SAR TEST REPORT

RF EXPOSURE EVALUATION — SPECIFIC ABSORPTION RATE

APPLICANT	VOCERA COMMUNICATIONS INC.			
PRODUCT	COMMUNICATIONS BADGE WITH 802.11B/G WLAN			
MODEL	B2000			
IDENTIFIER(S)	FCC ID:	QGZB2000	IC ID:	4362A-B2000
APPLICATION TYPE	New Certification			
STANDARD(S) APPLIED	FCC 47 CFR §2.1093		Health Canada Safety Code 6	
PROCEDURE(S) APPLIED	FCC OET Bulletin 65, Supplement C (01-01)			
	FCC OET SAR Measurement Procedures for 802.11a/b/g Transmitters			
	IEEE 1528-2003			
	Industry Canada RSS-102 Issue 2			
FCC DEVICE CLASSIFICATION	Digital Transmission System (DTS) - §15C			
IC DEVICE CLASSIFICATION	Low Power License-Exempt Radiocommunication Device (RSS-210)			
RF EXPOSURE CATEGORY	General Population / Uncontrolled Exposure			
RF EXPOSURE EVALUATION	Head SAR (held-to-ear)			
TEST REPORT SERIAL NO.	061807QGZ-T838-S15WH			
TEST REPORT REVISION NO.	Revision 1.0 (Initial Release)			
TEST REPORT ISSUE DATE	September 06, 2007			
TEST REPORT SIGNATORIES	Tested By	Test Report By	Report Reviewed By	
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TEST LAB ACCREDITATION(S)	ilac-MRA A2LA ACCREDITED Certificate No. 2470.01			

DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab Information:	**Name**	**CELLTECH LABS INC.**		**Address**	21-364 Lougheed Road, Kelowna B.C. V1X 7R8			
Applicant Information:	**Name**	**VOCERA COMMUNICATIONS INC.**		**Address**	20600 Lazaneo Drive, 3rd Floor Cupertino, CA 95014 USA			
Standard(s) Applied:	**FCC**	47 CFR §2.1093		**IC**	Health Canada Safety Code 6			
Procedure(s) Applied:	**FCC**	OET Bulletin 65, Supplement C (Edition 01-01)						
		OET SAR Measurement Procedures for 802.11a/b/g Transmitters						
		IEEE 1528-2003						
	IC	RSS-102 Issue 2						
Device Classification(s):	**FCC**	Digital Transmission System		**IC**	Low Power License-Exempt Radiocommunication Device			
Device Identifier(s):	**FCC ID:**	QGZB2000		**IC:**	4362A-B2000			
Device Description:	Portable Wireless Communications Badge with 802.11b/g WLAN (held-to-ear)							
Device Model(s):	B2000			**Serial No.:**	A1DE07F7AFC3	Pre-production		
Modulation Type(s):	802.11b	DBPSK (1 Mbps), DQPSK (2 Mbps), CCK (5.5, 11 Mbps)						
	802.11g	OFDM (6, 9, 12, 24, 36, 48, 54 Mbps)						
Transmit Frequency Range(s):	2412 - 2462 MHz			**No. of Channels:**	11			

Max. RF Output Power Tested:	**Transmit Mode**	**Frequency MHz**	**Channel**	**Data Rate**	**Conducted Power**			
					Average		**Peak**	
	802.11b	2412	1	1	12.2 dBm	16.6 mW	16.0 dBm	39.8 mW
		2442	7	1	13.8 dBm	24.0 mW	18.5 dBm	70.8 mW
		2462	11	1	13.2 dBm	20.9 mW	17.4 dBm	55.0 mW
	Conducted average output power levels at the higher data rates and 802.11g mode were also measured and the results were not 0.25 dB > conducted average power levels measured at the lowest data rate in 802.11b mode.							

Antenna Type(s) Tested:	Internal						
Battery Type(s) Tested:	Standard Battery		Lithium-ion		3.7V	Model: 00531	
	Extended Battery		Lithium-ion		3.7V	Model: 00532	
Max. SAR Level(s) Evaluated:	**Head**	**802.11b**	**1.16 W/kg**	**1g average**	**ANSI/IEEE SAR Limit:**	**1.6 W/kg**	**1g average**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device was compliant with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6 for the General Population / Uncontrolled Exposure environment. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01), FCC OET SAR Measurement Procedures for 802.11a/b/g Transmitters, IEEE 1528-2003 and Industry Canada RSS-102 Issue 2. 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.

Test Report Approved By:		
	Sean Johnston	**Celltech Labs Inc.**

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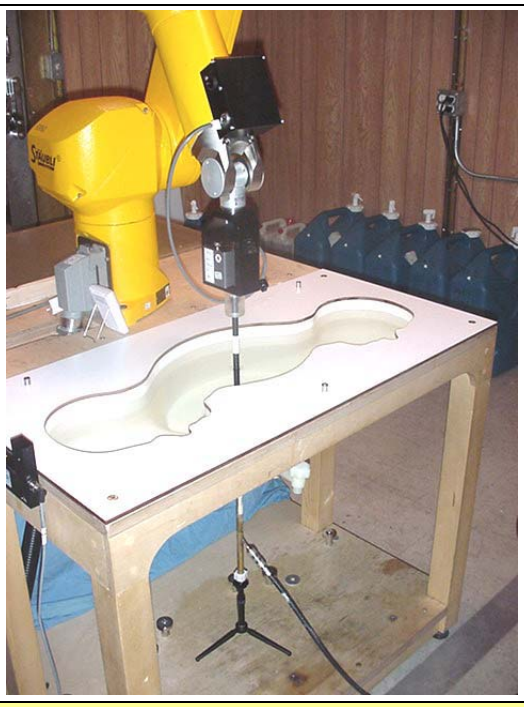
1.0 INTRODUCTION

This measurement report demonstrates that the VOCERA COMMUNICATIONS Model: B2000 Portable Communications Badge with 802.11b/g WLAN 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 General Population / Uncontrolled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]), FCC OET SAR Measurement Procedures for 802.11a/b/g Transmitters (see reference [7]), IEEE 1528-2003 (see reference [5]) and IC RSS-102 Issue 2 (see reference [4]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 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 System with SAM Phantom and validation dipole

DASY4 System with SAM Phantom and device holder

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3.0 MEASUREMENT SUMMARY

HEAD SAR EVALUATION RESULTS

Test Date	Transmit Mode	Test Mode	Freq.	Chan.	Data Rate	Battery Type	Phantom Section	Test Position	Cond. Power Before Test	SAR Drift During Test	Measured SAR 1g
			MHz		Mbps				dBm	dB	W/kg
Jul-17	802.11b	DSSS	2442	7	1	Standard	Right Ear	Cheek/Touch	13.8	0.175	1.16
Jul-17	802.11b	DSSS	2442	7	1	Standard	Right Ear	Ear/Tilt (15°)	13.8	-0.130	0.493
Aug-31	802.11b	DSSS	2412	1	1	Standard	Right Ear	Cheek/Touch	12.2	0.160	0.952
Aug-31	802.11b	DSSS	2462	11	1	Standard	Right Ear	Cheek/Touch	13.2	-0.174	0.914
Jul-17	802.11b	DSSS	2442	7	1	Standard	Left Ear	Cheek/Touch	13.8	-0.148	0.918
Jul-17	802.11b	DSSS	2442	7	1	Standard	Left Ear	Ear/Tilt (15°)	13.8	-0.202	0.511
Aug-31	802.11b	DSSS	2412	1	1	Standard	Left Ear	Cheek/Touch	12.2	-0.133	0.762
Aug-31	802.11b	DSSS	2462	11	1	Standard	Left Ear	Cheek/Touch	13.2	-0.205	1.05
Aug-31	802.11b	DSSS	2462	11	1	Extended	Left Ear	Cheek/Touch	13.2	-0.210	0.971
ANSI / IEEE C95.1: 2005 - SAFETY LIMIT:			BRAIN: 1.6 W/kg (averaged over 1 gram)					Spatial Peak Uncontrolled Exposure / General Population			

Test Date(s)			July 17, 2007		August 31, 2007	Test Date	Jul 17	Aug 31	Unit
Measured Fluid Type			2450 MHz Brain			Relative Humidity	31	30	%
	IEEE Target		Date	Measured	Deviation	Atmospheric Pressure	100.4	101.1	kPa
Dielectric Constant ε	39.2	±5%	Jul 17	37.3	-4.8%	Ambient Temperature	23.8	23.7	°C
			Aug 31	37.6	-4.0%	Fluid Temperature	22.2	22.5	°C
Conductivity σ (mho/m)	1.80	±5%	Jul 17	1.89	+5.0%	Fluid Depth	≥ 15	≥ 15	cm
			Aug 31	1.84	+2.3%	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 maximum output channel were ≥ 3 dB below the SAR limit, SAR evaluation for the remaining selected channels was optional (per FCC OET "SAR Measurement Procedures for 802.11a/b/g Transmitters" - see reference [7]).
3. Higher data rates and 802.11g mode were not evaluated based on the average output power levels were not 0.25 dB > the output power level measured at the lowest data rate in 802.11b mode (per FCC OET "SAR Measurement Procedures for 802.11a/b/g Transmitters" - see reference [7]).
4. The power drift of the DUT measured by the DASY4 system during the SAR evaluations was < 5% from the start power.
5. The DUT battery was fully charged prior to the SAR evaluations.
6. The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.
7. The dielectric parameters of the simulated tissue mixture were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C).
8. The SAR evaluations were performed within 24 hours of the system performance checks.

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4.0 DETAILS OF SAR EVALUATION

The VOCERA COMMUNICATIONS Model: B2000 Portable Communications Badge with 802.11b/g WLAN was compliant for localized Specific Absorption Rate (held-to-ear, Uncontrolled Exposure) based on the test provisions and conditions described below. The SAR test setup photographs are shown in Appendix D.

Ear-held Configuration

1) The DUT was tested in an ear-held configuration on both the left and right sections of the SAM phantom at the mid channel of the operating band. If the SAR level measured at the maximum output channel of the frequency band for each test configuration (left ear, right ear, cheek/touch, ear/tilt) was ≥ 3dB below the SAR limit, measurements at the low and high channels were optional (per FCC OET "SAR Measurement Procedures for 802.11a/b/g Transmitters" - see reference [7]).

a) The DUT was placed in the device holder in a normal operating position with the test device reference point located along the vertical centerline on the front of the device aligned to the ear reference point, with the center of the earpiece touching the center of the ear spacer of the SAM phantom.

b) With the DUT positioned parallel to the cheek, the test device reference point was aligned to the ear reference point on the head phantom, and the vertical centerline was aligned to the phantom reference plane (initial ear position).

c) While maintaining the three alignments, the body of the DUT was gradually adjusted to each of the following test positions:

- Cheek/Touch Position: the DUT was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

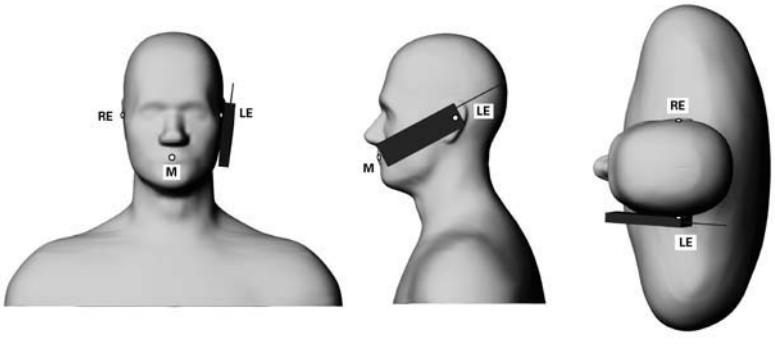

Figure 1. Position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for device positioning, are indicated (Shoulders are shown for illustration only).

- Ear/Tilt Position: With the device aligned in the Cheek/Touch position, the DUT was tilted away from the mouth with respect to the test device reference point by 15 degrees.

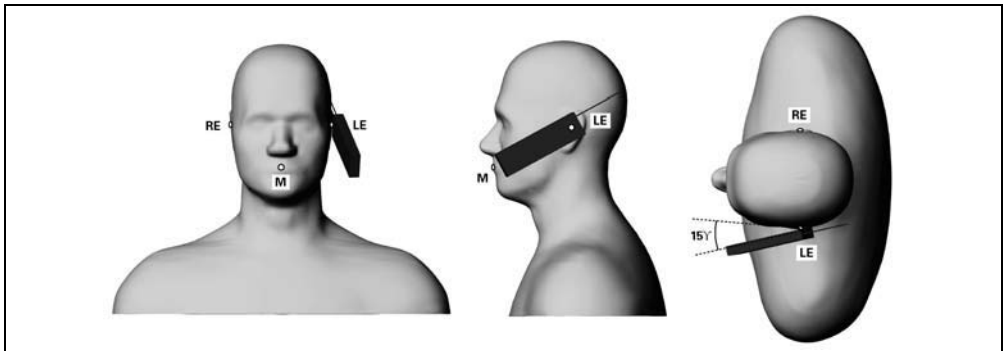

Figure 2. Position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for device positioning, are indicated (Shoulders are shown for illustration only).

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DETAILS OF SAR EVALUATION (Cont.)

Test Mode(s) & Power Setting(s)

2) The DUT was placed into test mode using the customer's internal test mode software controlled by the keypad.

3) The DUT was tested with a maximum power setting of 14 in continuous transmit operation with a modulated DSSS signal in 802.11b mode.

4) The average and peak conducted output power levels of the DUT were measured prior to the SAR evaluations using a spectrum analyzer according to 15.247(b) (KDB Publication #558074 - Power Output Option 2, Method 1). The RBW was set to 1 MHz and the VBW was set to 3 MHz.

5) The DUT battery was fully charged prior to the SAR evaluations.

6) The power drift of the DUT during the SAR evaluations was measured by the DASY4 system.

7) Body SAR evaluations are addressed in Celltech SAR Test Report Serial No. 061807QGZ-T838-S15W.

5.0 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 determine the values between the dipole center of the probe and the surface of the phantom. This data cannot be measured because the center of the dipole sensors is 1.0 mm away from the probe tip and the distance between the probe and the boundary must be larger than 25% of the probe diameter. The probe diameter is 2.4 mm. In the DASY4 software, the distance between the sensor center and phantom surface is set to 2.0 mm. This provides a distance of 1.0 mm between the probe tip and the surface. The extrapolation of the values between the dipole center and the surface of the phantom 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 1 mm grid (42875 interpolated points).

g. A zoom scan volume of 24 mm x 24 mm x 20 mm (7x7x9 points) centered at the peak SAR location determined from the area scan was used and a zoom scan resolution of 4 mm x 4 mm x 2.5 mm was used.

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EVALUATION PROCEDURES (Cont.)

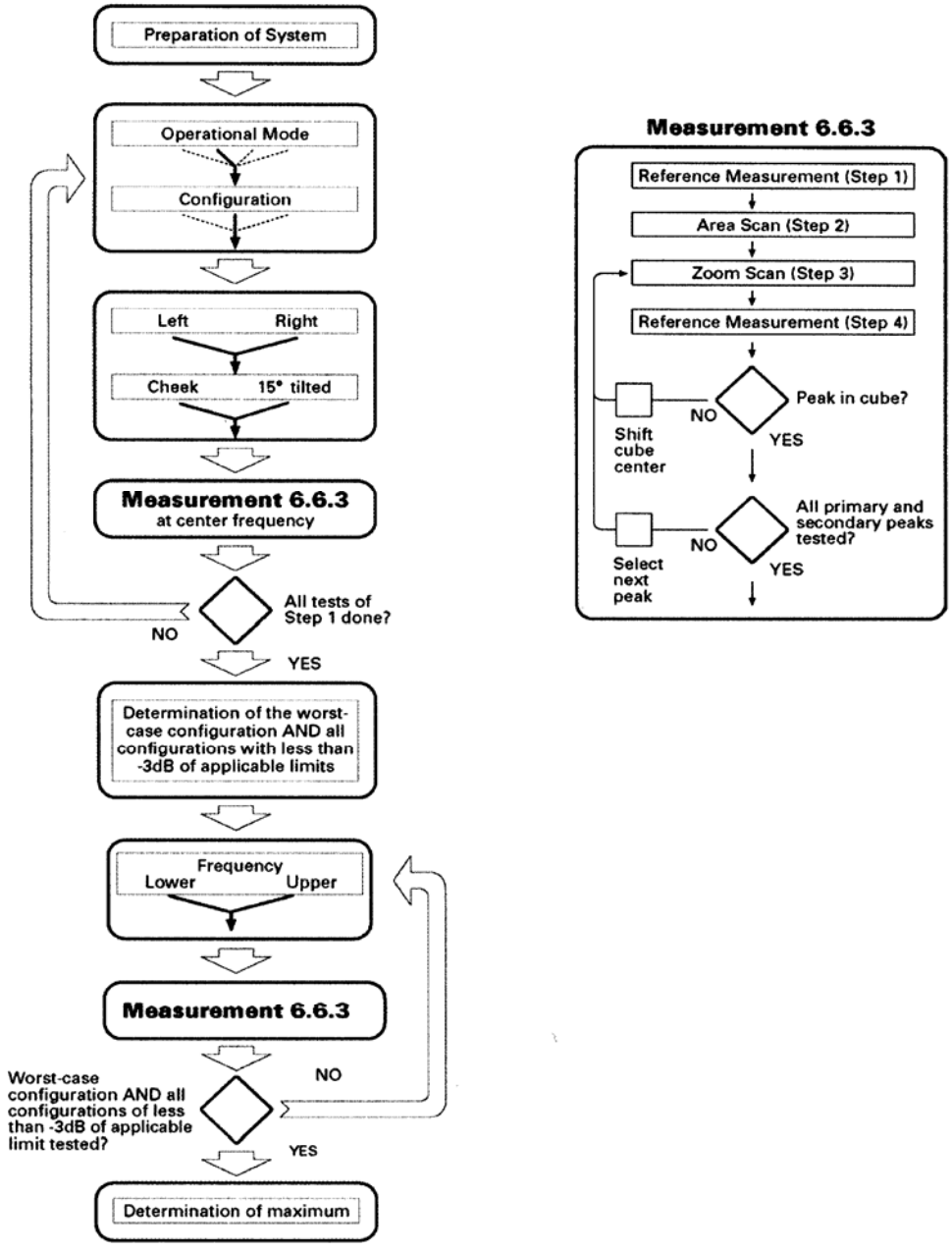

Figure 3. Flow Chart for determining the largest peak spatial-average SAR from all device configurations per IEEE Standard 1528-2003 (see reference [5]).

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6.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations, system checks were performed at the planar section of the SAM phantom with a 2450 MHz validation dipole (see Appendix B for system performance check test plots). The dielectric parameters of the simulated tissue mixtures were measured prior to the system performance checks using a Dielectric Probe Kit and Network Analyzer (see Appendix C). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of ±10% from the system validation target SAR value (see Appendix E for system validation procedures).

SYSTEM PERFORMANCE CHECK EVALUATIONS

Test Date	Equiv. Tissue	SAR 1g (W/kg)			Dielectric Constant ε_r			Conductivity σ (mho/m)			ρ (Kg/m^3)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
	2450 MHz	Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.						
Jul-17	Body	13.4 ±10%	12.3	-8.2%	50.1 ±5%	50.5	+0.8%	1.99 ±5%	2.00	+0.5%	1000	25.3	23.8	≥ 15	34	101.2
Aug-31	Brain	14.2±10%	14.2	0.0%	38.0 ±5%	37.6	-1.0%	1.84 ±5%	1.84	0.0%	1000	23.7	22.5	≥ 15	30	101.1

Note(s)

1. The target SAR values are referenced from the System Validation procedures performed by Celltech Labs Inc. (see Appendix E).
2. The target dielectric parameters are referenced from the System Validation procedures performed by Celltech Labs Inc. (see Appendix E).
3. The fluid temperature was measured prior to and after the system performance checks to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.
4. The SAR evaluations were performed within 24 hours of the system performance checks.

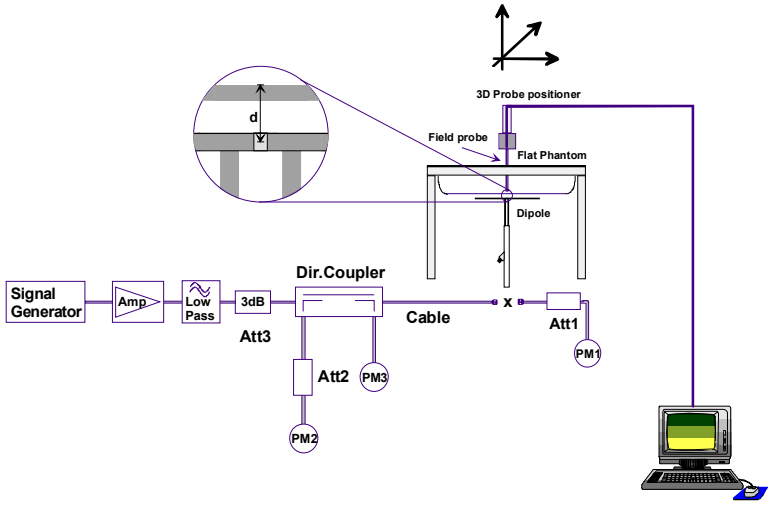

Figure 4. System Performance Check Measurement Setup Diagram

2450 MHz Validation Dipole Setup

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7.0 SIMULATED EQUIVALENT TISSUES

The 2450 MHz simulated tissue mixtures consisted of Glycol-monobutyl, water and salt (body only). The tissue mixtures were prepared according to standardized procedures and measured for dielectric parameters (permittivity and conductivity).

SIMULATED TISSUE MIXTURES		
INGREDIENT	**2450 MHz Brain**	**2450 MHz Body**
Water	52.00 %	69.98 %
Glycol Monobutyl	48.00 %	30.00 %
Salt	-	0.02 %

8.0 SAR SAFETY LIMITS

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

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9.0 ROBOT SYSTEM SPECIFICATIONS

Specifications	
Positioner	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability	0.02 mm
No. of axis	6
Data Acquisition Electronic (DAE) System	
Cell Controller	
Processor	AMD Athlon XP 2400+
Clock Speed	2.0 GHz
Operating System	Windows XP Professional
Data Converter	
Features	Signal Amplifier, multiplexer, A/D converter, and control logic
Software	Measurement Software: DASY4, V4.7 Build 44
	Postprocessing Software: SEMCAD, V1.8 Build 171
Connecting Lines	Optical downlink for data and status info.; Optical uplink for commands and clock
DASY4 Measurement Server	
Function	Real-time data evaluation for field measurements and surface detection
Hardware	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
Connections	COM1, COM2, DAE, Robot, Ethernet, Service Interface
E-Field Probe	
Model	EX3DV4
Serial No.	3600
Construction	Symmetrical design with triangular core
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
Phantom(s)	
Type	SAM V4.0C
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 25 liters

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10.0 PROBE SPECIFICATION (EX3DV4)

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. DGBE)
Calibration:	Basic Broadband Calibration in air: 10-3000 MHz Conversion Factors (CF) for HSL 900 and HSL 1750
Frequency:	10 MHz to >6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)
Directivity:	±0.3 dB in HSL (rotation around probe axis) ±0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range:	10 μW/g to >100 mW/g; Linearity: ±0.2 dB (noise: typically < 1 μW/g)
Dimensions:	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1.0 mm
Application:	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better than 30%.

EX3DV4 E-Field Probe

11.0 SAM PHANTOM V4.0C

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

SAM Phantom V4.0C

12.0 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

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13.0 TEST EQUIPMENT LIST

TEST EQUIPMENT			ASSET NO.	SERIAL NO.	DATE CALIBRATED		CALIBRATION DUE DATE
USED	DESCRIPTION						
x	Schmid & Partner DASY4 System		-	-	-		-
x	-DASY4 Measurement Server		00158	1078	N/A		N/A
x	-Robot		00046	599396-01	N/A		N/A
	-DAE4		00019	353	10Jul07		10Jul08
x	-DAE3		00018	370	13Mar07		13Mar08
	-ET3DV6 E-Field Probe		00016	1387	16Mar07		16Mar08
x	-EX3DV4 E-Field Probe		00213	3600	24Jan07		24Jan08
	-300 MHz Validation Dipole		00023	135	08Jun07		08Jun08
	-450 MHz Validation Dipole		00024	136	07Jun07		07Jun08
	-835 MHz Validation Dipole		00022	411	**Brain**	07Jun07	07Jun08
					Body	07Jun07	07Jun08
	-900 MHz Validation Dipole		00020	054	**Brain**	07Jun07	07Jun08
					Body	07Jun07	07Jun08
	-1800 MHz Validation Dipole		00021	247	**Brain**	06Jun07	06Jun08
					Body	06Jun07	06Jun08
	-1900 MHz Validation Dipole		00032	151	**Brain**	06Jun07	06Jun08
					Body	06Jun07	06Jun08
x	-2450 MHz Validation Dipole		00025	150	**Brain**	08Jun07	08Jun08
x					**Body**	08Jun07	08Jun08
	5GHz Validation Dipole	-5200 MHz	00126	1031	**Body**	18May07	18May08
		-5500 MHz			**Body**	22May07	22May08
		-5800 MHz			**Brain**	09May07	09May08
					Body	10May07	10May08
x	-SAM Phantom V4.0C		00154	1033	N/A		N/A
	-Barski Planar Phantom		00155	03-01	N/A		N/A
	-Plexiglas Side Planar Phantom		00156	161	N/A		N/A
	-Plexiglas Validation Planar Phantom		00157	137	N/A		N/A
x	HP 85070C Dielectric Probe Kit		00033	US39240170	N/A		N/A
x	ALS-PR-DIEL Dielectric Probe Kit		00160	260-00953	N/A		N/A
x	Gigatronics 8652A Power Meter		00007	1835272	26Mar07		26Mar08
	Gigatronics 8652A Power Meter		00008	1835267	22Jan07		22Jan08
	Gigatronics 80701A Power Sensor		00012	1834350	22Jan07		22Jan08
x	Gigatronics 80701A Power Sensor		00014	1833699	22Jan07		22Jan08
x	Gigatronics 80701A Power Sensor		00109	1834366	26Mar07		26Mar08
x	HP 8753ET Network Analyzer		00134	US39170292	20Apr07		20Apr08
x	HP 8648D Signal Generator		00005	3847A00611	NCR		NCR
	Rohde & Schwarz SMR20 Signal Generator		00006	100104	NCR		NCR
x	Amplifier Research 5S1G4 Power Amplifier		00106	26235	NCR		NCR
	Amplifier Research 10W1000C Power Amplifier		00041	27887	NCR		NCR
	Nextec NB00383 Microwave Amplifier		00151	0535	NCR		NCR
x	HP E4408B Spectrum Analyzer		00015	US39240170	05Feb07		05Feb08

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14.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**ci 1g**	**Uncertainty Value ±% (1g)**	**V_i or V_{eff}**
Measurement System						
Probe calibration (2450 MHz)	5.9	Normal	1	1	5.9	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	0.7	1.9	∞
Spherical isotropy of the probe	9.6	Rectangular	1.732050808	0.7	3.9	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	1	Rectangular	1.732050808	1	0.6	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0.8	Rectangular	1.732050808	1	0.5	∞
Integration time	2.6	Rectangular	1.732050808	1	1.5	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Test Sample Related						
Device positioning	2.9	Normal	1	1	2.9	12
Device holder uncertainty	3.6	Normal	1	1	3.6	8
Power drift	5	Rectangular	1.732050808	1	2.9	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	5	Normal	1	0.64	3.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	5	Normal	1	0.6	3.0	∞
Combined Standard Uncertainty					**11.44**	
Expanded Uncertainty (k=2)					**22.89**	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

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MEASUREMENT UNCERTAINTIES (Cont.)

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**ci 1g**	**Uncertainty Value ±% (1g)**	**V_i or V_{eff}**
Measurement System						
Probe calibration (2450 MHz)	5.9	Normal	1	1	5.9	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	1	2.7	∞
Spherical isotropy of the probe	0	Rectangular	1.732050808	1	0.0	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	1	Rectangular	1.732050808	1	0.6	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	5	Normal	1	0.64	3.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	5	Normal	1	0.6	3.0	∞
Combined Standard Uncertainty					**9.81**	
Expanded Uncertainty (k=2)					**19.61**	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

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15.0 REFERENCES

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

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

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

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

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

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

[7] Federal Communications Commission OET - “SAR Measurement Procedures for 802.11a/b/g Transmitters”: May 2007 (Rev 1.2).

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APPENDIX A - SAR MEASUREMENT DATA

Date Tested: 07/17/2007

Head SAR - Right Ear - Cheek/Touch Position - 2442 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

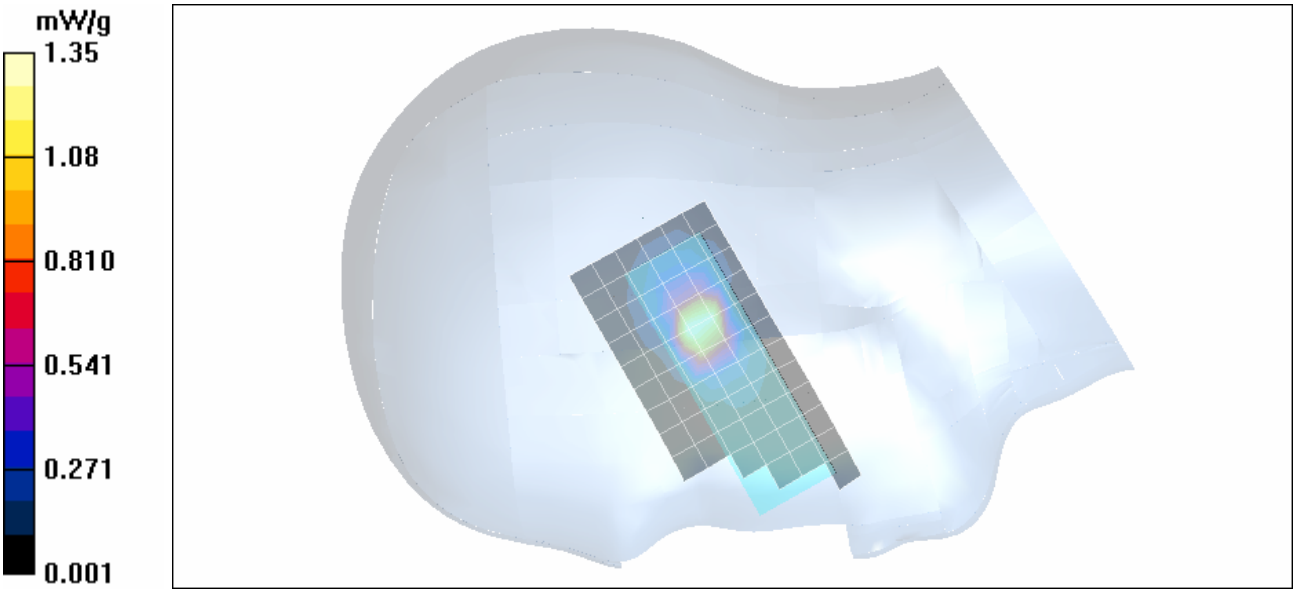
Ambient Temp: 23.8°C; Fluid Temp: 22.2°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

RF Conducted Power: 13.8 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2442 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2442 MHz; σ = 1.89 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Right Ear - Cheek/Touch Position - Mid Channel - 2442 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.41 mW/g

Head SAR - Right Ear - Cheek/Touch Position - Mid Channel - 2442 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = 0.175 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.394 mW/g
Maximum value of SAR (measured) = 1.35 mW/g



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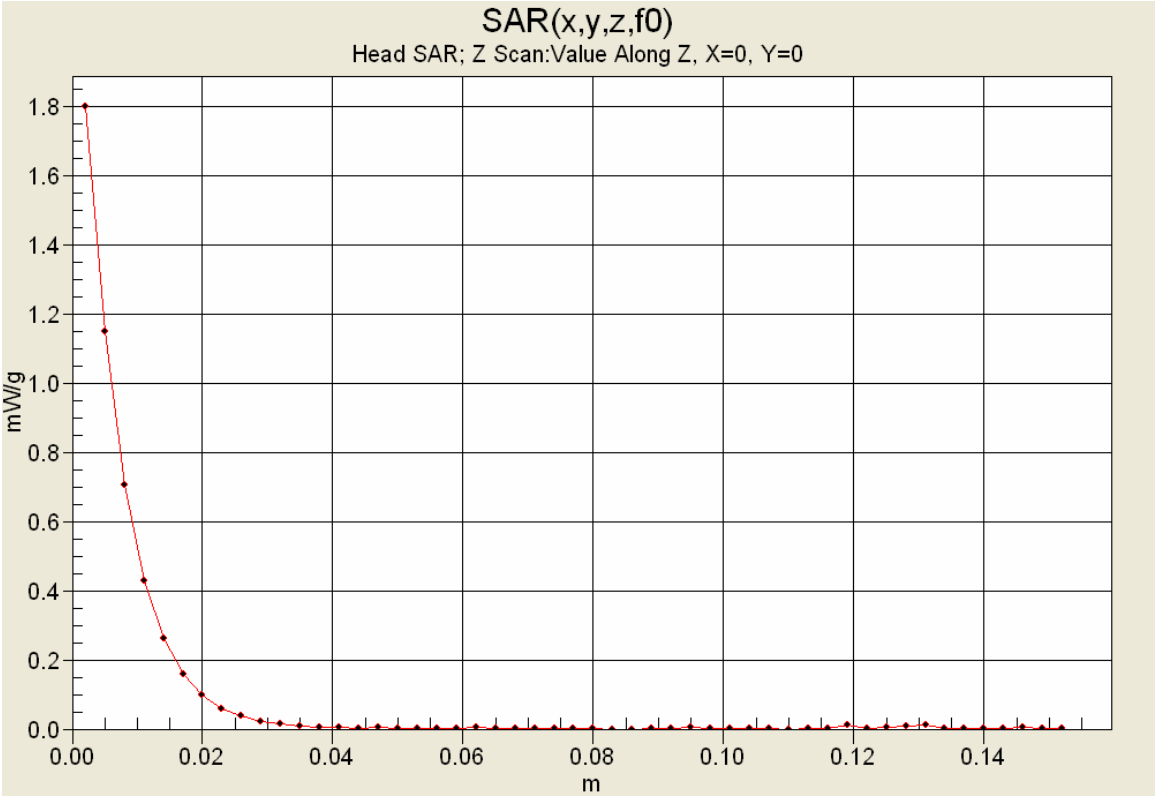
Z-Axis Scan


SAR(x,y,z,f0)
Head SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
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
m

Date Tested: 07/17/2007

Head SAR - Right Ear - Tilt Position (15°) - 2442 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

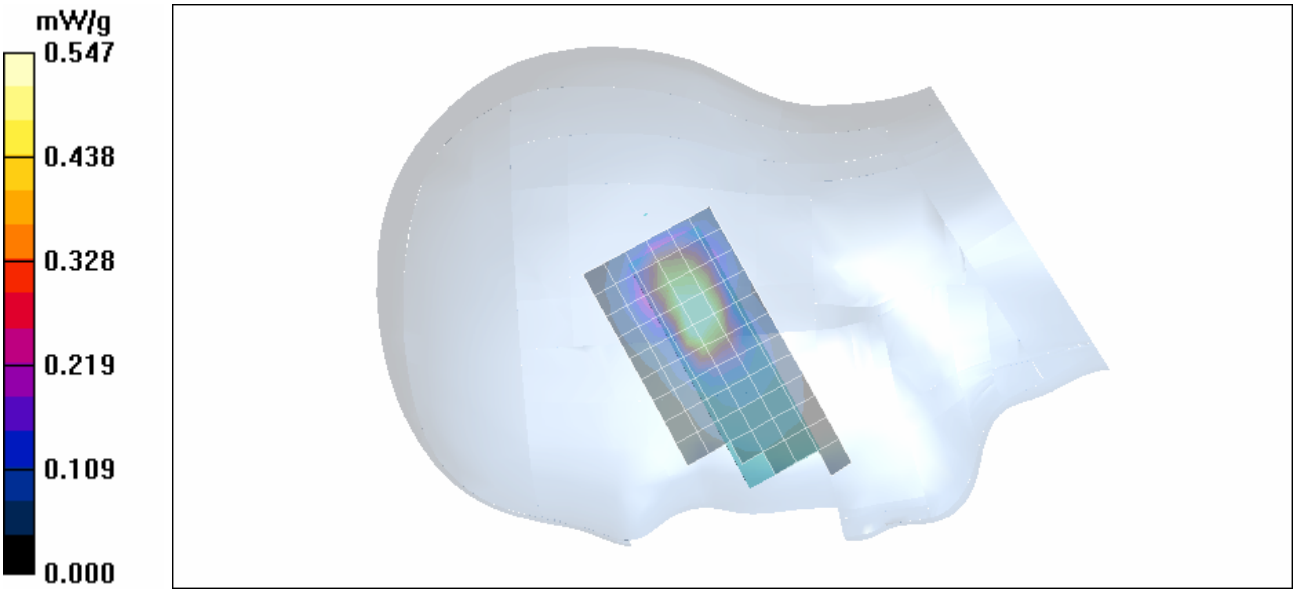
Ambient Temp: 23.8°C; Fluid Temp: 22.2°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

RF Conducted Power: 13.8 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2442 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2442 MHz; σ = 1.89 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Right Ear - Tilt Position (15°) - Mid Channel - 2442 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.662 mW/g

Head SAR - Right Ear - Tilt Position (15°) - Mid Channel - 2442 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.216 mW/g
Maximum value of SAR (measured) = 0.547 mW/g



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Date Tested: 08/31/2007

Head SAR - Right Ear - Cheek/Touch Position - 2412 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

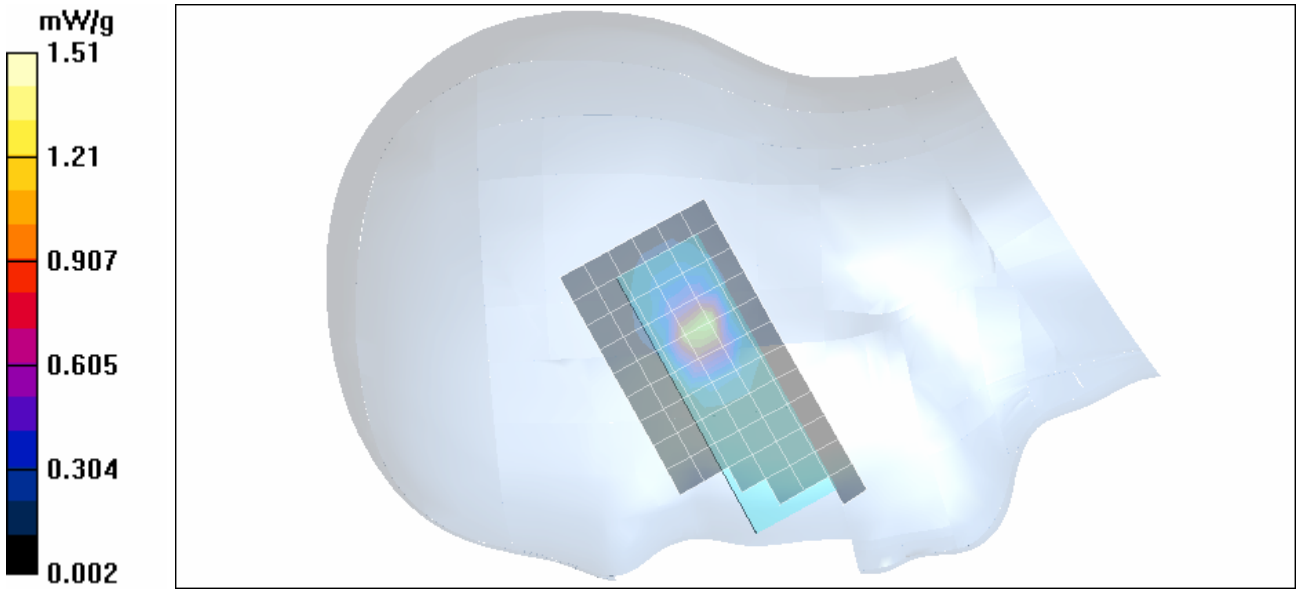
Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

RF Conducted Power: 12.2 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2412 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Right Ear - Cheek/Touch Position - Low Channel - 2412 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.21 mW/g

Head SAR - Right Ear - Cheek/Touch Position - Low Channel - 2412 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.3 V/m; Power Drift = 0.160 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 0.952 mW/g; SAR(10 g) = 0.341 mW/g
Maximum value of SAR (measured) = 1.51 mW/g



Date Tested: 08/31/2007

Head SAR - Right Ear - Cheek/Touch Position - 2462 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

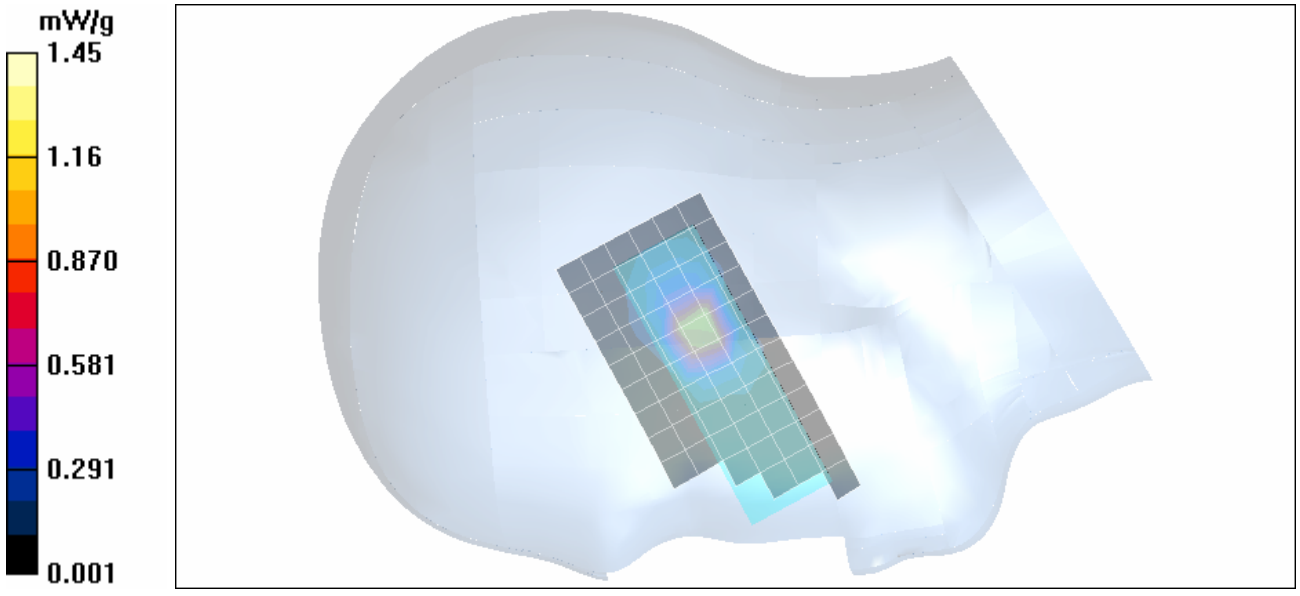
Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

RF Conducted Power: 13.2 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2462 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2462 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Right Ear - Cheek/Touch Position - High Channel - 2462 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.06 mW/g

Head SAR - Right Ear - Cheek/Touch Position - High Channel - 2462 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.4 V/m; Power Drift = -0.174 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 0.914 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 1.45 mW/g



Date Tested: 07/17/2007

Head SAR - Left Ear - Cheek/Touch Position - 2442 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

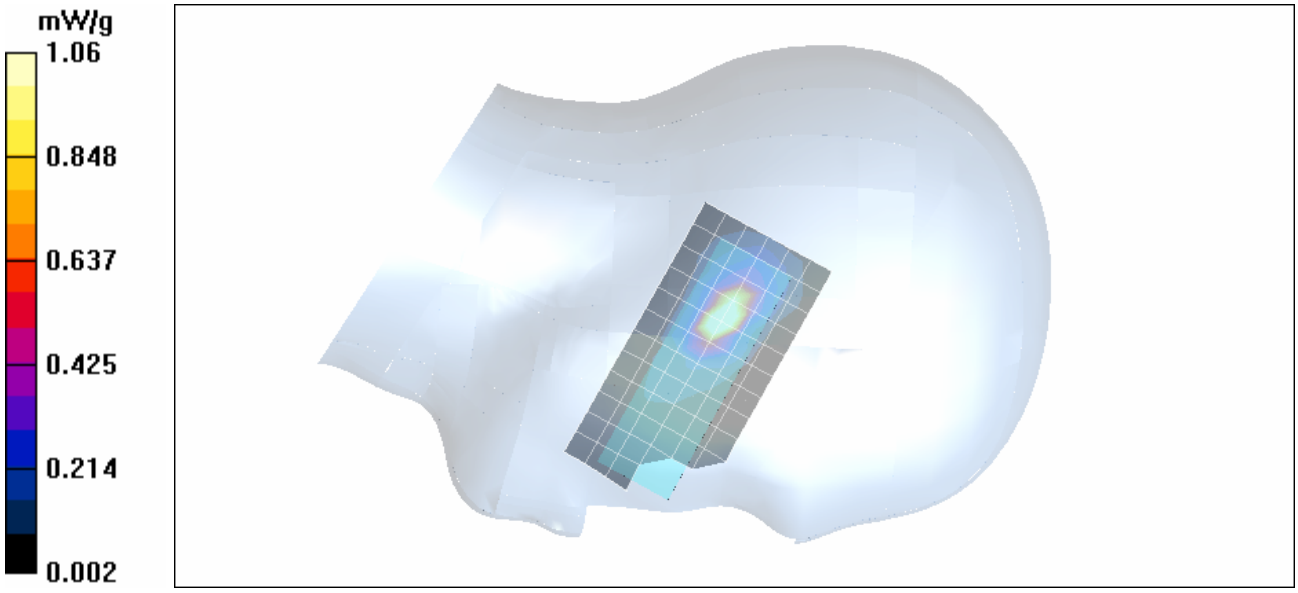
Ambient Temp: 23.8°C; Fluid Temp: 22.2°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

RF Conducted Power: 13.8 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2442 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2442 MHz; σ = 1.89 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Left Ear - Cheek/Touch Position - Mid Channel - 2442 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.64 mW/g

Head SAR - Left Ear - Cheek/Touch Position - Mid Channel - 2442 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.9 V/m; Power Drift = -0.148 dB
Peak SAR (extrapolated) = 2.55 W/kg
SAR(1 g) = 0.918 mW/g; SAR(10 g) = 0.314 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



Date Tested: 07/17/2007

Head SAR - Left Ear - Tilt Position (15°) - 2442 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

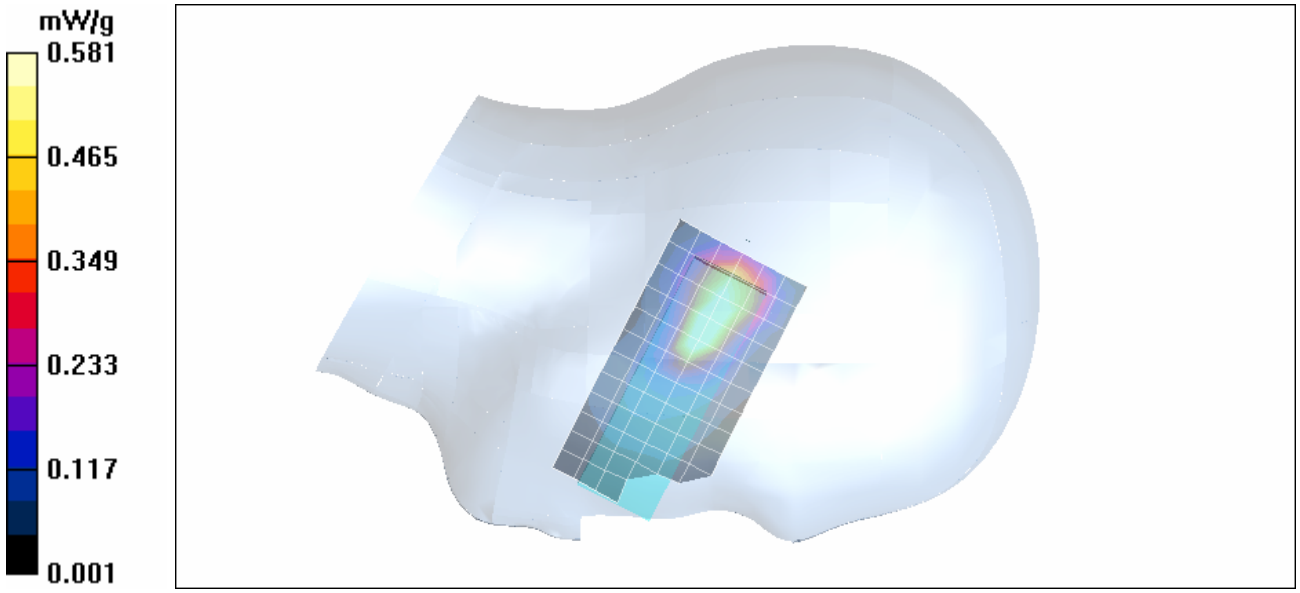
Ambient Temp: 23.8°C; Fluid Temp: 22.2°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

RF Conducted Power: 13.8 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2442 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2442 MHz; σ = 1.89 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Left Ear - Tilt Position (15°) - Mid Channel - 2442 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.764 mW/g

Head SAR - Left Ear - Tilt Position (15°) - Mid Channel - 2442 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = -0.202 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.235 mW/g
Maximum value of SAR (measured) = 0.581 mW/g



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Date Tested: 08/31/2007

Head SAR - Left Ear - Cheek/Touch Position - 2412 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

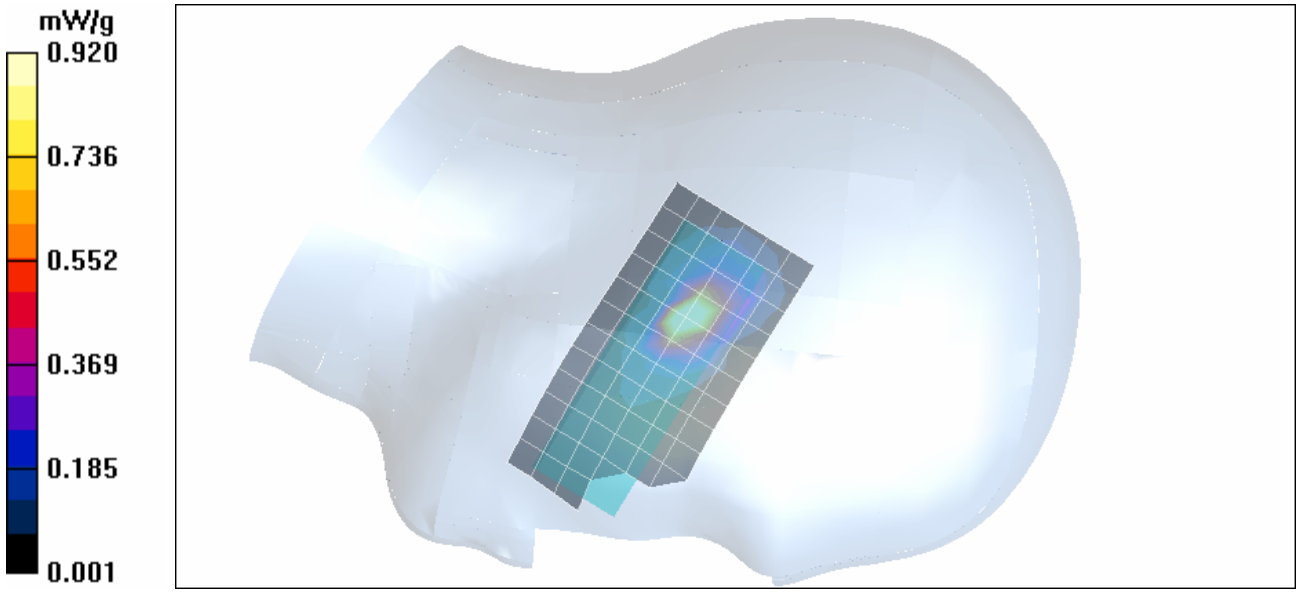
Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

RF Conducted Power: 12.2 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2412 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Left Ear - Cheek/Touch Position - Low Channel - 2412 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.30 mW/g

Head SAR - Left Ear - Cheek/Touch Position - Low Channel - 2412 MHz
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 0.762 mW/g; SAR(10 g) = 0.267 mW/g
Maximum value of SAR (measured) = 0.920 mW/g



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Date Tested: 08/31/2007

Head SAR - Left Ear - Cheek/Touch Position - 2462 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

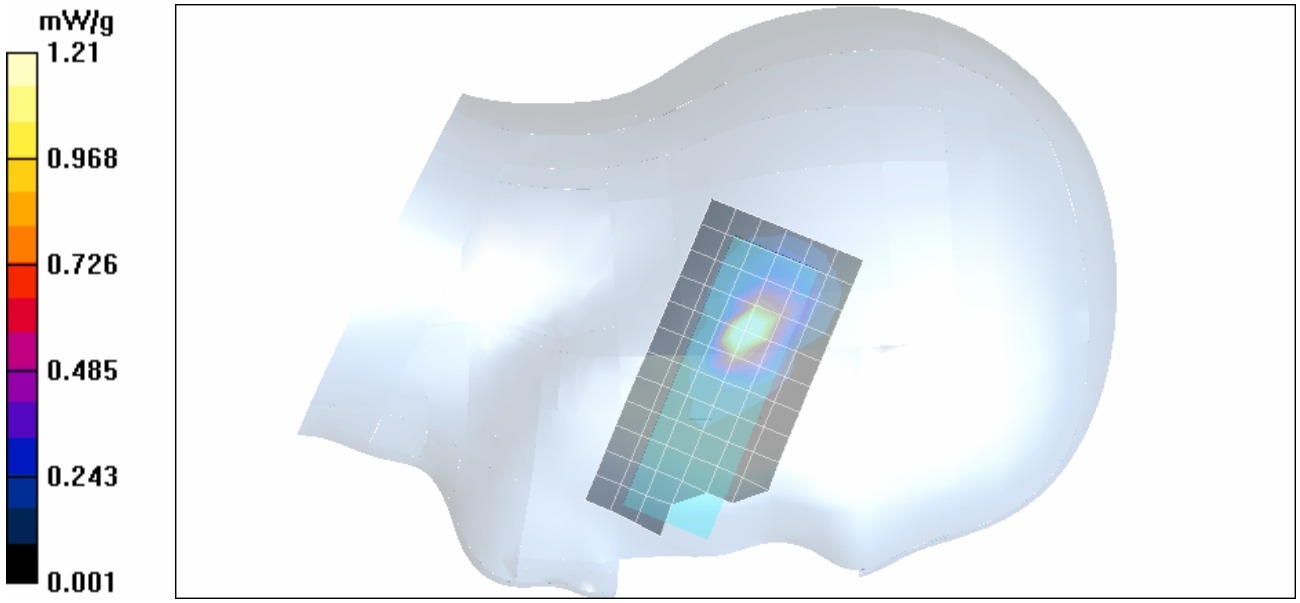
Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

RF Conducted Power: 13.2 dBm
Li-ion 3.7V Standard Battery (00531)
Frequency: 2462 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2462 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Left Ear - Cheek/Touch Position - High Channel - 2462 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.70 mW/g

Head SAR - Left Ear - Cheek/Touch Position - High Channel - 2462 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = -0.205 dB
Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.358 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



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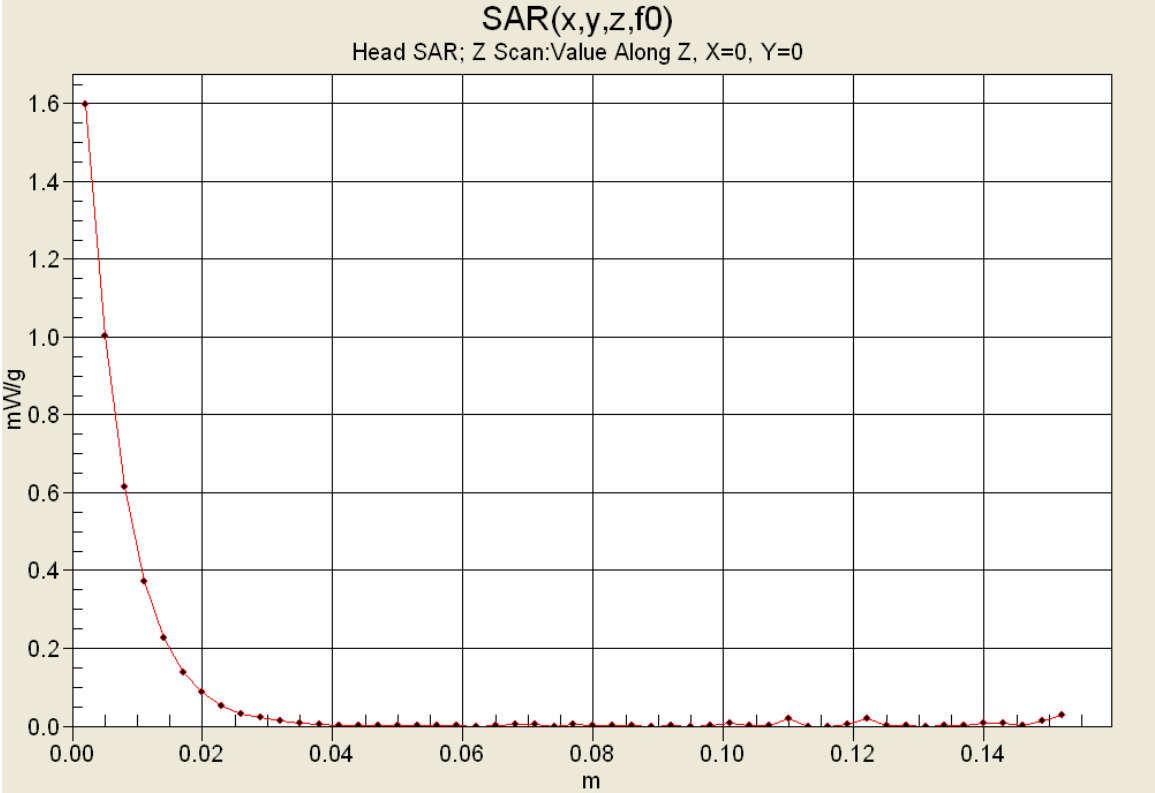
Z-Axis Scan


SAR(x,y,z,f0)
Head SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
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
m

Date Tested: 08/31/2007

Head SAR - Left Ear - Cheek/Touch Position - 2462 MHz - 802.11b - 1 Mbps

DUT: Vocera B2000; Type: Wireless Communications Badge with 802.11b/g; Serial: A1DE07F7AFC3

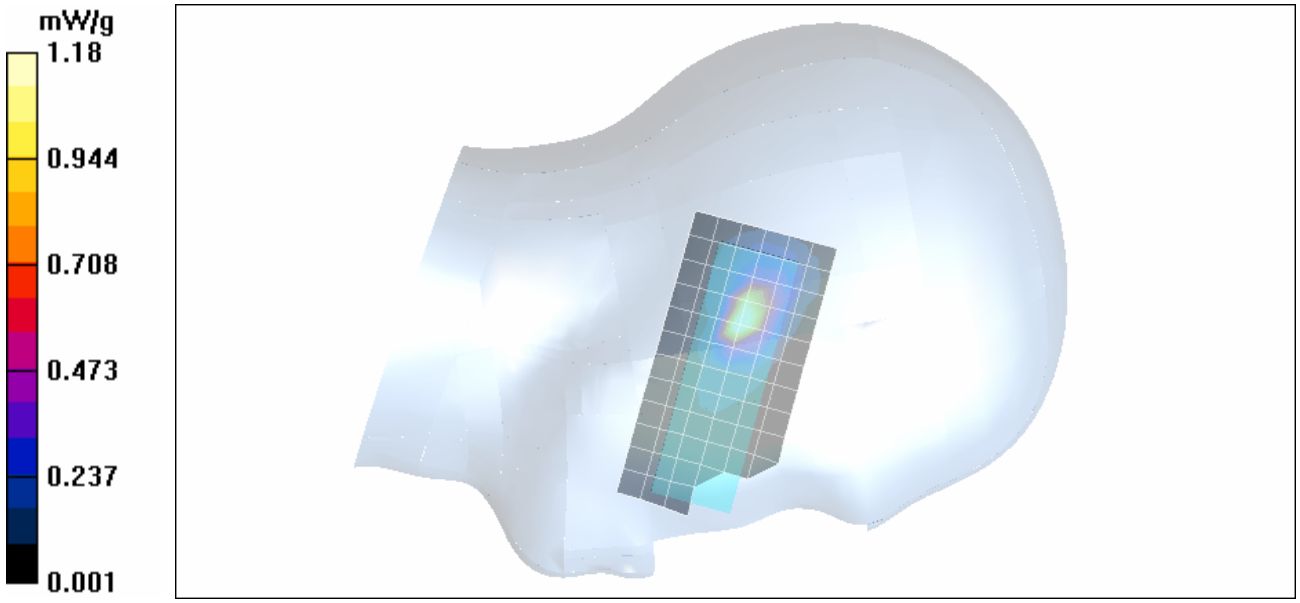
Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

RF Conducted Power: 13.2 dBm
3.7V Extended Battery (Model: 00532)
Frequency: 2462 MHz; Duty Cycle: 1:1
Communication System: DSSS WLAN
Medium: HSL2450 Medium parameters used: f = 2462 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Head SAR - Left Ear - Cheek/Touch Position - High Channel - 2462 MHz
Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.39 mW/g

Head SAR - Left Ear - Cheek/Touch Position - High Channel - 2462 MHz
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.0 V/m; Power Drift = -0.210 dB
Peak SAR (extrapolated) = 2.70 W/kg
SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.332 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



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APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

Date Tested: 07/17/2007

System Performance Check - 2450 MHz Dipole - MSL

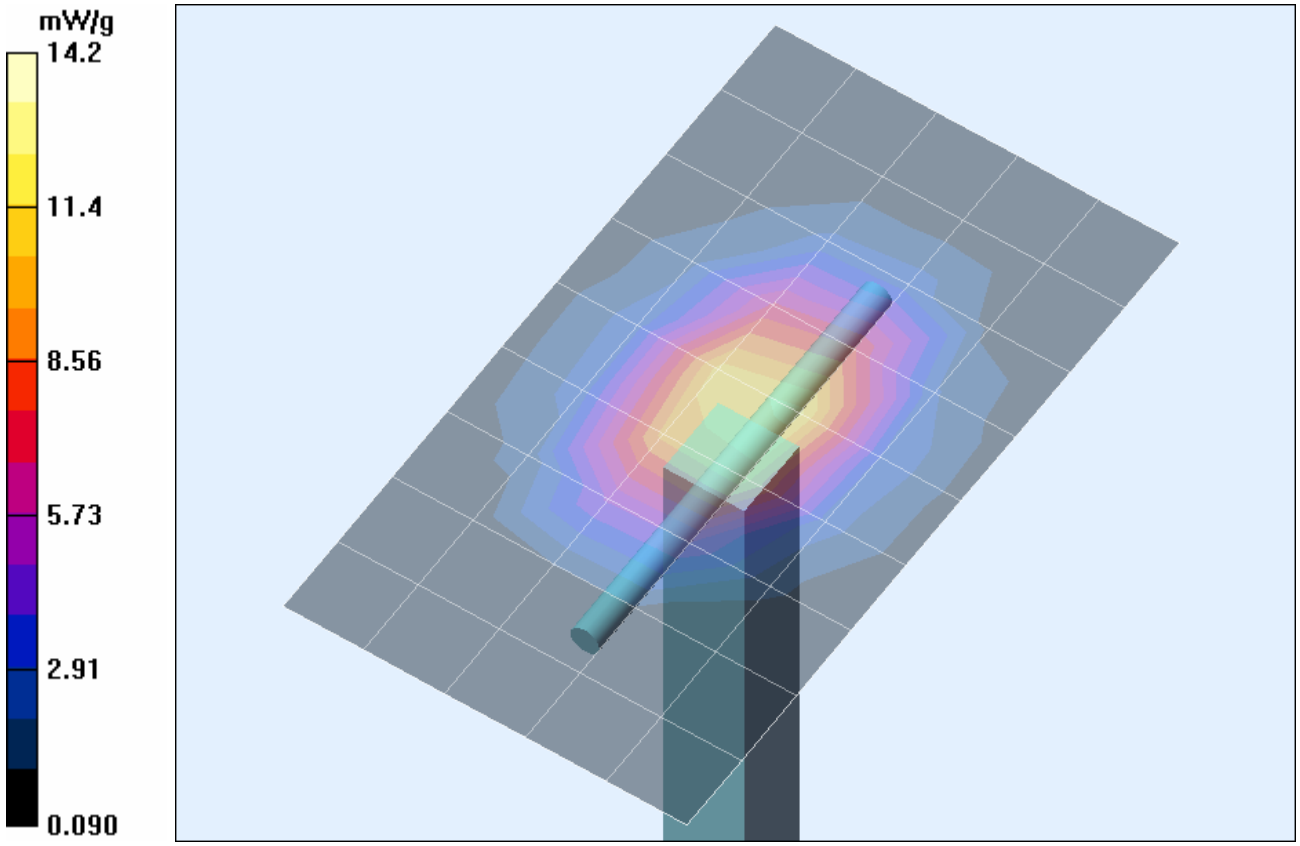
DUT: Dipole 2450 MHz; Asset: 00025; Serial: 150; Validation: 06/08/2007

Ambient Temp: 25.3°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 34%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 2.00 mho/m; ε_r = 50.5; ρ = 1000 kg/m^3
- Probe: EX3DV4 - SN3600; ConvF(6.31, 6.31, 6.31); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

2450 MHz Dipole - System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 11.7 mW/g

2450 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.8 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 25.5 W/kg
SAR(1 g) = 12.3 mW/g; SAR(10 g) = 5.6 mW/g
Maximum value of SAR (measured) = 14.2 mW/g



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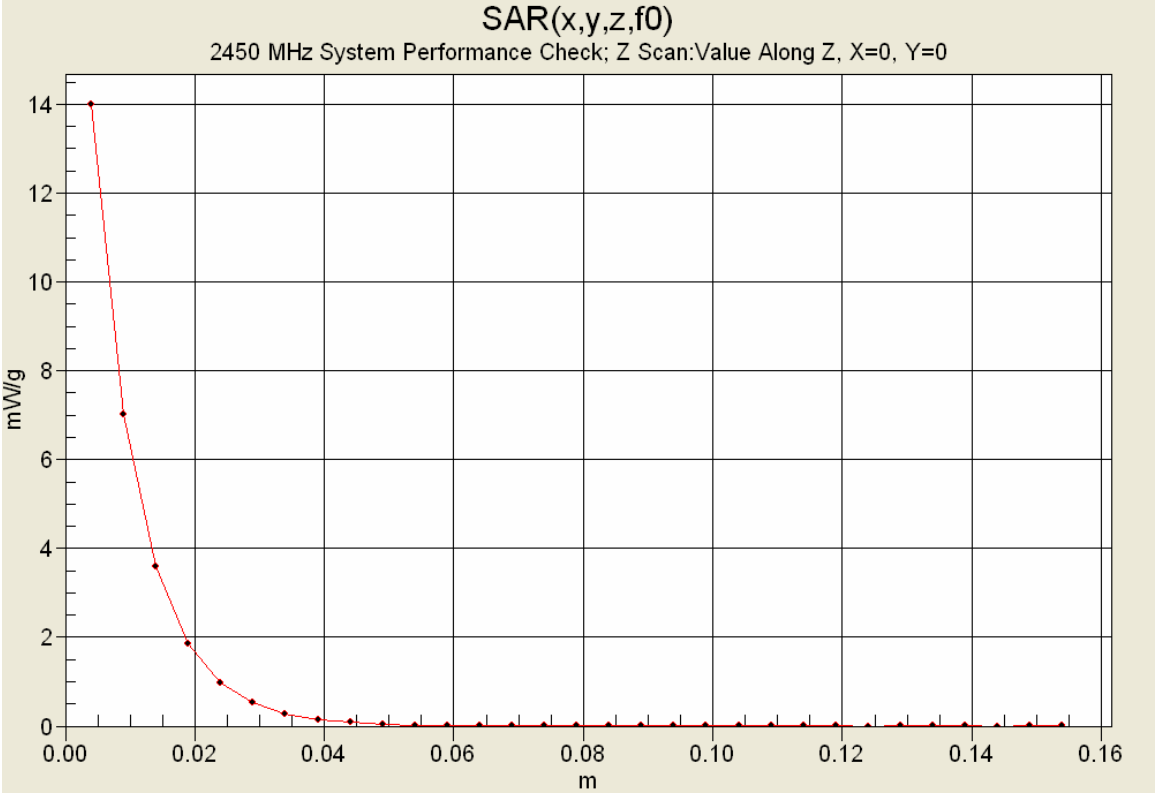
Z-Axis Scan



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Date Tested: 08/31/2007

System Performance Check - 2450 MHz Dipole - HSL

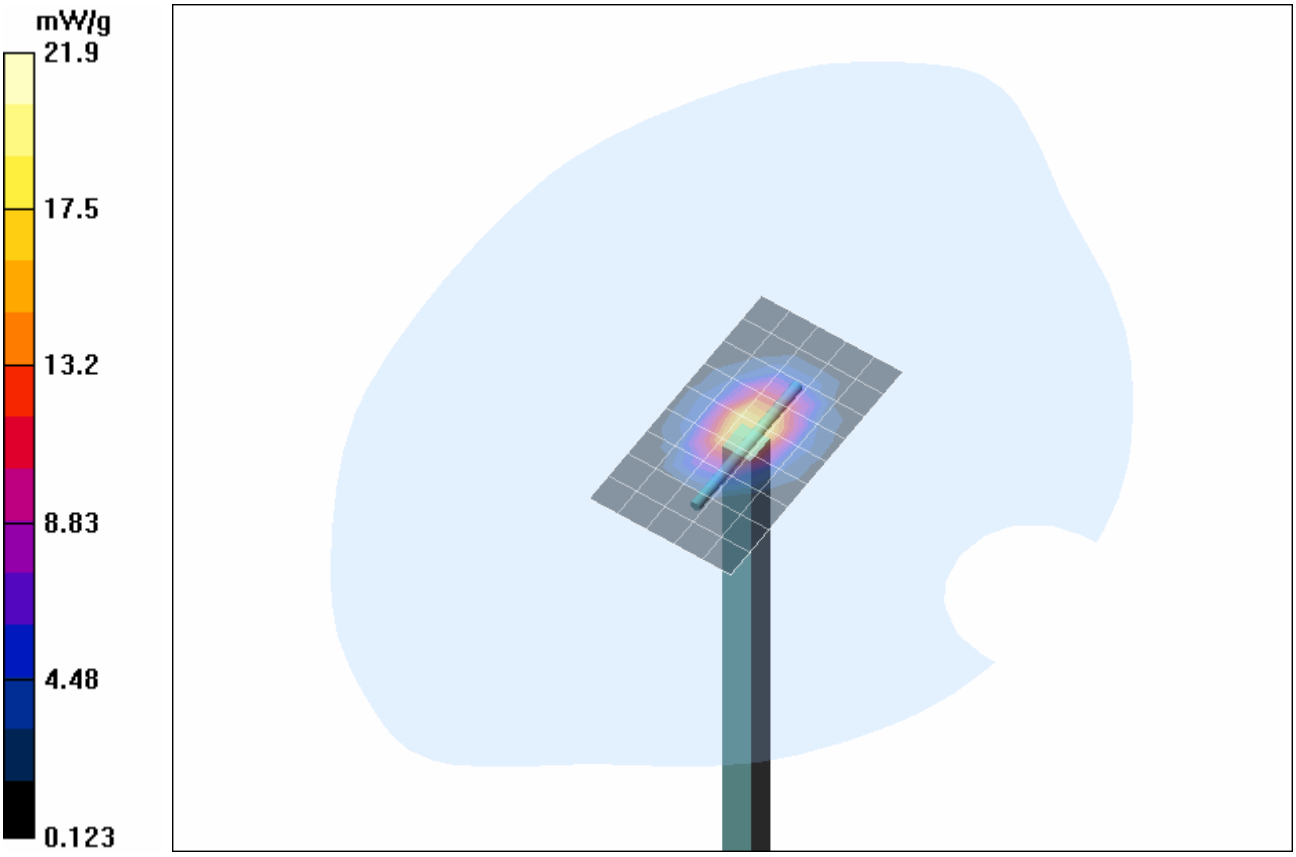
DUT: Dipole 2450 MHz; Asset: 00025; Serial: 150; Validation: 07/16/2007

Ambient Temp: 23.7°C; Fluid Temp: 22.5°C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used: f = 2450 MHz; σ = 1.84 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
- Probe: EX3DV4 - SN3600; ConvF(6.37, 6.37, 6.37); Calibrated: 24/01/2007
- Sensor-Surface: 2 mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 13/03/2007
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

2450 MHz System Performance Check/Area Scan (6x10x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 17.7 mW/g

2450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 111.4 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 14.2 mW/g; SAR(10 g) = 6.52 mW/g
Maximum value of SAR (measured) = 21.9 mW/g



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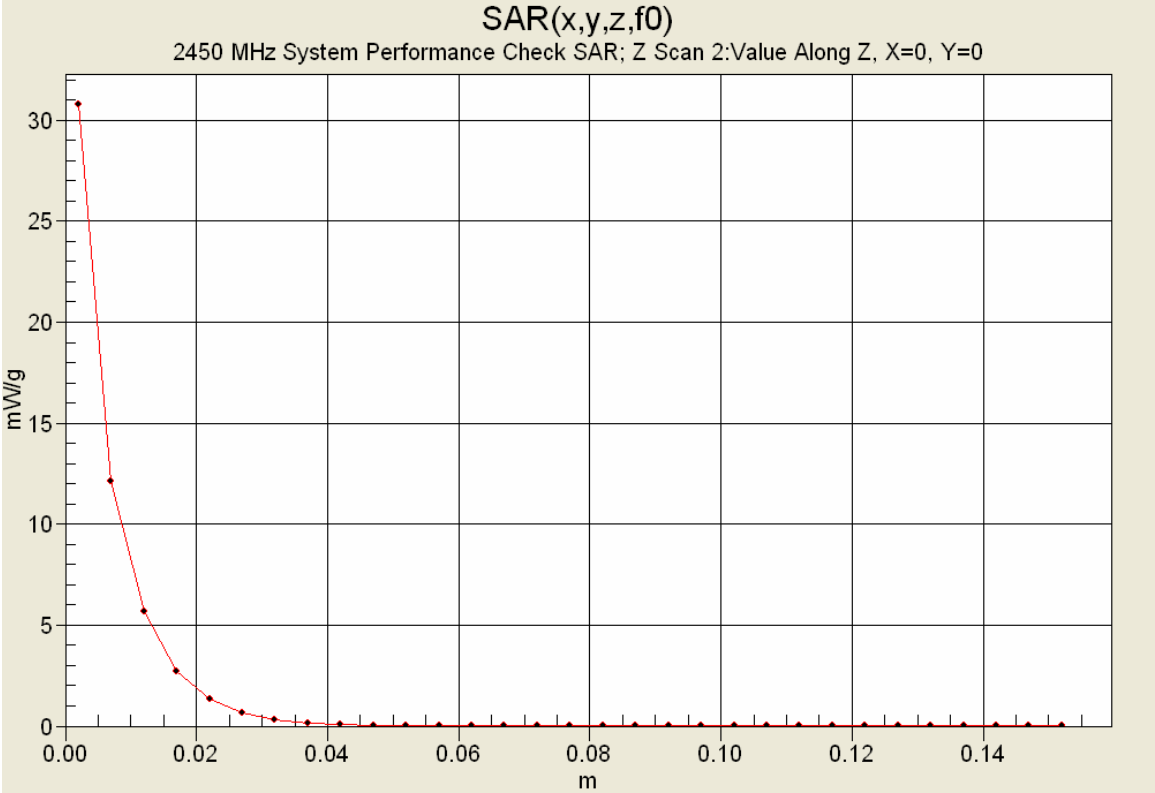
Z-Axis Scan


SAR(x,y,z,f0)
2450 MHz System Performance Check SAR; Z Scan 2:Value Along Z, X=0, Y=0
mW/g
30
25
20
15
10
5
0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

2450 MHz System Performance Check (Body)

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Tue 17/Jul/2007
Frequency (GHz)
FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eB	FCC_sB	Test_e	Test_s
2.3500	52.83	1.85	50.81	1.87
2.3600	52.82	1.86	50.77	1.88
2.3700	52.81	1.87	50.73	1.90
2.3800	52.79	1.88	50.72	1.90
2.3900	52.78	1.89	50.64	1.93
2.4000	52.77	1.90	50.60	1.94
2.4100	52.75	1.91	50.56	1.95
2.4200	52.74	1.92	50.59	1.96
2.4300	52.73	1.93	50.45	1.98
2.4400	52.71	1.94	50.54	1.98
2.4500	52.70	1.95	50.48	2.00
2.4600	52.69	1.96	50.46	2.02
2.4700	52.67	1.98	50.47	2.03
2.4800	52.66	1.99	50.46	2.04
2.4900	52.65	2.01	50.49	2.06
2.5000	52.64	2.02	50.38	2.07
2.5100	52.62	2.04	50.31	2.08
2.5200	52.61	2.05	50.30	2.11
2.5300	52.60	2.06	50.32	2.11
2.5400	52.59	2.08	50.22	2.12
2.5500	52.57	2.09	50.25	2.15

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2450 MHz DUT Evaluation (Brain)

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Tue 17/Jul/2007
Frequency (GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
2.3500	39.38	1.71	37.67	1.78
2.3600	39.36	1.72	37.64	1.78
2.3700	39.34	1.73	37.67	1.81
2.3800	39.32	1.74	37.54	1.81
2.3900	39.31	1.75	35.52	1.83
2.4000	39.29	1.76	37.50	1.83
2.4100	39.27	1.76	37.47	1.85
2.4200	39.25	1.77	37.46	1.86
2.4300	39.24	1.78	37.36	1.87
2.4400	39.22	1.79	37.37	1.88
2.4500	39.20	1.80	37.32	1.89
2.4600	39.19	1.81	37.31	1.91
2.4700	39.17	1.82	37.25	1.91
2.4800	39.16	1.83	37.25	1.94
2.4900	39.15	1.84	37.26	1.94
2.5000	39.14	1.85	37.18	1.96
2.5100	39.12	1.87	37.10	1.96
2.5200	39.11	1.88	37.04	1.98
2.5300	39.10	1.89	37.08	1.99
2.5400	39.09	1.90	37.00	2.00
2.5500	39.07	1.91	37.06	2.02

2450 MHz System Performance Check & DUT Evaluation (Brain)

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Fri 31/Aug/2007
Frequency (GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
2.3500	39.38	1.71	38.00	1.73
2.3600	39.36	1.72	38.01	1.73
2.3700	39.34	1.73	37.97	1.75
2.3800	39.32	1.74	37.91	1.76
2.3900	39.31	1.75	37.91	1.78
2.4000	39.29	1.76	37.76	1.78
2.4100	39.27	1.76	37.73	1.79
2.4200	39.25	1.77	37.74	1.81
2.4300	39.24	1.78	37.72	1.82
2.4400	39.22	1.79	37.65	1.83
2.4500	39.20	1.80	37.60	1.84
2.4600	39.19	1.81	37.58	1.85
2.4700	39.17	1.82	37.56	1.86
2.4800	39.16	1.83	37.50	1.88
2.4900	39.15	1.84	37.48	1.88
2.5000	39.14	1.85	37.35	1.90
2.5100	39.12	1.87	37.36	1.92
2.5200	39.11	1.88	37.28	1.93
2.5300	39.10	1.89	37.27	1.94
2.5400	39.09	1.90	37.23	1.95
2.5500	39.07	1.91	37.17	1.97

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APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY

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Schmid & Partner
Engineering AG

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

Certificate of conformity / First Article Inspection

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

Tests

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

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

Standards

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

Conformity

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

Date 18.11.2001

Signature / Stamp Schmid & Partner Engineering AG
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Tel. +41 1 245 97 00, Fax +41 1 245 97 79