/m; Power Drift = -1.42 dB
Peak SAR (extrapolated) = 2.20 W/kg
SAR(1 g) = 1.59 mW/g; SAR(10 g) = 1.07 mW/g
Maximum value of SAR (measured) = 1.77 mW/g

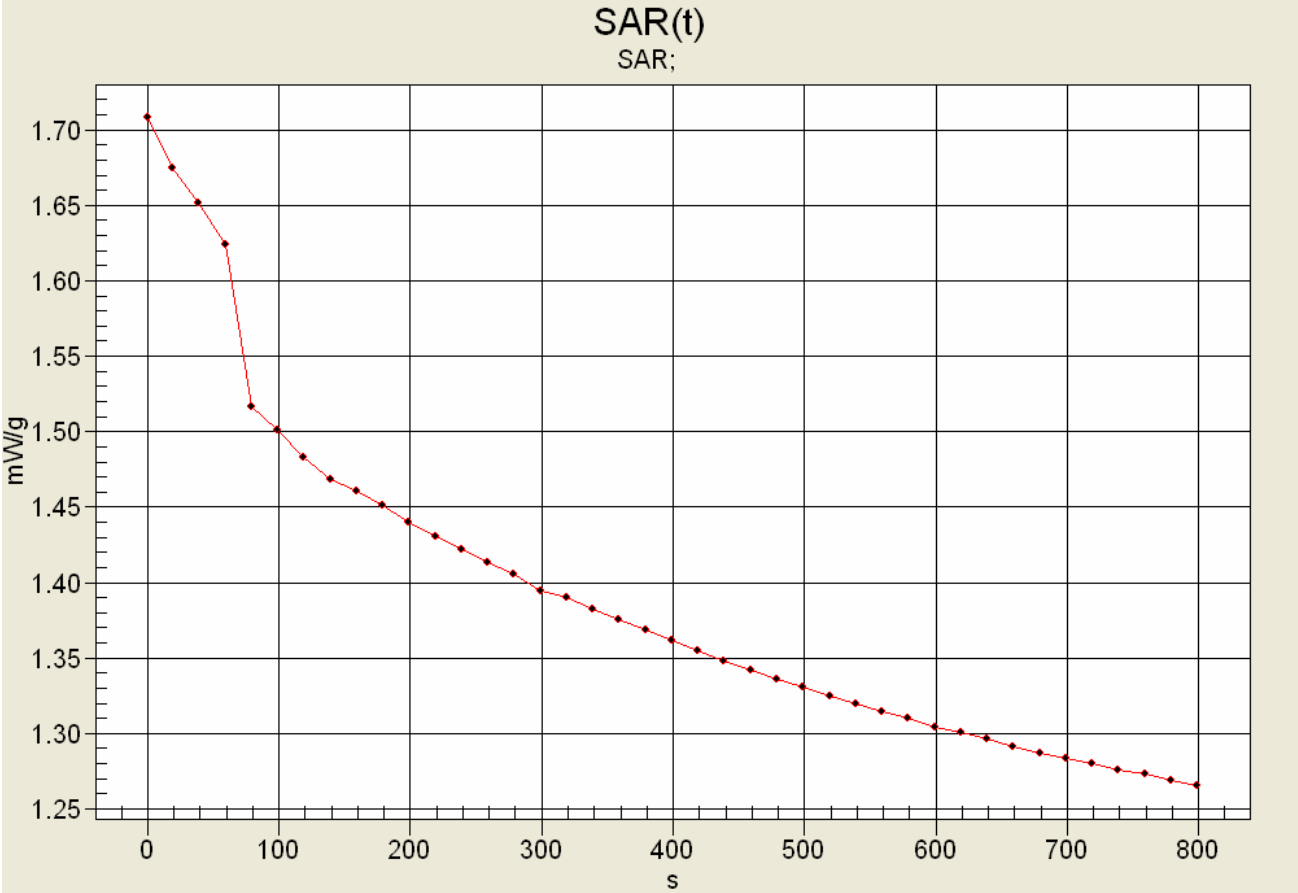


Z-Axis Scan



SAR-versus-Time Power Droop Evaluation

Face-Held Configuration
NiMH Battery Pack
Mid Channel 915.000 MHz



Max. SAR: 1.708 mW/g
Min. SAR: 1.266 mW/g (-1.30 dB)
SAR after 340s: 1.383 mW/g (-0.941 dB)
(340s = Zoom Scan Duration)
(800s = Area Scan Duration)

Date Tested: 01/24/2007

Face-Held SAR - NiMH Battery Pack - 906.275 MHz - Low Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

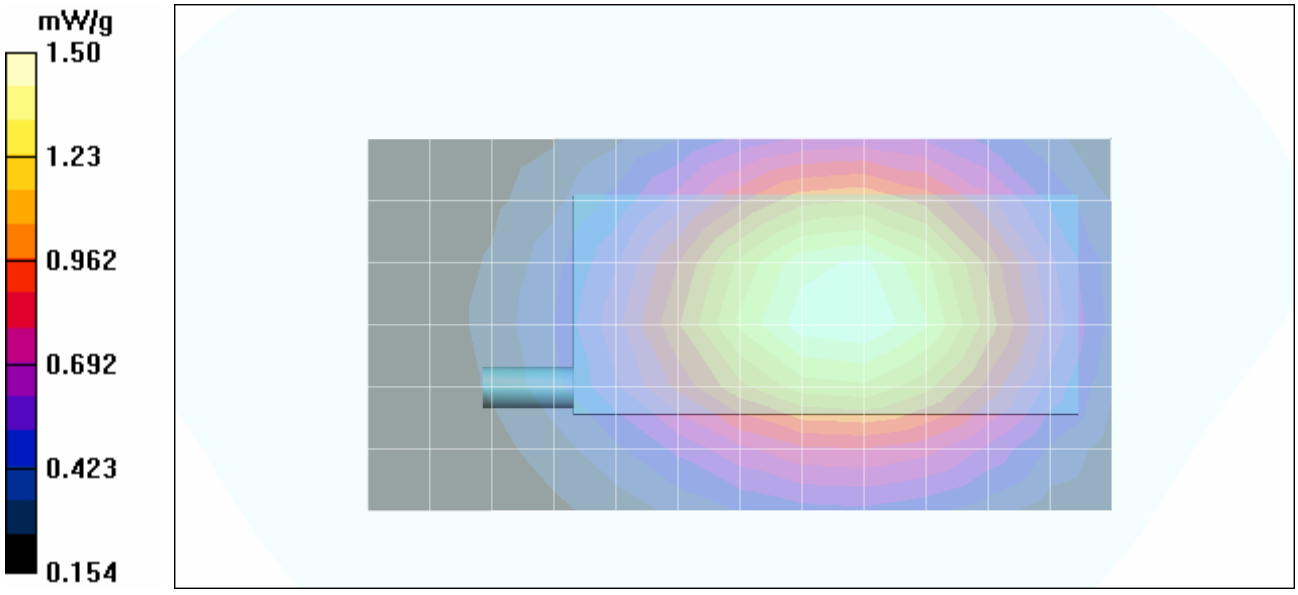
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.938 Watts (ERP)
Frequency: 906.275 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: HSL900 Medium parameters used: f = 906.275 MHz; σ = 0.94 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Low Channel - 906.275 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Low Channel - 906.275 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.0 V/m; Power Drift = -1.23 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 1.41 mW/g; SAR(10 g) = 1.01 mW/g
Maximum value of SAR (measured) = 1.50 mW/g



Date Tested: 01/24/2007

Face-Held SAR - NiMH Battery Pack - 923.750 MHz - High Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

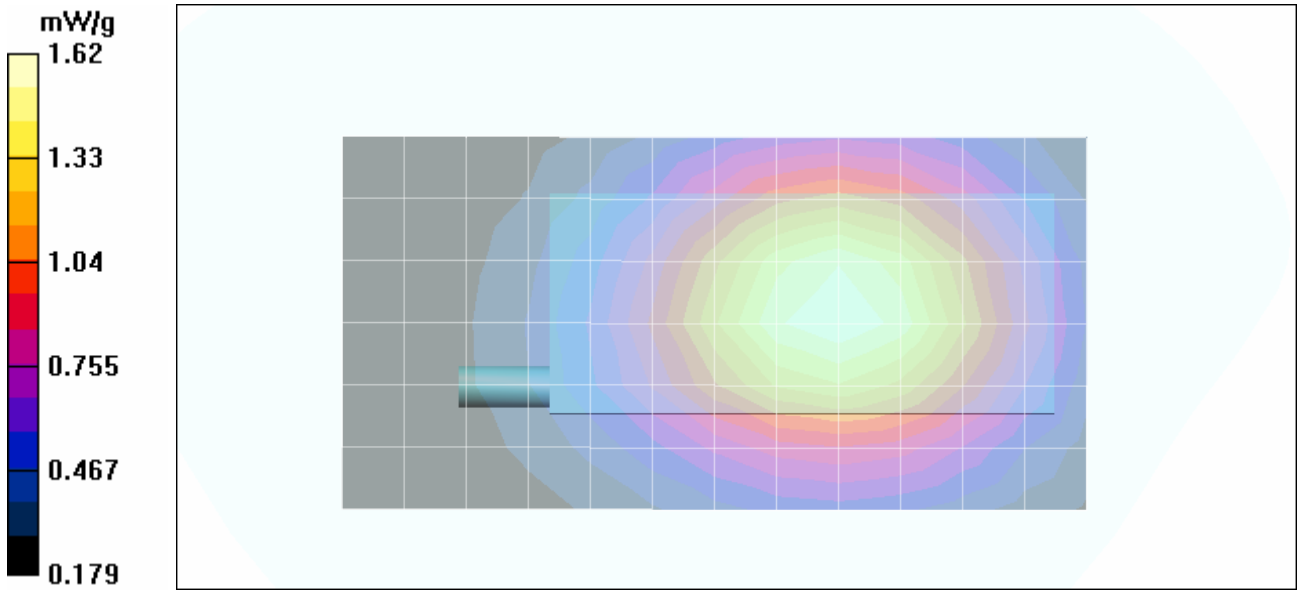
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.945 Watts (ERP)
Frequency: 923.750 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: HSL900 Medium parameters used: f = 923.750 MHz; σ = 0.94 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - High Channel - 923.750 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - High Channel - 923.750 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.1 V/m; Power Drift = -1.23 dB
Peak SAR (extrapolated) = 2.06 W/kg
SAR(1 g) = 1.47 mW/g; SAR(10 g) = 1.06 mW/g
Maximum value of SAR (measured) = 1.62 mW/g



Date Tested: 01/24/2007

Face-Held SAR - Alkaline Batteries - 915.000 MHz - Mid Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

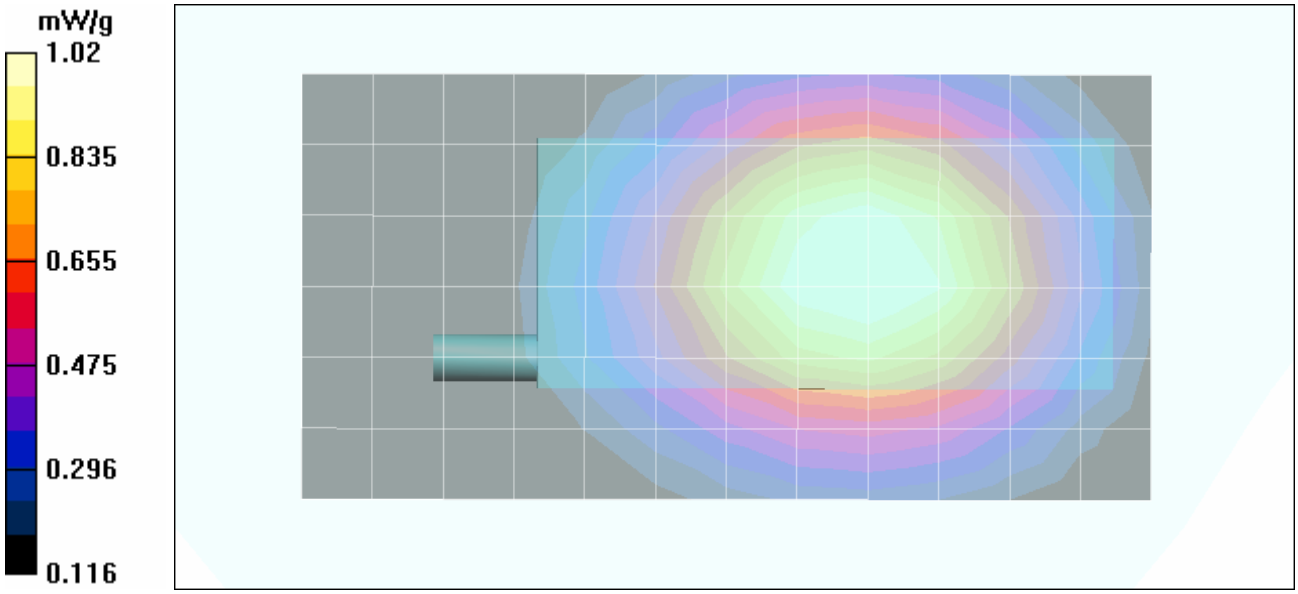
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

AA Alkaline Batteries x3 (4.5 V)
RF Output Power: 0.850 Watts (ERP)
Frequency: 915.000 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: HSL900 Medium parameters used: f = 915.000 MHz; σ = 0.94 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.2 V/m; Power Drift = -0.619 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.684 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



Date Tested: 01/24/2007

Body-Worn SAR - NiMH Battery Pack - 915.000 MHz - Mid Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

Body-Worn Accessory: Plastic Belt-Clip (with metal spring); Audio Accessory: Generic Ear-Microphone

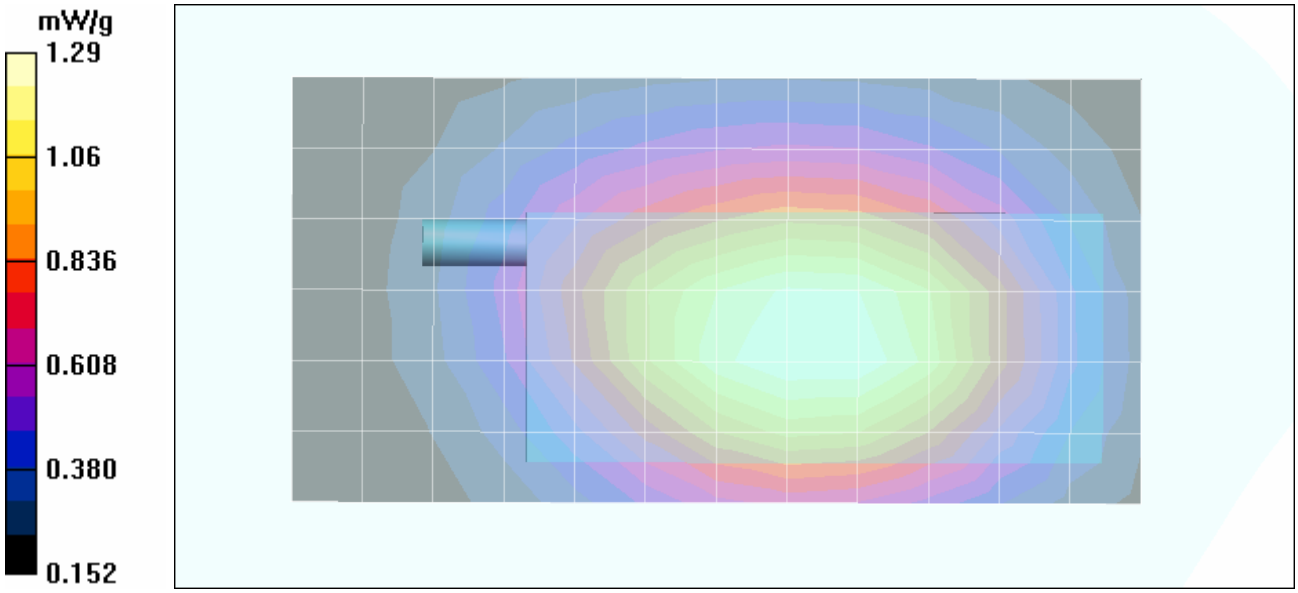
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.850 Watts (ERP)
Frequency: 915.000 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: M900 Medium parameters used: f = 915.000 MHz; σ = 1.02 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3

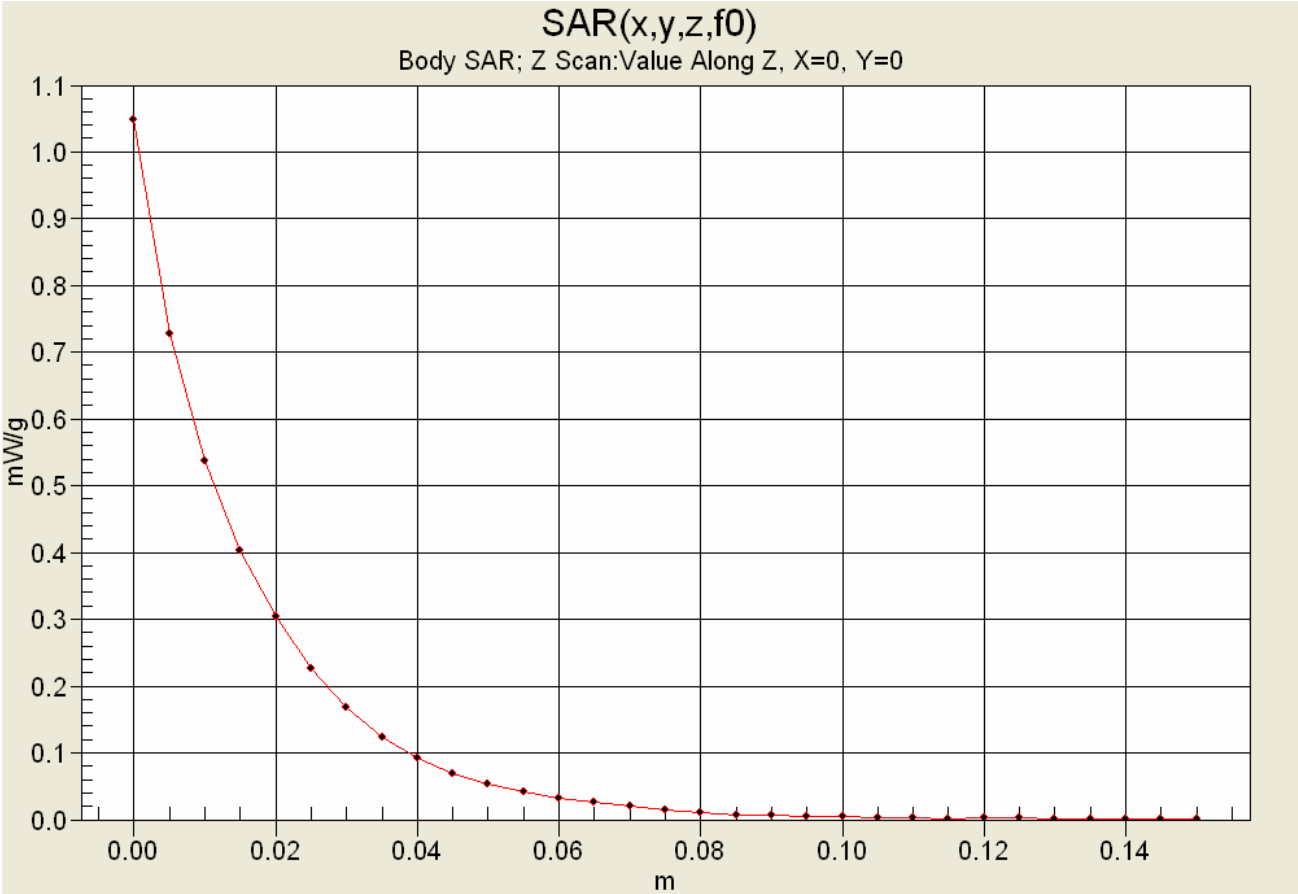
- Probe: ET3DV6 - SN1387; ConvF(6.04, 6.04, 6.04); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 36.2 V/m; Power Drift = -1.32 dB
Peak SAR (extrapolated) = 1.60 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.863 mW/g
Maximum value of SAR (measured) = 1.29 mW/g



Z-Axis Scan



Date Tested: 01/24/2007

Body-Worn SAR - NiMH Battery Pack - 906.275 MHz - Low Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

Body-Worn Accessory: Plastic Belt-Clip (with metal spring); Audio Accessory: Generic Ear-Microphone

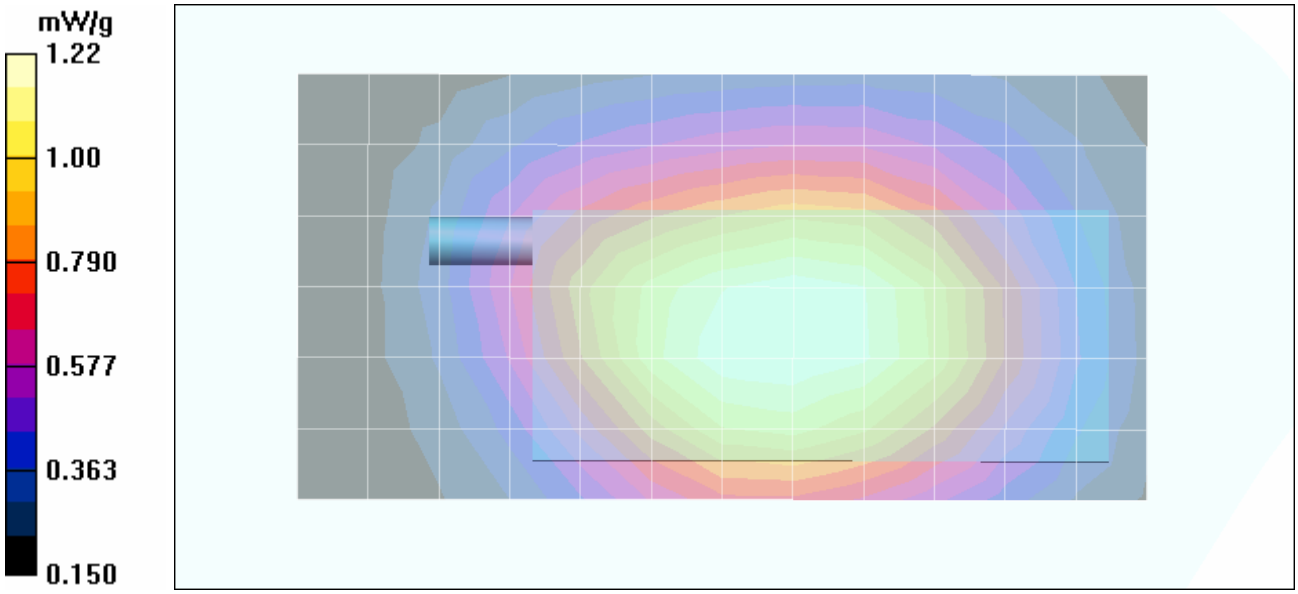
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.938 Watts (ERP)
Frequency: 906.275 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: M900 Medium parameters used f = 906.275 MHz; σ = 1.02 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.04, 6.04, 6.04); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Low Channel - 906.275 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Low Channel - 906.275 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.3 V/m; Power Drift = -1.18 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.852 mW/g
Maximum value of SAR (measured) = 1.22 mW/g



Date Tested: 01/24/2007

Body-Worn SAR - NiMH Battery Pack - 923.750 MHz - High Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

Body-Worn Accessory: Plastic Belt-Clip (with metal spring); Audio Accessory: Generic Ear-Microphone

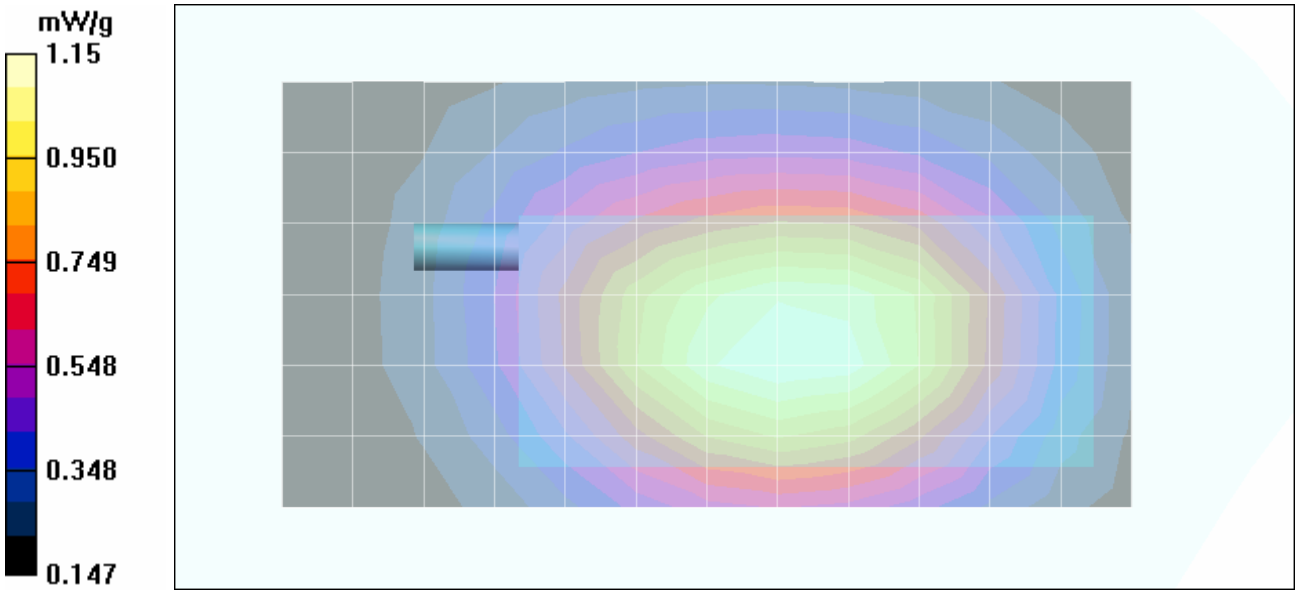
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

4.8V, 750mAh NiMH Battery Pack
RF Output Power: 0.945 Watts (ERP)
Frequency: 923.750 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: M900 Medium parameters used: f = 923.750 MHz; σ = 1.02 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.04, 6.04, 6.04); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - High Channel - 923.750 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - High Channel - 923.750 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.7 V/m; Power Drift = -1.11 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.789 mW/g
Maximum value of SAR (measured) = 1.15 mW/g



Date Tested: 01/24/2007

Body-Worn SAR - Alkaline Batteries - 915.000 MHz - Mid Channel

DUT: TriSquare; Model: TSX300; Type: 900 MHz Portable FHSS XRS PTT Radio Transceiver; Serial: None

Body-Worn Accessory: Plastic Belt-Clip (with metal spring); Audio Accessory: Generic Ear-Microphone

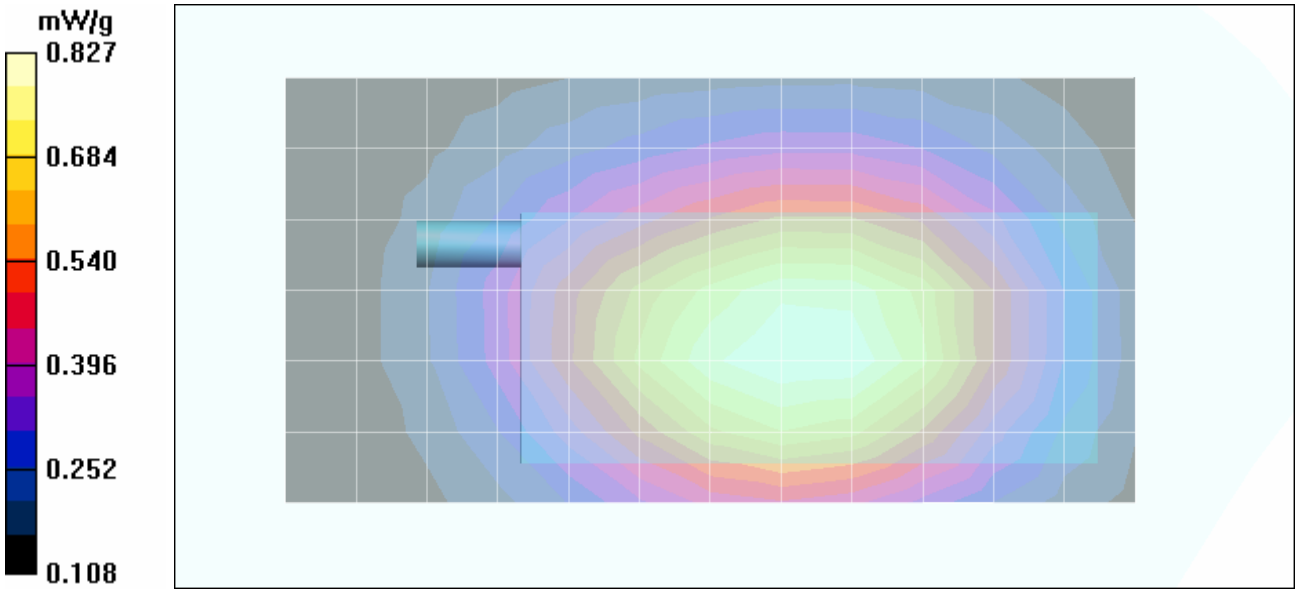
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2 kPa; Humidity: 36%

AA Alkaline Batteries x3 (4.5 V)
RF Output Power: 0.850 Watts (ERP)
Frequency: 915.000 MHz; Duty Cycle: 1:1
Communication System: Modulated Fixed Frequency
Medium: M900 Medium parameters used: f = 915.000 MHz; σ = 1.02 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(6.04, 6.04, 6.04); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Body-Worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 915.000 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.6 V/m; Power Drift = -0.680 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.782 mW/g; SAR(10 g) = 0.575 mW/g
Maximum value of SAR (measured) = 0.827 mW/g



APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

Date Tested: 01/24/2007

System Performance Check - 900 MHz Dipole

DUT: Dipole 900 MHz; Asset: 00020; Serial: 054; Validation: 06/06/2006

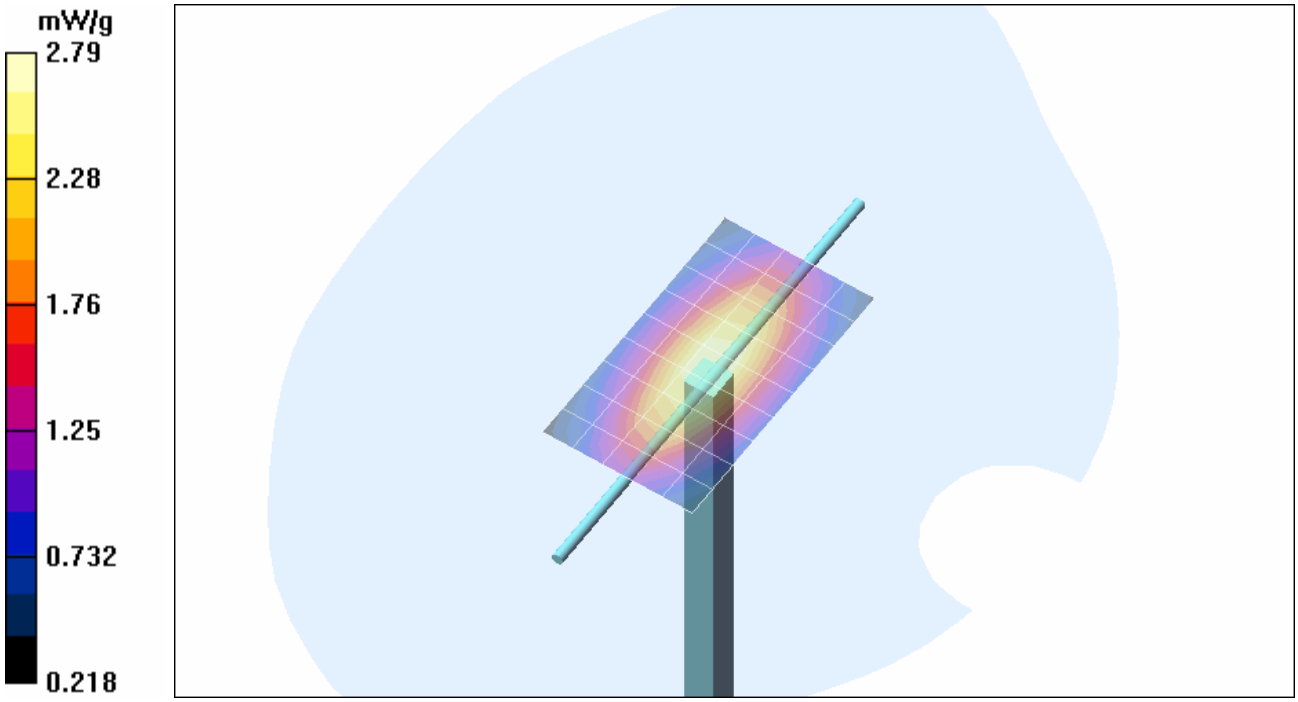
Ambient Temp: 23.4°C; Fluid Temp: 22.5°C; Barometric Pressure: 102.2kPa; Humidity: 36%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 900 MHz; Duty Cycle: 1:1
Medium: HSL900 Medium parameters used: f = 900 MHz; σ = 0.94 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

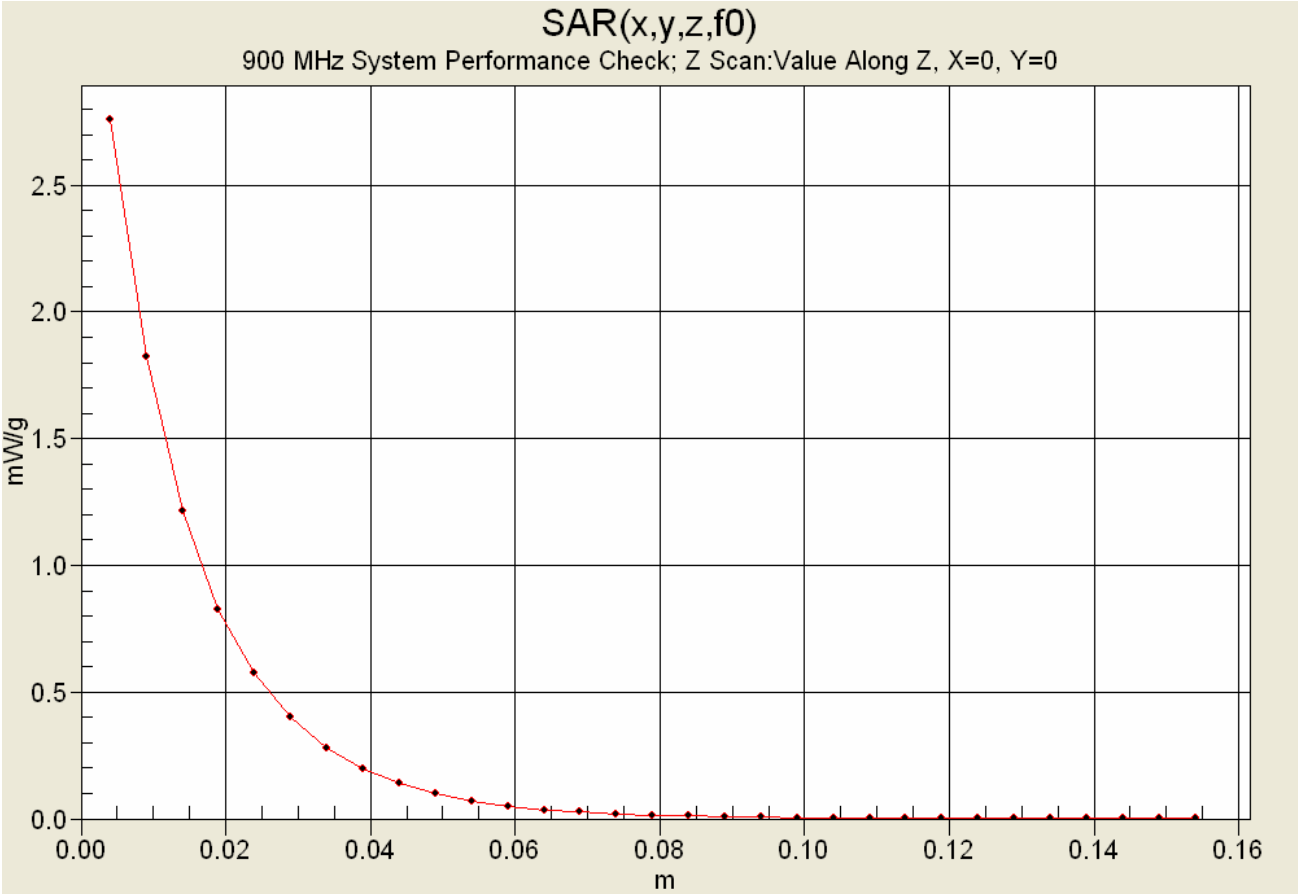
- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

900 MHz Dipole - System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.63 mW/g

900 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.7 V/m; Power Drift = 0.083 dB
Peak SAR (extrapolated) = 3.86 W/kg
SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 2.79 mW/g



Z-Axis Scan



APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

900 MHz System Performance Check & DUT Evaluation (Brain)

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Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Wed 24/Jan/2007
Frequency (GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.8000	41.68	0.90	43.33	0.85
0.8100	41.63	0.90	43.30	0.86
0.8200	41.58	0.90	42.99	0.86
0.8300	41.53	0.90	42.91	0.87
0.8400	41.50	0.91	42.95	0.88
0.8500	41.50	0.92	42.68	0.90
0.8600	41.50	0.93	42.54	0.90
0.8700	41.50	0.94	42.49	0.91
0.8800	41.50	0.95	42.43	0.93
0.8900	41.50	0.96	42.20	0.93
0.9000	41.50	0.97	42.20	0.94
0.9100	41.50	0.98	42.18	0.95
0.9200	41.49	0.98	41.97	0.96
0.9300	41.47	0.99	41.90	0.96
0.9400	41.45	0.99	41.77	0.98
0.9500	41.43	0.99	41.64	0.98
0.9600	41.42	1.00	41.61	0.99
0.9700	41.40	1.00	41.48	1.00
0.9800	41.38	1.01	41.62	1.01
0.9900	41.36	1.01	41.32	1.03
1.0000	41.34	1.01	41.22	1.03

900 MHz DUT Evaluation (Body)

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Wed 24/Jan/2007
Frequency (GHz)
FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

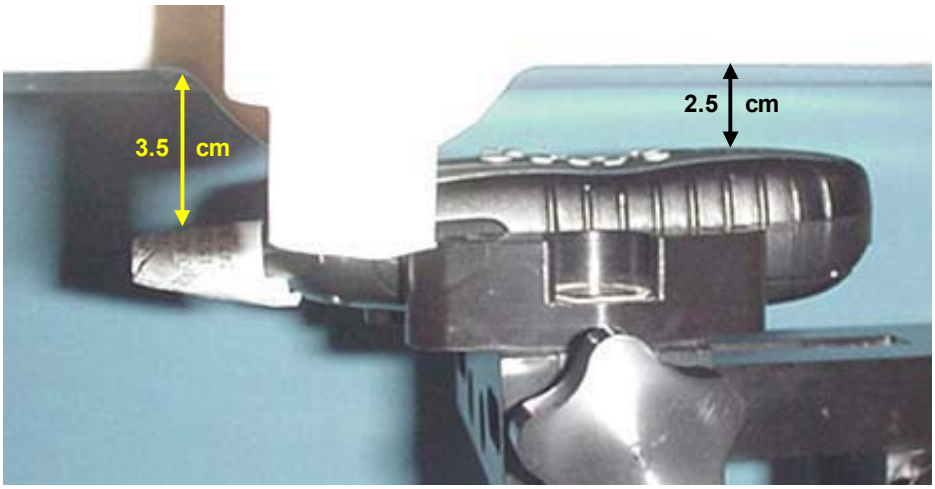
****

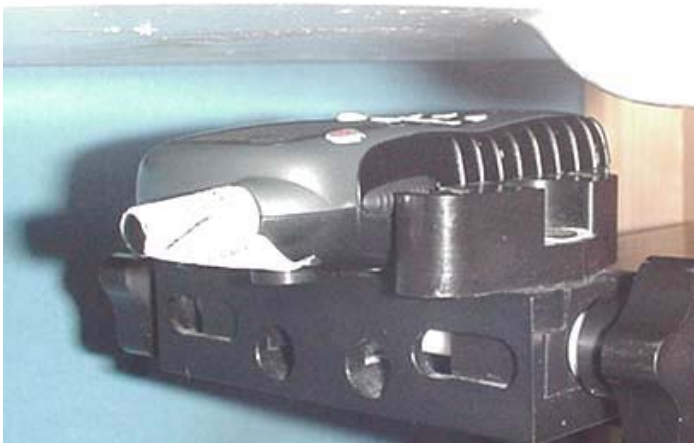
Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.8000	55.34	0.97	54.96	0.91
0.8100	55.30	0.97	55.12	0.93
0.8200	55.26	0.97	54.79	0.94
0.8300	55.22	0.97	54.71	0.95
0.8400	55.18	0.98	54.63	0.96
0.8500	55.15	0.99	54.49	0.97
0.8600	55.12	1.00	54.32	0.98
0.8700	55.09	1.01	54.34	0.99
0.8800	55.06	1.03	54.31	1.00
0.8900	55.03	1.04	54.18	1.01
0.9000	55.00	1.05	54.07	1.02
0.9100	55.00	1.06	54.01	1.02
0.9200	54.99	1.06	53.82	1.04
0.9300	54.97	1.07	53.84	1.04
0.9400	54.95	1.07	53.79	1.06
0.9500	54.93	1.08	53.50	1.06
0.9600	54.92	1.08	53.59	1.07
0.9700	54.90	1.08	53.46	1.08
0.9800	54.88	1.09	53.42	1.09
0.9900	54.86	1.09	53.37	1.09
1.0000	54.84	1.10	53.12	1.12

APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

FACE-HELD SAR TEST SETUP PHOTOGRAPHS

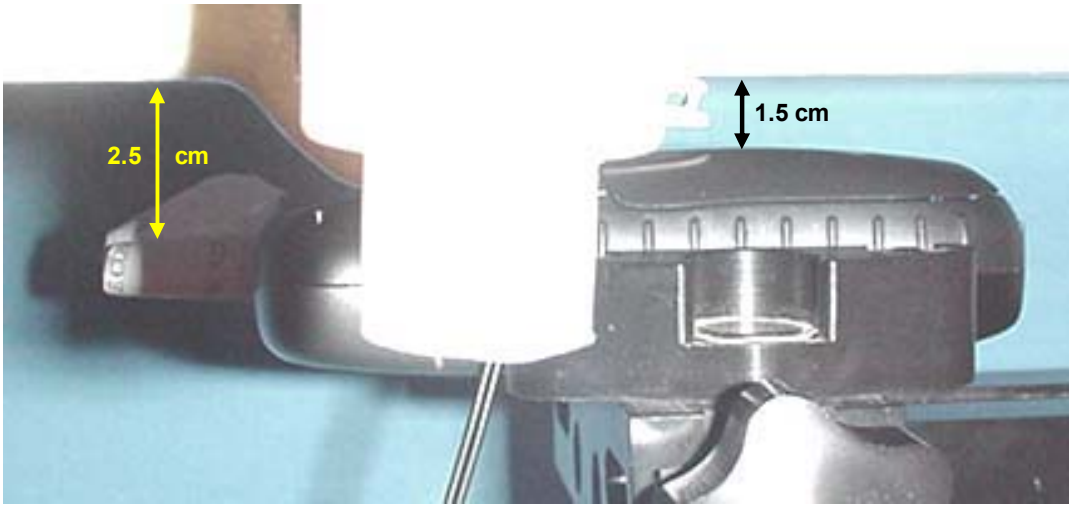
2.5 cm Spacing from Front of DUT to Planar Phantom

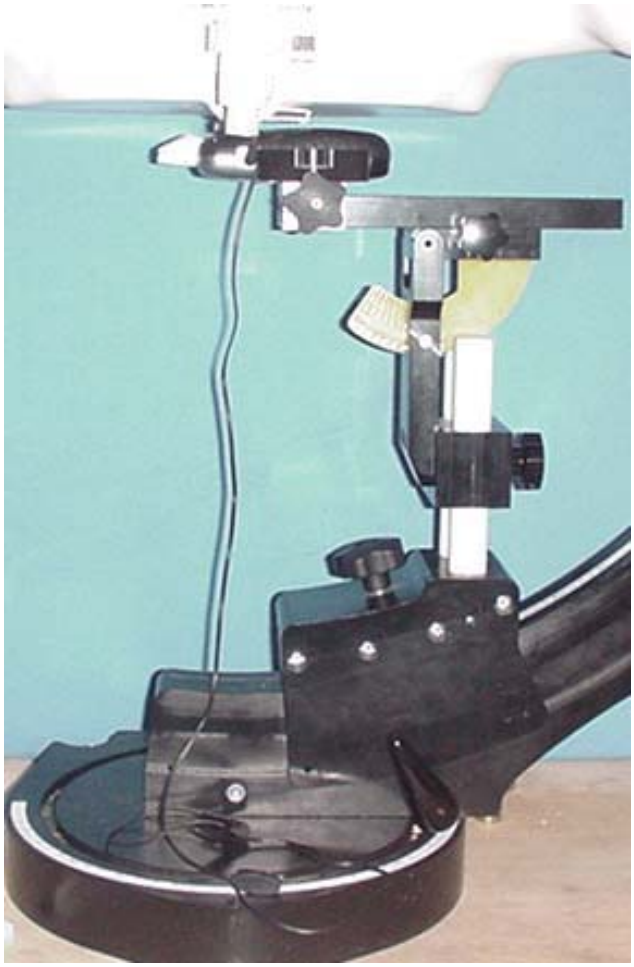




BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
With Generic Ear-Microphone Audio Accessory





DUT PHOTOGRAPHS

Front of DUT

Back of DUT

Back of DUT with Belt-Clip

Top end of DUT

Bottom end of DUT

DUT PHOTOGRAPHS

Left Side of DUT with Belt-Clip (P/N: TR000020-008)

Right Side of DUT with Belt-Clip (P/N: TR000020-008)

DUT PHOTOGRAPHS

DUT with Generic Ear-Microphone Audio Accessory

DUT Battery Compartment

DUT with NiMH Battery Pack

DUT with Alkaline Batteries

APPENDIX E - SYSTEM VALIDATION

900 MHz SYSTEM VALIDATION

Type:	**900 MHz Validation Dipole**
Asset Number:	**00020**
Serial Number:	**054**
Place of Validation:	**Celltech Labs Inc.**
Date of Validation:	**June 06, 2006**

Celltech Labs Inc. hereby certifies that the 900 MHz System Validation was performed on the date indicated above.

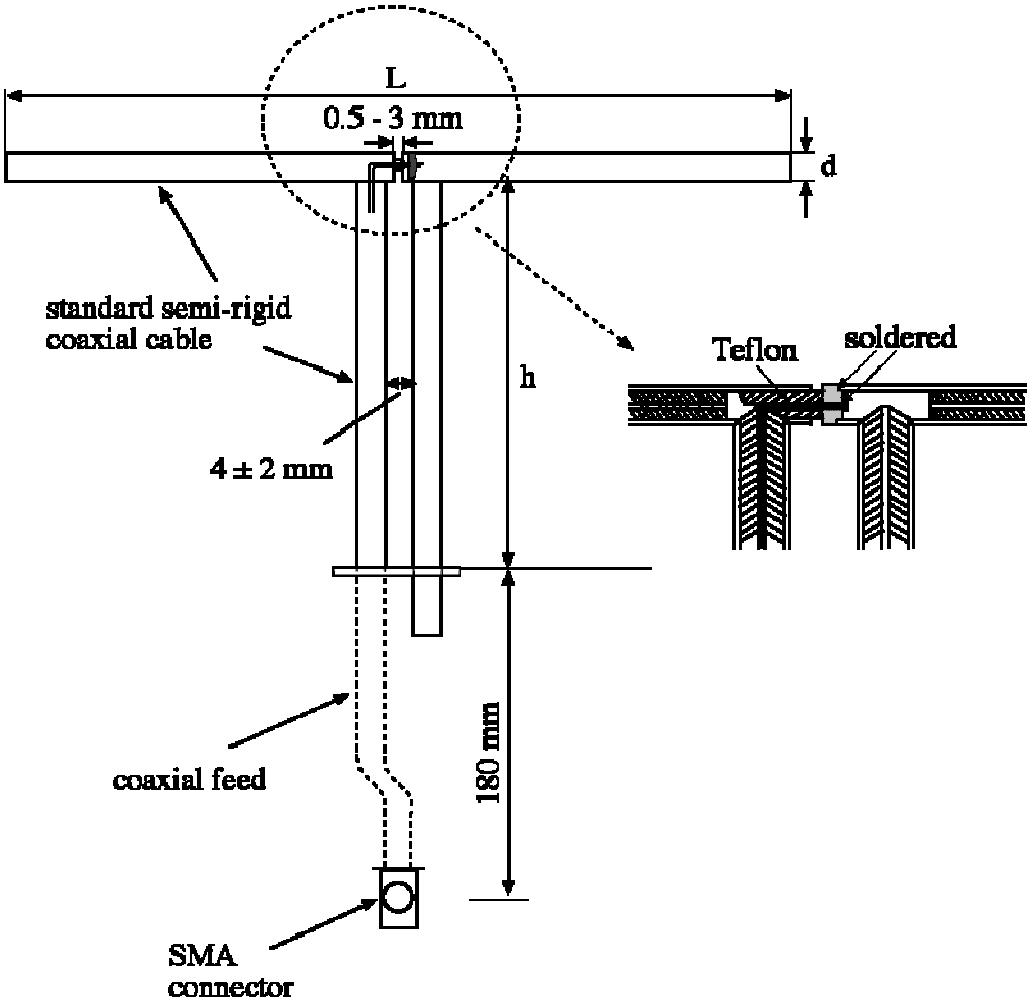
Performed by:	**Sean Johnston**
Approved by:	**Spencer Watson**

Celltech Labs Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-448-7047 • Fax. 250-448-7046 • e-mail: info@celltechlabs.com
www.celltechlabs.com

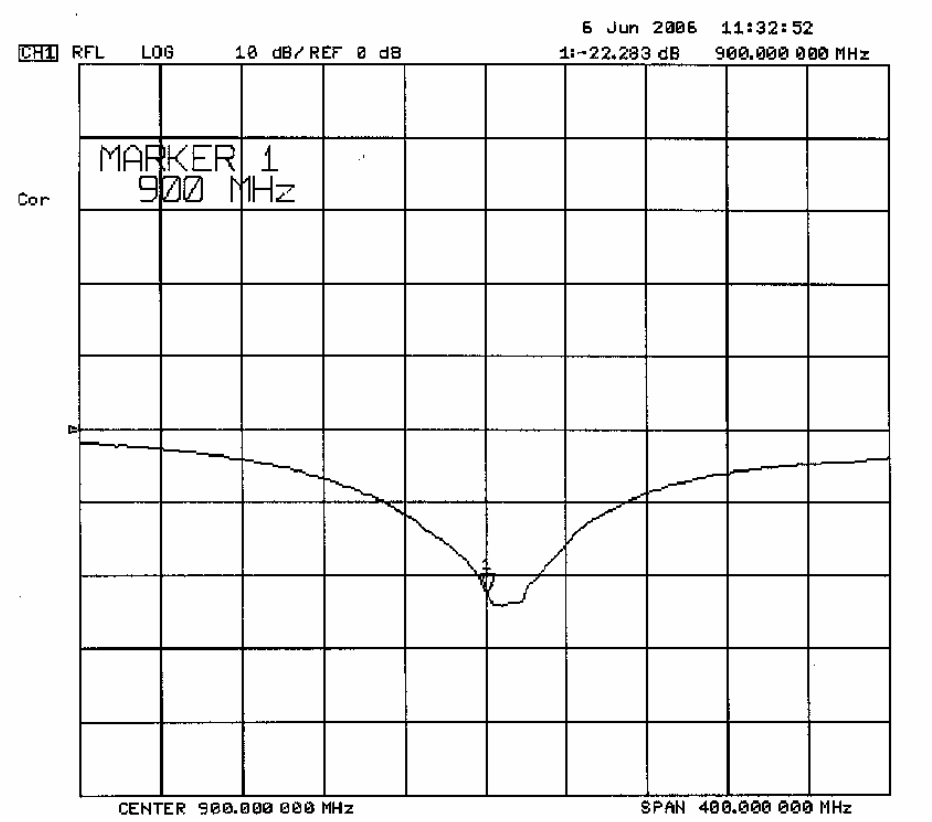
1. Dipole Construction & Electrical Characteristics

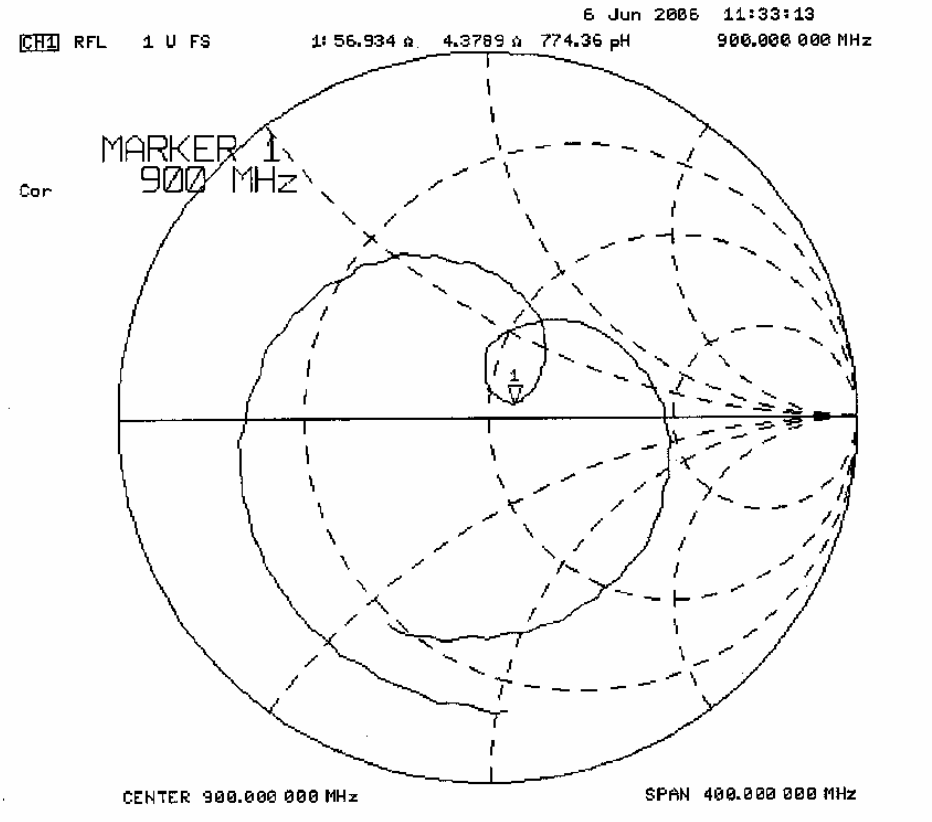
The validation dipole was constructed in accordance with the IEEE Standard "Annex G (informative) Reference dipoles for use in system validation". The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 10.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 900MHz	Re{Z} = 56.934Ω
	Im{Z} = 4.3789Ω
Return Loss at 900MHz	-22.283dB



2. Validation Dipole VSWR Data





3. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	420.0	250.0	6.2
450	288.0	167.0	6.2
835	161.0	89.8	3.6
900	149.0	83.3	3.6
1450	89.1	51.7	3.6
1800	72.0	41.7	3.6
1900	68.0	39.5	3.6
2000	64.5	37.5	3.6
2450	51.8	30.6	3.6
3000	41.5	25.0	3.6

4. Validation Phantom

The validation phantom is the SAM (Specific Anthropomorphic Mannequin) phantom manufactured by Schmid & Partner Engineering AG. The SAM phantom is a Fiberglass shell integrated in a wooden table. The shape of the shell corresponds to the phantom defined by SCC34-SC2. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness: 2.0 ± 0.1 mm
Filling Volume: Approx. 25 liters
Dimensions: 50 cm (W) x 100 cm (L)

5. 900 MHz System Validation Setup

6. 900 MHz System Validation Dipole

7. Measurement Conditions

The phantom was filled with 900 MHz Brain tissue simulant.

Relative Permittivity: 40.7 (-1.9 % deviation from target)
Conductivity: 0.95 mho/m (-2.0 % deviation from target)
Fluid Temperature: 22.5 °C
Fluid Depth: ≥ 15.0 cm

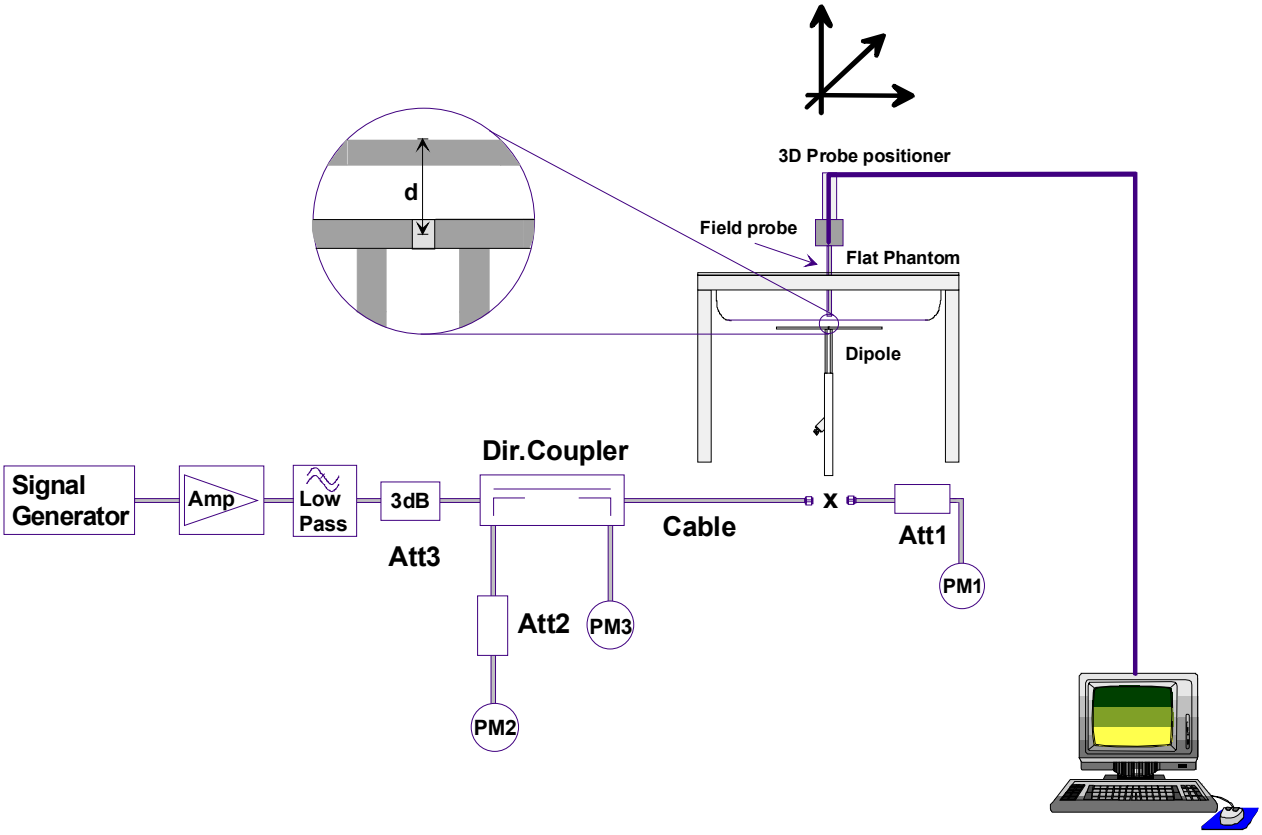
Environmental Conditions:
Ambient Temperature: 23.1 °C
Barometric Pressure: 101.2 kPa
Humidity: 34%

The 900 MHz Brain tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight
Water	40.71%
Sugar	56.63%
Salt	1.48%
Bactericide	0.19%
HEC	0.99%
Target Dielectric Parameters at 23 °C	ε_r = 41.5 (+/- 5%) σ = 0.97 S/m (+/- 5%)

8. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 50dB below the forward power.

9. Validation Dipole SAR Test Results

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

Validation Measurement	SAR @ 0.25W Input averaged over 1g	SAR @ 1W Input averaged over 1g	SAR @ 0.25W Input averaged over 10g	SAR @ 1W Input averaged over 10g	Peak SAR @ 0.25W Input
Test 1	2.55	10.20	1.62	6.48	2.76
Test 2	2.57	10.28	1.64	6.56	2.79
Test 3	2.57	10.28	1.64	6.56	2.80
Test 4	2.50	10.00	1.60	6.40	2.72
Test 5	2.50	10.00	1.59	6.36	2.72
Test 6	2.53	10.12	1.62	6.48	2.73
Test 7	2.59	10.36	1.65	6.60	2.82
Test 8	2.53	10.12	1.62	6.48	2.75
Test 9	2.53	10.12	1.62	6.48	2.74
Test 10	2.58	10.32	1.65	6.60	2.79
Average	**2.55**	**10.18**	**1.63**	**6.50**	**2.76**

The results have been normalized to 1W (forward power) into the dipole.

Target SAR @ 1 Watt Input averaged over 1 gram (W/kg)		Measured SAR @ 1 Watt Input averaged over 1 gram		Deviation from Target	Target SAR @ 1 Watt Input averaged over 10 grams (W/kg)		Measured SAR @ 1 Watt Input averaged over 10 grams		Deviation from Target
10.8	+/- 10%	**10.18**	W/kg	-5.7%	6.9	+/- 10%	**6.50**	W/kg	-5.8%

System Validation - Brain Simulant - 900 MHz Dipole - June 6, 2006

DUT: Dipole 900 MHz; Type: D900V2; Serial: 054; Asset: 00020
Ambient Temp: 23.1 °C; Fluid Temp: 22.5 °C; Barometric Pressure: 101.2 kPa; Humidity: 34%
Communication System: CW
Frequency: 900 MHz; Duty Cycle: 1:1
Medium: HSL900 (σ = 0.95 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3)
- Probe: ET3DV6 - SN1387; ConvF(6.35, 6.35, 6.35); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 08/02/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

900 MHz System Validation/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm

900 MHz System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.9 V/m; Power Drift = -0.009 dB
SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.76 mW/g

900 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.3 V/m; Power Drift = -0.005 dB
SAR(1 g) = 2.57 mW/g; SAR(10 g) = 1.64 mW/g
Maximum value of SAR (measured) = 2.79 mW/g

900 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = 0.037 dB
SAR(1 g) = 2.57 mW/g; SAR(10 g) = 1.64 mW/g
Maximum value of SAR (measured) = 2.80 mW/g

900 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.4 V/m; Power Drift = -0.002 dB
SAR(1 g) = 2.50 mW/g; SAR(10 g) = 1.60 mW/g
Maximum value of SAR (measured) = 2.72 mW/g

900 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.4 V/m; Power Drift = -0.036 dB
SAR(1 g) = 2.50 mW/g; SAR(10 g) = 1.59 mW/g
Maximum value of SAR (measured) = 2.72 mW/g

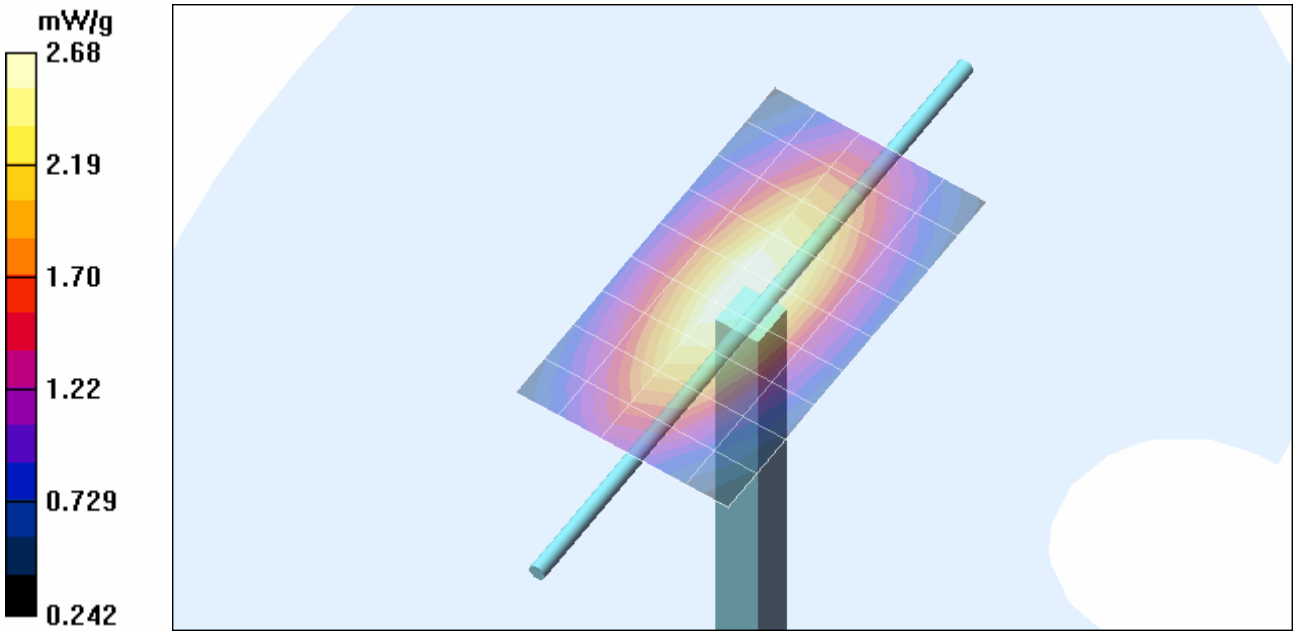
900 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.9 V/m; Power Drift = 0.005 dB
SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.73 mW/g

900 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.8 V/m; Power Drift = 0.092 dB
SAR(1 g) = 2.59 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 2.82 mW/g

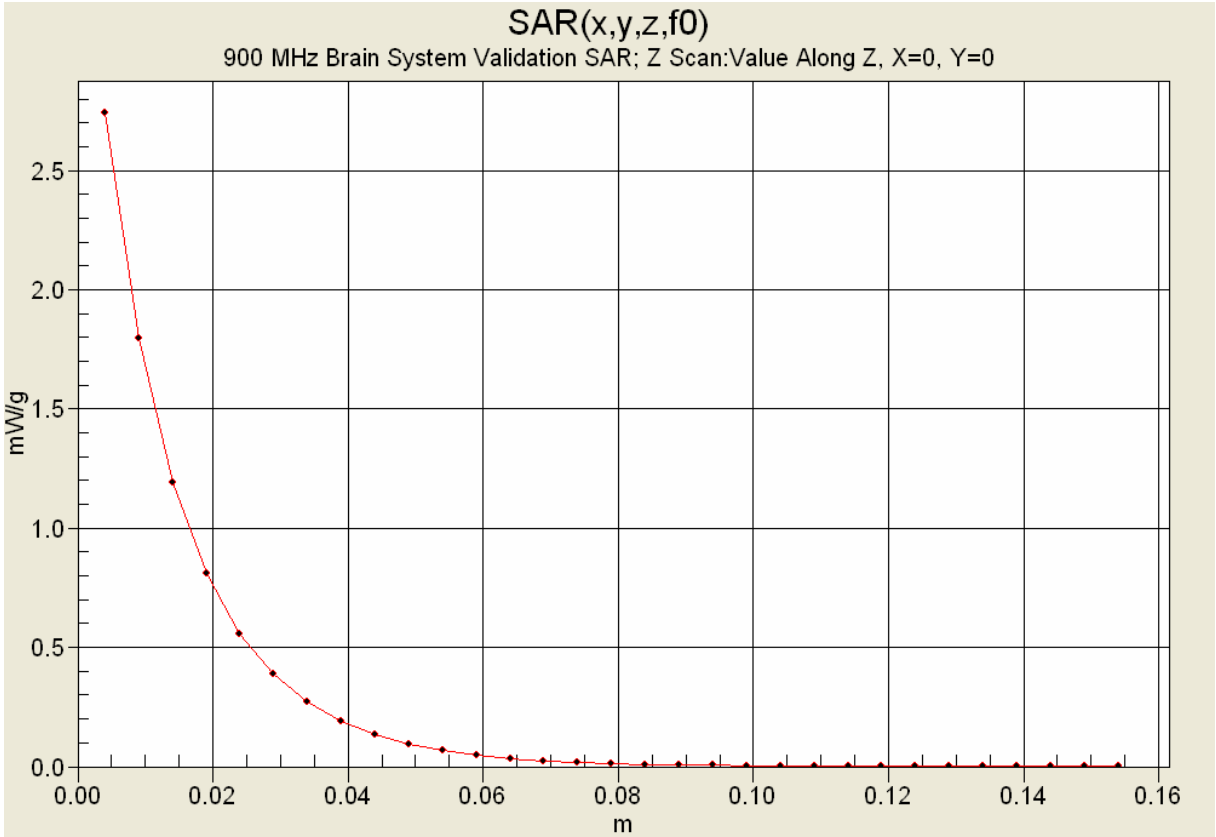
900 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.9 V/m; Power Drift = -0.027 dB
SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.75 mW/g

900 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.8 V/m; Power Drift = 0.041 dB
SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.74 mW/g

900 MHz System Validation/Zoom Scan 10 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.4 V/m; Power Drift = -0.055 dB
SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 2.79 mW/g



1 g average of 10 measurements: 2.55 mW/g
10 g average of 10 measurements: 1.63 mW/g



10. Measured Fluid Dielectric Parameters

900 MHz System Validation (Brain)

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Tue 06/Jun/2006
Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.8000	41.68	0.90	41.92	0.86
0.8100	41.63	0.90	41.70	0.87
0.8200	41.58	0.90	41.74	0.88
0.8300	41.53	0.90	41.60	0.89
0.8400	41.50	0.91	41.43	0.90
0.8500	41.50	0.92	41.34	0.91
0.8600	41.50	0.93	41.35	0.92
0.8700	41.50	0.94	41.06	0.93
0.8800	41.50	0.95	41.13	0.94
0.8900	41.50	0.96	41.08	0.94
0.9000	41.50	0.97	40.72	0.95
0.9100	41.50	0.98	40.80	0.96
0.9200	41.49	0.98	40.68	0.98
0.9300	41.47	0.99	40.57	0.98
0.9400	41.45	0.99	40.56	0.99
0.9500	41.43	0.99	40.28	1.00
0.9600	41.42	1.00	40.29	1.01
0.9700	41.40	1.00	40.19	1.02
0.9800	41.38	1.01	39.91	1.03
0.9900	41.36	1.01	40.01	1.04
1.0000	41.34	1.01	39.86	1.05

APPENDIX F - PROBE CALIBRATION

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

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Celltech Labs

Certificate No: ET3-1387_Mar06

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1387
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	March 16, 2006
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: March 16, 2006

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

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

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

Probe ET3DV6

SN:1387

Manufactured:	September 21, 1999
Last calibrated:	March 18, 2005
Recalibrated:	March 16, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.62** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**92** mV
NormY	**1.72** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**92** mV
NormZ	**1.72** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**92** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.3	5.0
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

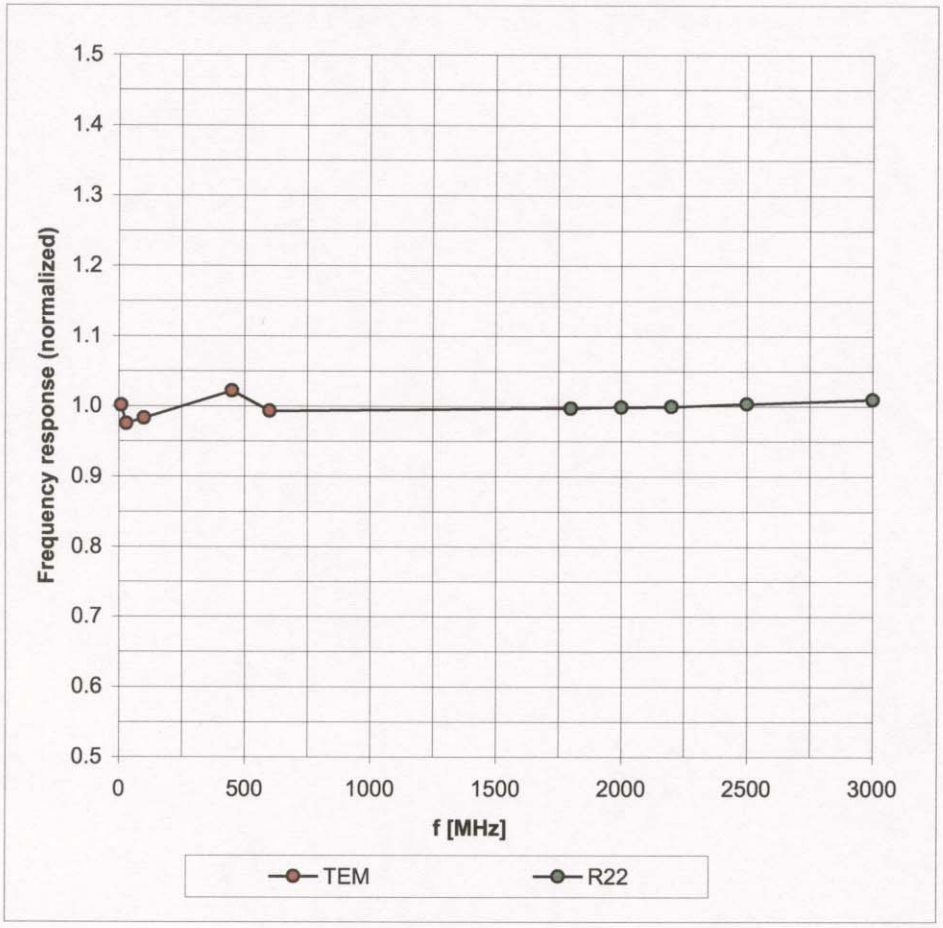
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

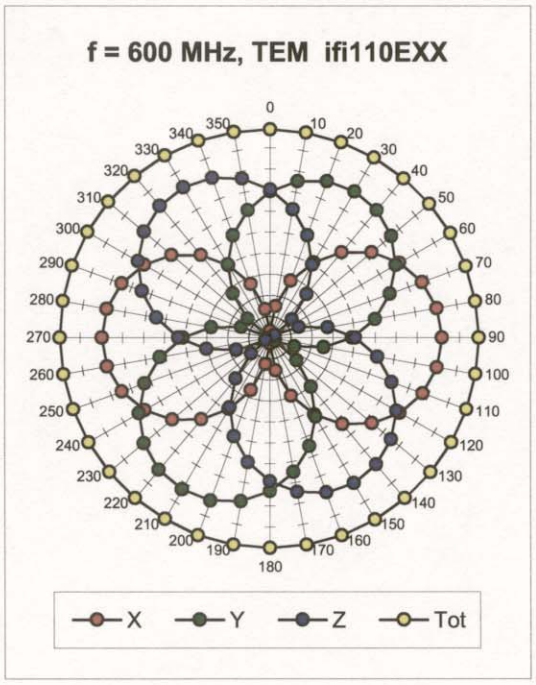
Frequency Response of E-Field

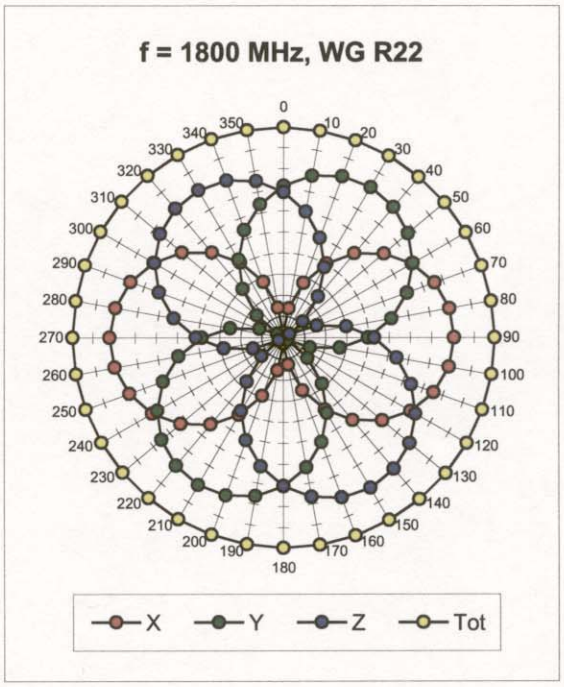
(TEM-Cell:ifi110 EXX, Waveguide: R22)

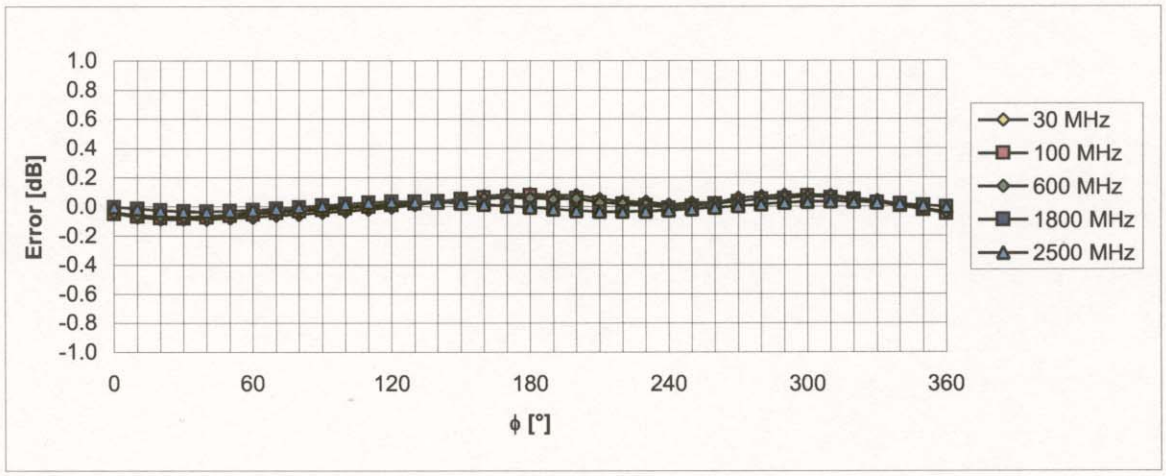


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



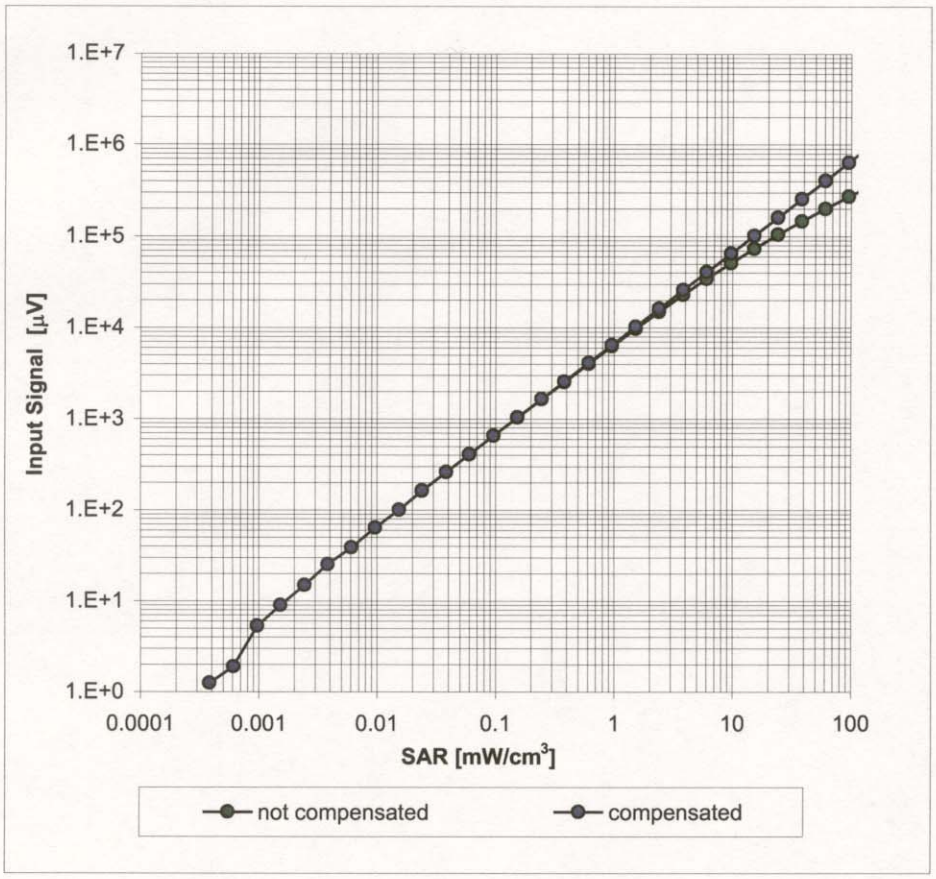


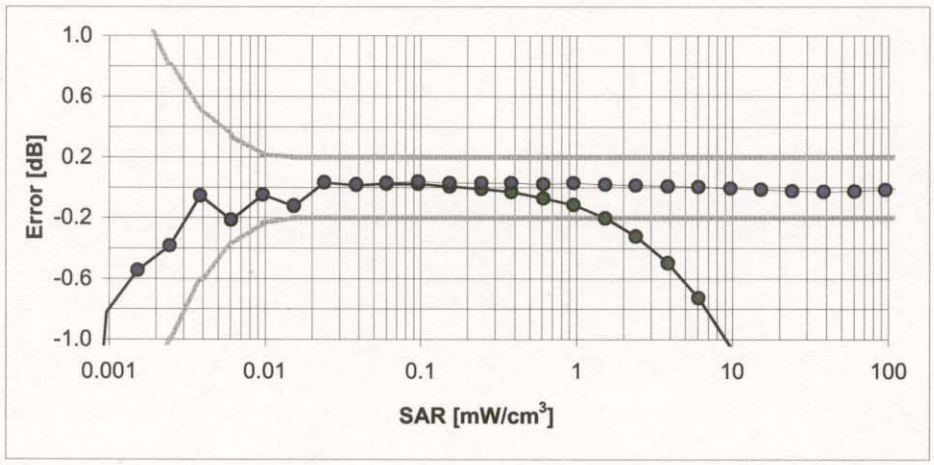


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

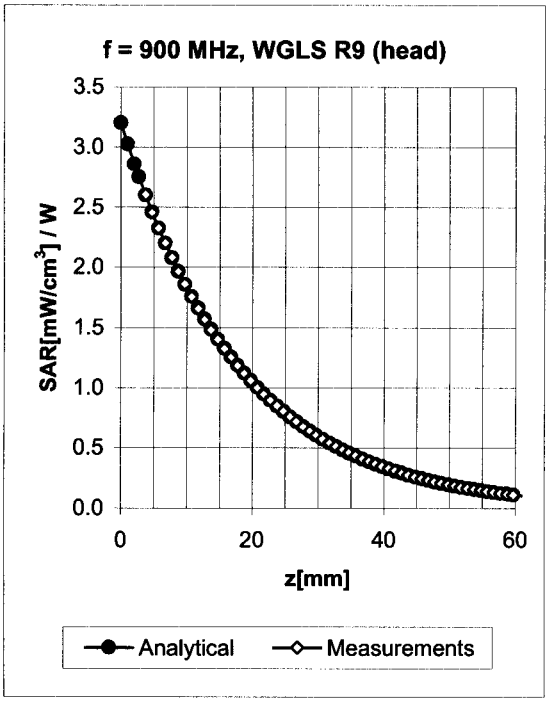
(Waveguide R22, f = 1800 MHz)

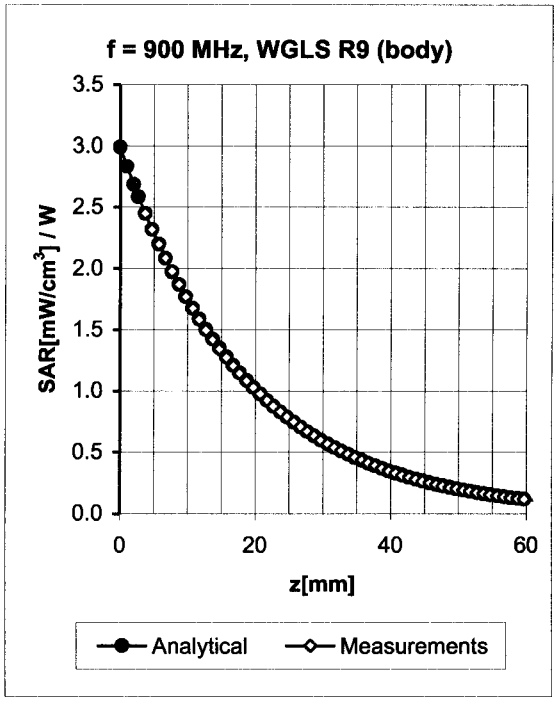




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



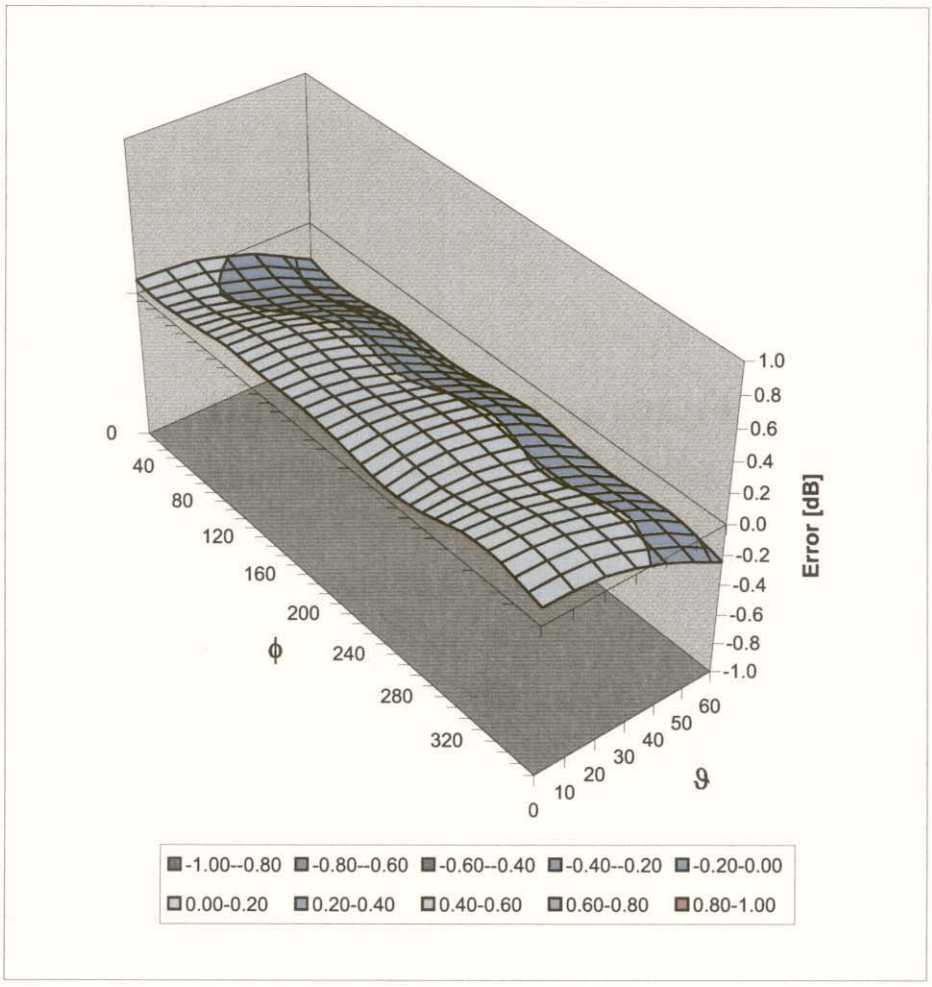


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.62	1.86	6.35 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.59	1.97	6.04 ± 11.0% (k=2)

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

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

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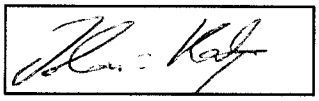
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1387**
Place of Assessment:	**Zurich**
Date of Assessment:	**March 18, 2006**
Probe Calibration Date:	**March 16, 2006**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:



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Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion factor (± standard deviation)

150 ± 50 MHz	ConvF	**8.6 ± 10%**	**ε_r = 52.3 ± 5%** **σ = 0.76 ± 5% mho/m** (head tissue)
150 ± 50 MHz	ConvF	**8.2 ± 10%**	**ε_r = 61.9 ± 5%** **σ = 0.80 ± 5% mho/m** (body tissue)
300 ± 50 MHz	ConvF	**7.8 ± 9%**	**ε_r = 45.3 ± 5%** **σ = 0.87 ± 5% mho/m** (head tissue)
450 ± 50 MHz	ConvF	**7.4 ± 8%**	**ε_r = 43.5 ± 5%** **σ = 0.87 ± 5% mho/m** (head tissue)
450 ± 50 MHz	ConvF	**7.3 ± 8%**	**ε_r = 56.7 ± 5%** **σ = 0.94 ± 5% mho/m** (body tissue)
750 ± 50 MHz	ConvF	**6.6± 7%**	**ε_r = 41.8 ± 5%** **σ = 0.89 ± 5% mho/m** (head tissue)
750 ± 50 MHz	ConvF	**6.4 ± 7%**	**ε_r = 55.4 ± 5%** **σ = 0.96 ± 5% mho/m** (body tissue)
1925 ± 50 MHz	ConvF	**5.0 ± 7%**	**ε_r = 39.8 ± 5%** **σ = 1.48 ± 5% mho/m** (head tissue)
1925 ± 50 MHz	ConvF	**4.7 ± 7%**	**ε_r = 53.2 ± 5%** **σ = 1.60 ± 5% mho/m** (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.
Please see also Section 4.7 of the DASY4 Manual.

APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY

Schmid & Partner
Engineering AG

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Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

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

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 18.11.2001

Signature / Stamp Schmid & Partner Engineering AG
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