DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab

CELLTECH LABS INC.
Testing and Engineering Services
1955 Moss Court
Kelowna, B.C.
Canada V1Y 9L3
Phone: 250-448-7047
Fax: 250-448-7046
e-mail: info@celltechlabs.com
web site: www.celltechlabs.com

Applicant Information

KENWOOD USA CORPORATION
3975 John Creek Court, Suite 300
Suwanee, GA 30024
United States

IDENTIFIER(s):	**FCC ID: ALH34703110** **IC ID: 282D-34703110**
Model(s):	**TK-2170-K, TK-2170-K2**
Rule Part(s):	**FCC 47 CFR §2.1093; IC RSS-102 Issue 1 (Provisional)**
Test Procedure(s):	**FCC OET Bulletin 65, Supplement C (Edition 01-01)**
Device Classification:	**Licensed Non-Broadcast Transmitter Held to Face (TNF)**
Device Description:	**Portable FM VHF PTT Radio Transceiver**
Modulation Type:	**FM (VHF)**
Tx Frequency Range:	**136 - 174 MHz**
Max. RF Output Power Measured:	**37.42 dBm Conducted (136.05 MHz)** **37.37 dBm Conducted (155.05 MHz)** **37.37 dBm Conducted (173.95 MHz)**
Antenna Type(s) Tested:	**Long Whip 148 - 162 MHz (P/N: KRA-25)** **Whip 146 - 162 MHz (P/N: KRA-26M)** **Whip 162 - 174 MHz (P/N: KRA-26M2)** **Whip 136 - 150 MHz (P/N: KRA-26M3)** **Stubby 146 - 162 MHz (P/N: KRA-22M)** **Stubby 162 - 174 MHz (P/N: KRA-22M2)** **Stubby 136 - 150 MHz (P/N: KRA-22M3)** **Stubby 148 - 162 MHz (P/N: KRA-16M)** **Stubby 162 - 174 MHz (P/N: KRA-16M2)** **Stubby 130 - 150 MHz (P/N: KRA-16M3)**
Battery Type(s) Tested:	**Alkaline 1.5 V AA x6 (Battery Case P/N: KBP-5)** **(1. Duracell Procell 2850 mAh, 2. Energizer E91 2850 mAh)** **Li-ion 7.4 V, 1400 mAh (P/N: KNB-35L) / Li-ion 7.4 V, 1400 mAh (P/N: KNB-24L)** **NiCd 7.2 V, 1200 mAh (P/N: KNB-25A) / NiMH 7.2 V, 2000 mAh (P/N: KNB-26N)**
Body-Worn Accessories Tested:	**Plastic Belt-Clip with Metal Spring (P/N: KBH-12)** **Speaker-Microphone (P/N: KMC-17)** **Boom-Mic Headset (P/N: KHS-21)**
Max. SAR Levels Evaluated:	**Face-held: 1.36 W/kg (50% Duty Cycle)** **Body-worn: 1.75 W/kg (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 1 (Provisional) for the Occupational / Controlled 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.

Performed By:

Spencer Watson
Compliance Technologist
Celltech Labs Inc.

Reviewed By:

Russell W. Pipe
Senior Compliance Technologist
Celltech Labs Inc.

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1.0 INTRODUCTION

This measurement report demonstrates compliance of the Kenwood USA Corporation Model(s): TK-2170-K, TK-2170-K2 Portable FM VHF PTT Radio Transceiver FCC ID: ALH34703110 with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]), and Health Canada Safety Code 6 (see reference [2]) for the Occupational / Controlled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C (Edition 01-01) (see reference [3]) and IC RSS-102 Issue 1 (Provisional) (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 various provisions of the rules are included within this test report.

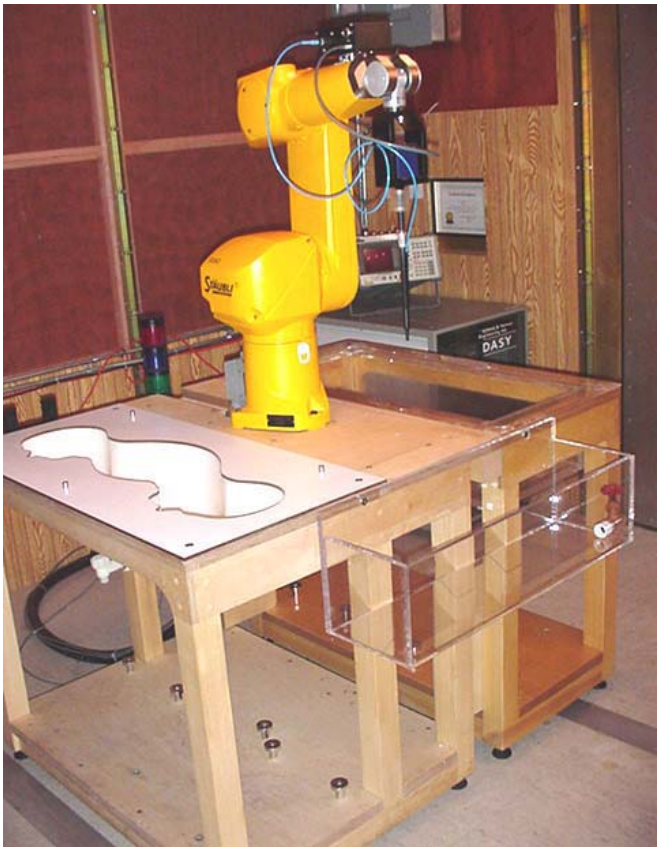
2.0 DESCRIPTION OF DEVICE UNDER TEST (DUT)

FCC Rule Part(s)	FCC 47 CFR §2.1093			
IC Rule Part(s)	RSS-102 Issue 1 (Provisional)			
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (Edition 01-01)			
Device Classification	Licensed Non-Broadcast Transmitter Held to Face (TNF)			
Device Description	Portable FM VHF PTT Radio Transceiver			
FCC IDENTIFIER	ALH34703110			
IC IDENTIFIER	282D-34703110			
Model(s)	TK-2170-K, TK-2170-K2			
Serial No.	1S-V1-22		Identical Prototype	
Modulation	FM (VHF)			
Tx Frequency Range	136 - 174 MHz			
Max. RF Output Power Tested	37.42 dBm		136.05 MHz	Conducted
	37.37 dBm		155.05 MHz	Conducted
	37.37 dBm		173.95 MHz	Conducted
Battery Type(s) Tested	Alkaline	1.5 V AA (x6)	Duracell 2850 mAh Energizer 2850 mAh	Battery Case P/N: KBP-5
	Li-ion	7.4 V	1400 mAh	P/N: KNB-35L
	Li-ion	7.4 V	1400 mAh	P/N: KNB-24L
	NiCd	7.2 V	1200 mAh	P/N: KNB-25A
	NiMH	7.2 V	2000 mAh	P/N: KNB-26N
Antenna Type(s) Tested	Long Whip	148-162 MHz	Length: 247 mm	P/N: KRA-25
	Whip	146-162 MHz	Length: 170 mm	P/N: KRA-26M
	Whip	162-174 MHz	Length: 170 mm	P/N: KRA-26M2
	Whip	136-150 MHz	Length: 170 mm	P/N: KRA-26M3
	Stubby	146-162 MHz	Length: 113 mm	P/N: KRA-22M
	Stubby	162-174 MHz	Length: 113 mm	P/N: KRA-22M2
	Stubby	136-150 MHz	Length: 113 mm	P/N: KRA-22M3
	Stubby	148-162 MHz	Length: 92 mm	P/N: KNB-16M
	Stubby	162-174 MHz	Length: 90 mm	P/N: KNB-16M2
	Stubby	130-150 MHz	Length: 103 mm	P/N: KNB-16M3
Body-Worn Accessories Tested	Belt-Clip (Plastic with Metal Spring)			P/N: KBH-12
	Speaker-Microphone			P/N: KMC-17
	Boom-Mic Headset			P/N: KHS-21

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 SAR Measurement System with validation phantom



DASY4 SAR Measurement System with Plexiglas planar phantom

4.0 MEASUREMENT SUMMARY

FACE-HELD SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
155.05	Mid	CW	Whip	KRA-26M	KBP-5 Duracell	2.5	37.24	1.43	0.715	-0.931	1.77	0.886
155.05	Mid	CW	Whip	KRA-26M	KNB-35L Li-ion	2.5	37.34	1.74	0.870	-0.116	1.79	0.894
155.05	Mid	CW	Whip	KRA-26M	KNB-24L Li-ion	2.5	37.26	1.79	0.895	-0.193	1.87	0.936
155.05	Mid	CW	Whip	KRA-26M	KNB-25A NiCd	2.5	37.29	1.73	0.865	-0.241	1.83	0.914
155.05	Mid	CW	Whip	KRA-26M	KNB-26N NiMH	2.5	37.36	1.86	0.930	-0.376	2.03	1.01
136.05	Low	CW	Whip	KRA-26M3	KNB-26N NiMH	2.5	37.39	0.299	0.150	-0.0547	0.303	0.151
173.95	High	CW	Whip	KRA-26M2	KNB-26N NiMH	2.5	37.37	2.17	1.09	-0.969	2.71	1.36
155.05	Mid	CW	Stubby	KRA-22M	KBP-5 Duracell	2.5	37.17	0.878	0.439	-0.747	1.04	0.521
155.05	Mid	CW	Stubby	KRA-22M	KNB-35L Li-ion	2.5	37.27	0.975	0.488	0.135	0.975	0.488
155.05	Mid	CW	Stubby	KRA-22M	KNB-24L Li-ion	2.5	37.23	0.957	0.479	-0.0503	0.968	0.484
155.05	Mid	CW	Stubby	KRA-22M	KNB-25A NiCd	2.5	37.33	0.989	0.495	-0.163	1.03	0.513
155.05	Mid	CW	Stubby	KRA-22M	KNB-26N NiMH	2.5	37.32	0.966	0.483	-0.122	0.994	0.497
136.05	Low	CW	Stubby	KRA-22M3	KBP-5 Duracell	2.5	37.29	0.188	0.0940	-0.561	0.214	0.107
173.95	High	CW	Stubby	KRA-22M2	KBP-5 Duracell	2.5	37.15	0.754	0.377	-2.17	1.24	0.621

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BRAIN: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date	October 27, 2004			**Relative Humidity**	31	%
Measured Fluid Type	**150 MHz Brain**			**Atmospheric Pressure**	102.5	kPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	22.9	°C
	52.3	**± 5%**	54.0	**Fluid Temperature**	21.7	°C
Conductivity σ **(mho/m)**	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.76	**± 5%**	0.75	**ρ (Kg/m³)**	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. The power drifts 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.
3. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
4. The dielectric parameters of the simulated tissue mixture were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).
5. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
155.05	Mid	CW	Long Whip	KRA-25	KBP-5 Duracell	2.5	37.21	1.22	0.610	-1.15	1.59	0.795
155.05	Mid	CW	Long Whip	KRA-25	KNB-35L Li-ion	2.5	37.36	1.38	0.690	-0.0933	1.41	0.705
155.05	Mid	CW	Long Whip	KRA-25	KNB-24L Li-ion	2.5	37.25	1.31	0.655	-0.437	1.45	0.724
155.05	Mid	CW	Long Whip	KRA-25	KNB-25A NiCd	2.5	37.35	1.29	0.645	-0.387	1.41	0.705
155.05	Mid	CW	Long Whip	KRA-25	KNB-26N NiMH	2.5	37.34	1.30	0.650	-0.396	1.42	0.712
155.05	Mid	CW	Stubby	KRA-16M	KBP-5 Duracell	2.5	37.24	1.06	0.530	-0.0889	1.08	0.541
155.05	Mid	CW	Stubby	KRA-16M	KNB-35L Li-ion	2.5	37.36	1.26	0.630	0.667	1.26	0.630
155.05	Mid	CW	Stubby	KRA-16M	KNB-24L Li-ion	2.5	37.32	1.26	0.630	0.461	1.26	0.630
155.05	Mid	CW	Stubby	KRA-16M	KNB-25A NiCd	2.5	37.37	1.14	0.570	0.458	1.14	0.570
155.05	Mid	CW	Stubby	KRA-16M	KNB-26N NiMH	2.5	37.37	1.17	0.585	0.597	1.17	0.585
136.05	Low	CW	Stubby	KRA-16M3	KNB-35L Li-ion	2.5	37.42	0.116	0.0580	-0.0742	0.118	0.0590
173.95	High	CW	Stubby	KRA-16M2	KNB-35L Li-ion	2.5	37.32	1.41	0.705	-0.823	1.70	0.852

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BRAIN: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date	October 28, 2004			**Relative Humidity**	32	%
Measured Fluid Type	**150 MHz Brain**			**Atmospheric Pressure**	102.2	kPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.0	°C
	52.3	**± 5%**	53.5	**Fluid Temperature**	22.8	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.76	**± 5%**	0.73	**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. The power drifts 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.
3. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
4. The dielectric parameters of the simulated tissue mixture were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).
5. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
155.05	Mid	CW	Long Whip	KRA-25	KBP-5 Duracell	Headset-Mic and Belt-Clip	1.0	37.22	0.556	0.278	-0.354	0.603	0.302
155.05	Mid	CW	Long Whip	KRA-25	KNB-35L Li-ion	Headset-Mic and Belt-Clip	1.4	37.32	1.55	0.775	1.29	1.55	0.775
155.05	Mid	CW	Long Whip	KRA-25	KNB-24L Li-ion	Headset-Mic and Belt-Clip	1.4	37.29	1.69	0.845	-0.239	1.79	0.893
155.05	Mid	CW	Long Whip	KRA-25	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.32	1.85	0.925	0.758	1.85	0.925
155.05	Mid	CW	Long Whip	KRA-25	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.32	1.81	0.905	0.103	1.81	0.905
155.05	Mid	CW	Long Whip	KRA-25	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.20	1.48	0.740	-1.09	1.90	0.951
155.05	Mid	CW	Long Whip	KRA-25	KNB-35L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.24	1.29	0.645	-0.370	1.40	0.702
155.05	Mid	CW	Long Whip	KRA-25	KNB-24L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.24	1.05	0.525	-0.501	1.18	0.589
155.05	Mid	CW	Long Whip	KRA-25	KNB-25A NiCd	Speaker-Mic and Belt-Clip	0.9	37.31	1.19	0.595	-0.615	1.37	0.686
155.05	Mid	CW	Long Whip	KRA-25	KNB-26N NiMH	Speaker-Mic and Belt-Clip	0.9	37.29	1.10	0.550	-0.578	1.26	0.628
155.05	Mid	CW	Whip	KRA-26M	KBP-5 Duracell	Headset-Mic and Belt-Clip	1.0	37.19	0.459	0.230	-0.284	0.490	0.245
155.05	Mid	CW	Whip	KRA-26M	KNB-35L Li-ion	Headset-Mic and Belt-Clip	1.4	37.26	1.69	0.845	-0.251	1.79	0.895
155.05	Mid	CW	Whip	KRA-26M	KNB-24L Li-ion	Headset-Mic and Belt-Clip	1.4	37.20	0.720	0.360	1.33	0.720	0.360
155.05	Mid	CW	Whip	KRA-26M	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.28	2.14	1.07	-0.343	2.32	1.16
155.05	Mid	CW	Whip	KRA-26M	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.27	2.28	1.14	0.484	2.28	1.14

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BODY: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date	October 29, 2004			Relative Humidity	32	%
Measured Fluid Type	150 MHz Body			Atmospheric Pressure	102.7	kPa
Dielectric Constant ε_r	IEEE Target		Measured	Ambient Temperature	22.9	°C
	61.9	± 5%	61.7	Fluid Temperature	22.4	°C
Conductivity σ (mho/m)	IEEE Target		Measured	Fluid Depth	≥ 15	cm
	0.80	± 5%	0.77	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. The power drifts 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.
3. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
4. The dielectric parameters of the simulated tissue mixture were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).
5. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle		
										100%	50%			100%	50%
136.05	Low	CW	Whip	KRA-26M3	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.41	P	2.81	1.41	-0.828	P	3.40	1.70
								37.42	S	2.72	1.36	-0.568	S	3.10	1.55
173.95	High	CW	Whip	KRA-26M2	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.30		2.69	1.35	-0.504		3.02	1.51
155.05	Mid	CW	Whip	KRA-26M	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.20		1.20	0.600	-0.973		1.50	0.751
155.05	Mid	CW	Whip	KRA-26M	KNB-35L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.28		0.943	0.472	-0.295		1.01	0.505
155.05	Mid	CW	Whip	KRA-26M	KNB-24L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.25		0.963	0.482	-0.461		1.07	0.535
155.05	Mid	CW	Whip	KRA-26M	KNB-25A NiCd	Speaker-Mic and Belt-Clip	0.9	37.30		0.696	0.348	-0.537		0.788	0.394
155.05	Mid	CW	Whip	KRA-26M	KNB-26N NiMH	Speaker-Mic and Belt-Clip	0.9	37.27		0.896	0.448	-0.712		1.06	0.528

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BODY: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date	October 30, 2004			**Relative Humidity**	31	%
Measured Fluid Type	**150 MHz Body**			**Atmospheric Pressure**	101.5	kPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.3	°C
	61.9	**± 5%**	62.3	**Fluid Temperature**	22.6	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.80	**± 5%**	0.78	**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. Secondary peak SAR levels measured within 2 dB of the primary were reported (P = Primary, S = Secondary).
3. The power drifts 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.
4. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
5. The dielectric parameters of the simulated tissue mixture were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).
6. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
155.05	Mid	CW	Stubby	KRA-22M	KBP-5 Duracell	Headset-Mic and Belt-Clip	1.0	37.18	1.44	0.720	-0.558	1.64	0.819
155.05	Mid	CW	Stubby	KRA-22M	KNB-35L Li-ion	Headset-Mic and Belt-Clip	1.4	37.30	1.48	0.740	-0.410	1.63	0.813
155.05	Mid	CW	Stubby	KRA-22M	KNB-24L Li-ion	Headset-Mic and Belt-Clip	1.4	37.26	1.38	0.690	-0.276	1.47	0.735
155.05	Mid	CW	Stubby	KRA-22M	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.32	1.84	0.920	-0.522	2.07	1.04
155.05	Mid	CW	Stubby	KRA-22M	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.26	1.83	0.915	-0.611	2.11	1.05
136.05	Low	CW	Stubby	KRA-22M3	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.37	1.19	0.595	-0.00933	1.19	0.596
173.95	High	CW	Stubby	KRA-22M2	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.33	1.14	0.507	-1.05	1.45	0.726
155.05	Mid	CW	Stubby	KRA-22M	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.22	1.21	0.605	-1.18	1.59	0.794
155.05	Mid	CW	Stubby	KRA-22M	KNB-35L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.30	0.924	0.462	-0.380	1.01	0.504
155.05	Mid	CW	Stubby	KRA-22M	KNB-24L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.21	1.05	0.525	-0.447	1.16	0.582
155.05	Mid	CW	Stubby	KRA-22M	KNB-25A NiCd	Speaker-Mic and Belt-Clip	0.9	37.29	0.890	0.445	-0.658	1.04	0.518
155.05	Mid	CW	Stubby	KRA-22M	KNB-26N NiMH	Speaker-Mic and Belt-Clip	0.9	37.28	0.861	0.431	-0.643	0.998	0.499

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BODY: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date	October 31, 2004			**Relative Humidity**	31	%
Measured Fluid Type	**150 MHz Body**			**Atmospheric Pressure**	103.0	kPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.0	°C
	61.9	**± 5%**	60.9	**Fluid Temperature**	22.5	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.80	**± 5%**	0.77	**ρ (Kg/m³)**	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. The power drifts 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.
3. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
4. The dielectric parameters of the simulated tissue mixture were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).
5. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Test Date	Freq. (MHz)	Chan.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle		
											100%	50%			100%	50%
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KBP-5 Duracell	Headset-Mic and Belt-Clip	1.0	37.19	P	0.661	0.331	-0.782	P	0.791	0.396
									37.16	S	0.725	0.363	-0.544	S	0.822	0.411
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-35L Li-ion	Headset-Mic and Belt-Clip	1.4	37.19	P	0.479	0.240	-0.367	P	0.521	0.261
									37.18	S	0.665	0.333	-0.0629	S	0.675	0.337
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-24L Li-ion	Headset-Mic and Belt-Clip	1.4	37.18	P	0.676	0.338	0.185	P	0.676	0.338
									37.23	S	0.758	0.379	-0.235	S	0.800	0.400
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-25A NiCd	Headset-Mic and Belt-Clip	0.9	37.24	P	0.916	0.458	0.192	P	0.916	0.458
									37.26	S	0.825	0.413	-0.117	S	0.848	0.424
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-26N NiMH	Headset-Mic and Belt-Clip	0.9	37.18	P	0.698	0.349	-0.205	P	0.732	0.366
									37.21	S	0.851	0.426	0.537	S	0.851	0.426
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.21		2.30	1.15	-1.02		2.91	1.45
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-35L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.23		2.56	1.28	-0.183		2.67	1.34
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-24L Li-ion	Speaker-Mic and Belt-Clip	1.4	37.15		2.45	1.23	-0.295		2.62	1.31
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-25A NiCd	Speaker-Mic and Belt-Clip	0.9	37.24		1.70	0.850	-0.525		1.92	0.959
Nov-24	155.05	Mid	CW	Stubby	KRA-16M	KNB-26N NiMH	Speaker-Mic and Belt-Clip	0.9	37.25		1.70	0.850	-0.586		1.95	0.973
Nov-25	136.05	Low	CW	Stubby	KRA-16M3	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.23	P	1.61	0.805	-1.40	P	2.22	1.11
									37.22	S	1.20	0.600	-1.58	S	1.73	0.863
Nov-25	173.95	High	CW	Stubby	KRA-16M2	KBP-5 Duracell	Speaker-Mic and Belt-Clip	1.0	37.17	P	1.17	0.585	-1.60	P	1.69	0.846
									37.16	S	1.21	0.605	-1.65	S	1.77	0.885
									37.15	S	1.12	0.560	-1.74	S	1.67	0.836
Nov-25	155.05	Mid	CW	Stubby	KRA-16M	KBP-5 - Energizer	Speaker-Mic and Belt-Clip	1.0	37.18		2.75	1.38	-1.04		3.49	1.75

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
BODY: 8.0 W/kg (averaged over 1 gram)
Spatial Peak - Controlled Exposure / Occupational

Test Date(s)	November 24, 2004			November 25, 2004		
Dielectric Constant ε_r	150 MHz Body			150 MHz Body		
	IEEE Target		Measured	IEEE Target		Measured
	61.9	± 5%	61.7	61.9	± 5%	61.6
Conductivity σ (mho/m)	150 MHz Body			150 MHz Body		
	IEEE Target		Measured	IEEE Target		Measured
	0.80	± 5%	0.78	0.80	± 5%	0.81

Test Date(s)	Nov-24	Nov-25	Unit
Relative Humidity	35	37	%
Atmospheric Pressure	101.3	101.0	kPa
Ambient Temperature	24.0	23.8	°C
Fluid Temperature	21.7	22.5	°C
Fluid Depth	≥ 15	≥ 15	cm
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. Secondary peak SAR levels measured within 2 dB of the primary were reported (P = Primary, S = Secondary).
3. A SAR-versus-Time power drift evaluation was performed in the test configuration that reported the maximum-scaled SAR level (body-worn, mid channel, Energizer Alkaline Batteries, Stubby Antenna P/N: KRA-16M, with Speaker-Microphone and Belt-Clip accessories). See Appendix A (SAR Test Plots) for SAR-versus-Time power drift evaluation plot.
4. The DUT was evaluated for SAR with Duracell Procell alkaline batteries. To report a SAR comparison between alternate alkaline battery types, the maximum scaled SAR level configuration evaluated with Duracell Procell alkaline batteries (body-worn, mid channel, Stubby Antenna P/N: KRA-16M, with Speaker-Microphone and Belt-Clip accessories), was repeated using Energizer E91 alkaline batteries as shown in the above test data table.

5.0 DETAILS OF SAR EVALUATION

The Kenwood USA Corporation Model(s): TK-2170-K, TK-2170-K2 Portable FM VHF PTT Radio Transceiver FCC ID: ALH34703110 was compliant for localized Specific Absorption Rate (Occupational / Controlled Exposure) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix F.

1. The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the planar phantom. A 2.5 cm separation distance was maintained between the front side of the DUT and the outer surface of the planar phantom.
2. The DUT was evaluated in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached belt-clip accessory was touching the planar phantom. With the Alkaline Battery Case the belt-clip accessory provided a 1.0 cm separation distance between the back of the DUT and the outer surface of the planar phantom. With the Li-ion battery the belt-clip accessory provided a 1.4 cm separation distance between the back of the DUT and the outer surface of the planar phantom. With the NiCd and NiMH batteries the belt-clip accessory provided a 0.9 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the speaker-microphone and boom-mic headset audio accessories connected consecutively.
3. The power drifts measured by the DASY4 system during the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the test data tables (pages 5-10).
4. A SAR-versus-Time power drift evaluation was performed in the test configuration that reported the maximum scaled SAR level (50% duty cycle). See Appendix A (SAR Test Plots) for SAR-versus-Time power drift evaluation plot.
5. The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down to room temperature and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
6. The conducted power levels were measured prior to each test using a Gigatronics 8652A Universal Power Meter according to the procedures described in FCC 47 CFR §2.1046.
7. The DUT was tested in unmodulated continuous transmit operation (Continuous Wave mode 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 SAR evaluations were performed using a Plexiglas planar phantom.
9. A stack of low-density, low-loss dielectric foamed polystyrene was used in place of the device holder.

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 form 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 D). 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 evaluation a system check was performed using a planar phantom with a 300MHz dipole (see Appendix C for system validation procedure). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters). A forward power of 250mW was applied to the dipole and the system was verified to a tolerance of ±10% (see Appendix B for system performance check test plots).

SYSTEM PERFORMANCE CHECK

Test Date	300MHz 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)
		IEEE Target	Measured	IEEE Target	Measured	IEEE Target	Measured						
10/26/04	Brain	**0.750 (±10%)**	0.737 (-1.7%)	**45.3 ±5%**	45.9	**0.87 ±5%**	0.87	1000	24.1	22.8	≥ 15	34	101.9
10/27/04	Brain	**0.750 (±10%)**	0.753 (-0.4%)	**45.3 ±5%**	45.5	**0.87 ±5%**	0.85	1000	23.7	22.9	≥ 15	32	102.1
10/29/04	Brain	**0.750 (±10%)**	0.710 (-5.3%)	**45.3 ±5%**	44.9	**0.87 ±5%**	0.84	1000	23.0	22.8	≥ 15	31	102.7
10/30/04	Brain	**0.750 (±10%)**	0.724 (-3.5%)	**45.3 ±5%**	46.2	**0.87 ±5%**	0.86	1000	22.8	22.9	≥ 15	32	101.3
10/31/04	Brain	**0.750 (±10%)**	0.750 (±0.0%)	**45.3 ±5%**	45.1	**0.87 ±5%**	0.85	1000	23.0	22.6	≥ 15	31	102.9
11/24/04	Brain	**0.750 (±10%)**	0.737 (-1.7%)	**45.3 ±5%**	45.2	**0.87 ±5%**	0.85	1000	23.2	22.3	≥ 15	33	101.3
11/25/04	Brain	**0.750 (±10%)**	0.730 (-2.7%)	**45.3 ±5%**	44.8	**0.87 ±5%**	0.84	1000	23.3	21.8	≥ 15	34	101.0

Note(s):
1. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the system performance check. The temperatures listed in the table above were consistent for all measurement periods.

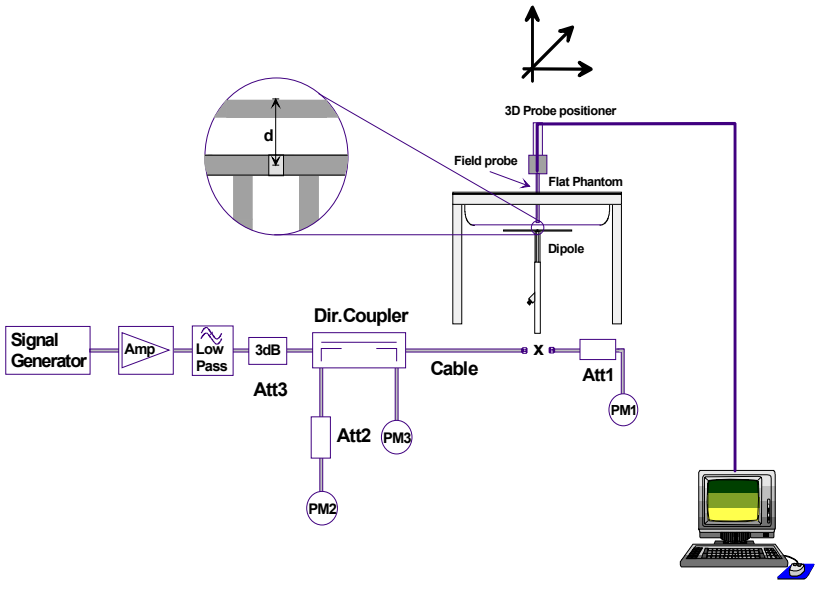


Figure 1. System Performance Check Setup Diagram

300MHz Dipole Setup

8.0 SIMULATED EQUIVALENT TISSUES

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

SIMULATED TISSUE MIXTURES			
INGREDIENT	300 MHz Brain (%)	150 MHz Brain (%)	150 MHz Body (%)
	System Check	DUT Evaluation	DUT Evaluation
Water	37.56	38.35	46.6
Sugar	55.32	55.5	49.7
Salt	5.95	5.15	2.6
HEC	0.98	0.9	1.0
Bactericide	0.19	0.1	0.1

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 1g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10g)	4.0	20.0

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. 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: DASY4 software
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)

Evaluation Phantom

Type: Planar Phantom
Shell Material: Plexiglas
Bottom Thickness: 2.0 mm ± 0.1 mm
Outer Dimensions: 75.0 cm (L) x 22.5 cm (W) x 20.5 cm (H); Back Plane: 25.7 cm (H)

Validation Phantom (≤ 450MHz)

Type: Planar Phantom
Shell Material: Plexiglas
Bottom Thickness: 6.2 mm ± 0.1 mm
Outer Dimensions: 86.0 cm (L) x 39.5 cm (W) x 21.8 cm (H)

11.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. 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 Detection:	± 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 PLANAR PHANTOM

The planar phantom is constructed of Plexiglas material with a 2.0 mm shell thickness for face-held and body-worn SAR evaluations of handheld and body-worn radio transceivers. The planar phantom is mounted on the side of the DASY4 compact system table.

Planar Phantom

13.0 VALIDATION PLANAR PHANTOM

The validation planar phantom is constructed of Plexiglas material with a 6.0 mm shell thickness for system validations at 450MHz and below. The validation planar phantom is mounted in the table of the DASY4 compact system.

Validation Planar Phantom

14.0 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

15.0 TEST EQUIPMENT LIST

TEST EQUIPMENT	SERIAL NO.	CALIBRATION DATE
Schmid & Partner DASY4 System	-	-
-DASY4 Measurement Server	1078	N/A
-Robot	599396-01	N/A
-DAE3	353	July 2004
-DAE3	370	May 2004
-ET3DV6 E-Field Probe	1387	Mar 2004
-ET3DV6 E-Field Probe	1590	May 2004
-300MHz Validation Dipole	135	Oct 2004
-450MHz Validation Dipole	136	Nov 2004
-835MHz Validation Dipole	411	Mar 2004
-900MHz Validation Dipole	054	June 2004
-1800MHz Validation Dipole	247	June 2004
-1900 MHz Validation Dipole	151	June 2004
-2450MHz Validation Dipole	150	Sept 2004
-SAM Phantom V4.0C	1033	N/A
-Barski Planar Phantom	03-01	N/A
-Plexiglas Planar Phantom	161	N/A
-Validation Planar Phantom	137	N/A
HP 85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8651A Power Meter	8650137	April 2004
Gigatronics 8652A Power Meter	1835267	April 2004
Gigatronics 80701A Power Sensor	1833535	April 2004
Gigatronics 80701A Power Sensor	1833542	April 2004
Gigatronics 80701A Power Sensor	1834350	April 2004
HP E4408B Spectrum Analyzer	US39240170	Dec 2003
HP 8594E Spectrum Analyzer	3543A02721	April 2004
HP 8753E Network Analyzer	US38433013	April 2004
HP 8648D Signal Generator	3847A00611	April 2004
Amplifier Research 5S1G4 Power Amplifier	26235	N/A

16.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.0	Normal	1	1	± 4.0	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrapolation & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	√3	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	√3	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					**± 13.03**	
Expanded Uncertainty (k=2)					**± 26.07**	

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	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.0	Normal	1	1	± 4.0	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrapolation & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Dipole						
Dipole Axis to Liquid Distance	± 2.0	Rectangular	√3	1	± 1.2	∞
Input Power	± 4.7	Rectangular	√3	1	± 2.7	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					**± 9.58**	
Expanded Uncertainty (k=2)					**± 19.16**	

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

17.0 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.

[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, “Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada’s Safety Code 6 for Exposure of Humans to Radio Frequency Fields”, Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.

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

APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

Date Tested: 10/26/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

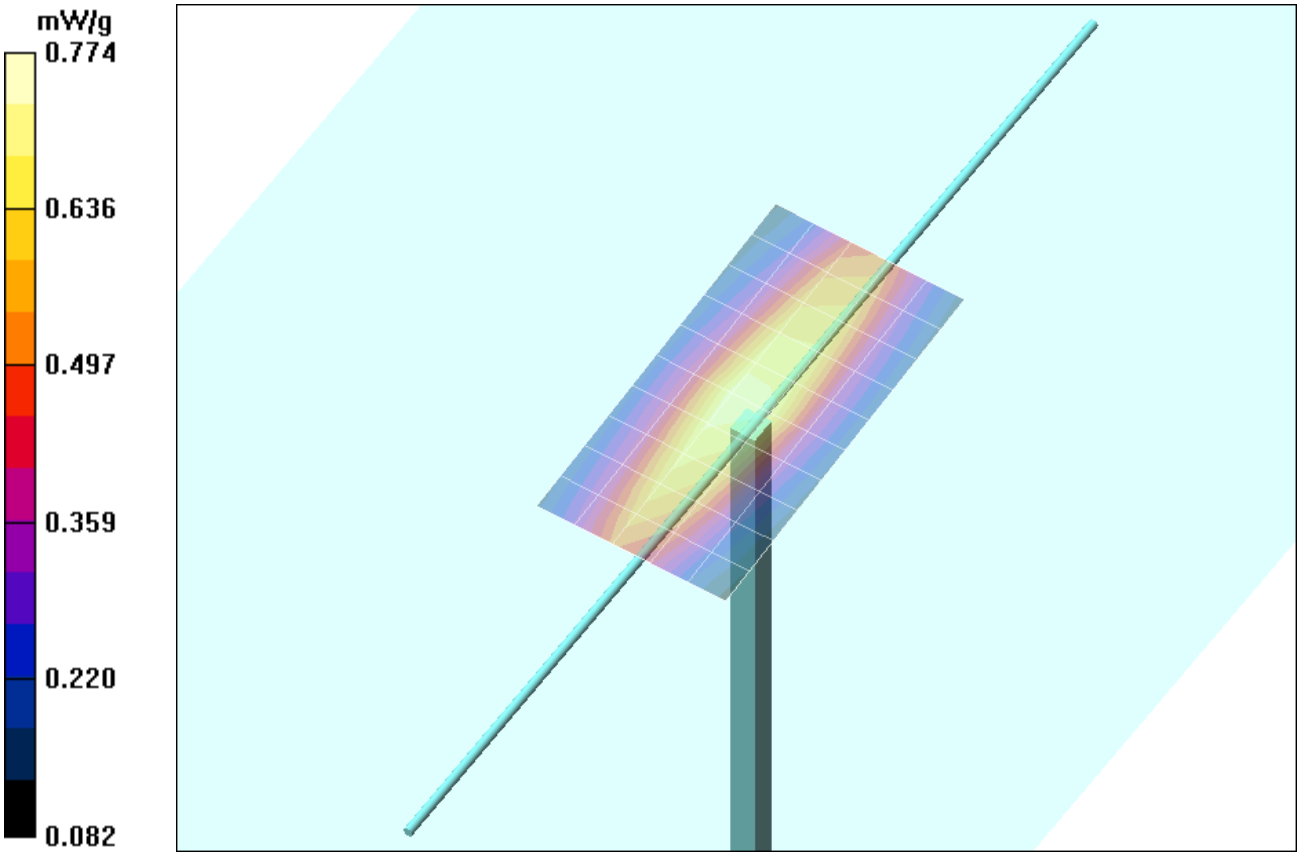
Ambient Temp: 24.1 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.9 kPa; Humidity: 34%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.87 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3)

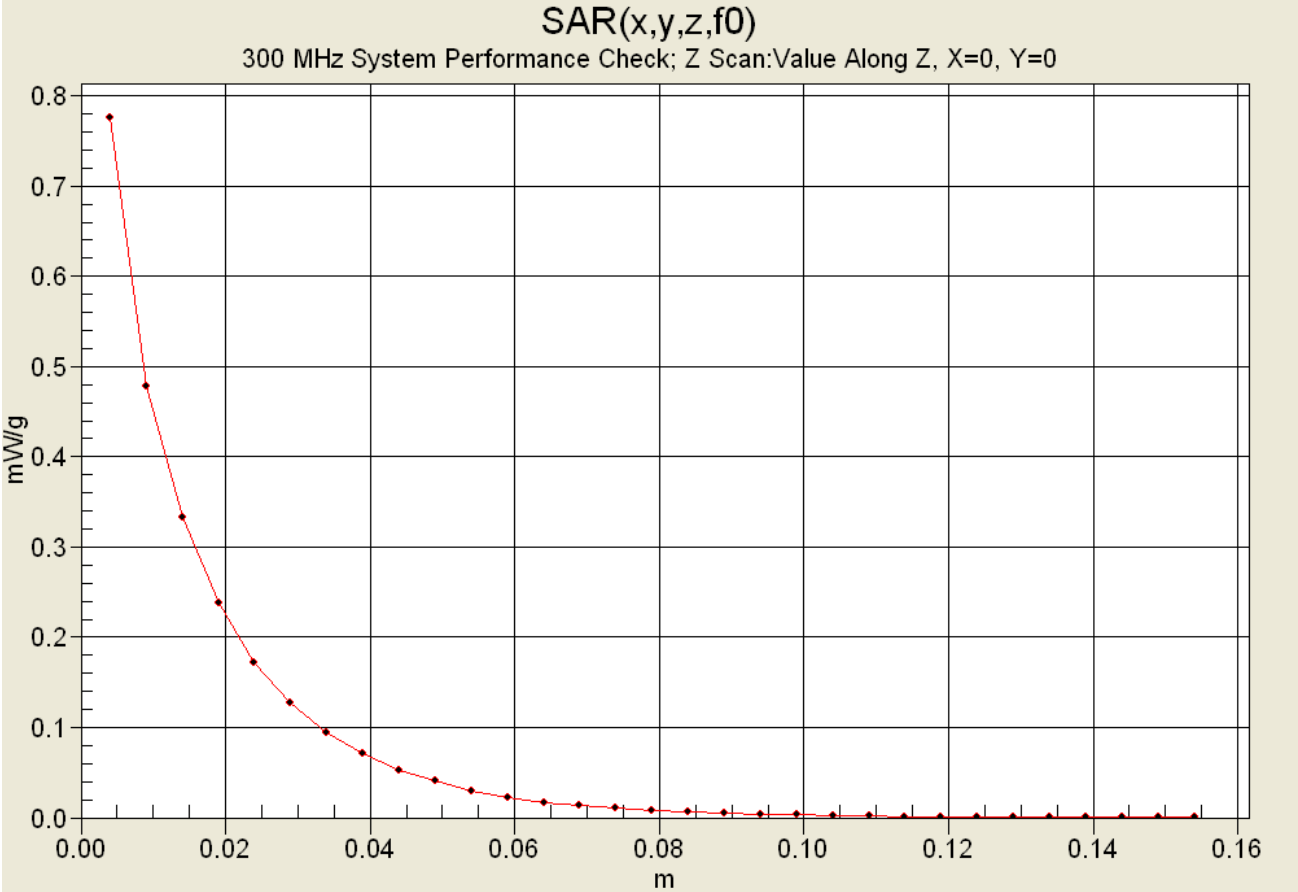
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.476 mW/g



Z-Axis Scan



Date Tested: 10/27/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

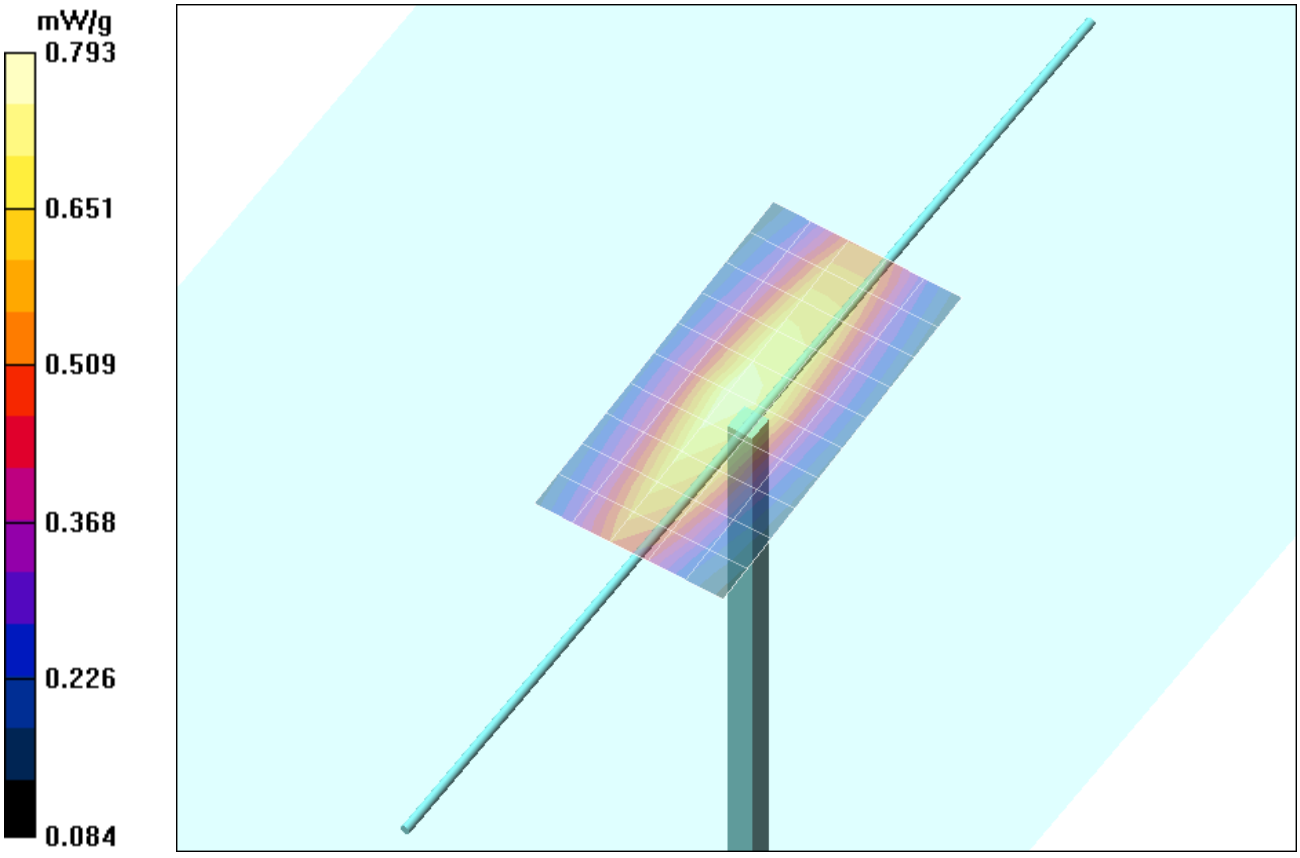
Ambient Temp: 23.7 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 102.1 kPa; Humidity: 32%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.85 mho/m; ε_r = 45.5; ρ = 1000 kg/m^3)

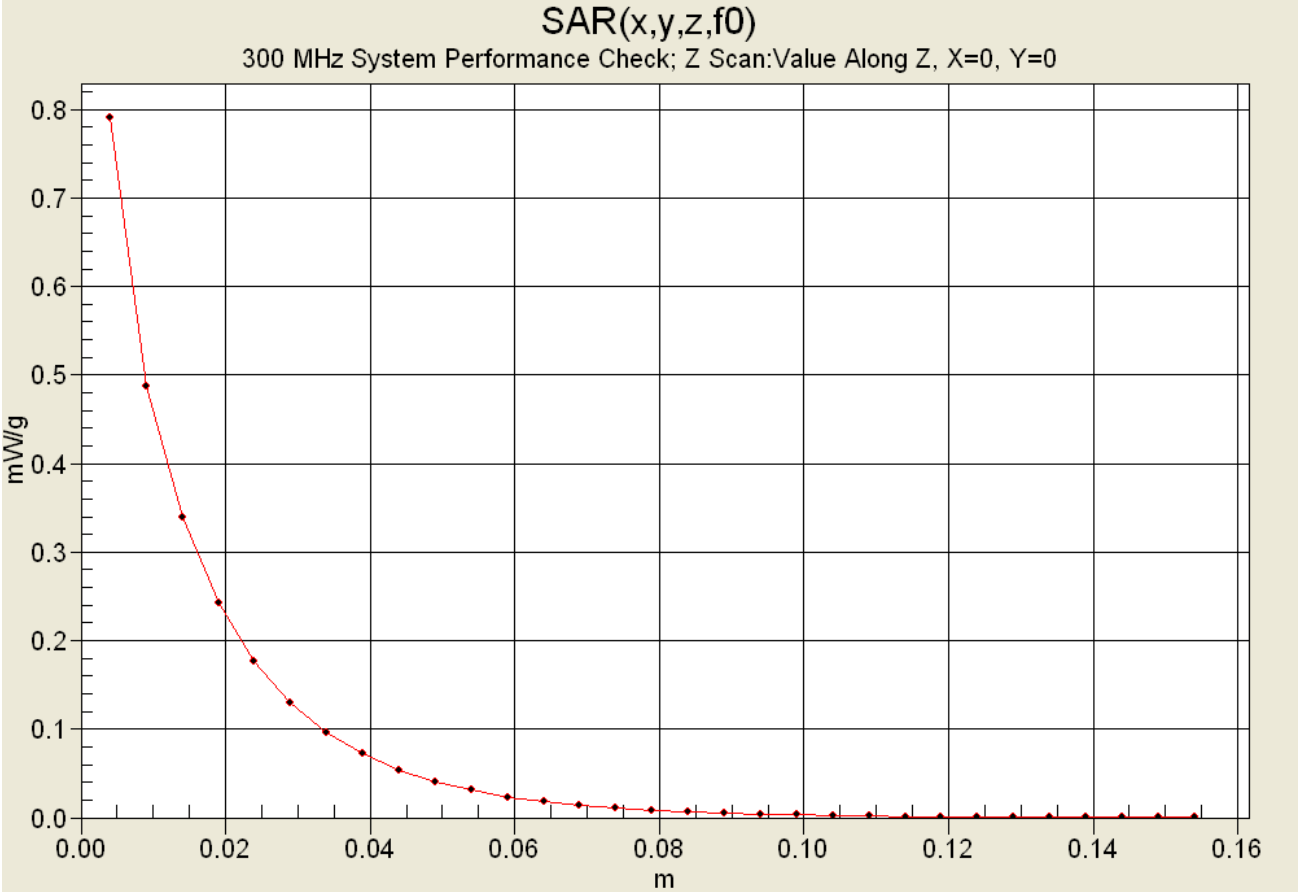
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.7 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.753 mW/g; SAR(10 g) = 0.487 mW/g



Z-Axis Scan



Date Tested: 10/29/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

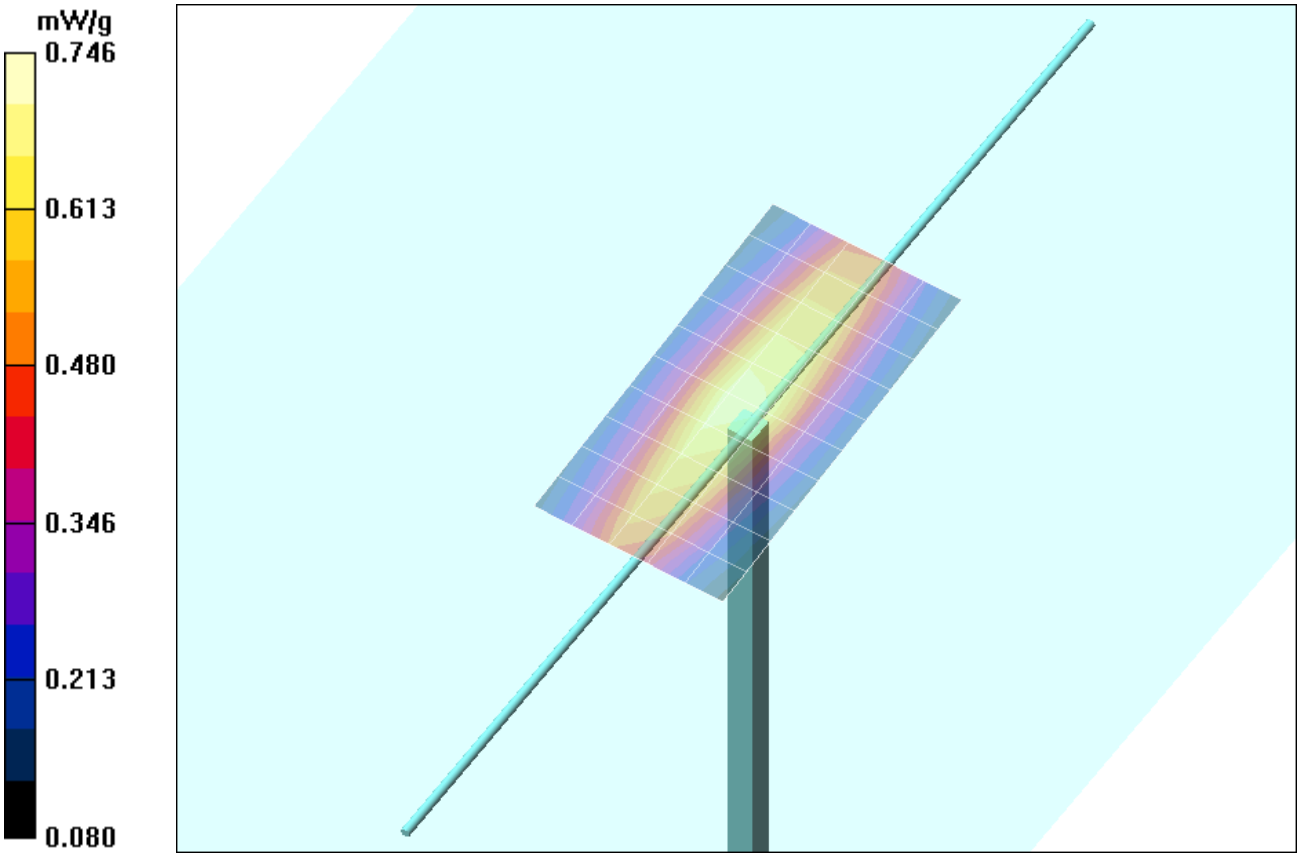
Ambient Temp: 23.0 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 102.7 kPa; Humidity: 31%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.84 mho/m; ε_r = 44.9; ρ = 1000 kg/m^3)

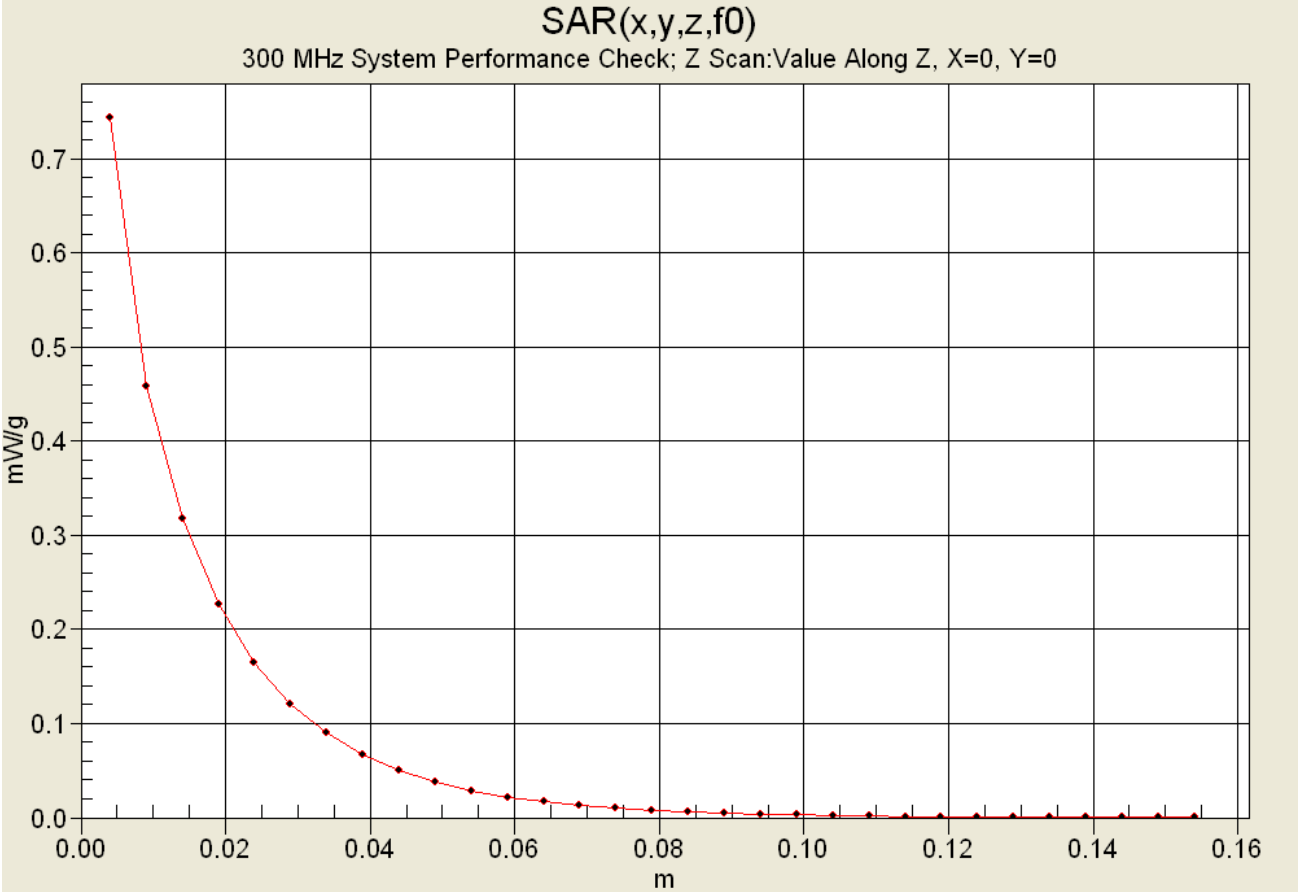
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.710 mW/g; SAR(10 g) = 0.458 mW/g



Z-Axis Scan



Date Tested: 10/30/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

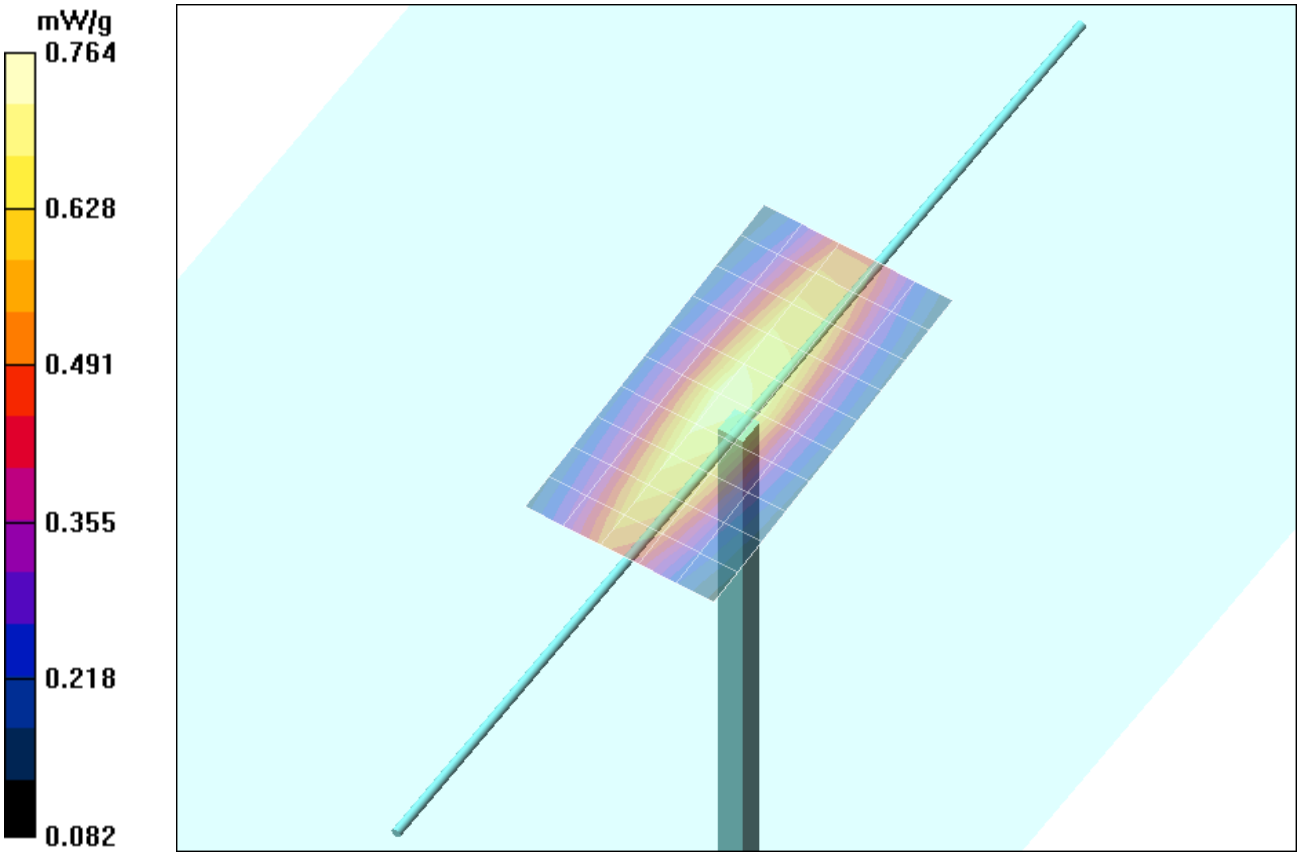
Ambient Temp: 22.8 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 101.3 kPa; Humidity: 32%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.86 mho/m; ε_r = 46.2; ρ = 1000 kg/m^3)

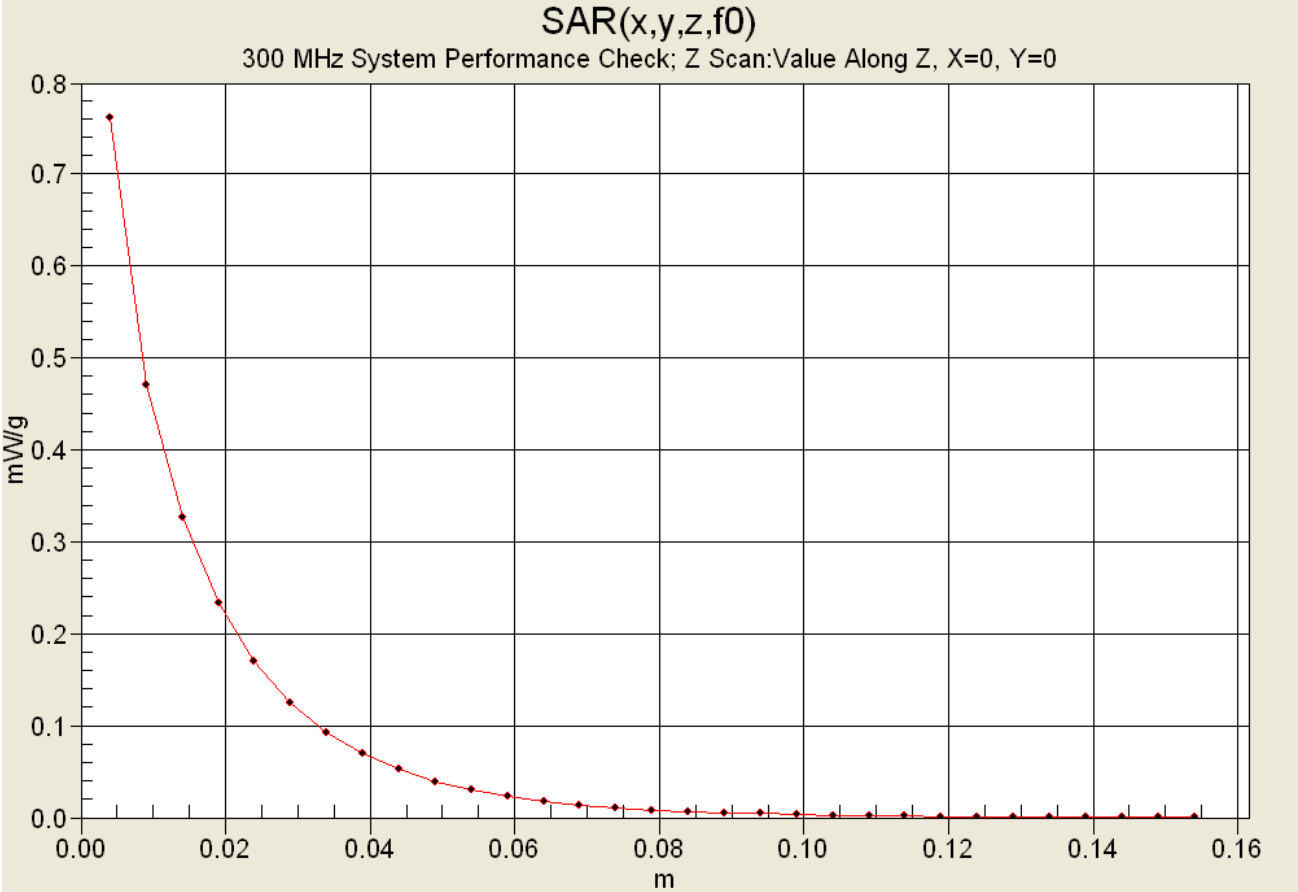
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.7 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.724 mW/g; SAR(10 g) = 0.469 mW/g



Z-Axis Scan



Date Tested: 10/31/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

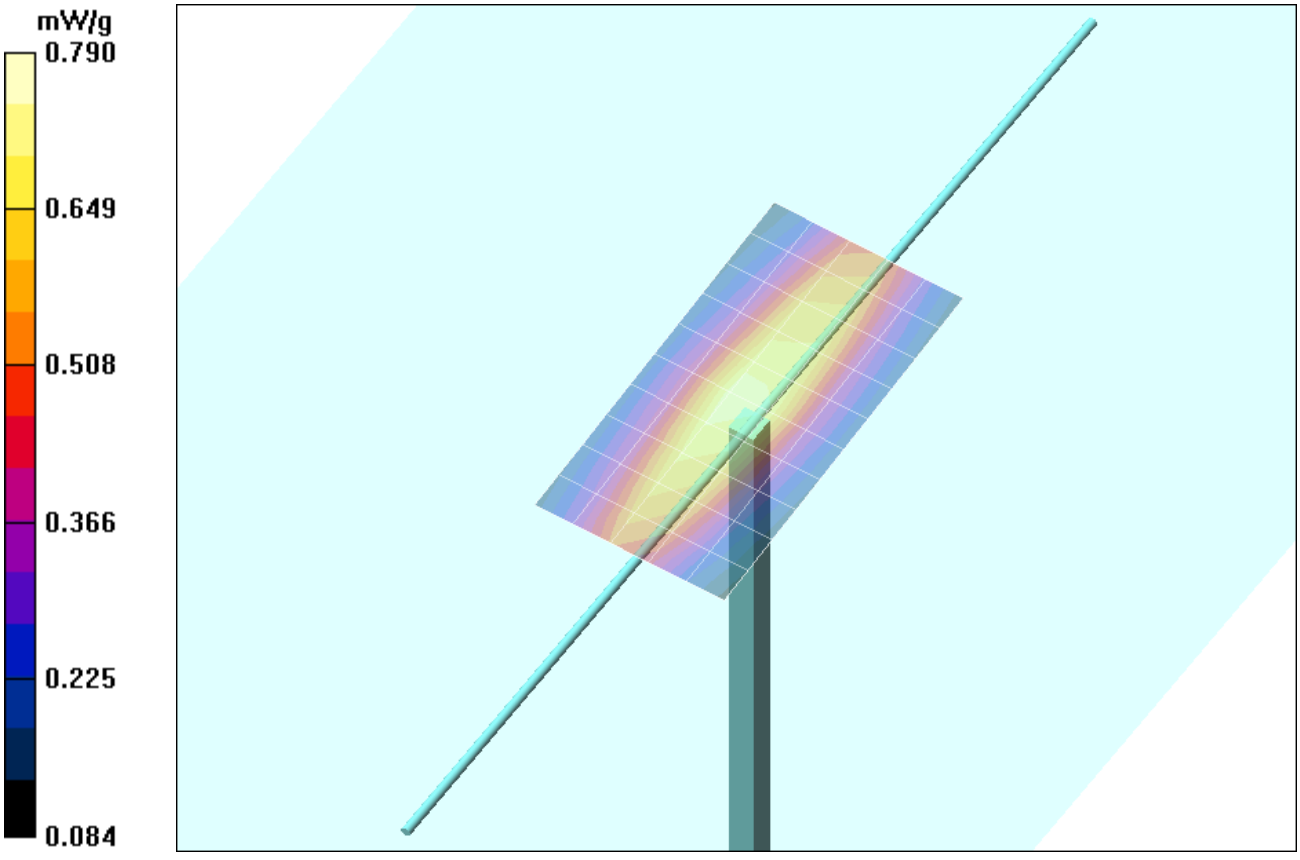
Ambient Temp: 23.0 °C; Fluid Temp: 22.6 °C; Barometric Pressure: 102.9 kPa; Humidity: 31%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.85 mho/m; ε_r = 45.1; ρ = 1000 kg/m^3)

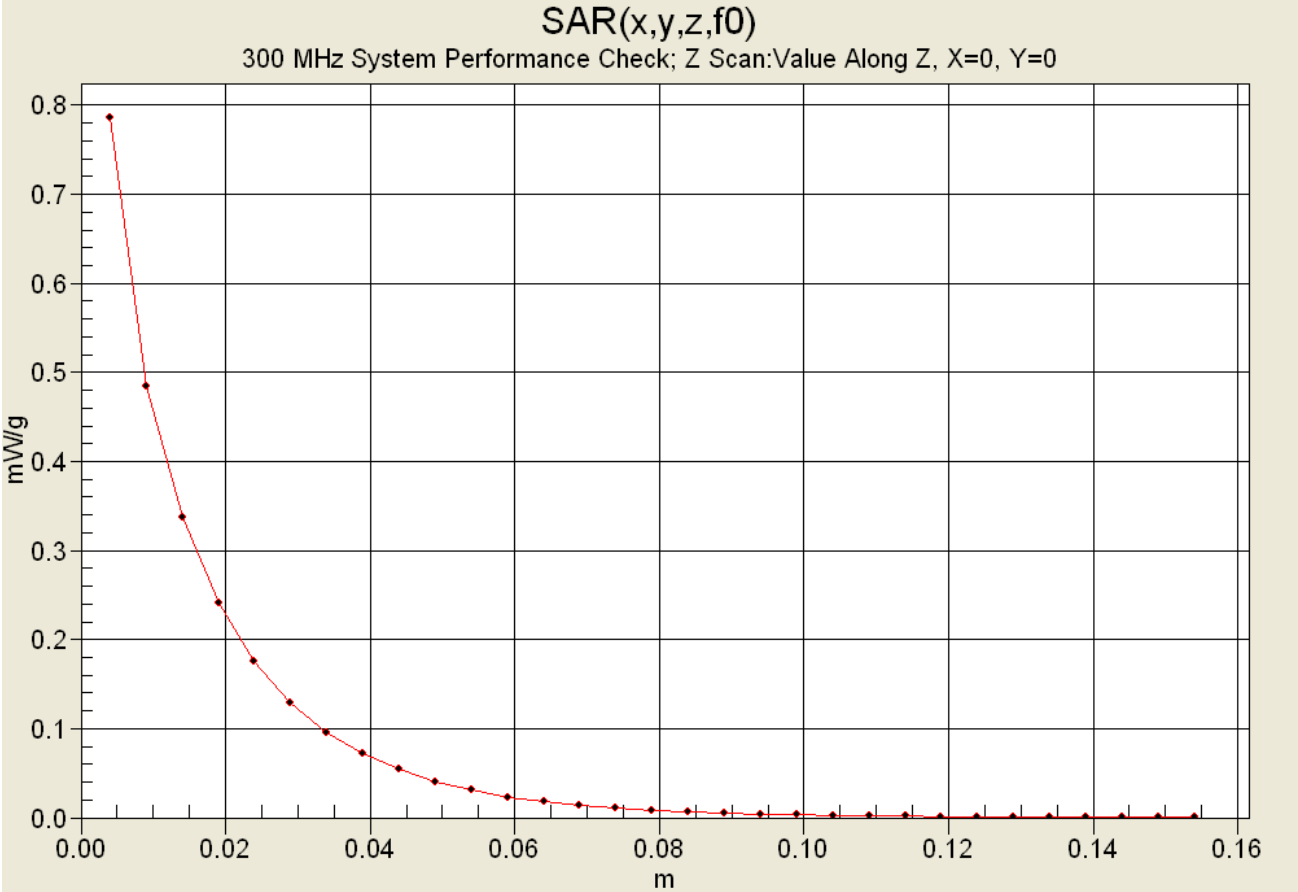
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.7 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.485 mW/g



Z-Axis Scan



Date Tested: 11/24/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

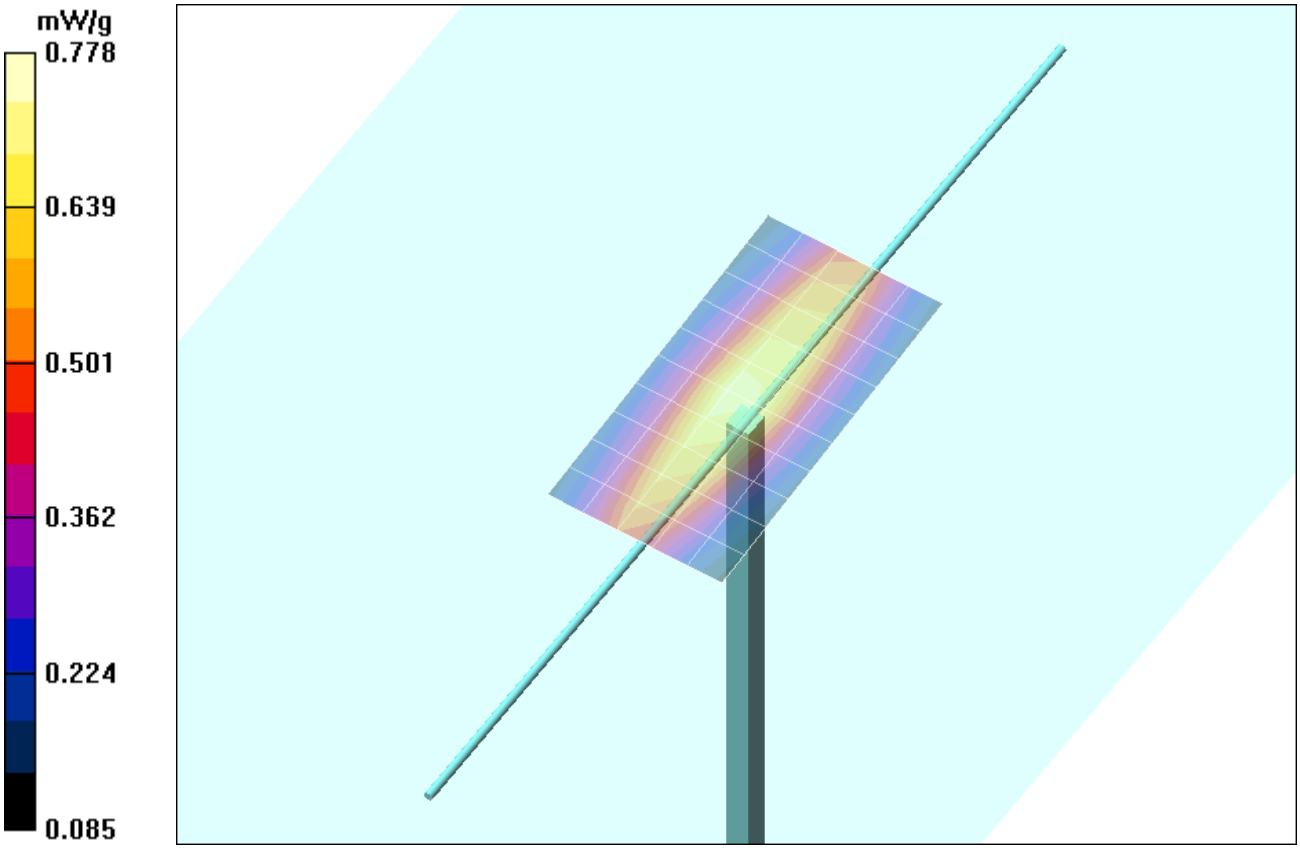
Ambient Temp: 23.2 °C; Fluid Temp: 22.3 °C; Barometric Pressure: 101.3 kPa; Humidity: 33%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.85 mho/m; ε_r = 45.2; ρ = 1000 kg/m^3)

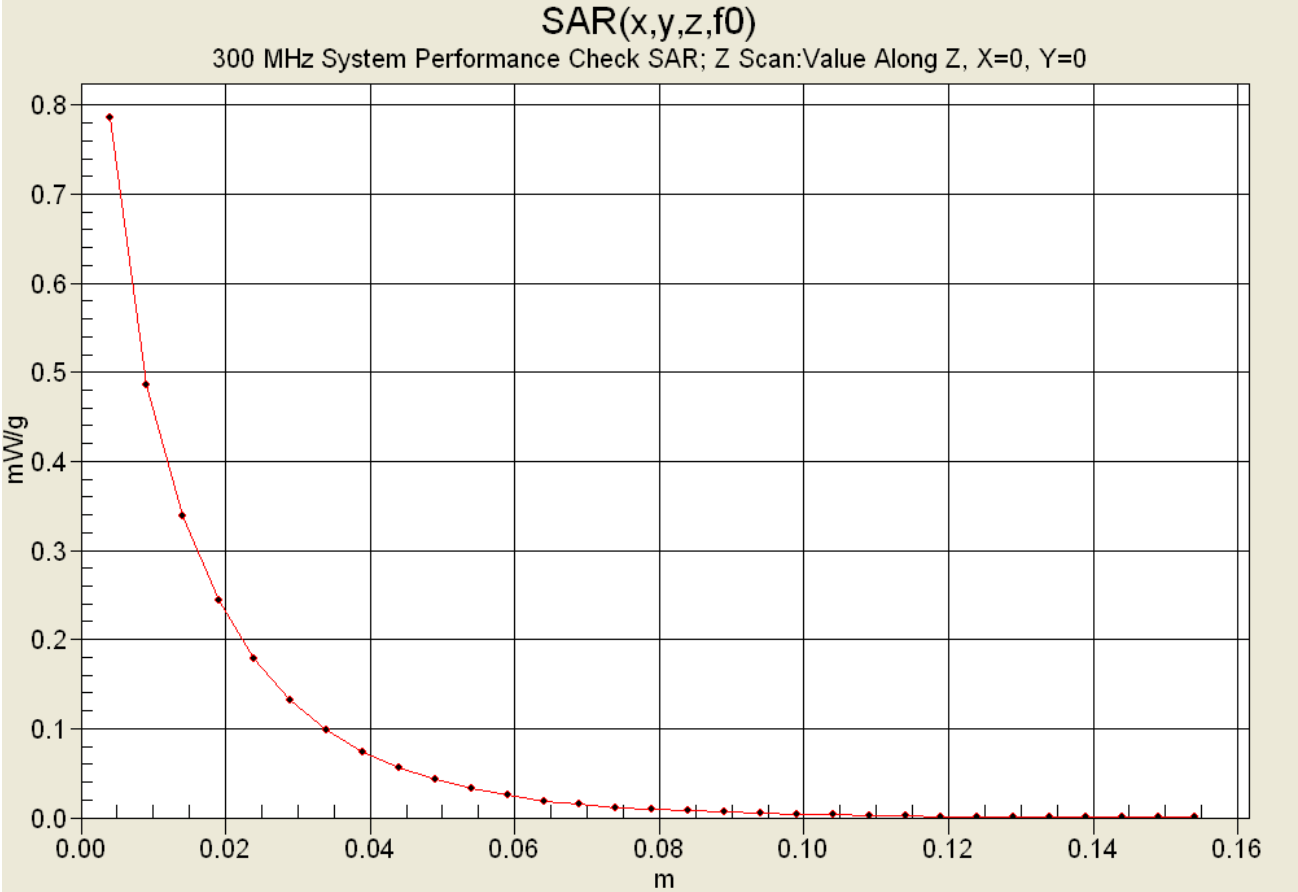
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.3 V/m; Power Drift = -0.0392 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.478 mW/g



Z-Axis Scan



Date Tested: 11/25/04

System Performance Check - 300 MHz Dipole

DUT: Dipole 300 MHz; Model: D300V2; Type: System Performance Check; Serial: 135; Calibrated: 10/26/2004

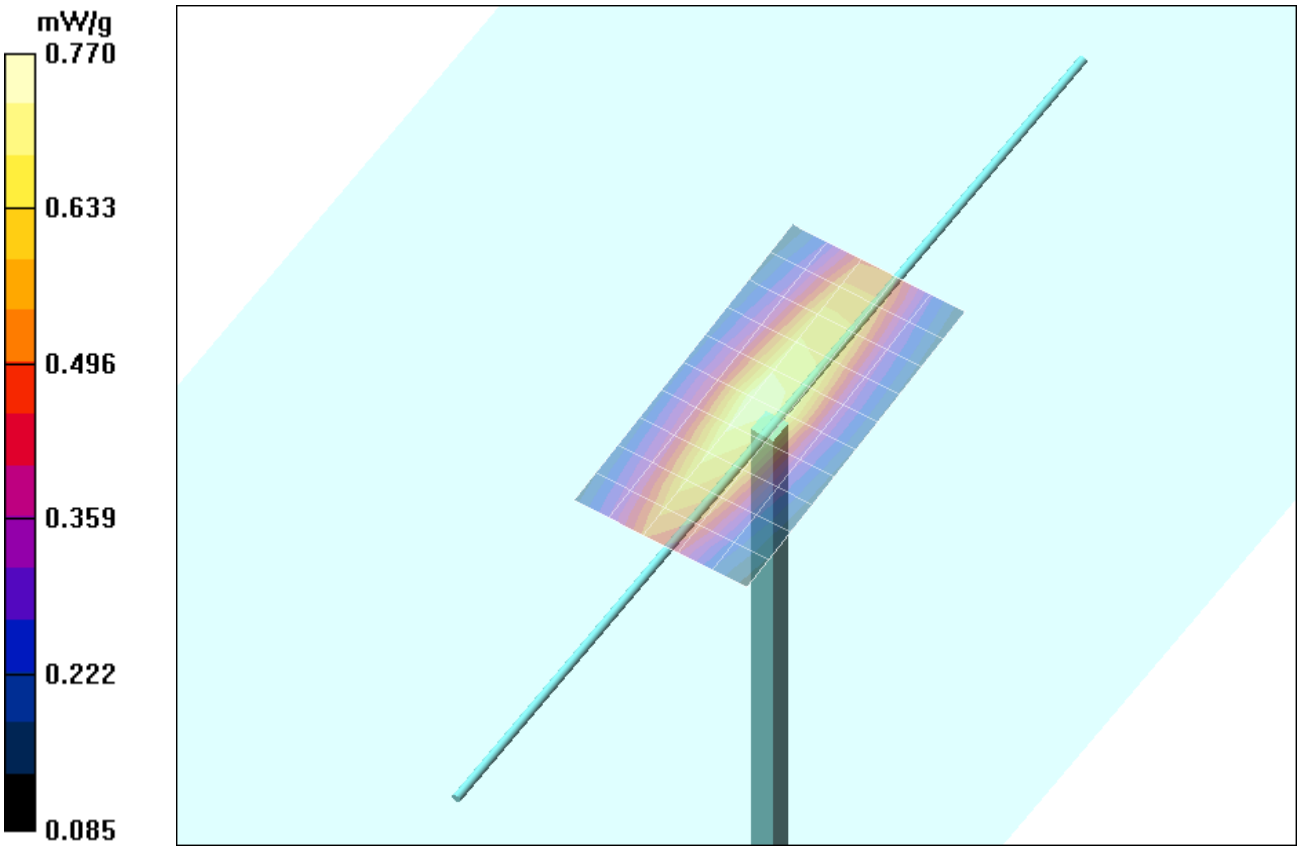
Ambient Temp: 23.3 °C; Fluid Temp: 21.8 °C; Barometric Pressure: 101.0 kPa; Humidity: 34%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.84 mho/m; ε_r = 44.8; ρ = 1000 kg/m^3)

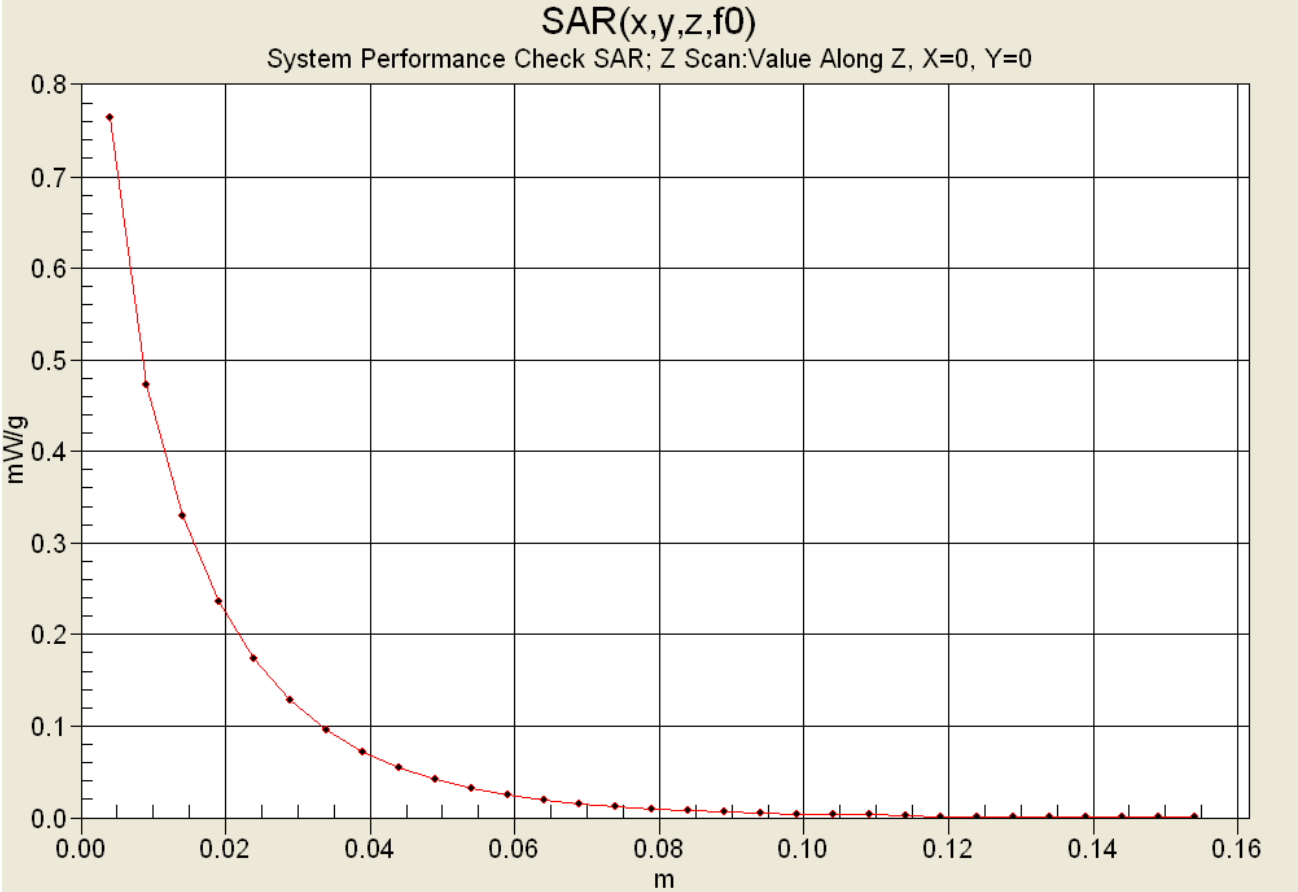
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz Dipole - System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

300 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.3 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.3 W/kg
SAR(1 g) = 0.730 mW/g; SAR(10 g) = 0.474 mW/g



Z-Axis Scan



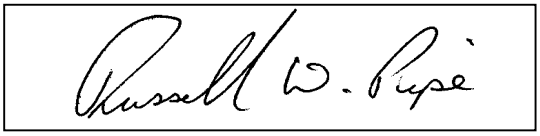
APPENDIX C - SYSTEM VALIDATION

300 MHz SYSTEM VALIDATION DIPOLE

Type:	**300 MHz Validation Dipole**
Serial Number:	**135**
Place of Calibration:	**Celltech Labs Inc.**
Date of Calibration:	**October 26, 2004**

Celltech Labs Inc. hereby certifies that this device has been calibrated on the date indicated above.

Calibrated by: 

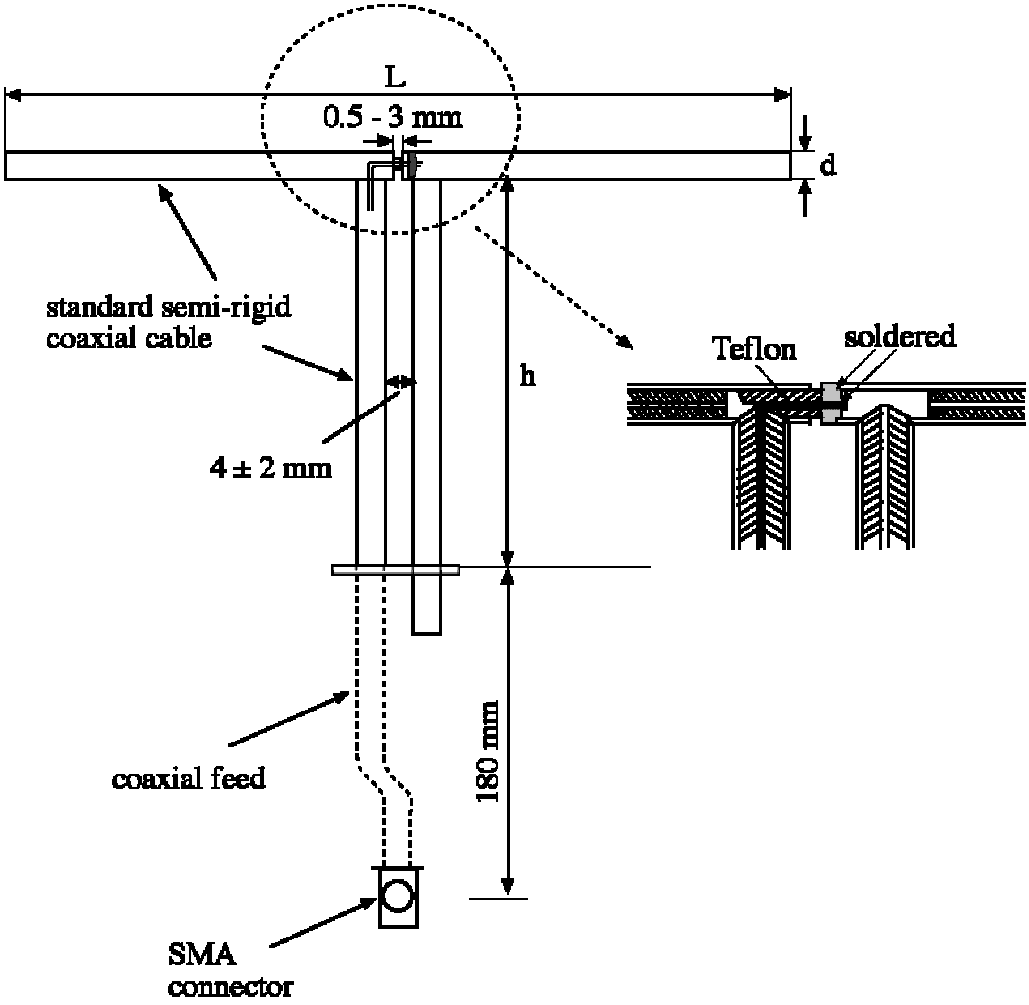
Approved by: 

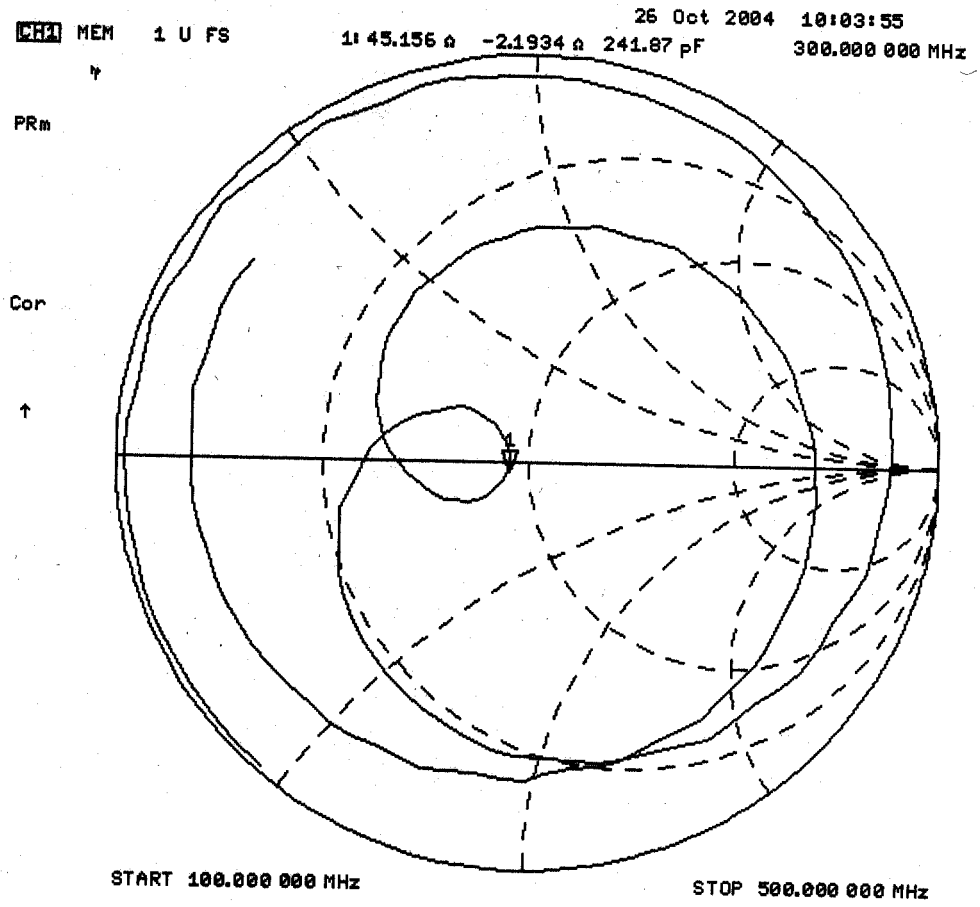
Celltech Labs Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-448-7047 • Fax. 250-448-7046 • e-mail: info@celltechlabs.com
www.celltechlabs.com

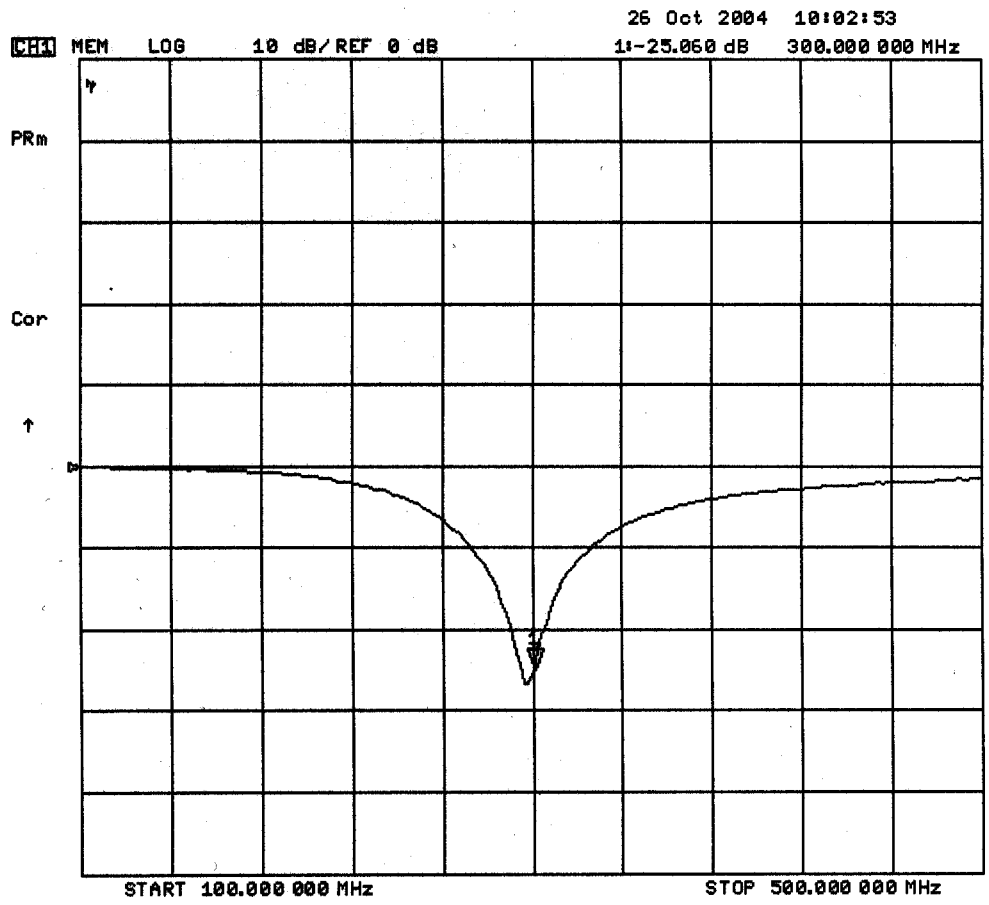
1. Validation Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std. “Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques”. The electrical properties were measured using an HP 8753E 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 15.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 300MHz	Re{Z} = 45.156Ω
	Im{Z} = -2.1934Ω
Return Loss at 300MHz	-25.060dB




CH1 MEM 1 U FS
1: 45.156 Ω -2.1934 Ω 241.87 pF
26 Oct 2004 10:03:55
300.000 000 MHz
PRm
Cor
START 100.000 000 MHz
STOP 500.000 000 MHz


26 Oct 2004 10:02:53
CH1 MEM LOG 10 dB/ REF 0 dB
1:-25.060 dB 300.000 000 MHz
PRm
Cor
START 100.000 000 MHz
STOP 500.000 000 MHz

2. 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

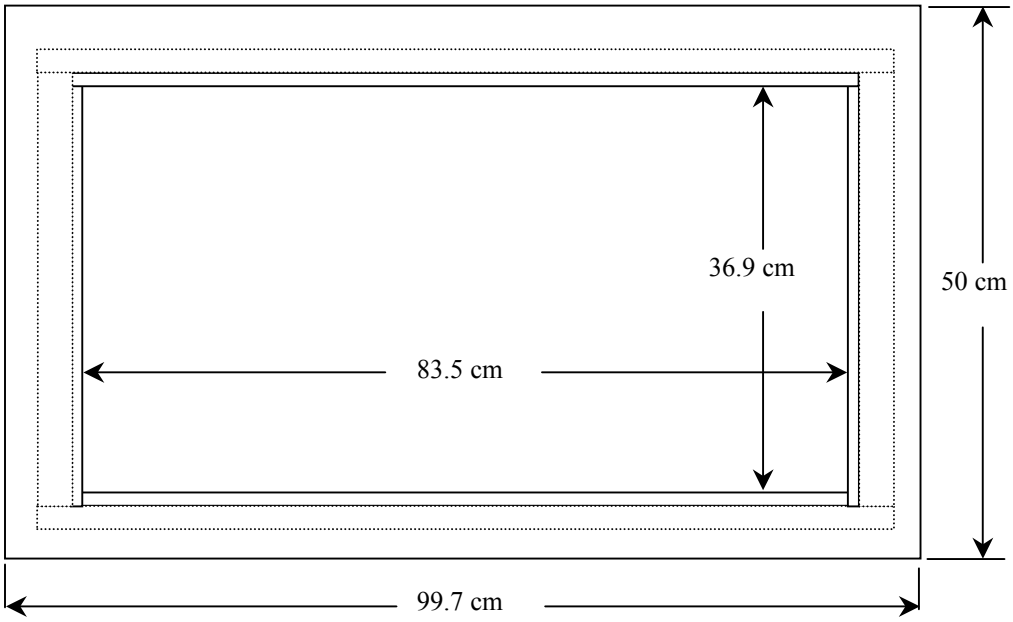
3. Validation Phantom

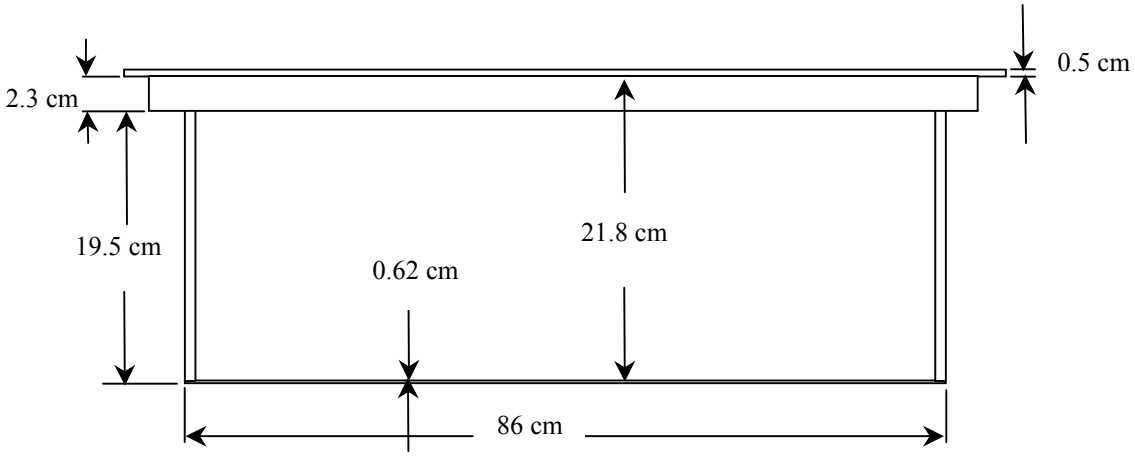
The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The inner dimensions of the phantom are as follows:

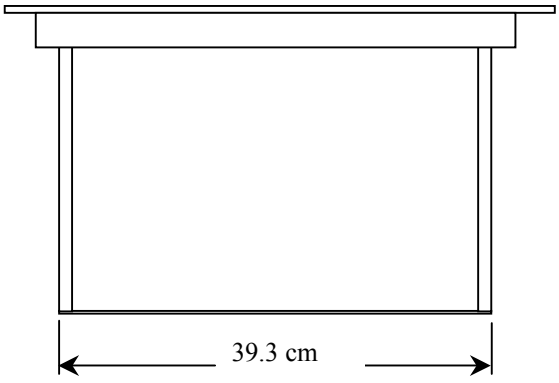
Length: 83.5 cm
Width: 36.9 cm
Height: 21.8 cm

The bottom section of the validation phantom is constructed of 6.2 ± 0.1mm Plexiglas.

4. Dimensions of Plexiglas Planar Phantom







5. 300 MHz System Validation Setup

300 MHz Validation Dipole Setup

6. Measurement Conditions

The planar phantom was filled with simulated brain tissue having the following parameters at 300 MHz:

Relative Permittivity:	45.9
Conductivity:	0.87 mho/m
Fluid Temperature:	22.8 °C
Fluid Depth:	≥ 15 cm

Environmental Conditions:

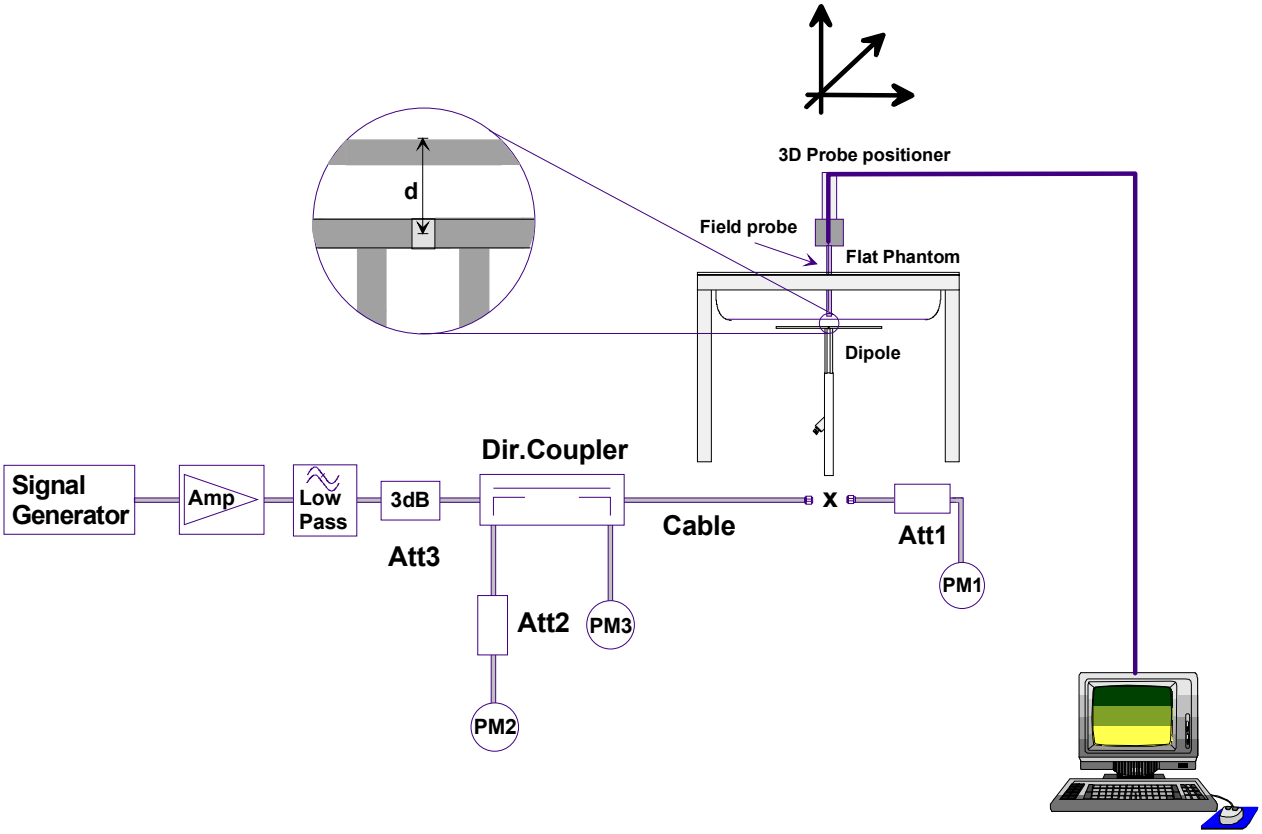
Ambient Temperature:	23.7 °C
Humidity:	33 %
Barometric Pressure:	101.9 kPa

The 300 MHz simulated brain tissue mixture consists of the following ingredients:

Ingredient	Percentage by weight
Water	37.56%
Sugar	55.32%
Salt	5.95%
HEC	0.98%
Dowicil 75	0.19%
300 MHz Target Dielectric Parameters at 22°C	ε_r = 45.3 σ = 0.87 S/m

7. 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 20dB below the forward power.

8. 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	0.740	2.96	0.478	1.91	0.779
Test 2	0.736	2.94	0.475	1.90	0.773
Test 3	0.747	2.99	0.482	1.93	0.790
Test 4	0.735	2.94	0.476	1.90	0.776
Test 5	0.743	2.97	0.480	1.92	0.781
Test 6	0.741	2.96	0.479	1.92	0.782
Test 7	0.742	2.97	0.480	1.92	0.780
Test 8	0.740	2.96	0.478	1.91	0.777
Test 9	0.748	2.99	0.484	1.94	0.787
Test 10	0.744	2.98	0.481	1.92	0.781
Average Value	0.742	2.97	0.479	1.92	0.781

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

IEEE Target over $1cm^3$ (1g) of tissue: 3.0 mW/g (+/- 10%)

Averaged over $1cm^3$ (1g) of tissue: 2.97 mW/g (-3% deviation)

IEEE Target over $10cm^3$ (10g) of tissue: 2.0 mW/g (+/- 10%)

Averaged over $10cm^3$ (10g) of tissue: 1.92 mW/g (-4% deviation)

300 MHz System Validation - October 26, 2004

DUT: Dipole 300 MHz; Model: D300V2; Serial: 135; Calibrated: 10/26/04
Ambient Temp: 23.7 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.9 kPa; Humidity: 33%

Communication System: CW
Frequency: 300 MHz; Duty Cycle: 1:1
Medium: 300 HSL (σ = 0.87 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3)
- Probe: ET3DV6 - SN1387; ConvF(7.8, 7.8, 7.8); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

300 MHz System Validation/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

300 MHz System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.478 mW/g

300 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.475 mW/g

300 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.747 mW/g; SAR(10 g) = 0.482 mW/g

300 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.735 mW/g; SAR(10 g) = 0.476 mW/g

300 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.743 mW/g; SAR(10 g) = 0.480 mW/g

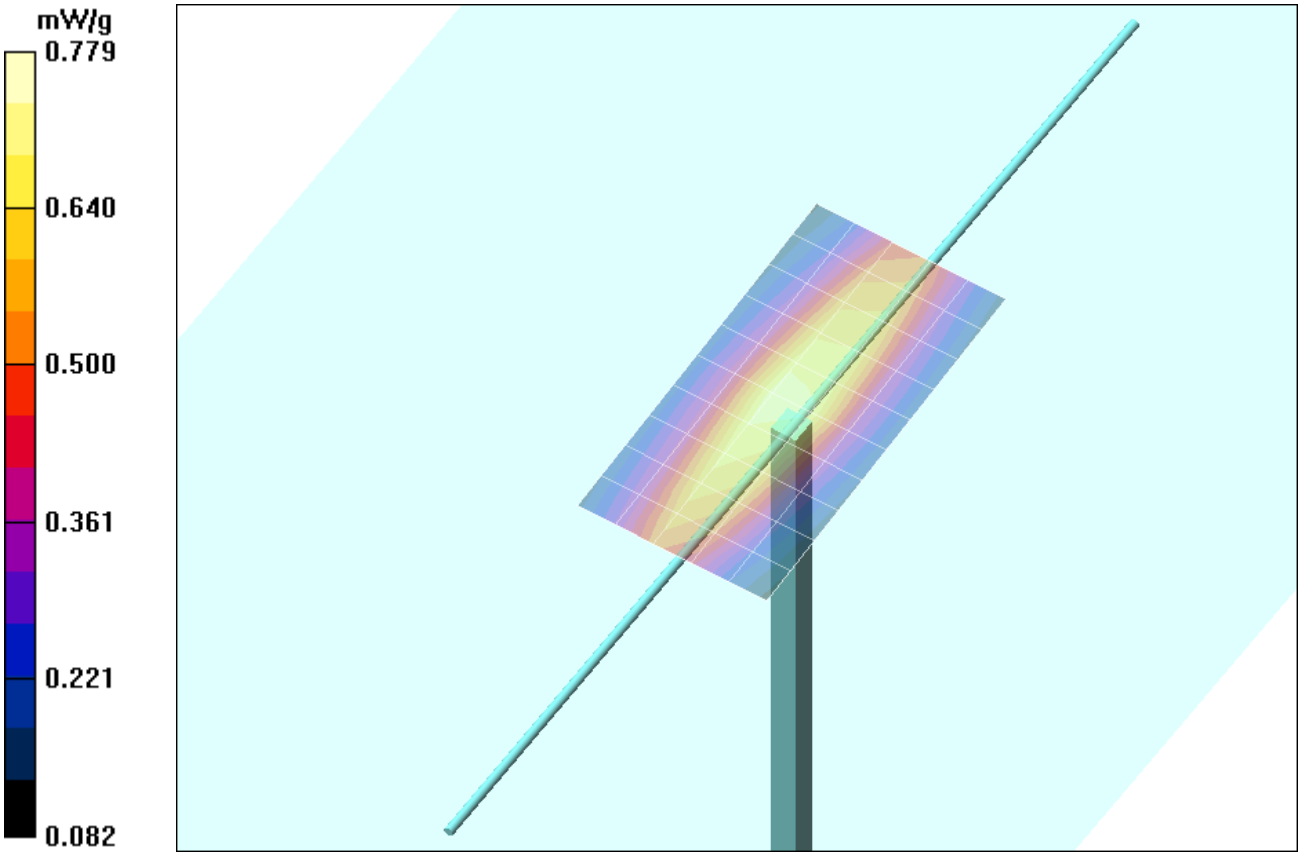
300 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.479 mW/g

300 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.742 mW/g; SAR(10 g) = 0.480 mW/g

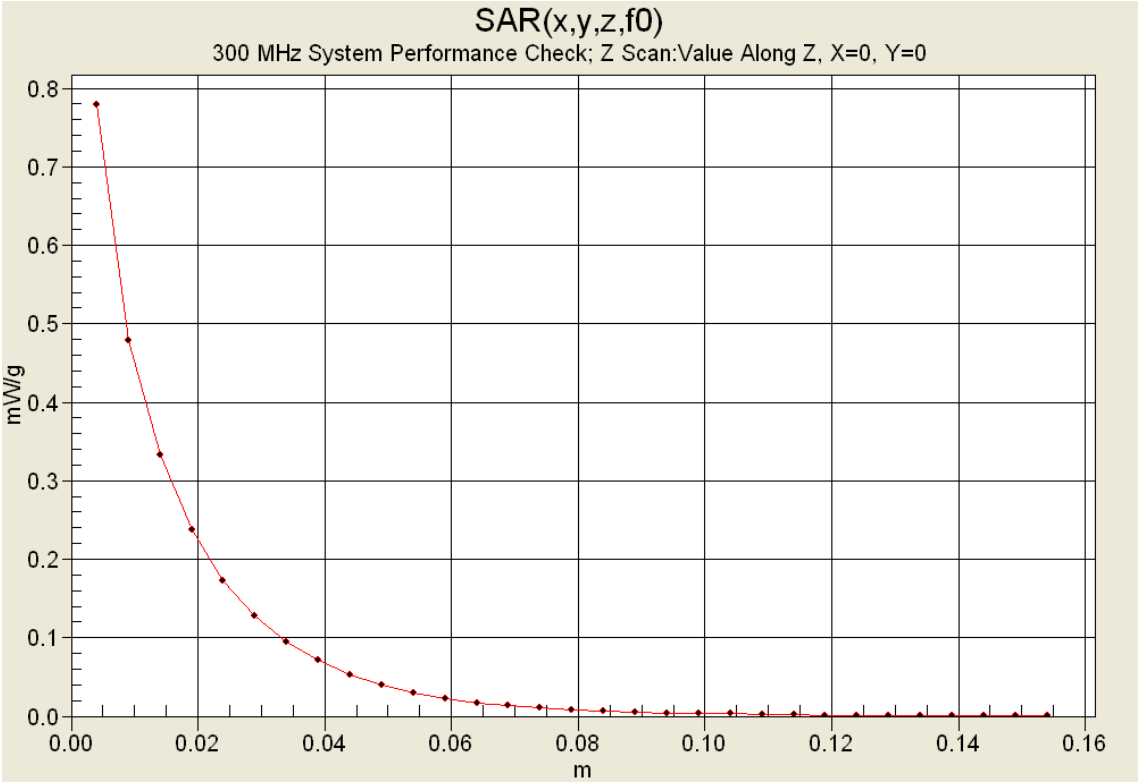
300 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = 4e-005 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.478 mW/g

300 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.748 mW/g; SAR(10 g) = 0.484 mW/g

300 MHz Validation/Zoom Scan 10 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.744 mW/g; SAR(10 g) = 0.481 mW/g



1 g average of 10 measurements: 0.742 mW/g
10 g average of 10 measurements: 0.479 mW/g



300 MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

October 26, 2004

Frequency	e'	e"
200.000000 MHz	49.9683	70.5699
210.000000 MHz	49.2757	67.8974
220.000000 MHz	49.0561	65.5986
230.000000 MHz	48.5199	63.5063
240.000000 MHz	47.9983	61.3980
250.000000 MHz	47.6116	59.5294
260.000000 MHz	47.1692	57.8735
270.000000 MHz	46.7769	56.3204
280.000000 MHz	46.4409	54.8280
290.000000 MHz	46.0613	53.4572
300.000000 MHz	45.8972	52.0989
310.000000 MHz	45.6039	51.0027
320.000000 MHz	45.2697	49.7697
330.000000 MHz	44.7890	48.6923
340.000000 MHz	44.3811	47.7213
350.000000 MHz	44.0222	46.8979
360.000000 MHz	43.6368	46.0075
370.000000 MHz	43.3432	45.1665
380.000000 MHz	43.1554	44.4459
390.000000 MHz	42.9327	43.7340
400.000000 MHz	42.6580	43.0434

APPENDIX D - PROBE CALIBRATION

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

Client **Celltech**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1387
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	March 18, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Reference 20 dB Attenuator	SN: 5086 (20b)	3-Apr-03 (METAS, No. 251-0340)	Apr-04
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: March 18, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Probe ET3DV6

SN:1387

Manufactured:	September 21, 1999
Last calibrated:	February 26, 2003
Recalibrated:	March 18, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space

Diode Compression[A]

NormX	**1.62** $\mu V/(V/m)^2$	DCP X	**92**	mV
NormY	**1.71** $\mu V/(V/m)^2$	DCP Y	**92**	mV
NormZ	**1.71** $\mu V/(V/m)^2$	DCP Z	**92**	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

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

Sensor Cener to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.3	4.4
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

Sensor to Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	14.8	10.0
SAR_{be} [%]	With Correction Algorithm	0.2	0.0

Sensor Offset

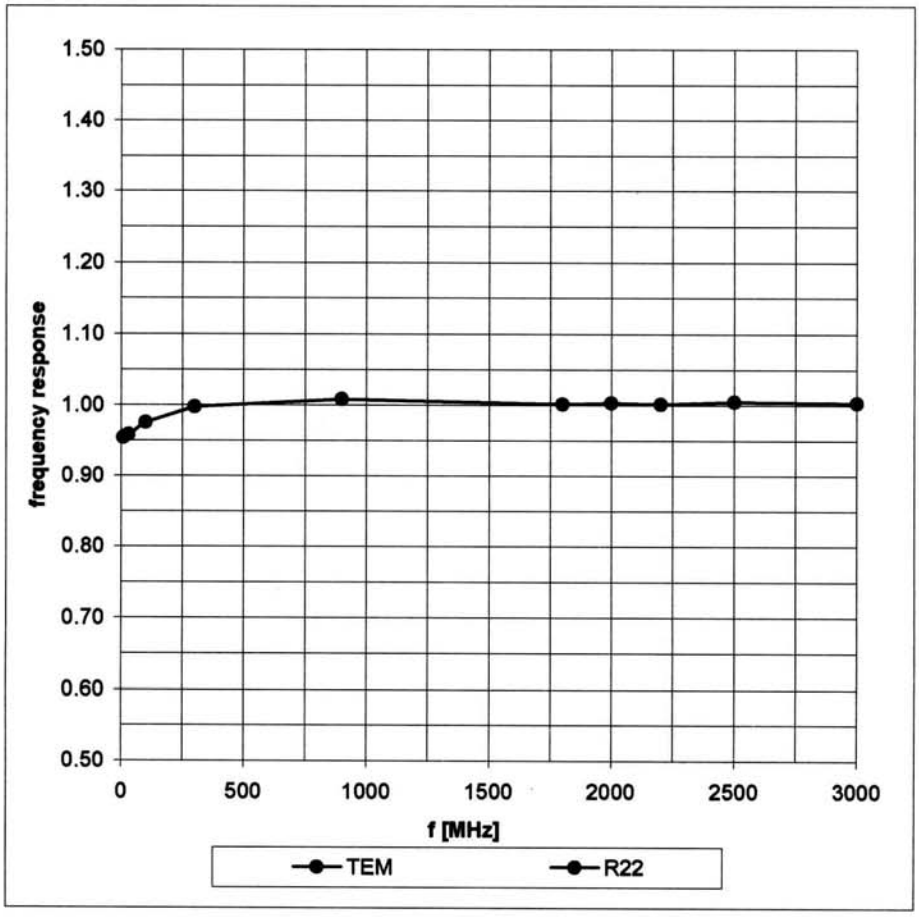
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

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%.

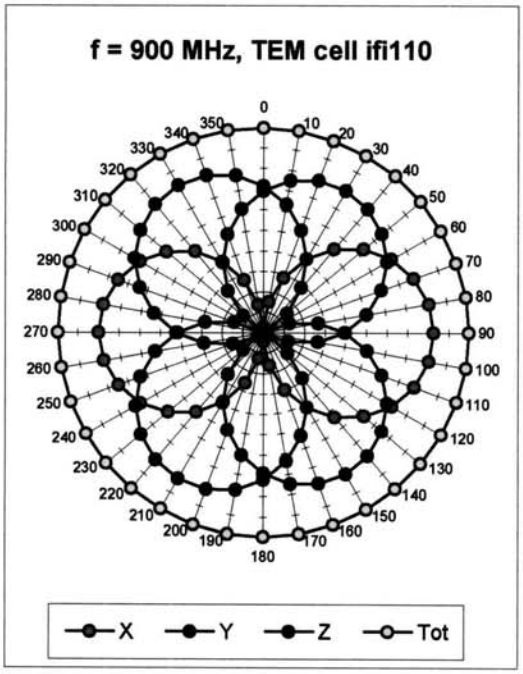
[A] numerical linearization parameter: uncertainty not required

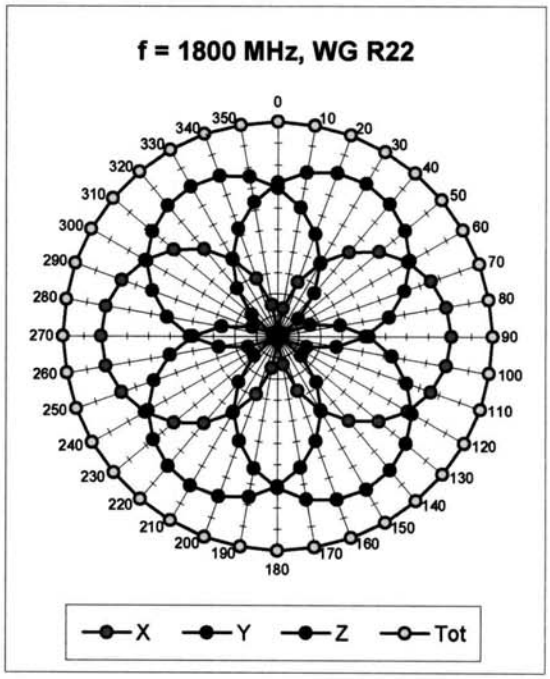
Frequency Response of E-Field

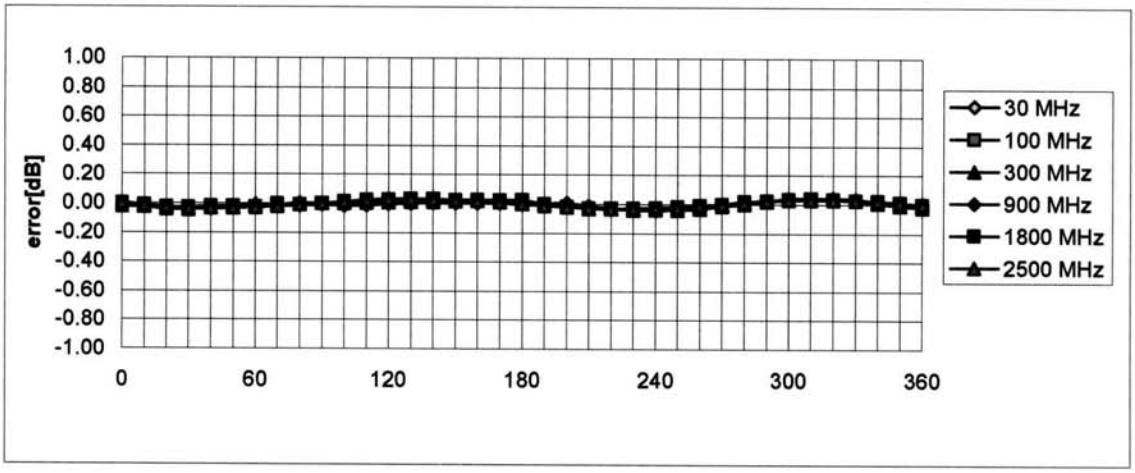
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ) , θ = 0°



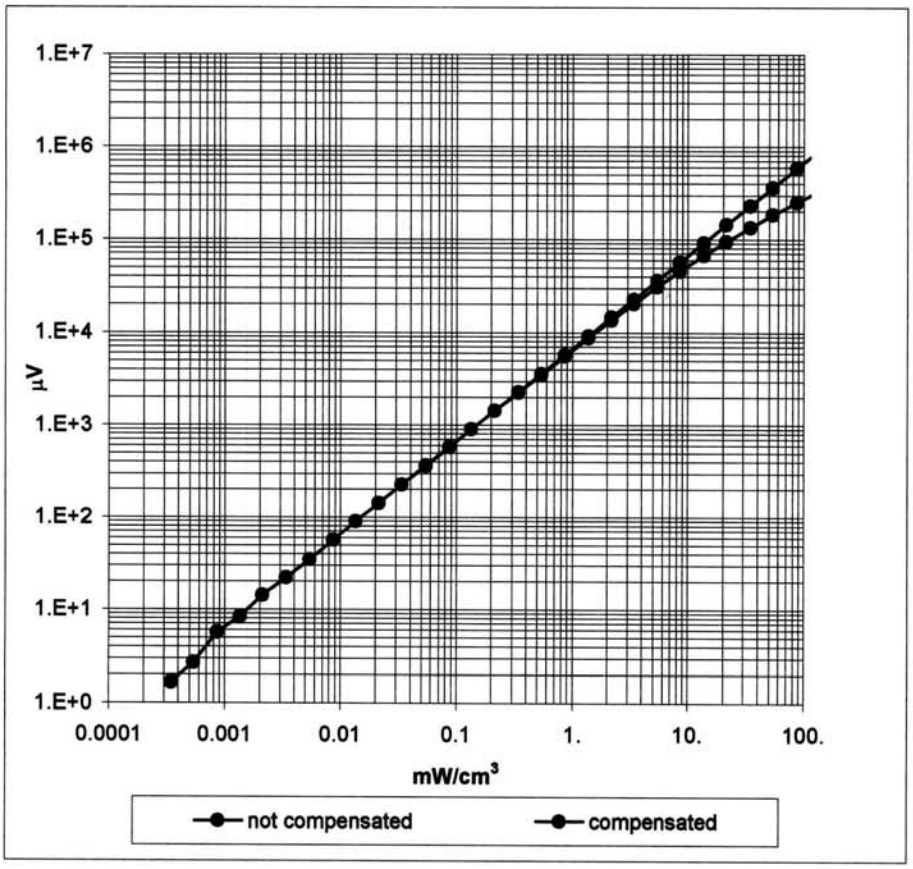


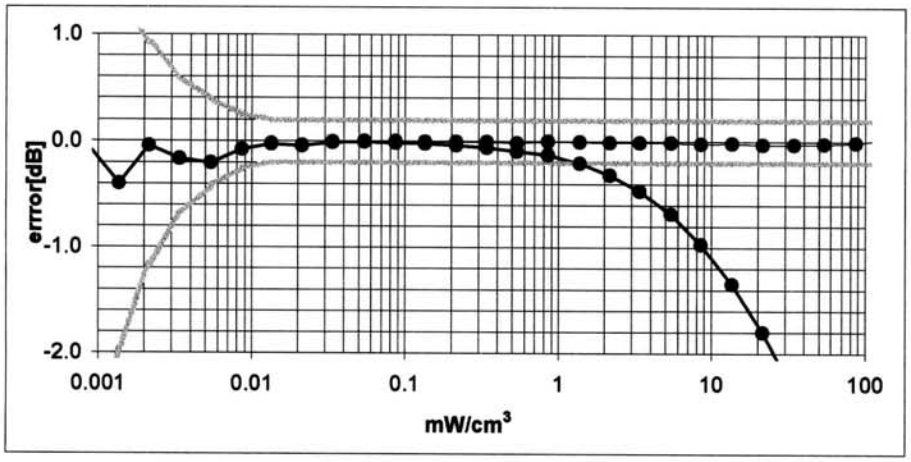


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

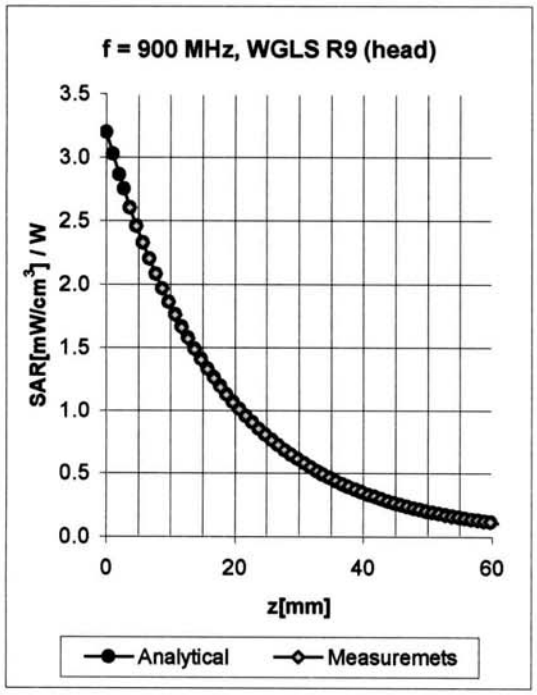
(Waveguide R22)

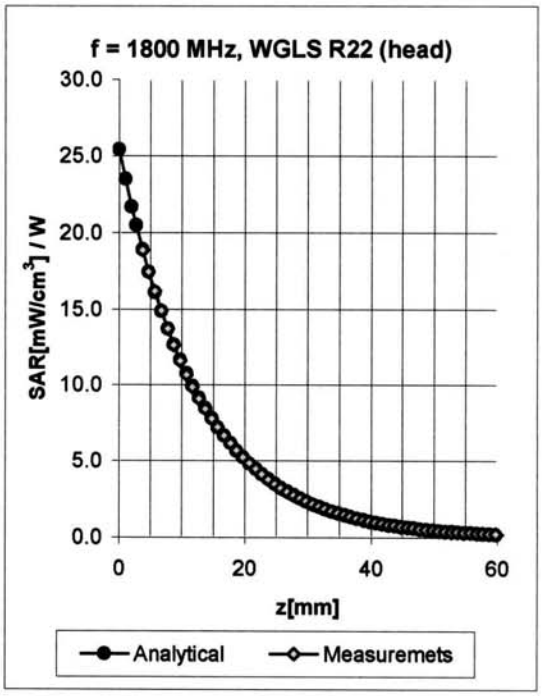




Probe Linearity < ± 0.2 dB

Conversion Factor Assessment



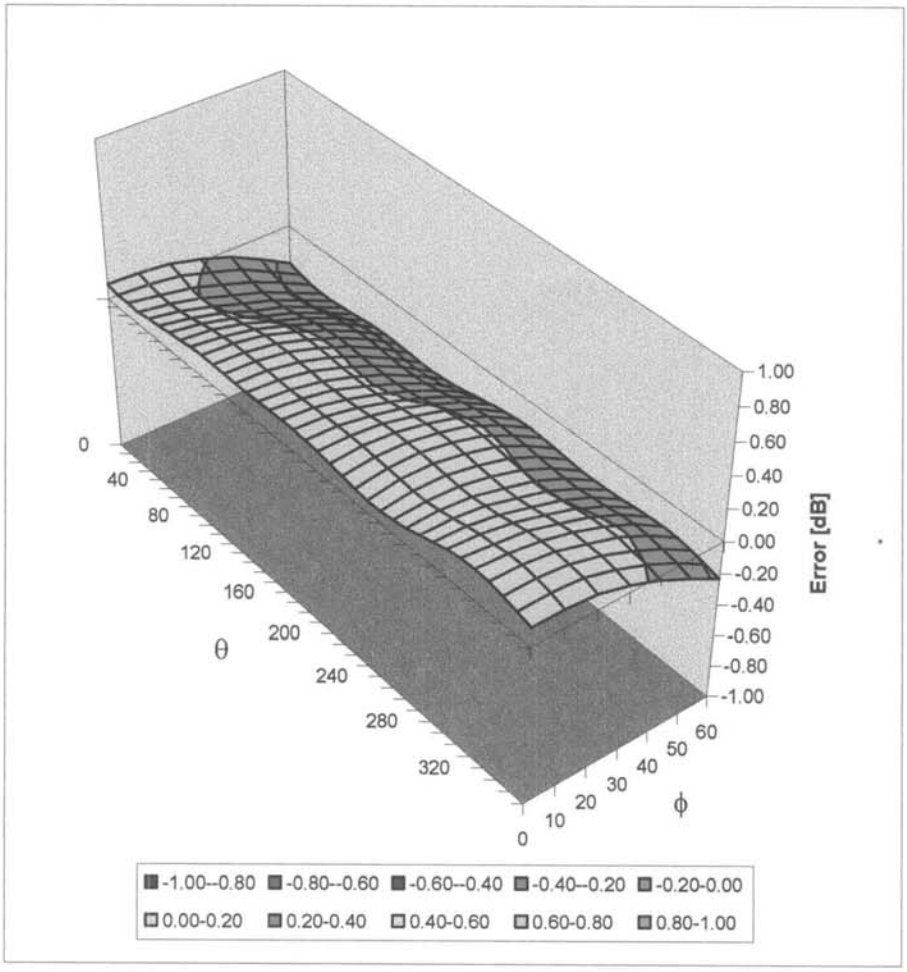


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	750-950	Head	41.5 ± 5%	0.90 ± 5%	0.72	1.78	6.71 ± 11.9% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.51	2.67	5.38 ± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.55	2.66	5.25 ± 9.7% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	0.99	1.89	4.77 ± 9.7% (k=2)
835	750-950	Body	55.2 ± 5%	0.97 ± 5%	0.56	2.04	6.24 ± 11.9% (k=2)
1750	1700-1800	Body	53.3 ± 5%	1.52 ± 5%	0.58	2.82	4.68 ± 9.7% (k=2)
1900	1850-1950	Body	53.3 ± 5%	1.52 ± 5%	0.62	2.77	4.57 ± 9.7% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	1.75	1.28	4.50 ± 9.7% (k=2)

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

Deviation from Isotropy in HSL

Error (θ,ϕ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

Schmid & Partner Engineering AG

s p e a g

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

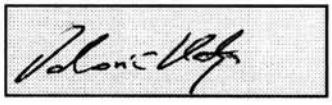
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1387**
Place of Assessment:	**Zurich**
Date of Assessment:	**March 22, 2004**
Probe Calibration Date:	**March 18, 2004**

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:



Schmid & Partner Engineering AG

s p e a g

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

Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion factor (± standard deviation)

150 MHz	ConvF	**9.1 ± 8%**	ε_r = 52.3 ± 5% σ = 0.76 ± 5% mho/m (head tissue)
300 MHz	ConvF	**7.8 ± 8%**	ε_r = 45.3 ± 5% σ = 0.87 ± 5% mho/m (head tissue)
450 MHz	ConvF	**7.5 ± 8%**	ε_r = 43.5 ± 5% σ = 0.87 ± 5% mho/m (head tissue)
150 MHz	ConvF	**8.7 ± 8%**	ε_r = 61.9 ± 5% σ = 0.80 ± 5% mho/m (body tissue)
450 MHz	ConvF	**7.6 ± 8%**	ε_r = 56.7 ± 5% σ = 0.94 ± 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 E - MEASURED FLUID DIELECTRIC PARAMETERS

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 26, 2004

Frequency	e'	e"
200.000000 MHz	49.9683	70.5699
210.000000 MHz	49.2757	67.8974
220.000000 MHz	49.0561	65.5986
230.000000 MHz	48.5199	63.5063
240.000000 MHz	47.9983	61.3980
250.000000 MHz	47.6116	59.5294
260.000000 MHz	47.1692	57.8735
270.000000 MHz	46.7769	56.3204
280.000000 MHz	46.4409	54.8280
290.000000 MHz	46.0613	53.4572
300.000000 MHz	45.8972	52.0989
310.000000 MHz	45.6039	51.0027
320.000000 MHz	45.2697	49.7697
330.000000 MHz	44.7890	48.6923
340.000000 MHz	44.3811	47.7213
350.000000 MHz	44.0222	46.8979
360.000000 MHz	43.6368	46.0075
370.000000 MHz	43.3432	45.1665
380.000000 MHz	43.1554	44.4459
390.000000 MHz	42.9327	43.7340
400.000000 MHz	42.6580	43.0434

150 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

October 27, 2004

Frequency	e'	e"
50.000000 MHz	68.1185	237.9476
60.000000 MHz	65.9213	200.5794
70.000000 MHz	63.4933	173.5954
80.000000 MHz	61.6711	154.2978
90.000000 MHz	60.1065	138.6016
100.000000 MHz	58.1040	126.2666
110.000000 MHz	56.7125	116.4856
120.000000 MHz	55.5832	108.0522
130.000000 MHz	55.0597	100.6311
140.000000 MHz	54.5808	94.6100
150.000000 MHz	53.9962	89.5833
160.000000 MHz	53.6618	85.0113
170.000000 MHz	53.1924	81.1255
180.000000 MHz	52.7975	77.2513
190.000000 MHz	52.3263	73.8730
200.000000 MHz	51.7376	71.0253
210.000000 MHz	51.1919	68.2288
220.000000 MHz	50.7758	65.6934
230.000000 MHz	50.1934	63.4819
240.000000 MHz	49.5524	61.3749
250.000000 MHz	49.1941	59.5606

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 27, 2004

Frequency	e'	e"
200.000000 MHz	49.8354	68.8922
210.000000 MHz	49.2891	66.1488
220.000000 MHz	48.8085	63.7988
230.000000 MHz	48.1861	61.5576
240.000000 MHz	47.5858	59.7095
250.000000 MHz	47.2206	57.8404
260.000000 MHz	46.9034	56.2849
270.000000 MHz	46.4445	54.8427
280.000000 MHz	46.1249	53.4905
290.000000 MHz	45.7830	52.3199
300.000000 MHz	45.5265	50.9958
310.000000 MHz	45.1364	49.8383
320.000000 MHz	44.7575	48.7266
330.000000 MHz	44.4280	47.7792
340.000000 MHz	44.1106	46.8002
350.000000 MHz	43.7292	45.8733
360.000000 MHz	43.4372	44.9648
370.000000 MHz	43.1954	44.1792
380.000000 MHz	43.0220	43.4150
390.000000 MHz	42.7674	42.6458
400.000000 MHz	42.5413	42.0175

150 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

October 28, 2004

Frequency	e'	e"
50.000000 MHz	68.4826	230.6026
60.000000 MHz	65.6828	195.1380
70.000000 MHz	63.0795	168.4159
80.000000 MHz	61.1585	148.9572
90.000000 MHz	59.5543	134.1239
100.000000 MHz	57.5458	122.0734
110.000000 MHz	56.5574	112.6145
120.000000 MHz	55.6385	104.6239
130.000000 MHz	54.6502	97.8329
140.000000 MHz	53.9440	91.7915
150.000000 MHz	53.5357	87.0776
160.000000 MHz	53.0066	82.5216
170.000000 MHz	52.6040	78.9709
180.000000 MHz	52.1608	75.1535
190.000000 MHz	51.6595	71.9979
200.000000 MHz	51.1219	69.0358
210.000000 MHz	50.5454	66.3972
220.000000 MHz	50.0504	64.0666
230.000000 MHz	49.4958	61.7461
240.000000 MHz	48.9021	59.7782
250.000000 MHz	48.4115	57.9926

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 29, 2004

Frequency	e'	e"
200.000000 MHz	49.1900	68.2648
210.000000 MHz	48.5406	65.6220
220.000000 MHz	47.9786	63.2883
230.000000 MHz	47.4613	61.0647
240.000000 MHz	46.8240	59.0892
250.000000 MHz	46.3062	57.2630
260.000000 MHz	45.8564	55.8429
270.000000 MHz	45.6027	54.4180
280.000000 MHz	45.2962	53.2327
290.000000 MHz	45.0574	51.9787
300.000000 MHz	44.8797	50.6756
310.000000 MHz	44.5015	49.5844
320.000000 MHz	44.2371	48.4058
330.000000 MHz	43.8322	47.3521
340.000000 MHz	43.3407	46.3472
350.000000 MHz	43.0267	45.4288
360.000000 MHz	42.7279	44.5252
370.000000 MHz	42.4542	43.7246
380.000000 MHz	42.2106	42.9850
390.000000 MHz	41.9245	42.3433
400.000000 MHz	41.6912	41.6852

150 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

October 29, 2004

Frequency	e'	e"
50.000000 MHz	78.5737	252.2147
60.000000 MHz	74.3555	212.3887
70.000000 MHz	71.9621	183.0125
80.000000 MHz	69.2043	162.0091
90.000000 MHz	66.3192	145.0549
100.000000 MHz	64.4457	131.8638
110.000000 MHz	63.3319	120.4018
120.000000 MHz	62.4343	111.2739
130.000000 MHz	62.2022	103.7844
140.000000 MHz	61.9406	97.1460
150.000000 MHz	61.7278	91.8404
160.000000 MHz	61.6364	86.9444
170.000000 MHz	61.6419	82.9659
180.000000 MHz	61.3076	78.8254
190.000000 MHz	60.9659	75.3085
200.000000 MHz	60.5632	72.1624
210.000000 MHz	59.9186	69.2160
220.000000 MHz	59.4296	66.5204
230.000000 MHz	59.0264	64.0831
240.000000 MHz	58.4987	61.9460
250.000000 MHz	58.1818	59.9546

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 30, 2004

Frequency	e'	e"
200.000000 MHz	51.1585	69.4855
210.000000 MHz	50.2534	66.8928
220.000000 MHz	49.5897	64.5945
230.000000 MHz	48.6183	62.3818
240.000000 MHz	47.7817	60.5368
250.000000 MHz	47.2945	58.6292
260.000000 MHz	46.8517	57.0724
270.000000 MHz	46.7188	55.5856
280.000000 MHz	46.6572	54.1797
290.000000 MHz	46.5209	53.0335
300.000000 MHz	46.2411	51.6705
310.000000 MHz	45.8842	50.6060
320.000000 MHz	45.3581	49.5101
330.000000 MHz	44.8684	48.3898
340.000000 MHz	44.3223	47.3319
350.000000 MHz	43.9007	46.3943
360.000000 MHz	43.4944	45.4265
370.000000 MHz	43.2214	44.6557
380.000000 MHz	43.0872	43.9191
390.000000 MHz	42.8919	43.2601
400.000000 MHz	42.7090	42.6322

150 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

October 30, 2004

Frequency	e'	e"
50.000000 MHz	91.0101	254.8019
60.000000 MHz	84.6586	214.1675
70.000000 MHz	78.8187	184.2949
80.000000 MHz	73.7955	164.3486
90.000000 MHz	69.7224	147.8830
100.000000 MHz	66.0180	135.3805
110.000000 MHz	63.6632	124.3650
120.000000 MHz	62.5651	115.1939
130.000000 MHz	62.0424	107.2044
140.000000 MHz	62.2084	100.1801
150.000000 MHz	62.2940	93.9385
160.000000 MHz	62.7207	88.6103
170.000000 MHz	62.7296	84.0647
180.000000 MHz	62.8089	79.7028
190.000000 MHz	62.3912	76.1129
200.000000 MHz	61.6674	72.8638
210.000000 MHz	60.7761	70.0788
220.000000 MHz	60.0816	67.6999
230.000000 MHz	59.3704	65.2590
240.000000 MHz	58.7450	63.2219
250.000000 MHz	58.3173	61.2758

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 31, 2004

Frequency	e'	e"
200.000000 MHz	49.0997	68.9500
210.000000 MHz	48.6006	66.3618
220.000000 MHz	48.1464	63.9486
230.000000 MHz	47.6378	61.8569
240.000000 MHz	47.1006	60.0635
250.000000 MHz	46.7465	58.2657
260.000000 MHz	46.2280	56.7329
270.000000 MHz	45.9012	55.2659
280.000000 MHz	45.6044	53.9302
290.000000 MHz	45.2675	52.6184
300.000000 MHz	45.0545	51.2694
310.000000 MHz	44.6694	50.1328
320.000000 MHz	44.3455	49.0220
330.000000 MHz	43.8761	47.9573
340.000000 MHz	43.5481	47.0644
350.000000 MHz	43.2287	46.1140
360.000000 MHz	42.9260	45.2854
370.000000 MHz	42.6574	44.4408
380.000000 MHz	42.3764	43.7651
390.000000 MHz	42.1171	42.9916
400.000000 MHz	41.8626	42.3415

150 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

October 31, 2004

Frequency	e'	e"
50.000000 MHz	69.6773	253.4513
60.000000 MHz	67.7040	212.0048
70.000000 MHz	66.2067	182.9431
80.000000 MHz	65.1149	161.6236
90.000000 MHz	64.2764	144.9690
100.000000 MHz	63.3502	132.0010
110.000000 MHz	62.7840	121.2495
120.000000 MHz	62.1448	112.1437
130.000000 MHz	61.6926	104.1953
140.000000 MHz	61.2472	97.7210
150.000000 MHz	60.9121	91.9273
160.000000 MHz	60.6528	86.8664
170.000000 MHz	60.4060	82.3884
180.000000 MHz	60.1163	78.3094
190.000000 MHz	60.0281	74.8064
200.000000 MHz	59.6205	71.6104
210.000000 MHz	59.2426	68.7698
220.000000 MHz	58.9473	66.4191
230.000000 MHz	58.6038	64.0199
240.000000 MHz	58.2834	62.0393
250.000000 MHz	58.0119	60.0743

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

November 24, 2004

Frequency	e'	e"
200.000000 MHz	49.4278	68.6776
210.000000 MHz	48.8085	66.2665
220.000000 MHz	48.4644	63.9405
230.000000 MHz	47.9927	61.8080
240.000000 MHz	47.3946	59.8819
250.000000 MHz	46.9166	58.1339
260.000000 MHz	46.4804	56.5331
270.000000 MHz	46.1820	55.1459
280.000000 MHz	45.8636	53.8444
290.000000 MHz	45.5089	52.4493
300.000000 MHz	45.2080	51.1415
310.000000 MHz	44.7675	49.9195
320.000000 MHz	44.4962	48.8478
330.000000 MHz	44.2132	47.7913
340.000000 MHz	43.8760	46.8032
350.000000 MHz	43.6077	45.8640
360.000000 MHz	43.2727	45.0554
370.000000 MHz	42.9974	44.2384
380.000000 MHz	42.7429	43.4955
390.000000 MHz	42.4711	42.7064
400.000000 MHz	42.2077	42.0621

150 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

November 24, 2004

Frequency	e'	e"
50.000000 MHz	70.4589	261.0759
60.000000 MHz	68.2144	219.3830
70.000000 MHz	66.4857	188.9273
80.000000 MHz	66.4513	166.7682
90.000000 MHz	65.0247	149.3809
100.000000 MHz	64.3152	135.7142
110.000000 MHz	63.6797	123.9914
120.000000 MHz	63.0799	114.6499
130.000000 MHz	62.4570	106.7667
140.000000 MHz	62.3244	99.7312
150.000000 MHz	61.6789	93.7916
160.000000 MHz	61.2976	88.8769
170.000000 MHz	61.0600	84.4469
180.000000 MHz	60.9561	80.3260
190.000000 MHz	60.4852	76.7252
200.000000 MHz	60.2821	73.5577
210.000000 MHz	59.8436	70.6472
220.000000 MHz	59.5640	67.9998
230.000000 MHz	59.1620	65.6803
240.000000 MHz	58.8865	63.5541
250.000000 MHz	58.5867	61.5794

300 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

November 25, 2004

Frequency	e'	e"
200.000000 MHz	49.0182	67.6418
210.000000 MHz	48.4345	65.2781
220.000000 MHz	47.9398	63.2728
230.000000 MHz	47.4125	61.1228
240.000000 MHz	46.7091	59.1511
250.000000 MHz	46.2348	57.5674
260.000000 MHz	45.8594	55.8745
270.000000 MHz	45.6120	54.3556
280.000000 MHz	45.2902	53.0254
290.000000 MHz	44.9329	51.7474
300.000000 MHz	44.7621	50.3544
310.000000 MHz	44.3409	49.2246
320.000000 MHz	43.9456	48.0200
330.000000 MHz	43.5483	46.9783
340.000000 MHz	43.1699	46.0462
350.000000 MHz	42.8990	45.2639
360.000000 MHz	42.6190	44.3981
370.000000 MHz	42.3729	43.6208
380.000000 MHz	42.1366	42.9277
390.000000 MHz	41.9190	42.3006
400.000000 MHz	41.5733	41.5948

150 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

November 25, 2004

Frequency	e'	e"
50.000000 MHz	70.1472	270.3890
60.000000 MHz	67.7061	226.8206
70.000000 MHz	66.6989	194.6999
80.000000 MHz	65.8253	172.5758
90.000000 MHz	65.3763	154.0075
100.000000 MHz	64.1900	139.6993
110.000000 MHz	63.7581	128.0931
120.000000 MHz	63.1748	118.5161
130.000000 MHz	62.4379	110.4102
140.000000 MHz	62.1557	102.8338
150.000000 MHz	61.6196	96.7395
160.000000 MHz	61.4298	91.2428
170.000000 MHz	61.0532	86.7361
180.000000 MHz	60.9708	82.3508
190.000000 MHz	60.7693	78.6434
200.000000 MHz	60.3560	75.4213
210.000000 MHz	59.9821	72.4377
220.000000 MHz	59.5903	70.0827
230.000000 MHz	59.3195	67.4798
240.000000 MHz	58.8990	65.2268
250.000000 MHz	58.5994	63.1375