




	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

Test Lab Certificate No. 2470.01

DECLARATION OF COMPLIANCE		SAR RF EXPOSURE EVALUATION		FCC & IC		
Test Lab Information	Name	CELLTECH LABS INC.				
	Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada				
Applicant Information	Name	VOCERA COMMUNICATIONS INC.				
	Address	525 Race Street, Suite 150, San Jose, CA 95126 United States				
Standard(s) Applied	FCC	47 CFR §2.1093	IC	Health Canada Safety Code 6		
Procedure(s) Applied	FCC	OET Bulletin 65, Supplement C (01-01)				
		KDB 447498 - Mobile and Portable RF Exposure Procedures				
		KDB 248227 - SAR Measurement Procedures for 802.11a/b/g Transmitters				
	IC	KDB 648474 - SAR Evaluation Considerations for Handsets with Multiple Tx'mttrs & Antennas				
		RSS-102 Issue 4				
	IEEE	1528-2003				
	IEC	62209-1:2005; 62209-2:2010				
Device RF Exposure Category	FCC/IC	General Population / Uncontrolled Environment				
Device Classification(s)	FCC	Digital Transmission System (DTS)				
	IC	Low Power License-Exempt Radio-communication Device				
Device Identifier(s)	FCC ID:	QGZAB3000				
	IC:	4362A-B3000				
Device Description	Portable Communication Badge with 802.11b/g WLAN & Bluetooth (Held-to-ear and Body-worn)					
Device Model(s)	B3000 Communication Badge					
Test Sample Serial No.	VEWF2F6070F (Identical Prototype)					
Test Sample Hardware Rev. No.	Rev. 11	Test Sample Firmware Rev. No.	125			
Date of Sample Receipt	August 31, 2012	Date(s) of Measurements	September 12-14, 2012			
Internal Transmitter(s)	802.11b/g WLAN and Bluetooth (WLAN and Bluetooth do not support simultaneous transmission)					
Modulations & Data Rates	802.11b: DBPSK (1 Mbps), DQPSK (2 Mbps), CCK (5.5, 11 Mbps)					
	802.11g: OFDM (6, 9, 12, 24, 36, 48, 54 Mbps)					
Manuf. Rated Cond. Output Power	802.11b: 19 dBm	802.11g: 16 dBm	Bluetooth: 2.5 dBm			
Transmit Frequency Range(s)	2412 - 2462 MHz (802.11b/g)		2402 - 2480 MHz (Bluetooth)			
Antenna Type(s) Tested	Internal (Quarter-wave Monopole)					
Battery Type(s) Tested	Lithium-Polymer	3.7V, 645mAh	P/N: 230-01977			
Body-worn Accessories Tested	Lanyard	contains metal	P/N: 230-01995			
	Universal Clip	contains metal	P/N: 230-01985			
Audio Accessories Tested	Headset (Plantronics)					
Max. SAR Level(s) Evaluated	HEAD	1.45 W/kg	1g average	FCC/IC SAR Limit	1.6 W/kg	1g average
	BODY	1.14 W/kg	1g average	FCC/IC SAR Limit	1.6 W/kg	1g average
<p>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 procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01), Industry Canada RSS-102 Issue 4, IEEE Standard 1528-2003, IEC International Standard 62209-1:2005 and IEC International Standard 62209-2:2010. All measurements were performed in accordance with the SAR system manufacturer recommendations.</p> <p>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.</p> <p>The results and statements contained in this report pertain only to the device evaluated.</p> <p>This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.</p>						
Test Report Approved By			Mike Meaker	Engineering Technologist	Celltech Labs Inc.	


Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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REVISION HISTORY			
REVISION NO.	DESCRIPTION	IMPLEMENTED BY	RELEASE DATE
1.0	1st Release	Jon Hughes	September 21, 2012
1.1	2nd Release	Mike Meaker	October 3, 2012
	-Corrected FCC ID, IC ID and Model Number listing. -Corrected conducted power measurement values for 802.11g ch. 1 in Section 3.0.		

TEST REPORT SIGN-OFF			
DEVICE TESTED BY	REPORT PREPARED BY	QA REVIEW BY	REPORT APPROVED BY
Mike Meaker	Mike Meaker	Jon Hughes	Mike Meaker

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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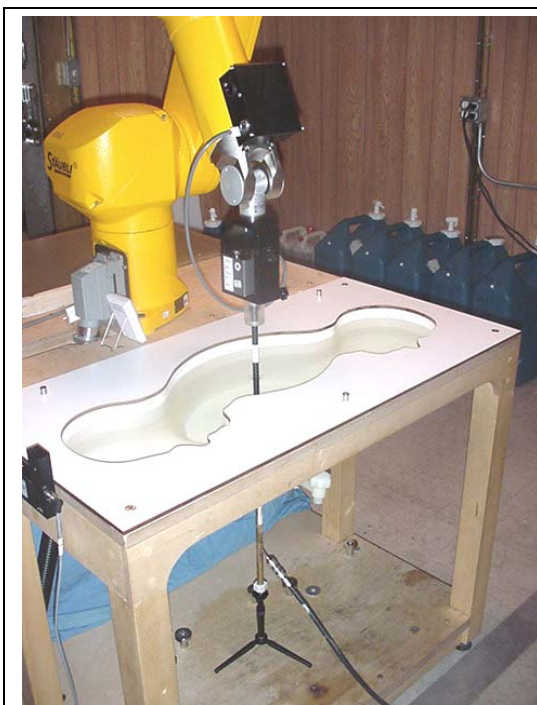
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1.0 INTRODUCTION

This measurement report demonstrates that the Vocera Communications Inc. Model: B3000 Communication Badge with 802.11b/g WLAN and Bluetooth 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]), IC RSS-102 Issue 4 (see reference [4]), IEEE Standard 1528-2003 (see reference [5]), IEC International Standard 62209-1:2005 (see reference [6]) and IEC International Standard 62209-2:2010 (see reference [7]) were employed. A description of the product, 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 Head 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 utilizes a controller with built in VME-bus computer.



DASY4 System with SAM Twin Phantom V4.0C



DASY4 Measurement Server

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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3.0 RF CONDUCTED OUTPUT POWER



RF CONDUCTED OUTPUT POWER MEASUREMENTS										
Freq. (MHz)	Ch.	Power Setting	Average Conducted RF Output Power Levels (dBm)							
802.11b Mode			1 Mbps	2 Mbps		5.5 Mbps		11 Mbps		
2412	1	18	18.2	18.2		18.1		18.1		
2437	6	19	18.6	18.6		18.5		18.5		
2462	11	19	18.5	18.5		18.4		18.4		
802.11g Mode			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
2412	1	14	14.3	14.2	14.2	14.2	14.1	14.3	14.1	14.3
2437	6	16	15.9	15.9	15.9	15.9	15.8	15.7	15.7	15.6
2462	11	16	15.8	15.8	15.8	15.8	15.7	15.6	15.6	15.5

Notes:

- The conducted output power levels of the DUT could not be measured by Celltech Labs due to the internal antenna type. The reference conducted output power levels for each power setting were provided by Vocera Communications.
- The maximum output power of the Bluetooth is 1.8 mW and therefore does not require routine SAR evaluation, based on the output power is $< 60/f_{\text{(GHz)}} \text{ mW}$, in accordance with the procedures of FCC KDB 447498 (see reference [8]).

4.0 ACCESSORY LISTING

Accessory ID # for Test Report	BODY-WORN	
	Part Number	Description
1	230-01995	Lanyard
2	230-01985	Universal Clip
Accessory ID # for Test Report	AUDIO	
	Manufacturer	Description
1	Plantronics	Headset


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5.0 FLUID DIELECTRIC PARAMETERS

FLUID DIELECTRIC PARAMETERS						
Date: 09/12/2012		Frequency: 2450 MHz			Tissue: Head	
Freq	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
2.350	41.24	1.75	39.2	1.8	5.20%	-2.78%
2.360	41.08	1.76	39.2	1.8	4.80%	-2.22%
2.370	41.03	1.76	39.2	1.8	4.67%	-2.22%
2.380	41.03	1.77	39.2	1.8	4.67%	-1.67%
2.390	40.93	1.78	39.2	1.8	4.41%	-1.11%
2.400	40.7	1.79	39.2	1.8	3.83%	-0.56%
2.410	40.51	1.81	39.2	1.8	3.34%	0.56%
2.420	40.57	1.84	39.2	1.8	3.49%	2.22%
2.430	40.53	1.83	39.2	1.8	3.39%	1.67%
2.437*	40.6	1.86	39.2	1.8	3.57%	3.33%
2.440	40.63	1.88	39.2	1.8	3.65%	4.44%
2.450	40.66	1.88	39.2	1.8	3.72%	4.44%
2.460	40.68	1.88	39.2	1.8	3.78%	4.44%
2.462*	40.7	1.88	39.2	1.8	3.83%	4.44%
2.470	40.65	1.9	39.2	1.8	3.70%	5.56%
2.480	40.78	1.89	39.2	1.8	4.03%	5.00%
2.490	40.78	1.91	39.2	1.8	4.03%	6.11%
2.500	40.31	1.94	39.2	1.8	2.83%	7.78%
2.510	40.19	1.94	39.2	1.8	2.53%	7.78%
2.520	40.3	1.95	39.2	1.8	2.81%	8.33%
2.530	40.32	1.98	39.2	1.8	2.86%	10.00%
2.540	40.12	1.99	39.2	1.8	2.35%	10.56%
2.550	40.21	2	39.2	1.8	2.58%	11.11%

*interpolated using DASY4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m ³)
Sep 12	2450 Head	23.0 °C	24.5 °C	≥ 15 cm	101.1 kPa	30%	1000


Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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FLUID DIELECTRIC PARAMETERS						
Date: 09/13-14/2012		Frequency: 2450 MHz			Tissue: Head	
Freq	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
2.350	40.41	1.8	39.2	1.8	3.09%	0.00%
2.360	40.32	1.79	39.2	1.8	2.86%	-0.56%
2.370	40.54	1.81	39.2	1.8	3.42%	0.56%
2.380	40.28	1.81	39.2	1.8	2.76%	0.56%
2.390	40.3	1.83	39.2	1.8	2.81%	1.67%
2.400	40.26	1.85	39.2	1.8	2.70%	2.78%
2.410	40.23	1.85	39.2	1.8	2.63%	2.78%
2.412*	40.2	1.85	39.2	1.8	2.55%	2.78%
2.420	40.2	1.86	39.2	1.8	2.55%	3.33%
2.430	40.34	1.89	39.2	1.8	2.91%	5.00%
2.437*	40.4	1.9	39.2	1.8	3.06%	5.56%
2.440	40.37	1.9	39.2	1.8	2.98%	5.56%
2.450	40.32	1.9	39.2	1.8	2.86%	5.56%
2.460	40.04	1.92	39.2	1.8	2.14%	6.67%
2.470	40.21	1.93	39.2	1.8	2.58%	7.22%
2.480	40.22	1.95	39.2	1.8	2.60%	8.33%
2.490	39.87	1.95	39.2	1.8	1.71%	8.33%
2.500	40.04	1.97	39.2	1.8	2.14%	9.44%
2.510	39.97	1.98	39.2	1.8	1.96%	10.00%
2.520	39.9	1.98	39.2	1.8	1.79%	10.00%
2.530	39.88	2	39.2	1.8	1.73%	11.11%
2.540	40.03	2.03	39.2	1.8	2.12%	12.78%
2.550	39.67	2.05	39.2	1.8	1.20%	13.89%

*interpolated using DASY4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m ³)
Sep 13	2450 Head	23.0 °C	24.5 °C	≥ 15 cm	101.1 kPa	30%	1000
Sep 14	2450 Head	24.0 °C	24.5 °C	≥ 15 cm	101.1 kPa	30%	1000

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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FLUID DIELECTRIC PARAMETERS						
Date: 09/14/2012		Frequency: 2450 MHz			Tissue: Body	
Freq	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
2.350	51.96	1.81	52.7	1.95	-1.40%	-7.18%
2.360	52.04	1.81	52.7	1.95	-1.25%	-7.18%
2.370	51.92	1.84	52.7	1.95	-1.48%	-5.64%
2.380	51.79	1.84	52.7	1.95	-1.73%	-5.64%
2.390	52.02	1.87	52.7	1.95	-1.29%	-4.10%
2.400	51.74	1.89	52.7	1.95	-1.82%	-3.08%
2.410	51.79	1.9	52.7	1.95	-1.73%	-2.56%
2.412*	51.8	1.91	52.7	1.95	-1.71%	-2.05%
2.420	51.94	1.93	52.7	1.95	-1.44%	-1.03%
2.430	51.83	1.98	52.7	1.95	-1.65%	1.54%
2.437*	51.8	1.96	52.7	1.95	-1.71%	0.51%
2.440	51.79	1.95	52.7	1.95	-1.73%	0.00%
2.450	51.75	1.97	52.7	1.95	-1.80%	1.03%
2.460	51.91	1.97	52.7	1.95	-1.50%	1.03%
2.462*	51.9	1.97	52.7	1.95	-1.52%	1.03%
2.470	51.78	1.99	52.7	1.95	-1.75%	2.05%
2.480	51.65	2	52.7	1.95	-1.99%	2.56%
2.490	51.32	1.99	52.7	1.95	-2.62%	2.05%
2.500	51.42	2.02	52.7	1.95	-2.43%	3.59%
2.510	51.49	2	52.7	1.95	-2.30%	2.56%
2.520	51.5	2.03	52.7	1.95	-2.28%	4.10%
2.530	51.31	2.04	52.7	1.95	-2.64%	4.62%
2.540	51.48	2.11	52.7	1.95	-2.31%	8.21%
2.550	51.65	2.11	52.7	1.95	-1.99%	8.21%

*interpolated using DASY4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m ³)
Sep 14	2450 Body	24.0 °C	23.9 °C	≥ 15 cm	101.1 kPa	30%	1000

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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7.0 SAR LEVEL ADJUSTMENT FOR FLUID SENSITIVITY

The measured fluid dielectric properties for 2450 MHz Head tissue simulant were outside the 5% measurement protocol tolerance as reported in the table below.

1. Chapter 22 of the SAR system manufacturer's DASY4 Manual (see reference [15]) provides the following calculation formula for making fluid sensitivity adjustments to the measured SAR values:

$$\% \text{ Change in SAR} = \text{Sensitivity} * \% \text{ Change in Value}$$

Measured Fluid Parameters:

Test Date	Freq (GHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
Sep 13	2.437*	40.4	1.9	39.2	1.8	3.06%	5.56%

*interpolated using DASY4 software

$$\% \text{ Change in SAR} = (-0.49 * 3.06\%) + (0.41 * 5.56\%)$$

$$\% \text{ Change in SAR} = 0.78\%$$

Since the % change in SAR is positive, the measured SAR value is already overestimated. Therefore, no adjustment is required to be made to the measured SAR values.

2. IEC 62209-2:2010 (see reference [7]) provides a formula for making fluid sensitivity adjustments to the measured SAR values:

$$\Delta \text{SAR} = C_e * \Delta E + C_\sigma * \Delta \sigma$$

Measured Fluid Parameters:


Test Date	Freq (GHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
Sep 13	2.437*	40.4	1.9	39.2	1.8	3.06%	5.56%



*interpolated using DASY4 software

Calculations as per IEC 62209-2:

Frequency (GHz)	2.437
C _e	-0.2250
C _σ	0.4831
Δ E	3.06%
Δ σ	5.56%
Δ SAR	2.00%

Since the calculated change in SAR is a positive value, the measured SAR value is already overestimated. Therefore, no adjustment is required to be made to the measured SAR values.

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
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8.0 SAR PROBE CALIBRATION & MEASUREMENT FREQUENCIES

The following procedures are recommended for measurements at 150 MHz - 3 GHz to minimize probe calibration and tissue dielectric parameter discrepancies. In general, SAR measurements below 300 MHz should be within ± 50 MHz of the probe calibration frequency. At 300 MHz to 3 GHz, measurements should be within ± 100 MHz of the probe calibration frequency. Measurements exceeding 50% of these intervals, ± 25 MHz < 300 MHz and ± 50 MHz ≥ 300 MHz, require additional steps (per FCC KDB 450824 D01 v01r01, SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz - 3 GHz - see reference [11]).

Probe Calibration Freq.	Device Measurement Freq.	Frequency Interval	± 50 MHz ≥ 300 MHz
2450 MHz	2412 MHz	38 MHz	< 50 MHz
	2437 MHz	13 MHz	< 50 MHz
	2462 MHz	12 MHz	< 50 MHz

The probe calibration and measurement frequency interval is < 50 MHz; therefore the additional steps are not required for this evaluation.

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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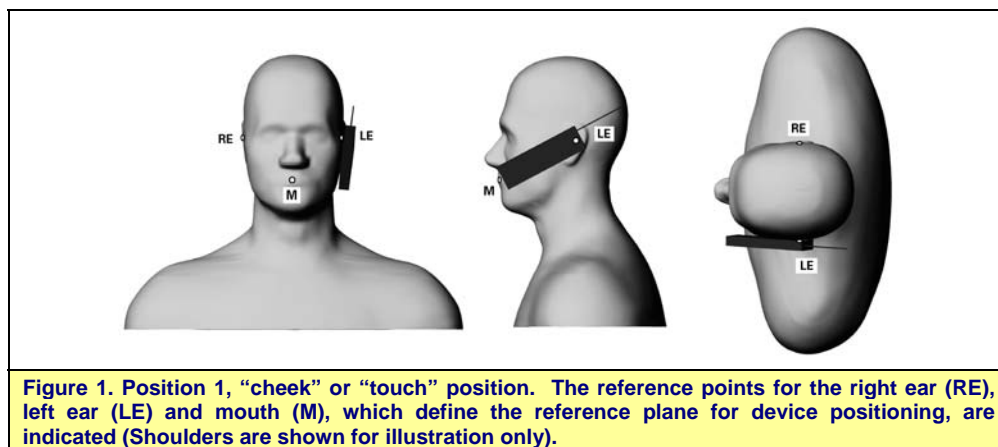
9.0 DETAILS OF SAR EVALUATION

The Vocera Communications Inc. Model: B3000 Communications Badge with 802.11b/g WLAN and Bluetooth was compliant for localized Specific Absorption Rate (Uncontrolled Exposure) based on the test provisions and conditions described below. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A. The detailed test setup photographs are shown in Appendix D.

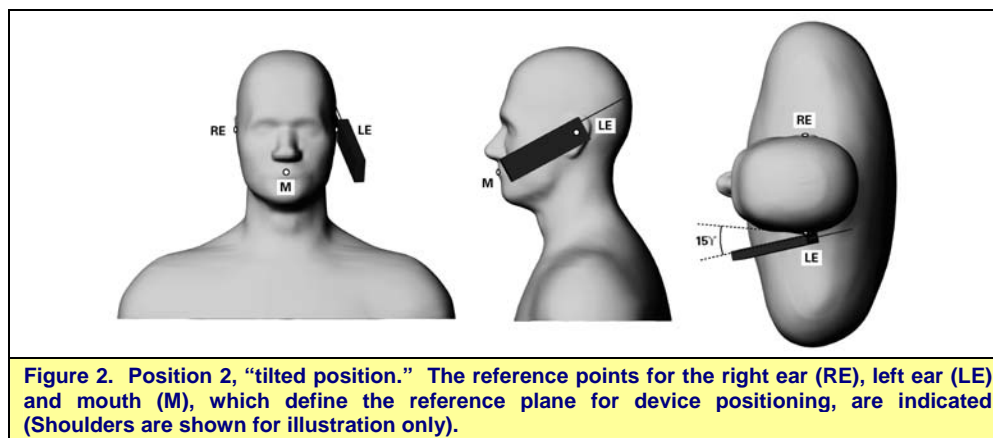
Ear-held Configuration


- 1) The DUT was tested in an ear-held configuration on both the left and right head sections of the SAM phantom.



 - 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 handset was gradually adjusted to each of the following test positions:
 - Cheek/Touch Position: the handset 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.



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



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DETAILS OF SAR EVALUATION (Cont.)

Body-worn Configuration

- 2) The DUT was tested with the Lanyard body-worn accessory with the back side of the DUT touching the outer surface of the SAM phantom planar section.
- 3) The DUT was tested with the Universal Clip body-worn accessory with the back side of the DUT touching the outer surface of the SAM phantom planar section.
- 4) Body-worn SAR evaluations were performed with and without (speaker mode) the audio accessory connected.

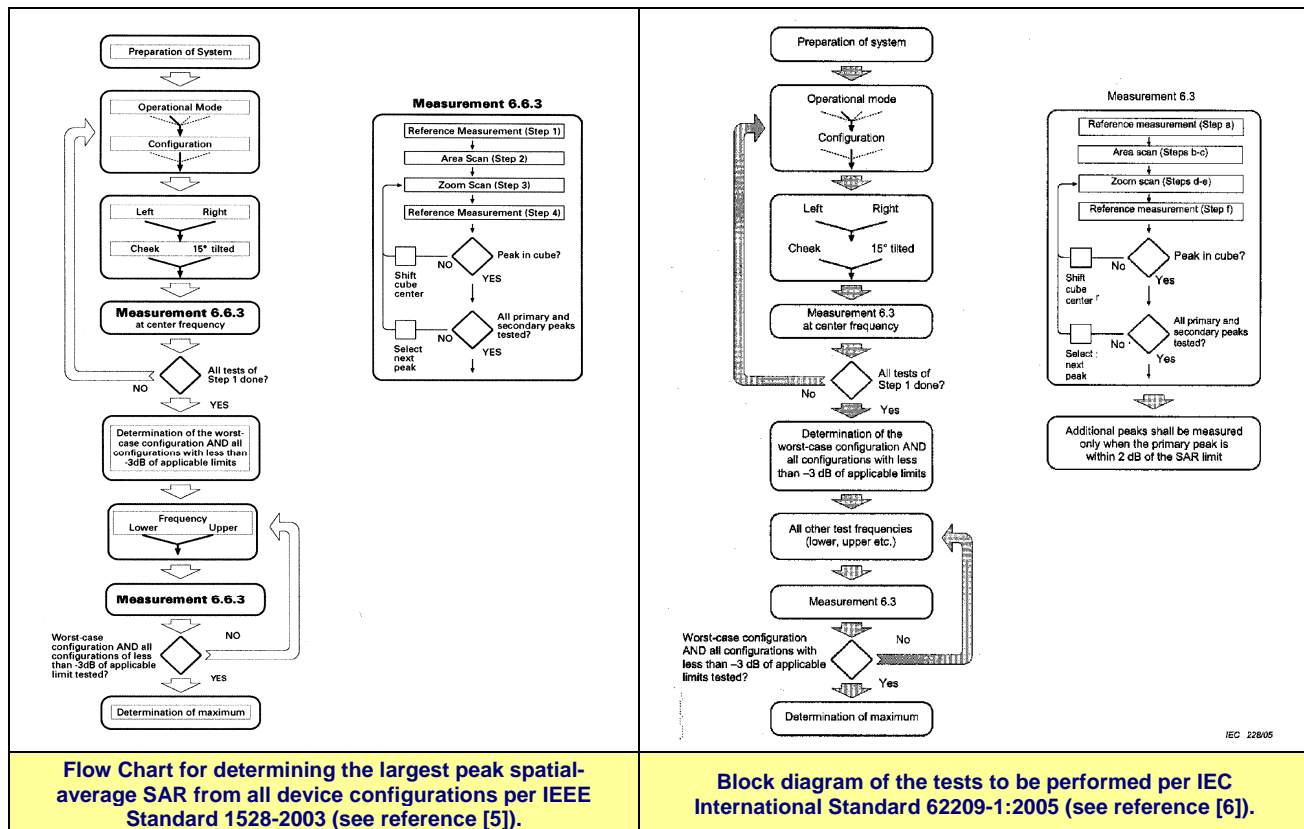
10.0 CO-LOCATED TRANSMITTER ASSESSMENT

The co-located Bluetooth transmitter does not transmit simultaneously with the 802.11b/g; therefore simultaneous transmission assessment was not required.

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
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11.0 SAR EVALUATION PROCEDURES

- (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.
- 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 10mm x 10mm.
An area scan was determined as follows:
- 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.
- 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:
- 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.
- 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).
- A zoom scan volume of 30 mm x 30 mm x 30 mm (5x5x7 points) centered at the peak SAR location determined from the area scan is used for all zoom scans for devices with a transmit frequency < 800 MHz. Zoom scans for frequencies ≥ 800 MHz are determined with a scan volume of 30 mm x 30 mm x 30 mm (7x7x7 points) to ensure complete capture of the peak spatial-average SAR.



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

Block diagram of the tests to be performed per IEC International Standard 62209-1:2005 (see reference [6]).

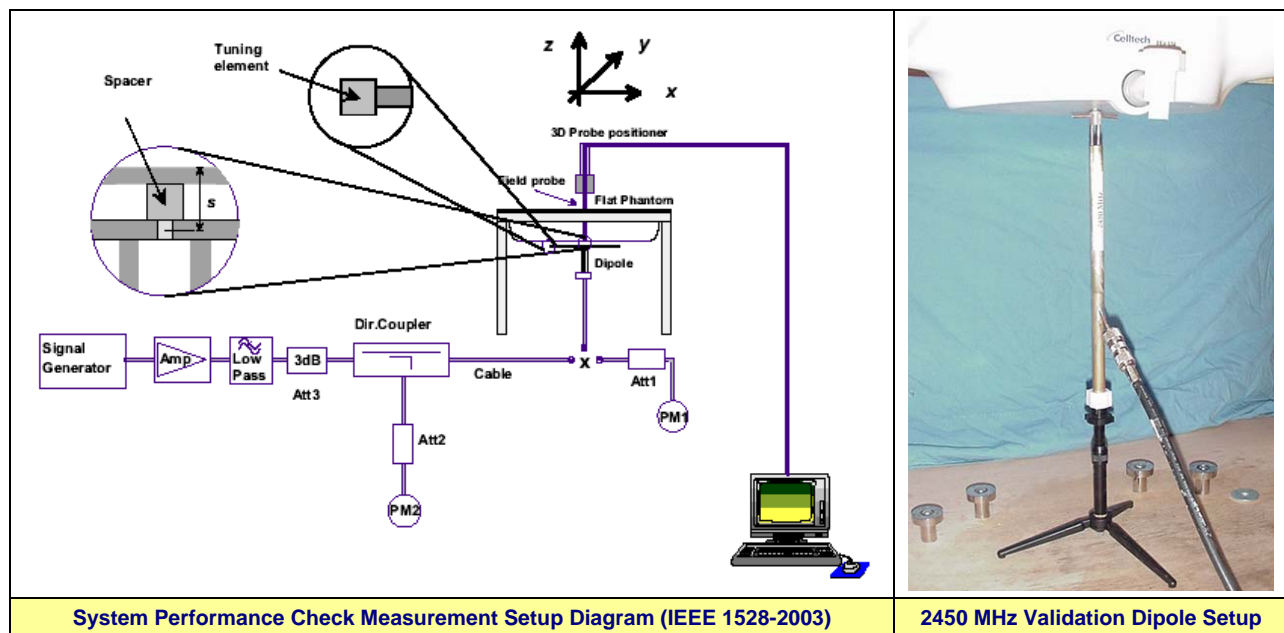
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12.0 SYSTEM PERFORMANCE CHECK



Prior to the SAR evaluations, a system check was performed at the planar section of the SAM phantom with a 2450MHz SPEAG validation dipole (see Appendix B for system performance check test plots) in accordance with the procedures described in IEEE Standard 1528-2003 (see reference [5]). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of $\pm 10\%$ from the system manufacturer's dipole calibration target SAR value (see Appendix E for system manufacturer's dipole calibration procedures).

SYSTEM PERFORMANCE CHECK EVALUATION

Test Date	Equiv. Tissue Freq. (MHz)	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)
		Target	Meas.	Dev.	Target	Meas.	Dev.	Target	Meas.	Dev.						
Sep 12	HEAD 2450	12.7 $\pm 10\%$	13.7	+7.9%	39.2 $\pm 5\%$	40.7	+3.8%	1.80 $\pm 5\%$	1.88	+4.4%	1000	23.0	24.5	≥ 15	30	101.1
Sep 14	BODY 2450	12.7 $\pm 10\%$	13.3	+4.7%	52.7 $\pm 5\%$	51.8	-1.7%	1.95 $\pm 5\%$	1.97	+1.0%	1000	24.0	23.9	≥ 15	30	101.1
Note(s)		1. The DUT SAR evaluations on Sep. 13, 2012 were performed within 24 hours of the system performance check on Sep. 12.														
		2. The target SAR value is the measured value specified in the dipole manufacturer's calibration document (see Appendix E).														
		3. The target dielectric parameters are the nominal values specified in the dipole manufacturer's calibration document (see Appendix E).														
		4. The fluid temperature remained within $\pm 2^\circ\text{C}$ from the dielectric parameter measurement to the completion of the evaluation.														
		5. The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).														



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13.0 SIMULATED EQUIVALENT TISSUES



The simulated equivalent tissue recipe listed in the table below is derived from the SAR system manufacturer's suggested recipe in the DASY4 manual (see reference [12] and [13]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2003 (see reference [5]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

1900 MHz SIMULATED TISSUE MIXTURES		
INGREDIENT	2450 MHz Head	2450 MHz Body
Water	55%	69%
Glycol Monobutyl	45%	31%

14.0 SAR LIMITS


SAR RF EXPOSURE LIMITS			
FCC 47 CFR 2.1093	Health Canada Safety Code 6	(General Population / Uncontrolled Exposure)	(Occupational / Controlled Exposure)
Spatial Average (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak (averaged over any 1 g of tissue)		1.6 W/kg	8.0 W/kg
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
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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15.0 ROBOT SYSTEM SPECIFICATIONS

<u>Specifications</u>	
Positioner	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability	0.02 mm
No. of axis	6
<u>Data Acquisition Electronic (DAE) System</u>	
<u>Cell Controller</u>	
Processor	AMD Athlon XP 2400+
Clock Speed	2.0 GHz
Operating System	Windows XP Professional
<u>Data Converter</u>	
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
<u>DASY4 Measurement Server</u>	
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
<u>E-Field Probe</u>	
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)
<u>Phantom(s)</u>	
Type	SAM V4.0C
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 25 liters

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16.0 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 μ W/g to >100 mW/g; Linearity: ± 0.2 dB
 (noise: typically < 1 μ W/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

17.0 SAM TWIN PHANTOM V4.0C

The SAM Twin 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 Twin Phantom V4.0C).




SAM Twin Phantom V4.0C



18.0 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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19.0 TEST EQUIPMENT LIST

TEST EQUIPMENT		ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
USED	DESCRIPTION				
x	Schmid & Partner DASY4 System	-	-	-	-
x	-DASY4 Measurement Server	00158	1078	CNR	CNR
x	-Robot	00046	599396-01	CNR	CNR
x	-DAE4	00019	353	19-Apr-12	Biennial
x	-EX3DV4 E-Field Probe	00213	3600	27-Apr-12	Annual
x	-D2450V2 Validation Dipole	00219	825	25-Apr-12	Triennial
x	-SAM Twin Phantom V4.0C	00154	1033	CNR	CNR
x	HP 85070C Dielectric Probe Kit	00033	None	CNR	CNR
x	Gigatronics 8652A Power Meter	00007	1835272	03-May-12	Biennial
x	Gigatronics 80701A Power Sensor	00014	1833542	03-May-12	Biennial
	Gigatronics 80334A Power Sensor	-	1837001	03-May-12	Biennial
x	HP 8753ET Network Analyzer	00134	US39170292	26-Apr-12	Biennial
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	CNR	CNR
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Abbr.	CNR = Calibration Not Required				

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20.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2003)									
Uncertainty Component	IEEE 1528 Section	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value $\pm\%$ (1g)	Uncertainty Value $\pm\%$ (10g)	V_i or V_{eff}
Measurement System									
Probe Calibration (2450 MHz)	E.2.1	6.0	Normal	1	1	1	6.0	6.0	∞
Axial Isotropy	E.2.2	4.7	Rectangular	1.732050808	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	Rectangular	1.732050808	0.7	0.7	3.9	3.9	∞
Boundary Effect	E.2.3	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	Rectangular	1.732050808	1	1	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3	Rectangular	1.732050808	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	Rectangular	1.732050808	1	1	0.2	0.2	∞
Probe Positioning wrt Phantom Shell	E.6.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	∞
Extrapolation, interpolation & integration algorithms for max. SAR evaluation	E.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	E.4.1	3.6	Normal	1	1	1	3.6	3.6	8
SAR Drift Measurement	6.6.2	14	Rectangular	1.732050808	1	1	8.1	8.1	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4	Rectangular	1.732050808	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5	Rectangular	1.732050808	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measured)	E.3.3	5.56	Normal	1	0.64	0.43	3.6	2.4	∞
Liquid Permittivity (target)	E.3.2	5	Rectangular	1.732050808	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measured)	E.3.3	3.83	Normal	1	0.6	0.49	2.3	1.9	∞
Combined Standard Uncertainty			RSS				13.71	13.28	
Expanded Uncertainty (95% Confidence Interval)			k=2				27.41	26.55	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

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MEASUREMENT UNCERTAINTIES (CONT.)

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEC 62209-2:2010)									
Source of Uncertainty	IEC 62209-2 Section	Tolerance / Uncertainty $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Standard Uncertainty $\pm\%$ (1g)	Standard Uncertainty $\pm\%$ (10g)	V_i or V_{eff}
Measurement System									
Probe Calibration (2450 MHz)	7.2.2.1	6.0	Normal	1	1	1	6.0	6.0	∞
Isotropy	7.2.2.2	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
Boundary Effect	7.2.2.6	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Linearity	7.2.2.3	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
Detection Limits	7.2.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Readout Electronics	7.2.2.7	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	7.2.2.8	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time	7.2.2.9	2.6	Rectangular	1.732050808	1	1	1.5	1.5	∞
RF Ambient Conditions	7.2.4.5	3	Rectangular	1.732050808	1	1	1.7	1.7	∞
Probe Positioner Mechanical Restrictions	7.2.3.1	0.4	Rectangular	1.732050808	1	1	0.2	0.2	∞
Probe Positioning wrt Phantom Shell	7.2.3.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	∞
Post-processing	7.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	7.2.3.4.3	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	7.2.3.4.2	3.6	Normal	1	1	1	3.6	3.6	8
Drift of Output Power (meas. SAR drift)	7.2.2.10	14	Rectangular	1.732050808	1	1	8.1	8.1	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	7.2.3.2	4	Rectangular	1.732050808	1	1	2.3	2.3	∞
SAR Correction Algorithm for deviations in permittivity and conductivity	7.2.4.3	1.9	Normal	1	1	0.81	1.9	1.54	∞
Liquid Conductivity (measured)	7.2.4.3	5.56	Normal	1	0.78	0.71	4.3	3.9	∞
Liquid Permittivity (measured)	7.2.4.3	3.83	Normal	1	0.23	0.26	0.9	1.0	∞
Liquid Permittivity - temp. uncertainty	7.2.4.4	1.23	Rectangular	1.732050808	0.78	0.71	0.6	0.5	∞
Liquid Conductivity - temp. uncertainty	7.2.4.4	0.93	Rectangular	1.732050808	0.23	0.26	0.1	0.1	∞
Combined Standard Uncertainty	7.3.1		RSS				13.25	13.09	
Expanded Uncertainty (95% Confidence Interval)	7.3.2		k=2				26.51	26.18	

Measurement Uncertainty Table in accordance with International Standard IEC 62209-2:2010


This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	


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- [10] Federal Communications Commission, Office of Engineering and Technology - "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas"; KDB 648474 D01 v01r05: September 2008.
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- [13] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 17 Application Note, Body Tissue Recipe: Sept. 2005.
- [14] International Standard ISO/IEC 17025:2005 - "General requirements for the competence of testing and calibration laboratories".
- [15] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 22 Application Note, SAR Sensitivities: Sept. 2005.

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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APPENDIX A - SAR MEASUREMENT PLOTS

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/12/2012

PLOT # H1

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.86$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Touch - Ch.6 - 1 Mbps/Area Scan (6x13x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.88 mW/g

Left Touch - Ch.6 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

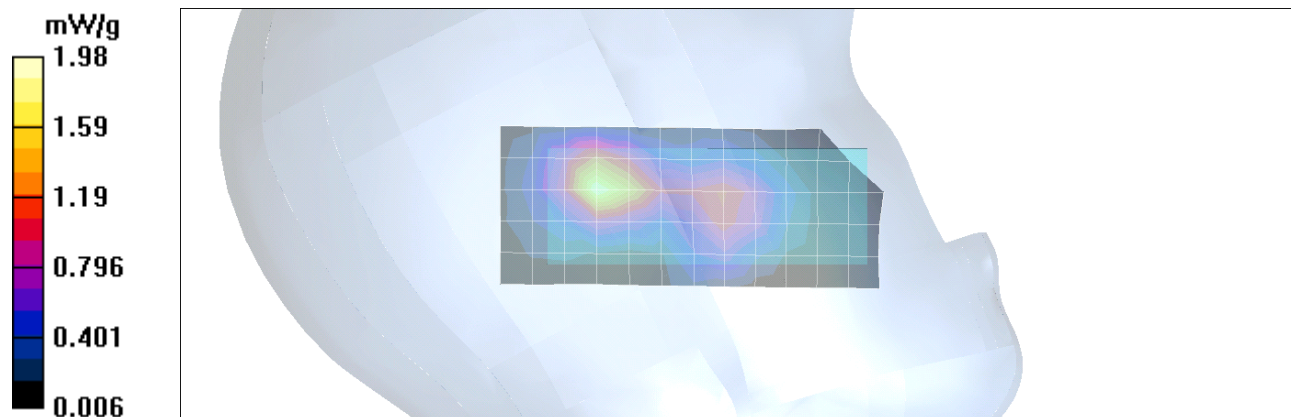
Reference Value = 34.9 V/m; Power Drift = -0.924 dB


Peak SAR (extrapolated) = 3.25 W/kg

SAR(1 g) = 1.45 mW/g; SAR(10 g) = 0.652 mW/g

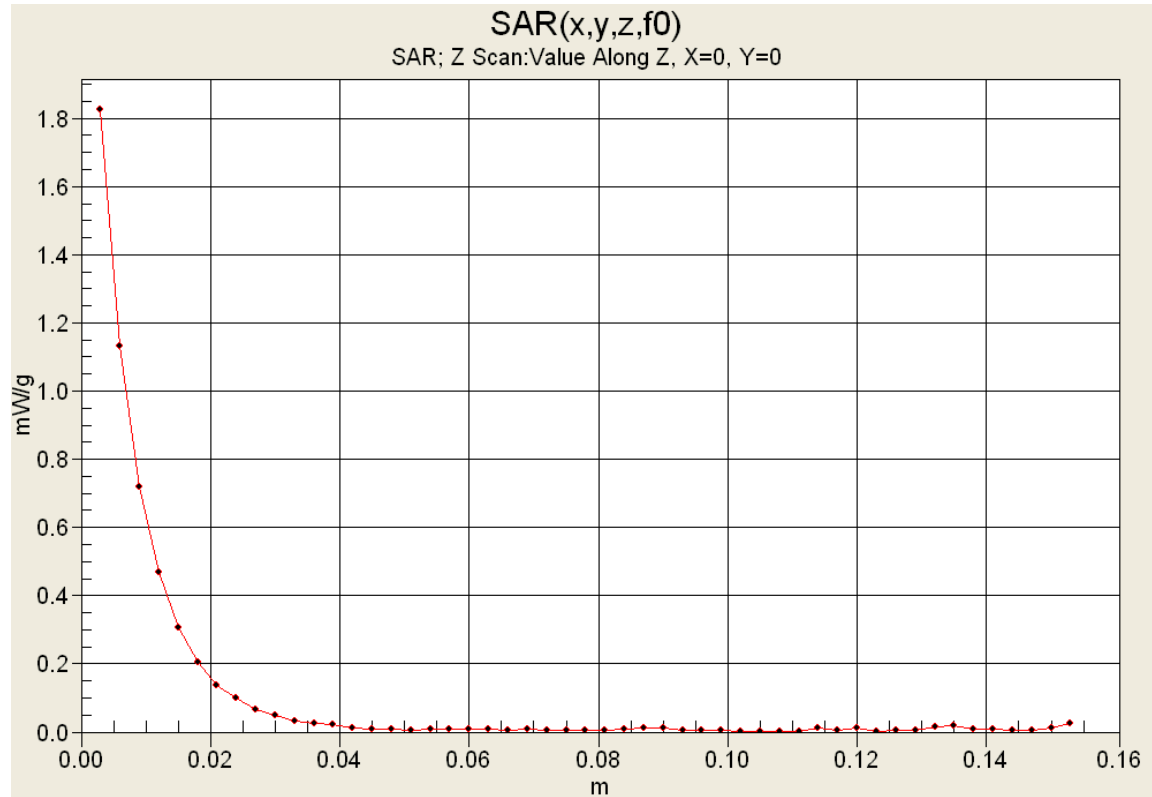
Info: Interpolated medium parameters used for SAR evaluation.



Maximum value of SAR (measured) = 1.98 mW/g



Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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Z-axis Scan



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Test Date: 09/13/2012

PLOT # H2

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.9$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Tilt - Ch.6 - 1 Mbps/Area Scan (6x13x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.741 mW/g

Left Tilt - Ch.6 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

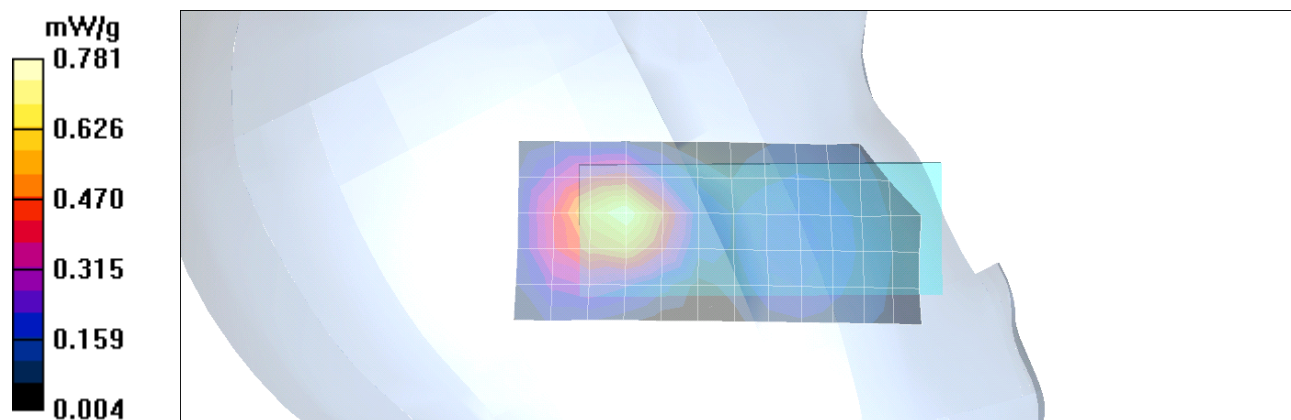
Reference Value = 22.4 V/m; Power Drift = -1.10 dB


Peak SAR (extrapolated) = 1.18 W/kg



SAR(1 g) = 0.610 mW/g; SAR(10 g) = 0.307 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.781 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/13/2012

PLOT # H3

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.9$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Touch - Ch.6 - 1 Mbps/Area Scan (6x13x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.61 mW/g

Right Touch - Ch.6 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

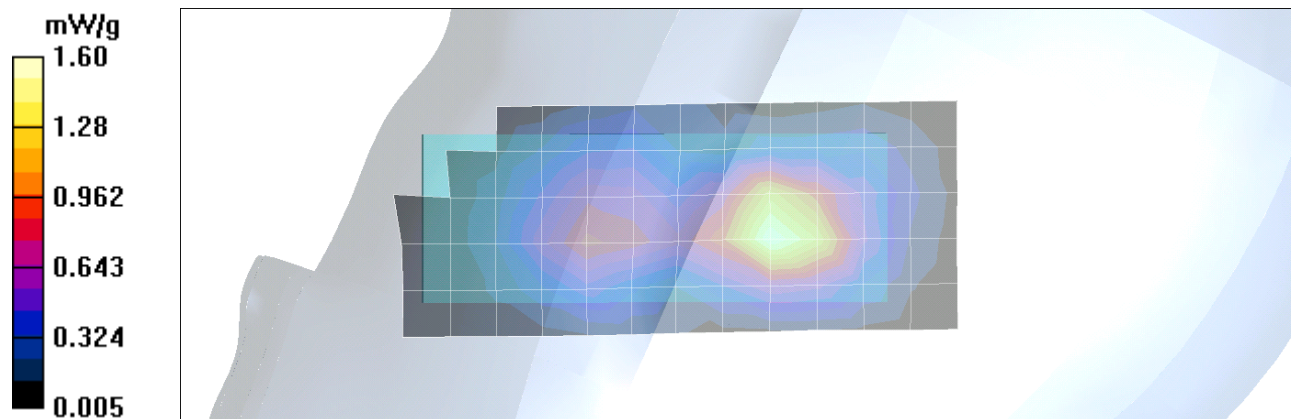
Reference Value = 30.9 V/m; Power Drift = -1.02 dB


Peak SAR (extrapolated) = 2.70 W/kg



SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.544 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

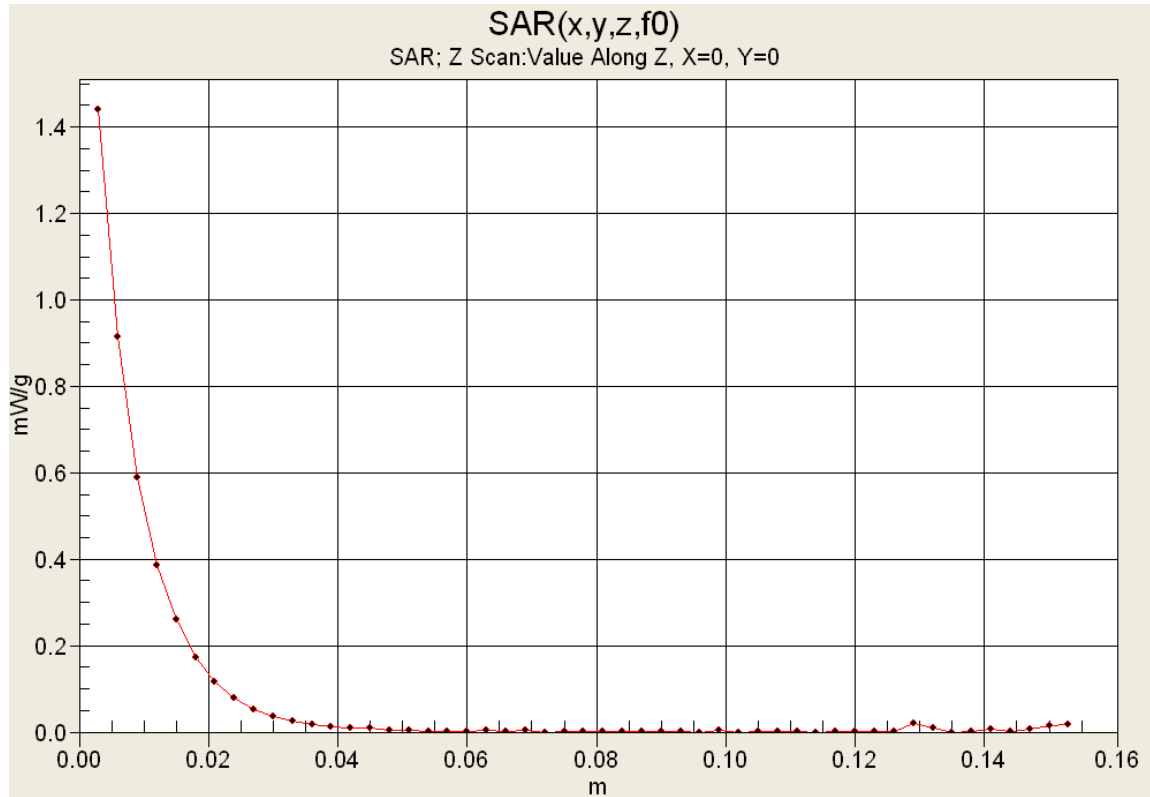
Maximum value of SAR (measured) = 1.60 mW/g






Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Lab Certificate No. 2470.01				

Z-axis Scan



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/13/2012

PLOT # H4

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.9$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Tilt - Ch.6 - 1 Mbps/Area Scan (6x13x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.621 mW/g

Right Tilt - Ch.6 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

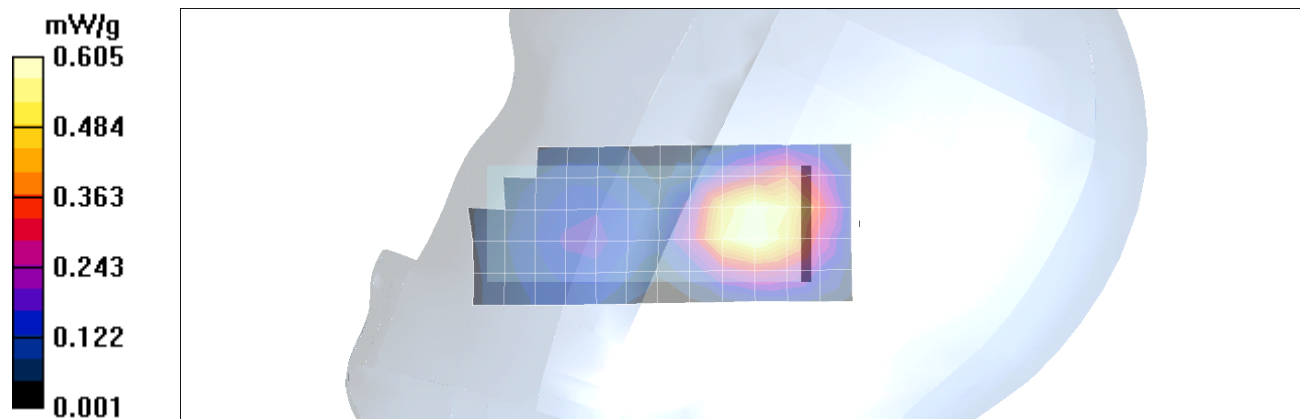
Reference Value = 19.2 V/m; Power Drift = -1.30 dB


Peak SAR (extrapolated) = 0.900 W/kg



SAR(1 g) = 0.488 mW/g; SAR(10 g) = 0.258 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.605 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/14/2012

PLOT # H5

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2412 \text{ MHz}$; $\sigma = 1.85 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Touch - Ch.1 - 1 Mbps/Area Scan (6x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.62 mW/g

Left Touch - Ch.1 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

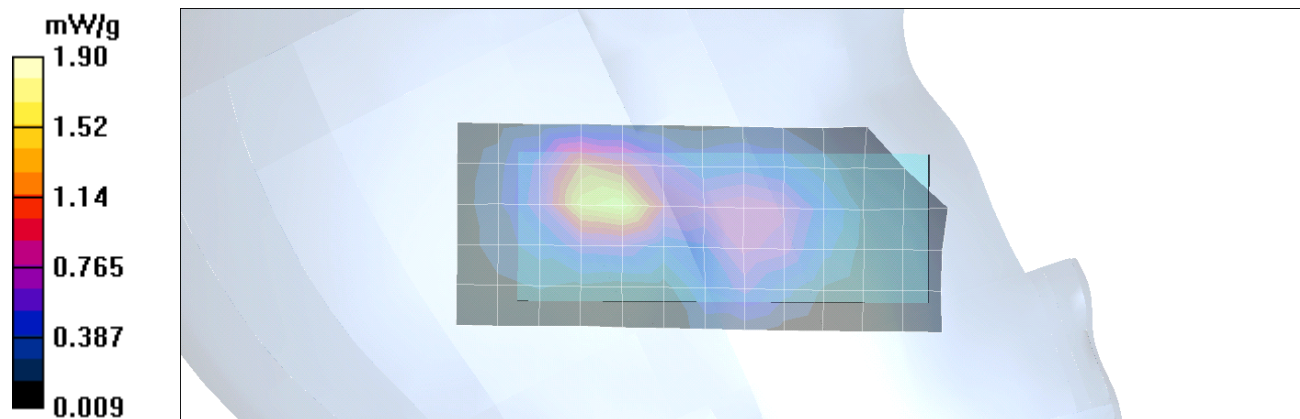
Reference Value = 31.0 V/m; Power Drift = -0.927 dB


Peak SAR (extrapolated) = 3.12 W/kg

SAR(1 g) = 1.39 mW/g; SAR(10 g) = 0.613 mW/g

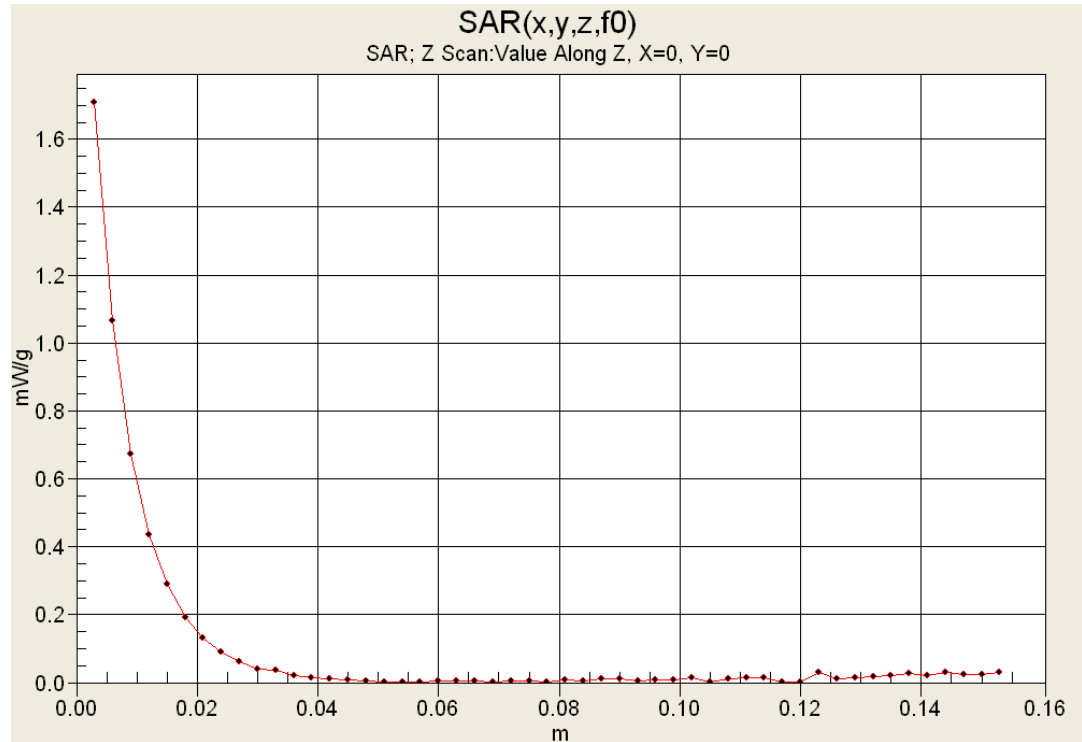
Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.90 mW/g

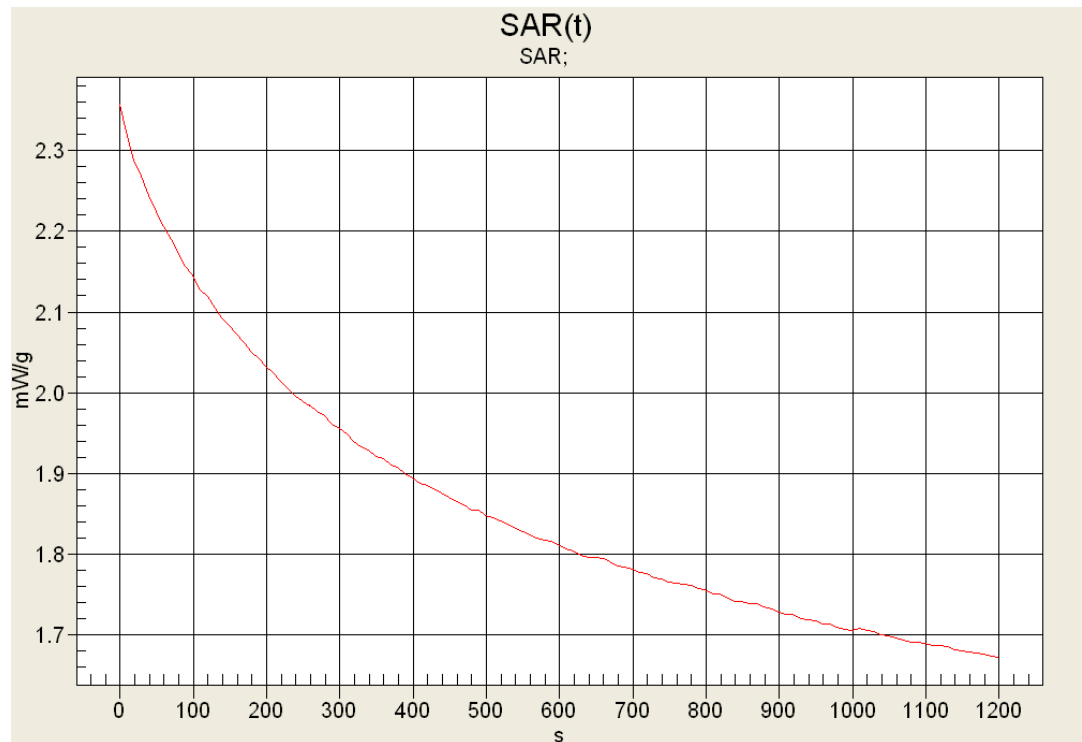




Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Z-axis Scan



SAR vs TIME



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Test Date: 09/12/2012

PLOT # H6

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.88 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Touch - Ch.11 - 1 Mbps/Area Scan (6x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.48 mW/g

Left Touch - Ch.11 - 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

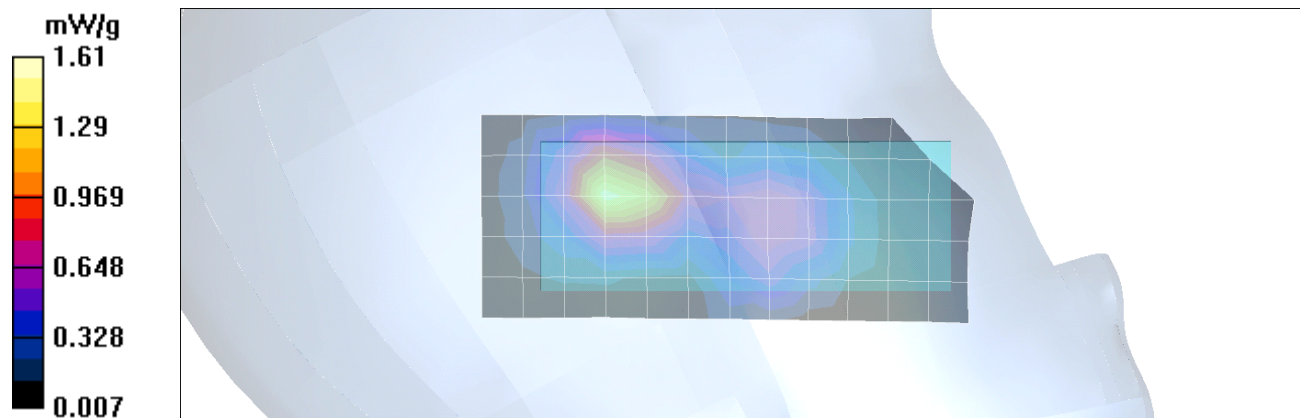
Reference Value = 31.7 V/m; Power Drift = -0.937 dB


Peak SAR (extrapolated) = 2.75 W/kg



SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.515 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.61 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/14/2012

PLOT # B1

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Lanyard - Ch.6 – 1 Mbps/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.48 mW/g

Body - Lanyard - Ch.6 – 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

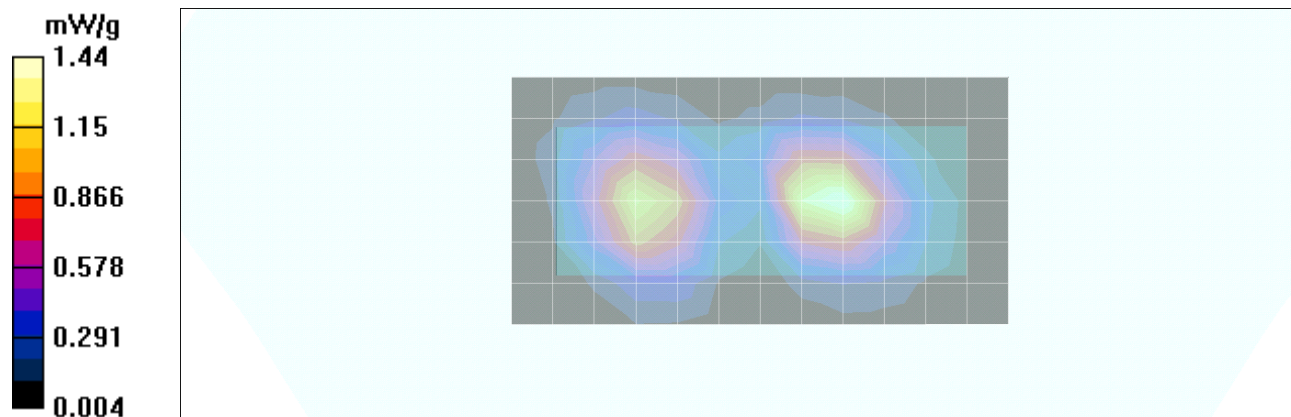
Reference Value = 27.4 V/m; Power Drift = -1.04 dB


Peak SAR (extrapolated) = 2.26 W/kg



SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.519 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

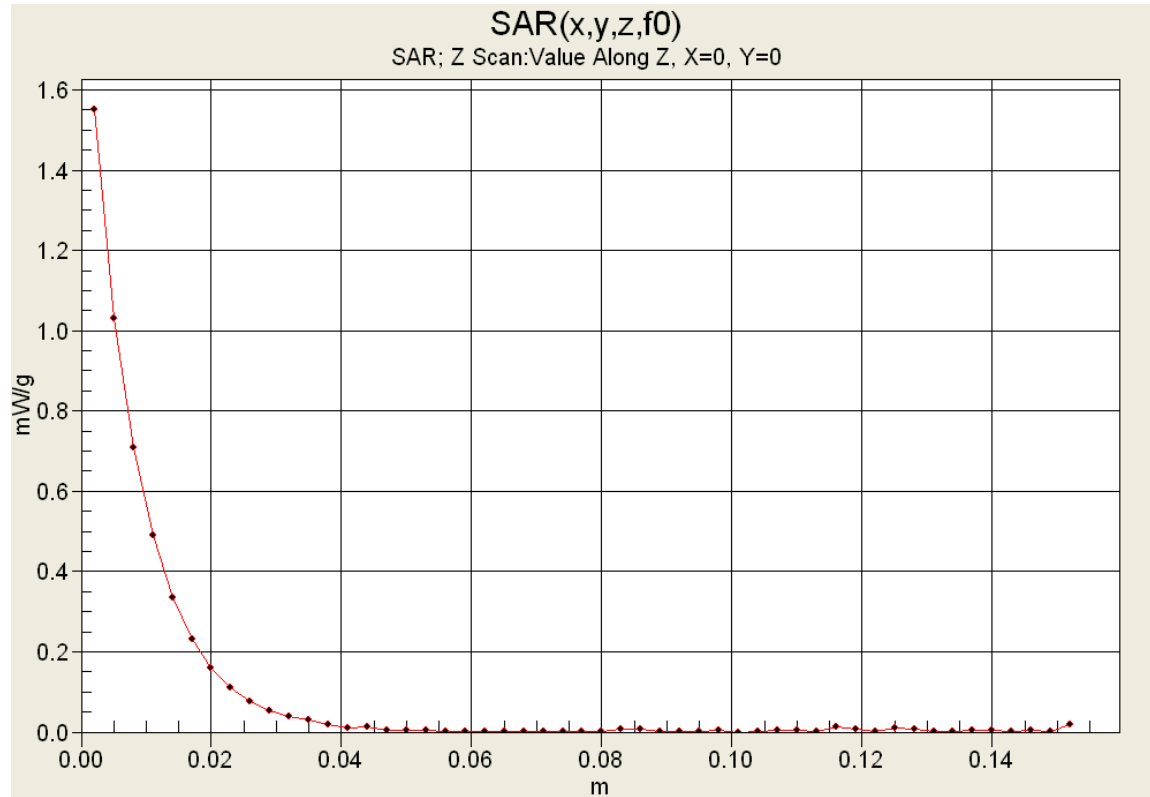
Maximum value of SAR (measured) = 1.44 mW/g






Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Z-axis Scan



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Test Date: 09/14/2012

PLOT # B2

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Lanyard - Ch.6 - 1.0Mbps - Headset/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.07 mW/g

Body - Lanyard - Ch.6 - 1 Mbps - Headset/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

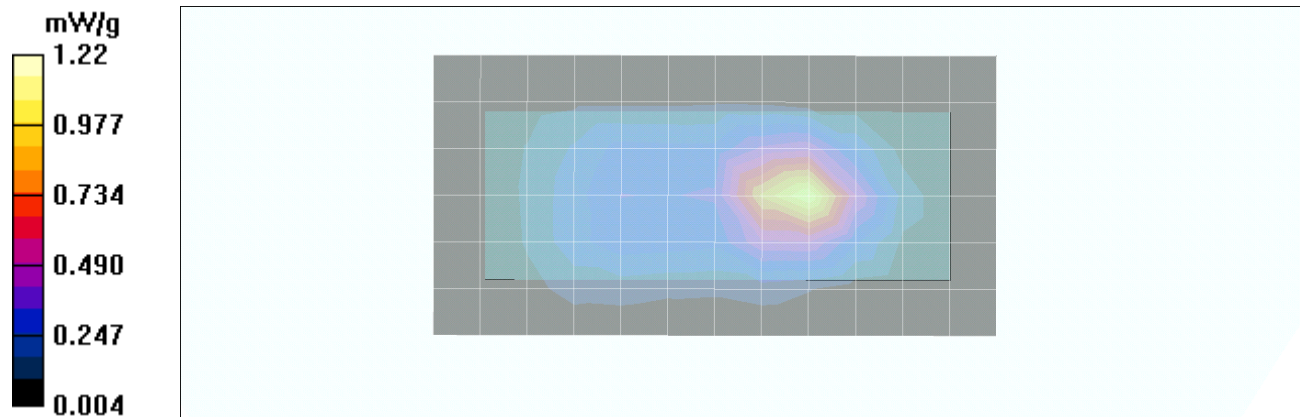
Reference Value = 24.6 V/m; Power Drift = -0.942 dB


Peak SAR (extrapolated) = 1.90 W/kg



SAR(1 g) = 0.935 mW/g; SAR(10 g) = 0.425 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.22 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Test Lab Certificate No. 2470.01

Test Date: 09/14/2012

PLOT # B3

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Universal Clip - Ch.6 – 1 Mbps/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.900 mW/g

Body - Universal Clip - Ch.6 – 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

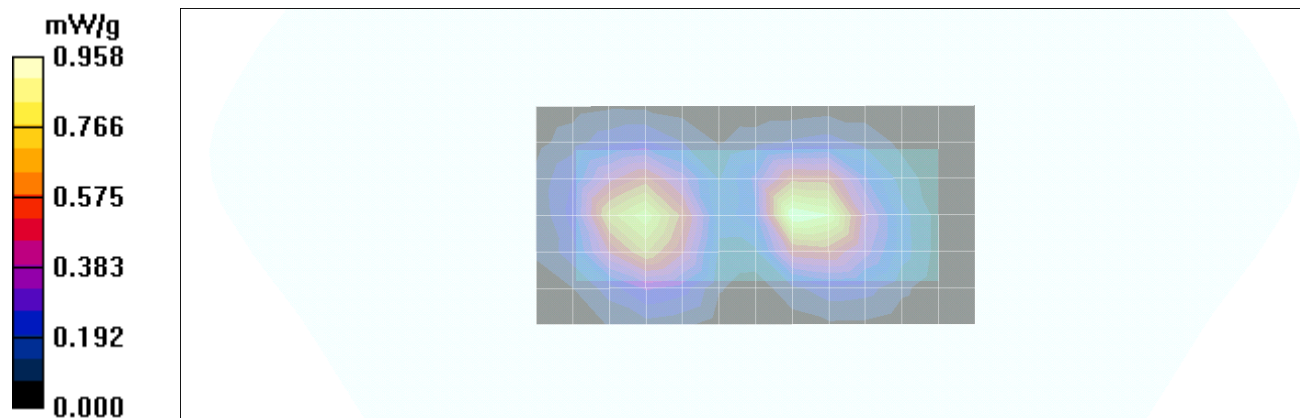
Reference Value = 20.5 V/m; Power Drift = -1.01 dB


Peak SAR (extrapolated) = 1.48 W/kg



SAR(1 g) = 0.766 mW/g; SAR(10 g) = 0.365 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.958 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Test Date: 09/14/2012

PLOT # B4

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Universal Clip - Ch.6 – 1 Mbps - Headset/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.977 mW/g

Body - Universal Clip - Ch.6 – 1 Mbps - Headset/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

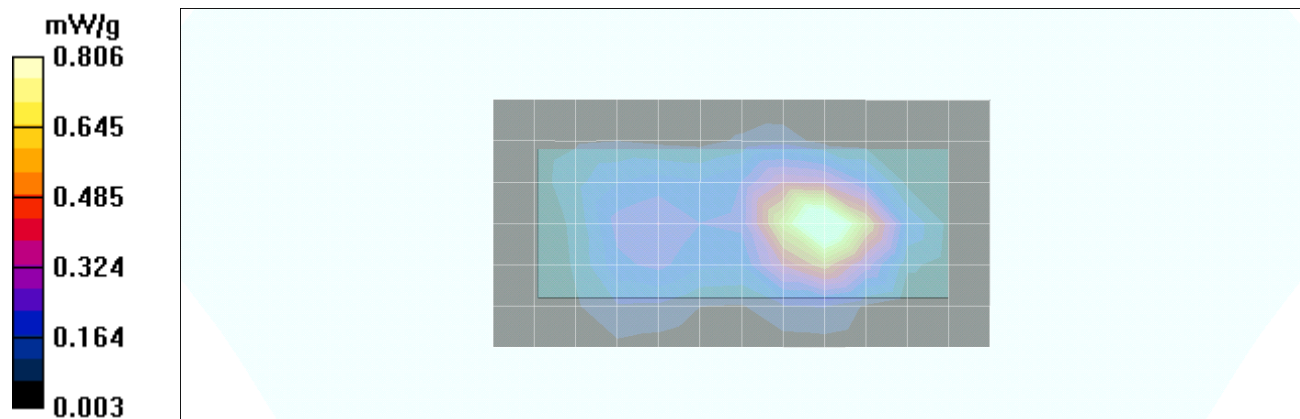
Reference Value = 20.5 V/m; Power Drift = -1.00 dB


Peak SAR (extrapolated) = 1.27 W/kg



SAR(1 g) = 0.640 mW/g; SAR(10 g) = 0.293 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.806 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Test Date: 09/14/2012

PLOT # B5

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2412 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Lanyard - Ch.1 – 1 Mbps/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.29 mW/g

Body - Lanyard - Ch.1 – 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

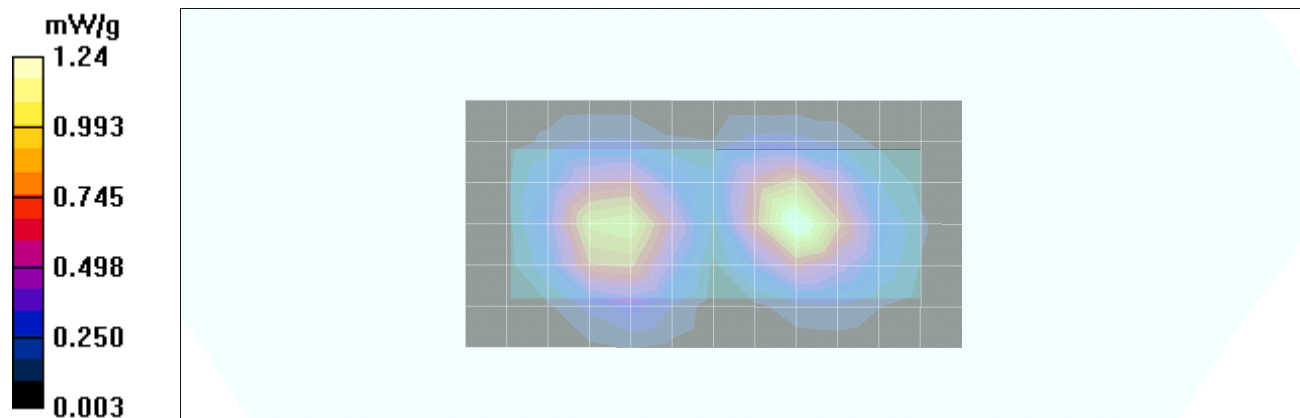
Reference Value = 25.6 V/m; Power Drift = -1.04 dB


Peak SAR (extrapolated) = 1.91 W/kg



SAR(1 g) = 0.952 mW/g; SAR(10 g) = 0.436 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.24 mW/g



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/14/2012

PLOT # B6

DUT: Vocera Communication Badge; Type: B3000; Serial: 6070F

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: 802.11b

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.97 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Lanyard - Ch.11 – 1 Mbps/Area Scan (7x13x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.08 mW/g

Body - Lanyard - Ch.11 – 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

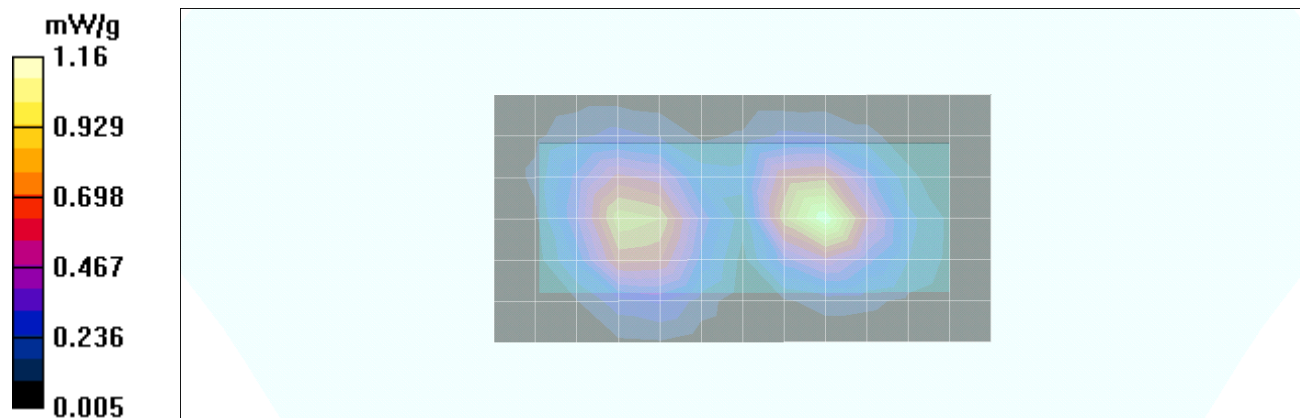
Reference Value = 23.1 V/m; Power Drift = -0.982 dB


Peak SAR (extrapolated) = 1.78 W/kg



SAR(1 g) = 0.882 mW/g; SAR(10 g) = 0.399 mW/g

Info: Interpolated medium parameters used for SAR evaluation.


Maximum value of SAR (measured) = 1.16 mW/g





Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Test Date: 09/12/2012

System Performance Check - 2450 MHz Dipole - Head

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 825; Calibrated: 25/04/2012

Ambient Temp: 23C; Fluid Temp: 24.5C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: CW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.88 \text{ mho/m}$; $\epsilon_r = 40.7$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.35, 6.35, 6.35); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head, d=10mm, Pin = 250mW/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 15.2 mW/g

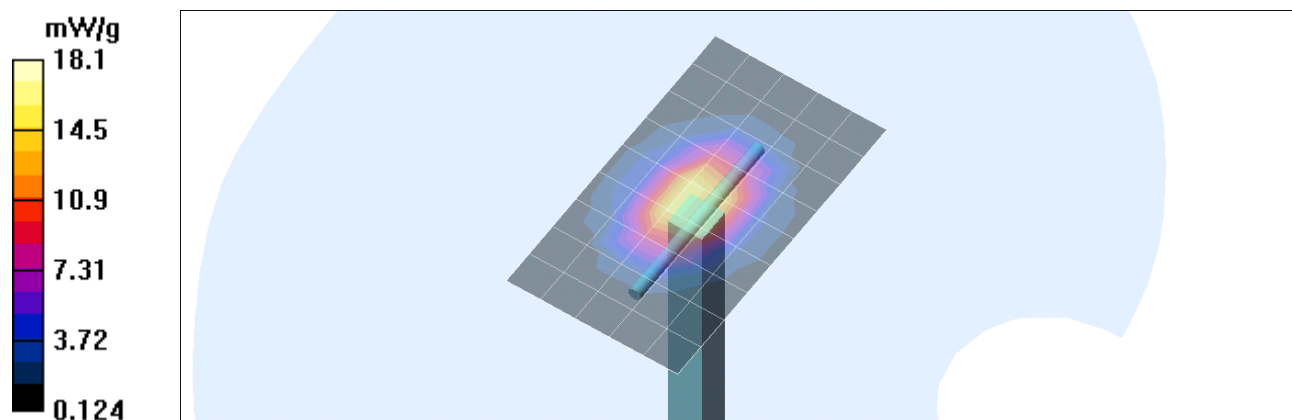
Head, d=10mm, Pin = 250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm


Reference Value = 99.3 V/m; Power Drift = -0.024 dB



Peak SAR (extrapolated) = 27.6 W/kg

SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.38 mW/g

Maximum value of SAR (measured) = 18.1 mW/g

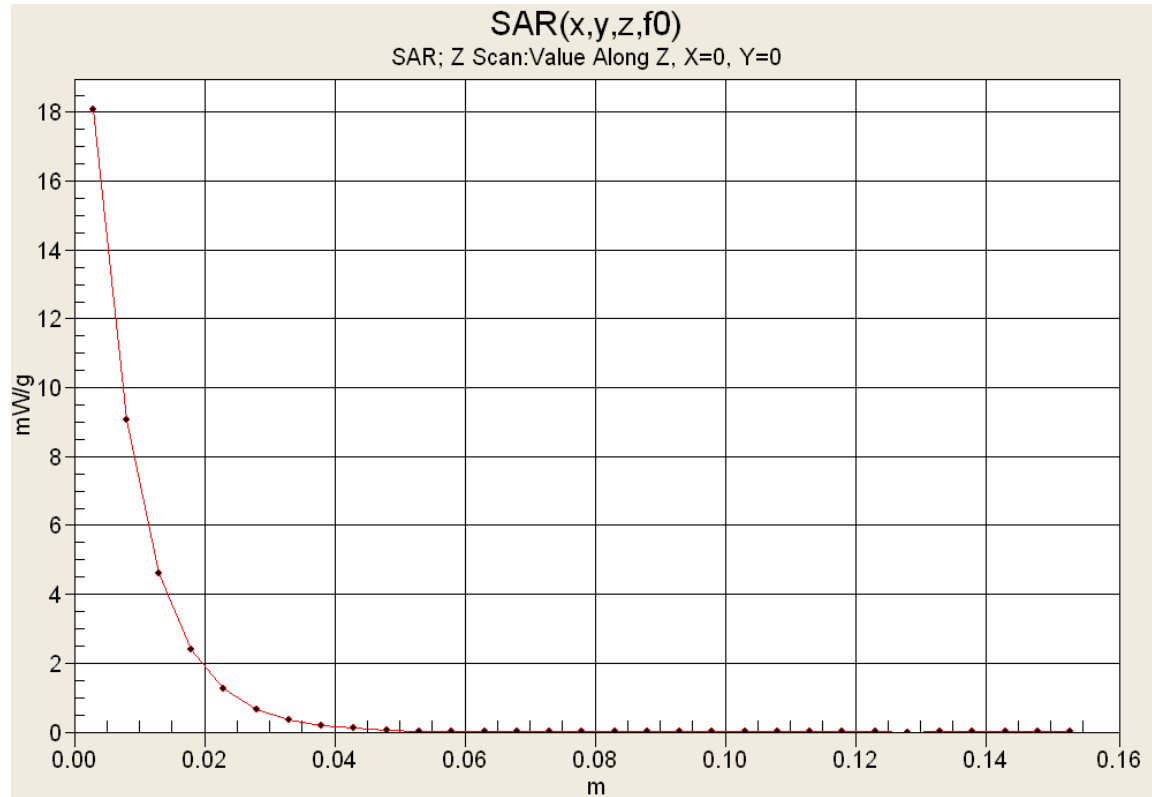



Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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Test Lab Certificate No. 2470.01

Z-axis Scan



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

Test Lab Certificate No. 2470.01

Test Date: 09/14/2012

System Performance Check - 2450 MHz Dipole - Body

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 825; Calibrated: 25/04/2012

Ambient Temp: 24C; Fluid Temp: 23.9C; Barometric Pressure: 101.1 kPa; Humidity: 30%

Communication System: CW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.97 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.34, 6.34, 6.34); Calibrated: 27/04/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450 MHz Dipole d=10mm P=250mW/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 15.0 mW/g

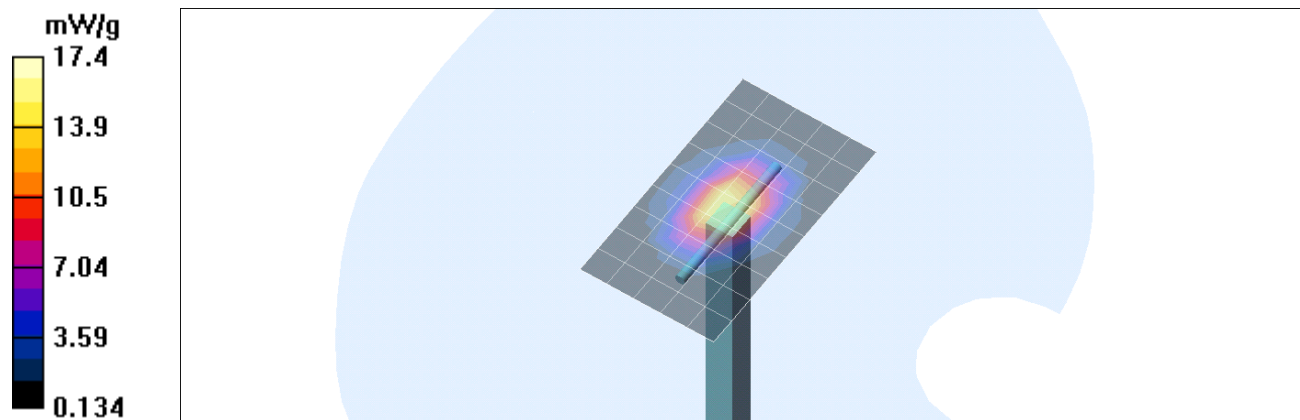
2450 MHz Dipole d=10mm P=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm


Reference Value = 93.0 V/m; Power Drift = 0.084 dB



Peak SAR (extrapolated) = 26.4 W/kg

SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.28 mW/g

Maximum value of SAR (measured) = 17.4 mW/g

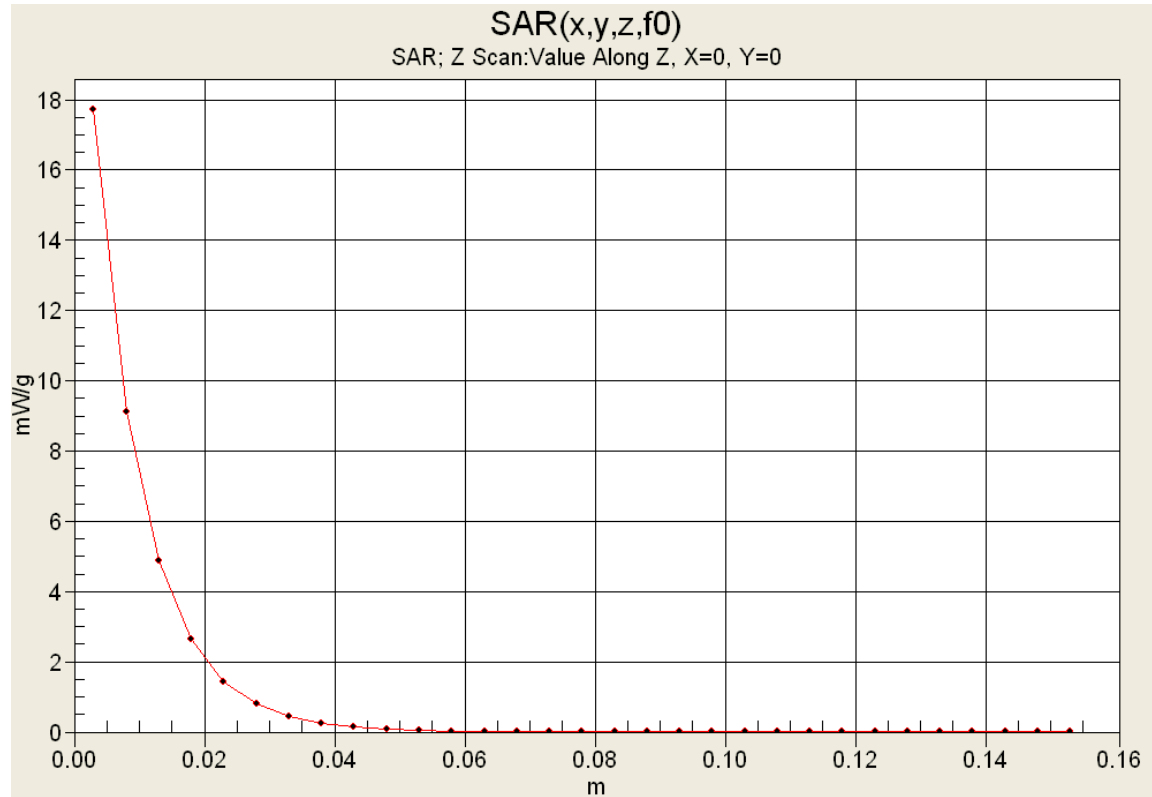



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

Test Lab Certificate No. 2470.01


Z-axis Scan





Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

2450 MHz Head

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

12/Sep/2012

Frequency (GHz)


FCC_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon



FCC_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

Freq	FCC_eHFCC_sH	Test_e	Test_s
2.3500	39.38 1.71	41.24	1.75
2.3600	39.36 1.72	41.08	1.76
2.3700	39.34 1.73	41.03	1.76
2.3800	39.32 1.74	41.03	1.77
2.3900	39.31 1.75	40.93	1.78
2.4000	39.29 1.76	40.70	1.79
2.4100	39.27 1.76	40.51	1.81
2.4200	39.25 1.77	40.57	1.84
2.4300	39.24 1.78	40.53	1.83
2.4400	39.22 1.79	40.63	1.88
2.4500	39.20 1.80	40.66	1.88
2.4600	39.19 1.81	40.68	1.88
2.4700	39.17 1.82	40.65	1.90
2.4800	39.16 1.83	40.78	1.89
2.4900	39.15 1.84	40.78	1.91
2.5000	39.14 1.85	40.31	1.94
2.5100	39.12 1.87	40.19	1.94
2.5200	39.11 1.88	40.30	1.95
2.5300	39.10 1.89	40.32	1.98
2.5400	39.09 1.90	40.12	1.99
2.5500	39.07 1.91	40.21	2.00

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

2450 MHz Head

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

13/Sep/2012

Frequency (GHz)


FCC_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon



FCC_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

Freq	FCC_eHFCC_sH	Test_e	Test_s
2.3500	39.38 1.71	40.41	1.80
2.3600	39.36 1.72	40.32	1.79
2.3700	39.34 1.73	40.54	1.81
2.3800	39.32 1.74	40.28	1.81
2.3900	39.31 1.75	40.30	1.83
2.4000	39.29 1.76	40.26	1.85
2.4100	39.27 1.76	40.23	1.85
2.4200	39.25 1.77	40.20	1.86
2.4300	39.24 1.78	40.34	1.89
2.4400	39.22 1.79	40.37	1.90
2.4500	39.20 1.80	40.32	1.90
2.4600	39.19 1.81	40.04	1.92
2.4700	39.17 1.82	40.21	1.93
2.4800	39.16 1.83	40.22	1.95
2.4900	39.15 1.84	39.87	1.95
2.5000	39.14 1.85	40.04	1.97
2.5100	39.12 1.87	39.97	1.98
2.5200	39.11 1.88	39.90	1.98
2.5300	39.10 1.89	39.88	2.00
2.5400	39.09 1.90	40.03	2.03
2.5500	39.07 1.91	39.67	2.05


Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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 <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 <small>Test Lab Certificate No. 2470.01</small>
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

2450 MHz Body


Celltech Labs Inc.
 Test Result for UIM Dielectric Parameter
 14/Sep/2012
 Frequency (GHz)
 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	51.96	1.81
2.3600	52.82	1.86	52.04	1.81
2.3700	52.81	1.87	51.92	1.84
2.3800	52.79	1.88	51.79	1.84
2.3900	52.78	1.89	52.02	1.87
2.4000	52.77	1.90	51.74	1.89
2.4100	52.75	1.91	51.79	1.90
2.4200	52.74	1.92	51.94	1.93
2.4300	52.73	1.93	51.83	1.98
2.4400	52.71	1.94	51.79	1.95
2.4500	52.70	1.95	51.75	1.97
2.4600	52.69	1.96	51.91	1.97
2.4700	52.67	1.98	51.78	1.99
2.4800	52.66	1.99	51.65	2.00
2.4900	52.65	2.01	51.32	1.99
2.5000	52.64	2.02	51.42	2.02
2.5100	52.62	2.04	51.49	2.00
2.5200	52.61	2.05	51.50	2.03
2.5300	52.60	2.06	51.31	2.04
2.5400	52.59	2.08	51.48	2.11
2.5500	52.57	2.09	51.65	2.11

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS


Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

HEAD SAR TEST SETUP PHOTOGRAPHS

Left Head Section / Cheek-Touch Position




Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

HEAD SAR TEST SETUP PHOTOGRAPHS

Left Head Section / Ear-Tilt Position (15°)




Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

HEAD SAR TEST SETUP PHOTOGRAPHS

Right Head Section / Cheek-Touch Position




Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

HEAD SAR TEST SETUP PHOTOGRAPHS

Right Head Section / Ear-Tilt Position (15°)

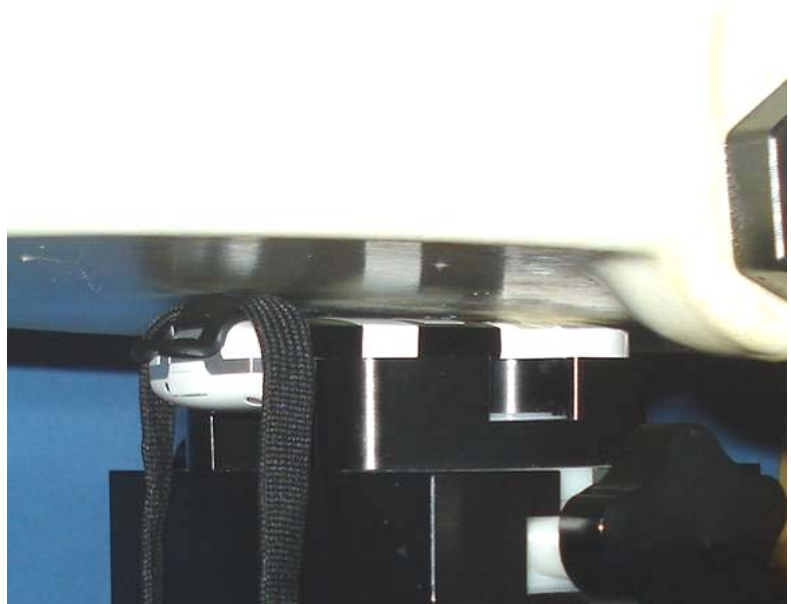
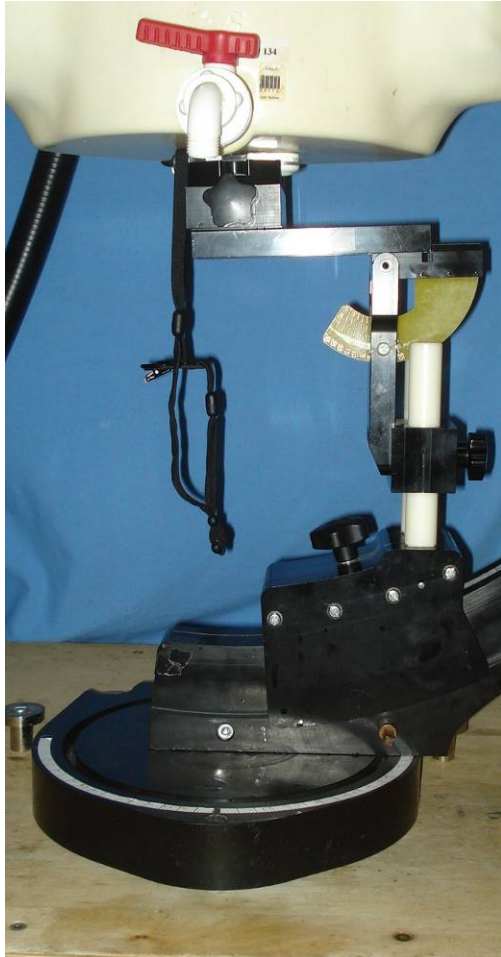



Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

BODY SAR TEST SETUP PHOTOGRAPHS

DUT with Body-worn Accessory #1 - no audio accessory

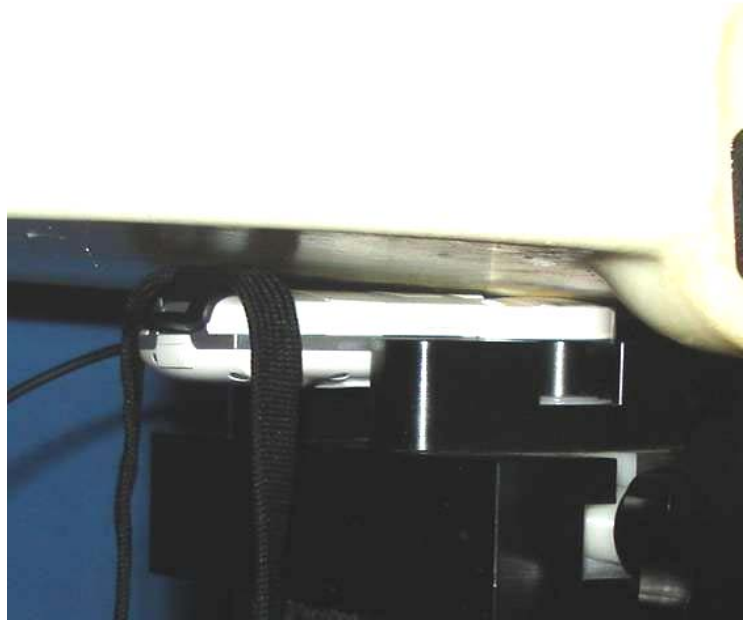



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

BODY SAR TEST SETUP PHOTOGRAPHS

DUT with Body-worn Accessory #1 & Audio Accessory #1

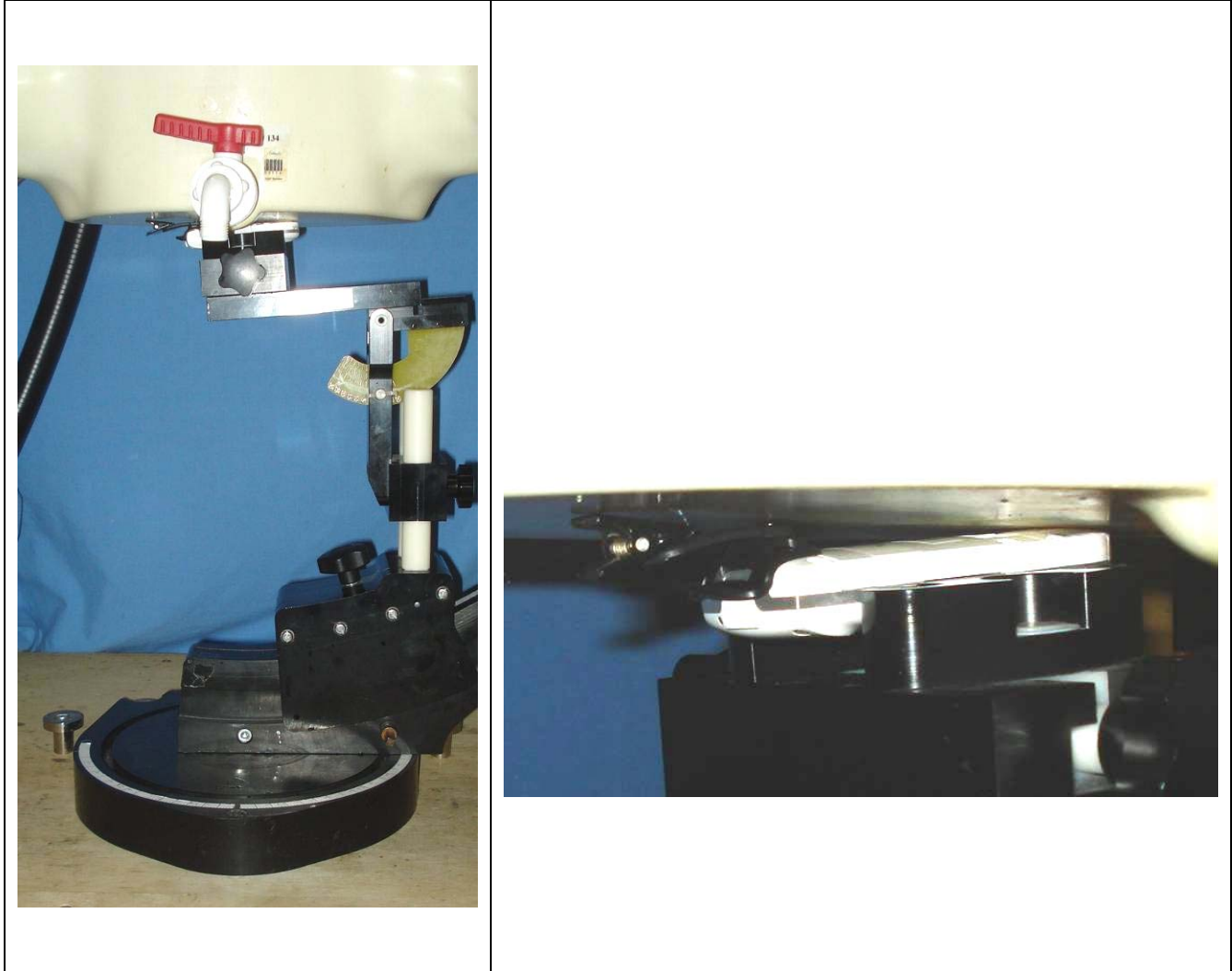



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

BODY SAR TEST SETUP PHOTOGRAPHS

DUT with Body-worn Accessory #2 - no Audio Accessory

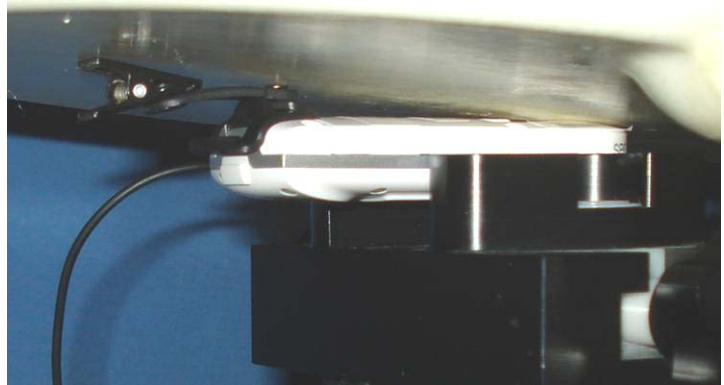



Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

BODY SAR TEST SETUP PHOTOGRAPHS

DUT with Body-worn Accessory #2 & Audio Accessory #1






Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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 Celltech Testing and Engineering Services Lab	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

DUT PHOTOGRAPHS


			
Front Side of DUT	Left Side of DUT	Back Side of DUT	Right Side of DUT
			
Bottom end of DUT	Top end of DUT		



Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

DUT PHOTOGRAPHS

		
Back Side of DUT (batt. removed)	Lithium Polymer Battery P/N: 230-01977	

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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	Date(s) of Evaluation Sept. 12-14, 2012	Test Report Serial No. 083112QGZ-T1194-S15W	Test Report Revision No. Rev. 1.1 (2nd Release)	
	Test Report Issue Date September 21, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Gen. Pop. / Uncontrolled	

Test Lab Certificate No. 2470.01

DUT PHOTOGRAPHS



Body-worn Accessory #1 (Lanyard P/N: 230-01995)



DUT with Body-worn Accessory #1






Body-worn Accessory #2 (Universal Clip P/N: 230-01985)



DUT with Body-worn Accessory #2

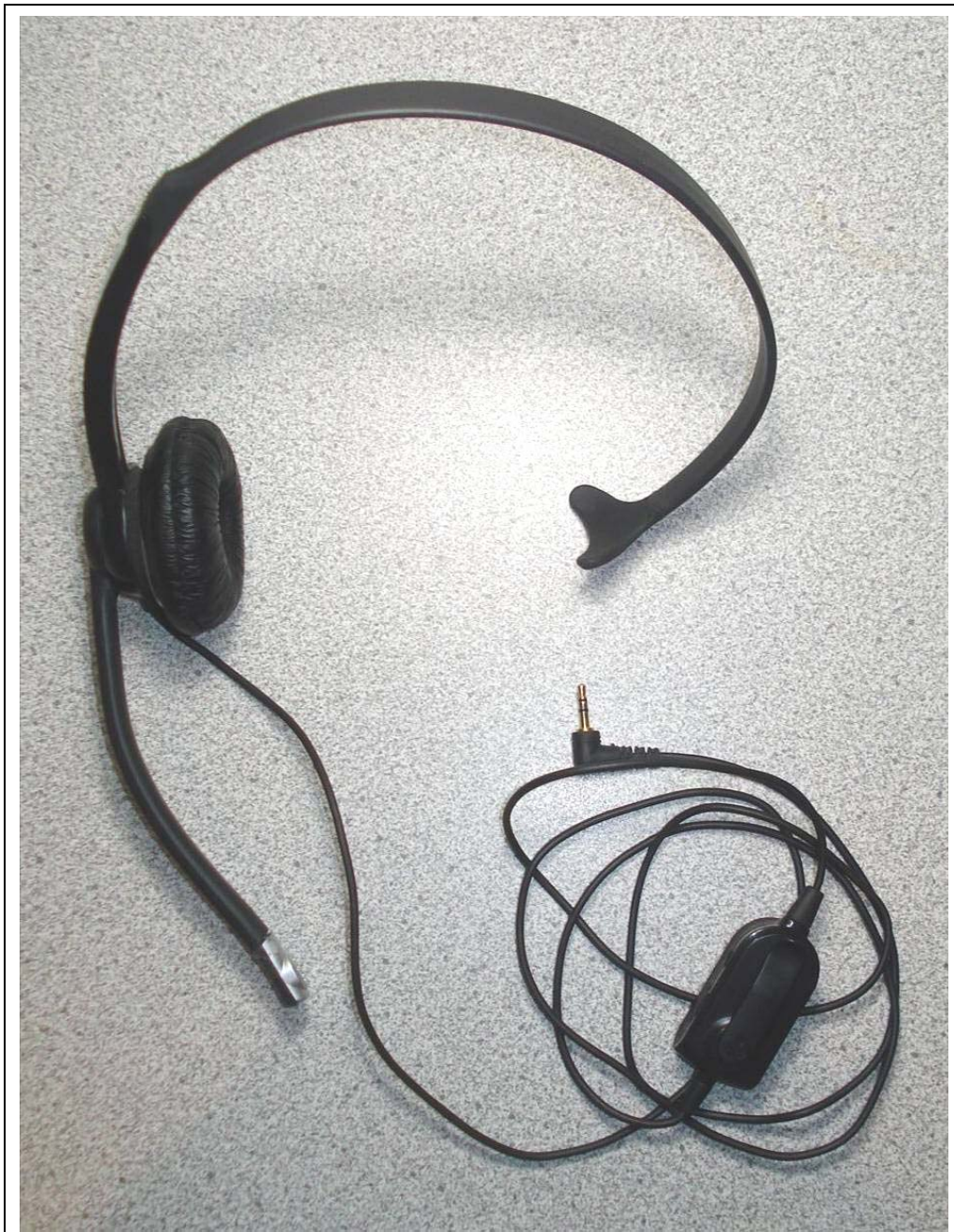


Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	



Test Lab Certificate No. 2470.01

DUT PHOTOGRAPHS




Audio Accessory #1 (Headset)

Applicant:	Vocera Communications Inc.		FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth				
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	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

APPENDIX E - DIPOLE CALIBRATION

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Celltech**

Certificate No: **D2450V2-825_Apr12**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 825**

Calibration procedure(s) **QA CAL-05.v8**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **April 25, 2012**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

Calibrated by: **Name** **Function** **Signature**
Jeton Kastrati **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Issued: April 25, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	39.6 \pm 6 %	1.81 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.7 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	50.8 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.90 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.6 mW / g \pm 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 \pm 0.2) °C	52.4 \pm 6 %	1.98 mho/m \pm 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	50.4 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.91 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.5 mW / g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 Ω + 5.5 j Ω
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.4 Ω + 6.1 j Ω
Return Loss	- 24.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.159 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 11, 2008

DASY5 Validation Report for Head TSL

Date: 25.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 825

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

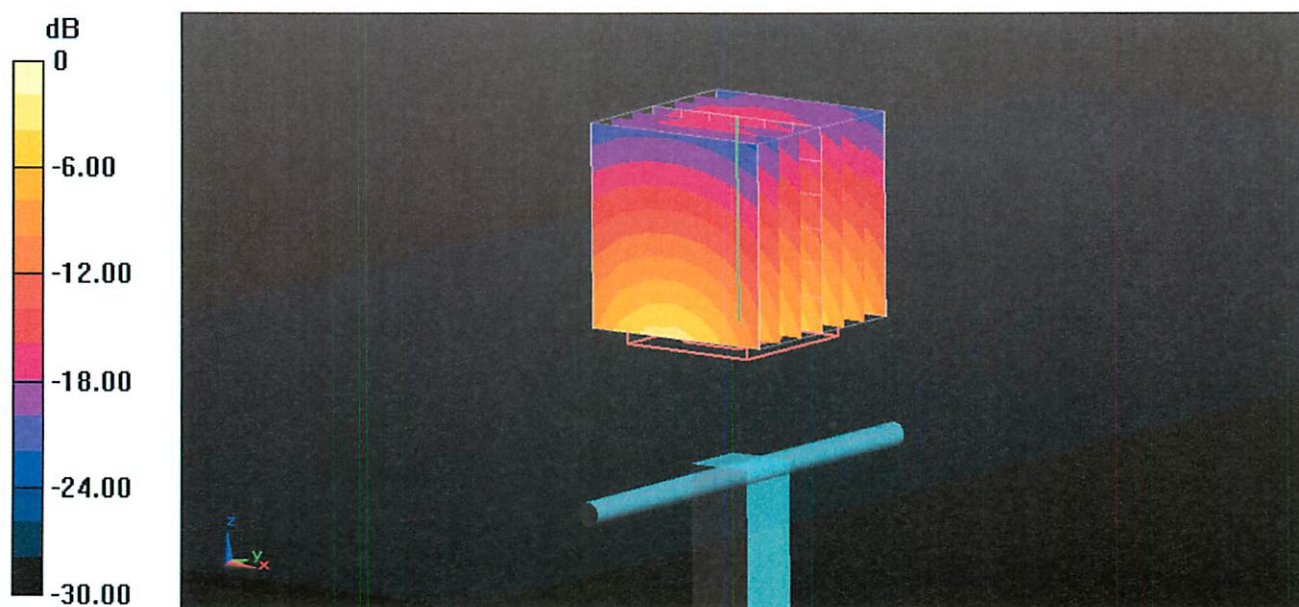
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.271 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 26.216 mW/g

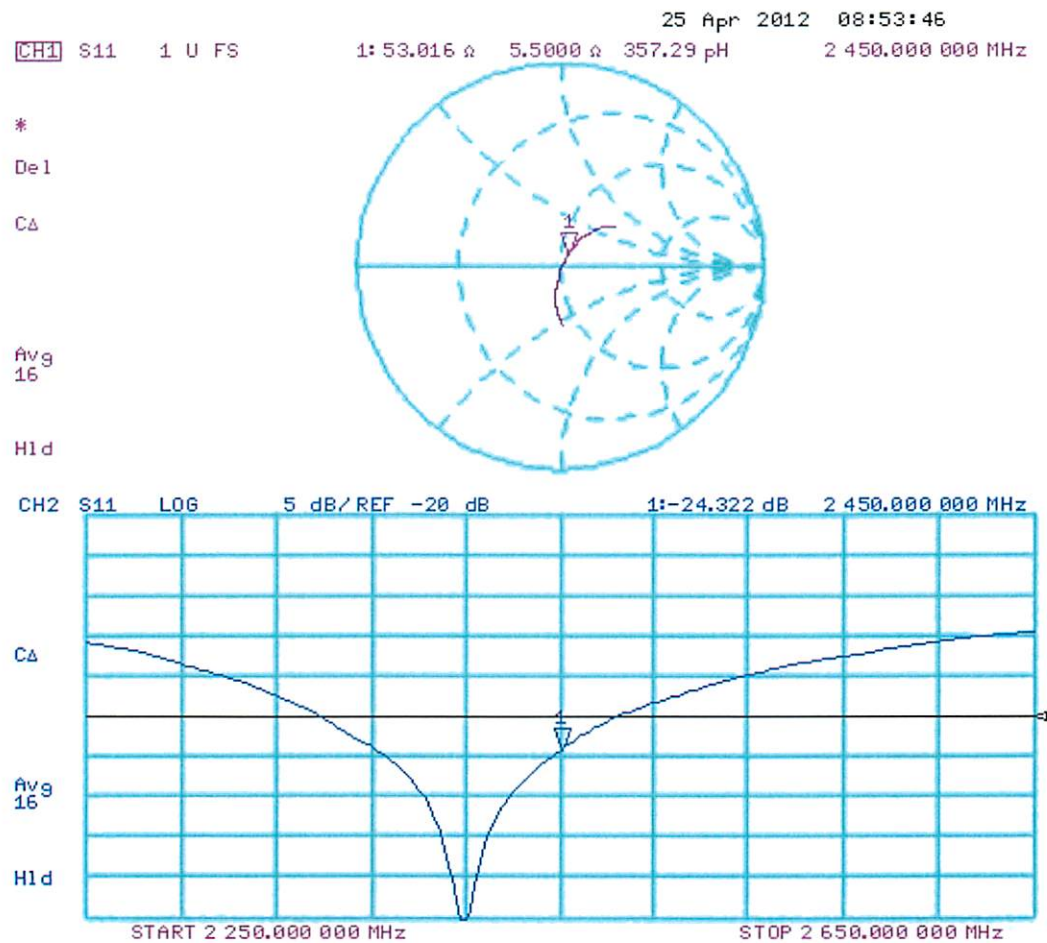
SAR(1 g) = 12.7 mW/g; SAR(10 g) = 5.9 mW/g

Maximum value of SAR (measured) = 16.5 mW/g



0 dB = 16.5 mW/g = 24.35 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 25.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 825

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.98$ mho/m; $\epsilon_r = 52.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

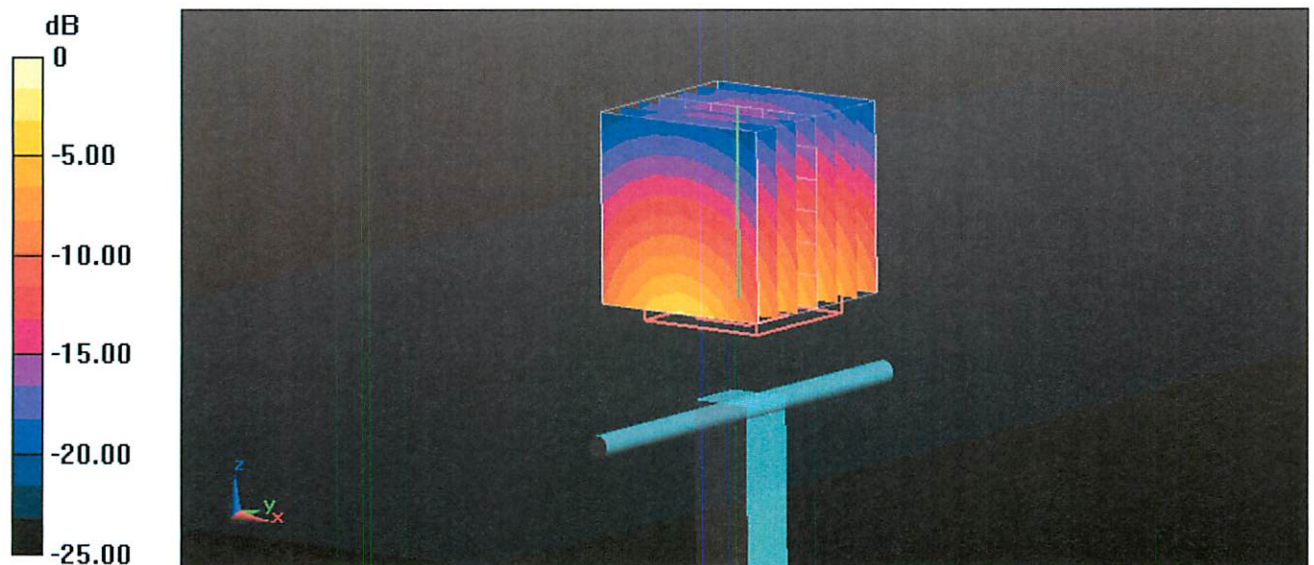
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.157 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 25.807 mW/g

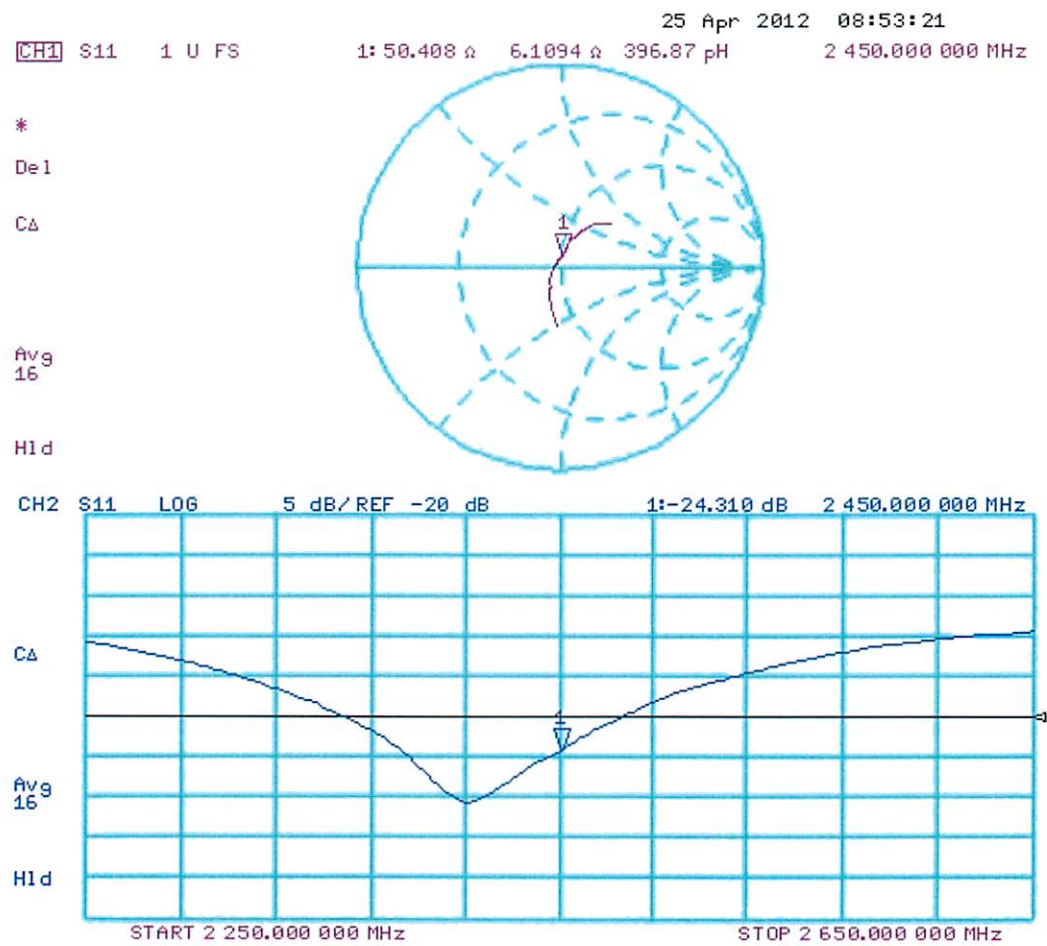
SAR(1 g) = 12.7 mW/g; SAR(10 g) = 5.91 mW/g



Maximum value of SAR (measured) = 16.7 mW/g




0 dB = 16.7 mW/g = 24.45 dB mW/g

Impedance Measurement Plot for Body TSL



	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

APPENDIX F - PROBE CALIBRATION

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Client **Celltech**

Certificate No: **EX3-3600_Apr12**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3600**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4**
Calibration procedure for dosimetric E-field probes

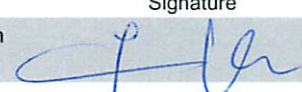

Calibration date: **April 27, 2012**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: April 28, 2012			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN:3600

Manufactured: January 10, 2007
Calibrated: April 27, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3600

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.50	0.52	0.38	± 10.1 %
DCP (mV) ^B	100.3	99.1	99.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
0	CW	0.00	X	0.00	0.00	1.00	111.1	±2.5 %
			Y	0.00	0.00	1.00	118.1	
			Z	0.00	0.00	1.00	123.5	

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

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3600

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
1810	40.0	1.40	7.12	7.12	7.12	0.14	1.52	± 12.0 %
1950	40.0	1.40	6.83	6.83	6.83	0.13	1.69	± 12.0 %
2450	39.2	1.80	6.35	6.35	6.35	0.24	1.29	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3600

Calibration Parameter Determined in Body Tissue Simulating Media

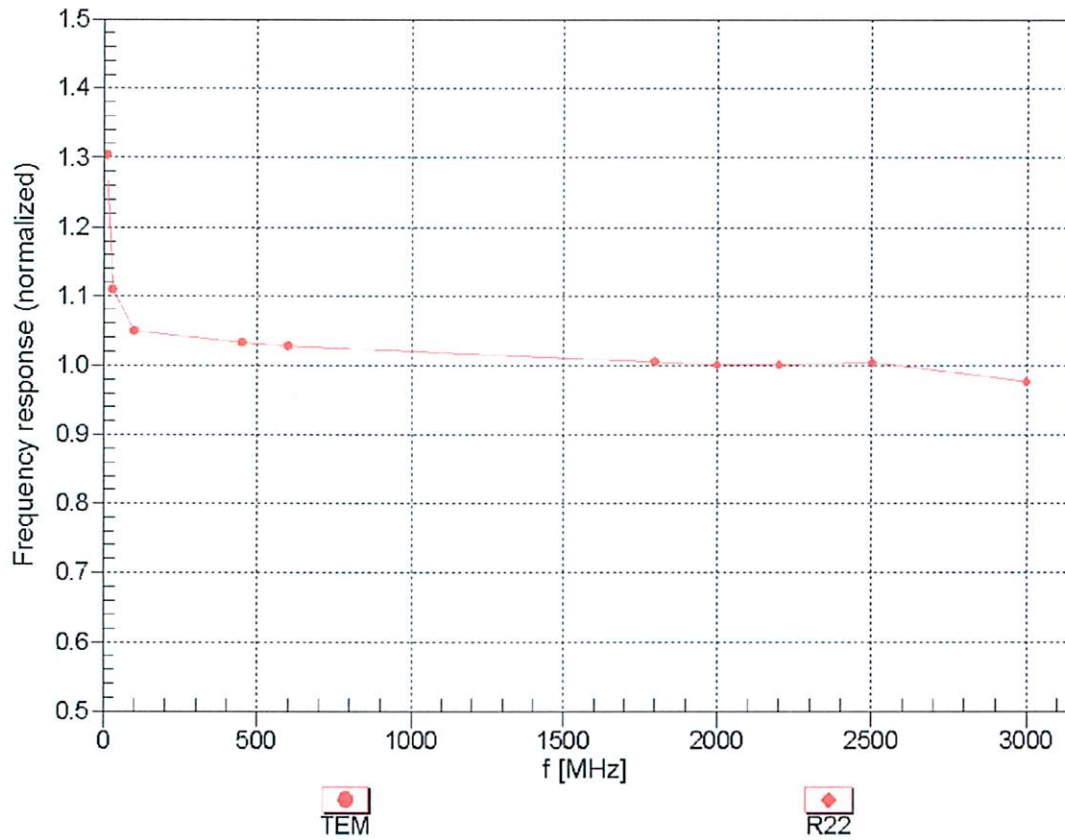
f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Uct. (k=2)
1810	53.3	1.52	6.80	6.80	6.80	0.11	3.00	± 12.0 %
1950	53.3	1.52	6.72	6.72	6.72	0.16	1.10	± 12.0 %
2450	52.7	1.95	6.34	6.34	6.34	0.79	0.50	± 12.0 %
5200	49.0	5.30	3.78	3.78	3.78	0.55	1.90	± 13.1 %
5500	48.6	5.65	3.29	3.29	3.29	0.60	1.90	± 13.1 %
5800	48.2	6.00	3.39	3.39	3.39	0.60	1.90	± 13.1 %

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field

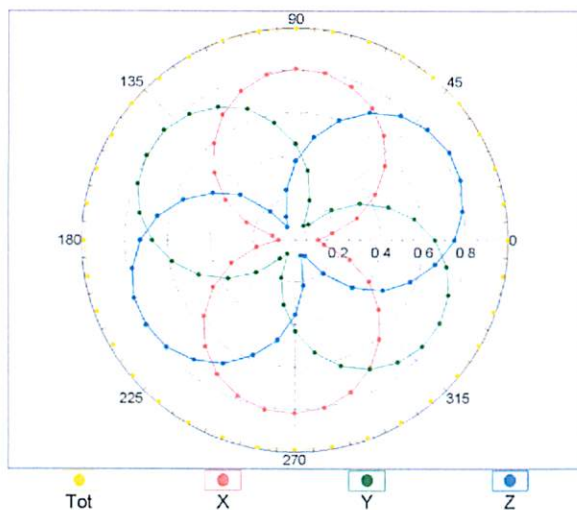
(TEM-Cell:ifi110 EXX, Waveguide: R22)



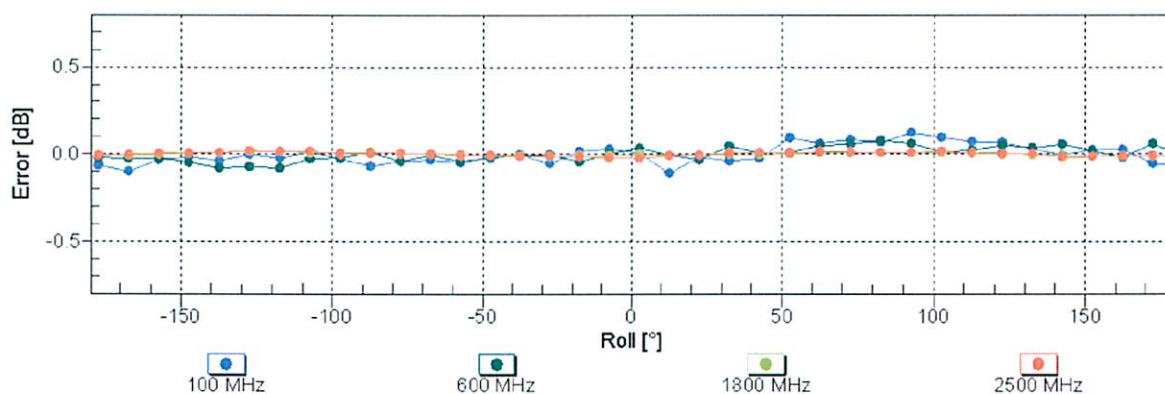
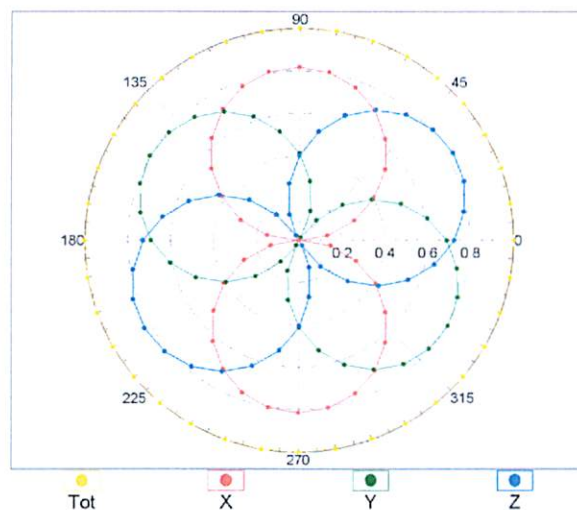
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

f=600 MHz, TEM

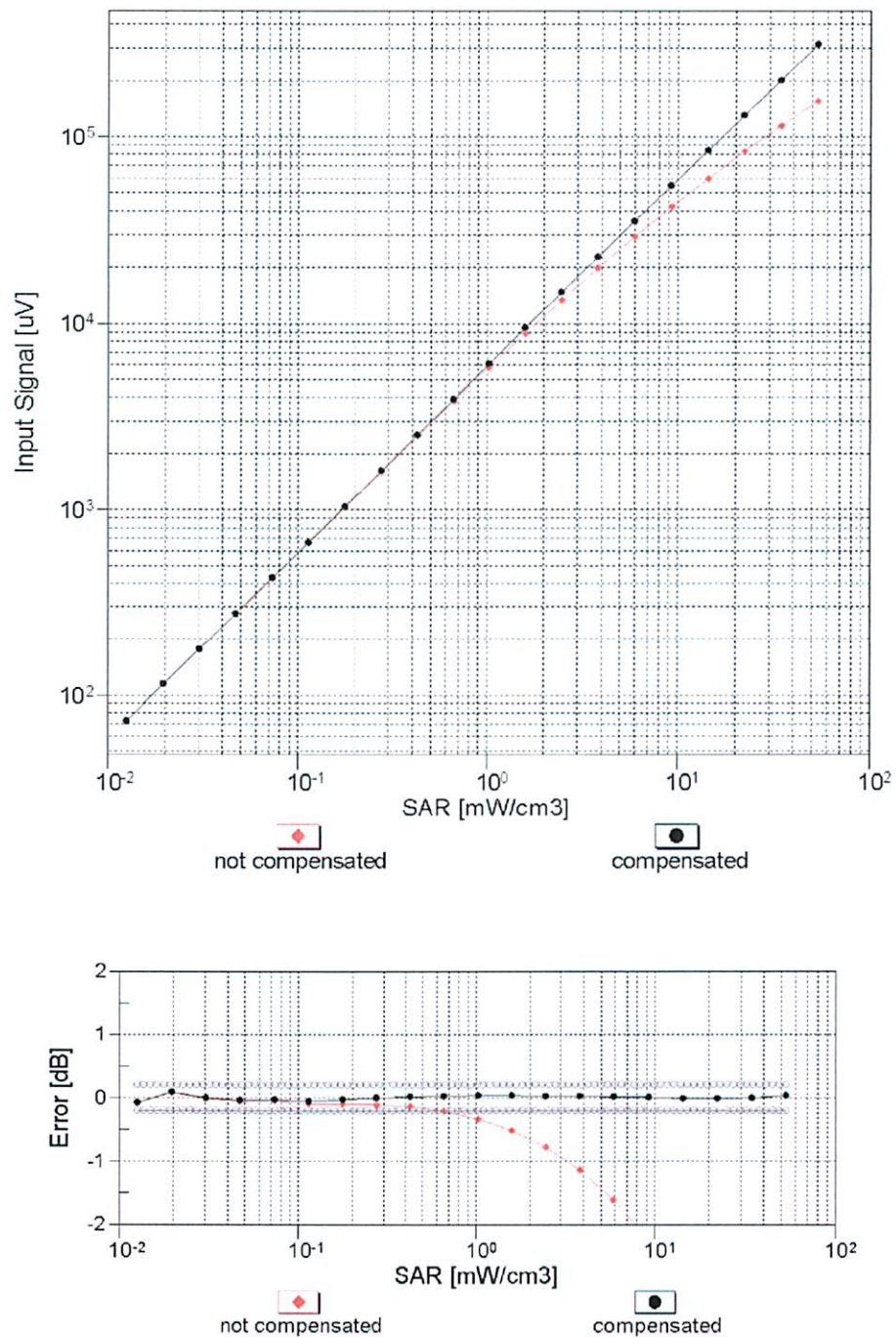


f=1800 MHz, R22



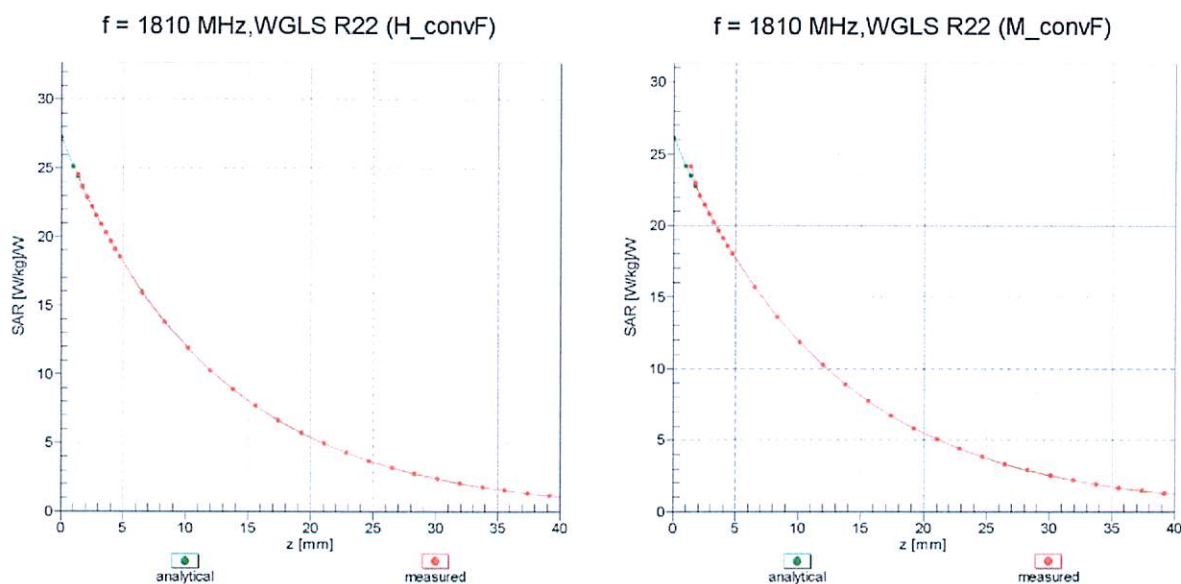
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell , $f = 900 \text{ MHz}$)



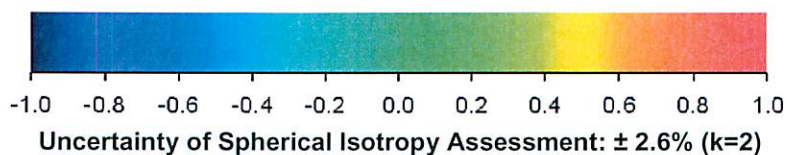
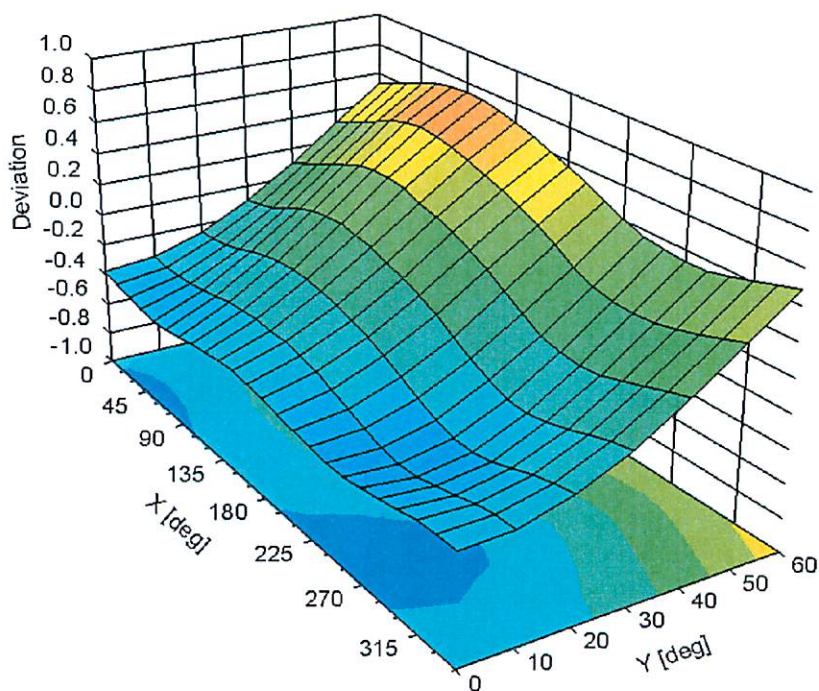
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid



Error (ϕ, θ), $f = 900 \text{ MHz}$




DASY/EASY - Parameters of Probe: EX3DV4 - SN:3600

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	32.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

	<u>Date(s) of Evaluation</u> Sept. 12-14, 2012	<u>Test Report Serial No.</u> 083112QGZ-T1194-S15W	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> September 21, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Gen. Pop. / Uncontrolled	

APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY

Applicant:	Vocera Communications Inc.	FCC ID:	QGZAB3000	IC:	4362A-B3000	
Model(s):	B3000	DUT Type:	Portable Communication Badge with 802.11b/g WLAN & Bluetooth			
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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

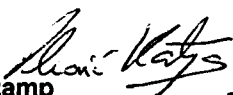
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

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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