DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab

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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**
Part No.(s) Tested:	**RU101219V71 (P7100 Scan), RU101219V72 (P7100 System)**
Additional Part No.(s):	**RU101219V73 (P7100), RU101219V171 (P5100), RU101219V173 (P5100)**
FCC IDENTIFIER:	**OWDTR-0023-E**
Model(s):	**P7100IP**
Tx Frequency Range(s):	**806-821 MHz (Repeater Input mode) / 821-824 MHz (NPSPAC, Repeater Input mode)** **851-866 MHz (Talk-Around mode) / 866-869 MHz (NPSPAC, Talk-Around mode)**
Max. RF Output Power Tested:	**3.35 Watts Conducted (815.5000 MHz)**
Antenna Type(s) Tested:	**Flexible Gain Antenna (P/N: KRE1011506/2)** **Whip Antenna (P/N: KRE1011223/01)** **Flexible Gain Antenna (P/N: KRE1011506/1)**
Battery Type(s) Tested:	**NiMH 7.5V - immersible - Intrinsically Safe (P/N: BKB191210/36)** **NiMH 7.5V - immersible - Non-Intrinsically Safe (P/N: BKB191210/34)** **NiCd 7.5V - immersible - Intrinsically Safe (P/N: BKB191210/35)** **NiCd 7.5V - immersible - Non-Intrinsically Safe (P/N: BKB191210/33)**
Additional Battery Type(s): **(Testing Not Required)**	**NiMH 7.5V - wind driven rain - Intrinsically Safe (P/N: BKB191210/46)** **NiMH 7.5V - wind driven rain - Non-Intrinsically Safe (P/N: BKB191210/44)** **NiCd 7.5V - wind driven rain - Intrinsically Safe (P/N: BKB191210/45)** **NiCd 7.5V - wind driven rain - Non-Intrinsically Safe (P/N: BKB191210/43)**
Body-Worn Accessories Tested:	**Speaker-Microphone Antenna Version Plus (P/N: KRY1011617/184)** **Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)** **Ranger Headset (P/N: OT-V4-10421), Behind-the-Head Headset (P/N: OT-V4-10450)** **Skull Microphone (P/N: OT-V4-10428), Throat Microphone (P/N: OT-V1-10656)** **Speaker-Microphone Non-Antenna Version (P/N: KRY1011617/183)** **Metal Belt-Clip (P/N: KRY1011647/1)** **Leather Belt Loop (P/N: KRY1011609/1) & Swivel-Mount Clip (P/N: KRY1011608/3)** **Leather Case (P/N: KRY1011639/1) & Leather Belt-Loop (P/N: KRY1011609/1)** **Nylon Case - black (P/N: KRY1011648/1) & Leather Belt-Loop (P/N: KRY1011609/1)** **Nylon T-Strap Holder (P/N: KRY1011656/1)**
Max. SAR Levels Measured:	**1.84 W/kg Face-held (50% Duty Cycle)** **6.47 W/kg Body-worn (50% Duty Cycle)**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) and Industry Canada RSS-102, Issue 1 (Provisional) for the Occupational / Controlled Exposure environment. All measurements were performed in accordance with the SAR system manufacturer recommendations.

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

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc. The results and statements contained in this report pertain only to the device(s) evaluated.

Russell W. Pipe
Senior Compliance Technologist
Celltech Labs Inc.

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1.0 INTRODUCTION

This measurement report demonstrates that the M/A-COM, Inc. Model: P7100IP Portable FM PTT Radio Transceiver FCC ID: OWDTR-0023-E 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)

Rule Part(s)	FCC 47 CFR §2.1093			IC RSS-102 Issue 1 (Provisional)	
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (Edition 01-01)				
Device Classification	Licensed Non-Broadcast Transmitter Held to Face (TNF)				
Device Type	Portable FM PTT Radio Transceiver				
FCC IDENTIFIER	OWDTR-0023-E				
Model(s)	P7100IP				
Part No.(s) Tested	RU101219V71			RU101219V72	
Serial No.(s) Tested	T1-PP04 (Identical Prototype)			T1-PP27 (Identical Prototype)	
Additional Part No.(s) Testing Not Required	RU101219V73 (P7100)		RU101219V171 (P5100)		RU101219V173 (P5100)
Modulation Tested	FM				
Tx Frequency Range(s) Tested	Low Band	806-821 MHz		Repeater Input mode	
		821-824 MHz		NPSPAC, Repeater Input mode	
	High Band	851-866 MHz		Talk-Around mode	
		866-869 MHz		NPSPAC, Talk-Around mode	
RF Output Power Measured	3.22 Watts		Conducted		806.0125 MHz
	3.35 Watts		Conducted		815.5000 MHz
	3.21 Watts		Conducted		823.9875 MHz
	3.10 Watts		Conducted		851.0125 MHz
	3.13 Watts		Conducted		860.5000 MHz
	3.02 Watts		Conducted		868.9875 MHz
Antenna Type(s) Tested	Flexible Gain		Length: 95 mm		P/N: KRE1011506/2
	Whip		Length: 110 mm		P/N: KRE1011223/01
	Flexible Gain		Length: 185 mm		P/N: KRE1011506/1
Battery Type(s) Tested	NiCd	7.5V	Immersible	Non-Intrinsically Safe	P/N: BKB191210/33
	NiMH	7.5V	Immersible	Non-Intrinsically Safe	P/N: BKB191210/34
	NiCd	7.5V	Immersible	Intrinsically Safe	P/N: BKB191210/35
	NiMH	7.5V	Immersible	Intrinsically Safe	P/N: BKB191210/36
Additional Battery Type(s) Testing Not Required	NiCd	7.5V	Wind Driven Rain	Non-Intrinsically Safe	P/N: BKB191210/43
	NiMH	7.5V	Wind Driven Rain	Non-Intrinsically Safe	P/N: BKB191210/44
	NiCd	7.5V	Wind Driven Rain	Intrinsically Safe	P/N: BKB191210/45
	NiMH	7.5V	Wind Driven Rain	Intrinsically Safe	P/N: BKB191210/46

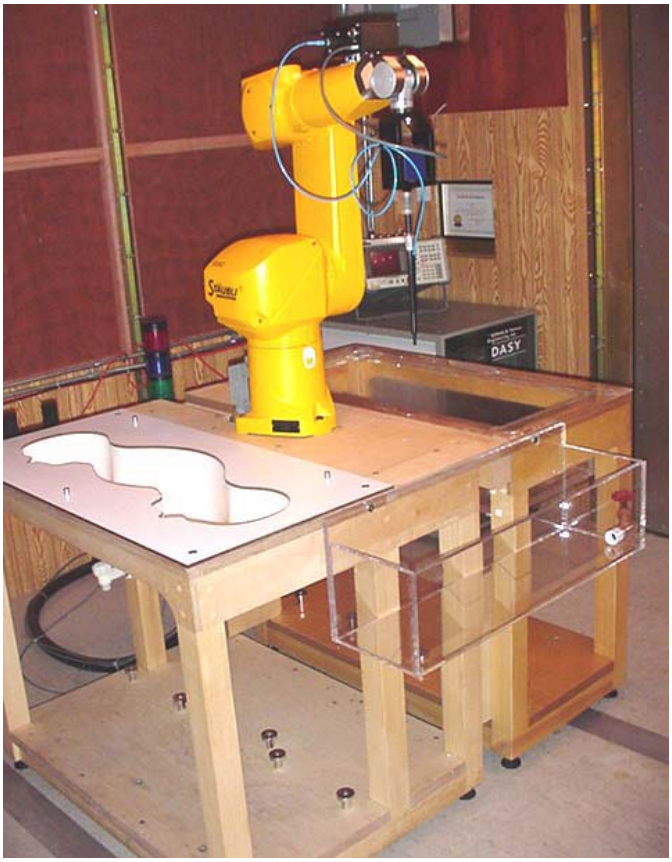
DESCRIPTION OF DEVICE UNDER TEST (DUT) - Continued

	Type	Part No.
Body-worn Accessories Tested	Metal Belt-Clip	KRY1011647/1
	Leather Belt-Loop (with Swivel-Mount Clip P/N: KRY1011608/3)	KRY1011609/1
	Leather Case (with Leather Belt-Loop P/N: KRY1011609/1)	KRY1011639/1
	Nylon Case - Black (with Leather Belt-Loop P/N: KRY1011609/1)	KRY1011648/1
	Nylon T-Strap Holder	KRY1011656/1
	Speaker-Microphone Non-Antenna Version	KRY1011617/183
	Speaker-Microphone Antenna Version	KRY1011617/184
	Speaker-Microphone Antenna Version Ruggedized	KRY1011617/384
	Ranger Headset	OT-V4-10421
	Behind-the-Head Headset	OT-V4-10450
	Skull Microphone	OT-V4-10428
	Throat Microphone	OT-V4-10656
Additional Body-Worn Accessories Testing Not Required	**Type**	**Part No.**
	Nylon Case - Orange	KRY1011649/1
	Speaker Microphone - Intrinsically Safe	KRY1011617/83
	Speaker-Microphone Antenna Version - Intrinsically Safe	KRY1011617/84
	Speaker Microphone - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/185
	Speaker Microphone - Antenna Version - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/186
	Speaker Microphone - Immersible - Intrinsically Safe	KRY1011617/283
	Speaker Microphone - Antenna Version - Immersible - Intrinsically Safe	KRY1011617/284
	Speaker Microphone - Antenna Version - Immersible - Intrinsically Safe, Charger Compatible	KRY1011617/287
	Speaker Microphone - Ruggedized - Intrinsically Safe	KRY1011617/383
	Speaker Microphone - Ruggedized - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/385
	Speaker Microphone - Ruggedized - Antenna Version - Intrinsically Safe, Charger Compatible	KRY1011617/387
	Earpiece Kit for Speaker Microphone - Intrinsically Safe	RLD54107/11
	Speaker Microphone - Industrial	OT-V2-10121
	Speaker Microphone - Industrial PLUS	OT-V2-10122
	Earphone Kit, Black	OT-V1-10520
	Earphone Kit, Beige	OT-V1-10521
	Earphone Kit, Black	OT-V1-10522
	Earphone Kit, Beige	OT-V1-10523
	3-Wire Mini-Lapel (Beige)	OT-V1-10524
	3-Wire Mini -Lapel (Black)	OT-V1-10525
	Ultra-Lite Headset with Inline PTT	OT-V4-10314
	Liteweight Headset with Single Speaker	OT-V4-10315
	Over-the-Head Headset	OT-V4-10316
	Behind-the-Head Headset	OT-V4-10317
	“Invisio” Bone Microphone with PTT system	TEA-INV101-0001 w/ TEA-CT200B-INV-EX
	“Lash” Throat Microphone	TEA-LSH2357DP-EX
	Boom Microphone	TEA-LTE2495DP-EX

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 SAM phantom



DASY4 SAR Measurement System with Plexiglas planar phantom

4.0 SAR COMPARISION

The only difference between the System Radio (P/N: RU101219V72) and the Scan Radio (P/N: RU101219V71) is the front keypad as shown below. SAR measurements were initially performed with the System Radio (P/N: RU101219V72). The test configuration with the maximum SAR level for face-held measurements with the System Radio (P/N: RU101219V72) was subsequently evaluated with the Scan Radio (P/N: RU101219V71). As shown in the comparison table below, the SAR level was lower with the Scan Radio (P/N: RU101219V71), therefore the SAR evaluations were completed with the System Radio (P/N: RU101219V72) to report worst-case SAR results.

SAR COMPARISON

Radio Type	Radio Part No.	Test Type	Antenna Type	Battery Type	Max. SAR 1g (W/kg) Duty Cycle			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle		
						100%	50%			100 %	50%
System	RU101219V72	Face-held	¼-Wave Whip	NiMH	P	3.42	1.71	-0.218	P	3.60	1.80
			P/N: KRE1011223/01	Intrinsically Safe	S	2.43	1.22		S	2.56	1.28
Scan	RU101219V71	Face-held	¼-Wave Whip	NiMH	P	2.94	1.47	-0.724	P	3.47	1.74
			P/N: KRE1011223/01	Intrinsically Safe	S	2.16	1.08		S	2.55	1.28

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

System Radio
P/N: RU101219V72

Scan Radio
P/N: RU101219V71

4.0 SAR MEASUREMENT SUMMARY

FACE-HELD SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiMH IS	2.5	3.27	3.18		1.59	-0.320	3.42		1.71
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	2.5	3.34	P	3.22	1.61	0.0400	P	3.22	1.61
								S	2.04	1.02		S	2.04	1.02
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	2.5	3.31	3.09		1.55	-0.150	3.20		1.60
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.31	3.25		1.63	-0.290	3.47		1.74
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	2.5	3.35	P	3.42	1.71	-0.218	P	3.60	1.80
								S	2.43	1.22		S	2.56	1.28
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH NIS	2.5	3.29	3.36		1.68	-0.0584	3.41		1.70
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiCd IS	2.5	3.30	3.13		1.57	-0.0659	3.18		1.59
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiCd NIS	2.5	3.31	P	3.24	1.62	-0.0471	P	3.28	1.64
								S	2.10	1.05		S	2.12	1.06
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	2.5	3.32	2.21		1.11	-0.306	2.37		1.19
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiMH NIS	2.5	3.31	2.21		1.11	-0.319	2.38		1.19
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	2.5	3.31	2.25		1.13	-0.327	2.43		1.21
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	2.5	3.32	2.23		1.12	-0.287	2.38		1.19

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

Test Date	**05/10/2004**			**Relative Humidity**	33	**%**
Measured Fluid Type	**815 MHz Brain**			**Atmospheric Pressure**	102.0	**kPa**
Dielectric Constant	**IEEE Target**		**Measured**	**Ambient Temperature**	21.0	**°C**
ε_r	**41.6**	**± 5%**	41.1	**Fluid Temperature**	20.6	**°C**
Conductivity	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
σ (mho/m)	**0.90**	**± 5%**	0.89	**ρ (Kg/m³)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the SAR levels measured at the mid channel were ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)		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%
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH IS	2.5	3.00	P	2.78	1.39	-0.0107	P	2.79	1.39
								S	1.84	0.920		S	1.84	0.922
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	2.5	3.00	P	2.78	1.39	-0.0182	P	2.79	1.40
								S	1.85	0.925		S	1.86	0.929
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	2.5	3.00	P	2.78	1.39	-0.0282	P	2.80	1.40
								S	1.84	0.920		S	1.85	0.926
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.01	P	2.82	1.41	-0.0353	P	2.84	1.42
								S	1.87	0.935		S	1.89	0.943
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH IS	2.5	3.00	P	2.35	1.18	-0.0428	P	2.37	1.19
								S	1.97	0.985		S	1.99	0.995
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	2.5	3.01	P	2.42	1.21	-0.0558	P	2.45	1.23
								S	1.99	1.00		S	2.02	1.01

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

Test Date	**05/10/2004**			**Relative Humidity**	34	**%**
Measured Fluid Type	**861 MHz Brain**			**Atmospheric Pressure**	101.5	**KPa**
Dielectric Constant	**IEEE Target**		**Measured**	**Ambient Temperature**	23.0	**°C**
ε_r	**41.5**	**± 5%**	40.5	**Fluid Temperature**	21.6	**°C**
Conductivity	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
σ (mho/m)	**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 ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd IS	2.5	3.05	P	2.28	1.14	-0.0267	P	2.29	1.15
								S	1.93	0.965		S	1.94	0.971
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd NIS	2.5	3.05	P	2.29	1.15	-0.0169	P	2.30	1.15
								S	1.92	0.960		S	1.93	0.964
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	2.5	3.07	1.67		0.835	-0.0698	1.70		0.849
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH NIS	2.5	3.07	1.63		0.815	-0.0229	1.64		0.819
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	2.5	3.06	1.63		0.815	-0.0392	1.64		0.822
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	2.5	3.06	1.70		0.850	-0.0269	1.71		0.855

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

Test Date	05/11/2004			Relative Humidity	33	%
Measured Fluid Type	861 MHz Brain			Atmospheric Pressure	101.9	KPa
Dielectric Constant ε_r	IEEE Target		Measured	Ambient Temperature	21.6	°C
	41.5	± 5%	40.1	Fluid Temperature	21.3	°C
Conductivity σ (mho/m)	IEEE Target		Measured	Fluid Depth	≥ 15	cm
	0.91	± 5%	0.90	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 ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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

Handheld System Radio (P/N: RU101219V72) with Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.22	1.62	0.810	-0.0975	1.66	0.828
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	2.5	3.23	1.13	0.565	-0.682	1.32	0.661
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	2.5	3.25	2.35	1.18	-0.509	2.64	1.32
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.09	2.17	1.09	-0.0355	2.19	1.09
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	2.5	3.09	1.78	0.890	-0.0549	1.80	0.901
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	2.5	3.06	2.21	1.11	0.122	2.21	1.11

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

Test Date	05/11/2004			05/11/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Brain			861 MHz Brain			Atmospheric Pressure	102.5	101.9	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	36	33	%
	41.6	± 5%	41.2	41.5	± 5%	40.1	Ambient Temperature	22.8	21.6	°C
Conductivity σ (mho/m)	815 MHz Brain			861 MHz Brain			Fluid Temperature	21.0	21.3	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.90	± 5%	0.90	0.91	± 5%	0.90	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna for the Speaker-Microphone Antenna Version was determined from the worst-case face-held SAR evaluation results with the Handheld Radio Transceiver (see test data pages 7-9).

SAR MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

Handheld System Radio (P/N: RU101219V72) with Speaker-Microphone Antenna Version (P/N: KRY1011617/184)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.18	2.03	1.02	-0.0766	2.07	1.03
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	2.5	3.20	1.77	0.885	-0.323	1.91	0.953
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	2.5	3.23	3.34	1.67	-0.430	3.69	1.84
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	2.5	3.09	2.63	1.32	-0.0584	2.67	1.33
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	2.5	3.07	2.23	1.12	-0.00428	2.23	1.12
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	2.5	3.08	2.78	1.39	0.0901	2.78	1.39

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

Test Date	05/12/2004			05/11/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Brain			861 MHz Brain			Atmospheric Pressure	102.7	101.9	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	35	33	%
	41.6	± 5%	40.4	41.5	± 5%	40.1	Ambient Temperature	21.8	21.6	°C
Conductivity σ (mho/m)	815 MHz Brain			861 MHz Brain			Fluid Temperature	21.0	21.3	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.90	± 5%	0.88	0.91	± 5%	0.90	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna for the Speaker-Microphone Antenna Version was determined from the worst-case face-held SAR evaluation results with the Handheld Radio Transceiver (see test data pages 7-9).

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Metal Belt-Clip (P/N: KRY1011647/1) & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiMH IS	1.1	3.20	7.06	3.53	-0.610	8.12	4.06
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	1.1	3.31	9.81	4.91	-0.473	10.9	5.47
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	1.1	3.21	10.7	5.35	-0.823	12.9	6.47
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	1.1	3.21	10.7	5.35	-0.144	11.1	5.53
806.0125	Low Low	CW	Flexible Gain	KRE1011506/2	NiCd IS	1.1	3.19	9.43	4.72	-0.793	11.3	5.66
823.9875	Low High	CW	Flexible Gain	KRE1011506/2	NiCd IS	1.1	3.19	9.43	4.72	-0.883	11.6	5.78
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	1.1	3.21	9.12	4.56	-0.0509	9.23	4.61
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiMH NIS	1.1	3.23	9.18	4.59	-0.478	10.25	5.12
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	1.1	3.22	8.84	4.42	-0.973	11.06	5.53
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	1.1	3.22	9.09	4.55	-0.276	9.69	4.84
806.0125	Low Low	CW	Flexible Gain	KRE1011506/1	NiCd IS	1.1	3.22	8.60	4.30	-0.0415	8.68	4.34
823.9875	Low High	CW	Flexible Gain	KRE1011506/1	NiCd IS	1.1	3.20	9.11	4.56	-0.397	9.98	4.99

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

Test Date	**05/12/2004**			**Relative Humidity**	33	**%**
Measured Fluid Type	**815 MHz Body**			**Atmospheric Pressure**	102.7	**kPa**
Dielectric Constant	**IEEE Target**		**Measured**	**Ambient Temperature**	22.7	**°C**
ε_r	**55.3**	**± 5%**	54.9	**Fluid Temperature**	21.6	**°C**
Conductivity	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
σ (mho/m)	**0.97**	**± 5%**	0.98	**ρ (Kg/m³)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the SAR levels measured at the mid channel were ≥ 3dB 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 in the table above 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.
7. The Belt-Clip accessory contains metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Metal Belt-Clip (P/N: KRY1011647/1) & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	1.1	3.22		7.32	3.66	-0.766		8.73	4.37
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH NIS	1.1	3.25	P	9.43	4.72	-0.481	P	10.5	5.27
							3.22	S	5.38	2.69	-0.481	S	6.01	3.01
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiCd IS	1.1	3.22		7.41	3.71	-0.829		8.97	4.48
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiCd NIS	1.1	3.22	P	7.99	4.00	-0.239	P	8.44	4.22
							3.22	S	5.00	2.50	-0.407	S	5.49	2.75
806.0125	Low Low	CW	Whip	KRE1011223/01	NiMH NIS	1.1	3.21	P	8.34	4.17	-0.554	P	9.47	4.74
							3.20	S	4.98	2.49	-0.674	S	5.82	2.91
823.9875	Low High	CW	Whip	KRE1011223/01	NiMH NIS	1.1	3.21	P	7.17	3.59	-0.329	P	7.73	3.87
							3.20	S	5.02	2.51	-0.349	S	5.44	2.72

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

Test Date	**05/12/2004**			**Relative Humidity**	33	**%**
Measured Fluid Type	**815 MHz Body**			**Atmospheric Pressure**	102.7	**kPa**
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	22.7	**°C**
	55.3	**± 5%**	54.9	**Fluid Temperature**	21.6	**°C**
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
	0.97	**± 5%**	0.98	**ρ (Kg/m³)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the SAR levels measured at the mid channel were ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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.
8. The Belt-Clip accessory contains metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Metal Belt-Clip (P/N: KRY1011647/1) & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)		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%
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH IS	1.1	3.05		8.51	4.26	-0.119		8.75	4.37
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	1.1	3.04		9.84	4.92	-0.00547		9.85	4.93
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	1.1	3.04		9.47	4.74	-0.152		9.81	4.90
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	1.1	3.04		8.83	4.42	-0.146		9.13	4.57
851.0125	High Low	CW	Flexible Gain	KRE1011506/2	NiMH NIS	1.1	3.10		10.5	5.25	-0.0506		10.6	5.31
868.9875	High High	CW	Flexible Gain	KRE1011506/2	NiMH NIS	1.1	3.02		8.82	4.41	-0.0421		8.91	4.45
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH IS	1.1	3.05	P	5.14	2.57	0.0893	P	5.14	2.57
							3.05	S	4.39	2.20	-0.172	S	4.57	2.28
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	1.1	3.05	P	4.64	2.32	-0.148	P	4.80	2.40
							3.06	S	3.99	2.00	-0.0316	S	4.02	2.01
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd IS	1.1	3.06	P	4.61	2.31	-0.0109	P	4.62	2.31
							3.06	S	4.20	2.10	-0.00358	S	4.20	2.10
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd NIS	1.1	3.05	P	6.22	3.11	-0.0928	P	6.35	3.18
							3.06	S	4.33	2.17	-0.00922	S	4.34	2.17

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

Test Date	**05/13/2004**			**Relative Humidity**	34	**%**
Measured Fluid Type	**861 MHz Body**			**Atmospheric Pressure**	102.4	**kPa**
Dielectric Constant	**IEEE Target**		**Measured**	**Ambient Temperature**	23.2	**°C**
ε_r	**55.1**	**± 5%**	54.5	**Fluid Temperature**	21.5	**°C**
Conductivity	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
σ (mho/m)	**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 ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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.
8. The Belt-Clip accessory contains metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Metal Belt-Clip (P/N: KRY1011647/1) & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	1.1	3.08	6.39	3.20	-0.282	6.82	3.41
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH NIS	1.1	3.06	6.02	3.01	-0.133	6.21	3.10
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	1.1	3.06	6.18	3.09	-0.102	6.33	3.16
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	1.1	3.06	6.01	3.01	0.0980	6.01	3.01

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

Test Date	**05/14/2004**			**Relative Humidity**	33	**%**
Measured Fluid Type	**861 MHz Body**			**Atmospheric Pressure**	102.3	**kPa**
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	22.2	**°C**
	55.1	**± 5%**	54.6	**Fluid Temperature**	20.8	**°C**
Conductivity σ **(mho/m)**	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
	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 ≥ 3dB 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 peak SAR levels were reported 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 in the table above 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.
8. The Belt-Clip accessory contains metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Leather Belt-Loop (P/N: KRY1011609/1), Swivel-Mount Clip (P/N: KRY1011608/3), & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	3.3	3.29	2.48	1.24	-0.480	2.77	1.38
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH NIS	3.3	3.28	2.81	1.41	-0.189	2.93	1.47
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	3.3	3.30	4.14	2.07	-0.486	4.63	2.32
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	3.3	3.10	2.99	1.50	0.110	2.99	1.50
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd NIS	3.3	3.09	2.49	1.25	-0.0908	2.54	1.27
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	3.3	3.13	2.83	1.42	-0.128	2.91	1.46

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

Test Date	05/19/2004			05/19/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	38	38	%
	55.3	± 5%	53.9	55.1	± 5%	54.1	Ambient Temperature	23.3	23.5	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	22.1	22.1	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.96	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna was determined from the worst-case body-worn SAR evaluation results with the belt-clip and speaker-microphone accessories (see test data pages 12-15).
8. The Leather Belt-Loop and Swivel-Mount Clip accessories contain metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Nylon Case (P/N: KRY1011648/1), Leather Belt-Loop (P/N: KRY1011609/1), & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	4.0	3.25	1.77	0.885	-0.772	2.11	1.06
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH NIS	4.0	3.24	2.22	1.11	-0.806	2.67	1.34
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	4.0	3.24	3.36	1.68	-0.716	3.96	1.98
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	4.0	3.07	2.10	1.05	-0.102	2.15	1.07
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd NIS	4.0	3.07	1.95	0.975	-0.0642	1.98	0.990
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	4.0	3.07	2.47	1.24	0.0618	2.47	1.24

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

Test Date	05/20/2004			05/20/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	37	37	%
	55.3	± 5%	54.5	55.1	± 5%	54.1	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	21.9	21.9	°C
	IEEE Target		Measured	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna was determined from the worst-case body-worn SAR evaluation results with the belt-clip and speaker-microphone accessories (see test data pages 12-15).
8. The Nylon Case and Leather Belt-Loop accessories contain metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Leather Case (P/N: KRY1011639/1), Leather Belt-Loop (P/N: KRY1011609/1), & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	4.2	3.24	1.24	0.620	-0.666	1.45	0.723
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH NIS	4.2	3.23	1.59	0.795	-0.566	1.81	0.906
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	4.2	3.25	1.84	0.920	-0.987	2.31	1.15
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	4.2	3.06	1.33	0.665	-0.0926	1.36	0.679
860.5000	High Mid	CW	Whip	KRE1011223/01	NiCd NIS	4.2	3.06	1.26	0.630	-0.0746	1.28	0.641
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiMH IS	4.2	3.06	1.40	0.700	-0.183	1.46	0.730

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

Test Date	05/20/2004			05/20/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	37	37	%
	55.3	± 5%	54.5	55.1	± 5%	54.1	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	21.9	21.9	°C
	IEEE Target		Measured	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna was determined from the worst-case body-worn SAR evaluation results with the belt-clip and speaker-microphone accessories (see test data pages 12-15).
8. The Leather Case and Leather Belt-Loop accessories contain metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld Radio Transceiver (System Radio P/N: RU101219V72)

With Nylon T-Strap Holder (P/N: KRY1011656/1) & Speaker-Microphone (P/N: KRY1011617/183)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd IS	1.6	3.28	4.78	2.39	-0.770	5.71	2.85
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiMH NIS	1.6	3.07	5.51	2.76	-0.0826	5.62	2.81

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

Test Date	05/19/2004			05/19/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	38	38	%
	55.3	± 5%	53.9	55.1	± 5%	54.1	Ambient Temperature	23.3	23.5	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	22.1	22.1	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.96	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 ≥ 3dB 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 in the table above 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.
7. The battery and antenna type tested were determined from the worst-case body-worn SAR evaluation results with the belt-clip and speaker-microphone accessories (see test data pages 12-15).
8. The Nylon T-Strap Holder accessory does not contain metallic components.

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld System Radio (P/N: RU101219V72) with Speaker-Microphone Antenna Version (P/N: KRY1011617/184)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	1.3	3.28	4.39	2.20	-0.0626	4.45	2.23
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	1.3	3.30	3.31	1.66	-0.0571	3.35	1.68
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	1.3	3.30	4.74	2.37	-0.494	5.31	2.66
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	1.3	3.09	5.33	2.67	-0.0335	5.37	2.69
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	1.3	3.09	3.82	1.91	-0.0559	3.87	1.93
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	1.3	3.08	4.27	2.14	0.188	4.27	2.14

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

Test Date	05/19/2004			05/19/2004			Fluid Type	815 MHz	861 MHz	Unit
Dielectric Constant ε_r	815 MHz Body			861 MHz Body			Atmospheric Pressure	102.3	102.3	kPa
	IEEE Target		Measured	IEEE Target		Measured	Relative Humidity	38	38	%
	55.3	± 5%	53.9	55.1	± 5%	54.1	Ambient Temperature	23.3	23.5	°C
Conductivity σ (mho/m)	815 MHz Body			861 MHz Body			Fluid Temperature	22.1	22.1	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.97	± 5%	0.96	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 ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna for the Speaker-Microphone Antenna Version body-worn evaluations was equivalent to the face-held SAR evaluations (see test data page 11).

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld System Radio (P/N: RU101219V72) with Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body Worn Accessories	Separation Distance to Planar Phantom	Cond. Power Before Test (Watts)	Meas. SAR 1g (W/kg) Duty Cycle 100%	Meas. 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%
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Ranger Headset	1.3	3.27	4.33	2.17	-0.213	4.55	2.27
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Behind-the-Head Headset	1.3	3.26	4.33	2.17	-0.137	4.47	2.23
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Skull Microphone	1.3	3.27	4.39	2.20	-0.0772	4.47	2.23
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Throat Microphone	1.3	3.27	4.31	2.16	-0.0827	4.39	2.20
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	Ranger Headset	1.3	3.27	2.64	1.32	-0.668	3.08	1.54
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	Behind-the-Head Headset	1.3	3.26	2.61	1.31	-0.597	2.99	1.50
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	Skull Microphone	1.3	3.27	2.72	1.36	-0.697	3.19	1.60
815.5000	Low Mid	CW	Whip	KRE1011223/01	NiMH IS	Throat Microphone	1.3	3.27	2.72	1.36	-0.698	3.19	1.60
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	Ranger Headset	1.3	3.26	5.55	2.78	-0.570	6.33	3.16
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	Behind-the-Head Headset	1.3	3.27	5.53	2.77	-0.556	6.29	3.14
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	Skull Microphone	1.3	3.28	5.75	2.88	-0.445	6.37	3.19
815.5000	Low Mid	CW	Flexible Gain	KRE1011506/1	NiCd IS	Throat Microphone	1.3	3.28	5.87	2.94	-0.458	6.52	3.26

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

Test Date	**05/16/2004**			**Relative Humidity**	42	**%**
Measured Fluid Type	**815 MHz Body**			**Atmospheric Pressure**	101.9	**kPa**
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	22.8	**°C**
	55.3	**± 5%**	54.5	**Fluid Temperature**	21.4	**°C**
Conductivity σ **(mho/m)**	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
	0.97	**± 5%**	0.98	**ρ (Kg/m³)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the SAR levels measured at the mid channel were ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna for the Speaker-Microphone Antenna Version Ruggedized body-worn evaluations was equivalent to the face-held SAR evaluations (see test data page 10).

SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Handheld System Radio (P/N: RU101219V72) with Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Freq. (MHz)	Band/Ch.	Test Mode	Antenna Type	Antenna Part No.	Battery Type	Body Worn Accessories	Separation Distance to Planar Phantom	Cond. Power Before Test (Watts)	Meas. SAR 1g (W/kg) Duty Cycle 100%	Meas. 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%
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Ranger Headset	1.3	3.07	6.16	3.08	-0.0483	6.23	3.11
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Behind-the-Head Headset	1.3	3.06	6.01	3.01	-0.0484	6.08	3.04
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Skull Microphone	1.3	3.07	6.00	3.00	-0.106	6.15	3.07
860.5000	High Mid	CW	Flexible Gain	KRE1011506/2	NiCd NIS	Throat Microphone	1.3	3.07	6.02	3.01	-0.0674	6.11	3.06
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	Ranger Headset	1.3	3.07	4.80	2.40	-0.134	4.95	2.48
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	Behind-the-Head Headset	1.3	3.07	4.65	2.33	-0.0835	4.74	2.37
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	Skull Microphone	1.3	3.06	4.67	2.34	-0.0858	4.76	2.38
860.5000	High Mid	CW	Whip	KRE1011223/01	NiMH NIS	Throat Microphone	1.3	3.07	4.47	2.24	-0.0911	4.56	2.28
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	Ranger Headset	1.3	3.07	5.98	2.99	0.122	5.98	2.99
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	Behind-the-Head Headset	1.3	3.07	5.82	2.91	0.148	5.82	2.91
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	Skull Microphone	1.3	3.06	5.78	2.89	0.145	5.78	2.89
860.5000	High Mid	CW	Flexible Gain	KRE1011506/1	NiCd NIS	Throat Microphone	1.3	3.08	5.78	2.89	0.142	5.78	2.89

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

Test Date	**05/14/2004**			**Relative Humidity**	33	**%**
Measured Fluid Type	**861 MHz Body**			**Atmospheric Pressure**	102.3	**kPa**
Dielectric Constant	**IEEE Target**		**Measured**	**Ambient Temperature**	22.2	**°C**
ε_r	**55.1**	**± 5%**	54.6	**Fluid Temperature**	20.8	**°C**
Conductivity	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	**cm**
σ (mho/m)	**0.98**	**± 5%**	1.03	**ρ (Kg/m³)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the SAR levels measured at the mid channel were ≥ 3dB 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 in the table above 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.
7. The battery type tested with each antenna for the Speaker-Microphone Antenna Version Ruggedized body-worn evaluations was equivalent to the face-held SAR evaluations (see test data page 10).

5.0 DETAILS OF SAR EVALUATION

The M/A-COM, Inc. Model: P7100IP Portable FM PTT Radio Transceiver FCC ID: OWDTR-0023-E was compliant for localized Specific Absorption Rate (Occupational / Controlled Exposure) based on the test provisions and conditions described below. Detailed photographs of the test setup are shown in Appendix G.

1. The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the planar phantom. A 2.5 cm separation distance was maintained between the front side of the DUT and the outer surface of the planar phantom for the duration of the tests.
2. The Speaker-Microphone Antenna Version (P/N: KRY1011617/184) and the Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384) were evaluated in a face-held configuration connected to the handheld radio with the front of the speaker-microphone placed parallel to the outer surface of the planar phantom at a 2.5 cm separation distance.
3. The DUT was tested in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached Metal Belt-Clip accessory (P/N: KRY1011647/1) was touching the planar phantom and provided a 1.1 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version accessory (P/N: KRY1011617/183).
4. The DUT was evaluated in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached Leather Belt-Loop accessory (P/N: KRY1011609/1) was touching the outer surface of the planar phantom and provided a 3.3 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version accessory (P/N: KRY1011617/183).
5. The DUT was tested in a body-worn configuration with the radio placed inside the Nylon Case accessory (P/N: KRY1011648/1) with rear swivel mount attached to the Leather Belt-Loop accessory (P/N: KRY1011609/1) and the back of the radio facing parallel to the outer surface of the planar phantom. The back of the Leather Belt-Loop accessory (P/N: KRY1011609/1) was touching the outer surface of the planar phantom and provided a 4.0 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version accessory (P/N: KRY1011617/183).
6. The DUT was tested in a body-worn configuration with the radio placed inside the Leather Case accessory (P/N: KRY1011639/1) with the rear swivel mount attached to the Leather Belt-Loop accessory (P/N: KRY1011609/1) and the back of the radio facing parallel to the outer surface of the planar phantom. The back of the Leather Belt-Loop accessory (P/N: KRY1011609/1) was touching the outer surface of the planar phantom and provided a 4.2 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version accessory (P/N: KRY1011617/183).
7. The DUT was tested in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached Nylon T-Strap Holder accessory (P/N: KRY1011656/1) was touching the outer surface of the planar phantom and provided a 1.6 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version accessory (P/N: KRY1011617/183).
8. The Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384) was tested in a body-worn configuration connected to the handheld radio with the back of the speaker-microphone 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 1.3 cm separation distance between the back of the speaker-microphone and the outer surface of the planar phantom. The Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384) was evaluated for body-worn SAR with the Ranger Headset accessory (P/N: OT-V4-10421), Behind-the-Head Headset accessory (P/N: OT-V4-10450), Throat Microphone accessory (P/N: OT-V1-10656), and Skull Microphone accessory (P/N: OT-V4-10428).
9. The Speaker-Microphone Antenna Version (P/N: KRY1011617/184) was tested in a body-worn configuration connected to the handheld radio with the back of the speaker-microphone 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 1.3 cm separation distance between the back of the speaker-microphone and the outer surface of the planar phantom.
10. 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.
11. A SAR versus time power drift evaluation was performed for the duration of the area scan measurement in the test configuration that reported the maximum scaled SAR level. See Appendix A (SAR Test Plots) for SAR versus Time power drift evaluation plot.
12. The area scan evaluation was performed with a fully charged battery. After the area scan evaluation was completed the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
13. 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.
14. Due to the dimensions of the DUT a Plexiglas planar phantom was used in place of the SAM phantom.
15. A stack of low-density, low-loss dielectric foamed polystyrene was used in place of the device holder.

6.0 EVALUATION PROCEDURES

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

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

An area scan was determined as follows:

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

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

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

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

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

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

7.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluation a system check was performed at the planar section of the SAM phantom with an 835MHz dipole (see Appendix C for system validation procedures). Prior to the system performance check the dielectric parameters of the simulated brain 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 plot).

SYSTEM PERFORMANCE CHECK

Test Date	835MHz Equiv. Tissue	SAR 1g (W/kg)		Dielectric Constant ε_r		Conductivity σ (mho/m)		ρ (Kg/m^3)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		IEEE Target	Measured	IEEE Target	Measured	IEEE Target	Measured						
05/09/04	Brain	**2.38 ±10%**	2.38	**41.5 ±5%**	41.8	**0.90 ±5%**	0.94	1000	22.5	21.8	≥ 15	33	102.3
05/10/04	Brain	**2.38 ±10%**	2.18 (-8.4%)	**41.5 ±5%**	40.8	**0.90 ±5%**	0.91	1000	23.0	21.6	≥ 15	33	101.5
05/11/04	Brain	**2.38 ±10%**	2.18 (-8.4%)	**41.5 ±5%**	41.0	**0.90 ±5%**	0.92	1000	22.8	21.0	≥ 15	36	102.5
05/12/04	Brain	**2.38 ±10%**	2.24 (-5.9%)	**41.5 ±5%**	39.7	**0.90 ±5%**	0.90	1000	23.3	22.1	≥ 15	32	102.7
05/14/04	Brain	**2.38 ±10%**	2.18 (-8.4%)	**41.5 ±5%**	40.2	**0.90 ±5%**	0.90	1000	21.5	21.4	≥ 15	33	102.3
05/16/04	Brain	**2.38 ±10%**	2.30 (-3.4%)	**41.5 ±5%**	41.1	**0.90 ±5%**	0.92	1000	22.2	23.4	≥ 15	41	101.9
05/19/04	Brain	**2.38 ±10%**	2.30 (-3.4%)	**41.5 ±5%**	40.8	**0.90 ±5%**	0.90	1000	21.6	22.3	≥ 15	41	102.3
05/20/04	Brain	**2.38 ±10%**	2.21 (-7.1%)	**41.5 ±5%**	41.0	**0.90 ±5%**	0.90	1000	21.1	22.7	≥ 15	42	102.3

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 reported in the table above were consistent for all measurement periods.

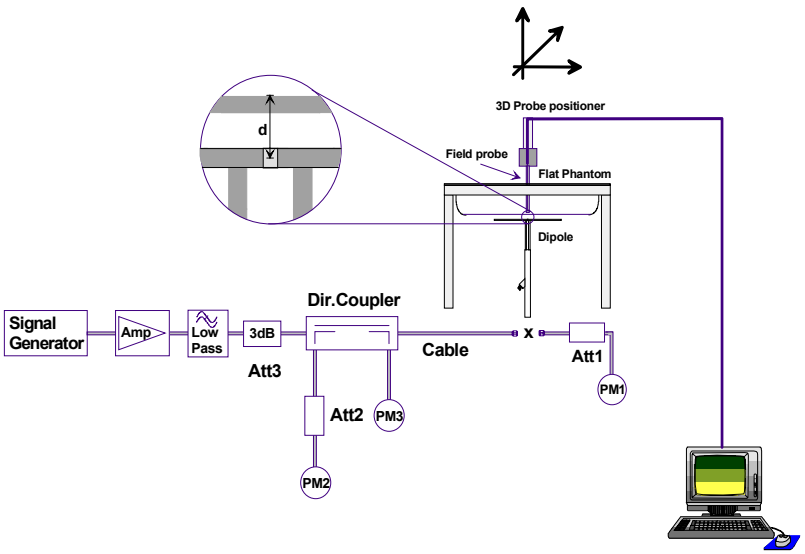


Figure 1. System Performance Check Setup Diagram

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)	815 MHz & 861 MHz Brain (DUT Evaluation)	815 MHz & 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

14.0 DEVICE HOLDER

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

Device Holder

15.0 TEST EQUIPMENT LIST

TEST EQUIPMENT	SERIAL NO.	CALIBRATION DATE
Schmid & Partner DASY4 System	-	-
DASY4 Measurement Server	1078	N/A
-Robot	599396-01	N/A
DAE3	353	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 2003
-1800MHz Validation Dipole	247	June 2003
-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: 05/09/04

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

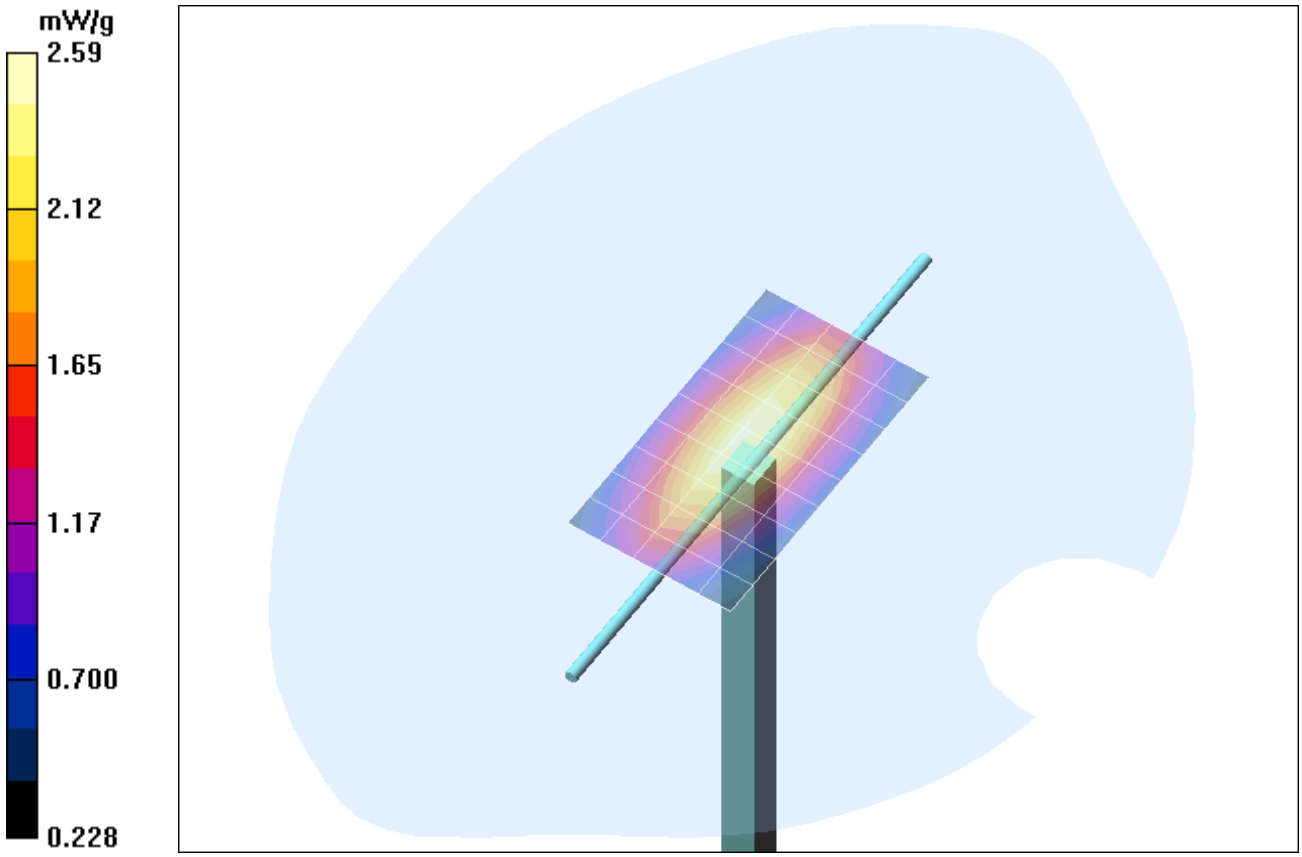
Ambient Temp: 22.5 °C; Fluid Temp: 21.8 °C; Barometric Pressure: 102.3 kPa; Humidity: 33%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.94 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3)

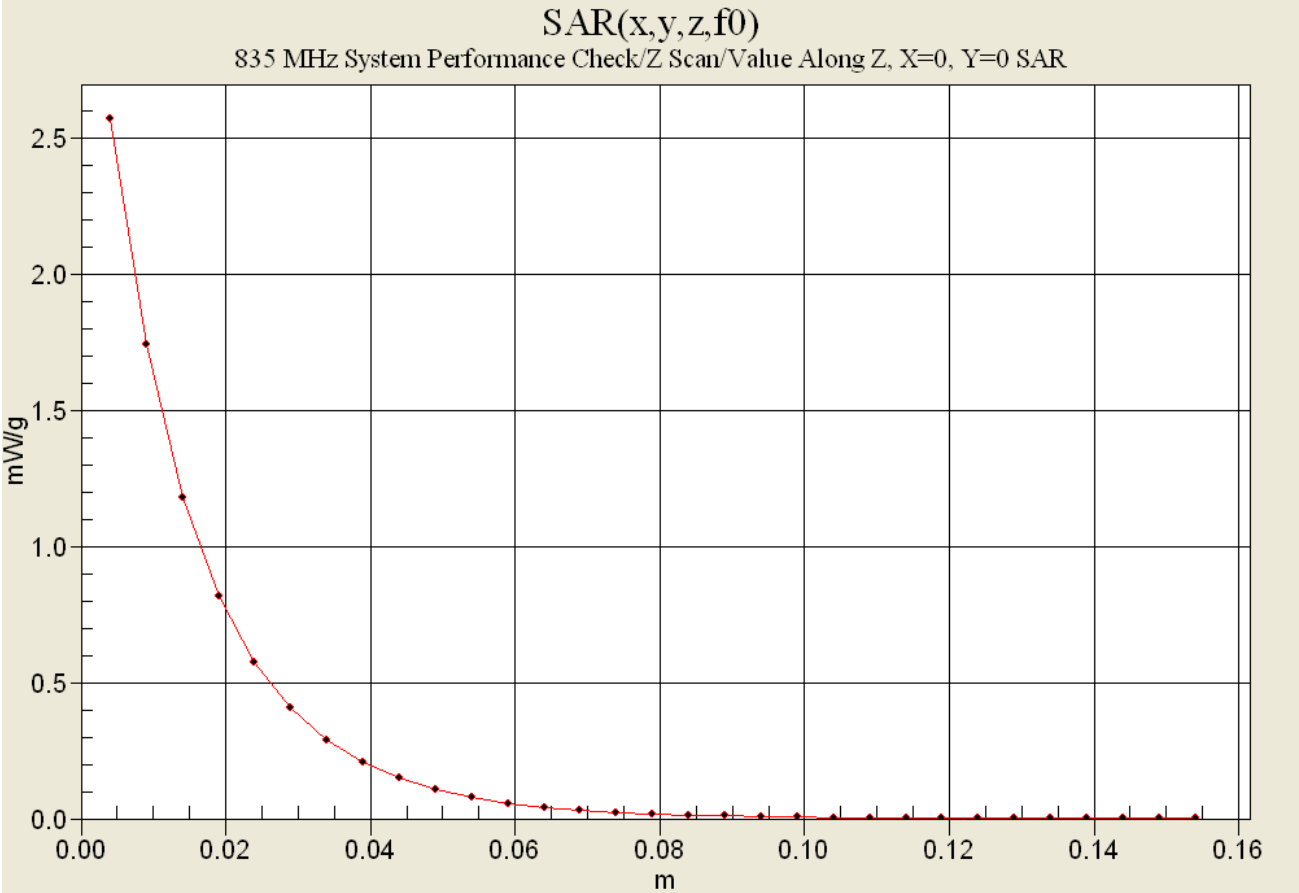
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = -0.006 dB
Peak SAR (extrapolated) = 3.47 W/kg
SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.55 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: 05/10/04

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

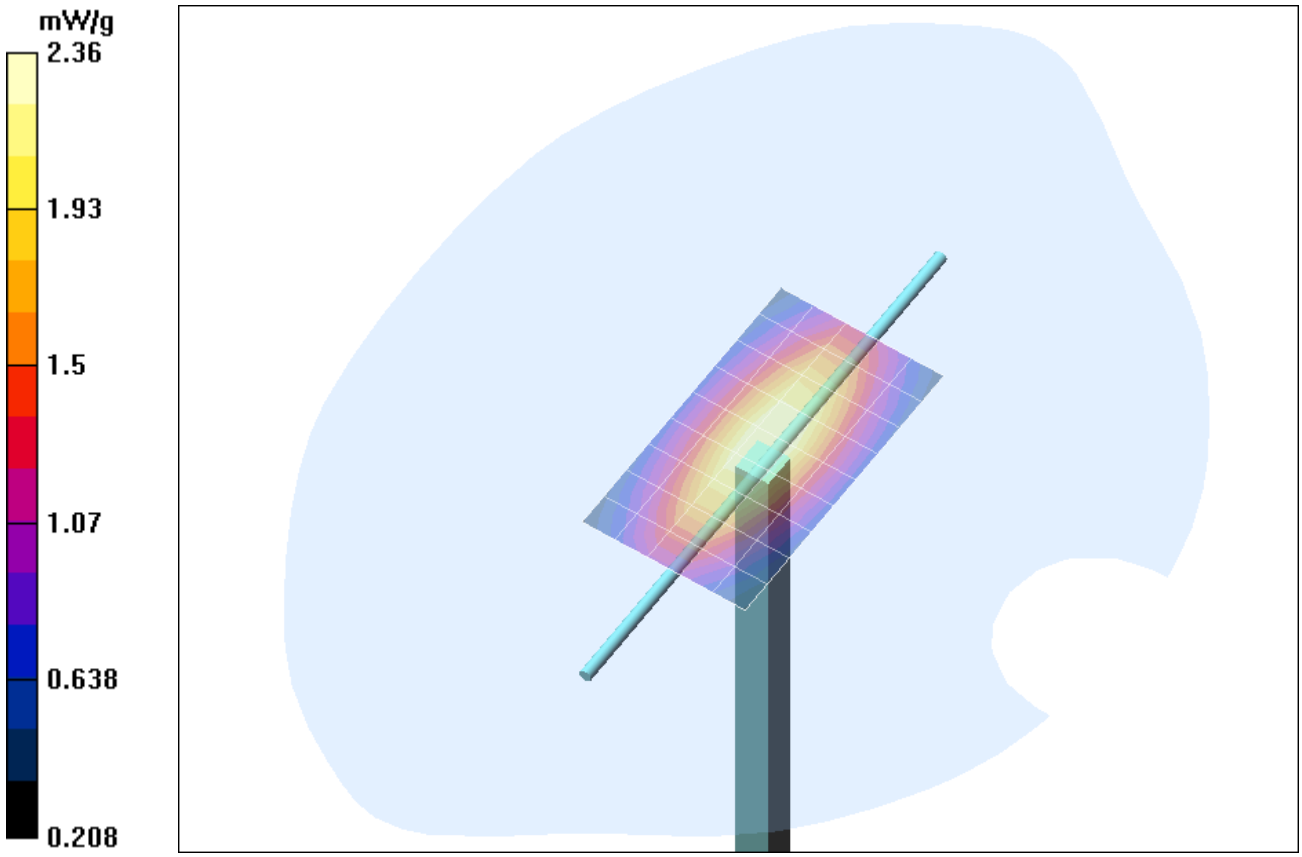
Ambient Temp: 23.0 °C; Fluid Temp: 21.6 °C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.91 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3)

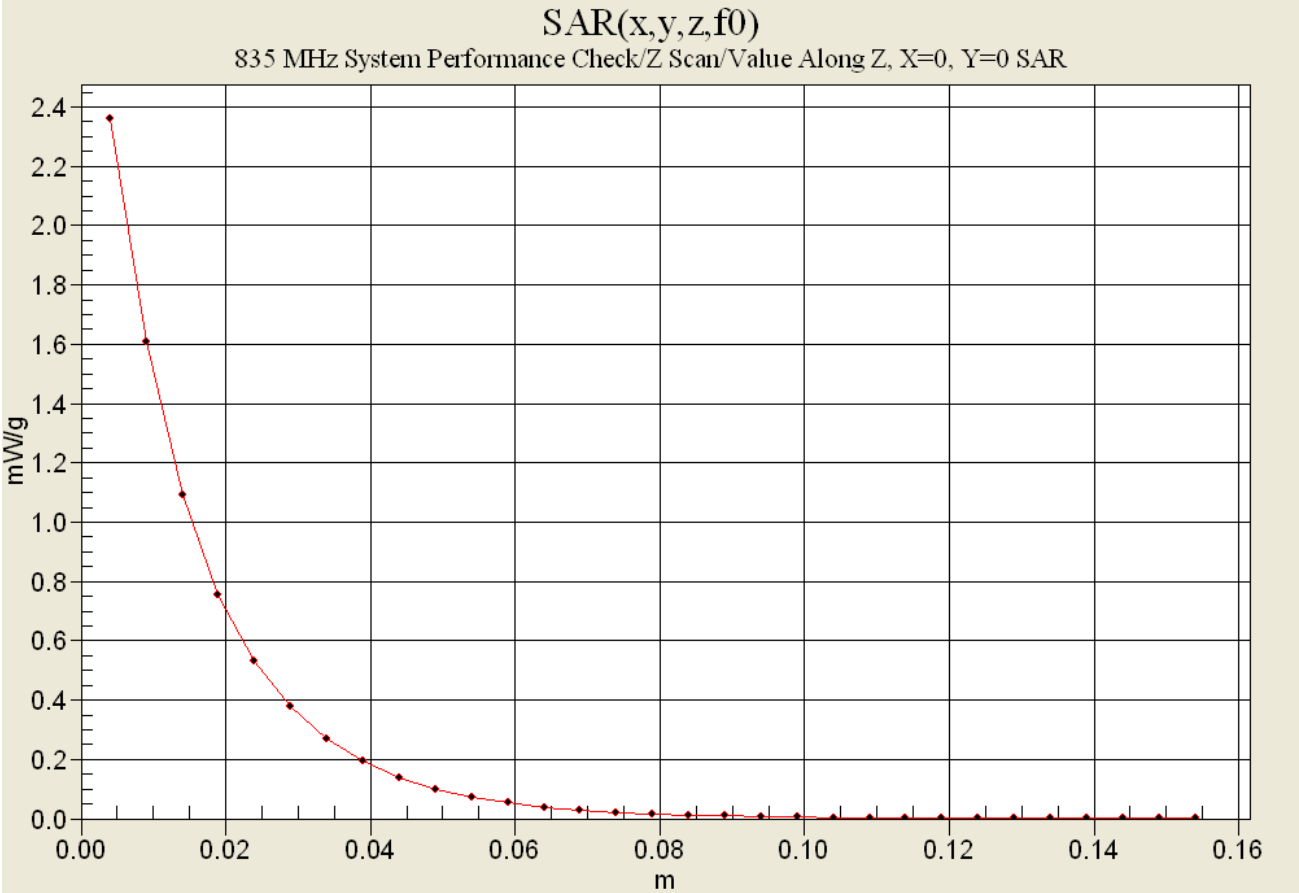
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 52.6 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.15 W/kg
SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.42 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: 05/11/04

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

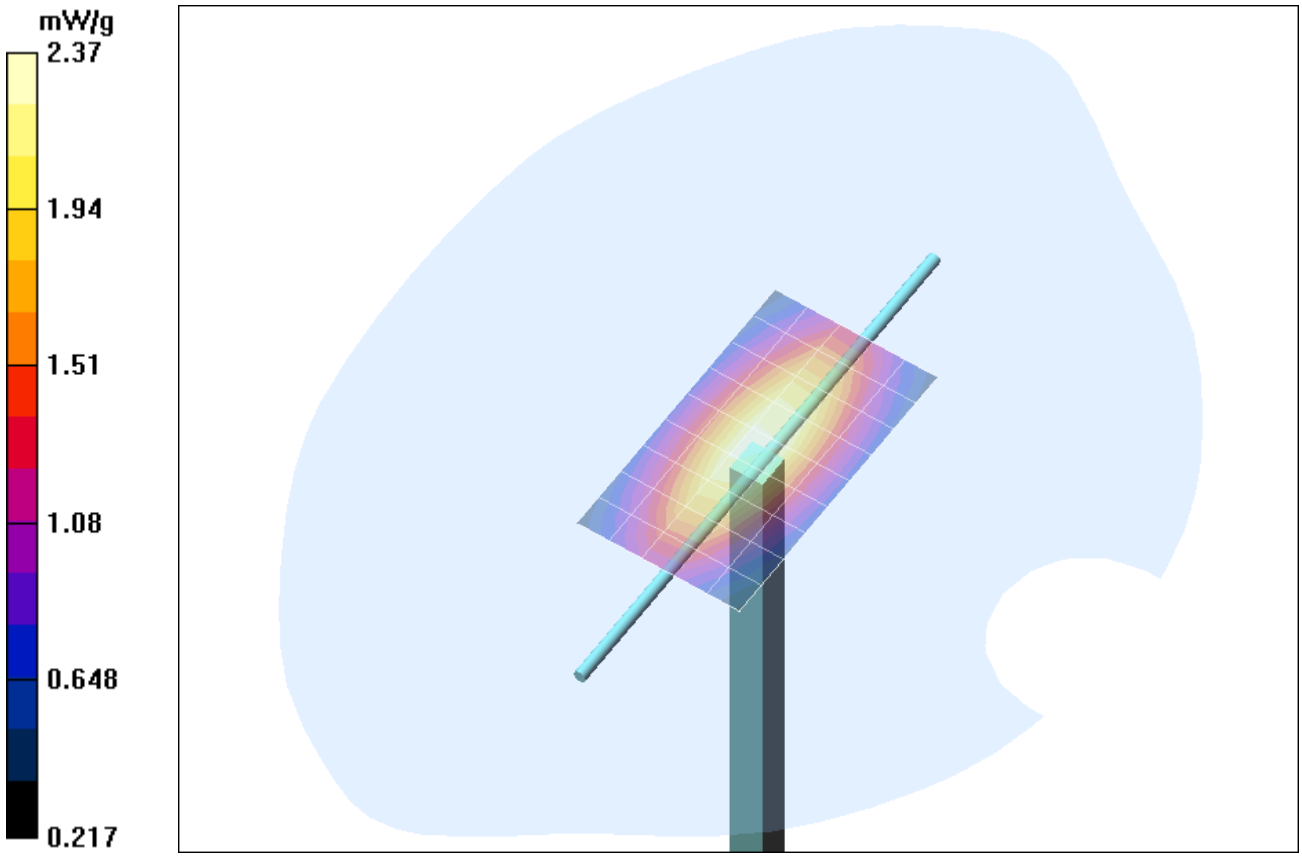
Ambient Temp: 22.8 °C; Fluid Temp: 21.0 °C; Barometric Pressure: 102.5 kPa; Humidity: 36%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.92 mho/m; ε_r = 41.0; ρ = 1000 kg/m^3)

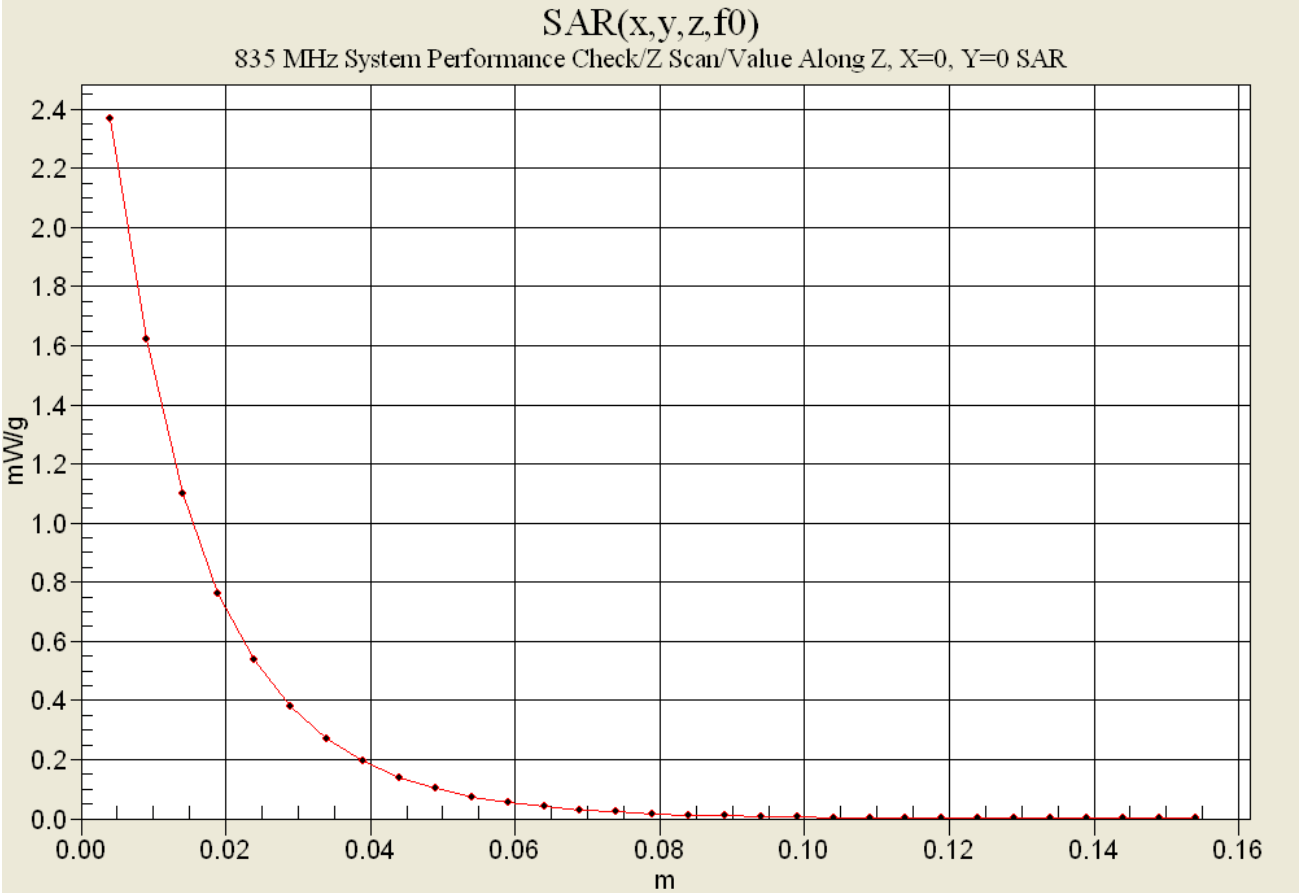
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 54.3 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.44 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: 05/12/04

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

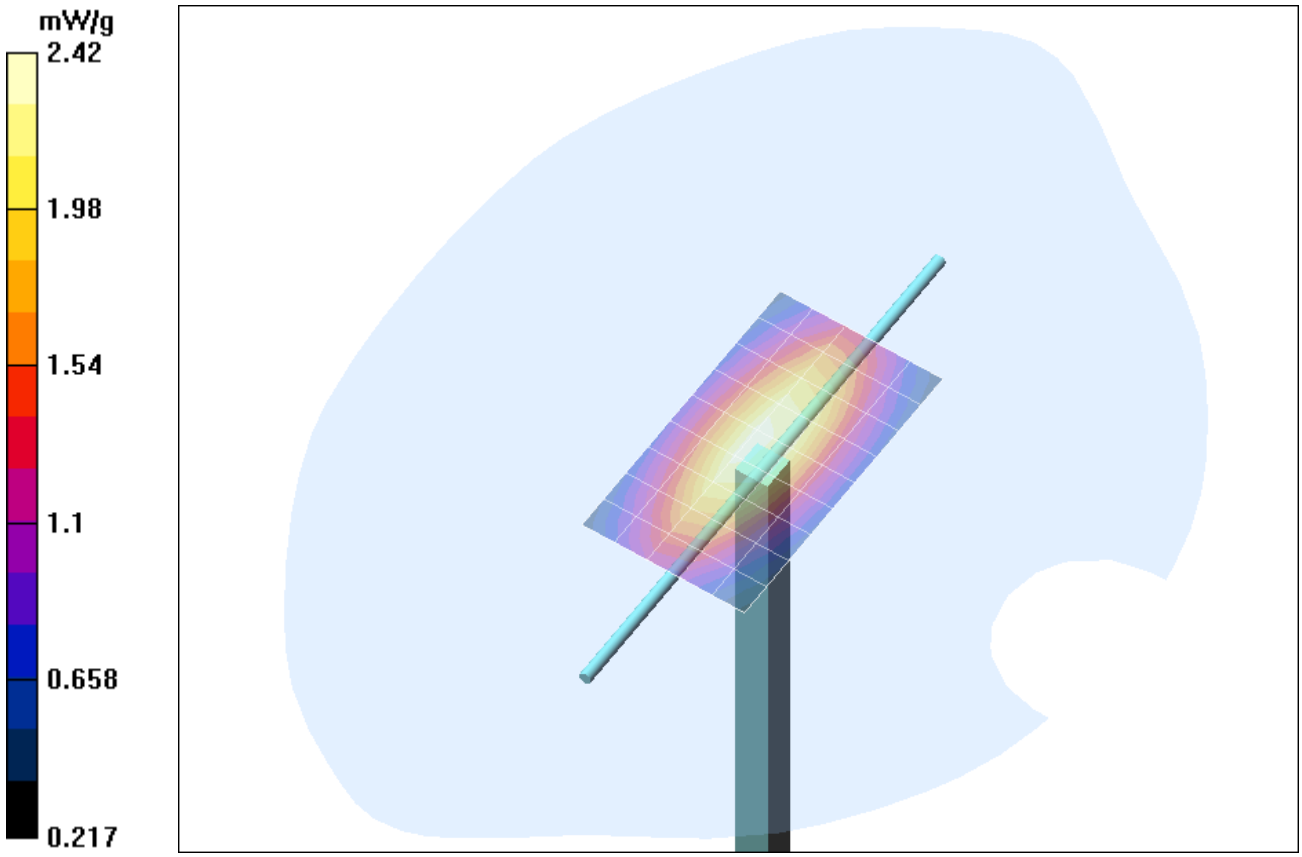
Ambient Temp: 23.3 °C; Fluid Temp: 22.1 °C; Barometric Pressure: 102.7 kPa; Humidity: 32%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3)

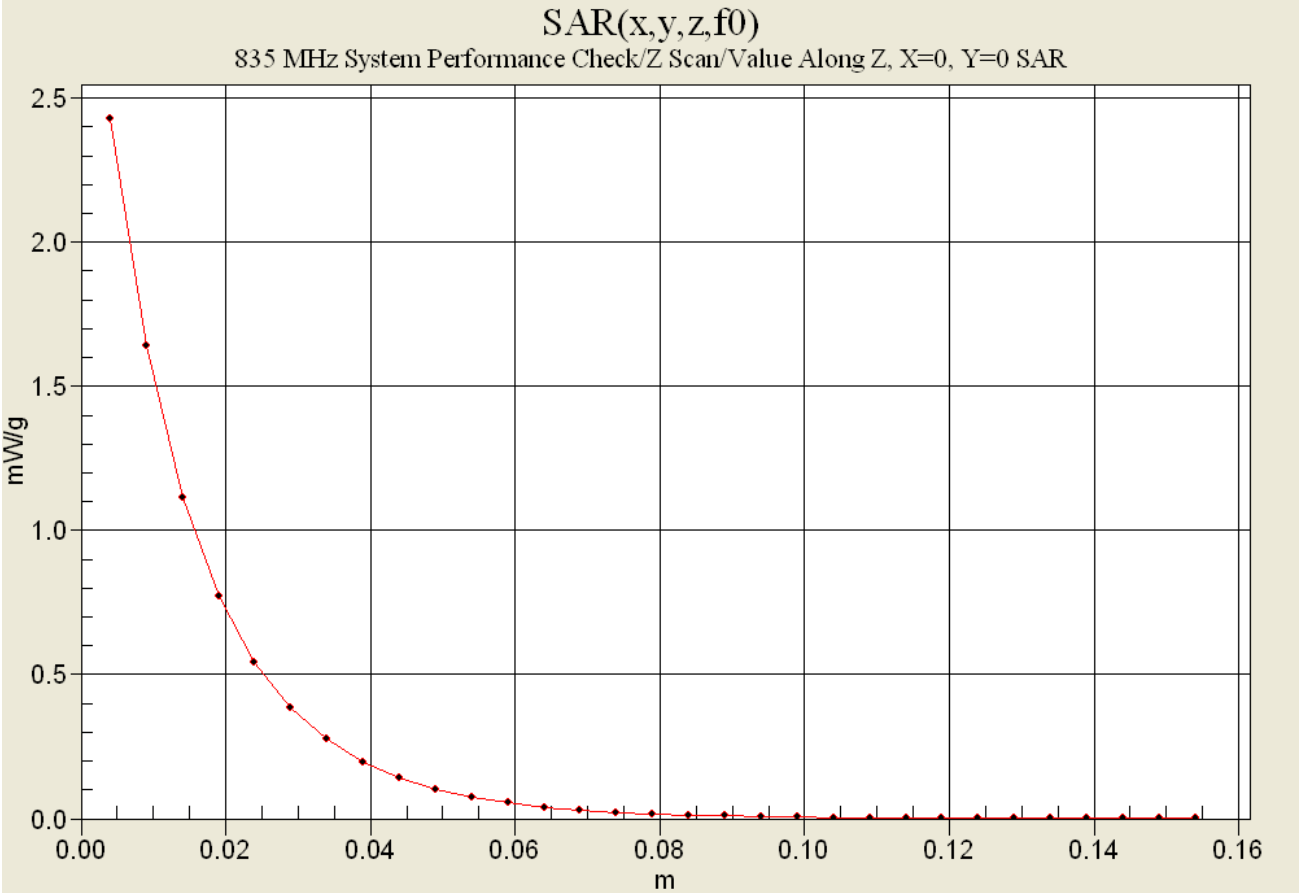
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 55.3 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 2.24 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: 05/14/04

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

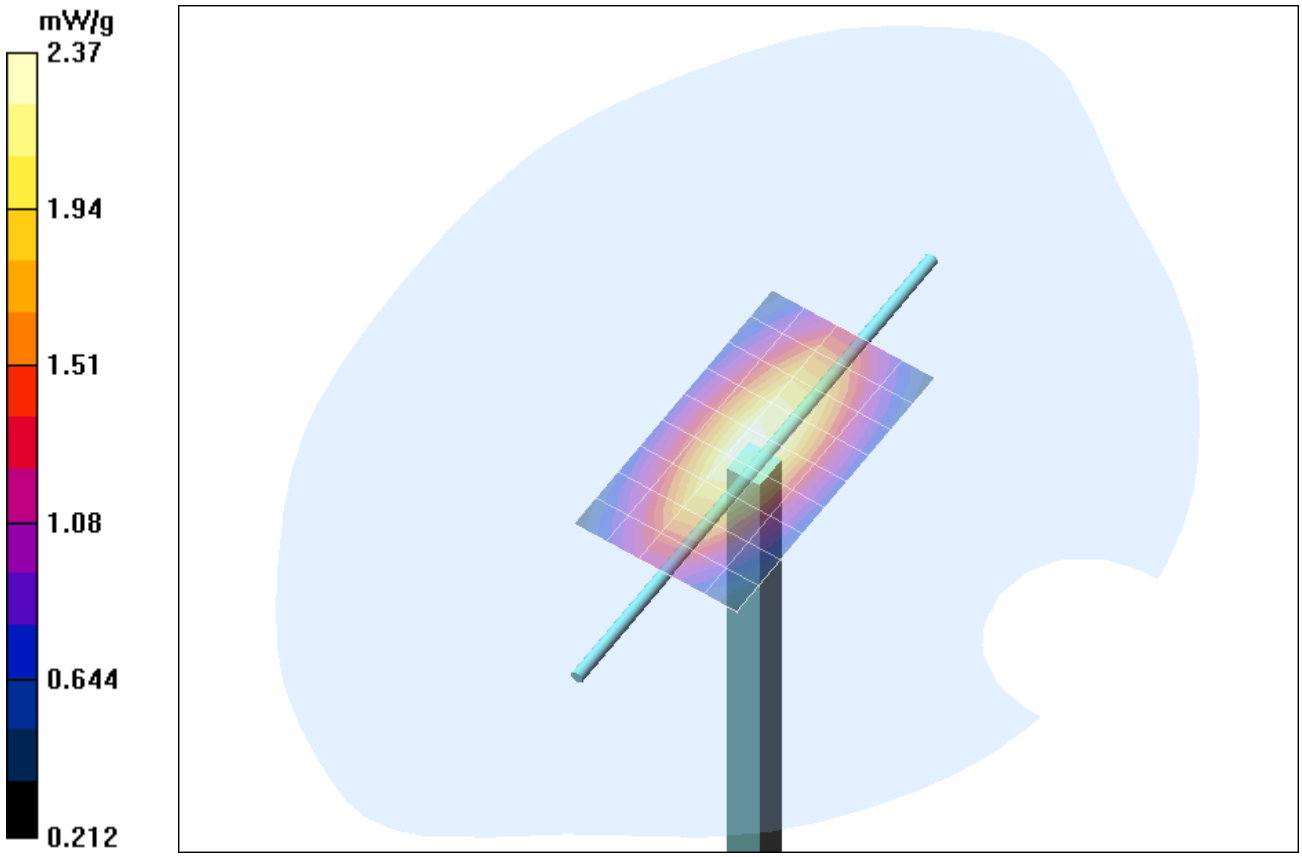
Ambient Temp: 21.5 °C; Fluid Temp: 21.4 °C; Barometric Pressure: 102.3 kPa; Humidity: 33%

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)

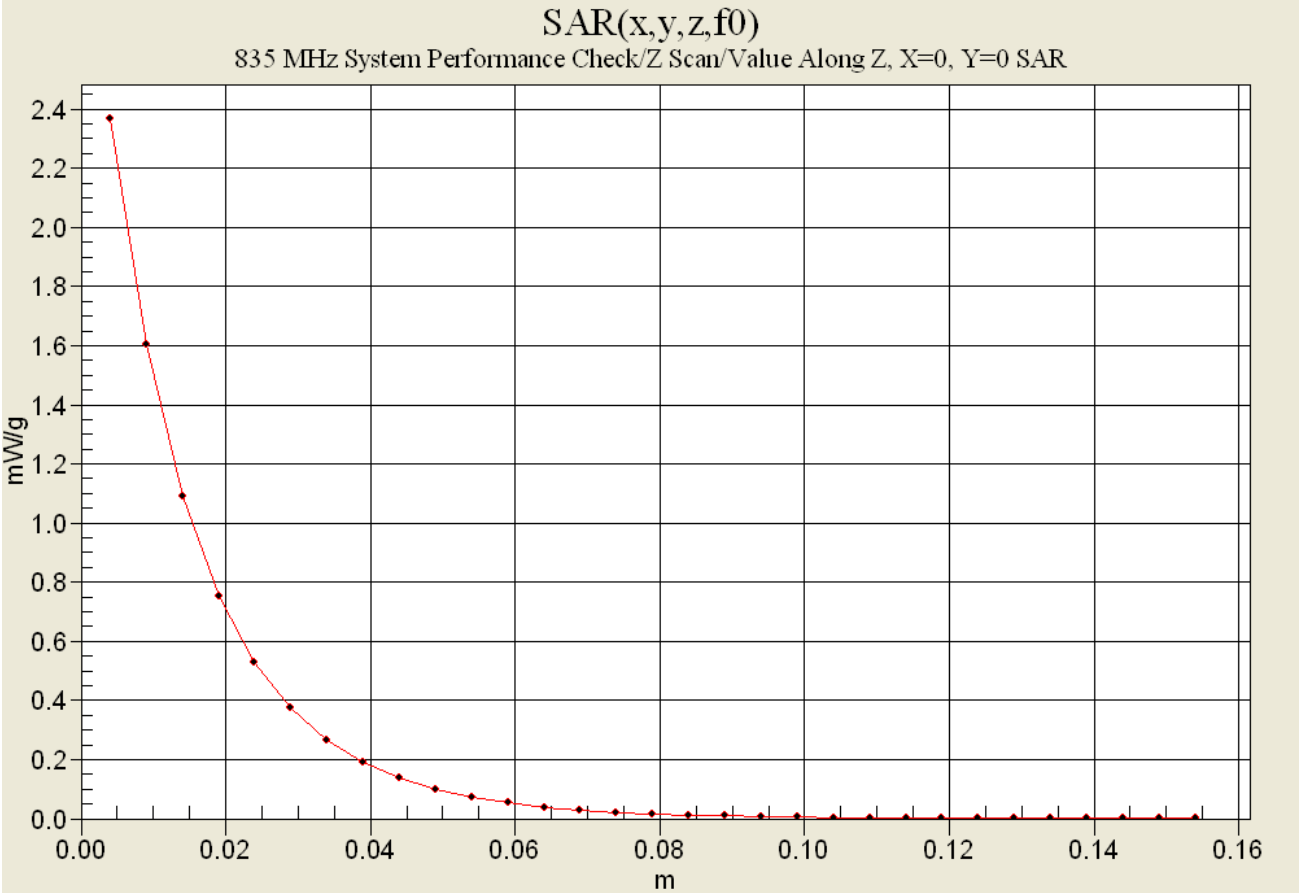
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 55 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.15 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: 05/16/04

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

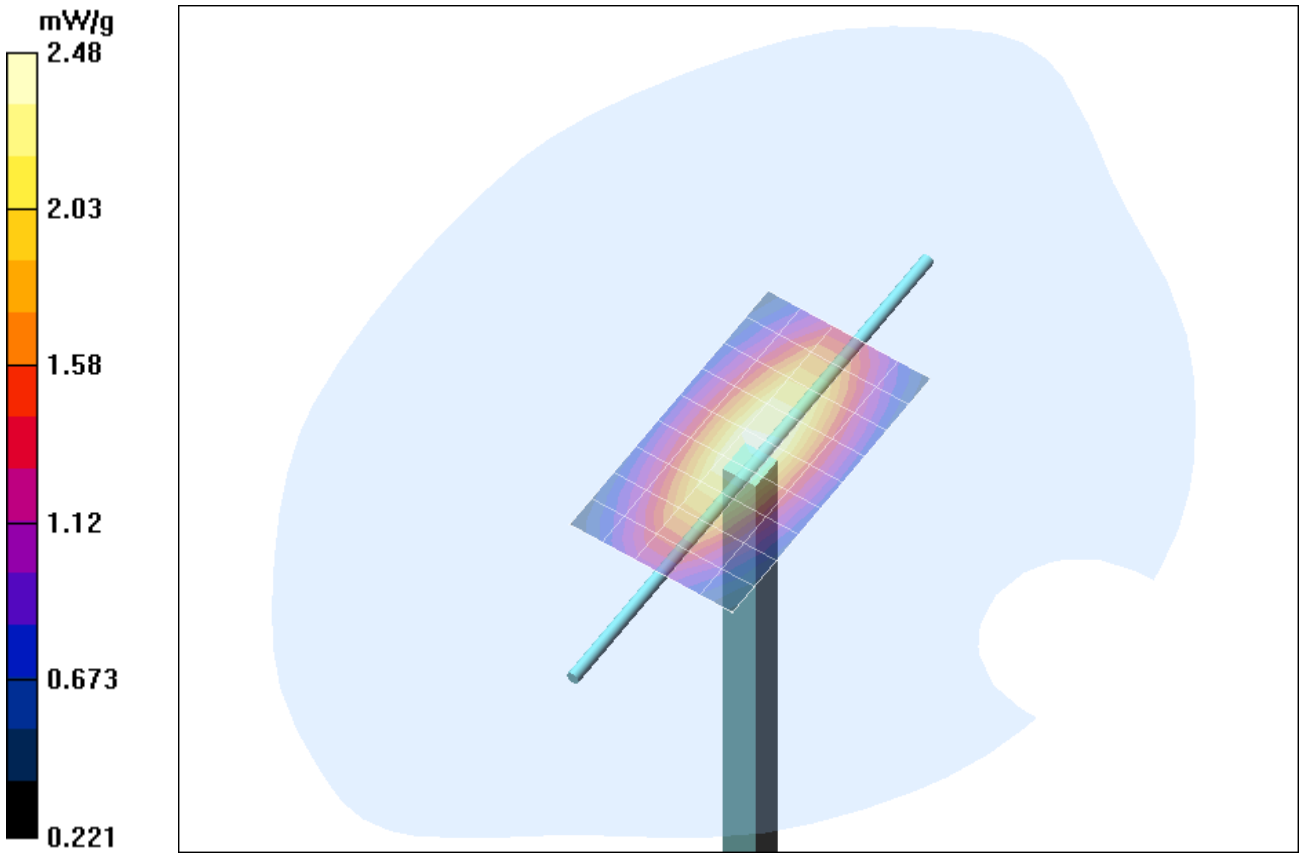
Ambient Temp: 22.2 °C; Fluid Temp: 23.4 °C; Barometric Pressure: 101.9 kPa; Humidity: 41%

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)

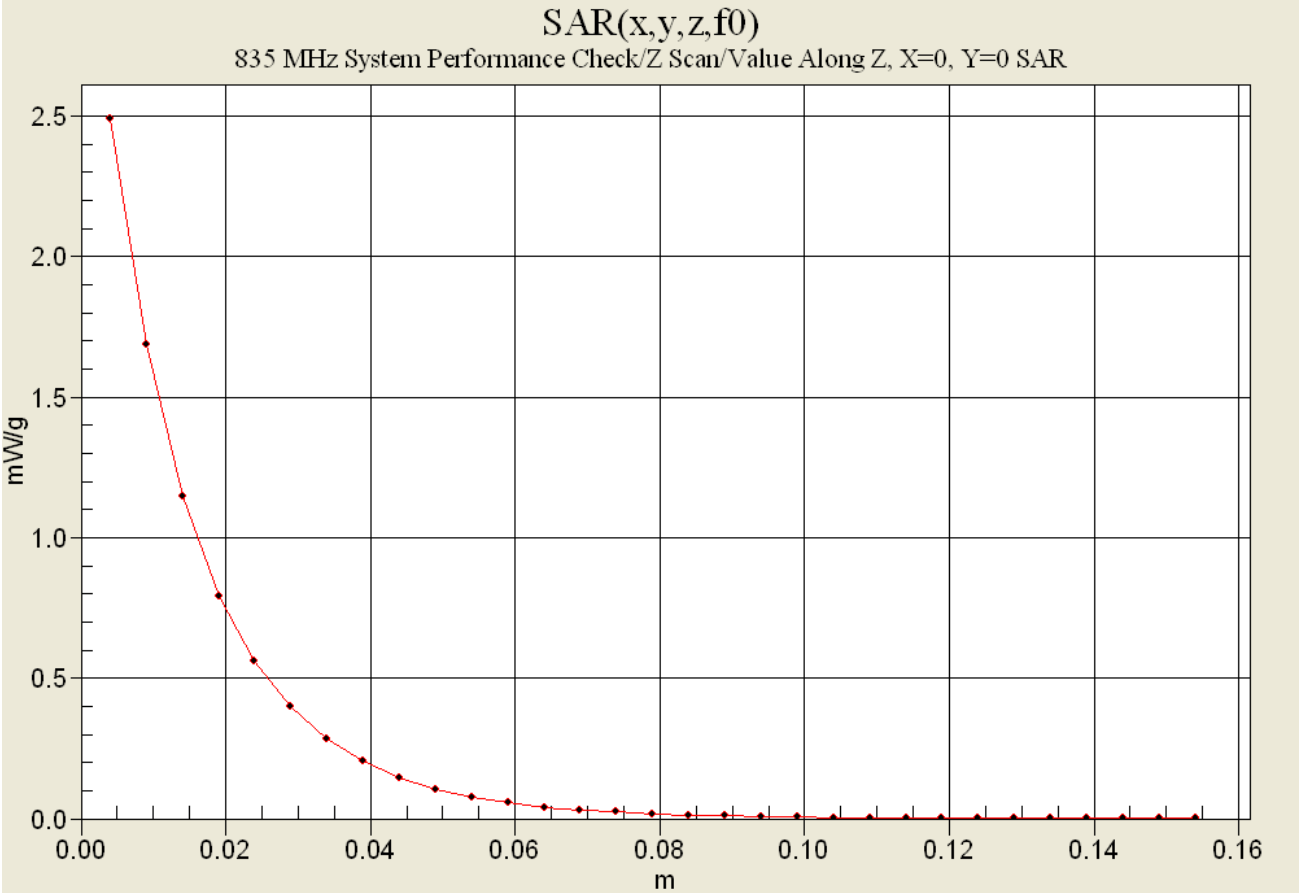
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 54.8 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.35 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

System Performance Check - 835 MHz Dipole

Date Tested: 05/19/04

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

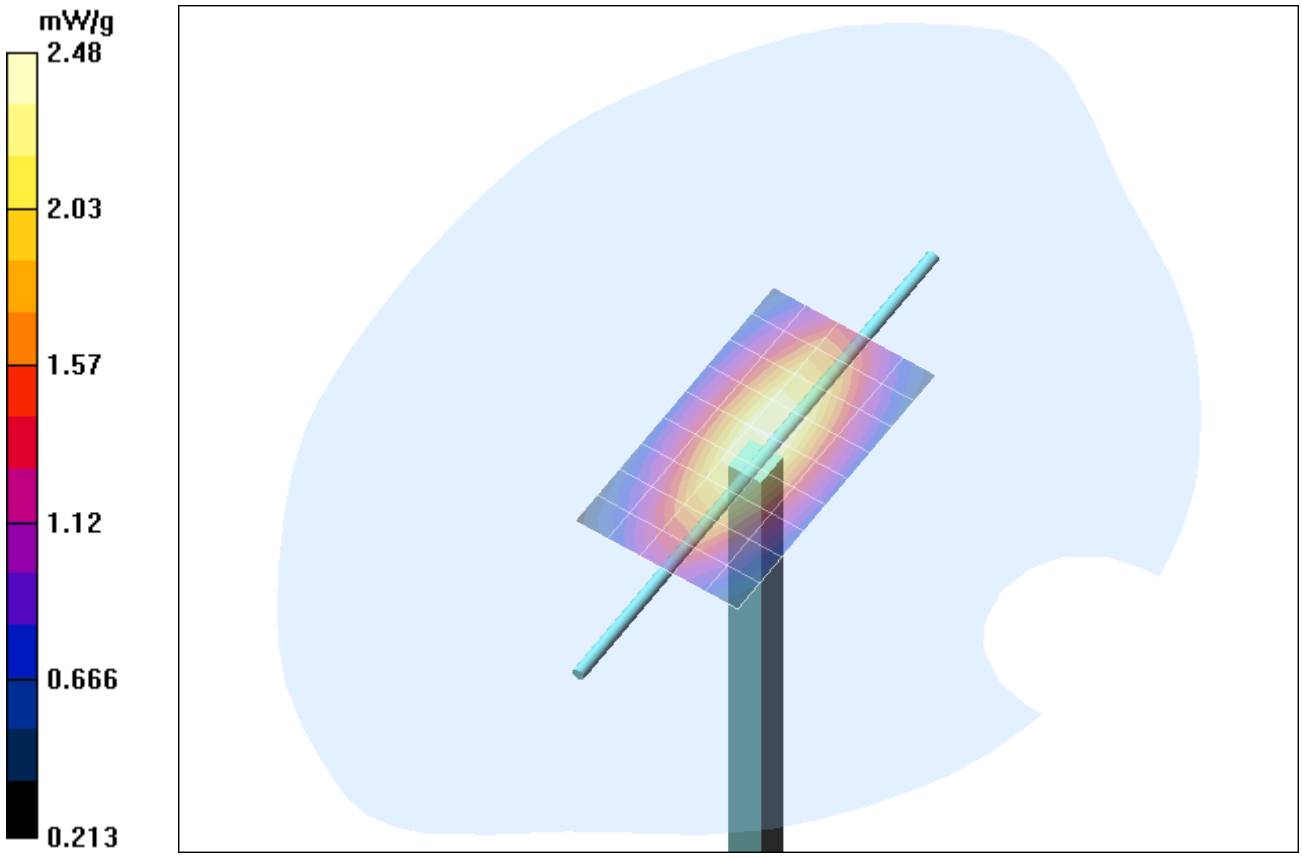
Ambient Temp: 21.6 °C; Fluid Temp: 22.3 °C; Barometric Pressure: 102.3 kPa; Humidity: 41%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3)

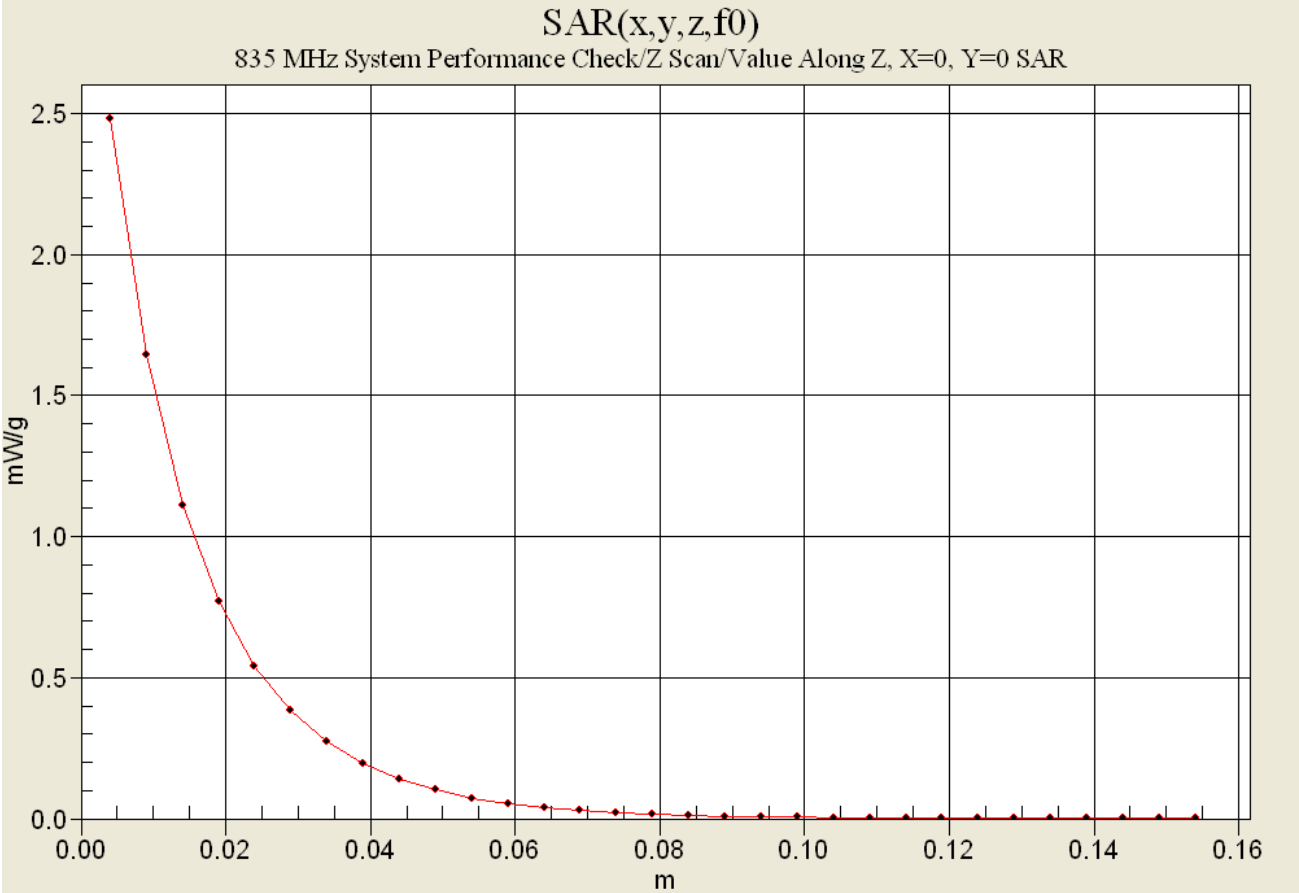
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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 = 54.1 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 2.30 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: 05/20/04

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

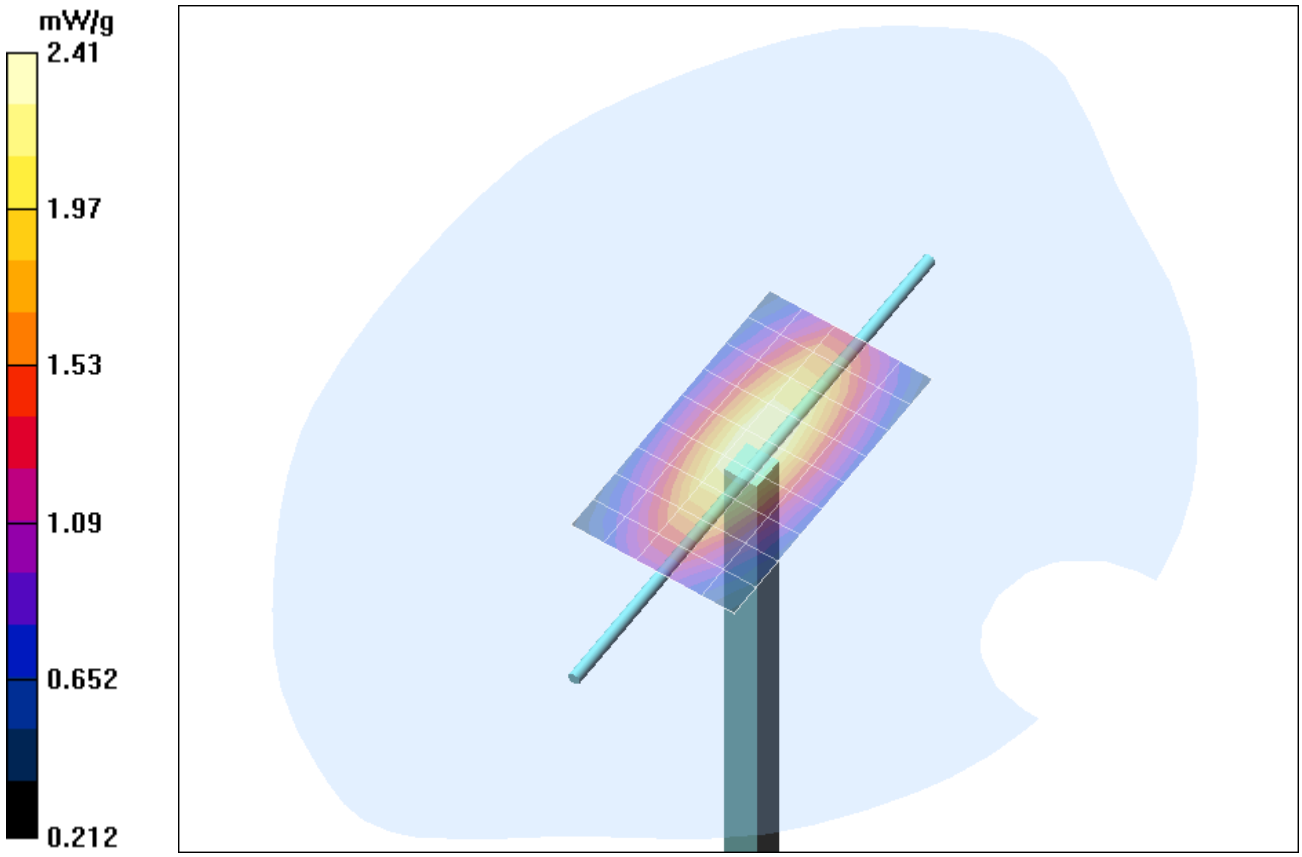
Ambient Temp: 21.1 °C; Fluid Temp: 22.7 °C; Barometric Pressure: 102.3 kPa; Humidity: 42%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL835 (σ = 0.90 mho/m; ε_r = 41.0; ρ = 1000 kg/m^3)

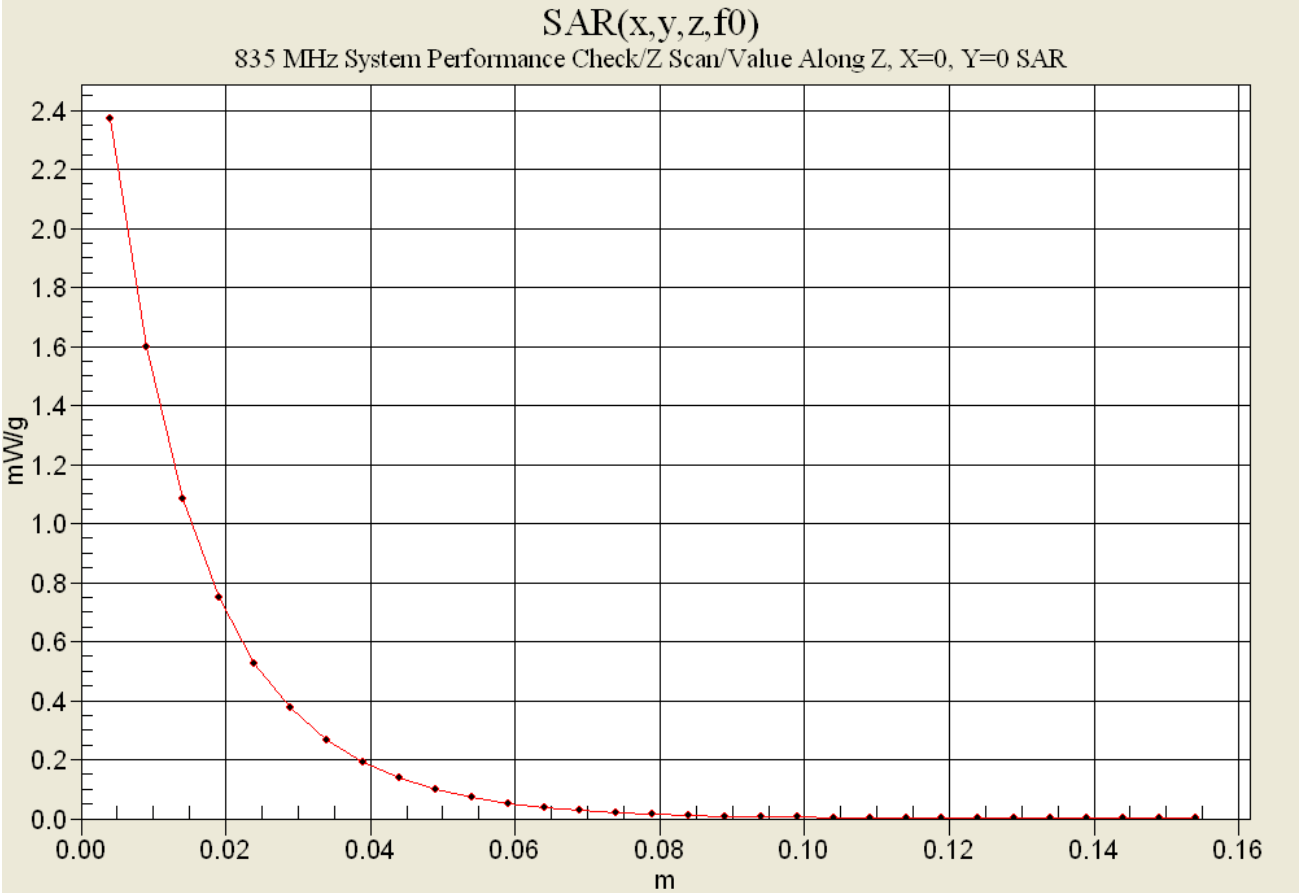
- Probe: ET3DV6 - SN1387; ConvF(6.71, 6.71, 6.71); Calibrated: 18/03/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn353; Calibrated: 19/12/2003
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, 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) = 3.26 W/kg
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.44 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

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: Spencer Watson

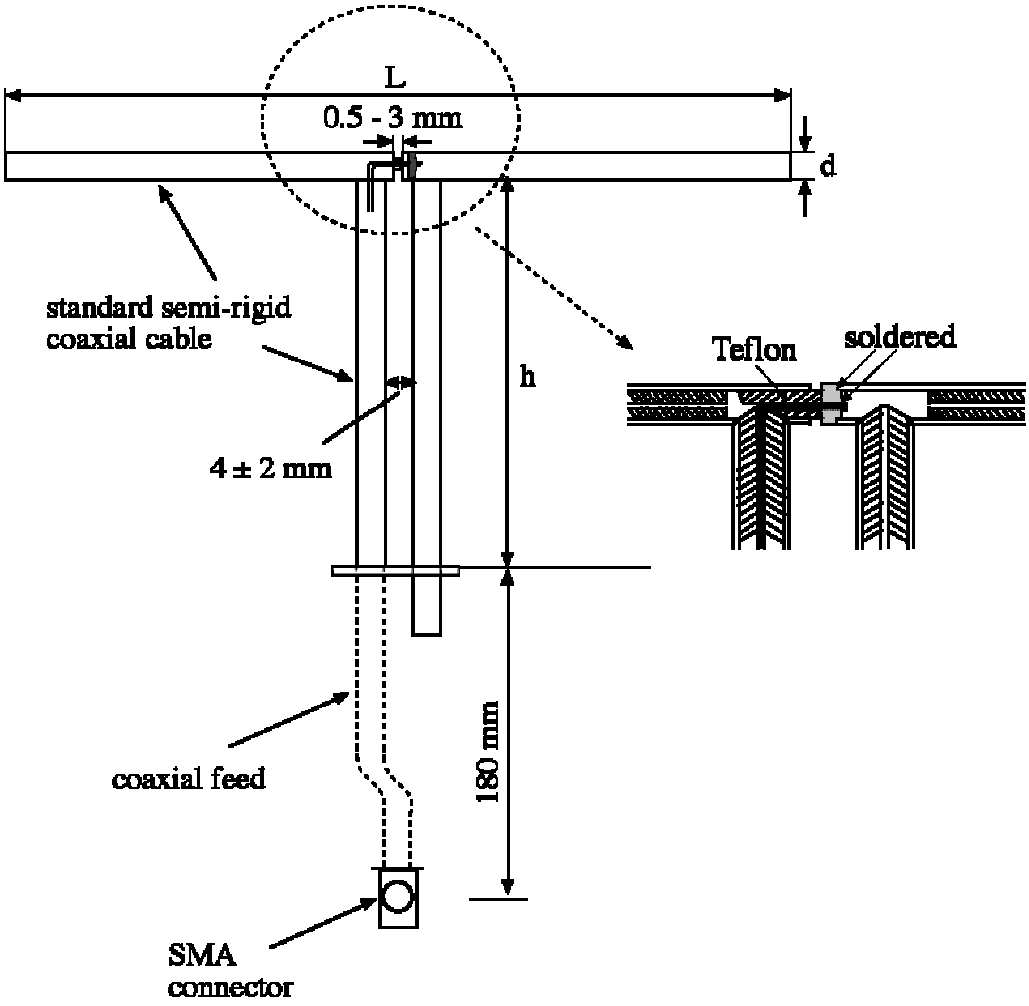
Approved by: Russell W. Pope

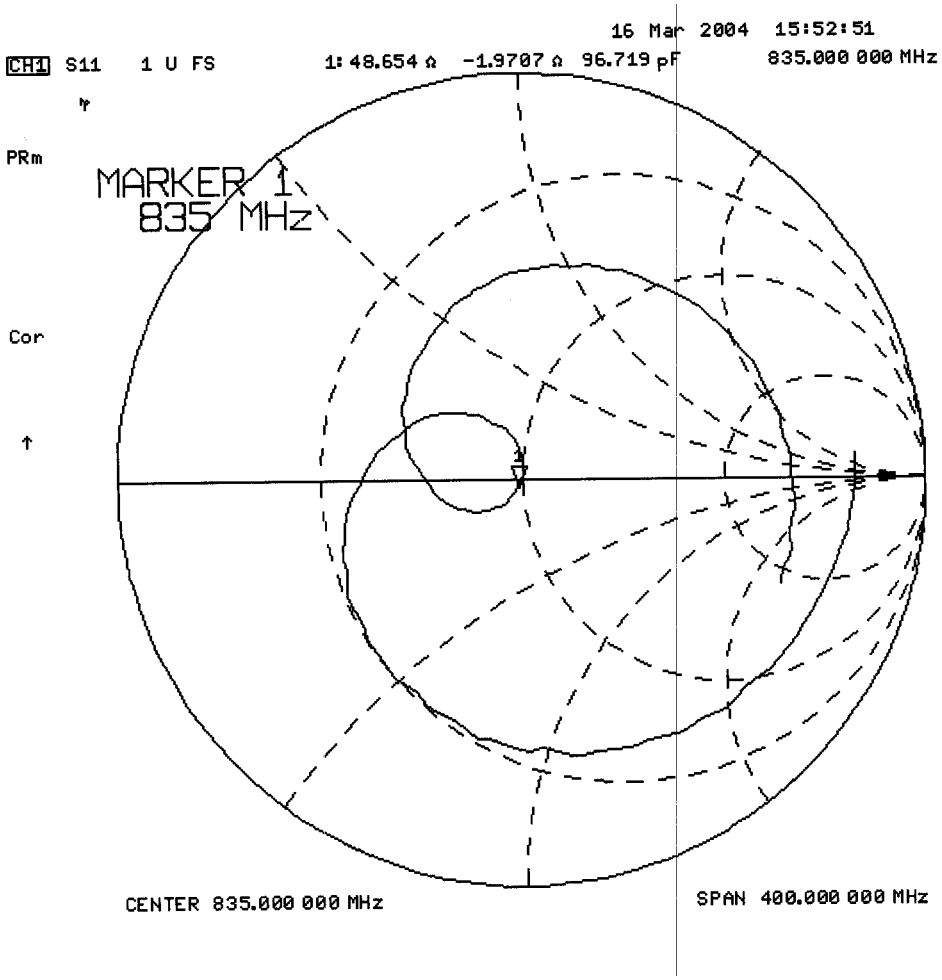
Celltech Labs Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-448-7047 • Fax. 250-448-7046 • e-mail: info@celltechlabs.com
www.celltechlabs.com

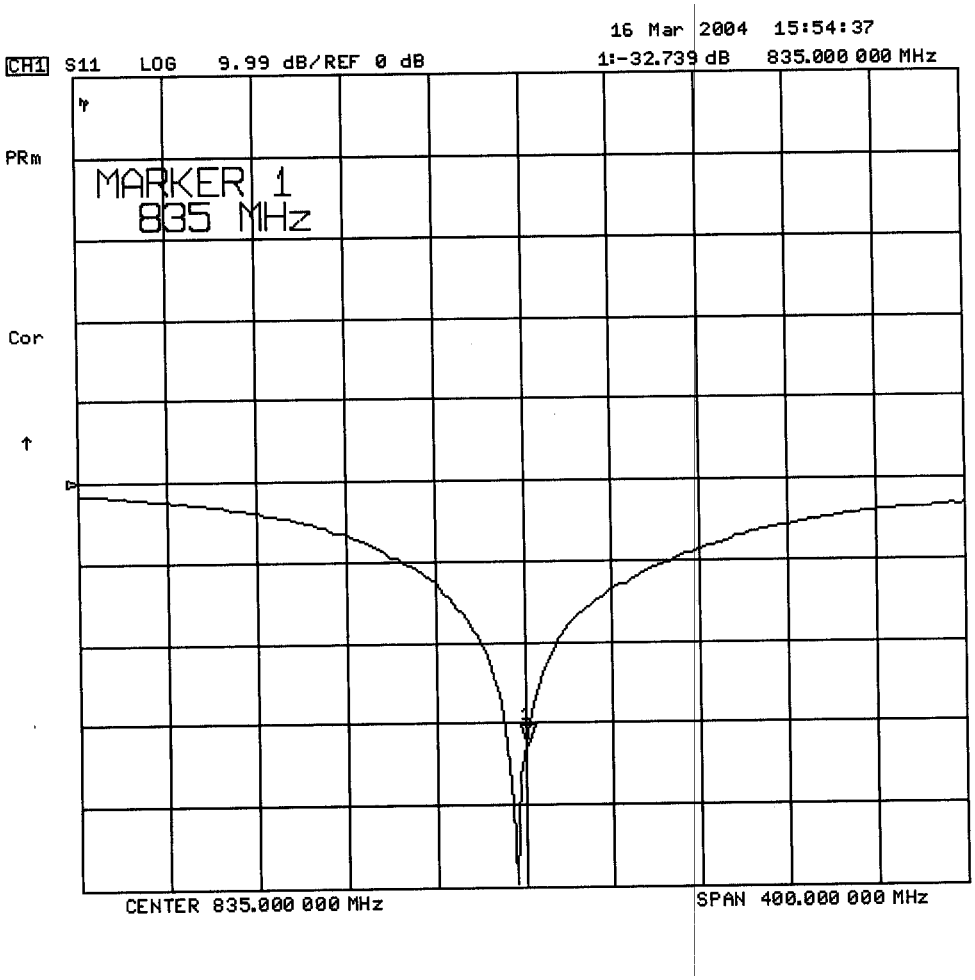
1. Dipole Construction & Electrical Characteristics

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%

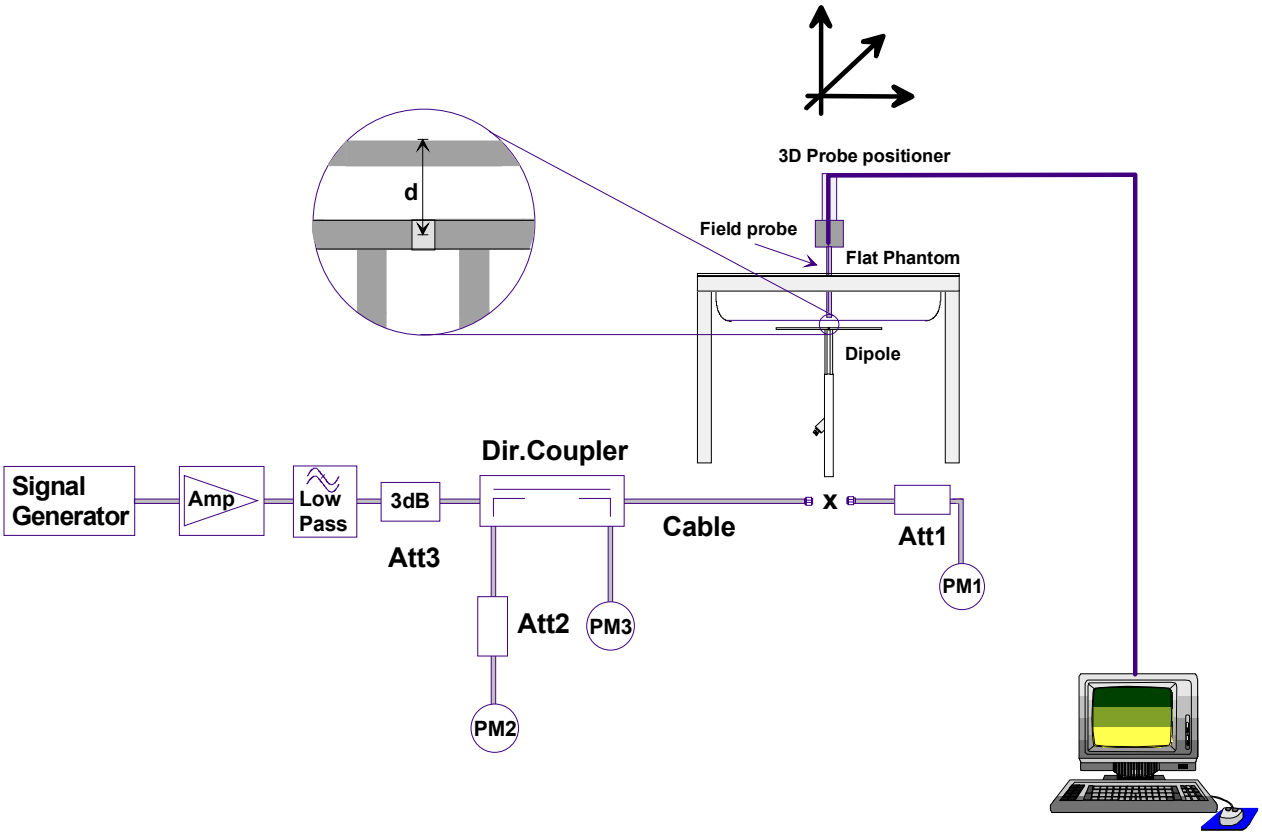
The 835 MHz simulating tissue consists of the following ingredients:

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

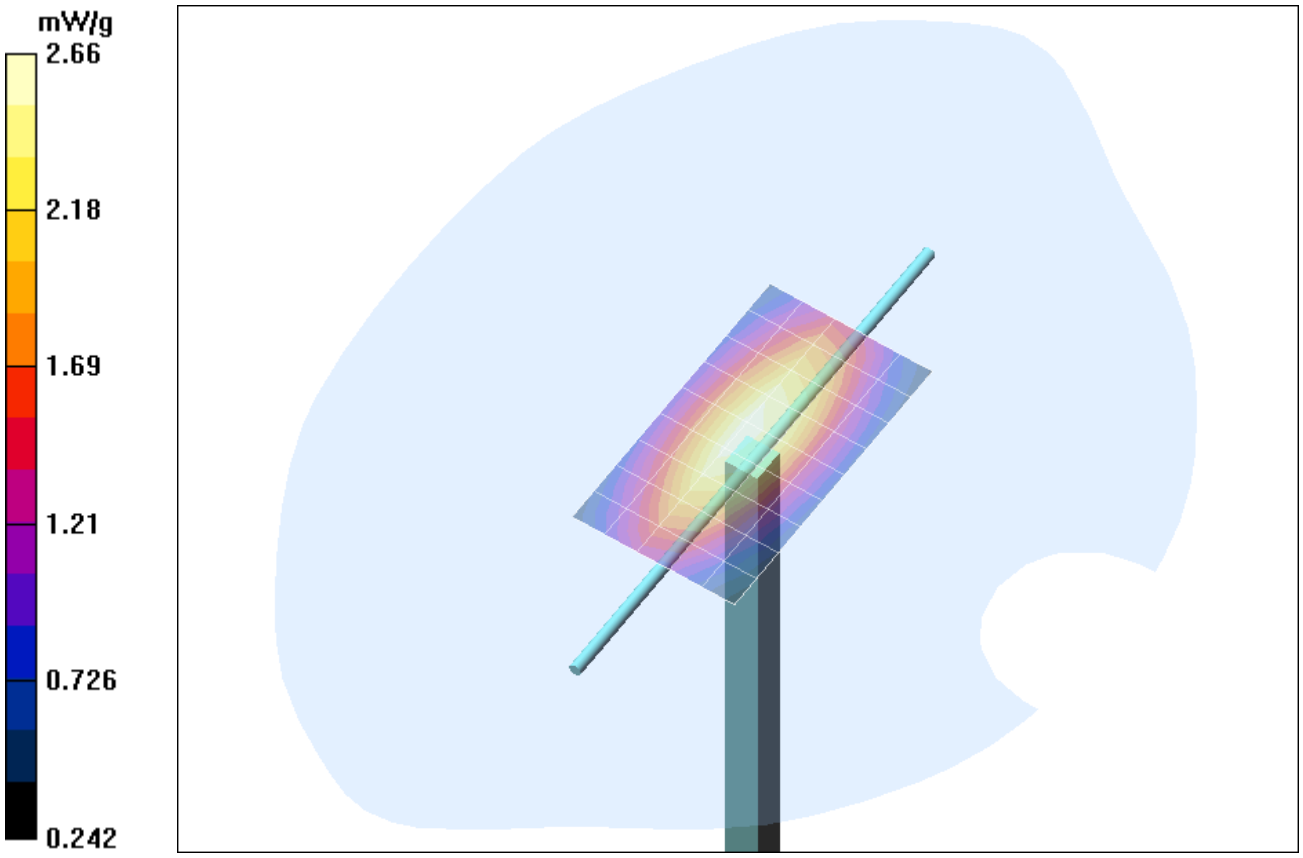
835 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

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

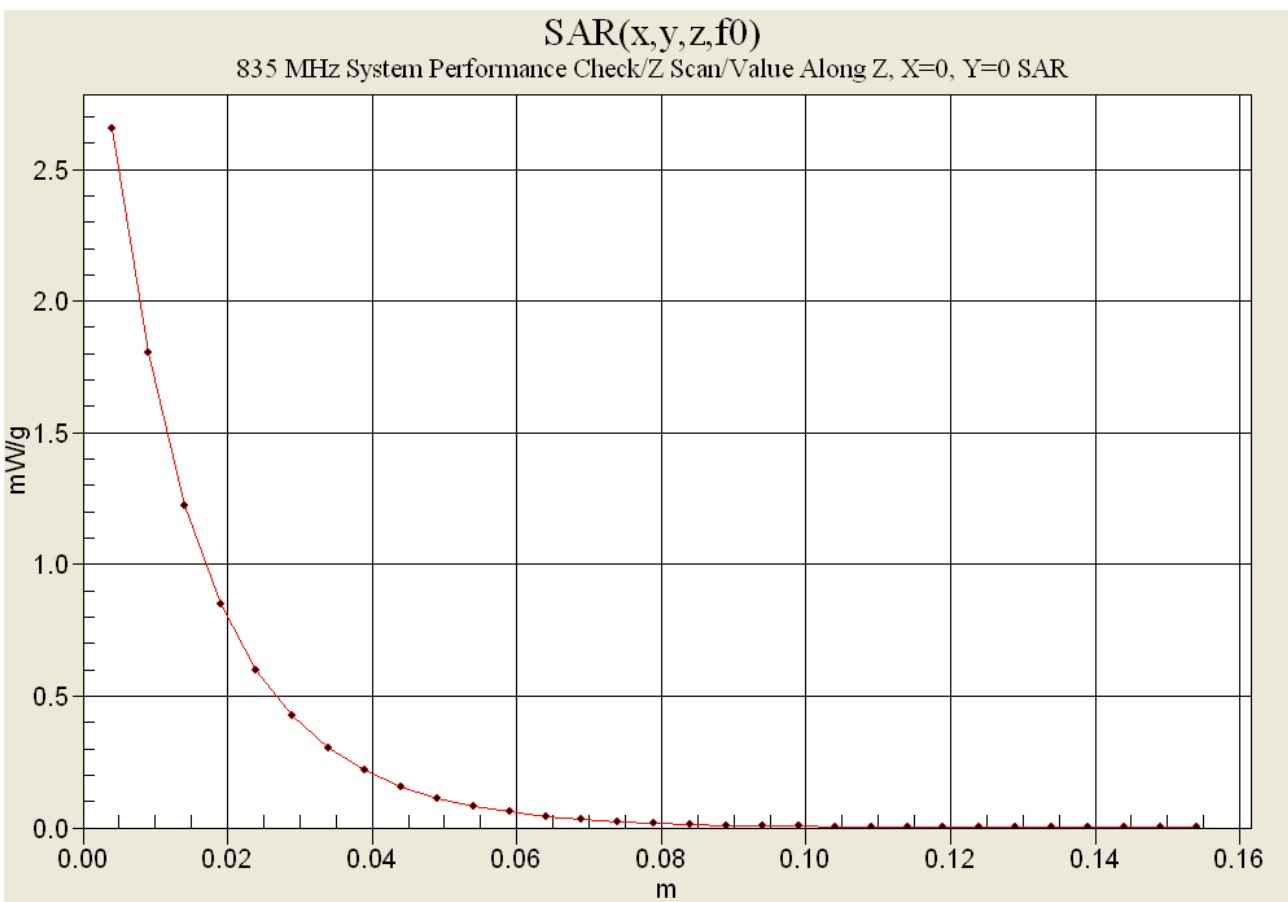
835 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.2 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.54 W/kg
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

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

NormX	**1.62** μV/(V/m)^2
NormY	**1.71** μV/(V/m)^2
NormZ	**1.71** μV/(V/m)^2

Diode Compression[A]

DCP X	**92**	mV
DCP Y	**92**	mV
DCP Z	**92**	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

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

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

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

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

Sensor Offset

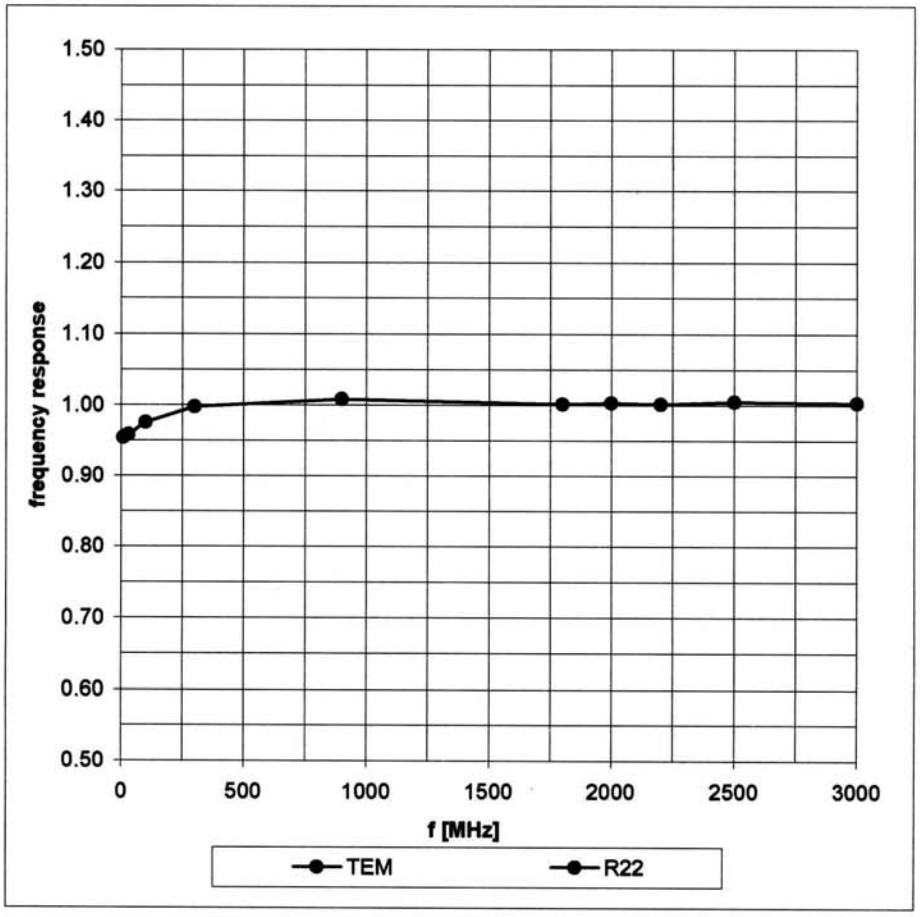
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

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

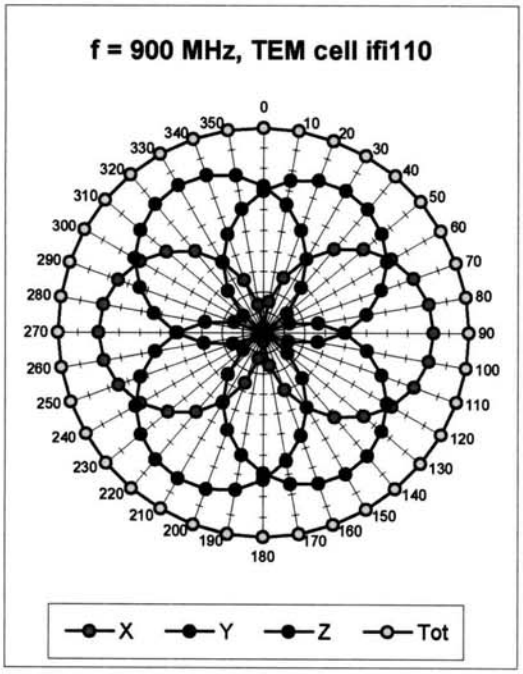
[A] numerical linearization parameter: uncertainty not required

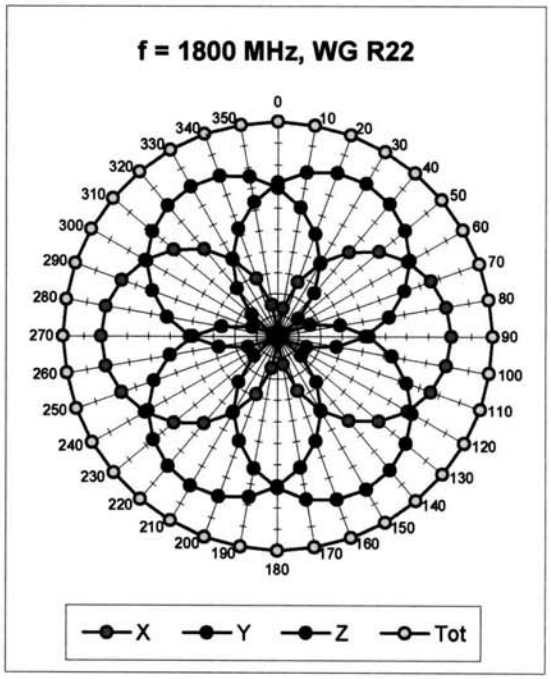
Frequency Response of E-Field

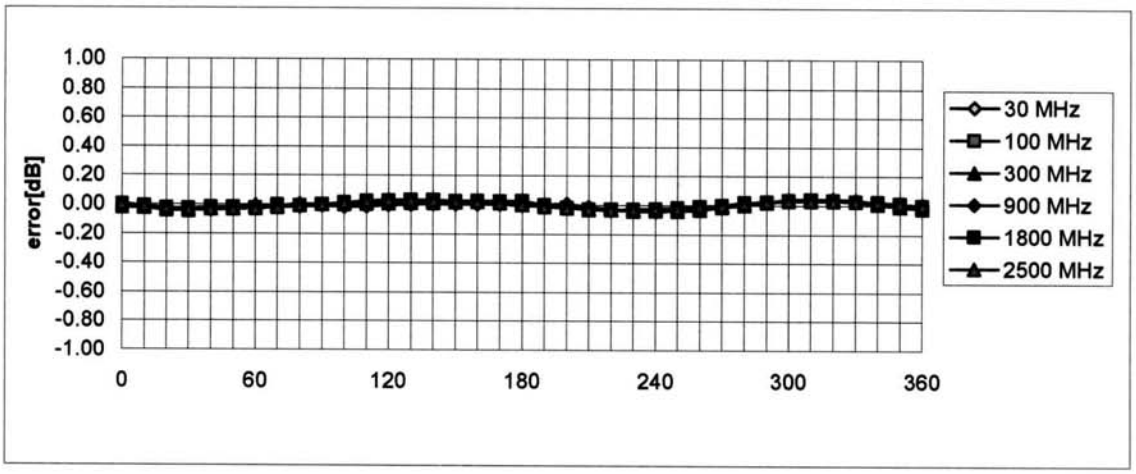
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ) , θ = 0°



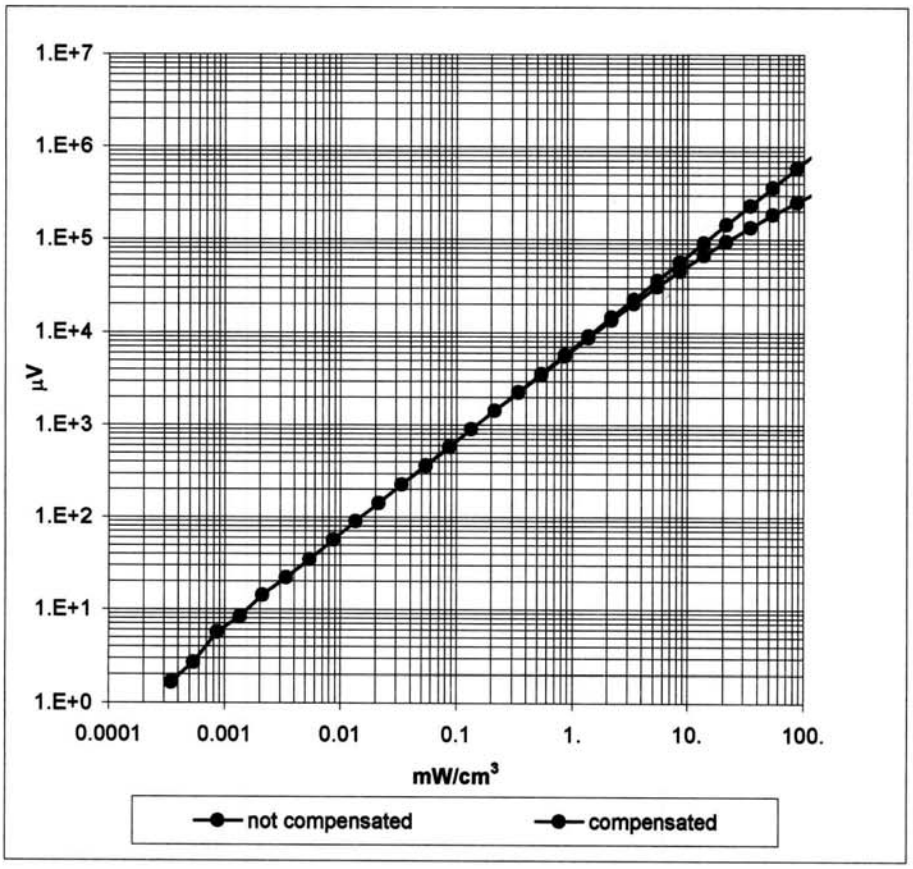


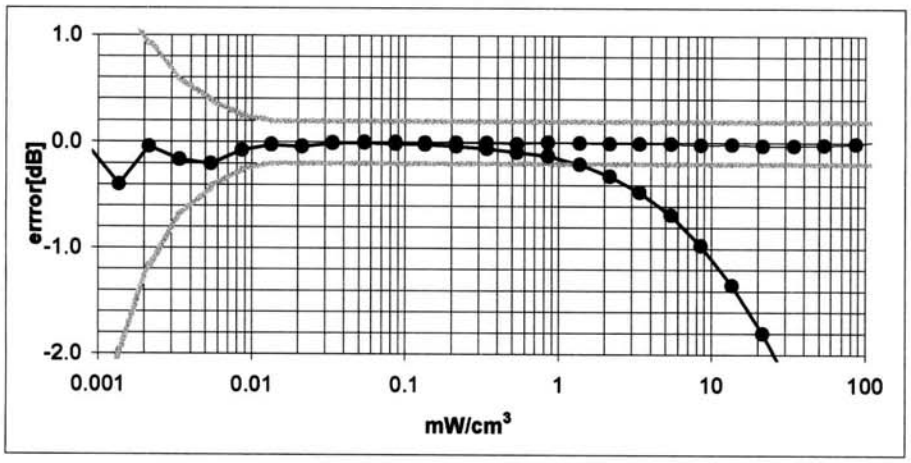


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

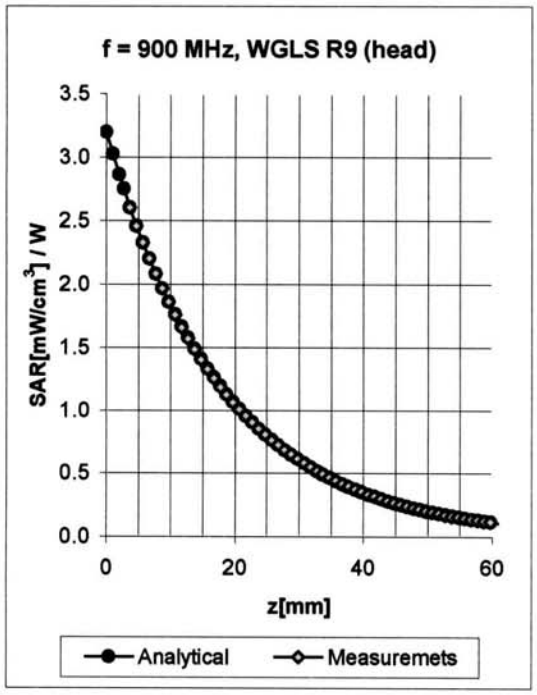
(Waveguide R22)

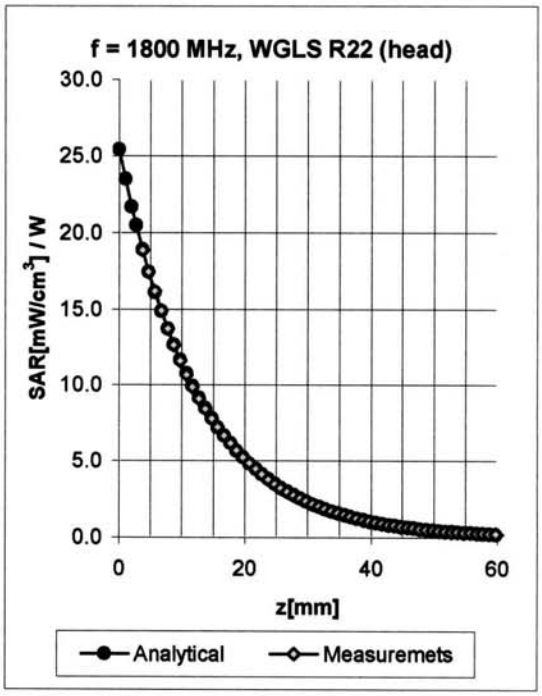




Probe Linearity < ± 0.2 dB

Conversion Factor Assessment



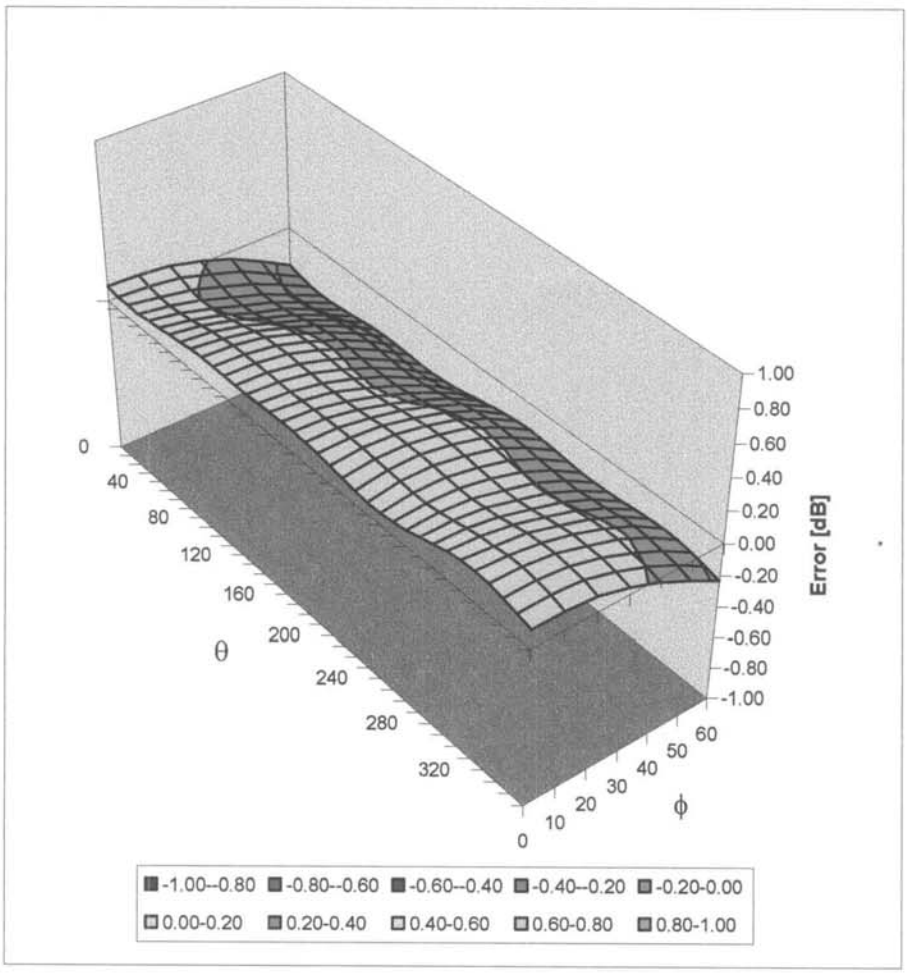


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
835	750-950	Head	41.5 ± 5%	0.90 ± 5%	0.72	1.78	6.71	± 11.9% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.51	2.67	5.38	± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.55	2.66	5.25	± 9.7% (k=2)
2450	2400-2500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

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

Deviation from Isotropy in HSL

Error (θ,ϕ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

Schmid & Partner Engineering AG

s p e a g

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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:

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

Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion factor (± standard deviation)

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

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also Section 4.7 of the DASY4 Manual.

APPENDIX E - MEASURED FLUID DIELECTRIC PARAMETERS

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 9, 2004

Frequency	e'	e"
735.000000 MHz	43.1398	20.6491
745.000000 MHz	42.9761	20.5892
755.000000 MHz	42.8366	20.5138
765.000000 MHz	42.6833	20.4559
775.000000 MHz	42.5301	20.4226
785.000000 MHz	42.3895	20.3764
795.000000 MHz	42.3310	20.3319
805.000000 MHz	42.2605	20.3133
815.000000 MHz	42.1466	20.3017
825.000000 MHz	41.9976	20.3222
835.000000 MHz	41.8360	20.2991
845.000000 MHz	41.6884	20.2526
855.000000 MHz	41.5287	20.2218
865.000000 MHz	41.3816	20.1478
875.000000 MHz	41.2308	20.1181
885.000000 MHz	41.1478	20.0297
895.000000 MHz	41.0913	19.9555
905.000000 MHz	41.0050	19.9411
915.000000 MHz	40.8834	19.9625
925.000000 MHz	40.7574	19.9565
935.000000 MHz	40.5883	19.8920

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 10, 2004

Frequency	e'	e"
735.000000 MHz	42.0984	20.0086
745.000000 MHz	41.9457	19.9588
755.000000 MHz	41.7902	19.9230
765.000000 MHz	41.6186	19.8931
775.000000 MHz	41.4958	19.8579
785.000000 MHz	41.3565	19.8283
795.000000 MHz	41.2642	19.7933
805.000000 MHz	41.1598	19.7408
815.000000 MHz	41.0711	19.7338
825.000000 MHz	40.9599	19.6698
835.000000 MHz	40.8100	19.6444
845.000000 MHz	40.6963	19.6209
855.000000 MHz	40.5347	19.5602
865.000000 MHz	40.3897	19.5073
875.000000 MHz	40.2486	19.5260
885.000000 MHz	40.1197	19.5017
895.000000 MHz	40.0510	19.4315
905.000000 MHz	39.9210	19.3806
915.000000 MHz	39.8115	19.3546
925.000000 MHz	39.7026	19.3199
935.000000 MHz	39.5969	19.2854

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 11, 2004

Frequency	e'	e"
735.000000 MHz	42.2360	20.2318
745.000000 MHz	42.0795	20.1680
755.000000 MHz	41.9336	20.1268
765.000000 MHz	41.7714	20.0915
775.000000 MHz	41.6541	20.0799
785.000000 MHz	41.5330	20.0369
795.000000 MHz	41.4269	20.0353
805.000000 MHz	41.3571	19.9918
815.000000 MHz	41.2311	19.9485
825.000000 MHz	41.0943	19.9096
835.000000 MHz	40.9582	19.8774
845.000000 MHz	40.7984	19.8011
855.000000 MHz	40.6617	19.7932
865.000000 MHz	40.4889	19.7145
875.000000 MHz	40.3754	19.7231
885.000000 MHz	40.2457	19.6966
895.000000 MHz	40.1854	19.6215
905.000000 MHz	40.0884	19.5832
915.000000 MHz	39.9476	19.5688
925.000000 MHz	39.8423	19.5304
935.000000 MHz	39.7296	19.5052

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 12, 2004

Frequency	e'	e"
735.000000 MHz	40.9753	19.6663
745.000000 MHz	40.8461	19.6204
755.000000 MHz	40.7081	19.6126
765.000000 MHz	40.5933	19.5434
775.000000 MHz	40.4224	19.5017
785.000000 MHz	40.3240	19.4654
795.000000 MHz	40.2296	19.4728
805.000000 MHz	40.1081	19.4444
815.000000 MHz	39.9904	19.3947
825.000000 MHz	39.8521	19.3733
835.000000 MHz	39.7223	19.3090
845.000000 MHz	39.5945	19.2773
855.000000 MHz	39.4654	19.2267
865.000000 MHz	39.3530	19.2241
875.000000 MHz	39.2042	19.2221
885.000000 MHz	39.0849	19.2029
895.000000 MHz	38.9930	19.1277
905.000000 MHz	38.8708	19.0579
915.000000 MHz	38.7769	19.0257
925.000000 MHz	38.7068	18.9828
935.000000 MHz	38.5857	18.9701

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 14, 2004

Frequency	e'	e"
735.000000 MHz	41.4405	19.7101
745.000000 MHz	41.2937	19.6598
755.000000 MHz	41.1371	19.5969
765.000000 MHz	41.0014	19.5535
775.000000 MHz	40.8180	19.5239
785.000000 MHz	40.7125	19.4540
795.000000 MHz	40.6572	19.4385
805.000000 MHz	40.5969	19.4137
815.000000 MHz	40.5214	19.4416
825.000000 MHz	40.3235	19.4543
835.000000 MHz	40.1905	19.4138
845.000000 MHz	39.9851	19.3791
855.000000 MHz	39.8417	19.2884
865.000000 MHz	39.6749	19.2475
875.000000 MHz	39.5167	19.1859
885.000000 MHz	39.4394	19.1138
895.000000 MHz	39.4313	19.0336
905.000000 MHz	39.3332	19.0292
915.000000 MHz	39.2254	19.0816
925.000000 MHz	39.0605	19.0733
935.000000 MHz	38.8857	19.0165

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 16, 2004

Frequency	e'	e"
735.000000 MHz	42.3793	20.1959
745.000000 MHz	42.2210	20.1322
755.000000 MHz	42.0571	20.0724
765.000000 MHz	41.9040	20.0347
775.000000 MHz	41.7466	19.9830
785.000000 MHz	41.6176	19.9371
795.000000 MHz	41.5561	19.9022
805.000000 MHz	41.4928	19.8903
815.000000 MHz	41.4032	19.9287
825.000000 MHz	41.2330	19.8718
835.000000 MHz	41.0937	19.8717
845.000000 MHz	40.9173	19.7785
855.000000 MHz	40.8043	19.7119
865.000000 MHz	40.6204	19.6365
875.000000 MHz	40.5108	19.5933
885.000000 MHz	40.4047	19.5505
895.000000 MHz	40.3646	19.4501
905.000000 MHz	40.2679	19.4716
915.000000 MHz	40.1183	19.4843
925.000000 MHz	40.0010	19.4445
935.000000 MHz	39.8620	19.3695

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 19, 2004

Frequency	e'	e"
735.000000 MHz	42.0834	19.7610
745.000000 MHz	41.9371	19.6952
755.000000 MHz	41.7996	19.6007
765.000000 MHz	41.6566	19.6008
775.000000 MHz	41.5377	19.5452
785.000000 MHz	41.4166	19.5085
795.000000 MHz	41.3466	19.4431
805.000000 MHz	41.2695	19.4623
815.000000 MHz	41.1777	19.4530
825.000000 MHz	41.0072	19.4339
835.000000 MHz	40.8487	19.4025
845.000000 MHz	40.6708	19.3781
855.000000 MHz	40.5212	19.3269
865.000000 MHz	40.3611	19.2601
875.000000 MHz	40.2533	19.2213
885.000000 MHz	40.1515	19.1920
895.000000 MHz	40.1130	19.0959
905.000000 MHz	40.0221	19.0855
915.000000 MHz	39.9049	19.1077
925.000000 MHz	39.7614	19.0608
935.000000 MHz	39.6142	19.0215

835 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

May 20, 2004

Frequency	e'	e"
735.000000 MHz	42.2566	19.7762
745.000000 MHz	42.0866	19.7383
755.000000 MHz	41.9396	19.7021
765.000000 MHz	41.8055	19.6529
775.000000 MHz	41.6631	19.6411
785.000000 MHz	41.5357	19.6043
795.000000 MHz	41.4847	19.5925
805.000000 MHz	41.3774	19.5417
815.000000 MHz	41.2779	19.5063
825.000000 MHz	41.1316	19.5008
835.000000 MHz	40.9581	19.4565
845.000000 MHz	40.8178	19.4206
855.000000 MHz	40.6572	19.3713
865.000000 MHz	40.5091	19.3511
875.000000 MHz	40.3693	19.3096
885.000000 MHz	40.2812	19.2951
895.000000 MHz	40.2286	19.2212
905.000000 MHz	40.1418	19.1587
915.000000 MHz	40.0163	19.1384
925.000000 MHz	39.9157	19.0924
935.000000 MHz	39.8023	19.0420

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 10, 2004

Frequency	e'	e"
785.000000 MHz	41.3795	19.7891
790.000000 MHz	41.3403	19.7587
795.000000 MHz	41.2841	19.7442
800.000000 MHz	41.2343	19.7500
805.000000 MHz	41.1827	19.7455
810.000000 MHz	41.1267	19.7207
815.000000 MHz	41.0671	19.7188
820.000000 MHz	41.0207	19.7028
825.000000 MHz	40.9288	19.6729
830.000000 MHz	40.8611	19.6687
835.000000 MHz	40.8029	19.6568
840.000000 MHz	40.7403	19.6256
845.000000 MHz	40.6716	19.6068
850.000000 MHz	40.5821	19.5840
855.000000 MHz	40.5087	19.5777
860.000000 MHz	40.4786	19.5391
865.000000 MHz	40.3776	19.5005
870.000000 MHz	40.3073	19.4945
875.000000 MHz	40.2553	19.5140
880.000000 MHz	40.2150	19.4999
885.000000 MHz	40.1489	19.4633

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 11, 2004

Frequency	e'	e"
735.000000 MHz	42.2360	20.2318
745.000000 MHz	42.0795	20.1680
755.000000 MHz	41.9336	20.1268
765.000000 MHz	41.7714	20.0915
775.000000 MHz	41.6541	20.0799
785.000000 MHz	41.5330	20.0369
795.000000 MHz	41.4269	20.0353
805.000000 MHz	41.3571	19.9918
815.000000 MHz	41.2311	19.9485
825.000000 MHz	41.0943	19.9096
835.000000 MHz	40.9582	19.8774
845.000000 MHz	40.7984	19.8011
855.000000 MHz	40.6617	19.7932
865.000000 MHz	40.4889	19.7145
875.000000 MHz	40.3754	19.7231
885.000000 MHz	40.2457	19.6966
895.000000 MHz	40.1854	19.6215
905.000000 MHz	40.0884	19.5832
915.000000 MHz	39.9476	19.5688
925.000000 MHz	39.8423	19.5304
935.000000 MHz	39.7296	19.5052

815 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 12, 2004

Frequency	e'	e"
765.000000 MHz	41.0017	19.6436
770.000000 MHz	40.9067	19.6177
775.000000 MHz	40.8499	19.6050
780.000000 MHz	40.7717	19.5481
785.000000 MHz	40.6872	19.5488
790.000000 MHz	40.6360	19.5028
795.000000 MHz	40.5887	19.5109
800.000000 MHz	40.5750	19.4777
805.000000 MHz	40.5086	19.4477
810.000000 MHz	40.4777	19.4465
815.000000 MHz	40.4075	19.4558
820.000000 MHz	40.3682	19.4569
825.000000 MHz	40.2971	19.4348
830.000000 MHz	40.2235	19.4191
835.000000 MHz	40.1292	19.4199
840.000000 MHz	40.1070	19.4118
845.000000 MHz	39.9851	19.3791
850.000000 MHz	39.9138	19.3746
855.000000 MHz	39.8670	19.3431
860.000000 MHz	39.8115	19.3144
865.000000 MHz	39.7137	19.2775

861 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 10, 2004

Frequency	e'	e"
761.000000 MHz	41.8377	19.9981
771.000000 MHz	41.6546	19.9592
781.000000 MHz	41.5555	19.9227
791.000000 MHz	41.4765	19.9480
801.000000 MHz	41.3847	19.9111
811.000000 MHz	41.2580	19.8522
821.000000 MHz	41.1452	19.8502
831.000000 MHz	40.9880	19.7869
841.000000 MHz	40.8497	19.7573
851.000000 MHz	40.6924	19.6826
861.000000 MHz	40.5354	19.6308
871.000000 MHz	40.4083	19.5980
881.000000 MHz	40.2876	19.5748
891.000000 MHz	40.1639	19.5287
901.000000 MHz	40.1130	19.4827
911.000000 MHz	40.0036	19.4646
921.000000 MHz	39.8896	19.4196
931.000000 MHz	39.7726	19.3866
941.000000 MHz	39.6791	19.3573
951.000000 MHz	39.5711	19.3334
961.000000 MHz	39.4468	19.2921

861 MHz DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

May 11, 2004

Frequency	e'	e"
811.000000 MHz	40.7396	18.9718
816.000000 MHz	40.6706	18.9791
821.000000 MHz	40.6172	18.9612
826.000000 MHz	40.5241	18.9488
831.000000 MHz	40.4904	18.9578
836.000000 MHz	40.4349	18.9413
841.000000 MHz	40.3365	18.9158
846.000000 MHz	40.2786	18.9212
851.000000 MHz	40.2261	18.9048
856.000000 MHz	40.1381	18.8676
861.000000 MHz	40.0642	18.8781
866.000000 MHz	39.9982	18.8765
871.000000 MHz	39.9387	18.8582
876.000000 MHz	39.8972	18.8653
881.000000 MHz	39.8222	18.8568
886.000000 MHz	39.7851	18.8380
891.000000 MHz	39.7421	18.8310
896.000000 MHz	39.6976	18.7458
901.000000 MHz	39.6404	18.7189
906.000000 MHz	39.6008	18.7168
911.000000 MHz	39.5472	18.6799

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 12, 2004

Frequency	e'	e"
765.000000 MHz	55.3319	21.7653
770.000000 MHz	55.2647	21.7223
775.000000 MHz	55.2343	21.7139
780.000000 MHz	55.1939	21.6741
785.000000 MHz	55.1586	21.6792
790.000000 MHz	55.1171	21.6632
795.000000 MHz	55.0563	21.6543
800.000000 MHz	55.0097	21.6177
805.000000 MHz	54.9865	21.5957
810.000000 MHz	54.9336	21.5676
815.000000 MHz	54.8600	21.5416
820.000000 MHz	54.8008	21.5053
825.000000 MHz	54.7602	21.5017
830.000000 MHz	54.7026	21.4488
835.000000 MHz	54.6446	21.4520
840.000000 MHz	54.5902	21.4319
845.000000 MHz	54.5393	21.3888
850.000000 MHz	54.4618	21.3889
855.000000 MHz	54.4107	21.3685
860.000000 MHz	54.3795	21.3408
865.000000 MHz	54.3020	21.3310

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 16, 2004

Frequency	e'	e"
715.000000 MHz	55.4301	22.0894
725.000000 MHz	55.3265	22.0245
735.000000 MHz	55.2058	21.9666
745.000000 MHz	55.1065	21.9031
755.000000 MHz	54.9831	21.8251
765.000000 MHz	54.8683	21.7581
775.000000 MHz	54.7548	21.7156
785.000000 MHz	54.6632	21.6551
795.000000 MHz	54.6105	21.6280
805.000000 MHz	54.5374	21.5969
815.000000 MHz	54.4614	21.5616
825.000000 MHz	54.3603	21.5080
835.000000 MHz	54.2301	21.4387
845.000000 MHz	54.1361	21.3963
855.000000 MHz	53.9912	21.3522
865.000000 MHz	53.8570	21.2950
875.000000 MHz	53.7637	21.2774
885.000000 MHz	53.6650	21.2625
895.000000 MHz	53.6201	21.1589
905.000000 MHz	53.5474	21.1249
915.000000 MHz	53.4627	21.0653

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 19, 2004

Frequency	e'	e"
715.000000 MHz	54.8645	21.7599
725.000000 MHz	54.7667	21.7009
735.000000 MHz	54.6223	21.6339
745.000000 MHz	54.5106	21.5943
755.000000 MHz	54.3966	21.4969
765.000000 MHz	54.2767	21.4391
775.000000 MHz	54.1669	21.3795
785.000000 MHz	54.0928	21.3435
795.000000 MHz	54.0308	21.2810
805.000000 MHz	53.9798	21.2721
815.000000 MHz	53.9063	21.2204
825.000000 MHz	53.7829	21.2209
835.000000 MHz	53.6741	21.1559
845.000000 MHz	53.5331	21.1262
855.000000 MHz	53.4053	21.0605
865.000000 MHz	53.2854	21.0044
875.000000 MHz	53.1616	20.9833
885.000000 MHz	53.0676	20.9731
895.000000 MHz	53.0257	20.8699
905.000000 MHz	52.9484	20.8441
915.000000 MHz	52.8514	20.8112

815 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 20, 2004

Frequency	e'	e"
715.000000 MHz	55.5164	22.0866
725.000000 MHz	55.3728	22.0341
735.000000 MHz	55.2717	21.9815
745.000000 MHz	55.1319	21.9067
755.000000 MHz	55.0512	21.8500
765.000000 MHz	54.9142	21.7543
775.000000 MHz	54.8107	21.7081
785.000000 MHz	54.7288	21.6439
795.000000 MHz	54.6886	21.5891
805.000000 MHz	54.6182	21.5681
815.000000 MHz	54.5330	21.5414
825.000000 MHz	54.4114	21.4950
835.000000 MHz	54.2834	21.4634
845.000000 MHz	54.1372	21.4288
855.000000 MHz	54.0246	21.3832
865.000000 MHz	53.8842	21.3386
875.000000 MHz	53.7979	21.3391
885.000000 MHz	53.6955	21.3143
895.000000 MHz	53.6487	21.2055
905.000000 MHz	53.5698	21.1422
915.000000 MHz	53.4761	21.0859

861 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 13, 2004

Frequency	e'	e"
761.000000 MHz	55.4141	21.9640
771.000000 MHz	55.3427	21.8893
781.000000 MHz	55.2491	21.8235
791.000000 MHz	55.1777	21.8089
801.000000 MHz	55.1082	21.7708
811.000000 MHz	55.0287	21.7255
821.000000 MHz	54.9489	21.6529
831.000000 MHz	54.7882	21.6227
841.000000 MHz	54.6976	21.5735
851.000000 MHz	54.5690	21.5287
861.000000 MHz	54.4508	21.4706
871.000000 MHz	54.3515	21.4229
881.000000 MHz	54.2483	21.4099
891.000000 MHz	54.1402	21.3731
901.000000 MHz	54.1141	21.2682
911.000000 MHz	54.0237	21.2318
921.000000 MHz	53.9224	21.1851
931.000000 MHz	53.8599	21.1238
941.000000 MHz	53.7746	21.1237
951.000000 MHz	53.7028	21.0981
961.000000 MHz	53.6117	21.0660

861 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 14, 2004

Frequency	e'	e"
761.000000 MHz	55.5844	21.9057
771.000000 MHz	55.4867	21.8630
781.000000 MHz	55.4008	21.8404
791.000000 MHz	55.3433	21.8196
801.000000 MHz	55.2452	21.8019
811.000000 MHz	55.1498	21.7780
821.000000 MHz	55.0585	21.6915
831.000000 MHz	54.9079	21.6453
841.000000 MHz	54.8234	21.6148
851.000000 MHz	54.6745	21.5764
861.000000 MHz	54.5671	21.4914
871.000000 MHz	54.4495	21.4821
881.000000 MHz	54.3605	21.4517
891.000000 MHz	54.2698	21.4069
901.000000 MHz	54.1928	21.3210
911.000000 MHz	54.1224	21.2964
921.000000 MHz	54.0507	21.2469
931.000000 MHz	53.9313	21.2485
941.000000 MHz	53.8734	21.2154
951.000000 MHz	53.7630	21.1944
961.000000 MHz	53.6667	21.1734

861 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 19, 2004

Frequency	e'	e"
761.000000 MHz	55.0472	21.8987
771.000000 MHz	54.9340	21.8300
781.000000 MHz	54.8395	21.7681
791.000000 MHz	54.7774	21.7537
801.000000 MHz	54.7112	21.6836
811.000000 MHz	54.6474	21.6420
821.000000 MHz	54.5502	21.5906
831.000000 MHz	54.4124	21.5385
841.000000 MHz	54.3096	21.5082
851.000000 MHz	54.1679	21.4497
861.000000 MHz	54.0593	21.3806
871.000000 MHz	53.9191	21.3735
881.000000 MHz	53.8394	21.3441
891.000000 MHz	53.7476	21.3148
901.000000 MHz	53.7114	21.2435
911.000000 MHz	53.6137	21.2077
921.000000 MHz	53.5472	21.1501
931.000000 MHz	53.4476	21.1170
941.000000 MHz	53.3812	21.0815
951.000000 MHz	53.2762	21.0423
961.000000 MHz	53.1953	21.0043

861 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 20, 2004

Frequency	e'	e"
761.000000 MHz	55.1040	21.8913
771.000000 MHz	54.9830	21.8014
781.000000 MHz	54.8774	21.7433
791.000000 MHz	54.8210	21.6808
801.000000 MHz	54.7613	21.6316
811.000000 MHz	54.6797	21.6530
821.000000 MHz	54.5894	21.5595
831.000000 MHz	54.4490	21.5473
841.000000 MHz	54.3290	21.5010
851.000000 MHz	54.2050	21.4904
861.000000 MHz	54.0902	21.4339
871.000000 MHz	53.9733	21.4172
881.000000 MHz	53.8850	21.3798
891.000000 MHz	53.8169	21.3301
901.000000 MHz	53.7315	21.2147
911.000000 MHz	53.6479	21.1630
921.000000 MHz	53.5916	21.1323
931.000000 MHz	53.4809	21.0729
941.000000 MHz	53.4212	21.0550
951.000000 MHz	53.2884	21.0474
961.000000 MHz	53.2006	21.0171

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

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