APPENDIX A: RF EXPOSURE

Please see the SAR Evaluation that follows.

DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab

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Applicant Information

E.F. JOHNSON CO.
299 Johnson Ave. SW
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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)**
FCC Device Classification:	**Licensed Non-Broadcast Transmitter Held to Face (TNF)**
Device Type:	**Portable FM PTT Radio Transceiver**
FCC IDENTIFIER:	**ATH2425171**
Model(s):	**242-5172**
Tx Frequency Range(s):	**762-776 MHz (Receive & Transmit Talk-Around)** **792-806 MHz (Transmit)** **806-824 MHz (Transmit)** **851-869 MHz (Receive & Transmit Talk-Around)**
Max. RF Output Power Tested:	**34.88 dBm Conducted (769.0125 MHz)** **34.89 dBm Conducted (799.0125 MHz)** **35.24 dBm Conducted (814.5125 MHz)** **35.28 dBm Conducted (859.5125 MHz)**
Antenna Type(s) Tested:	**½ Wave Whip (P/N: 501-0105-013)** **¼ Wave Stubby (P/N: 501-0105-012)**
Battery Type(s) Tested:	**NiMH 7.5 V 3600 mAh (P/N: 587-5100-360)** **Alkaline 1.5 V AA x12 (Battery Case P/N: 250-5100-280)** **(Type 1: Duracell Procell 2850 mAh, Type 2: Energizer E91 2850 mAh)**
Body-Worn Accessories:	**Speaker-Microphone with Antenna (P/N: 589-0015-058)** **Speaker-Microphone (P/N: 589-0015-057)** **Boom-Microphone Headset (P/N: 589-0015-059)** **Plastic Belt-Clip with Metal Spring Connector (P/N: 585-5100-128)**
Max. SAR Levels Measured:	**Face-held: 2.27 W/kg (50% Duty Cycle)** **Body-worn: 5.00 W/kg (50% Duty Cycle)**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device was compliant 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.

Russell W. Pipe
Senior Compliance Technologist
Celltech Labs Inc.

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1.0 INTRODUCTION

This measurement report demonstrates that the E.F. Johnson Model: 242-5172 Portable FM PTT Radio Transceiver FCC ID: ATH2425171 complies 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 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 device, 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)	IC RSS-102 Issue 1 (Provisional)			
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (Edition 01-01)			
FCC Device Classification	Licensed Non-Broadcast Transmitter Held to Face (TNF)			
Device Type	Portable FM PTT Radio Transceiver			
FCC IDENTIFIER	ATH2425171			
Model(s)	242-5172			
Serial No.(s)	51720A000A 00001		Production Unit	
Tx Frequency Range(s)	762-776 MHz		Receive and Transmit Talk-Around	
	792-806 MHz		Transmit	
	806-824 MHz		Transmit	
	851-869 MHz		Receive and Transmit Talk-Around	
Max. RF Output Power Measured	34.88 dBm		Conducted	769.0125 MHz
	34.89 dBm		Conducted	799.0125 MHz
	35.24 dBm		Conducted	814.5125 MHz
	35.28 dBm		Conducted	859.5125 MHz
Antenna Type(s) Tested	½ Wave Whip		Length - 183 mm	P/N: 501-0105-013
	¼ Wave Stubby		Length - 99 mm	P/N: 501-0105-012
Battery Type(s) Tested	NiMH	7.5 V, 3600 mAh		P/N: 587-5100-360
	Alkaline	1.5V AA (x12)	Duracell Procell 2850 mAh	With Battery Case P/N: 250-5100-280
			Energizer E91 2850 mAh	
Body-worn Accessories Tested	Speaker-Microphone with Antenna (P/N: 589-0015-058)			
	Speaker-Microphone (P/N: 589-0015-057)			
	Boom-Microphone Headset (P/N: 589-0015-059)			
	Plastic Belt-Clip with Metal Spring Connector (P/N: 585-5100-128)			

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 side-mount planar phantom

4.0 SAR MEASUREMENT SUMMARY

FACE-HELD SAR EVALUATION RESULTS

Radio Transceiver

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Whip	501-0105-013	2.5	34.88		1.61	0.805	-0.400	1.77	0.883
769.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	2.5	34.87		1.58	0.790	-0.398	1.73	0.866
799.0125	Mid	CW	NiMH	Whip	501-0105-013	2.5	34.89		2.04	1.02	-0.765	2.43	1.22
799.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	2.5	34.83		1.94	0.970	-1.22	2.57	1.29

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

Test Date	May 23, 2004			May 23, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Brain			799 MHz Brain			Atmospheric Pressure	102.5	102.5	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	37	37	%
	41.8	± 5%	42.3	41.7	± 5%	42.0	Ambient Temperature	23.5	23.5	°C
Conductivity σ (mho/m)	769 MHz Brain			799 MHz Brain			Fluid Temperature	21.5	21.5	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.89	± 5%	0.85	0.89	± 5%	0.88	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Radio Transceiver

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
814.5125	Mid	CW	NiMH	Whip	501-0105-013	2.5	35.20		2.42	1.21	-0.965	3.02	1.51
814.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	2.5	35.22		2.59	1.30	-1.42	3.59	1.80
859.5125	Mid	CW	NiMH	Whip	501-0105-013	2.5	35.24		1.60	0.800	-0.122	1.65	0.823
859.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	2.5	35.23		1.58	0.790	-0.104	1.62	0.809

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

Test Date	May 23, 2004			May 23, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Brain			860 MHz Brain			Atmospheric Pressure	102.5	102.5	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	37	37	%
	41.6	± 5%	41.4	41.5	± 5%	40.8	Ambient Temperature	23.5	23.5	°C
Conductivity σ (mho/m)	815 MHz Brain			860 MHz Brain			Fluid Temperature	21.5	21.5	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.90	± 5%	0.89	0.91	± 5%	0.93	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Radio Transceiver

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	34.83		3.07	1.54	-0.422	3.38	1.69
769.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	2.5	34.75		3.32	1.66	-0.799	3.99	2.00
799.0125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	34.82		2.74	1.37	-0.619	3.16	1.58
799.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	2.5	34.73		2.81	1.41	-1.34	3.83	1.91

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

Test Date	May 25, 2004			May 25, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Brain			799 MHz Brain			Atmospheric Pressure	102.1	102.1	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	40	40	%
	41.8	± 5%	42.1	41.7	± 5%	41.8	Ambient Temperature	22.9	22.9	°C
Conductivity σ (mho/m)	769 MHz Brain			799 MHz Brain			Fluid Temperature	21.2	21.2	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.89	± 5%	0.85	0.89	± 5%	0.88	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Radio Transceiver

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)		
							dBm	☑	Duty Cycle				Duty Cycle		
							Watts		100%		50%		100%		50%
814.5125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	35.14		3.02		1.51	-0.584	3.45		1.73
814.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	2.5	35.09	P	3.25		1.63	-1.46	P	4.55	2.27
							35.11	S	1.97		0.99	-1.53	S	2.80	1.40
859.5125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	35.12	P	2.97		1.49	-0.757	P	3.54	1.77
							35.15	S	2.13		1.07	-0.638	S	2.47	1.23
859.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	2.5	35.08	P	2.71		1.36	-1.36	P	3.71	1.85
							35.10	S	2.31		1.16	-1.15	S	3.01	1.51

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

Test Date	May 25, 2004			May 25, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Brain			860 MHz Brain			Atmospheric Pressure	102.1	102.1	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	40	40	%
	41.6	± 5%	41.7	41.5	± 5%	41.0	Ambient Temperature	22.9	22.9	°C
Conductivity σ (mho/m)	815 MHz Brain			860 MHz Brain			Fluid Temperature	21.2	21.2	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.90	± 5%	0.90	0.91	± 5%	0.94	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 SAR levels measured at the mid channel 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. Secondary hotspots were reported for SAR levels within 2 dB of the primary (P = Primary, S = Secondary).
4. The power drifts measured by the DASY 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 table.
5. 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.
6. 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).
7. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Speaker-Microphone with Antenna

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Whip	501-0105-013	2.5	34.78		2.41	1.21	-0.768	2.88	1.44
769.0125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	34.73		2.41	1.21	-0.401	2.64	1.32
799.0125	Mid	CW	NiMH	Whip	501-0105-013	2.5	34.79		1.73	0.865	-0.354	1.88	0.938
799.0125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	34.83		2.40	1.20	-0.209	2.52	1.26

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

Test Date	May 26, 2004			May 26, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Brain			799 MHz Brain			Atmospheric Pressure	101.1	101.1	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	38	38	%
	41.8	± 5%	41.9	41.7	± 5%	41.6	Ambient Temperature	23.3	23.3	°C
Conductivity σ (mho/m)	769 MHz Brain			799 MHz Brain			Fluid Temperature	21.1	21.1	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.89	± 5%	0.85	0.89	± 5%	0.88	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Speaker-Microphone with Antenna

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
814.5125	Mid	CW	NiMH	Whip	501-0105-013	2.5	35.19		2.67	1.34	-0.178	2.78	1.39
814.5125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	35.15		2.62	1.31	-0.175	2.73	1.36
859.5125	Mid	CW	NiMH	Whip	501-0105-013	2.5	35.28		2.46	1.23	-0.0598	2.49	1.25
859.5125	Mid	CW	NiMH	Stubby	501-0105-012	2.5	35.22		2.79	1.40	-0.713	3.29	1.64

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

Test Date	May 26, 2004			May 26, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Brain			860 MHz Brain			Atmospheric Pressure	101.3	101.3	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	41	41	%
	41.6	± 5%	41.4	41.5	± 5%	40.8	Ambient Temperature	22.4	22.4	°C
Conductivity σ (mho/m)	815 MHz Brain			860 MHz Brain			Fluid Temperature	20.9	20.9	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.90	± 5%	0.88	0.91	± 5%	0.93	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Speaker-Microphone with Antenna

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Body-worn Accessory	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
								dBm	☑	Duty Cycle			Duty Cycle	
								Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Whip	501-0105-013	Lapel-Clip	1.2	34.82		5.26	2.63	-0.689	6.16	3.08
769.0125	Mid	CW	NiMH	Stubby	501-0105-012	Lapel-Clip	1.2	34.80		5.94	2.97	-0.245	6.28	3.14
799.0125	Mid	CW	NiMH	Whip	501-0105-013	Lapel-Clip	1.2	34.78		3.71	1.86	-0.256	3.94	1.97
799.0125	Mid	CW	NiMH	Stubby	501-0105-012	Lapel-Clip	1.2	34.78		6.36	3.18	-0.194	6.65	3.33

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

Test Date	May 27, 2004			May 27, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Body			799 MHz Body			Atmospheric Pressure	101.5	101.5	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	36	36	%
	55.4	± 5%	54.9	55.3	± 5%	54.6	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	769 MHz Body			799 MHz Body			Fluid Temperature	21.7	21.7	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.96	± 5%	0.93	0.96	± 5%	0.96	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Speaker-Microphone with Antenna

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Body-worn Accessory	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
								dBm	☑	Duty Cycle			Duty Cycle	
								Watts		100%	50%		100%	50%
814.5125	Mid	CW	NiMH	Whip	501-0105-013	Lapel-Clip	1.2	35.13		5.96	2.98	-0.0807	6.07	3.04
814.5125	Mid	CW	NiMH	Stubby	501-0105-012	Lapel-Clip	1.2	35.14		5.32	2.66	-0.173	5.54	2.77
859.5125	Mid	CW	NiMH	Whip	501-0105-013	Lapel-Clip	1.2	35.19		6.08	3.04	-0.109	6.23	3.12
859.5125	Mid	CW	NiMH	Stubby	501-0105-012	Lapel-Clip	1.2	35.20		5.88	2.94	-0.810	7.09	3.54

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

Test Date	May 27, 2004			May 27, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Body			860 MHz Body			Atmospheric Pressure	101.5	101.5	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	36	36	%
	55.3	± 5%	54.4	55.1	± 5%	53.9	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	815 MHz Body			860 MHz Body			Fluid Temperature	21.7	21.7	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.98	0.98	± 5%	1.02	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Boom-Microphone Headset (P/N: 589-0015-059)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Whip	501-0105-013	1.3	34.76		5.24	2.62	-0.458	5.82	2.91
769.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	34.73		4.63	2.32	-0.398	5.07	2.54
799.0125	Mid	CW	NiMH	Whip	501-0105-013	1.3	34.75		6.10	3.05	-0.631	7.05	3.53
799.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	34.70		4.53	2.27	-0.741	5.37	2.69

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

Test Date	May 27, 2004			May 27, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Body			799 MHz Body			Atmospheric Pressure	101.5	101.5	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	36	36	%
	55.4	± 5%	54.9	55.3	± 5%	54.6	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	769 MHz Body			799 MHz Body			Fluid Temperature	21.7	21.7	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.96	± 5%	0.93	0.96	± 5%	0.96	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Boom-Microphone Headset (P/N: 589-0015-059)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
806.0125	Low	CW	NiMH	Whip	501-0105-013	1.3	35.18		6.56	3.28	-0.547	7.44	3.72
814.5125	Mid	CW	NiMH	Whip	501-0105-013	1.3	35.12		7.99	4.00	-0.608	9.19	4.60
823.9875	High	CW	NiMH	Whip	501-0105-013	1.3	35.21		8.44	4.22	-0.734	9.99	5.00
806.0125	Low	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.21		5.33	2.67	-0.520	6.01	3.00
814.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.12		6.79	3.40	-1.06	8.67	4.33
823.9875	High	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.16		6.40	3.20	-0.468	7.13	3.56
859.5125	Mid	CW	NiMH	Whip	501-0105-013	1.3	35.14		5.27	2.64	-0.0839	5.37	2.69
859.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.15		4.27	2.14	-0.149	4.42	2.21

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

Test Date	May 28, 2004			May 28, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Body			860 MHz Body			Atmospheric Pressure	101.3	101.3	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	39	39	%
	55.3	± 5%	54.4	55.1	± 5%	53.9	Ambient Temperature	23.2	23.2	°C
Conductivity σ (mho/m)	815 MHz Body			860 MHz Body			Fluid Temperature	21.5	21.5	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.98	0.98	± 5%	1.03	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Boom-Microphone Headset (P/N: 589-0015-059)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)		
							dBm ☑		Duty Cycle				Duty Cycle		
							Watts		100%		50%		100%		50%
769.0125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	34.70	P	5.21		2.61	-0.529	P	5.88	2.94
							34.71	S	4.12		2.06	-0.346	S	4.46	2.23
							34.74	S	3.66		1.83	-0.232	S	3.86	1.93
769.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	34.79	P	3.45		1.73	-0.695	P	4.05	2.02
							34.86	S	2.87		1.44	-0.567	S	3.27	1.64
							34.84	S	2.93		1.47	-0.628	S	3.39	1.69
799.0125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	34.68	P	5.25		2.63	-0.209	P	5.51	2.75
							34.71	S	5.07		2.54	-0.322	S	5.46	2.73
							34.76	S	4.62		2.31	-0.305	S	4.96	2.48
799.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	34.86	P	4.07		2.04	-0.193	P	4.25	2.13
							34.84	S	3.11		1.56	-0.202	S	3.26	1.63

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

Test Date	May 28, 2004			May 28, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Body			799 MHz Body			Atmospheric Pressure	101.3	101.3	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	39	39	%
	55.4	± 5%	53.7	55.3	± 5%	53.5	Ambient Temperature	23.2	23.2	°C
Conductivity σ (mho/m)	769 MHz Body			799 MHz Body			Fluid Temperature	21.5	21.5	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.96	± 5%	0.91	0.96	± 5%	0.94	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 SAR levels measured at the mid channel 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. Secondary hotspots were reported for SAR levels within 2 dB of the primary (P = Primary, S = Secondary).
4. The power drifts measured by the DASY 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 table.
5. 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.
6. 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).
7. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Boom-Microphone Headset (P/N: 589-0015-059)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)		
							dBm	☑	Duty Cycle				Duty Cycle		
							Watts		100%		50%		100%		50%
814.5125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	35.10	P	5.48		2.74	-0.525	P	6.18	3.09
							35.15	S	5.86		2.93	-0.617	S	6.75	3.38
							35.11	S	4.26		2.13	-0.486	S	4.76	2.38
814.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	35.20		4.70		2.35	-0.614		5.41	2.71
859.5125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	35.24	P	5.32		2.66	-0.605	P	6.12	3.06
							35.20	S	5.38		2.69	-0.767	S	6.42	3.21
859.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	35.18		3.99		2.00	-1.01		5.03	2.52

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

Test Date	May 29, 2004			May 29, 2004			Fluid Type	815 MHz	860 MHz	Units
Dielectric Constant ε_r	815 MHz Body			860 MHz Body			Atmospheric Pressure	101.9	101.9	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	40	40	%
	55.3	± 5%	54.0	55.1	± 5%	53.5	Ambient Temperature	22.2	22.2	°C
Conductivity σ (mho/m)	815 MHz Body			860 MHz Body			Fluid Temperature	20.7	20.7	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.98	0.98	± 5%	1.02	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 SAR levels measured at the mid channel 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. Secondary hotspots were reported for SAR levels within 2 dB of the primary (P = Primary, S = Secondary).
4. The power drifts measured by the DASY 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 table.
5. 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.
6. 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).
7. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Speaker-Microphone (P/N: 589-0015-057)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
769.0125	Mid	CW	NiMH	Whip	501-0105-013	1.3	34.83		5.40	2.70	-0.505	6.07	3.03
769.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	34.86		4.24	2.12	-0.322	4.57	2.28
799.0125	Mid	CW	NiMH	Whip	501-0105-013	1.3	34.83		6.34	3.17	-0.552	7.20	3.60
799.0125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	34.83		5.16	2.58	-0.762	6.15	3.07

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

Test Date	June 10, 2004			June 10, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Body			799 MHz Body			Atmospheric Pressure	101.7	101.7	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	43	43	%
	55.4	± 5%	55.3	55.3	± 5%	55.0	Ambient Temperature	24.0	24.0	°C
Conductivity σ (mho/m)	769 MHz Body			799 MHz Body			Fluid Temperature	23.0	23.0	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.96	± 5%	0.95	0.96	± 5%	0.98	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Speaker-Microphone (P/N: 589-0015-057)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)	
							dBm	☑	Duty Cycle			Duty Cycle	
							Watts		100%	50%		100%	50%
814.5125	Mid	CW	NiMH	Whip	501-0105-013	1.3	35.21		7.41	3.71	-0.746	8.80	4.40
814.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.23		6.22	3.11	-0.972	7.78	3.89
859.5125	Mid	CW	NiMH	Whip	501-0105-013	1.3	35.13		5.63	2.82	-0.108	5.77	2.89
859.5125	Mid	CW	Duracell Alkaline	Whip	501-0105-013	1.3	35.25		4.02	2.01	0.0166	4.02	2.01

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

Test Date	June 10, 2004			June 10, 2004			Fluid Type	815 MHz	861 MHz	Units
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	101.7	101.7	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	43	43	%
	55.3	± 5%	54.3	55.1	± 5%	53.7	Ambient Temperature	24.0	24.0	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	23.0	23.0	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.98	0.98	± 5%	1.03	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 SAR levels measured at the mid channel 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 power drifts measured by the DASY 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 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. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Speaker-Microphone (P/N: 589-0015-057)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before		Measured SAR 1g (W/kg)			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg)		
							dBm	☑	Duty Cycle				Duty Cycle		
							Watts			100%	50%			100%	50%
769.0125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	34.74	P	5.36	2.68		-0.520	P	6.04	3.02
							34.80	S	4.80	2.40		-0.484	S	5.37	2.68
							34.77	S	4.45	2.23		-0.479	S	4.97	2.48
769.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	34.76	P	3.57	1.79		-0.555	P	4.06	2.03
							34.77	S	2.97	1.49		-0.494	S	3.33	1.66
							34.82	S	2.35	1.18		-0.644	S	2.73	1.36
799.0125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	34.78	P	5.30	2.65		-0.729	P	6.27	3.13
							34.82	S	5.08	2.54		-0.622	S	5.86	2.93
							34.82	S	4.53	2.27		-0.490	S	5.07	2.54
799.0125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	34.76	P	3.88	1.94		-0.216	P	4.08	2.04
							34.81	S	2.63	1.32		-0.123	S	2.71	1.35

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

Test Date	June 11, 2004			June 11, 2004			Fluid Type	769 MHz	799 MHz	Units
Dielectric Constant ε_r	769 MHz Body			799 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	41	41	%
	55.4	± 5%	54.0	55.3	± 5%	53.8	Ambient Temperature	22.7	22.7	°C
Conductivity σ (mho/m)	769 MHz Body			799 MHz Body			Fluid Temperature	21.2	21.2	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.96	± 5%	0.93	0.96	± 5%	0.95	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 SAR levels measured at the mid channel 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. Secondary hotspots were reported for SAR levels within 2 dB of the primary (P = Primary, S = Secondary).
4. The power drifts measured by the DASY 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 table.
5. 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.
6. 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).
7. SAR measurements were performed within 24 hours of the system performance check.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Radio Transceiver with Belt-Clip (P/N: 585-5100-128) & Speaker-Microphone (P/N: 589-0015-057)

Freq. (MHz)	Chan.	Test Mode	Battery Type	Antenna Type	Antenna Part No.	Separation Distance to Planar Phantom (cm)	Cond. Power Before (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%
814.5125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	35.13	P	5.34		2.67	-0.689	P	6.26	3.13
							35.18	S	5.30		2.65	-0.650	S	6.16	3.08
							35.20	S	3.97		1.98	-0.643	S	4.59	2.30
814.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	35.24		4.49		2.25	-0.771		5.36	2.68
859.5125	Mid	CW	NiMH	Stubby	501-0105-012	1.3	35.20	P	4.97		2.49	-0.772	P	5.94	2.97
							35.20	S	5.17		2.59	-0.946	S	6.43	3.21
859.5125	Mid	CW	Duracell Alkaline	Stubby	501-0105-012	1.3	35.19		3.61		1.81	-1.02		4.57	2.28
814.5125	Mid	CW	**Energizer* Alkaline**	Whip	501-0105-013	1.3	35.11		6.29		3.14	-1.09		8.07	4.04

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

Test Date	June 11, 2004			June 11, 2004			Fluid Type	815 MHz	861 MHz	Units
Dielectric Constant ε_r	815 MHz Body			860 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Relative Humidity	41	41	%
	55.3	± 5%	53.2	55.1	± 5%	52.7	Ambient Temperature	22.7	22.7	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	21.2	21.2	°C
	Interpolated IEEE Target		Measured	Interpolated IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.97	0.98	± 5%	1.01	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 SAR levels measured at the mid channel 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. Secondary hotspots were reported for SAR levels within 2 dB of the primary (P = Primary, S = Secondary).
4. The power drifts measured by the DASY 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 table.
5. 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.
6. 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).
7. SAR measurements were performed within 24 hours of the system performance check.

* The DUT was evaluated for SAR with Duracell Procell alkaline batteries. To report a SAR comparison between alternate alkaline battery types, the maximum SAR level configuration evaluated with Duracell Procell alkaline batteries (814.5125 MHz, Whip Antenna, Belt-Clip and Boom-Microphone Headset accessories, tested on May 28, 2004) was repeated using Energizer E91 alkaline batteries as shown in the above test data table.

5.0 DETAILS OF SAR EVALUATION

The E.F. Johnson Model: 242-5172 Portable FM PTT Radio Transceiver FCC ID: ATH2425171 was compliant for localized Specific Absorption Rate (Controlled Exposure) based on the test provisions and conditions described below. Detailed photographs of the test setup are shown in Appendix G.

1. The Radio Transceiver (DUT) was evaluated for face-held configuration with the front of the DUT placed parallel to the outer surface of the planar phantom at a 2.5 cm separation distance.
2. The Speaker-Microphone with Antenna (DUT) was evaluated for face-held configuration connected to the Radio Transceiver with the front of the DUT placed parallel to the outer surface of the planar phantom at a 2.5 cm separation distance. The Speaker-Microphone with Antenna was evaluated with the NiMH battery option only. The alkaline battery pack is not intended for operation in the Speaker-Microphone with Antenna configuration.
3. The Radio Transceiver (DUT) was evaluated for body-worn configuration with the back of the DUT placed parallel to the outer surface of the planar phantom. The attached Belt-Clip accessory was touching the outer surface of the planar phantom and provided a 1.3 cm separation distance between the back of the DUT and the planar phantom. The DUT was evaluated with both the speaker-microphone and boom-microphone headset accessories.
4. The Speaker-Microphone with Antenna (DUT) was evaluated for body-worn configuration with the back of the DUT placed parallel to the outer surface of the planar phantom. The attached Lapel-Clip was touching the outer surface of the planar phantom and provided a 1.2 cm separation distance between the back of the DUT and the planar phantom. The Speaker-Microphone with Antenna was evaluated with the NiMH battery option only. The alkaline battery pack is not intended for operation in the Speaker-Microphone with Antenna configuration.
5. The conducted power levels were measured before each test using a Gigatronics 8652A Universal Power Meter according to the procedures described in FCC 47 CFR §2.1046.
6. The power drifts measured by the DASY system during the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the test data tables.
7. 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 the SAR-versus-Time power drift evaluation data.
8. The area scan evaluation was performed with fully charged battery(ies). After the area scan was completed the DUT was cooled down to room temperature and the battery(ies) was/were replaced with fully charged battery(ies) prior to the zoom scan evaluation.
9. 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.
10. Due to the dimensions of the DUT, a Plexiglas planar phantom was used in place of the SAM phantom.
11. 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 (5x5x7 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 (7x7x7) to ensure complete capture of the peak spatial-average SAR.

7.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations a daily system check was performed at the planar section of the SAM phantom with an 835 MHz dipole (see Appendix C for system validation procedures). Prior to the system performance check the dielectric parameters of the simulated tissue mixture were measured 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 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 plots).

SYSTEM PERFORMANCE CHECK

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)
	835 MHz	IEEE Target	Measured	IEEE Target	Measured	IEEE Target	Measured						
05/23/04	Brain	**2.38 ±10%**	2.28 (-4.2%)	**41.5 ±5%**	41.2	**0.90 ±5%**	0.91	1000	22.7	21.4	≥ 15	39	102.4
05/25/04	Brain	**2.38 ±10%**	2.19 (-8.0%)	**41.5 ±5%**	40.6	**0.90 ±5%**	0.91	1000	22.0	21.2	≥ 15	39	102.2
05/26/04	Brain	**2.38 ±10%**	2.27 (-4.6%)	**41.5 ±5%**	40.6	**0.90 ±5%**	0.90	1000	21.2	21.0	≥ 15	38	101.3
05/27/04	Brain	**2.38 ±10%**	2.25 (-5.5%)	**41.5 ±5%**	41.0	**0.90 ±5%**	0.91	1000	22.2	21.3	≥ 15	37	101.5
05/28/04	Brain	**2.38 ±10%**	2.18 (-8.4%)	**41.5 ±5%**	40.2	**0.90 ±5%**	0.90	1000	22.6	22.5	≥ 15	40	101.3
05/29/04	Brain	**2.38 ±10%**	2.35 (-1.3%)	**41.5 ±5%**	41.1	**0.90 ±5%**	0.92	1000	21.6	21.2	≥ 15	42	101.9
06/10/04	Brain	**2.38 ±10%**	2.36 (-0.8%)	**41.5 ±5%**	40.2	**0.90 ±5%**	0.91	1000	22.9	23.3	≥ 15	53	101.6
06/11/04	Brain	**2.38 ±10%**	2.30 (-3.4%)	**41.5 ±5%**	40.6	**0.90 ±5%**	0.90	1000	22.4	21.7	≥ 15	43	102.2

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.

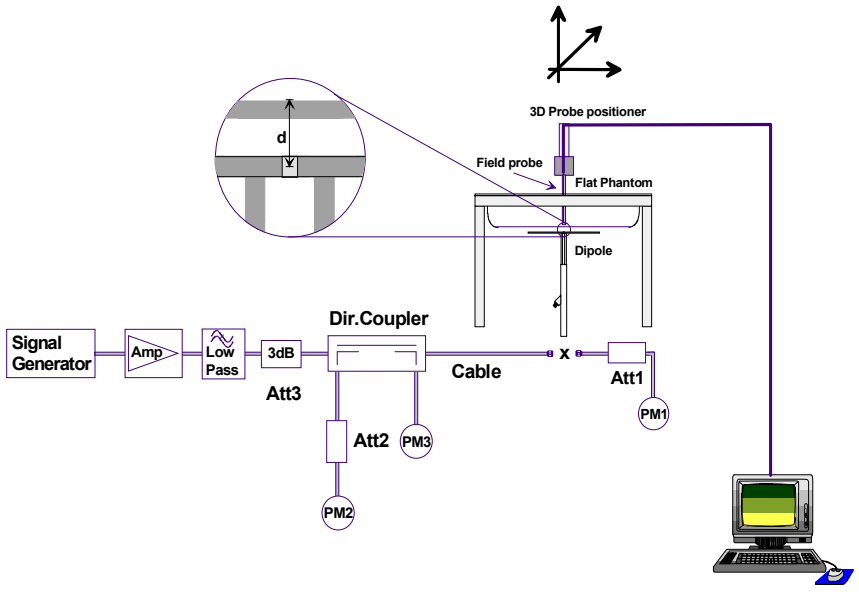


Figure 1. System Performance Check Setup Diagram

835MHz Dipole Setup

8.0 SIMULATED EQUIVALENT TISSUES

The 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	**835 MHz Brain (System Check)**	**769/799/815/861 MHz Brain (DUT Evaluation)**	**769/799/815/861 MHz Body (DUT Evaluation)**
Water	40.71 %	40.71 %	53.79 %
Sugar	56.63 %	56.63 %	45.13 %
Salt	1.48 %	1.48 %	0.98 %
HEC	0.99 %	0.99 %	--
Bactericide	0.19 %	0.19 %	0.10 %

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

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

Type: SAM V4.0C
Shell Material: Fiberglass
Thickness: 2.0 ±0.1 mm
Volume: Approx. 20 liters

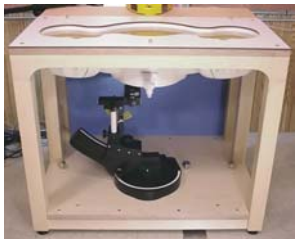
11.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, 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 SAM PHANTOM V4.0C

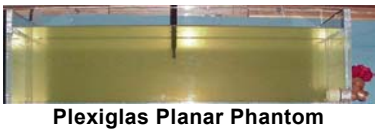
The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm (+/-0.2 mm) shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard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



SAM Phantom

13.0 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 radio transceivers. The planar phantom is mounted on the side of the DASY4 compact system table.



Plexiglas Planar Phantom

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	Dec 2003
DAE3	370	May 2004
-ET3DV6 E-Field Probe	1387	Mar 2004
-ET3DV6 E-Field Probe	1590	May 2004
-300MHz Validation Dipole	135	Oct 2003
-450MHz Validation Dipole	136	Nov 2003
-835MHz Validation Dipole	411	Mar 2004
-900MHz Validation Dipole	054	June 2004
-1800MHz Validation Dipole	247	June 2004
-2450MHz Validation Dipole	150	Sept 2003
-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	± 5.95	Normal	1	1	± 5.95	∞
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					**± 13.76**	
Expanded Uncertainty (k=2)					**± 27.51**	

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	± 5.95	Normal	1	1	± 5.95	∞
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					**± 10.54**	
Expanded Uncertainty (k=2)					**± 21.09**	

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 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”.

APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

System Performance Check - 835 MHz Dipole

Date Tested: 05/23/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

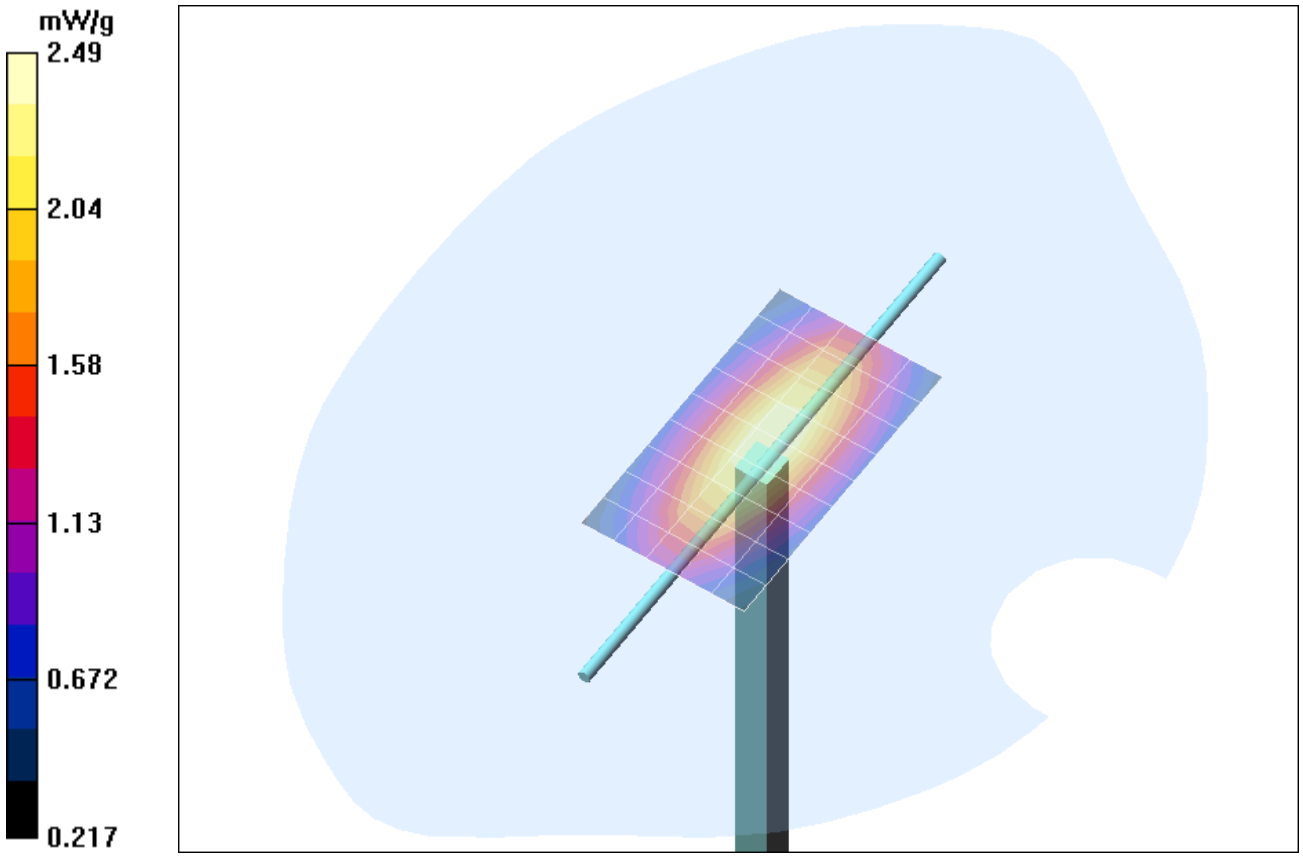
Ambient Temp: 22.7 °C; Fluid Temp: 21.4 °C; Barometric Pressure: 102.4 kPa; Humidity: 39%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.91 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3)

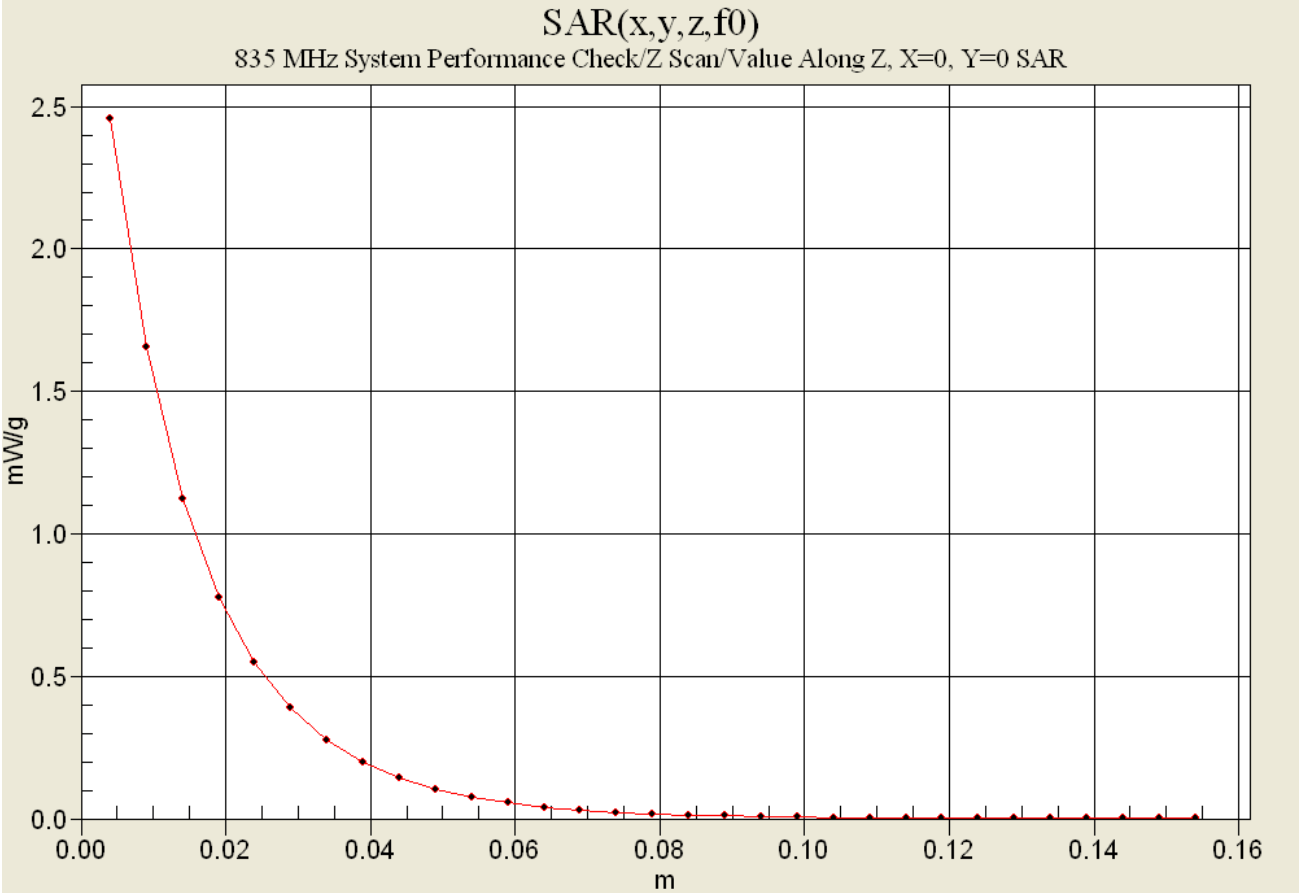
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.2 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 3.35 W/kg
SAR(1 g) = 2.28 mW/g; SAR(10 g) = 1.49 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 05/25/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

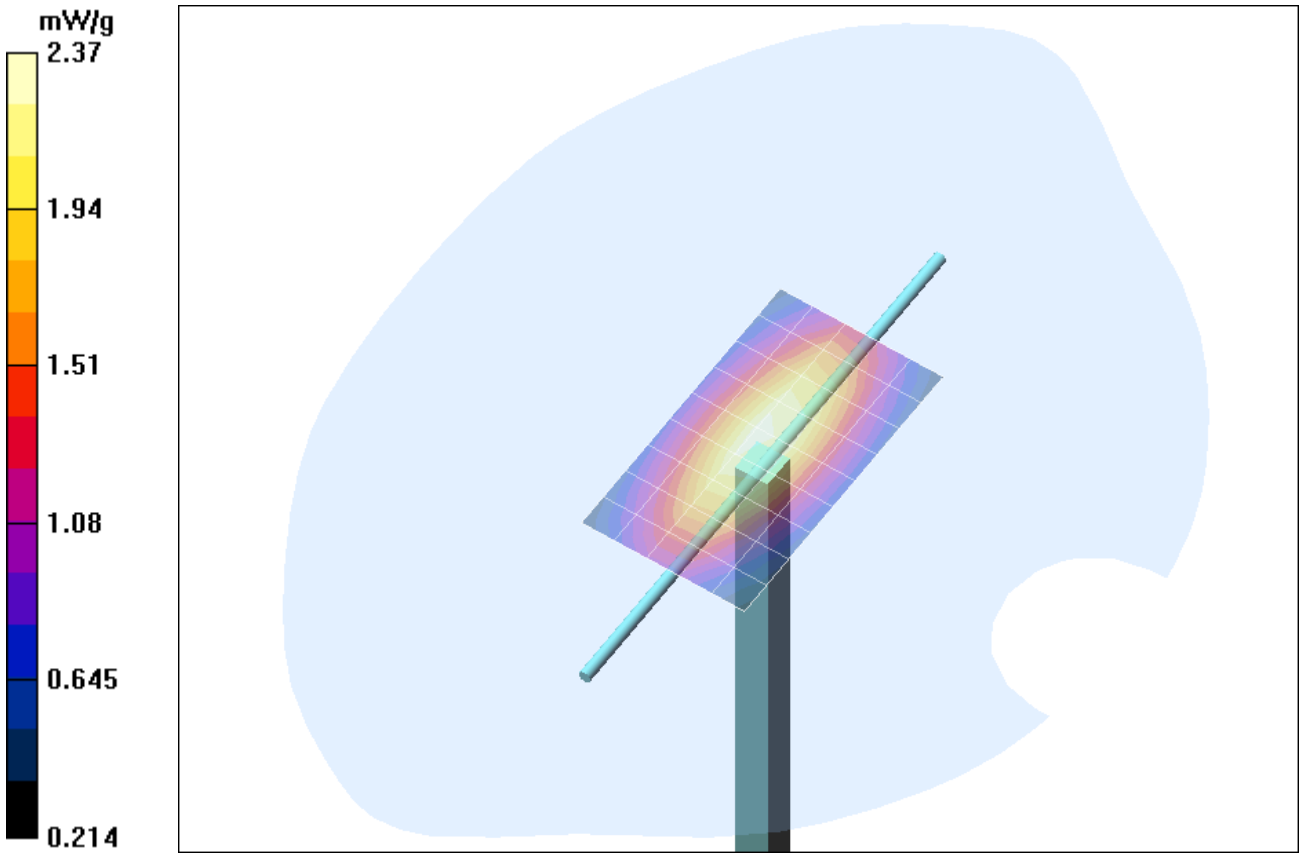
Ambient Temp: 22.0 °C; Fluid Temp: 21.2 °C; Barometric Pressure: 102.2 kPa; Humidity: 39%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.91 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3)

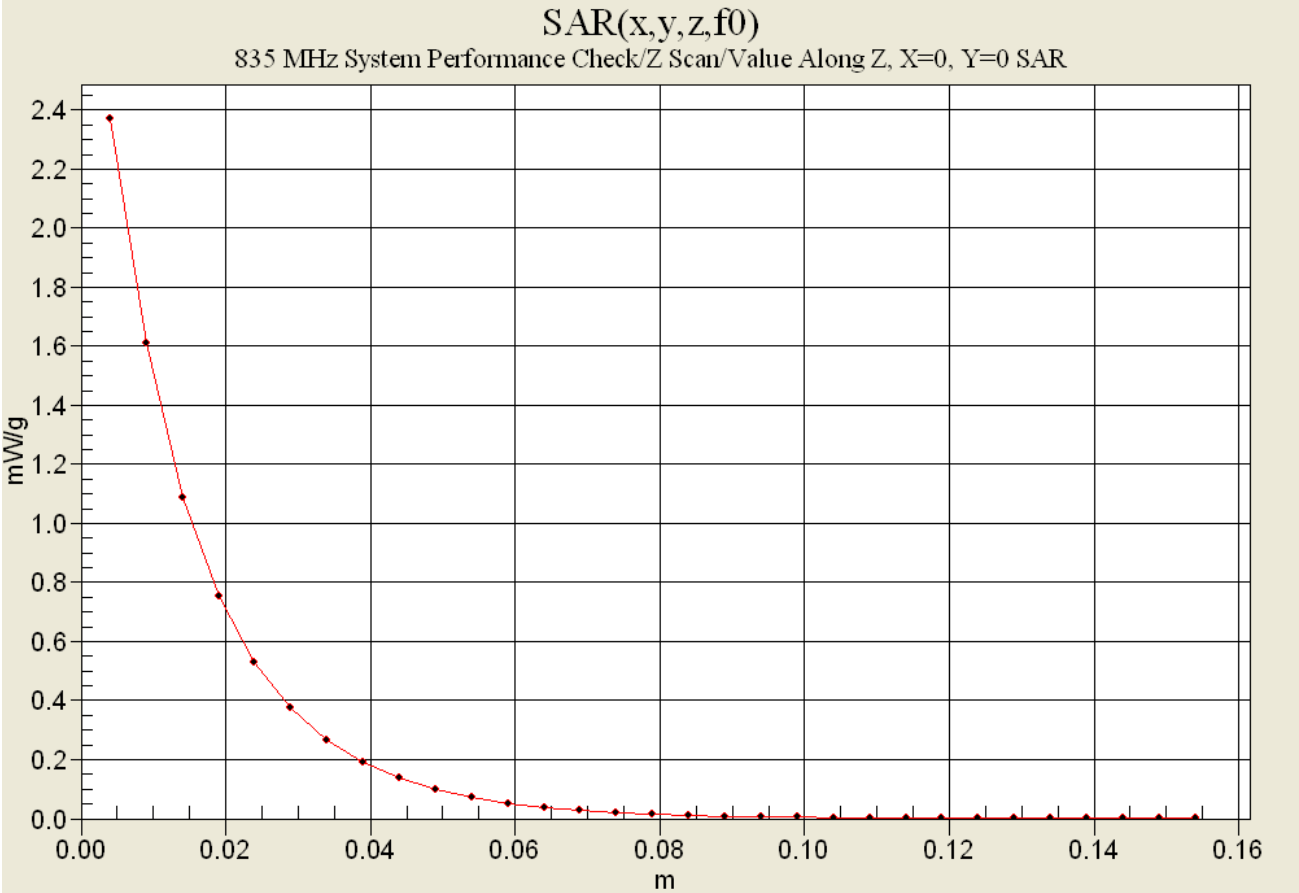
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.8 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 1.43 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 05/26/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

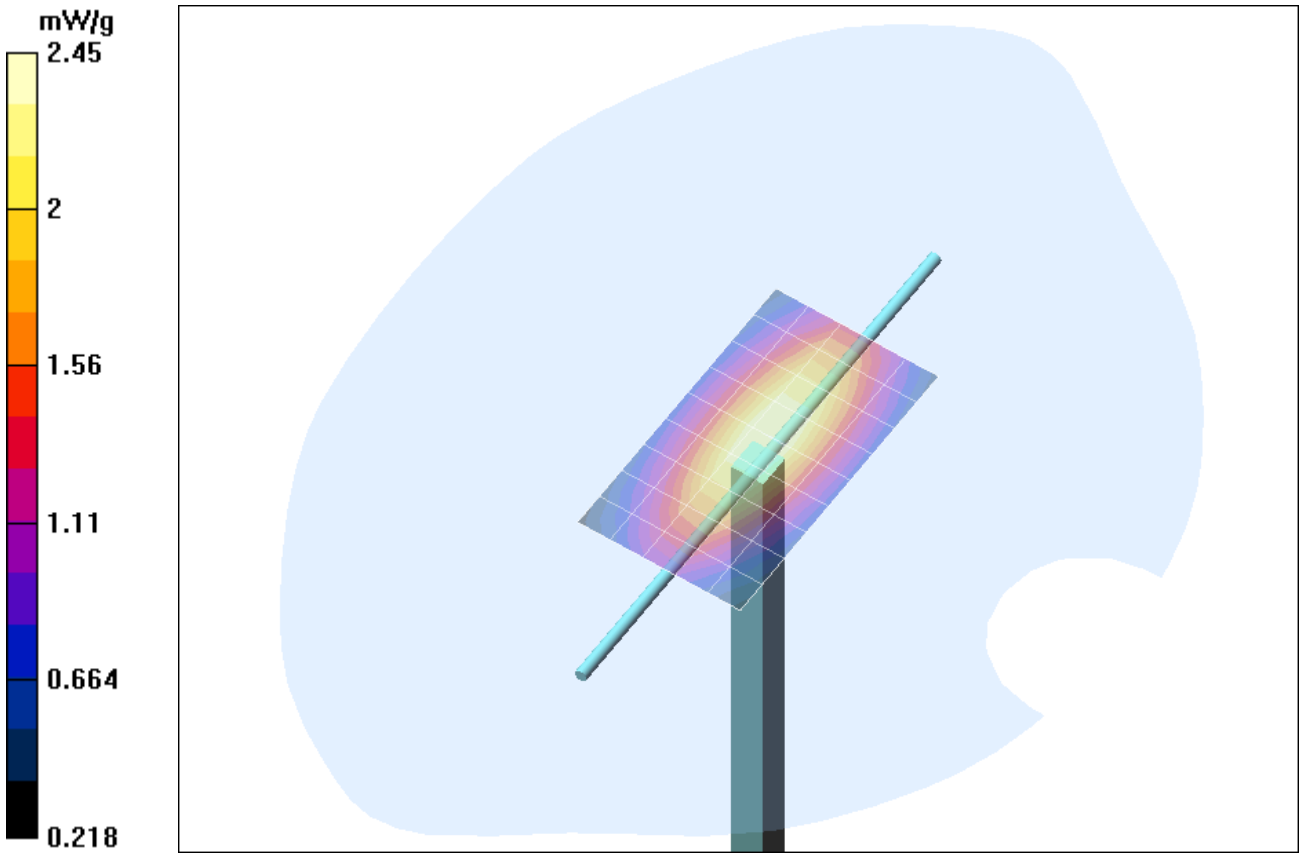
Ambient Temp: 21.2 °C; Fluid Temp: 21.0 °C; Barometric Pressure: 101.3 kPa; Humidity: 38%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3)

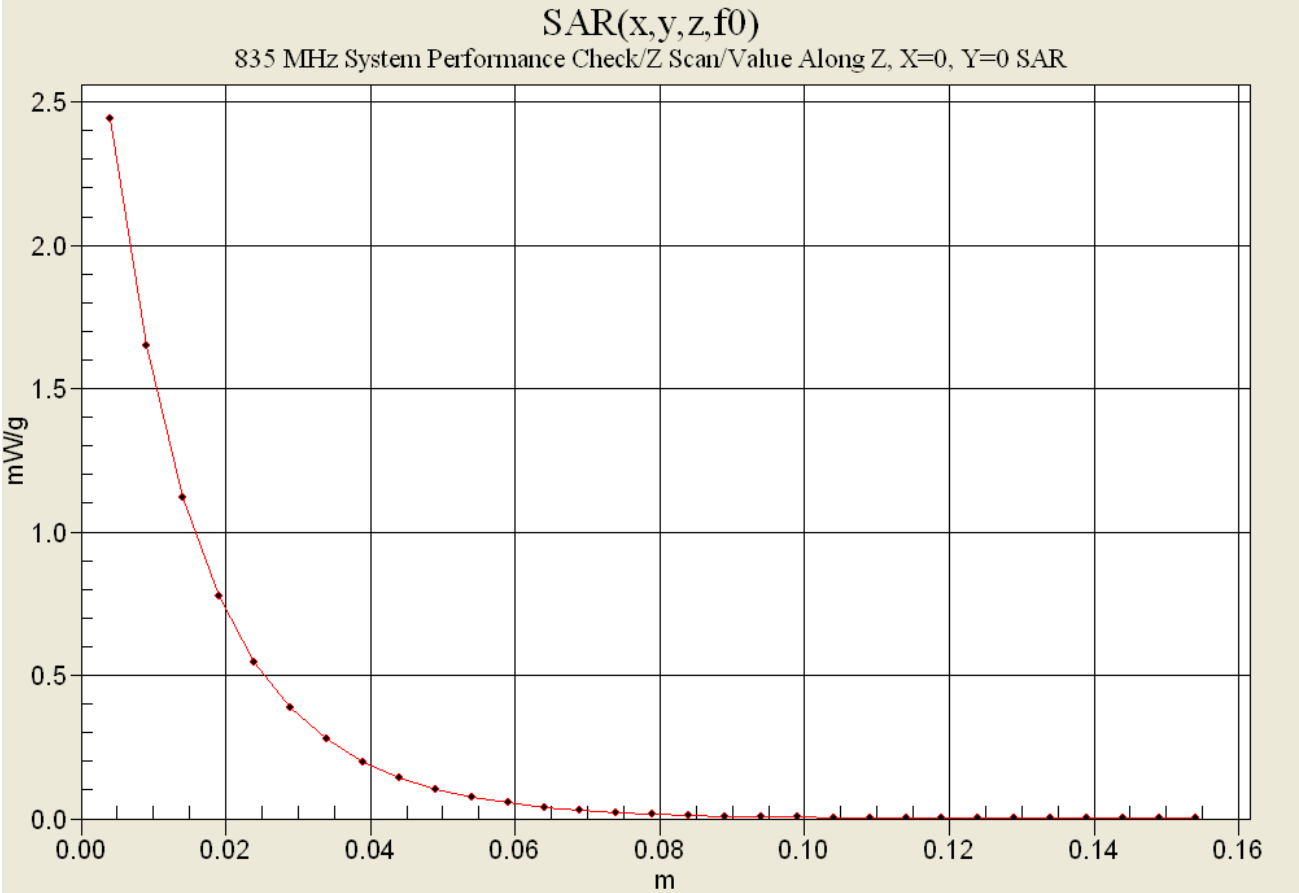
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.9 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.49 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 05/27/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

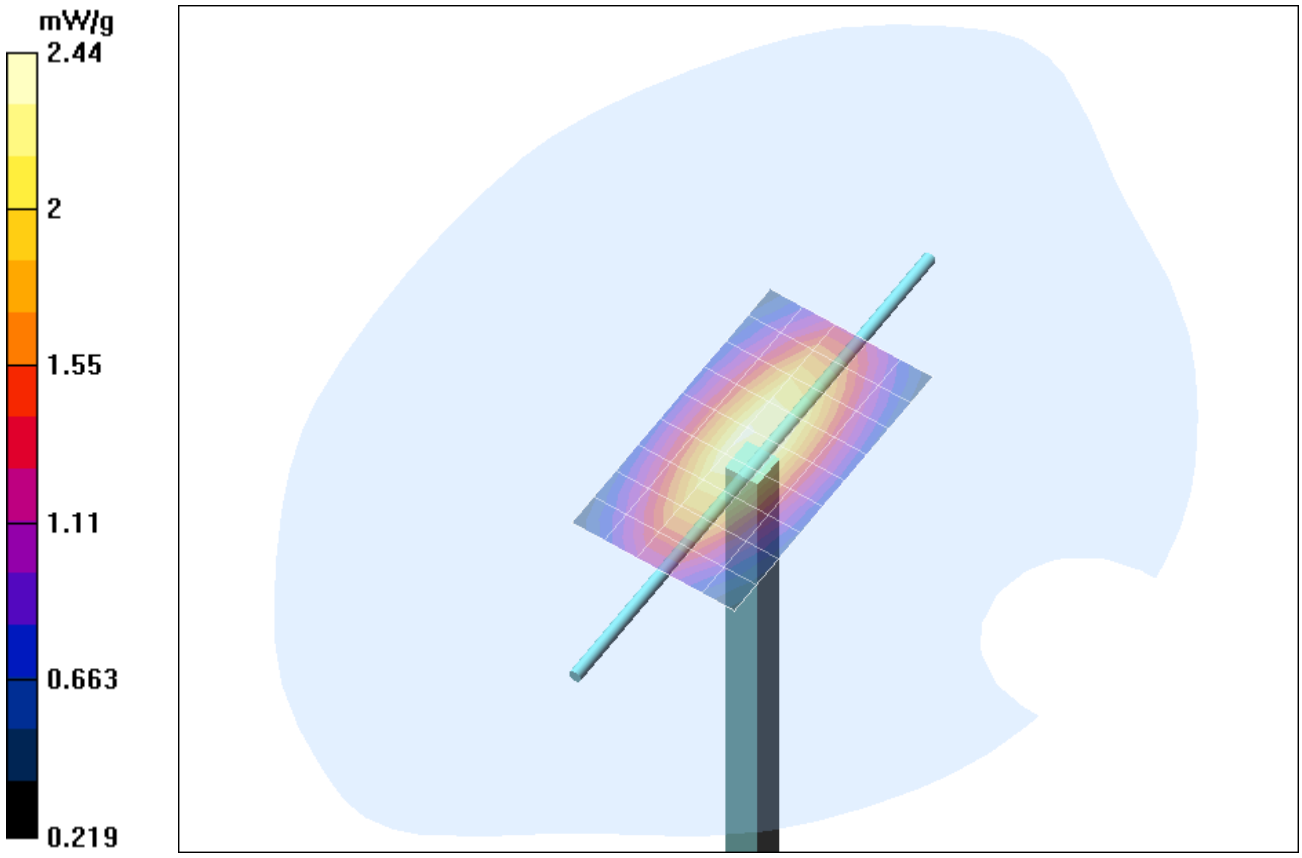
Ambient Temp: 22.2 °C; Fluid Temp: 21.3 °C; Barometric Pressure: 101.5 kPa; Humidity: 37%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.91 mho/m; ε_r = 41.0; ρ = 1000 kg/m^3)

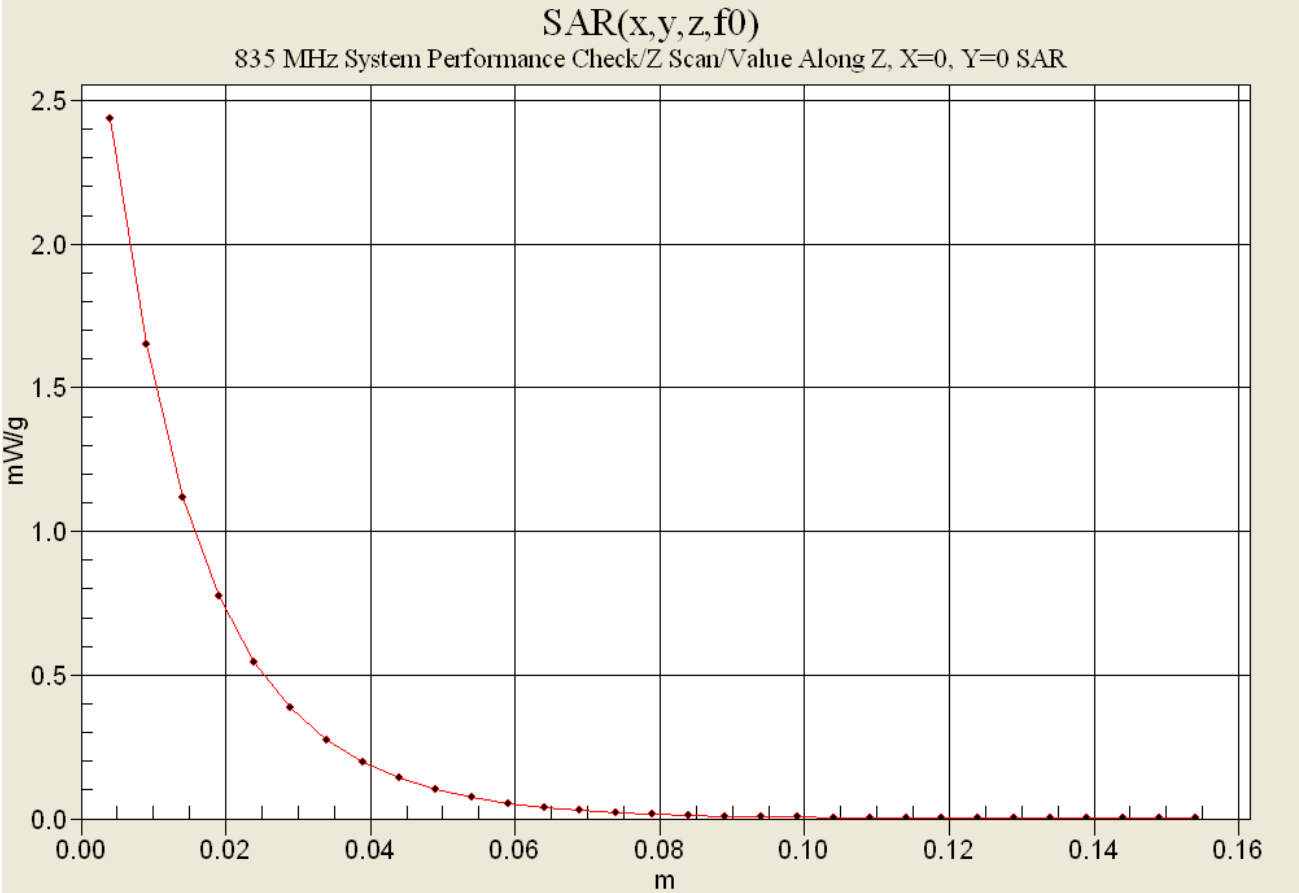
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.9 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 3.27 W/kg
SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.47 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 05/28/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

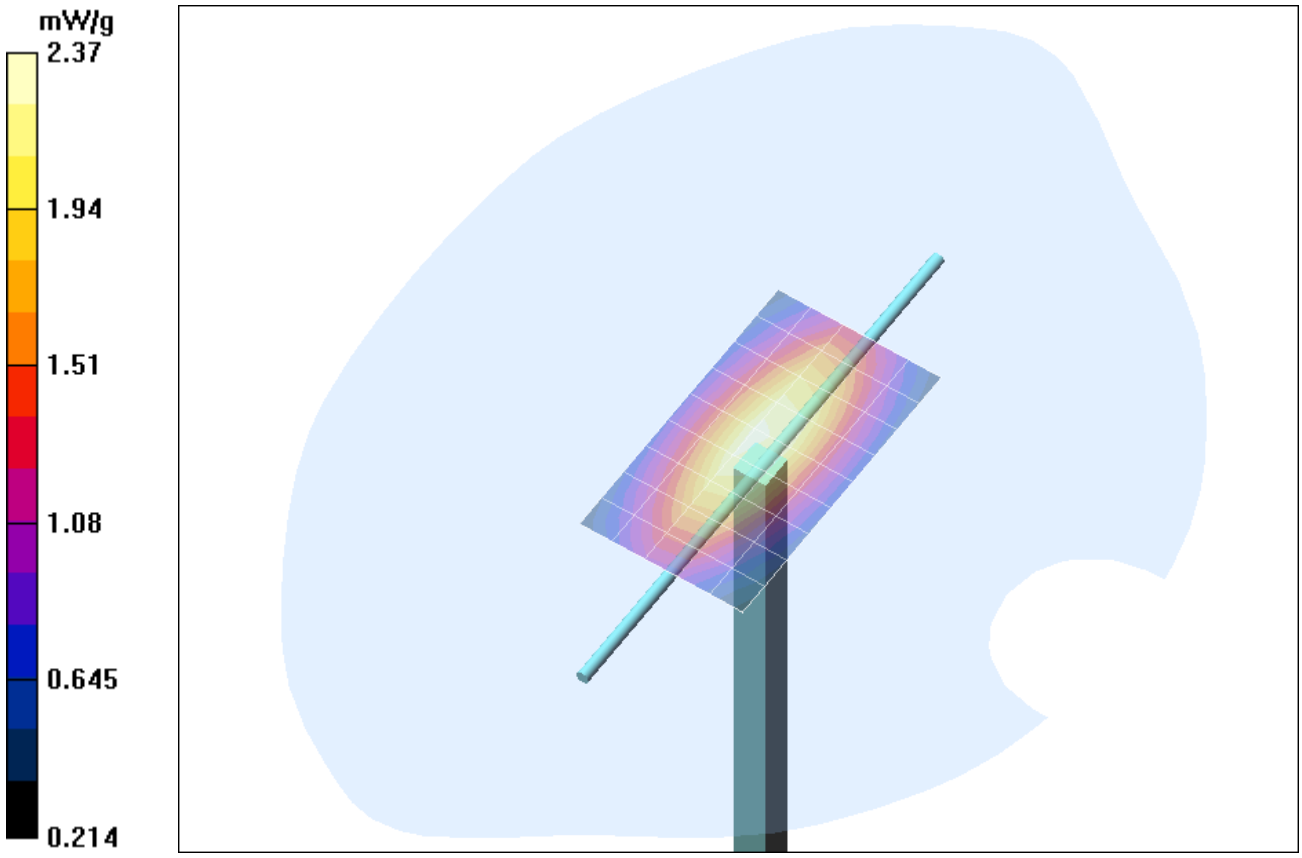
Ambient Temp: 22.6 °C; Fluid Temp: 22.5 °C; Barometric Pressure: 101.3 kPa; Humidity: 40%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3)

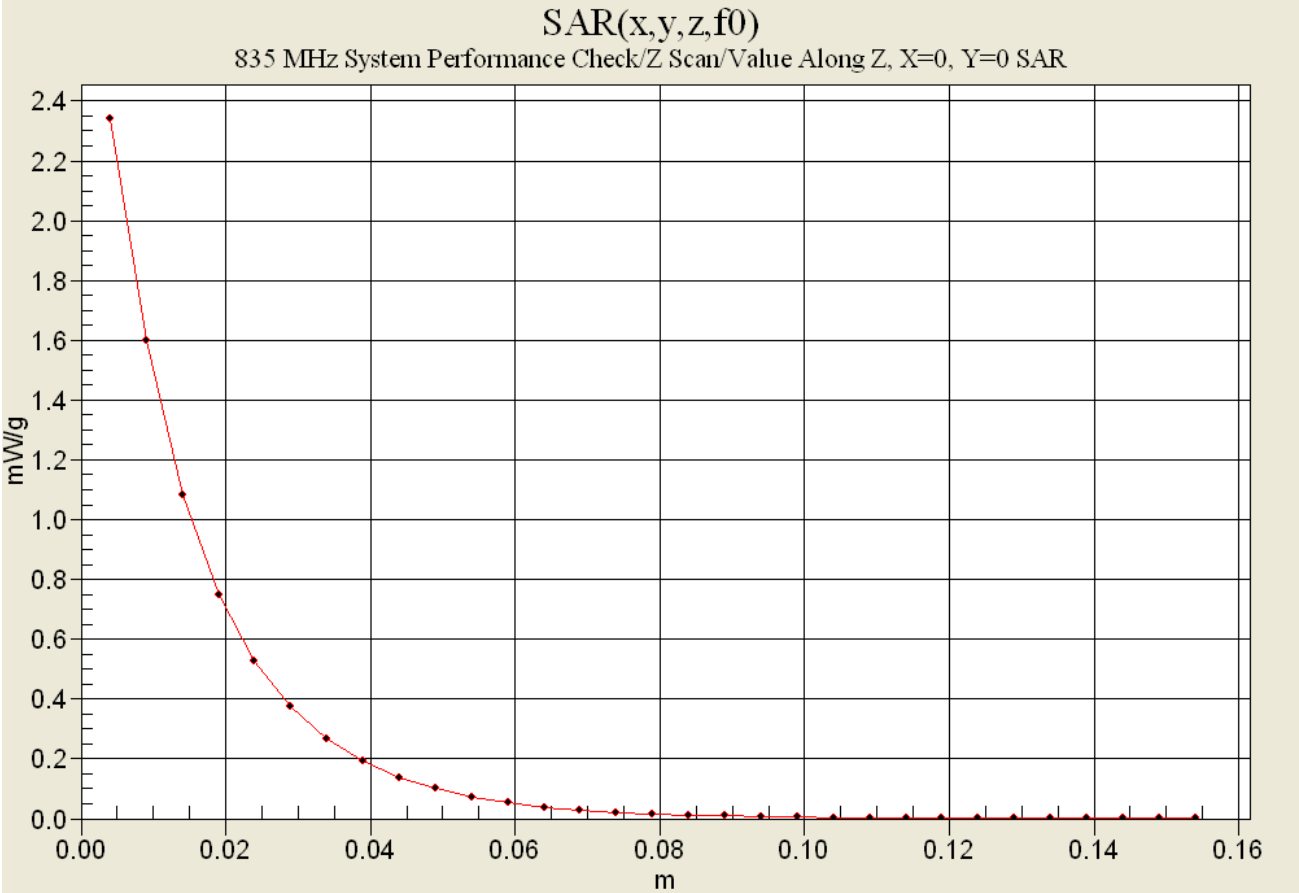
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.8 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 3.14 W/kg
SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.43 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 05/29/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

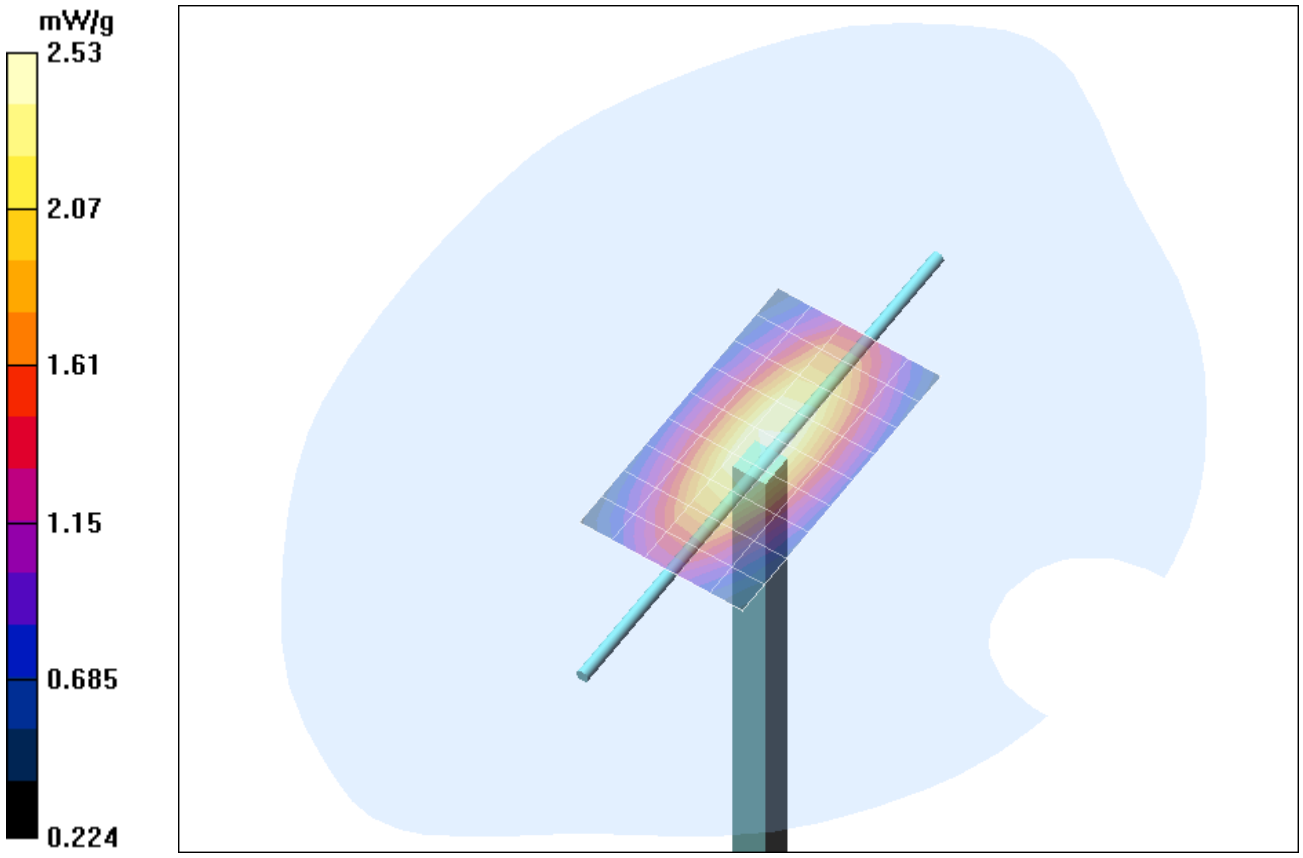
Ambient Temp: 21.6 °C; Fluid Temp: 21.2 °C; Barometric Pressure: 101.9 kPa; Humidity: 42%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.92 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3)

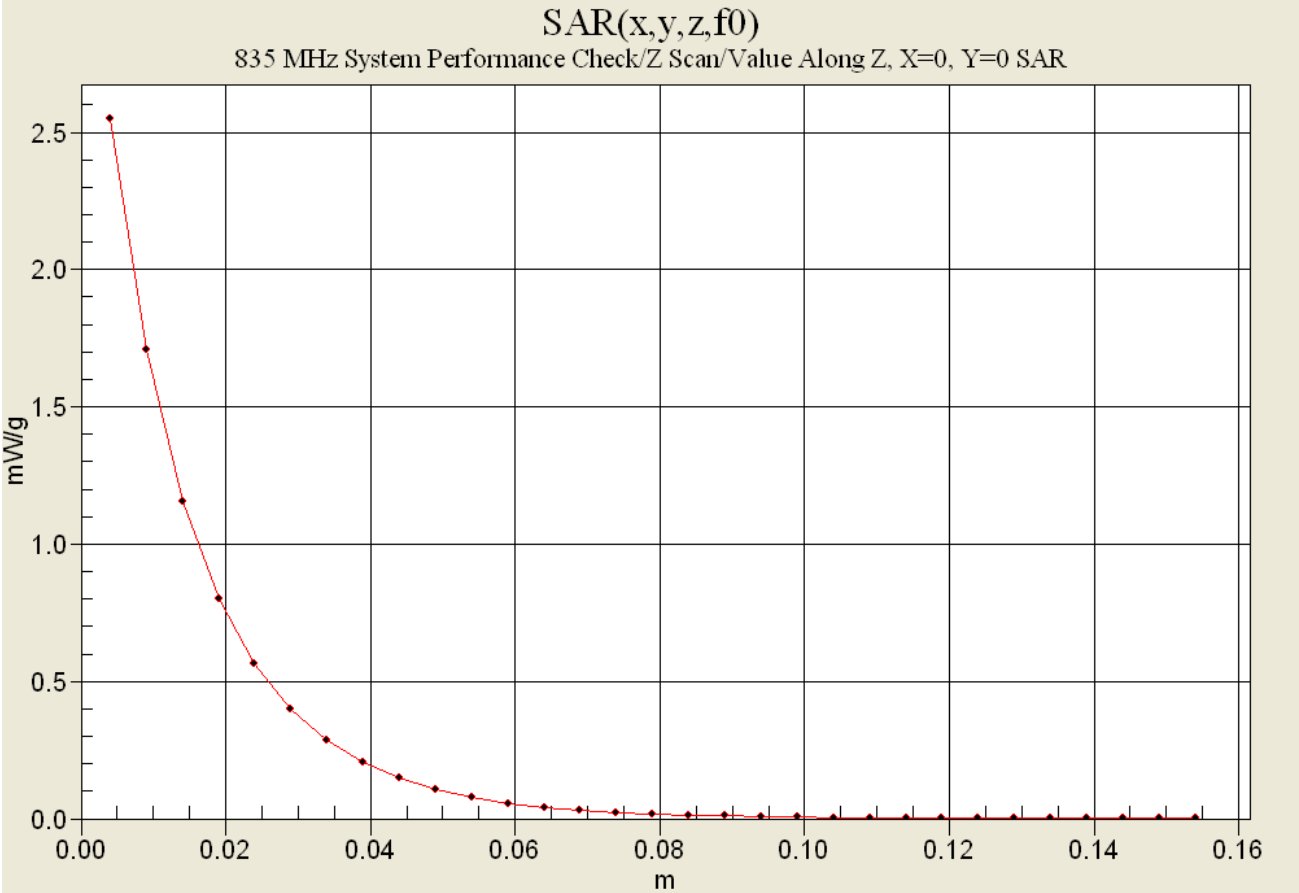
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.5 V/m; Power Drift = 0.0 dB
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.54 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 06/10/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

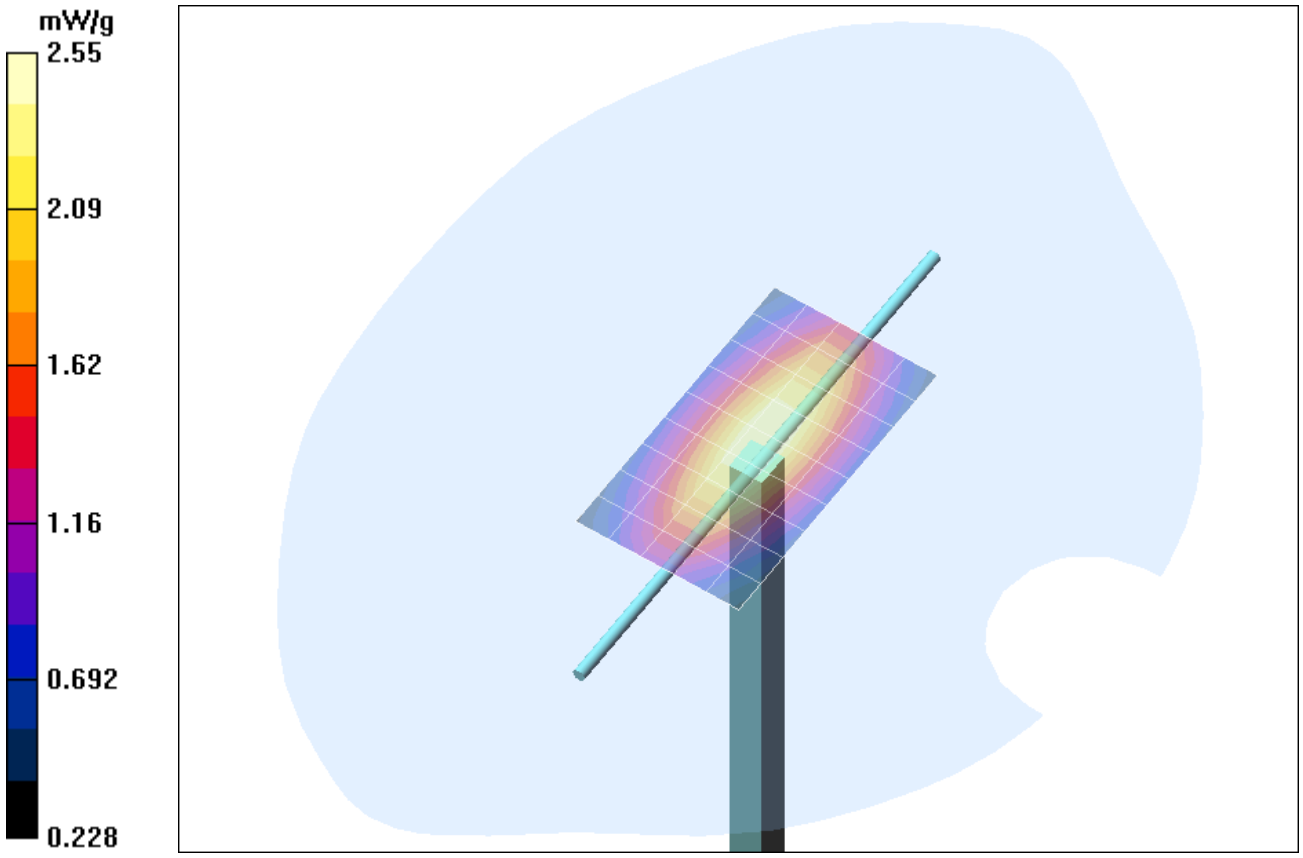
Ambient Temp: 22.9 °C; Fluid Temp: 23.3 °C; Barometric Pressure: 101.6 kPa; Humidity: 53%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.91 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3)

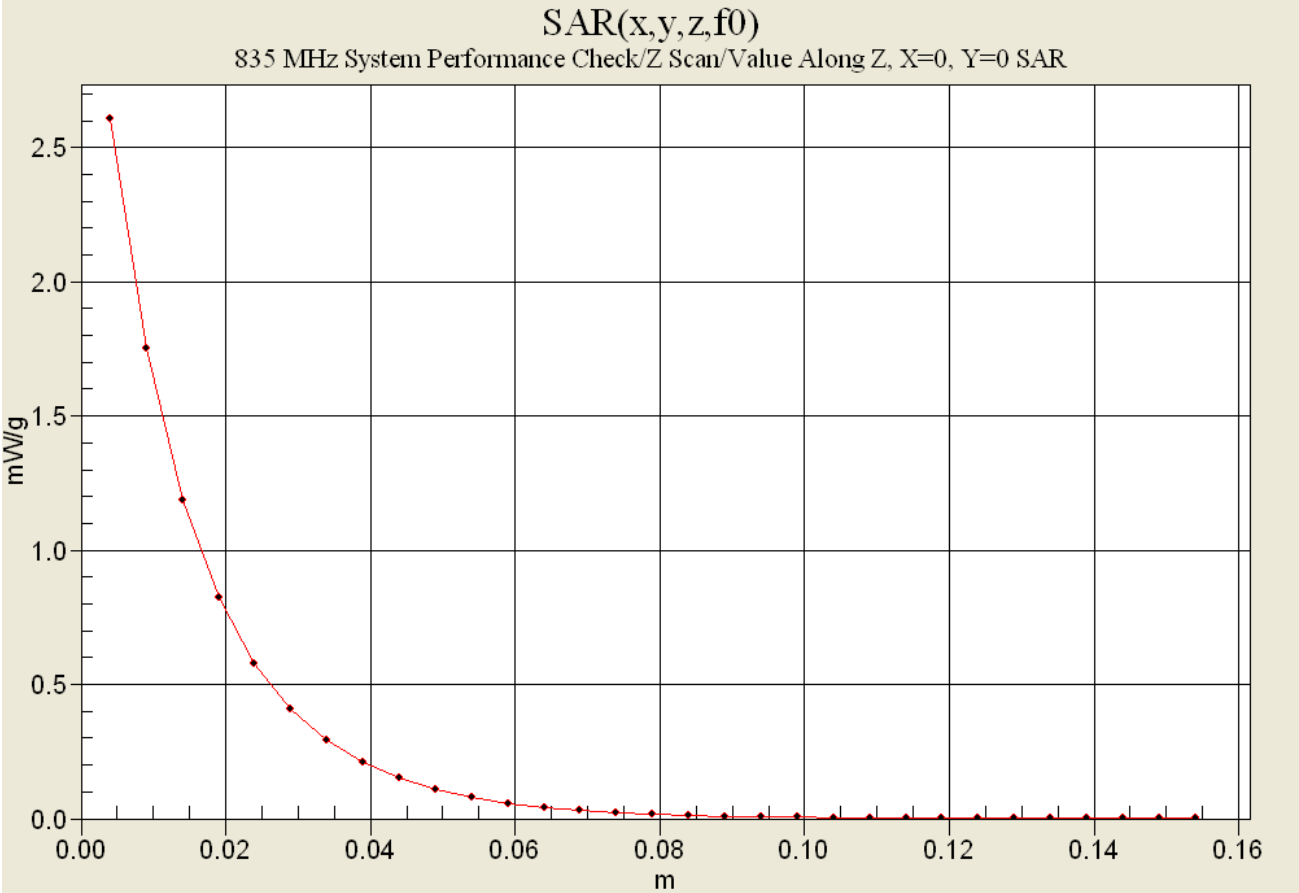
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.4 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.54 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

System Performance Check - 835 MHz Dipole

Date Tested: 06/11/04

DUT: Dipole 835 MHz; Model: D835V2; Type: System Performance Check; Serial: 411

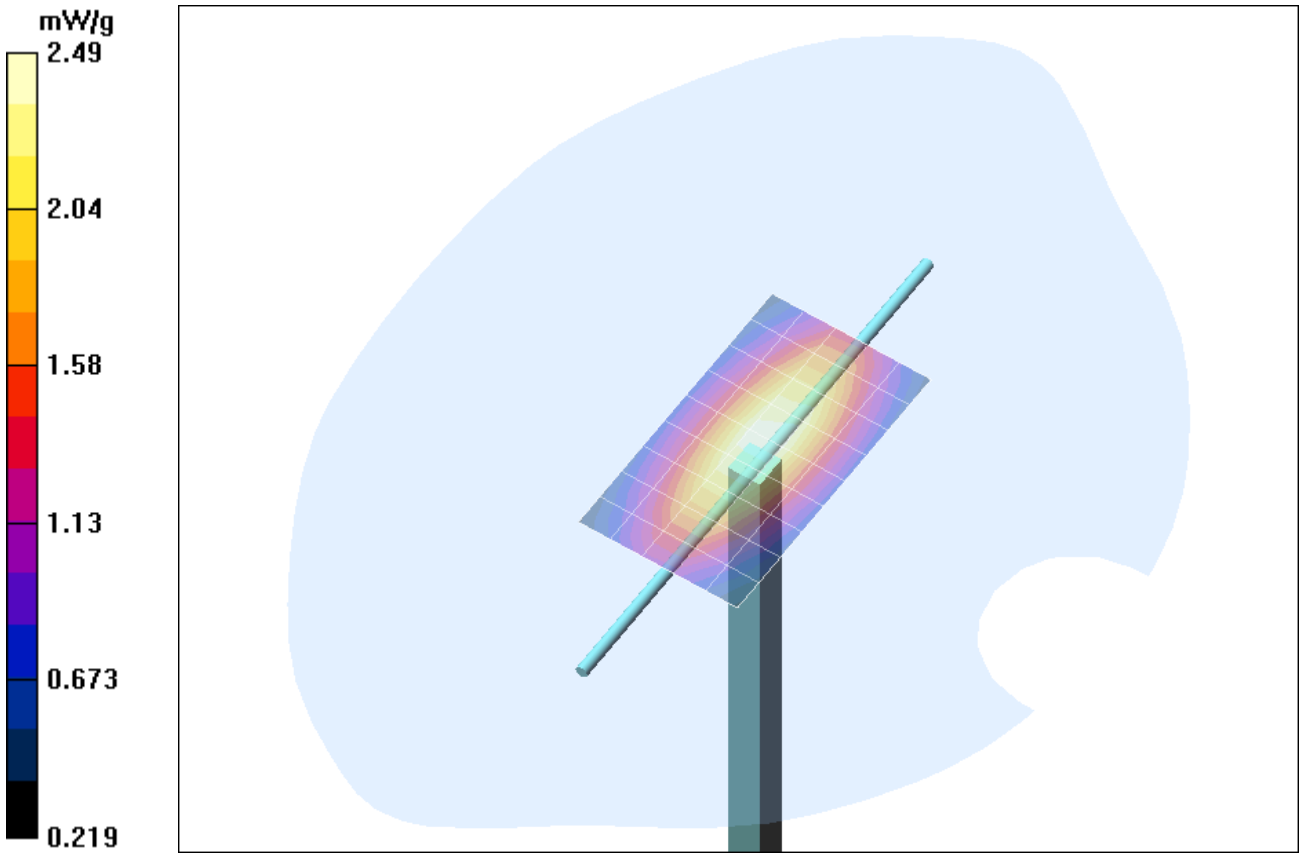
Ambient Temp: 22.4 °C; Fluid Temp: 21.7 °C; Barometric Pressure: 102.2 kPa; Humidity: 43%

Communication System: CW
Forward Conducted Power: 240mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3)

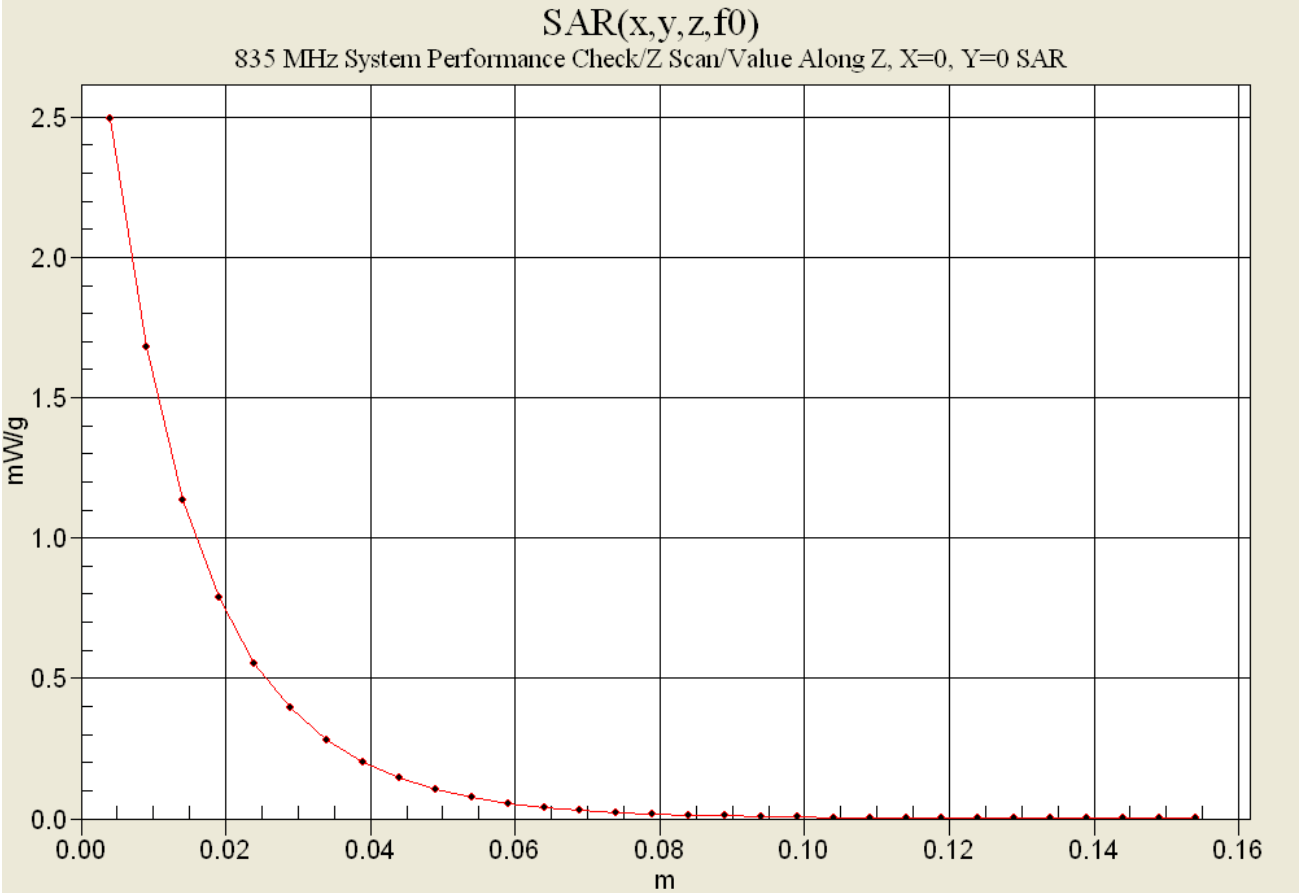
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

835 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm

835 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.4 W/kg
SAR(1 g) = 2.30 mW/g; SAR(10 g) = 1.51 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
835 MHz System Performance Check/Z Scan/Value Along Z, X=0, Y=0 SAR
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

APPENDIX C - SYSTEM VALIDATION

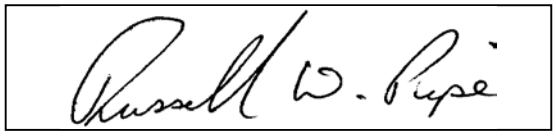
Celltech
Testing and Engineering Services Lab

835 MHz SYSTEM VALIDATION DIPOLE

Type:	**835 MHz Validation Dipole**
Serial Number:	**411**
Place of Calibration:	**Celltech Labs Inc.**
Date of Calibration:	**March 16, 2004**

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

Calibrated by: 

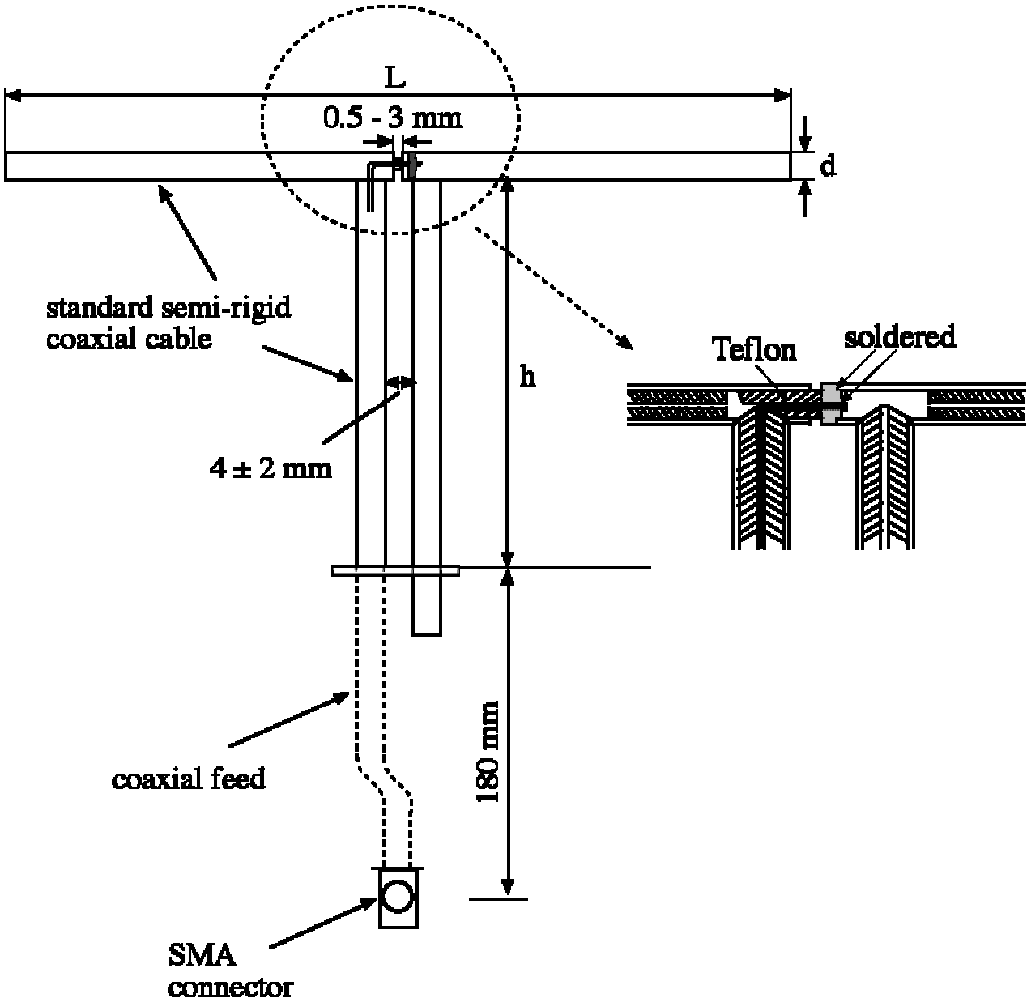
Approved by: 

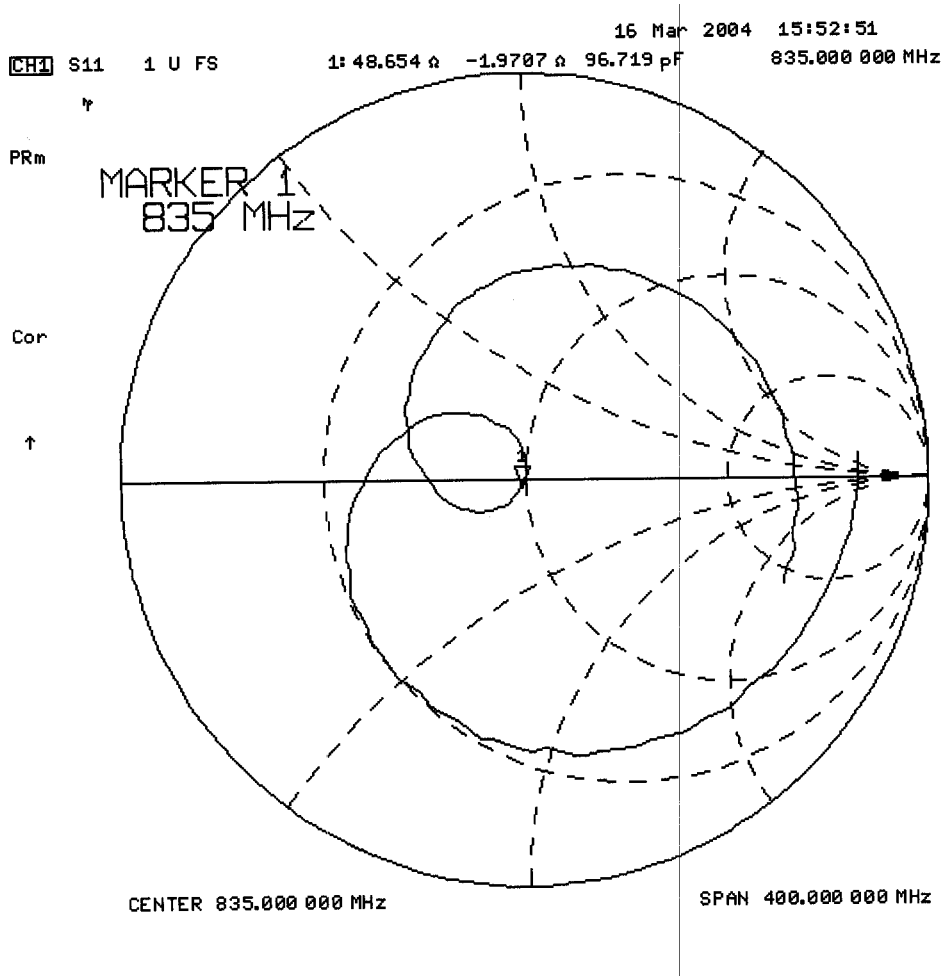
Celltech Labs Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-448-7047 • Fax. 250-448-7046 • e-mail: info@celltechlabs.com
www.celltechlabs.com

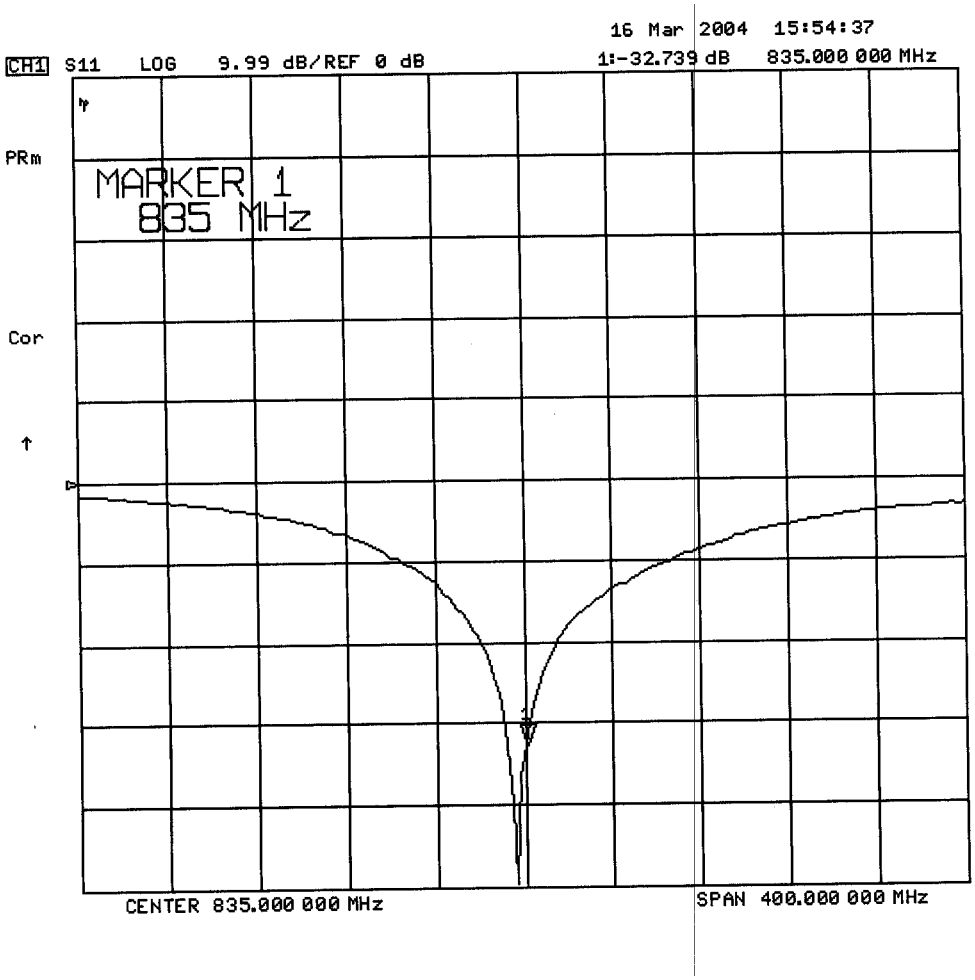
1. Dipole Construction & Electrical Characteristics

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 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 835MHz	Re{Z} = 48.654Ω
	Im{Z} = -1.9707Ω
Return Loss at 835MHz	-32.739dB




16 Mar 2004 15:52:51
CH1 S11 1 U FS
1: 48.654 Ω -1.9707 Ω 96.719 pF
835.000 000 MHz
PRm
MARKER 1
835 MHz
Cor
CENTER 835.000 000 MHz
SPAN 400.000 000 MHz


16 Mar 2004 15:54:37
CH1 S11 LOG 9.99 dB/REF 0 dB
1:-32.739 dB 835.000 000 MHz
PRm
MARKER 1
835 MHz
Cor
CENTER 835.000 000 MHz
SPAN 400.000 000 MHz

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

2. 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. 20 liters
Dimensions: 50 cm (W) x 100 cm (L)

835 MHz System Validation Setup

835 MHz System Validation Setup

3. Measurement Conditions

The SAM phantom was filled with 835 MHz brain simulating tissue.

Relative Permittivity:	42.6
Conductivity:	0.94 mho/m
Ambient Temperature:	24.6 °C
Fluid Temperature:	21.9 °C
Fluid Depth:	≥ 15.0 cm
Barometric Pressure:	101.6 kPa
Humidity:	31%

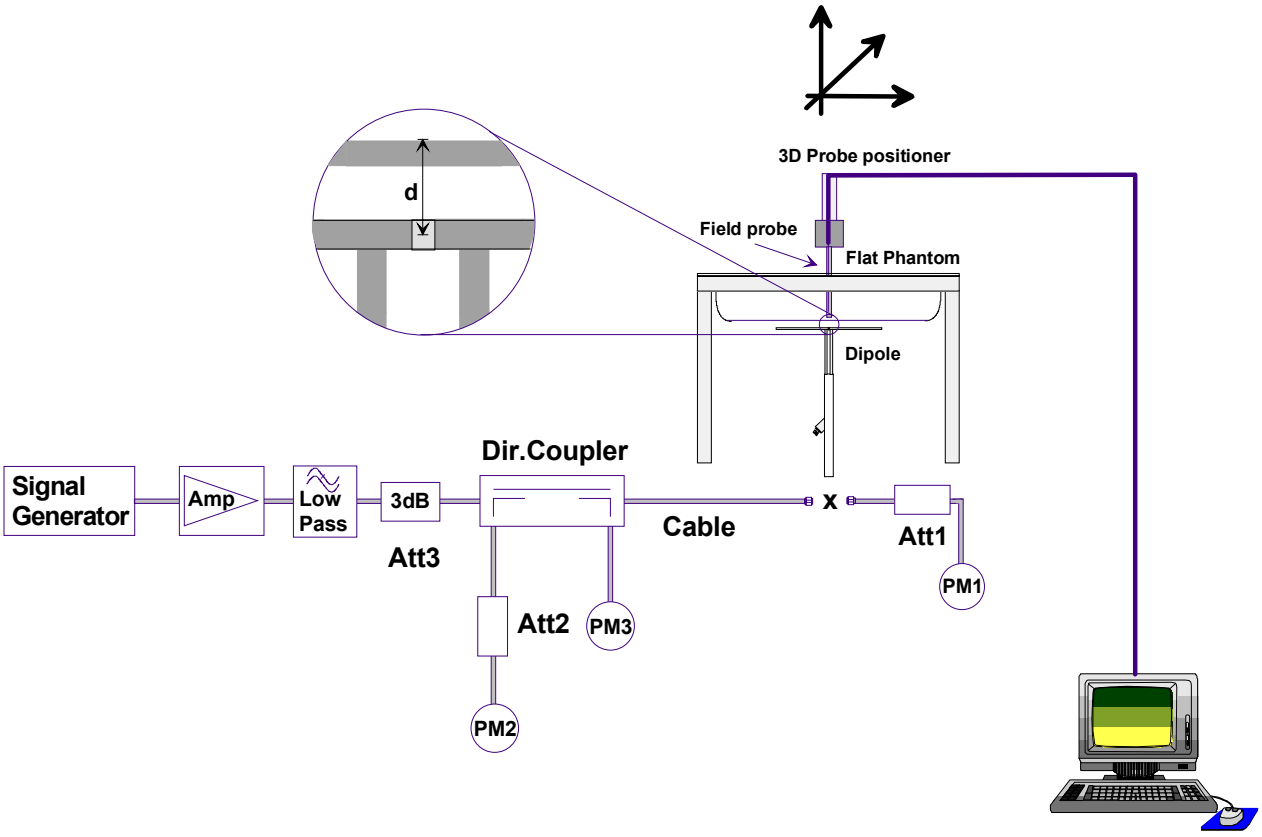
The 835 MHz simulating tissue consists of the following ingredients:

Ingredient	Percentage by weight
Water	40.71%
Sugar	56.63%
Salt	1.48%
HEC	0.99%
Dowicil 75	0.19%
Target Dielectric Parameters at 22 °C	ε_r = 41.5 σ = 0.90 S/m

Measurements were taken in the flat section of the SAM phantom using a dosimetric E-field probe ET3DV5 (s/n: 1590, conversion factor 7.0).

4. 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.

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

Validation Dipole SAR Test Results

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	2.46	9.84	1.61	6.44	3.56
Test 2	2.45	9.80	1.60	6.40	3.56
Test 3	2.45	9.80	1.61	6.44	3.56
Test 4	2.44	9.76	1.60	6.40	3.55
Test 5	2.43	9.72	1.60	6.40	3.53
Test 6	2.44	9.76	1.60	6.40	3.53
Test 7	2.44	9.76	1.60	6.40	3.55
Test 8	2.44	9.76	1.60	6.40	3.54
Test 9	2.47	9.88	1.62	6.48	3.58
Test10	2.47	9.88	1.62	6.48	3.62
Average Value	2.45	9.80	1.61	6.42	3.56

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

Averaged over 1cm (1g) of tissue: 9.80 mW/g

Averaged over 10cm (10g) of tissue: 6.42 mW/g

835 MHz System Validation - March 16, 2004

DUT: Dipole 835 MHz; Type: D835V2; Serial: 411
Ambient Temp: 24.6°C; Fluid Temp: 21.9°C; Barometric Pressure: 101.6 kPa; Humidity: 31%

Communication System: CW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.94 mho/m; ε_r = 42.6; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7, 7, 7); Calibrated: 15/05/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

835 MHz System Validation/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB

835 MHz System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.61 mW/g

835 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g

835 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.61 mW/g

835 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

835 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g

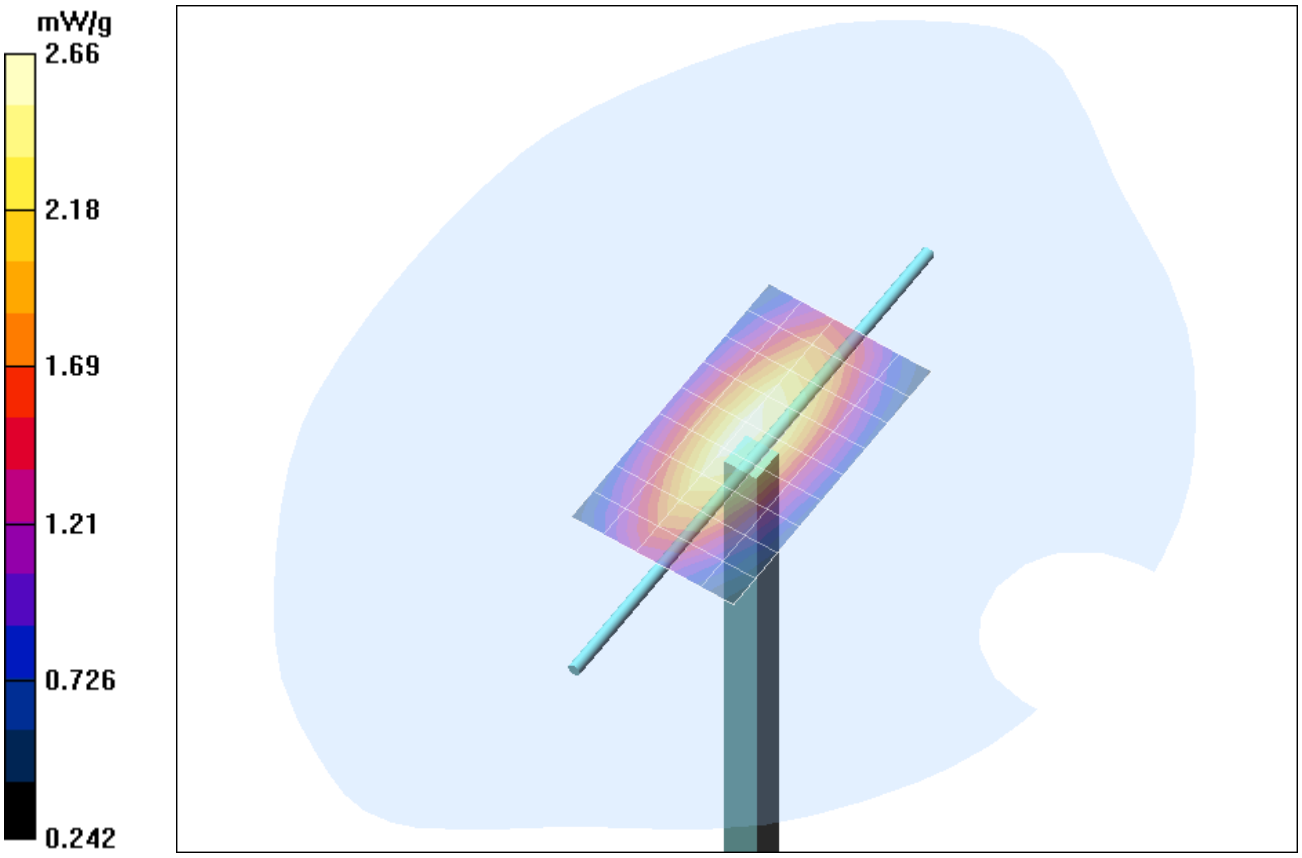
835 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

835 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

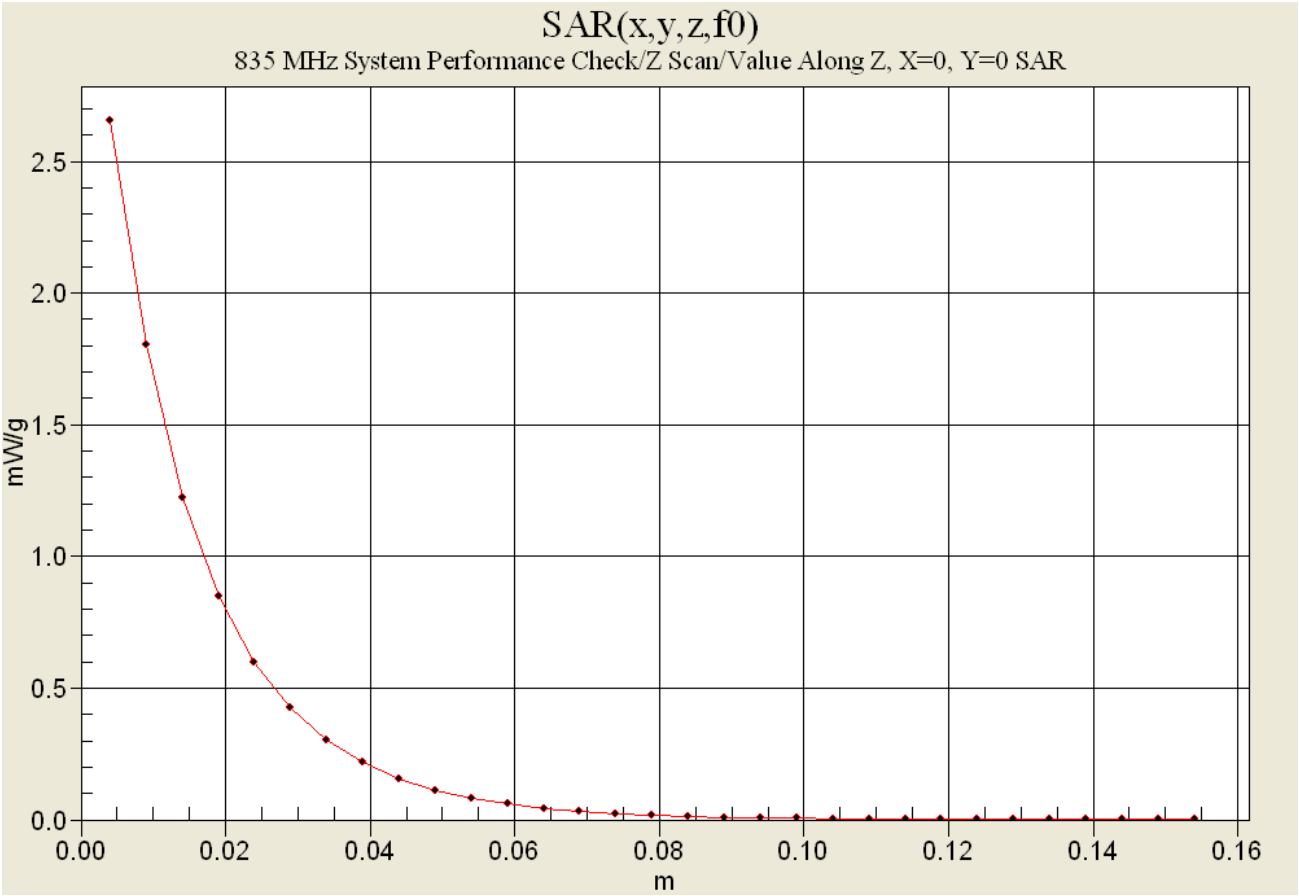
835 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.54 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

835 MHz System Validation/Zoom Scan 11 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g

835 MHz System Validation/Zoom Scan 12 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g



1 g average of 10 measurements: 2.449 mW/g
10 g average of 10 measurements: 1.606 mW/g



835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

March 16, 2004

Frequency	e'	e"
735.000000 MHz	43.8577	20.6938
745.000000 MHz	43.6899	20.6481
755.000000 MHz	43.5341	20.5840
765.000000 MHz	43.4161	20.5576
775.000000 MHz	43.3026	20.5312
785.000000 MHz	43.2065	20.5122
795.000000 MHz	43.1067	20.5061
805.000000 MHz	43.0154	20.4762
815.000000 MHz	42.8927	20.4182
825.000000 MHz	42.7420	20.3806
835.000000 MHz	42.6206	20.2993
845.000000 MHz	42.4357	20.2595
855.000000 MHz	42.2984	20.1872
865.000000 MHz	42.1422	20.1432
875.000000 MHz	42.0082	20.1253
885.000000 MHz	41.8996	20.1110
895.000000 MHz	41.8514	20.0192
905.000000 MHz	41.7550	20.0083
915.000000 MHz	41.6535	19.9701
925.000000 MHz	41.5521	19.9380
935.000000 MHz	41.4477	19.9175

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

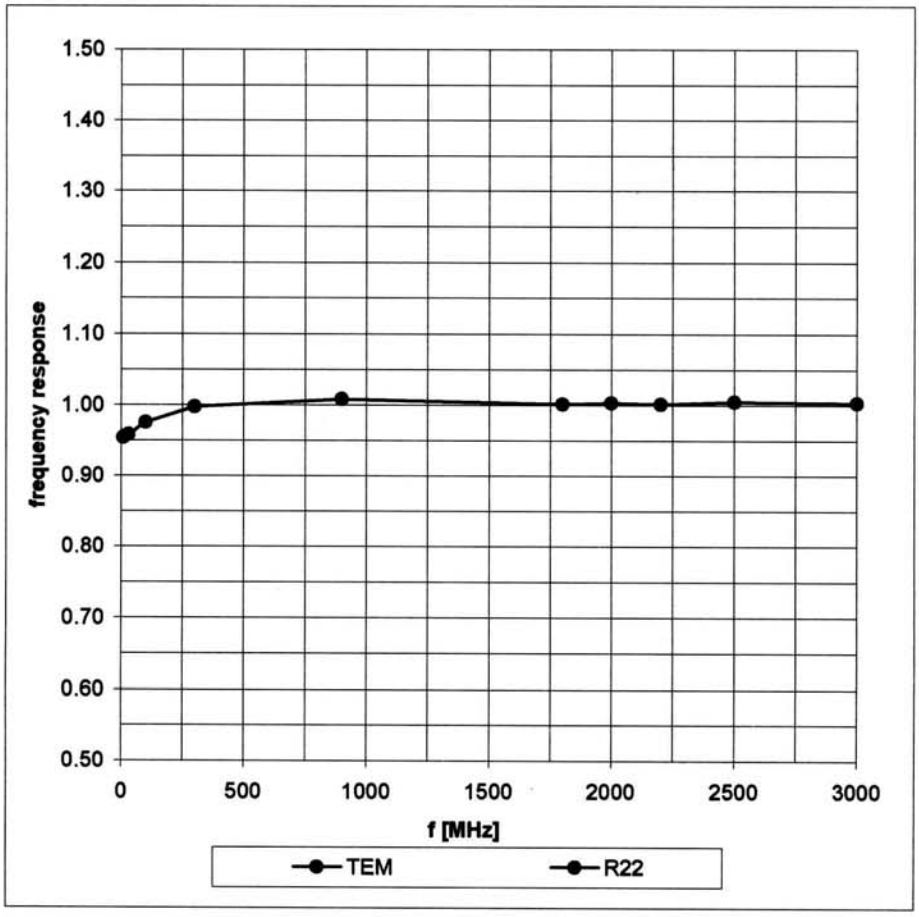
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

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%.

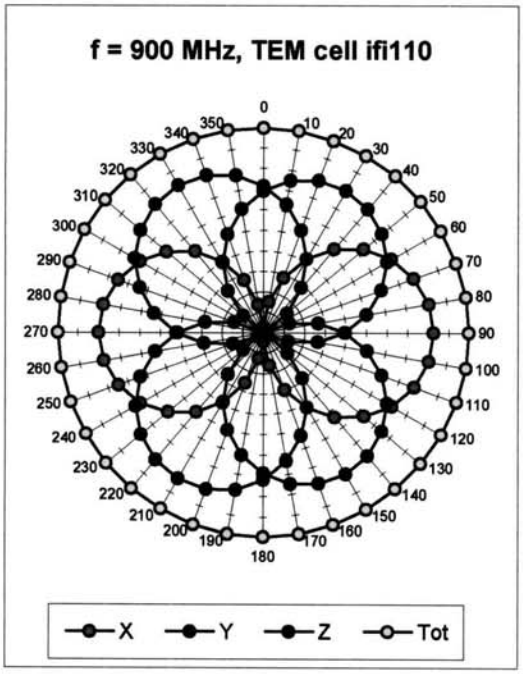
[A] numerical linearization parameter: uncertainty not required

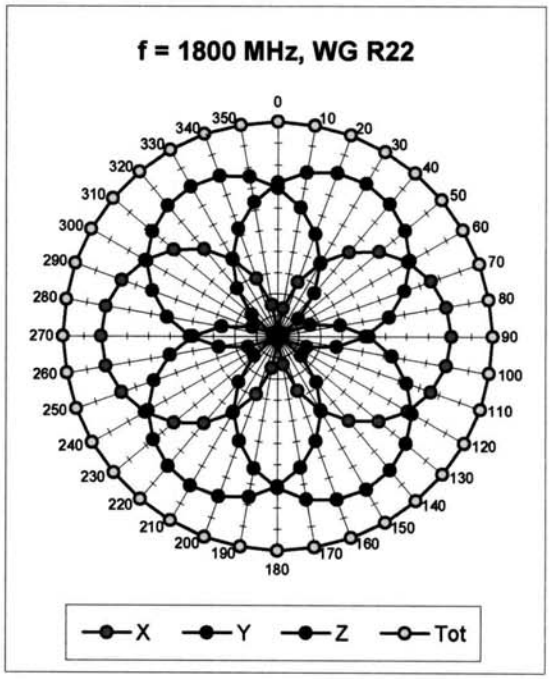
Frequency Response of E-Field

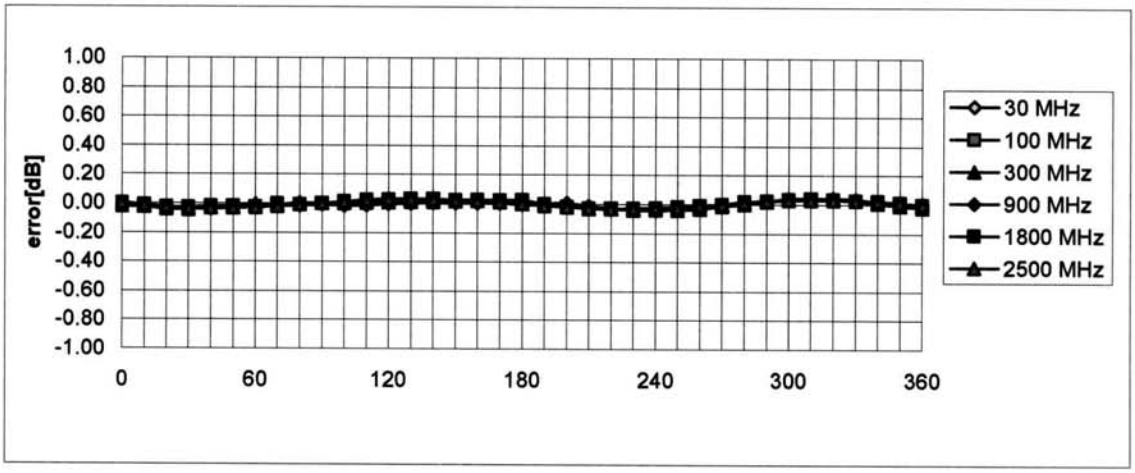
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ) , θ = 0°



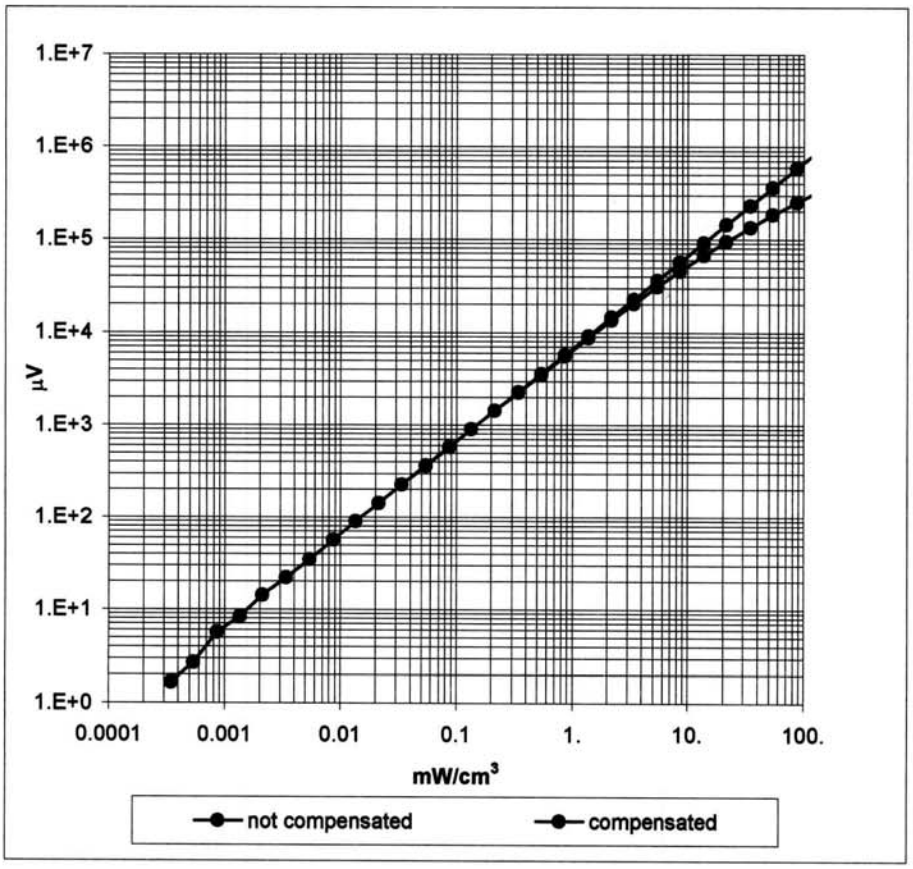


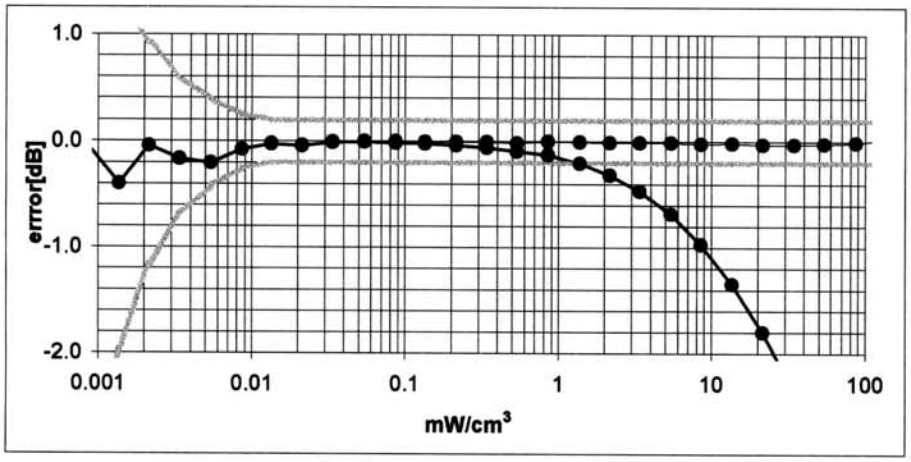


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

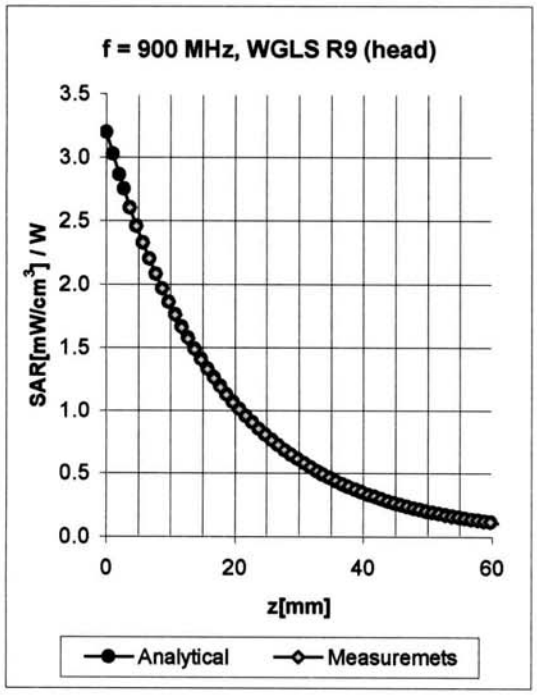
(Waveguide R22)

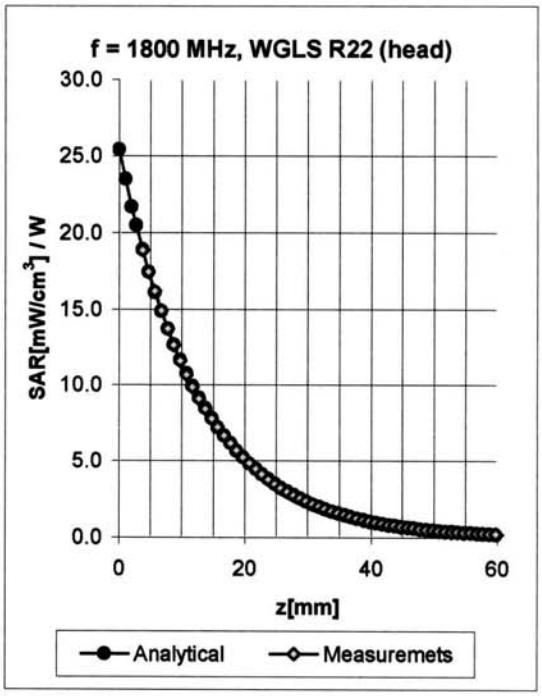




Probe Linearity < ± 0.2 dB

Conversion Factor Assessment



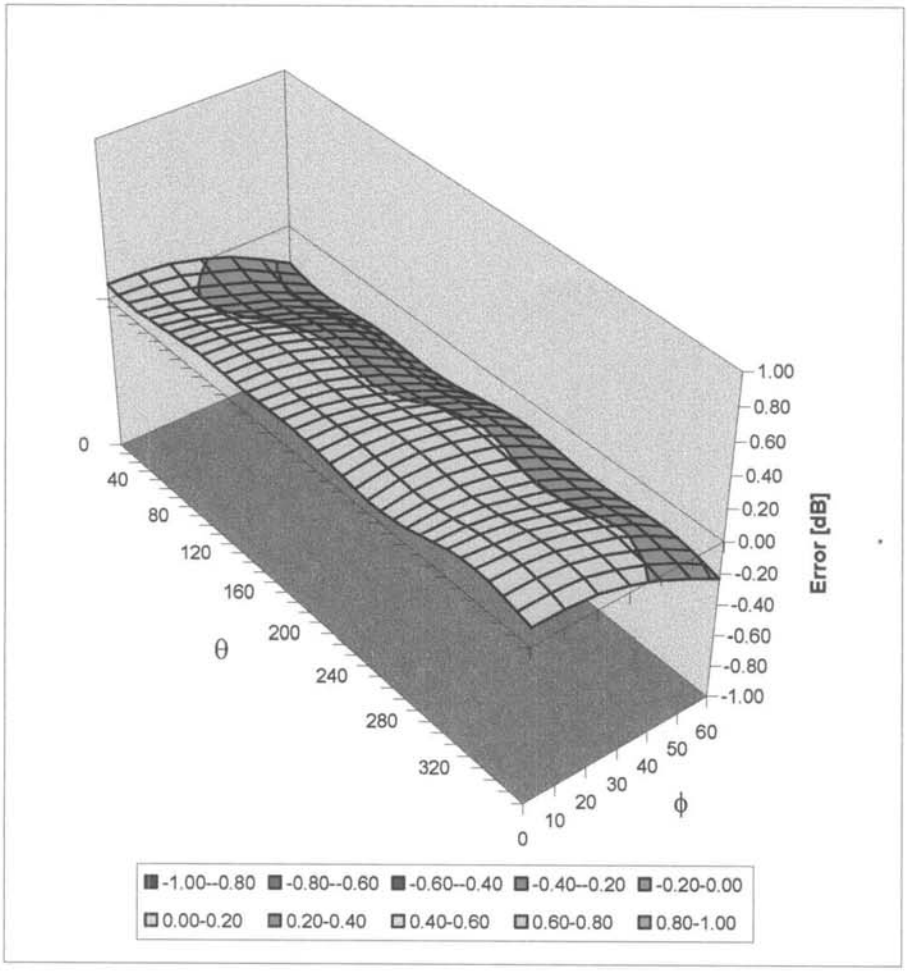


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	750-950	Head	41.5 ± 5%	0.90 ± 5%	0.72	1.78	6.71 ± 11.9% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.51	2.67	5.38 ± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.55	2.66	5.25 ± 9.7% (k=2)
2450	2400-2500	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

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info@speag.com, http://www.speag.com

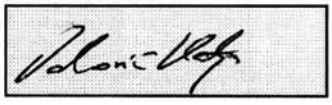
Additional Conversion Factors

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:



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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

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 23, 2004

Frequency	e'	e"
735.000000 MHz	42.3434	19.9824
745.000000 MHz	42.2123	19.9608
755.000000 MHz	42.0883	19.8813
765.000000 MHz	41.9478	19.8536
775.000000 MHz	41.8380	19.7968
785.000000 MHz	41.7168	19.7669
795.000000 MHz	41.6203	19.7316
805.000000 MHz	41.5274	19.6965
815.000000 MHz	41.4321	19.6791
825.000000 MHz	41.2741	19.6530
835.000000 MHz	41.1614	19.6213
845.000000 MHz	40.9946	19.5693
855.000000 MHz	40.8582	19.5728
865.000000 MHz	40.6856	19.5056
875.000000 MHz	40.5698	19.5157
885.000000 MHz	40.4563	19.4855
895.000000 MHz	40.3578	19.3925
905.000000 MHz	40.2781	19.3552
915.000000 MHz	40.1689	19.3081
925.000000 MHz	40.0619	19.2908
935.000000 MHz	39.9413	19.2497

769 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 23, 2004

Frequency	e'	e"
679.000000 MHz	43.5725	20.4033
689.000000 MHz	43.4227	20.3424
699.000000 MHz	43.2983	20.3387
709.000000 MHz	43.1552	20.2375
719.000000 MHz	43.0254	20.2196
729.000000 MHz	42.8575	20.1474
739.000000 MHz	42.7310	20.1257
749.000000 MHz	42.5753	20.0837
759.000000 MHz	42.4113	20.0343
769.000000 MHz	42.2949	19.9745
779.000000 MHz	42.1623	19.9654
789.000000 MHz	42.0673	19.9141
799.000000 MHz	41.9767	19.9066
809.000000 MHz	41.8892	19.8772
819.000000 MHz	41.7348	19.8456
829.000000 MHz	41.5900	19.8129
839.000000 MHz	41.4616	19.7666
849.000000 MHz	41.3014	19.7414
859.000000 MHz	41.1648	19.7110
869.000000 MHz	41.0202	19.6741
879.000000 MHz	40.8719	19.6804

799 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 23, 2004

Frequency	e'	e"
679.000000 MHz	43.5725	20.4033
689.000000 MHz	43.4227	20.3424
699.000000 MHz	43.2983	20.3387
709.000000 MHz	43.1552	20.2375
719.000000 MHz	43.0254	20.2196
729.000000 MHz	42.8575	20.1474
739.000000 MHz	42.7310	20.1257
749.000000 MHz	42.5753	20.0837
759.000000 MHz	42.4113	20.0343
769.000000 MHz	42.2949	19.9745
779.000000 MHz	42.1623	19.9654
789.000000 MHz	42.0673	19.9141
799.000000 MHz	41.9767	19.9066
809.000000 MHz	41.8892	19.8772
819.000000 MHz	41.7348	19.8456
829.000000 MHz	41.5900	19.8129
839.000000 MHz	41.4616	19.7666
849.000000 MHz	41.3014	19.7414
859.000000 MHz	41.1648	19.7110
869.000000 MHz	41.0202	19.6741
879.000000 MHz	40.8719	19.6804

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 23, 2004

Frequency	e'	e"
785.000000 MHz	41.7533	19.7794
790.000000 MHz	41.7175	19.7692
795.000000 MHz	41.6463	19.7466
800.000000 MHz	41.6223	19.7336
805.000000 MHz	41.5329	19.7167
810.000000 MHz	41.4969	19.7127
815.000000 MHz	41.4148	19.6945
820.000000 MHz	41.3643	19.6895
825.000000 MHz	41.2971	19.6786
830.000000 MHz	41.2090	19.6262
835.000000 MHz	41.1516	19.6239
840.000000 MHz	41.0925	19.6119
845.000000 MHz	40.9849	19.5720
850.000000 MHz	40.9087	19.5655
855.000000 MHz	40.8459	19.5659
860.000000 MHz	40.7924	19.5228
865.000000 MHz	40.7099	19.5191
870.000000 MHz	40.6299	19.4845
875.000000 MHz	40.5698	19.5157
880.000000 MHz	40.5332	19.5199
885.000000 MHz	40.4616	19.5040

860 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 23, 2004

Frequency	e'	e"
785.000000 MHz	41.7533	19.7794
790.000000 MHz	41.7175	19.7692
795.000000 MHz	41.6463	19.7466
800.000000 MHz	41.6223	19.7336
805.000000 MHz	41.5329	19.7167
810.000000 MHz	41.4969	19.7127
815.000000 MHz	41.4148	19.6945
820.000000 MHz	41.3643	19.6895
825.000000 MHz	41.2971	19.6786
830.000000 MHz	41.2090	19.6262
835.000000 MHz	41.1516	19.6239
840.000000 MHz	41.0925	19.6119
845.000000 MHz	40.9849	19.5720
850.000000 MHz	40.9087	19.5655
855.000000 MHz	40.8459	19.5659
860.000000 MHz	40.7924	19.5228
865.000000 MHz	40.7099	19.5191
870.000000 MHz	40.6299	19.4845
875.000000 MHz	40.5698	19.5157
880.000000 MHz	40.5332	19.5199
885.000000 MHz	40.4616	19.5040

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 25, 2004

Frequency	e'	e"
735.000000 MHz	41.8961	19.9712
745.000000 MHz	41.7336	19.8965
755.000000 MHz	41.5991	19.8457
765.000000 MHz	41.4296	19.8171
775.000000 MHz	41.2758	19.7638
785.000000 MHz	41.1687	19.7445
795.000000 MHz	41.0680	19.7136
805.000000 MHz	40.9682	19.6725
815.000000 MHz	40.8851	19.6605
825.000000 MHz	40.7635	19.6115
835.000000 MHz	40.6071	19.5947
845.000000 MHz	40.4794	19.5141
855.000000 MHz	40.3496	19.4879
865.000000 MHz	40.1969	19.4388
875.000000 MHz	40.0496	19.4305
885.000000 MHz	39.9291	19.3956
895.000000 MHz	39.8475	19.3112
905.000000 MHz	39.7414	19.2702
915.000000 MHz	39.6243	19.2483
925.000000 MHz	39.5183	19.2194
935.000000 MHz	39.4089	19.1687

769 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 25, 2004

Frequency	e'	e"
679.000000 MHz	43.4576	20.3680
689.000000 MHz	43.3090	20.3327
699.000000 MHz	43.1835	20.2689
709.000000 MHz	43.0329	20.2314
719.000000 MHz	42.8821	20.1717
729.000000 MHz	42.7215	20.1462
739.000000 MHz	42.5800	20.0824
749.000000 MHz	42.4207	20.0657
759.000000 MHz	42.2771	20.0006
769.000000 MHz	42.1332	19.9603
779.000000 MHz	41.9876	19.9167
789.000000 MHz	41.9064	19.8907
799.000000 MHz	41.7990	19.8561
809.000000 MHz	41.7248	19.8299
819.000000 MHz	41.6105	19.7833
829.000000 MHz	41.4724	19.7712
839.000000 MHz	41.3159	19.7338
849.000000 MHz	41.1791	19.7135
859.000000 MHz	41.0070	19.6631
869.000000 MHz	40.8760	19.6338
879.000000 MHz	40.7330	19.6193

799 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 25, 2004

Frequency	e'	e"
679.000000 MHz	43.4576	20.3680
689.000000 MHz	43.3090	20.3327
699.000000 MHz	43.1835	20.2689
709.000000 MHz	43.0329	20.2314
719.000000 MHz	42.8821	20.1717
729.000000 MHz	42.7215	20.1462
739.000000 MHz	42.5800	20.0824
749.000000 MHz	42.4207	20.0657
759.000000 MHz	42.2771	20.0006
769.000000 MHz	42.1332	19.9603
779.000000 MHz	41.9876	19.9167
789.000000 MHz	41.9064	19.8907
799.000000 MHz	41.7990	19.8561
809.000000 MHz	41.7248	19.8299
819.000000 MHz	41.6105	19.7833
829.000000 MHz	41.4724	19.7712
839.000000 MHz	41.3159	19.7338
849.000000 MHz	41.1791	19.7135
859.000000 MHz	41.0070	19.6631
869.000000 MHz	40.8760	19.6338
879.000000 MHz	40.7330	19.6193

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 25, 2004

Frequency	e'	e"
785.000000 MHz	41.9821	19.9738
790.000000 MHz	41.9144	19.9705
795.000000 MHz	41.8628	19.9411
800.000000 MHz	41.8148	19.9220
805.000000 MHz	41.7880	19.8975
810.000000 MHz	41.7605	19.8680
815.000000 MHz	41.6768	19.8865
820.000000 MHz	41.6160	19.8666
825.000000 MHz	41.5576	19.8518
830.000000 MHz	41.4961	19.8222
835.000000 MHz	41.4054	19.8170
840.000000 MHz	41.3425	19.7939
845.000000 MHz	41.2709	19.7737
850.000000 MHz	41.1907	19.7563
855.000000 MHz	41.0926	19.7444
860.000000 MHz	41.0434	19.7191
865.000000 MHz	40.9733	19.6899
870.000000 MHz	40.8855	19.6662
875.000000 MHz	40.8216	19.6870
880.000000 MHz	40.7748	19.6927
885.000000 MHz	40.7141	19.6824

860 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 25, 2004

Frequency	e'	e"
785.000000 MHz	41.9821	19.9738
790.000000 MHz	41.9144	19.9705
795.000000 MHz	41.8628	19.9411
800.000000 MHz	41.8148	19.9220
805.000000 MHz	41.7880	19.8975
810.000000 MHz	41.7605	19.8680
815.000000 MHz	41.6768	19.8865
820.000000 MHz	41.6160	19.8666
825.000000 MHz	41.5576	19.8518
830.000000 MHz	41.4961	19.8222
835.000000 MHz	41.4054	19.8170
840.000000 MHz	41.3425	19.7939
845.000000 MHz	41.2709	19.7737
850.000000 MHz	41.1907	19.7563
855.000000 MHz	41.0926	19.7444
860.000000 MHz	41.0434	19.7191
865.000000 MHz	40.9733	19.6899
870.000000 MHz	40.8855	19.6662
875.000000 MHz	40.8216	19.6870
880.000000 MHz	40.7748	19.6927
885.000000 MHz	40.7141	19.6824

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 26, 2004

Frequency	e'	e"
735.000000 MHz	41.8373	19.8047
745.000000 MHz	41.7145	19.7742
755.000000 MHz	41.5316	19.7144
765.000000 MHz	41.4314	19.6472
775.000000 MHz	41.2944	19.6193
785.000000 MHz	41.1944	19.5886
795.000000 MHz	41.0869	19.5773
805.000000 MHz	40.9839	19.5276
815.000000 MHz	40.8766	19.5288
825.000000 MHz	40.7305	19.5090
835.000000 MHz	40.5867	19.4427
845.000000 MHz	40.4238	19.4254
855.000000 MHz	40.2795	19.3837
865.000000 MHz	40.1326	19.3547
875.000000 MHz	39.9951	19.3447
885.000000 MHz	39.8843	19.3082
895.000000 MHz	39.8186	19.2104
905.000000 MHz	39.7171	19.1691
915.000000 MHz	39.6129	19.1591
925.000000 MHz	39.4985	19.1190
935.000000 MHz	39.3942	19.0868

769 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 26, 2004

Frequency	e'	e"
679.000000 MHz	43.2057	20.4153
689.000000 MHz	43.0420	20.3287
699.000000 MHz	42.9267	20.3190
709.000000 MHz	42.7711	20.2473
719.000000 MHz	42.6263	20.2471
729.000000 MHz	42.4925	20.1505
739.000000 MHz	42.3608	20.1378
749.000000 MHz	42.2067	20.0857
759.000000 MHz	42.0471	20.0371
769.000000 MHz	41.9243	19.9809
779.000000 MHz	41.7959	19.9726
789.000000 MHz	41.6816	19.9173
799.000000 MHz	41.5924	19.9006
809.000000 MHz	41.4875	19.8726
819.000000 MHz	41.3601	19.8464
829.000000 MHz	41.2152	19.7997
839.000000 MHz	41.0696	19.7918
849.000000 MHz	40.9315	19.7205
859.000000 MHz	40.7564	19.7236
869.000000 MHz	40.6374	19.6915
879.000000 MHz	40.4835	19.7010

799 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 26, 2004

Frequency	e'	e"
679.000000 MHz	43.2057	20.4153
689.000000 MHz	43.0420	20.3287
699.000000 MHz	42.9267	20.3190
709.000000 MHz	42.7711	20.2473
719.000000 MHz	42.6263	20.2471
729.000000 MHz	42.4925	20.1505
739.000000 MHz	42.3608	20.1378
749.000000 MHz	42.2067	20.0857
759.000000 MHz	42.0471	20.0371
769.000000 MHz	41.9243	19.9809
779.000000 MHz	41.7959	19.9726
789.000000 MHz	41.6816	19.9173
799.000000 MHz	41.5924	19.9006
809.000000 MHz	41.4875	19.8726
819.000000 MHz	41.3601	19.8464
829.000000 MHz	41.2152	19.7997
839.000000 MHz	41.0696	19.7918
849.000000 MHz	40.9315	19.7205
859.000000 MHz	40.7564	19.7236
869.000000 MHz	40.6374	19.6915
879.000000 MHz	40.4835	19.7010

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 26, 2004

Frequency	e'	e"
785.000000 MHz	41.7096	19.6138
790.000000 MHz	41.6608	19.5970
795.000000 MHz	41.6313	19.6082
800.000000 MHz	41.5842	19.5913
805.000000 MHz	41.5150	19.5697
810.000000 MHz	41.4437	19.5761
815.000000 MHz	41.4077	19.5301
820.000000 MHz	41.3358	19.5264
825.000000 MHz	41.2587	19.5191
830.000000 MHz	41.1792	19.5181
835.000000 MHz	41.1209	19.4746
840.000000 MHz	41.0645	19.4731
845.000000 MHz	40.9719	19.4506
850.000000 MHz	40.9176	19.4490
855.000000 MHz	40.8438	19.4117
860.000000 MHz	40.7507	19.4113
865.000000 MHz	40.6913	19.3813
870.000000 MHz	40.6408	19.3797
875.000000 MHz	40.5818	19.3806
880.000000 MHz	40.5238	19.3814
885.000000 MHz	40.4401	19.3597

860 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 26, 2004

Frequency	e'	e"
785.000000 MHz	41.7096	19.6138
790.000000 MHz	41.6608	19.5970
795.000000 MHz	41.6313	19.6082
800.000000 MHz	41.5842	19.5913
805.000000 MHz	41.5150	19.5697
810.000000 MHz	41.4437	19.5761
815.000000 MHz	41.4077	19.5301
820.000000 MHz	41.3358	19.5264
825.000000 MHz	41.2587	19.5191
830.000000 MHz	41.1792	19.5181
835.000000 MHz	41.1209	19.4746
840.000000 MHz	41.0645	19.4731
845.000000 MHz	40.9719	19.4506
850.000000 MHz	40.9176	19.4490
855.000000 MHz	40.8438	19.4117
860.000000 MHz	40.7507	19.4113
865.000000 MHz	40.6913	19.3813
870.000000 MHz	40.6408	19.3797
875.000000 MHz	40.5818	19.3806
880.000000 MHz	40.5238	19.3814
885.000000 MHz	40.4401	19.3597

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 27, 2004

Frequency	e'	e"
735.000000 MHz	42.2649	20.0899
745.000000 MHz	42.1118	20.0210
755.000000 MHz	41.9759	19.9786
765.000000 MHz	41.8259	19.9077
775.000000 MHz	41.7167	19.8900
785.000000 MHz	41.5931	19.8438
795.000000 MHz	41.4907	19.8209
805.000000 MHz	41.3920	19.7979
815.000000 MHz	41.2615	19.7630
825.000000 MHz	41.1366	19.7332
835.000000 MHz	40.9631	19.6655
845.000000 MHz	40.8506	19.6510
855.000000 MHz	40.6790	19.6334
865.000000 MHz	40.5679	19.5593
875.000000 MHz	40.4158	19.5799
885.000000 MHz	40.3093	19.5679
895.000000 MHz	40.2557	19.4519
905.000000 MHz	40.1427	19.4145
915.000000 MHz	40.0457	19.3542
925.000000 MHz	39.9195	19.3331
935.000000 MHz	39.8233	19.3043

769 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 27, 2004

Frequency	e'	e"
679.000000 MHz	55.8913	22.2588
689.000000 MHz	55.7763	22.1604
699.000000 MHz	55.6926	22.1050
709.000000 MHz	55.5589	22.0351
719.000000 MHz	55.4609	21.9432
729.000000 MHz	55.3303	21.8884
739.000000 MHz	55.2343	21.8481
749.000000 MHz	55.0925	21.7638
759.000000 MHz	54.9776	21.7084
769.000000 MHz	54.8674	21.6528
779.000000 MHz	54.7619	21.5969
789.000000 MHz	54.7164	21.5675
799.000000 MHz	54.6299	21.5412
809.000000 MHz	54.5508	21.5070
819.000000 MHz	54.4457	21.4828
829.000000 MHz	54.3178	21.4287
839.000000 MHz	54.2113	21.3904
849.000000 MHz	54.0707	21.3660
859.000000 MHz	53.9621	21.2982
869.000000 MHz	53.8566	21.2846
879.000000 MHz	53.7737	21.2630

799 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 27, 2004

Frequency	e'	e"
679.000000 MHz	55.8913	22.2588
689.000000 MHz	55.7763	22.1604
699.000000 MHz	55.6926	22.1050
709.000000 MHz	55.5589	22.0351
719.000000 MHz	55.4609	21.9432
729.000000 MHz	55.3303	21.8884
739.000000 MHz	55.2343	21.8481
749.000000 MHz	55.0925	21.7638
759.000000 MHz	54.9776	21.7084
769.000000 MHz	54.8674	21.6528
779.000000 MHz	54.7619	21.5969
789.000000 MHz	54.7164	21.5675
799.000000 MHz	54.6299	21.5412
809.000000 MHz	54.5508	21.5070
819.000000 MHz	54.4457	21.4828
829.000000 MHz	54.3178	21.4287
839.000000 MHz	54.2113	21.3904
849.000000 MHz	54.0707	21.3660
859.000000 MHz	53.9621	21.2982
869.000000 MHz	53.8566	21.2846
879.000000 MHz	53.7737	21.2630

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 27, 2004

Frequency	e'	e"
785.000000 MHz	54.6394	21.6865
790.000000 MHz	54.6043	21.6818
795.000000 MHz	54.5594	21.6460
800.000000 MHz	54.5568	21.6299
805.000000 MHz	54.5107	21.6177
810.000000 MHz	54.4794	21.6118
815.000000 MHz	54.3797	21.5853
820.000000 MHz	54.3352	21.5675
825.000000 MHz	54.2868	21.5514
830.000000 MHz	54.2148	21.4830
835.000000 MHz	54.1654	21.4735
840.000000 MHz	54.1135	21.4540
845.000000 MHz	54.0169	21.4295
850.000000 MHz	53.9516	21.4266
855.000000 MHz	53.9149	21.3807
860.000000 MHz	53.8542	21.3550
865.000000 MHz	53.7663	21.3400
870.000000 MHz	53.7279	21.3388
875.000000 MHz	53.6846	21.3502
880.000000 MHz	53.6409	21.3298
885.000000 MHz	53.5925	21.3221

860 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 27, 2004

Frequency	e'	e"
785.000000 MHz	54.6394	21.6865
790.000000 MHz	54.6043	21.6818
795.000000 MHz	54.5594	21.6460
800.000000 MHz	54.5568	21.6299
805.000000 MHz	54.5107	21.6177
810.000000 MHz	54.4794	21.6118
815.000000 MHz	54.3797	21.5853
820.000000 MHz	54.3352	21.5675
825.000000 MHz	54.2868	21.5514
830.000000 MHz	54.2148	21.4830
835.000000 MHz	54.1654	21.4735
840.000000 MHz	54.1135	21.4540
845.000000 MHz	54.0169	21.4295
850.000000 MHz	53.9516	21.4266
855.000000 MHz	53.9149	21.3807
860.000000 MHz	53.8542	21.3550
865.000000 MHz	53.7663	21.3400
870.000000 MHz	53.7279	21.3388
875.000000 MHz	53.6846	21.3502
880.000000 MHz	53.6409	21.3298
885.000000 MHz	53.5925	21.3221

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 28, 2004

Frequency	e'	e"
735.000000 MHz	41.4032	19.7717
745.000000 MHz	41.2746	19.7222
755.000000 MHz	41.1210	19.6693
765.000000 MHz	40.9724	19.6172
775.000000 MHz	40.8577	19.5918
785.000000 MHz	40.7340	19.5588
795.000000 MHz	40.6376	19.5309
805.000000 MHz	40.5320	19.4956
815.000000 MHz	40.4477	19.4665
825.000000 MHz	40.3179	19.4134
835.000000 MHz	40.1808	19.4165
845.000000 MHz	40.0133	19.3299
855.000000 MHz	39.8852	19.2970
865.000000 MHz	39.7153	19.2465
875.000000 MHz	39.6031	19.2425
885.000000 MHz	39.4628	19.1972
895.000000 MHz	39.3946	19.1133
905.000000 MHz	39.3099	19.0849
915.000000 MHz	39.1855	19.0445
925.000000 MHz	39.0794	19.0388
935.000000 MHz	38.9975	18.9742

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 28, 2004

Frequency	e'	e"
785.000000 MHz	54.6466	21.7072
790.000000 MHz	54.6048	21.7162
795.000000 MHz	54.5738	21.6869
800.000000 MHz	54.5508	21.6777
805.000000 MHz	54.4909	21.6419
810.000000 MHz	54.4661	21.6222
815.000000 MHz	54.3941	21.6252
820.000000 MHz	54.3744	21.5983
825.000000 MHz	54.3124	21.5756
830.000000 MHz	54.2203	21.5588
835.000000 MHz	54.1869	21.5320
840.000000 MHz	54.1288	21.5255
845.000000 MHz	54.0393	21.5199
850.000000 MHz	53.9801	21.5034
855.000000 MHz	53.9470	21.4665
860.000000 MHz	53.8709	21.4570
865.000000 MHz	53.8090	21.4532
870.000000 MHz	53.7612	21.4550
875.000000 MHz	53.7201	21.4436
880.000000 MHz	53.6765	21.4227
885.000000 MHz	53.6003	21.4251

860 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 28, 2004

Frequency	e'	e"
785.000000 MHz	54.6466	21.7072
790.000000 MHz	54.6048	21.7162
795.000000 MHz	54.5738	21.6869
800.000000 MHz	54.5508	21.6777
805.000000 MHz	54.4909	21.6419
810.000000 MHz	54.4661	21.6222
815.000000 MHz	54.3941	21.6252
820.000000 MHz	54.3744	21.5983
825.000000 MHz	54.3124	21.5756
830.000000 MHz	54.2203	21.5588
835.000000 MHz	54.1869	21.5320
840.000000 MHz	54.1288	21.5255
845.000000 MHz	54.0393	21.5199
850.000000 MHz	53.9801	21.5034
855.000000 MHz	53.9470	21.4665
860.000000 MHz	53.8709	21.4570
865.000000 MHz	53.8090	21.4532
870.000000 MHz	53.7612	21.4550
875.000000 MHz	53.7201	21.4436
880.000000 MHz	53.6765	21.4227
885.000000 MHz	53.6003	21.4251

769 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 28, 2004

Frequency	e'	e"
679.000000 MHz	54.7179	21.9355
689.000000 MHz	54.6271	21.8997
699.000000 MHz	54.4906	21.8217
709.000000 MHz	54.3900	21.7409
719.000000 MHz	54.3053	21.6568
729.000000 MHz	54.1725	21.6385
739.000000 MHz	54.0350	21.5501
749.000000 MHz	53.9421	21.5093
759.000000 MHz	53.8003	21.4499
769.000000 MHz	53.7060	21.4117
779.000000 MHz	53.6229	21.3416
789.000000 MHz	53.5333	21.2749
799.000000 MHz	53.4684	21.2521
809.000000 MHz	53.3784	21.2102
819.000000 MHz	53.2925	21.1844
829.000000 MHz	53.1395	21.1444
839.000000 MHz	53.0405	21.1031
849.000000 MHz	52.9035	21.0658
859.000000 MHz	52.7832	21.0022
869.000000 MHz	52.6539	21.0185
879.000000 MHz	52.5560	20.9918

799 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 28, 2004

Frequency	e'	e"
679.000000 MHz	54.7179	21.9355
689.000000 MHz	54.6271	21.8997
699.000000 MHz	54.4906	21.8217
709.000000 MHz	54.3900	21.7409
719.000000 MHz	54.3053	21.6568
729.000000 MHz	54.1725	21.6385
739.000000 MHz	54.0350	21.5501
749.000000 MHz	53.9421	21.5093
759.000000 MHz	53.8003	21.4499
769.000000 MHz	53.7060	21.4117
779.000000 MHz	53.6229	21.3416
789.000000 MHz	53.5333	21.2749
799.000000 MHz	53.4684	21.2521
809.000000 MHz	53.3784	21.2102
819.000000 MHz	53.2925	21.1844
829.000000 MHz	53.1395	21.1444
839.000000 MHz	53.0405	21.1031
849.000000 MHz	52.9035	21.0658
859.000000 MHz	52.7832	21.0022
869.000000 MHz	52.6539	21.0185
879.000000 MHz	52.5560	20.9918

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 29, 2004

Frequency	e'	e"
735.000000 MHz	42.3269	20.0802
745.000000 MHz	42.1798	20.0153
755.000000 MHz	42.0161	19.9569
765.000000 MHz	41.8711	19.9073
775.000000 MHz	41.7523	19.8976
785.000000 MHz	41.6323	19.8667
795.000000 MHz	41.5220	19.8565
805.000000 MHz	41.4149	19.8026
815.000000 MHz	41.3160	19.7858
825.000000 MHz	41.1812	19.7795
835.000000 MHz	41.0532	19.7249
845.000000 MHz	40.9054	19.6984
855.000000 MHz	40.7391	19.6269
865.000000 MHz	40.5827	19.5756
875.000000 MHz	40.4653	19.5759
885.000000 MHz	40.3225	19.5440
895.000000 MHz	40.2714	19.4374
905.000000 MHz	40.1681	19.4170
915.000000 MHz	40.0397	19.3999
925.000000 MHz	39.9522	19.4106
935.000000 MHz	39.8197	19.3245

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 29, 2004

Frequency	e'	e"
785.000000 MHz	54.2313	21.7120
790.000000 MHz	54.1980	21.6734
795.000000 MHz	54.1553	21.6383
800.000000 MHz	54.1350	21.6642
805.000000 MHz	54.0891	21.6306
810.000000 MHz	54.0650	21.6236
815.000000 MHz	54.0160	21.5915
820.000000 MHz	53.9419	21.5801
825.000000 MHz	53.9004	21.5628
830.000000 MHz	53.8233	21.5364
835.000000 MHz	53.7822	21.5139
840.000000 MHz	53.6899	21.4994
845.000000 MHz	53.6315	21.4839
850.000000 MHz	53.5767	21.4455
855.000000 MHz	53.5134	21.4107
860.000000 MHz	53.4583	21.3950
865.000000 MHz	53.3853	21.3862
870.000000 MHz	53.3358	21.3796
875.000000 MHz	53.2780	21.3763
880.000000 MHz	53.2399	21.3657
885.000000 MHz	53.1586	21.3506

860 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 29, 2004

Frequency	e'	e"
785.000000 MHz	54.2313	21.7120
790.000000 MHz	54.1980	21.6734
795.000000 MHz	54.1553	21.6383
800.000000 MHz	54.1350	21.6642
805.000000 MHz	54.0891	21.6306
810.000000 MHz	54.0650	21.6236
815.000000 MHz	54.0160	21.5915
820.000000 MHz	53.9419	21.5801
825.000000 MHz	53.9004	21.5628
830.000000 MHz	53.8233	21.5364
835.000000 MHz	53.7822	21.5139
840.000000 MHz	53.6899	21.4994
845.000000 MHz	53.6315	21.4839
850.000000 MHz	53.5767	21.4455
855.000000 MHz	53.5134	21.4107
860.000000 MHz	53.4583	21.3950
865.000000 MHz	53.3853	21.3862
870.000000 MHz	53.3358	21.3796
875.000000 MHz	53.2780	21.3763
880.000000 MHz	53.2399	21.3657
885.000000 MHz	53.1586	21.3506

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

June 10, 2004

Frequency	e'	e"
735.000000 MHz	41.5314	20.0087
745.000000 MHz	41.4073	19.9779
755.000000 MHz	41.2554	19.9324
765.000000 MHz	41.1272	19.9166
775.000000 MHz	40.9589	19.9009
785.000000 MHz	40.8325	19.8980
795.000000 MHz	40.7207	19.8920
805.000000 MHz	40.5921	19.8477
815.000000 MHz	40.4887	19.7823
825.000000 MHz	40.3419	19.7409
835.000000 MHz	40.2325	19.6859
845.000000 MHz	40.1029	19.6589
855.000000 MHz	39.9964	19.6267
865.000000 MHz	39.8459	19.6079
875.000000 MHz	39.7358	19.6095
885.000000 MHz	39.6066	19.6372
895.000000 MHz	39.4947	19.5708
905.000000 MHz	39.3710	19.5047
915.000000 MHz	39.2650	19.4549
925.000000 MHz	39.1767	19.4063
935.000000 MHz	39.0900	19.3873

769 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 10, 2004

Frequency	e'	e"
679.000000 MHz	56.2570	22.7704
689.000000 MHz	56.1168	22.7160
699.000000 MHz	56.0521	22.6394
709.000000 MHz	55.9386	22.5544
719.000000 MHz	55.8338	22.4809
729.000000 MHz	55.7507	22.3835
739.000000 MHz	55.6168	22.3414
749.000000 MHz	55.5192	22.2824
759.000000 MHz	55.3833	22.2377
769.000000 MHz	55.2668	22.1642
779.000000 MHz	55.1377	22.1086
789.000000 MHz	55.0519	22.0626
799.000000 MHz	54.9833	21.9884
809.000000 MHz	54.9382	21.9069
819.000000 MHz	54.8242	21.8909
829.000000 MHz	54.7515	21.8827
839.000000 MHz	54.6191	21.8359
849.000000 MHz	54.5130	21.7589
859.000000 MHz	54.3849	21.7573
869.000000 MHz	54.2660	21.7098
879.000000 MHz	54.1548	21.6714

799 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 10, 2004

Frequency	e'	e"
679.000000 MHz	56.2570	22.7704
689.000000 MHz	56.1168	22.7160
699.000000 MHz	56.0521	22.6394
709.000000 MHz	55.9386	22.5544
719.000000 MHz	55.8338	22.4809
729.000000 MHz	55.7507	22.3835
739.000000 MHz	55.6168	22.3414
749.000000 MHz	55.5192	22.2824
759.000000 MHz	55.3833	22.2377
769.000000 MHz	55.2668	22.1642
779.000000 MHz	55.1377	22.1086
789.000000 MHz	55.0519	22.0626
799.000000 MHz	54.9833	21.9884
809.000000 MHz	54.9382	21.9069
819.000000 MHz	54.8242	21.8909
829.000000 MHz	54.7515	21.8827
839.000000 MHz	54.6191	21.8359
849.000000 MHz	54.5130	21.7589
859.000000 MHz	54.3849	21.7573
869.000000 MHz	54.2660	21.7098
879.000000 MHz	54.1548	21.6714

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 10, 2004

Frequency	e'	e"
785.000000 MHz	54.4612	21.8410
790.000000 MHz	54.4438	21.7839
795.000000 MHz	54.3796	21.7550
800.000000 MHz	54.3679	21.7422
805.000000 MHz	54.3548	21.7072
810.000000 MHz	54.3406	21.6670
815.000000 MHz	54.2793	21.6664
820.000000 MHz	54.2400	21.6299
825.000000 MHz	54.2110	21.6347
830.000000 MHz	54.1284	21.5812
835.000000 MHz	54.0795	21.5713
840.000000 MHz	53.9991	21.5622
845.000000 MHz	53.9393	21.5459
850.000000 MHz	53.9058	21.5091
855.000000 MHz	53.8218	21.4807
860.000000 MHz	53.7463	21.4712
865.000000 MHz	53.7169	21.4663
870.000000 MHz	53.6459	21.4342
875.000000 MHz	53.5903	21.4395
880.000000 MHz	53.5380	21.4224
885.000000 MHz	53.5101	21.4386

860 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 10, 2004

Frequency	e'	e"
785.000000 MHz	54.4612	21.8410
790.000000 MHz	54.4438	21.7839
795.000000 MHz	54.3796	21.7550
800.000000 MHz	54.3679	21.7422
805.000000 MHz	54.3548	21.7072
810.000000 MHz	54.3406	21.6670
815.000000 MHz	54.2793	21.6664
820.000000 MHz	54.2400	21.6299
825.000000 MHz	54.2110	21.6347
830.000000 MHz	54.1284	21.5812
835.000000 MHz	54.0795	21.5713
840.000000 MHz	53.9991	21.5622
845.000000 MHz	53.9393	21.5459
850.000000 MHz	53.9058	21.5091
855.000000 MHz	53.8218	21.4807
860.000000 MHz	53.7463	21.4712
865.000000 MHz	53.7169	21.4663
870.000000 MHz	53.6459	21.4342
875.000000 MHz	53.5903	21.4395
880.000000 MHz	53.5380	21.4224
885.000000 MHz	53.5101	21.4386

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

June 11, 2004

Frequency	e'	e"
735.000000 MHz	41.8386	19.8570
745.000000 MHz	41.7172	19.7850
755.000000 MHz	41.5343	19.7251
765.000000 MHz	41.3892	19.7032
775.000000 MHz	41.2290	19.6473
785.000000 MHz	41.1184	19.6360
795.000000 MHz	41.0126	19.5859
805.000000 MHz	40.9164	19.5997
815.000000 MHz	40.8293	19.5522
825.000000 MHz	40.6877	19.5471
835.000000 MHz	40.5778	19.4871
845.000000 MHz	40.4221	19.4571
855.000000 MHz	40.2753	19.4055
865.000000 MHz	40.1258	19.3668
875.000000 MHz	39.9764	19.3500
885.000000 MHz	39.8710	19.3320
895.000000 MHz	39.8134	19.2615
905.000000 MHz	39.6873	19.2023
915.000000 MHz	39.5836	19.1920
925.000000 MHz	39.4556	19.1702
935.000000 MHz	39.3404	19.1315

769 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 11, 2004

Frequency	e'	e"
679.000000 MHz	55.0493	22.1979
689.000000 MHz	54.9476	22.1535
699.000000 MHz	54.8292	22.0583
709.000000 MHz	54.7395	22.0189
719.000000 MHz	54.6663	21.9378
729.000000 MHz	54.5179	21.8578
739.000000 MHz	54.4041	21.7931
749.000000 MHz	54.2537	21.7661
759.000000 MHz	54.1234	21.6743
769.000000 MHz	54.0123	21.6607
779.000000 MHz	53.9178	21.5781
789.000000 MHz	53.8210	21.5440
799.000000 MHz	53.7642	21.5138
809.000000 MHz	53.6887	21.4679
819.000000 MHz	53.6254	21.4295
829.000000 MHz	53.4714	21.3910
839.000000 MHz	53.3804	21.3752
849.000000 MHz	53.2277	21.3281
859.000000 MHz	53.0895	21.2775
869.000000 MHz	52.9757	21.2515
879.000000 MHz	52.8732	21.2437

799 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 11, 2004

Frequency	e'	e"
679.000000 MHz	55.0493	22.1979
689.000000 MHz	54.9476	22.1535
699.000000 MHz	54.8292	22.0583
709.000000 MHz	54.7395	22.0189
719.000000 MHz	54.6663	21.9378
729.000000 MHz	54.5179	21.8578
739.000000 MHz	54.4041	21.7931
749.000000 MHz	54.2537	21.7661
759.000000 MHz	54.1234	21.6743
769.000000 MHz	54.0123	21.6607
779.000000 MHz	53.9178	21.5781
789.000000 MHz	53.8210	21.5440
799.000000 MHz	53.7642	21.5138
809.000000 MHz	53.6887	21.4679
819.000000 MHz	53.6254	21.4295
829.000000 MHz	53.4714	21.3910
839.000000 MHz	53.3804	21.3752
849.000000 MHz	53.2277	21.3281
859.000000 MHz	53.0895	21.2775
869.000000 MHz	52.9757	21.2515
879.000000 MHz	52.8732	21.2437

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 11, 2004

Frequency	e'	e"
785.000000 MHz	53.4133	21.4143
790.000000 MHz	53.4013	21.3958
795.000000 MHz	53.3800	21.4147
800.000000 MHz	53.3249	21.3655
805.000000 MHz	53.2985	21.3633
810.000000 MHz	53.2606	21.3257
815.000000 MHz	53.2294	21.3365
820.000000 MHz	53.1831	21.2855
825.000000 MHz	53.1032	21.2470
830.000000 MHz	53.0676	21.2209
835.000000 MHz	53.0172	21.2278
840.000000 MHz	52.9478	21.2088
845.000000 MHz	52.8752	21.1477
850.000000 MHz	52.8019	21.1418
855.000000 MHz	52.7672	21.0898
860.000000 MHz	52.6703	21.0718
865.000000 MHz	52.6100	21.0622
870.000000 MHz	52.5568	21.0396
875.000000 MHz	52.4893	21.0333
880.000000 MHz	52.4358	21.0326
885.000000 MHz	52.3890	21.0189

860 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

June 11, 2004

Frequency	e'	e"
785.000000 MHz	53.4133	21.4143
790.000000 MHz	53.4013	21.3958
795.000000 MHz	53.3800	21.4147
800.000000 MHz	53.3249	21.3655
805.000000 MHz	53.2985	21.3633
810.000000 MHz	53.2606	21.3257
815.000000 MHz	53.2294	21.3365
820.000000 MHz	53.1831	21.2855
825.000000 MHz	53.1032	21.2470
830.000000 MHz	53.0676	21.2209
835.000000 MHz	53.0172	21.2278
840.000000 MHz	52.9478	21.2088
845.000000 MHz	52.8752	21.1477
850.000000 MHz	52.8019	21.1418
855.000000 MHz	52.7672	21.0898
860.000000 MHz	52.6703	21.0718
865.000000 MHz	52.6100	21.0622
870.000000 MHz	52.5568	21.0396
875.000000 MHz	52.4893	21.0333
880.000000 MHz	52.4358	21.0326
885.000000 MHz	52.3890	21.0189

APPENDIX F - SAM PHANTOM CERTIFICATE OF CONFORMITY

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

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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