DECLARATION OF COMPLIANCE

SAR RF EXPOSURE EVALUATION - FCC / IC Original Filing

TEST LAB INFORMATION	Name	CELLTECH LABS INC.			
	Address	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada			
TEST LAB ACCREDITATION	Type	ISO / IEC 17025	Accreditation	A2LA Test Lab Certificate No. 2470.01	
APPLICANT INFORMATION	Name	VOCERA COMMUNICATIONS INC.			
	Address	525 Race Street, Suite 150, San Jose, CA 95126 United States			
STANDARDS APPLIED	FCC	47 CFR §2.1093	IC	Health Canada Safety Code 6	
PROCEDURES APPLIED	FCC	KDB 447498 D01v05r01, KDB 865664 D01v01r03	IC	RSS102 Issue 4	
	FCC	KDB 865664 D02v01r01, KDB 643646 D01v01r01	IEC	62209-1:2005	
	IEEE	IEEE 1528-2013	IEC	62209-2:2010	
DEVICE CLASSIFICATION	FCC	Digital Transmission System (DTS) - §15 Subpart C			
	FCC	Unlicensed National Information Infrastructure TX (NII) - §15 Subpart E			
	IC	Low Power License-Exempt Radiocommunication Device (RSS-210 Issue 8)			
DEVICE DESCRIPTION	Portable Communications Device with 802.11a/b/g/n WLAN (Held-to-ear and Body-Worn)				
APPLICATION TYPE	Original Filing				
DATE(S) OF EVALUATION	May 26 - June 18, Oct 16-17, 2014		SAMPLES RECEIVED		
DEVICE IDENTIFIERS	FCC ID	QGZB3000N	IC ID	4632A-B3000N	TEST SAMPLE S/N #4A

Devices Tested

Model	Internal Transmitters	Modulation & Data Rates	Frequency Range	Manufacturer's Rated Output Power
B3000N	802.11a	OFDM (6, 9, 12, 24, 36, 48, 54 Mbps)	5180 – 5825 MHz	15dBm
	802.11b	DBPSK (1 Mbps), DQPSK (2 Mbps), CCK (5.5, 11 Mbps)	2412 – 2462 MHz	16.5dBm
	802.11g	OFDM (6, 9, 12, 24, 36, 48, 54 Mbps)	2412 – 2462 MHz	16.5dBm
	802.11n	MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7	2412 – 2462 MHz 5180 – 5825 MHz	16.5dBm 15dBm
	Bluetooth	BT2.0 and BT3.0 @71% TDC	2402 – 2488MHz	4.7, 4.3dBm

Antennas Tested	Batteries Tested		
Internal (Quarter-wave Monopole)	Lithium-Polymer	3.7V, 645mAh	P/N: 230-01977

Body-Warn Accessories Tested		Audio Accessories Tested		
Description	Part Number	Part Number	Description	
Lanyard (Contains Metal)	P/N: 230-01995		Wired Headset	Previously Evaluated
Universal Clip (Contains Metal)	P/N: 230-01985		BlueTooth Headset	

EVALUATION RESULTS

Maximum SAR Level Evaluated FCC*	Head	1.42	W/kg	1g	FCC/IC SAR Limit	General Public / Uncontrolled
	Body	0.993				
Maximum SAR Level Evaluated IC*	Head	1.42			1.6 W/kg	
	Body	0.993			1g average	

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada 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 1528-2013 and International Standard IEC 62209-2:2010. All measurements were performed in accordance with the SAR system manufacturer recommendations.

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The results and statements contained in this report pertain only to the device(s) evaluated

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.

Test Report Approved By		Art Voss, P.Eng.	Senior Engineer	Celltech Labs Inc.

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TEST REPORT REVISION HISTORY			
REVISION NO.	**DESCRIPTION**	**IMPLEMENTED BY**	**RELEASE DATE**
1.0	1st Release	Art Voss	July 18, 2014
1.1	2nd Release – Report Corrections	Art Voss	July 25, 2014
1.2	3rd Release – Reduce File Size	Art Voss	Sep 11, 2014
1.3	4th Release – Re-Evaluate Certain Plots	Art Voss	Oct 17, 2014
1.4	5th Release – Remove Previous Data	Art Voss	Oct 21, 2014

TEST REPORT SIGN-OFF			
DEVICE TESTED BY	**REPORT PREPARED BY**	**QA REVIEW BY**	**REPORT APPROVED BY**
Art Voss	Cheri Frangiadakis	Art Voss	Art Voss

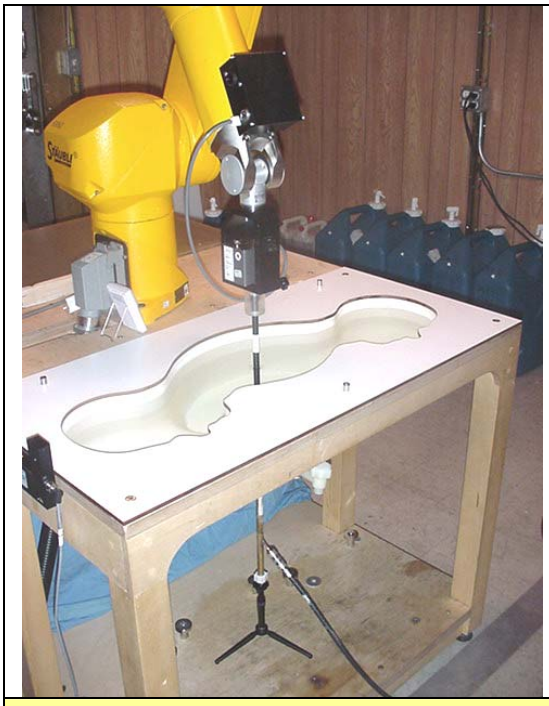
1.0 STATEMENT OF COMPLIANCE

This measurement report demonstrates that the Vocera Communications Inc. NorthStar B3000N Portable Communications Device with 802.11a/b/g/n WLAN complies with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) for the General Population / Uncontrolled Exposure environment. The measurement procedures described in KDB 447498 (see reference [8]), KDB 865664 (see reference [9]), IC RSS-102 Issue 4 (see reference [4]), IEEE Standard 1528-2013 (see reference [5]) and IEC Standard 62209-2:2010 (see reference [6]) were employed. A description of the device, operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used and the various provisions of the rules are included within this test report.

*This device was evaluated at 100% WiFi Transmit Duty Cycle.

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 uses a controller with a built in VME-bus computer.



DASY4 System with SAM Twin Phantom V4.0C

DASY4 Measurement Server

3.0 RF CONDUCTED OUTPUT POWER MEASUREMENTS

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	15.10		15.00		14.90		14.85	
802.11g Mode			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
2412	1	18	15.10	15.00	14.95	15.00	14.85	14.80	14.85	14.80
802.11n Mode			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
2412	1	18	14.90	14.85	14.85	14.85	14.80	14.80	14.80	14.75
802.11a Mode			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
5180	36	16	13.20	13.10	13.50	13.60	13.40	13.35	13.40	13.35
802.11n Mode			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
5180	36	16	13.30	13.70	13.30	13.55	13.60	13.50	13.60	13.50

RF CONDUCTED OUTPUT POWER MEASUREMENTS (2 GHz)					
Freq. (MHz)	Ch.	Power Setting	Average Conducted RF Output Power Levels (dBm)		
			802.11b	802.11g	802.11n
			1 Mbps	6 Mbps	MCS0
2412	1	18	15.10	15.10	14.90
2417	2	18	15.10	15.10	14.90
2422	3	18	15.30	15.05	14.95
2427	4	18	15.30	15.10	15.00
2432	5	18	14.90	14.75	14.65
2437	6	18	14.90	14.75	14.70
2442	7	18	15.00	14.80	14.75
2447	8	18	15.00	14.90	14.80
2452	9	18	15.05	14.95	14.85
2457	10	18	15.10	15.00	14.90
2462	11	18	15.10	14.80	14.70
2467	12	18	15.15	14.80	14.75
2472	13	18	15.20	14.90	14.80

RF CONDUCTED OUTPUT POWER MEASUREMENTS (5GHz)				
Freq. (MHz)	Ch.	Power Setting	Average Conducted RF Output Power Levels (dBm)	
			802.11a	802.11n
			6 Mbps	MCS0
5180	36	16	13.20	13.30
5200	40	16	13.60	13.75
5220	44	16	13.70	13.75
5240	48	16	13.70	13.75
5260	52	16	13.75	13.80
5280	56	16	14.20	14.25
5300	60	16	14.20	14.30
5320	64	16	14.20	14.25
5500	100	16	13.90	14.00
5520	104	16	14.00	14.10
5540	108	16	14.05	14.15
5560	112	16	14.10	14.20
5580	116	16	14.15	14.20
5600	120	16	14.15	14.20
5620	124	16	14.10	14.15
5640	128	16	14.05	14.10
5660	132	16	14.40	14.45
5680	136	16	14.45	14.40
5700	140	16	14.35	14.25
5745	149	16	13.30	13.40
5765	153	16	13.65	13.65
5785	157	16	13.50	13.50
5810	161	16	13.80	13.80
5825	165	16	13.65	13.60

Notes:

1. The conducted output power levels of the DUT were measured using a modified DUT provided by Vocera Communications.
2. The maximum output power of the Bluetooth (BT) is 4.7dBm (<3.0 mW) and does not simultaneously transmit with any other mode. As per KDB 447498 4.3.1: SAR Test Exclusion may be applied.

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
		Bluetooth Headset

5.0 FLUID DIELECTRIC PARAMETERS

FLUID DIELECTRIC PARAMETERS						
Date: 23 May 2014		Frequency: 2450 MHz			Tissue: Body	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
2350	51.40	1.78	52.83	1.85	-2.71%	-3.78%
2360	51.36	1.82	52.82	1.86	-2.76%	-2.15%
2370	51.21	1.80	52.81	1.87	-3.03%	-3.74%
2380	51.15	1.82	52.79	1.88	-3.11%	-3.19%
2390	51.23	1.83	52.78	1.89	-2.94%	-3.17%
2400	51.09	1.87	52.77	1.90	-3.18%	-1.58%
2410	51.27	1.87	52.75	1.91	-2.81%	-2.09%
2412*	51.20	1.87	52.75	1.91	-2.94%	-2.09%
2420	51.04	1.88	52.74	1.92	-3.22%	-2.08%
2430	50.88	1.91	52.73	1.93	-3.51%	-1.04%
2437*	51.00	1.92	52.72	1.94	-3.26%	-1.03%
2440	51.09	1.93	52.71	1.94	-3.07%	-0.52%
2450	51.00	1.94	52.70	1.95	-3.23%	-0.51%
2457*	50.90	1.93	52.69	1.96	-3.40%	-1.53%
2460	50.85	1.94	52.69	1.96	-3.49%	-1.02%
2470	51.10	1.93	52.67	1.98	-2.98%	-2.53%
2480	50.87	1.98	52.66	1.99	-3.40%	-0.50%
2490	50.73	1.98	52.65	2.01	-3.65%	-1.49%
2500	50.69	1.99	52.64	2.02	-3.70%	-1.49%
2510	50.76	1.99	52.62	2.04	-3.53%	-2.45%
2520	50.65	2.03	52.61	2.05	-3.73%	-0.98%
2530	50.54	2.01	52.60	2.06	-3.92%	-2.43%
2540	50.62	2.03	52.59	2.08	-3.75%	-2.40%
2550	50.54	2.06	52.57	2.09	-3.86%	-1.44%

*interpolated using DASY4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
May 26	2450 Body	23°C	23.0°C	≥ 15 cm	102.6 kPa	32%	1000
May 27	2450 Body	23°C	22.7°C	≥ 15 cm	102.6 kPa	24%	1000
May 29	2450 Body	24°C	23.0°C	≥ 15 cm	102.6 kPa	31%	1000
May 30	2450 Body	24°C	22.6°C	≥ 15 cm	102.6 kPa	27%	1000
May 31	2450 Body	24°C	23.0°C	≥ 15 cm	102.6 kPa	26%	1000

FLUID DIELECTRIC PARAMETERS

Date: 2 June 2014		Frequency: 5200 MHz			Tissue: Head	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
5100	36.25	4.72	36.10	4.55	0.42%	3.74%
5110	36.07	4.76	36.09	4.56	-0.06%	4.39%
5120	36.14	4.77	36.08	4.57	0.17%	4.38%
5130	36.27	4.76	36.07	4.58	0.55%	3.93%
5140	36.15	4.78	36.05	4.59	0.28%	4.14%
5150	36.06	4.81	36.04	4.60	0.06%	4.57%
5160	36.14	4.86	36.03	4.61	0.31%	5.42%
5170	36.25	4.84	36.02	4.62	0.64%	4.76%
5180	36.11	4.80	36.01	4.63	0.28%	3.67%
5190	36.04	4.80	36.00	4.64	0.11%	3.45%
5200	36.25	4.81	35.99	4.65	0.72%	3.44%
5210	35.95	4.81	35.97	4.67	-0.06%	3.00%
5220	36.04	4.80	35.96	4.68	0.22%	2.56%
5230	36.21	4.83	35.95	4.69	0.72%	2.99%
5240	35.90	4.83	35.94	4.70	-0.11%	2.77%
5250	36.07	4.85	35.93	4.71	0.39%	2.97%
5260	35.73	4.89	35.92	4.72	-0.53%	3.60%
5270	35.85	4.88	35.91	4.73	-0.17%	3.17%
5280	35.77	4.97	35.89	4.74	-0.33%	4.85%
5290	35.95	4.86	35.88	4.75	0.20%	2.32%
5300	36.12	4.89	35.87	4.76	0.70%	2.73%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
June 2	5200 Head	25°C	24.5°C	≥ 15 cm	102.6 kPa	30%	1000
June 3	5200 Head	25°C	24.5°C	≥ 15 cm	102.6 kPa	31%	1000
June 4	5200 Head	25°C	24.1°C	≥ 15 cm	102.6 kPa	31%	1000
June 5	5200 Head	25°C	24.1°C	≥ 15 cm	102.6 kPa	18%	1000
June 6	5200 Head	25°C	24.0°C	≥ 15 cm	102.6 kPa	21%	1000

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FLUID DIELECTRIC PARAMETERS

Date: 9 Jun 2014		Frequency: 2450 MHz			Tissue: Head	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
2350	40.99	1.75	39.38	1.71	4.09%	2.34%
2360	40.92	1.79	39.36	1.72	3.96%	4.07%
2370	40.87	1.77	39.34	1.73	3.89%	2.31%
2380	40.83	1.81	39.32	1.74	3.84%	4.02%
2390	40.76	1.81	39.31	1.75	3.69%	3.43%
2400	40.48	1.82	39.29	1.76	3.03%	3.41%
2410	40.53	1.84	39.27	1.76	3.21%	4.55%
2412*	40.50	1.85	39.57	1.76	2.35%	5.11%
2420	40.60	1.87	39.25	1.77	3.44%	5.65%
2430	40.28	1.87	39.24	1.78	2.65%	5.06%
2437*	40.50	1.88	39.23	1.79	3.24%	5.03%
2440	40.53	1.89	39.22	1.79	3.34%	5.59%
2450	40.36	1.89	39.20	1.80	2.96%	5.00%
2457*	40.40	1.90	39.19	1.81	3.09%	4.97%
2460	40.36	1.91	39.19	1.81	2.99%	5.52%
2470	40.38	1.91	39.17	1.82	3.09%	4.95%
2480	40.24	1.92	39.16	1.83	2.76%	4.92%
2490	40.31	1.95	39.15	1.84	2.96%	5.98%
2500	40.36	1.94	39.14	1.85	3.12%	4.86%
2510	40.11	1.97	39.12	1.87	2.53%	5.35%
2520	40.16	1.97	39.11	1.88	2.68%	4.79%
2530	40.11	1.98	39.10	1.89	2.58%	4.76%
2540	40.05	2.01	39.09	1.90	2.46%	5.79%
2550	40.00	2.02	39.07	1.91	2.38%	5.76%

*interpolated using DASY4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
June 9	2450 Head	24°C	24.0°C	≥ 15 cm	102.6 kPa	24%	1000
June 10	2450 Head	24°C	24.2°C	≥ 15 cm	102.6 kPa	30%	1000
June 11	2450 Head	25°C	24.2°C	≥ 15 cm	102.6 kPa	23%	1000
June 12	2450 Head	23°C	24.0°C	≥ 15 cm	102.6 kPa	27%	1000
June 13	2450 Head	24°C	24.1°C	≥ 15 cm	102.6 kPa	31%	1000

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FLUID DIELECTRIC PARAMETERS

Date: 18 June 2014		Frequency: 5200 MHz			Tissue: Body	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
5100	51.30	5.37	49.15	5.18	4.37%	3.67%
5110	51.18	5.38	49.14	5.19	4.15%	3.66%
5120	51.39	5.44	49.12	5.21	4.62%	4.41%
5130	50.89	5.48	49.11	5.22	3.62%	4.98%
5140	51.20	5.53	49.10	5.23	4.28%	5.74%
5150	51.35	5.78	49.08	5.24	4.63%	10.31%
5160	51.23	5.75	49.07	5.25	4.40%	9.52%
5170	51.60	5.74	49.06	5.26	5.18%	9.13%
5180	51.17	5.71	49.04	5.28	4.34%	8.14%
5190	51.68	5.70	49.03	5.29	5.40%	7.75%
5200	51.69	5.61	49.01	5.30	5.47%	5.85%
5210	51.40	5.54	49.00	5.31	4.90%	4.33%
5220	51.12	5.55	48.99	5.32	4.35%	4.32%
5230	50.83	5.45	48.97	5.33	3.80%	2.25%
5240	51.00	5.69	48.96	5.35	4.17%	6.36%
5250	50.74	5.84	48.95	5.36	3.66%	8.96%
5260	50.95	5.86	48.93	5.37	4.13%	9.12%
5270	50.93	5.90	48.92	5.38	4.11%	9.67%
5280	51.42	5.90	48.91	5.39	5.13%	9.46%
5290	51.43	5.79	48.89	5.40	5.20%	7.22%
5300	51.69	4.89	48.88	5.42	5.75%	-9.78%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
June 18	5200 Body	25°C	24.0°C	≥ 15 cm	102.6 kPa	21%	1000

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FLUID DIELECTRIC PARAMETERS

Date: Oct 17 2014		Frequency: 5200 MHz			Tissue: Body	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
5100.0000	46.65	5.28	49.15	5.18	-5.09%	1.93%
5110.0000	46.63	5.29	49.14	5.19	-5.11%	1.93%
5120.0000	46.71	5.33	49.12	5.21	-4.91%	2.30%
5130.0000	46.74	5.34	49.11	5.22	-4.83%	2.30%
5140.0000	46.78	5.34	49.10	5.23	-4.73%	2.10%
5150.0000	46.78	5.35	49.08	5.24	-4.69%	2.10%
5160.0000	46.82	5.34	49.07	5.25	-4.59%	1.71%
5170.0000	46.80	5.39	49.06	5.26	-4.61%	2.47%
5180.0000	46.81	5.38	49.04	5.28	-4.55%	1.89%
5190.0000	46.91	5.42	49.03	5.29	-4.32%	2.46%
5200.0000	46.89	5.42	49.01	5.30	-4.33%	2.26%
5210.0000	46.86	5.47	49.00	5.31	-4.37%	3.01%
5220.0000	46.94	5.49	48.99	5.32	-4.18%	3.20%
5230.0000	47.01	5.51	48.97	5.33	-4.00%	3.38%
5240.0000	46.79	5.52	48.96	5.35	-4.43%	3.18%
5250.0000	46.98	5.55	48.95	5.36	-4.02%	3.54%
5260.0000	46.94	5.53	48.93	5.37	-4.07%	2.98%
5270.0000	47.03	5.53	48.92	5.38	-3.86%	2.79%
5280.0000	47.05	5.59	48.91	5.39	-3.80%	3.71%
5290.0000	46.93	5.60	48.89	5.40	-4.01%	3.70%
5300.0000	46.99	5.62	48.88	5.42	-3.87%	3.69%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Oct 17	5200 Body	24°C	20.0°C	≥ 15 cm	102.5 kPa	31%	1000

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FLUID DIELECTRIC PARAMETERS

Date: 16 Oct 2014		Frequency: 5200 MHz			Tissue: Head	
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
5100.0000	35.45	4.73	36.10	4.55	-1.80%	3.96%
5110.0000	35.40	4.75	36.09	4.56	-1.91%	4.17%
5120.0000	35.42	4.78	36.08	4.57	-1.83%	4.60%
5130.0000	35.41	4.79	36.07	4.58	-1.83%	4.59%
5140.0000	35.35	4.80	36.05	4.59	-1.94%	4.58%
5150.0000	35.32	4.83	36.04	4.60	-2.00%	5.00%
5160.0000	35.35	4.82	36.03	4.61	-1.89%	4.56%
5170.0000	35.35	4.81	36.02	4.62	-1.86%	4.11%
5180.0000	35.36	4.85	36.01	4.63	-1.81%	4.75%
5190.0000	35.25	4.86	36.00	4.64	-2.08%	4.74%
5200.0000	35.21	4.86	35.99	4.65	-2.17%	4.52%
5210.0000	35.24	4.91	35.97	4.67	-2.03%	5.14%
5220.0000	35.28	4.93	35.96	4.68	-1.89%	5.34%
5230.0000	35.31	4.94	35.95	4.69	-1.78%	5.33%
5240.0000	35.19	4.95	35.94	4.70	-2.09%	5.32%
5250.0000	35.26	4.95	35.93	4.71	-1.86%	5.10%
5260.0000	35.16	4.93	35.92	4.72	-2.12%	4.45%
5270.0000	35.09	4.95	35.91	4.73	-2.28%	4.65%
5280.0000	35.03	4.94	35.89	4.74	-2.40%	4.22%
5290.0000	35.06	4.97	35.88	4.75	-2.29%	4.63%
5300.0000	35.05	4.98	35.87	4.76	-2.29%	4.62%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Oct 16	5200 Head	23°C	19.6°C	≥ 15 cm	102.8 kPa	33%	1000
Oct 17	5200 Body	24°C	20.8°C	≥ 15 cm	102.6 kPa	29%	1000

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6.0 SAR MEASUREMENT SUMMARY

TABLE 1	HEAD SAR EVALUATION SUMMARY											
Test Date	Plot #	Test Freq.	Ch.	Mode	Mod.	Data Rate	Phantom Section Test Position	Cond. RF Output Power Setting Before Test	Meas. Conducted Power	SAR Drift During Test	Measured SAR (1g)
		MHz			MHz	Mbps			dBm	dB	W/kg
Oct 16	H6b	5200	40	802.11a	20	6	Left Ear Cheek/Touch	16	13.60	1.17	0.595
Oct 16	H7b	5240	48	802.11a	20	6	Left Ear Cheek/Touch	16	13.70	0.495	0.748
Oct 16	H8b	5280	56	802.11a	20	6	Left Ear Cheek/Touch	16	14.20	1.41	0.769
Oct 16	H17b	5300	60	802.11a	20	6	Left Ear Cheek/Touch	16	14.20	-0.328	0.788
Jun 3	H9	5200	40	802.11a	20	6	Left Ear Ear/Tilt (15°)	16	13.60	0.544	0.290
Jun 4	H10	5240	48	802.11a	20	6	Left Ear Ear/Tilt (15°)	16	13.70	0.448	0.375
Jun 4	H11	5280	56	802.11a	20	6	Left Ear Ear/Tilt (15°)	16	14.20	0.974	0.324
Jun 4	H12	5280	56	802.11n	40	MCS0	Left Ear Ear/Tilt (15°)	16	14.25	-0.639	0.411
Oct 17	H13b	5200	40	802.11n	40	MCS0	Left Ear Cheek/Touch	16	13.75	0.644	0.649
Oct 17	H14b	5240	48	802.11n	40	MCS0	Left Ear Cheek/Touch	16	13.75	-0.062	0.684
Oct 17	H15b	5280	56	802.11n	40	MCS0	Left Ear Cheek/Touch	16	14.25	0.070	0.851
Oct 17	H16b	5300	60	802.11n	40	MCS0	Left Ear Cheek/Touch	16	14.30	-0.197	0.900

TABLE 1 CONT.	HEAD SAR EVALUATION SUMMARY											
Test Date	Plot #	Test Freq.	Ch.	Mode	Mod.	Data Rate	Phantom Section Test Position	Cond. RF Output Power Setting Before Test	Meas. Conducted Power	SAR Drift During Test	Measured SAR (1g)
		MHz			MHz	Mbps			dBm	dB	W/kg
Jun 4	H18	5240	48	802.11a	40	6	Right Ear Cheek/Touch	16	13.70	0.926	0.693
Jun 5	H19	5200	40	802.11a	40	6	Right Ear Cheek/Touch	16	13.60	0.863	0.669
Jun 5	H20	5280	56	802.11a	40	6	Right Ear Cheek/Touch	16	14.20	-0.133	0.746
Jun 5	H21	5300	60	802.11a	40	6	Right Ear Cheek/Touch	16	14.20	-0.032	0.575
Jun 5	H22	5240	48	802.11n	40	MCS0	Right Ear Cheek/Touch	16	13.75	-0.280	0.554
Jun 5	H23	5200	40	802.11n	40	MCS0	Right Ear Cheek/Touch	16	13.75	0.714	0.633
Jun 5	H24	5280	56	802.11n	40	MCS0	Right Ear Cheek/Touch	16	14.25	0.130	0.656
Jun 6	H25	5300	60	802.11n	40	MCS0	Right Ear Cheek/Touch	16	14.30	0.527	0.857

SAR SAFETY LIMIT(S)		HEAD	SPATIAL PEAK	RF EXPOSURE CATEGORY
FCC 47 CFR 2.1093	Health Canada Safety Code 6	1.6 W/kg	1g average	General Population / Uncontrolled

Notes	
1.	Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2.	The DUT was evaluated in 802.11a/n at the highest output power default test channel in the lowest data rate. The output power level of the higher data rates are < ¼ dB higher than the lowest data rate and therefore are not required to be evaluated, in accordance with the procedures of FCC KDB 248227 (see reference [9]). The maximum SAR level configuration measured at the highest output power default test channel was further evaluated at the remaining default test channels.
3.	The DUT was placed in test mode via internal test software protocol provided by Vocera enabling the selection of mode, channel, data rate, and output level setting prescribed by the manufacturer. All test modes were set to 100% continuous duty cycle transmission.
4.	The fluid temperature remained within +/-2°C from the dielectric parameter measurement to the completion of each SAR test.

TABLE 2 — HEAD SAR EVALUATION SUMMARY

Test Date	Plot #	Test Freq. (MHz)	Ch.	Mode	Mod. (MHz)	Data Rate (Mbps)	Phantom Section Test Position	Cond. RF Output Power Setting Before Test	Meas. Conducted Power (dBm)	SAR Drift During Test (dB)	Measured SAR (1g) (W/kg)
Jun 10	H26	2412	1	802.11b	20	1	Left Ear Cheek/Touch	18	15.10	0.538	1.01
Jun 10	H27	2437	6	802.11b	20	1	Left Ear Cheek/Touch	18	14.90	0.078	0.677
Jun 10	H28	2457	10	802.11b	20	1	Left Ear Cheek/Touch	18	15.10	-0.710	0.777
Jun 10	H30	2412	1	802.11g	20	6	Left Ear Cheek/Touch	18	15.10	0.572	0.923
Jun 11	H31	2412	1	802.11n	20	MCS0	Left Ear Cheek/Touch	18	14.90	-0.143	0.820
Jun 11	H32	2412	1	802.11b	20	1	Left Ear Ear/Tilt (15°)	18	15.10	-1.16	0.320
Jun 11	H33	2437	6	802.11b	20	1	Left Ear Ear/Tilt (15°)	18	14.90	0.406	0.346
Jun 11	H35	2437	6	802.11g	20	6	Left Ear Ear/Tilt (15°)	18	14.75	-0.842	0.085
Jun 11	H36	2437	6	802.11n	20	MCS0	Left Ear Ear/Tilt (15°)	18	14.70	-1.08	0.352
Jun 12	H37	2412	1	802.11b	20	1	Right Ear Cheek/Touch	18	15.10	0.974	0.701
Jun 12	H38	2437	6	802.11b	20	1	Right Ear Cheek/Touch	18	14.90	0.706	0.619
Jun 12	H40	2412	1	802.11g	20	6	Right Ear Cheek/Touch	18	15.10	-0.413	0.703
Jun 12	H41	2412	1	802.11n	20	MCS0	Right Ear Cheek/Touch	18	14.90	-0.550	0.666
Jun 13	H42	2412	1	802.11b	20	1	Right Ear Ear/Tilt (15°)	18	15.10	0.057	0.351
Jun 13	H43	2437	6	802.11b	20	1	Right Ear Ear/Tilt (15°)	18	14.90	-0.877	0.323
Jun 13	H45	2412	1	802.11g	20	6	Right Ear Ear/Tilt (15°)	18	15.10	0.007	0.284
Jun 13	H46	2412	1	802.11n	20	MCS0	Right Ear Ear/Tilt (15°)	18	14.90	-1.40	0.297

SAR SAFETY LIMIT(S)		HEAD	SPATIAL PEAK	RF EXPOSURE CATEGORY
FCC 47 CFR 2.1093	Health Canada Safety Code 6	1.6 W/kg	1g average	General Population / Uncontrolled

Notes

1. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. The DUT was evaluated in 802.11b/g/n at the highest output power default test channel in the lowest data rate. The output power level of the higher data rates are < ¼ dB higher than the lowest data rate and therefore are not required to be evaluated, in accordance with the procedures of FCC KDB 248227 (see reference [9]). The maximum SAR level configuration measured at the highest output power default test channel was further evaluated at the remaining default test channels.
3. The DUT was placed in test mode via internal test software protocol provided by Vocera enabling the selection of mode, channel, data rate, and output level setting prescribed by the manufacturer. All test modes were set to 100% continuous duty cycle transmission.
4. The fluid temperature remained within +/-2°C from the dielectric parameter measurement to the completion of each SAR test.

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TABLE 3	BODY SAR EVALUATION SUMMARY												
Test Date	Plot #	Freq.	Ch.	Mode	Mod.	Data Rate	Accessories		DUT Distance to Planar Phantom	Cond. RF Output Power Setting Before Test	Meas. Cond. Power	SAR Drift During Test	Meas. SAR (1g)
		MHz			MHz	Mbps	Body-worn	Audio			dBm	dB	W/kg
May 26	B1	2412	1	802.11b	20	1	Belt Clip	N/A	12 mm	18	15.10	-0.155	0.182
May 27	B5	2437	6	802.11b	20	1	Lanyard	N/A	5 mm	18	14.90	0.189	0.579
May 29	B6	2412	1	802.11b	20	1	Lanyard	N/A	5 mm	18	15.10	0.582	**0.720**
May 31	B15	2457	10	802.11b	20	1	Lanyard	N/A	5 mm	18	15.10	0.980	0.553
May 29	B9	2412	1	802.11g	20	6	Lanyard	N/A	5 mm	18	15.10	-0.215	0.494
May 30	B10	2437	6	802.11g	20	6	Lanyard	N/A	5 mm	18	14.75	-0.558	0.476
May 31	B16	2457	10	802.11g	20	6	Lanyard	N/A	5 mm	18	15.00	0.139	0.617
May 30	B12	2412	1	802.11n	20	MCS0	Lanyard	N/A	5 mm	18	14.90	-0.234	0.528
May 30	B13	2437	6	802.11n	20	MCS0	Lanyard	N/A	5 mm	18	14.70	-0.772	0.469
May 31	B17	2457	10	802.11n	20	MCS0	Lanyard	N/A	5 mm	18	14.90	0.014	0.532

SAR SAFETY LIMIT(S)		BODY	SPATIAL PEAK	RF EXPOSURE CATEGORY
FCC 47 CFR 2.1093	Health Canada Safety Code 6	1.6 W/kg	1g average	General Population / Uncontrolled

Notes	
1.	Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2.	The DUT was evaluated in 802.11b/g/n at the highest output power default test channel in the lowest data rate. The output power level of the higher data rates are < ¼ dB higher than the lowest data rate and therefore are not required to be evaluated, in accordance with the procedures of FCC KDB 248227 (see reference [9]). The maximum SAR level configuration measured at the highest output power default test channel was further evaluated at the remaining default test channels.
3.	The DUT was tested in the default Belt Clip configuration which resulted in a lower SAR than the default Lanyard configuration. Since the default Lanyard configuration produced a more conservative result, further testing in the Belt Clip configuration was not required.
4.	The DUT was placed in test mode via internal test software protocol provided by Vocera enabling the selection of mode, channel, data rate, and output level setting prescribed by the manufacturer. All test modes were set to 100% continuous duty cycle transmission.
5.	The fluid temperature remained within +/-2°C from the dielectric parameter measurement to the completion of each SAR test.

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TABLE 4	BODY SAR EVALUATION SUMMARY												
Test Date	Plot #	Freq.	Ch.	Mode	Mod.	Data Rate	Accessories		DUT Distance to Planar Phantom	Cond. RF Output Power Setting Before Test	Meas. Cond. Power	SAR Drift During Test	Meas. SAR (1g)
		MHz			MHz	Mbps	Body-worn	Audio			dBm	dB	W/kg
Oct 17	B30b	5280	56	802.11n	40	MCS0	Lanyard	N/A	5 mm	16	14.25	0.09	0.251
Oct 17	B31b	5280	56	802.11n	40	MCS0	Lanyard	N/A	5 mm	16	14.25	0.849	0.336

SAR SAFETY LIMIT(S)		BODY	SPATIAL PEAK	RF EXPOSURE CATEGORY
FCC 47 CFR 2.1093	Health Canada Safety Code 6	1.6 W/kg	1g average	General Population / Uncontrolled

Notes	
1.	Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2.	The DUT was evaluated in 802.11a/n at the highest output power default test channel in the lowest data rate. The output power level of the higher data rates are < ¼ dB higher than the lowest data rate and therefore are not required to be evaluated, in accordance with the procedures of FCC KDB 248227 (see reference [9]). The maximum SAR level configuration measured at the highest output power default test channel was further evaluated at the remaining default test channels.
3.	The DUT was not required to be evaluated at the other channels since the 1-g averaged SAR was < 0.8W/kg and the extrapolated maximum peak SAR was less than 1.6W/kg, in accordance with the procedures of FCC KDB 248227 (see reference [9]).
4.	The DUT was placed in test mode via internal test software protocol provided by Vocera enabling the selection of mode, channel, data rate, and output level setting prescribed by the manufacturer. All test modes were set to 100% continuous duty cycle transmission.
5.	The fluid temperature remained within +/-2°C from the dielectric parameter measurement to the completion of each SAR test.

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7.0 SAR SCALING (TUNE-UP TOLERANCE)

SCALING OF MAXIMUM SAR LEVELS TO MANUFACTURER'S TUNE-UP TOLERANCE SPECIFICATION

Test Config.	Test Freq. (MHz)	Antenna ID#	Battery ID#	Body-worn Accessory ID #	Cond. Power	Drift	SAR Level 1g		Scaling up to Manuf. Upper Tol. Power Spec.	Scaled SAR 1g (W/kg)
					dB	dB	W/kg	Plot #		
FCC / IC										
Head	2412	n/a	n/a	n/a	15.1	+0.538	1.03	H26	+1.4dB	**1.42**
Body	2412	Lanyard	n/a	n/a	15.1	+0.582	0.720	B6	+1.4dB	**0.993**

Notes:

1. Only the highest SAR values for head and body per frequency band are scaled.
2. The resulting value is the reported SAR.
3. The scaled SAR levels are below the FCC/IC General Public Use SAR Limit of 1.6 W/kg.
4. The drift was positive therefore no scaling for IC was required.

8.0 SAR PROBE CALIBRATION & MEASUREMENT FREQUENCIES

The following procedures are recommended for 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 6 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 865664 D01v01r03 - see reference [15]).

Probe Calibration Freq.	Device Measurement Freq.	Frequency Interval	±50 MHz ≥ 300 MHz
2450MHz	2412 MHz	38 MHz	< 50 MHz[1]
	2437 MHz	13 MHz	< 50 MHz[1]
	2457 MHz	7 MHz	< 50 MHz[1]
5200 MHz	5200 MHz	0 MHz	< 50 MHz[1]
	5240 MHz	40 MHz	< 50 MHz[1]
	5280 MHz	80 MHz	> 50 MHz[2]
	5300 MHz	100 MHz	> 50 MHz[2]

1. The probe calibration and measurement frequency interval is < 50 MHz; therefore the additional steps were not required.

2. The probe calibration and measurement frequency interval is > 50 MHz; therefore the following additional steps were implemented (per FCC KDB 450824 D01 v01r01): *The measured 1-g SAR may be compensated with respect to +5% tolerances in ε_r and -5% tolerances in σ, computed according to valid SAR sensitivity data, to reduce SAR underestimation and maintain conservativeness.*

9.0 SAR LEVEL CORRECTION FOR FLUID DEVIATION (IC RSS-102 / IEC 62209-2)

The SAR levels are corrected for deviation of complex permittivity in accordance with Section 6.1.1 of IEC 62209-2:2010 (see reference [6]) as shown below.

Test Config.	Date	Test Freq. (GHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	Measured SAR Level 50% d/f (W/kg)	Corrected SAR Level 50% d/f (W/kg)
H26	6/10	2412	40.50	1.85	39.57	1.76	2.35%	5.11%	1.01	1.03

**interpolated using DASY4 software*

SAR Correction Formula (IEC 62209-2:2010 Section 6.1.1)

$$\Delta SAR = c_\varepsilon \, \Delta\varepsilon_r + c_\sigma \, \Delta\sigma \qquad (F.1)$$

where

$c_\varepsilon = \partial(\Delta SAR)/\partial(\Delta\varepsilon)$ is the coefficients representing the sensitivity of SAR to permittivity where SAR is normalized to output power;

$c_\sigma = \partial(\Delta SAR)/\partial(\Delta\sigma)$ is the coefficients representing the sensitivity of SAR to conductivity, where SAR is normalized to output power.

The values of c_ε and c_σ have a simple relationship with frequency that can be described using polynomial equations. For the 1 g averaged SAR c_ε and c_σ are given by

$$c_\varepsilon = -7{,}854\times10^{-4} f^3 + 9{,}402\times10^{-3} f^2 - 2{,}742\times10^{-2} f - 0{,}202\,6 \qquad (F.2)$$

$$c_\sigma = 9{,}804\times10^{-3} f^3 - 8{,}661\times10^{-2} f^2 + 2{,}981\times10^{-2} f + 0{,}782\,9 \qquad (F.3)$$

where

f is the frequency in GHz.

SAR Correction Calculation

Date	**6/10**
Frequency (GHz)	**2.412**
Ce	-0.2251
Cσ	0.4885
Δ E	2.35%
Δσ	5.11%
ΔSAR	1.97%

Conclusion

The correction ΔSAR has a negative sign; therefore correction is applied to the measured SAR level.

10.0 DETAILS OF SAR EVALUATION

The Vocera Communications Inc. Model: NorthStar B3000N Communications Badge with 802.11a/b/g/n 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.

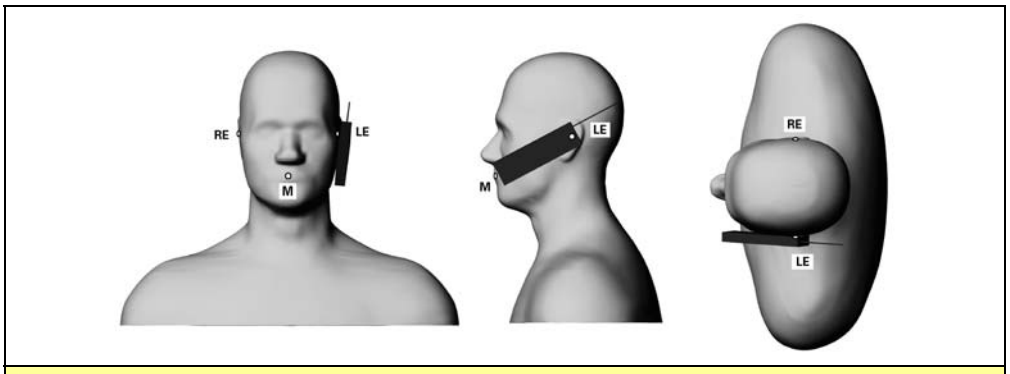


Figure 1. Position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for device positioning, are indicated (Shoulders are shown for illustration only).

- Ear/Tilt Position: With the 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.

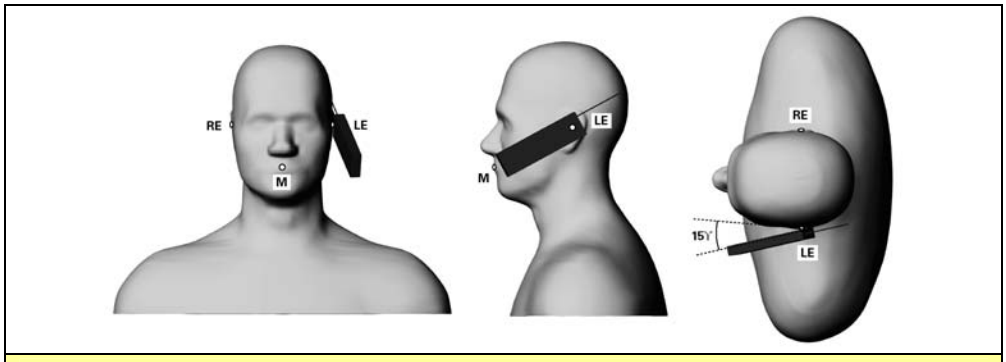


Figure 2. Position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for device positioning, are indicated (Shoulders are shown for illustration only).

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.

11.0 SAR EVALUATION PROCEDURES

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

   (ii) For body-worn and face-held devices, a planar phantom was used.

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

   An area scan was determined as follows:

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

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

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

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

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

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

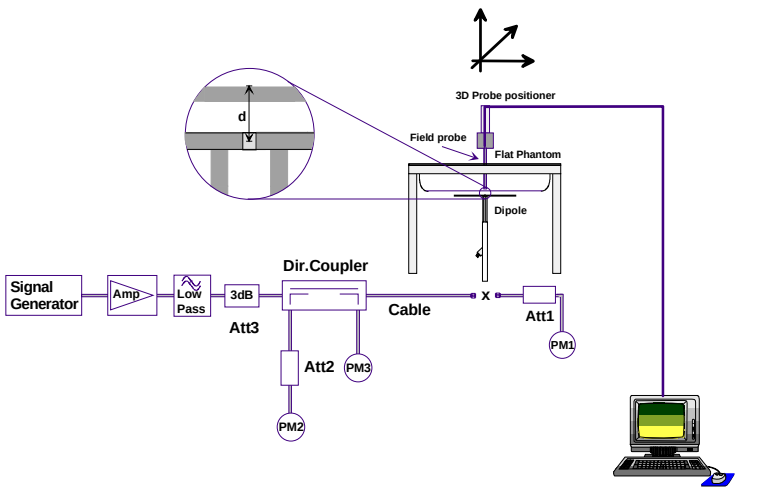
12.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations, system checks were performed using the planar section of the SAM phantom with a 2450MHz SPEAG validation dipole and a SPEAG 5GHz (see Appendix B) in accordance with the procedures described in IEEE Standard 1528-2013 (see reference [5]) and IEC Standard 62209-2:2010 (see reference [6]). 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). A forward power of 250 mW (2450MHz) and 100mW (5200MHz) was applied to the dipole and the system was verified to a tolerance of ±10% from the SAR system manufacturer's dipole calibration target SAR value (see Appendix E).

SYSTEM PERFORMANCE CHECK EVALUATIONS

Test Date	Equiv. Tissue	SAR 1g (W/kg)			Dielectric Constant ε_r			Conductivity σ (mho/m)			ρ (Kg/m³)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
	Freq. (MHz)	Target	Meas.	Dev.	Target	Meas.	Dev.	Target	Meas.	Dev.						
May26	BODY 2450	12.7 ±10%	13.9	+9.5%	52.7 ±5%	51.0	-3.2%	1.95 ±5%	1.94	-0.5%	1000	23	23.0	≥ 15	32	102.6
Jun2	HEAD 5200	7.69 ±10%	8.07	+4.9%	36.0 ±5%	36.3	+0.7%	4.66 ±5%	4.81	+3.4%	1000	25	24.5	≥ 15	30	102.6
Jun9	HEAD 2450	12.7 ±10%	12.6	-0.8%	39.2 ±5%	40.4	+3.0%	1.80 ±5%	1.89	+5.0%	1000	24	24.0	≥ 15	24	102.6
Jun18	BODY 5200	7.32 ±10%	7.08	-3.3%	49.0 ±5%	51.7	+5.5%	5.30 ±5%	5.61	+5.9%	1000	25	24.0	≥ 15	21	102.6
Oct 16	Head 5200	7.69 ±10%	7.04	-8.5%	36.0 ±5%	35.21	-2.2%	4.66 ±5%	4.86	4.52%	1000	23	19.6.0	≥ 15	33	-
Oct 17	BODY 5200	7.32 ±10%	7.61	4.0%	49.0 ±5%	46.89	-4.3%	5.30 ±5%	5.42	+2.26%	1000	24	20.0.0	≥ 15	31	-

Notes		
	1.	The target SAR values are the measured values from the SAR system manufacturer's dipole calibration (see Appendix E).
	2.	The target dielectric parameters are the nominal values from the SAR system manufacturer's dipole calibration (see Appendix E).
	3.	The fluid temperature was measured prior to and after the system performance check evaluations. The fluid temperature remained within +/-2°C during the system performance check evaluations.
	4.	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).



System Performance Check Measurement Setup Diagram (IEEE Standard 1528-2013)

2450 MHz SPEAG Validation Dipole Setup

5 GHz SPEAG Validation Dipole Setup

13.0 SIMULATED EQUIVALENT TISSUES

The simulated equivalent tissue recipes in the table below are derived from the SAR system manufacturer's suggested recipes in the DASY4 manual (see references [10] and [11]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2013 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [7]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

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

SIMULATED TISSUE MIXTURE (5 GHz)		
INGREDIENT	**5 GHZ HEAD**	**5 GHz BODY**
n/a	SPEAG PN:SL AAH 502 AC	SPEAG PN:SL AAM 501 EA

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.			

15.0 ROBOT SYSTEM SPECIFICATIONS

Specifications	
Positioner	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability	0.02 mm
No. of axis	6
Data Acquisition Electronic (DAE) System	
Cell Controller	
Processor	AMD Athlon XP 2400+
Clock Speed	2.0 GHz
Operating System	Windows XP Professional
Data Converter	
Features	Signal Amplifier, multiplexer, A/D converter, and control logic
Software	Measurement Software: DASY4, V4.7 Build 80
	Postprocessing Software: SEMCAD, V1.8 Build 186
Connecting Lines	Optical downlink for data and status info., Optical uplink for commands and clock
DASY4 Measurement Server	
Function	Real-time data evaluation for field measurements and surface detection
Hardware	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
Connections	COM1, COM2, DAE, Robot, Ethernet, Service Interface
E-Field Probe	
Model	EX3DV4
Serial No.	3600
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
Phantom	
Type	SAM V4.0C
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 25 liters

16.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core; Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, glycol)
Calibration:	In air from 10 MHz to 2.5 GHz In head simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy ± 8%)
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity:	± 0.2 dB in head tissue (rotation around probe axis) ± 0.4 dB in head tissue (rotation normal to probe axis)
Dynamic Range:	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Surface Detect:	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions:	Overall length: 330 mm; Tip length: 16 mm; Body diameter: 12 mm; Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application:	General dosimetry up to 3 GHz; Compliance tests of mobile phone

ET3DV6 E-Field Probe

17.0 PHANTOM(S)

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 H 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	9-Apr-14	Biennial
x	-EX3DV4 E-Field Probe	00213	3600	15-Apr-14	Annual
x	-D2450V2 Validation Dipole	00219	825	20-Apr-12	Triennial
x	-D5GHzV2 Validation Dipole (Head)	00126	1031	26-Apr-14	Triennial
x	-D5GHzV2 Validation Dipole (Body)	00126	1031	18-Apr-12	Triennial
	Side Planar Phantom	00156	161	CNR	CNR
	Barski Planar Phantom	00155	03-01	CNR	CNR
x	SPEAG 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	17June-14	Biennial
x	Gigatronics 80701A Power Sensor	00248	1833687	18 Feb-14	Biennial
x	Gigatronics 80701A Power Sensor	00249	1834473	17 Feb-14	Biennial
x	HP 8753ET Network Analyzer	00134	US39170292	26-Apr-12	Biennial Extended
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	08-May-14	Biennial
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Abbr.	CNR = Calibration Not Required				

20.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEC 62209-2:2010)									
Source of Uncertainty	**IEC 62209-2 Section**	**Tolerance / Uncertainty ±%**	**Probability Distribution**	**Divisor**	**ci 1g**	**ci 10g**	**Standard Uncertainty ±% (1g)**	**Standard Uncertainty ±% (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	0	Rectangular	1.732050808	1	1	0.0	0.0	∞
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	10.39	Normal	1	0.78	0.71	8.1	7.4	∞
Liquid Permittivity (measured)	7.2.4.3	5.47	Normal	1	0.23	0.26	1.3	1.4	∞
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**				**12.57**	**12.08**	
Expanded Uncertainty (95% Confidence Interval)	**7.3.2**		**k=2**				**25.14**	**24.16**	
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

21.0 REFERENCES

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

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

[3] Federal Communications Commission, Office of Engineering and Technology - "SAR Measurement Requirements for 100 MHz to 6 GHz"; KDB 865664 D01v01r03: Feb 2014.

[4] Industry Canada - "Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)", Radio Standards Specification RSS-102 Issue 4: March 2010.

[5] IEEE Standard 1528-2013 - "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques": December 2003.

[6] International Standard IEC 62209-2 Edition 1.0 2010-03 - "Human exposure to radio frequency fields from hand-held & body-mounted wireless communication devices - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)".

[7] IEC International Standard 62209-1:2005 - "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures."

[8] Federal Communications Commission, Office of Engineering and Technology - "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies"; KDB 447498 D01v05r01: May 2013.

[9] Federal Communications Commission, Office of Engineering and Technology - "SAR Test Reduction Considerations for Occupational PTT Radios", KDB 643646 D01v01r01: April 2011.

[10] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 16 Application Note, Head Tissue Recipe: Sept. 2005.

[11] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 17 Application Note, Body Tissue Recipe: Sept. 2005.

[12] ISO/IEC 17025 - "General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)."

[13] Federal Communications Commission - "Measurements Required: RF Power Output"; Rule Part 47 CFR §2.1046.

[14] Industry Canada - "General Requirements and Information for the Certification of Radiocommunication Equipment", Radio Standards Specification RSS-Gen Issue 3: December 2010.

[15] Federal Communications Commission, Office of Engineering and Technology - "SAR Measurement Requirements for 100 MHz to 6 GHz"; KDB 865664 D01v01r03: Feb 2014.

[16] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 22 Application Note, SAR Sensitivities: Sept. 2005.

APPENDIX A - SAR MEASUREMENT PLOTS

Plot H6b

Date/Time: 16/10/2014 5:06:45 PM

1289 - 5G Head Left SAR Oct 16

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 16 Oct 2014 Ambient Temp: 23C Fluid Temp: 19.6C Humidity: 33%

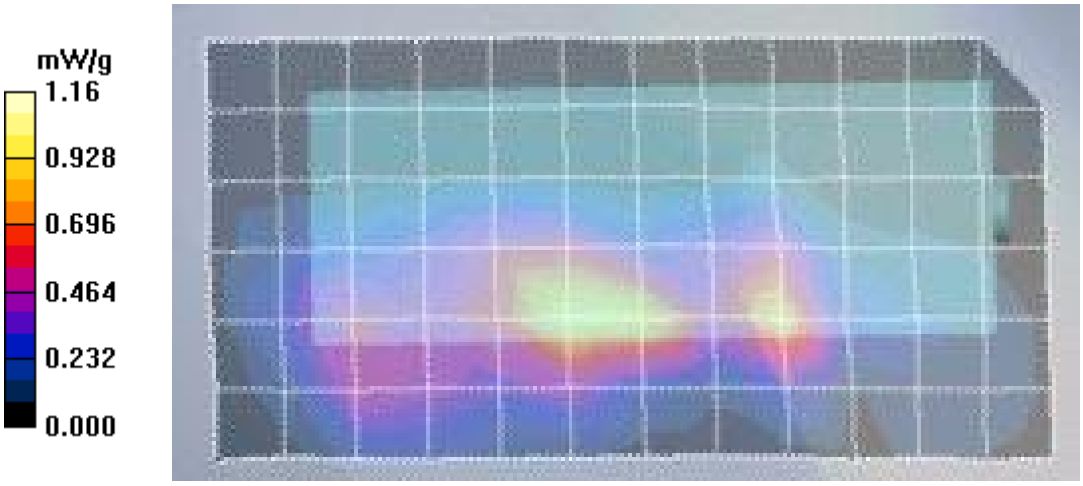
Procedure Notes:

Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5200 MHz; σ = 4.86 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H6b, L-Touch, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6 2/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.04 mW/g

H6b, L-Touch, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6 2/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.85 V/m; Power Drift = 1.17 dB
Peak SAR (extrapolated) = 2.40 W/kg
SAR(1 g) = 0.595 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 1.16 mW/g



Top of device = Right

Plot H7b

Date/Time: 16/10/2014 5:45:33 PM

1289 - 5G Head Left SAR Oct 16

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 16 Oct 2014 Ambient Temp: 23C Fluid Temp: 19.6C Humidity: 33%

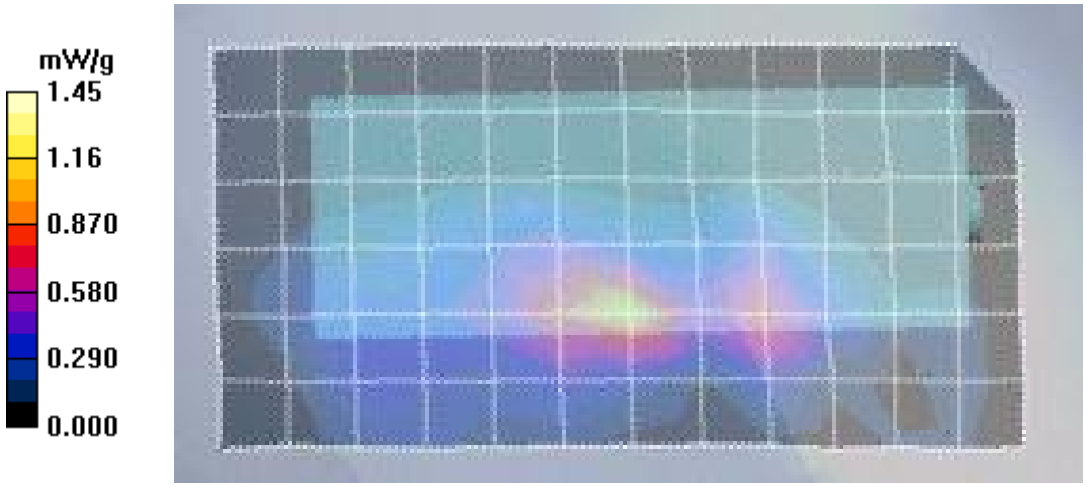
Procedure Notes:

Communication System: CW
Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5240 MHz; σ = 4.95 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

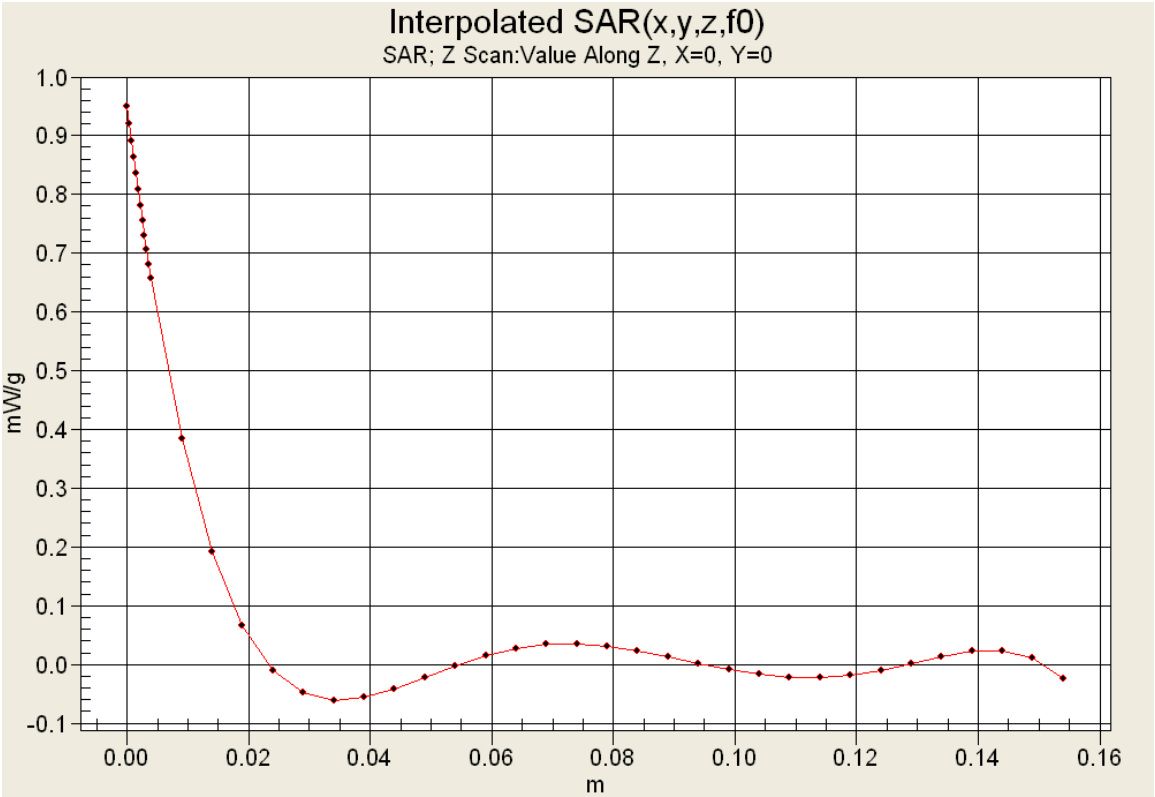
H7b, L-Touch, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.13 mW/g

H7b, L-Touch, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.68 V/m; Power Drift = 0.495 dB
Peak SAR (extrapolated) = 3.04 W/kg
SAR(1 g) = 0.748 mW/g; SAR(10 g) = 0.240 mW/g
Maximum value of SAR (measured) = 1.45 mW/g



Top of device = Right

Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot H8b

Date/Time: 16/10/2014 6:16:01 PM

1289 - 5G Head Left SAR Oct 16

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 16 Oct 2014 Ambient Temp: 23C Fluid Temp: 19.6C Humidity: 33%

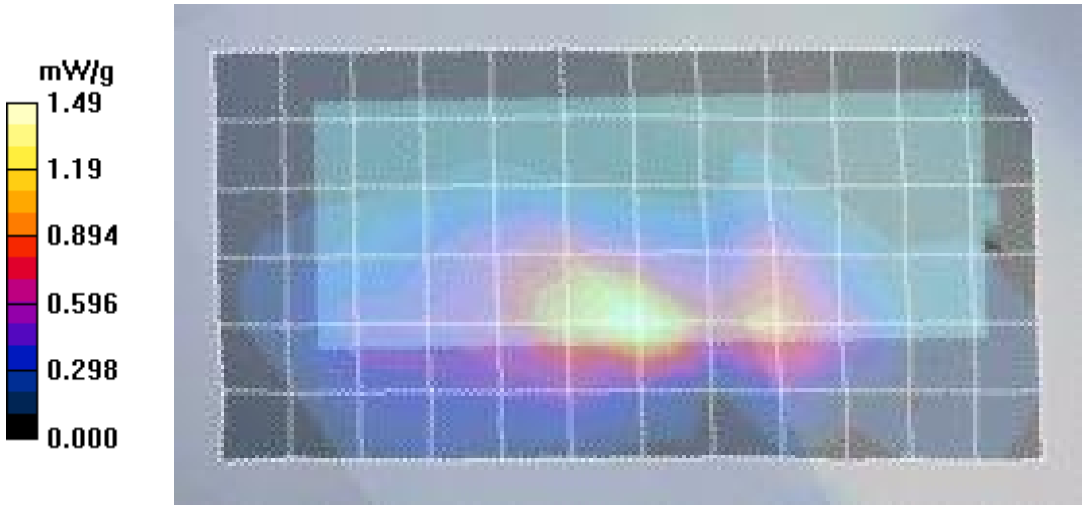
Procedure Notes:

Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5280 MHz; σ = 4.94 mho/m; ε_r = 35; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H8b, L-Touch, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.54 mW/g

H8b, L-Touch, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.25 V/m; Power Drift = 1.41 dB
Peak SAR (extrapolated) = 3.17 W/kg
SAR(1 g) = 0.769 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 1.49 mW/g



Top of device = Right

Plot H17b

Date/Time: 16/10/2014 6:55:37 PM

1289 - 5G Head Left SAR Oct 16

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 16 Oct 2014 Ambient Temp: 23C Fluid Temp: 19.6C Humidity: 33%

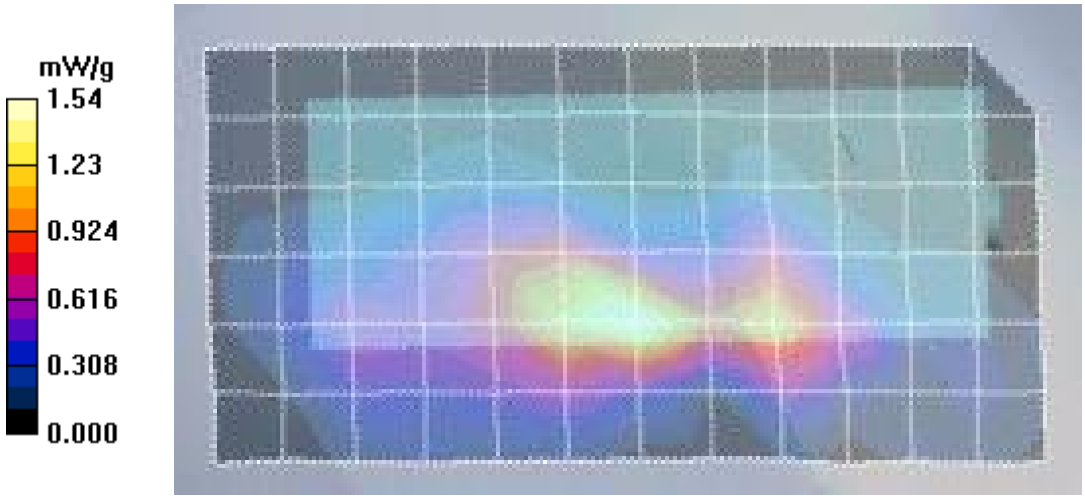
Procedure Notes:

Communication System: CW
Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5300 MHz; σ = 4.98 mho/m; ε_r = 35; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H17b, L-Touch, 802.11a Ch 60, 5300MHz, BW=40MHz, BR=6/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.68 mW/g

H17b, L-Touch, 802.11a Ch 60, 5300MHz, BW=40MHz, BR=6/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.77 V/m; Power Drift = -0.328 dB
Peak SAR (extrapolated) = 3.26 W/kg
SAR(1 g) = 0.788 mW/g; SAR(10 g) = 0.259 mW/g
Maximum value of SAR (measured) = 1.54 mW/g



Top of device = Right

Plot H9

Date Tested: 06/03/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 3 June2014 Ambient Temp: 25C Fluid Temp: 24.5C Humidity: 31%

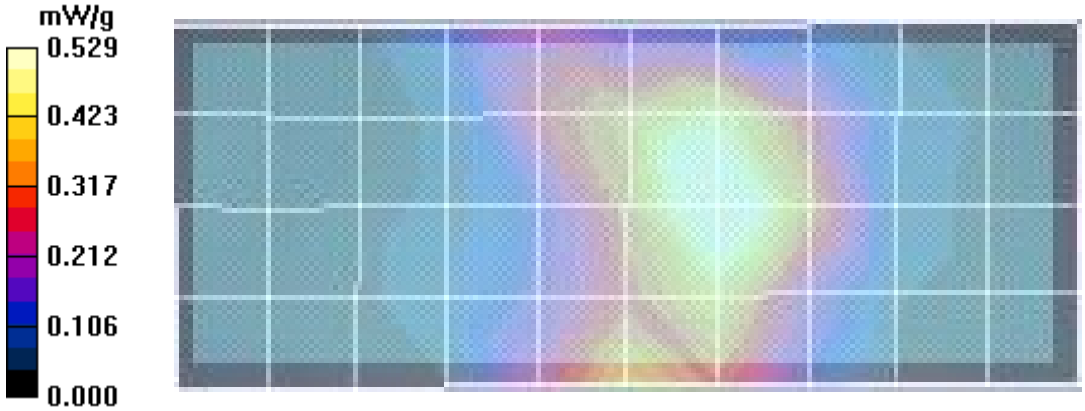
Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5200 MHz; σ = 4.81 mho/m; ε_r = 36.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.652 mW/g

L-Tilt, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.88 V/m; Power Drift = 0.544 dB
Peak SAR (extrapolated) = 0.978 W/kg
SAR(1 g) = 0.290 mW/g; SAR(10 g) = 0.116 mW/g

Maximum value of SAR (measured) = 0.529 mW/g



Plot H10

Date Tested: 06/04/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 4 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 31%

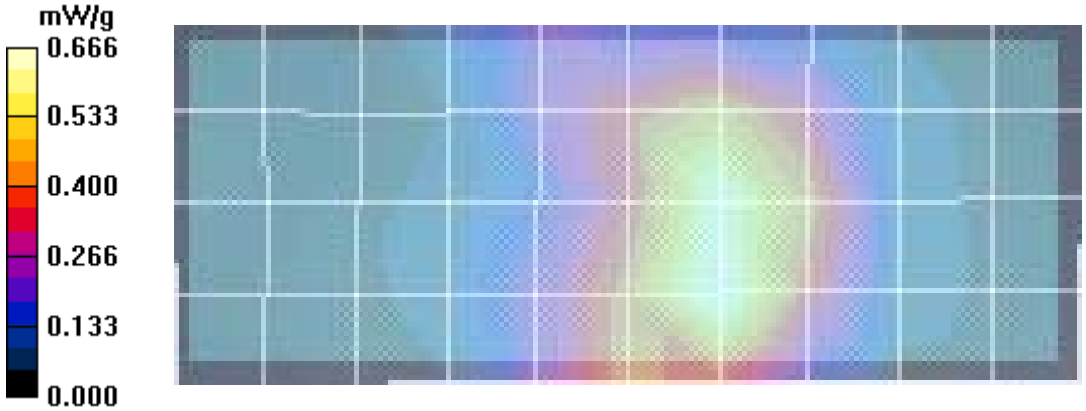
Communication System: CW
Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5240 MHz; σ = 4.83 mho/m; ε_r = 35.9; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.701 mW/g

L-Tilt, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.99 V/m; Power Drift = 0.448 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.375 mW/g; SAR(10 g) = 0.149 mW/g

Maximum value of SAR (measured) = 0.666 mW/g



Plot H11

Date Tested: 06/04/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 4 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 31%

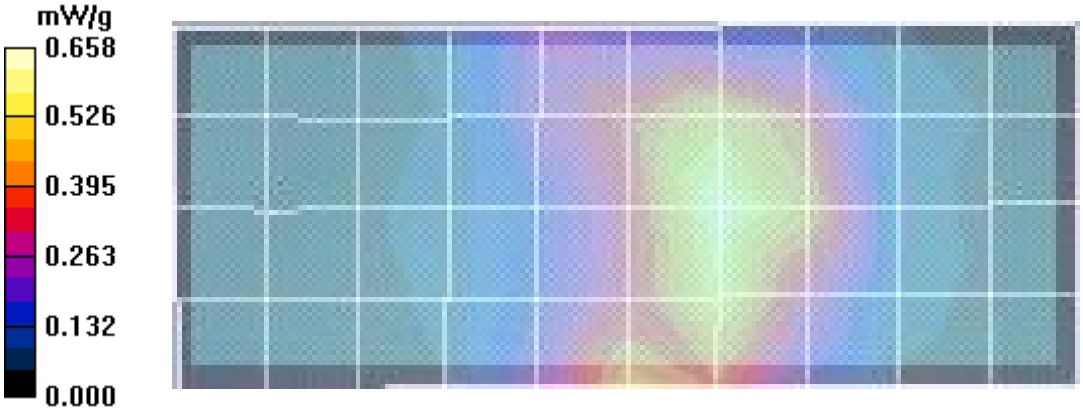
Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5280 MHz; σ = 4.89 mho/m; ε_r = 35.8; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.621 mW/g

L-Tilt, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.59 V/m; Power Drift = 0.974 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.324 mW/g; SAR(10 g) = 0.119 mW/g

Maximum value of SAR (measured) = 0.658 mW/g



Plot H12

Date Tested: 06/04/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 4 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 31%

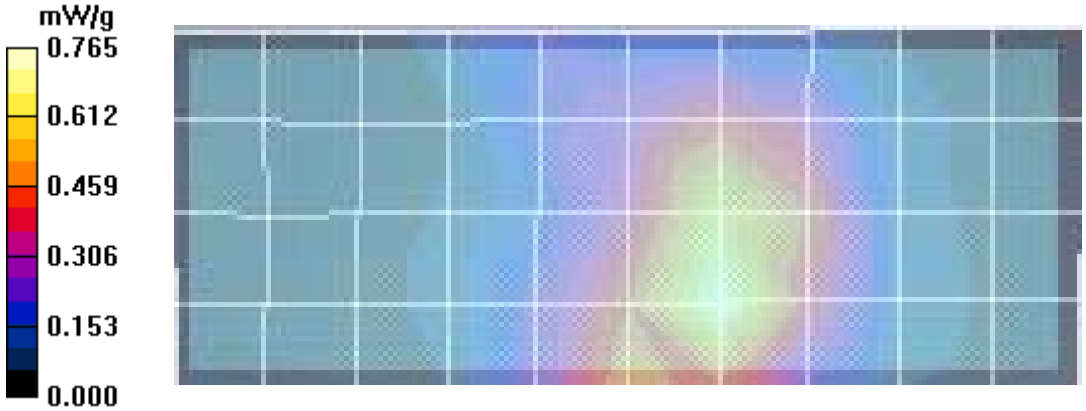
Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5280 MHz; σ = 4.89 mho/m; ε_r = 35.8; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.750 mW/g

L-Tilt, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.49 V/m; Power Drift = -0.639 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.157 mW/g

Maximum value of SAR (measured) = 0.765 mW/g



Plot H13b

Date/Time: 17/10/2014 9:20:04 AM

1289 - 5G Head Left SAR Oct 17

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

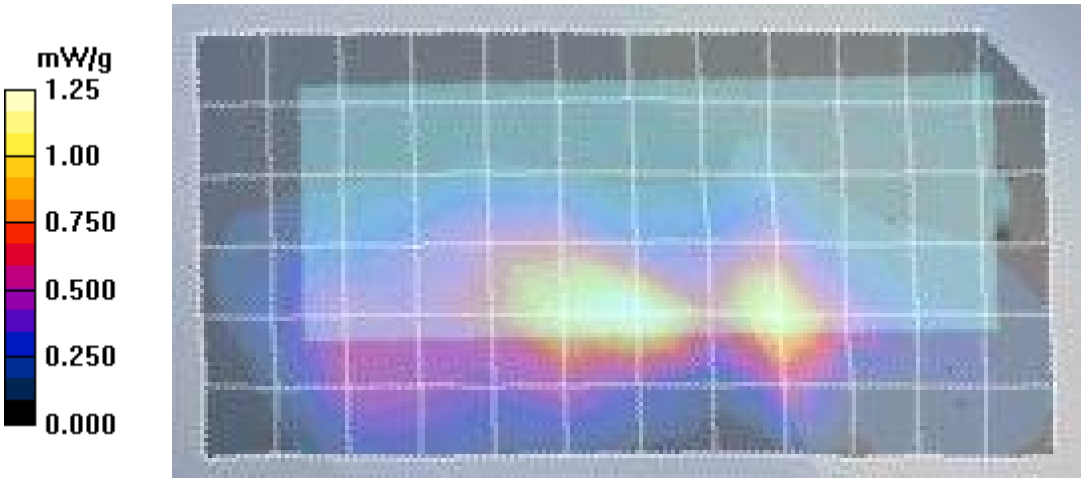
Procedure Notes:

Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5200 MHz; σ = 4.86 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H13b, L-Touch, 802.11n Ch 40, 5200MHz, BW=40MHz, BR=MCS0/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.35 mW/g

H13b, L-Touch, 802.11n Ch 40, 5200MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.39 V/m; Power Drift = 0.644 dB
Peak SAR (extrapolated) = 2.57 W/kg
SAR(1 g) = 0.649 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 1.25 mW/g



Top of device = Right

Plot H14b

Date/Time: 17/10/2014 9:50:23 AM

1289 - 5G Head Left SAR Oct 17

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

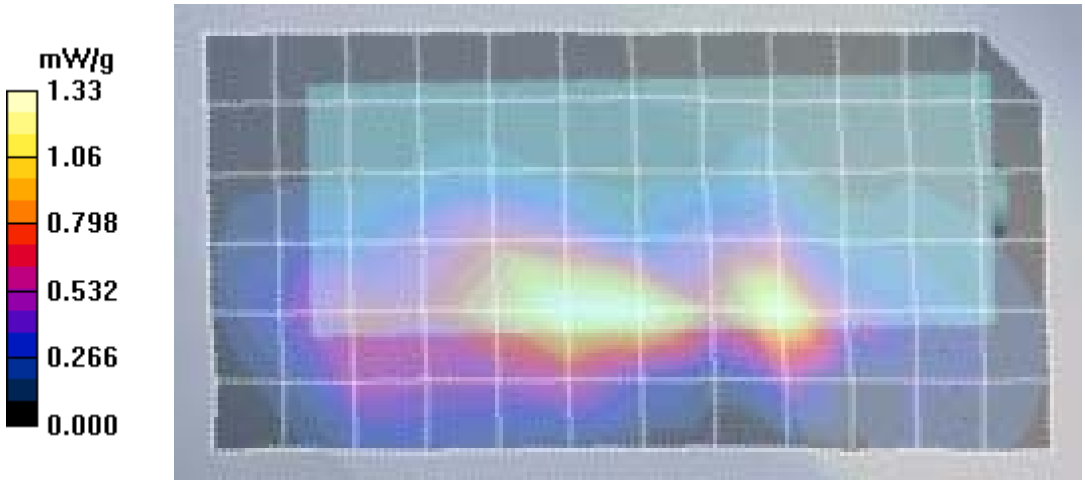
Procedure Notes:

Communication System: CW
Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5240 MHz; σ = 4.95 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H14b, L-Touch, 802.11n Ch 48, 5240MHz, BW=40MHz, BR=MCS0/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.35 mW/g

H14b, L-Touch, 802.11n Ch 48, 5240MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.52 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 2.77 W/kg
SAR(1 g) = 0.684 mW/g; SAR(10 g) = 0.222 mW/g
Maximum value of SAR (measured) = 1.33 mW/g



Top of device = Right

Plot H15b

Date/Time: 17/10/2014 10:53:25 AM

1289 - 5G Head Left SAR Oct 17

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

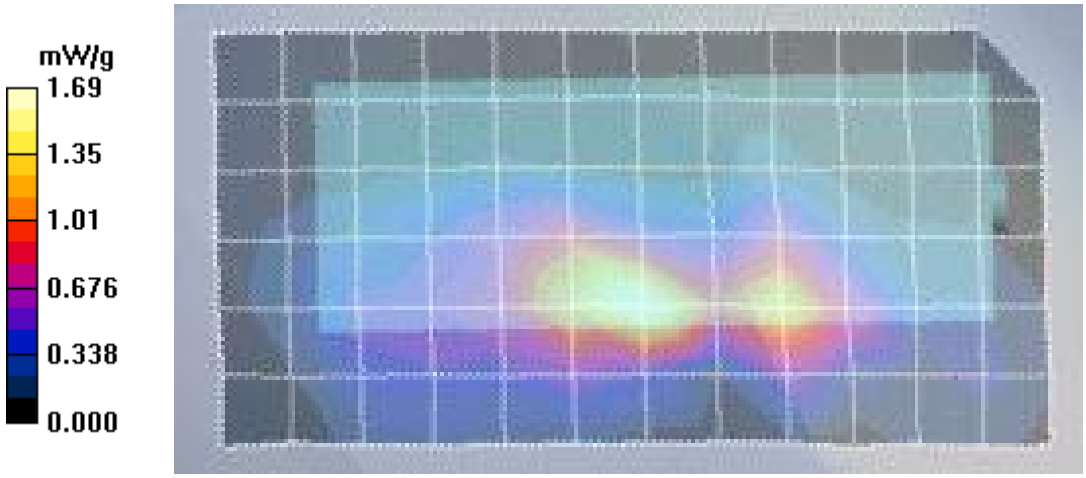
Procedure Notes:

Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5280 MHz; σ = 4.94 mho/m; ε_r = 35; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H15b, L-Touch, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.88 mW/g

H15b, L-Touch, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.20 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.276 mW/g
Maximum value of SAR (measured) = 1.69 mW/g



Top of device = Right

Plot H16b

Date/Time: 17/10/2014 11:47:46 AM

1289 - 5G Head Left SAR Oct 17

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

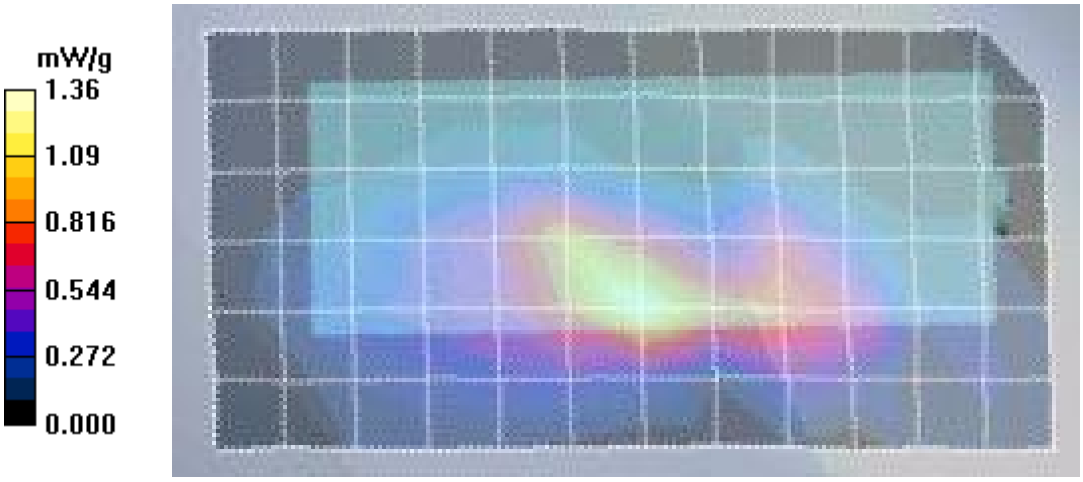
Procedure Notes:

Communication System: CW
Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5300 MHz; σ = 4.98 mho/m; ε_r = 35; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

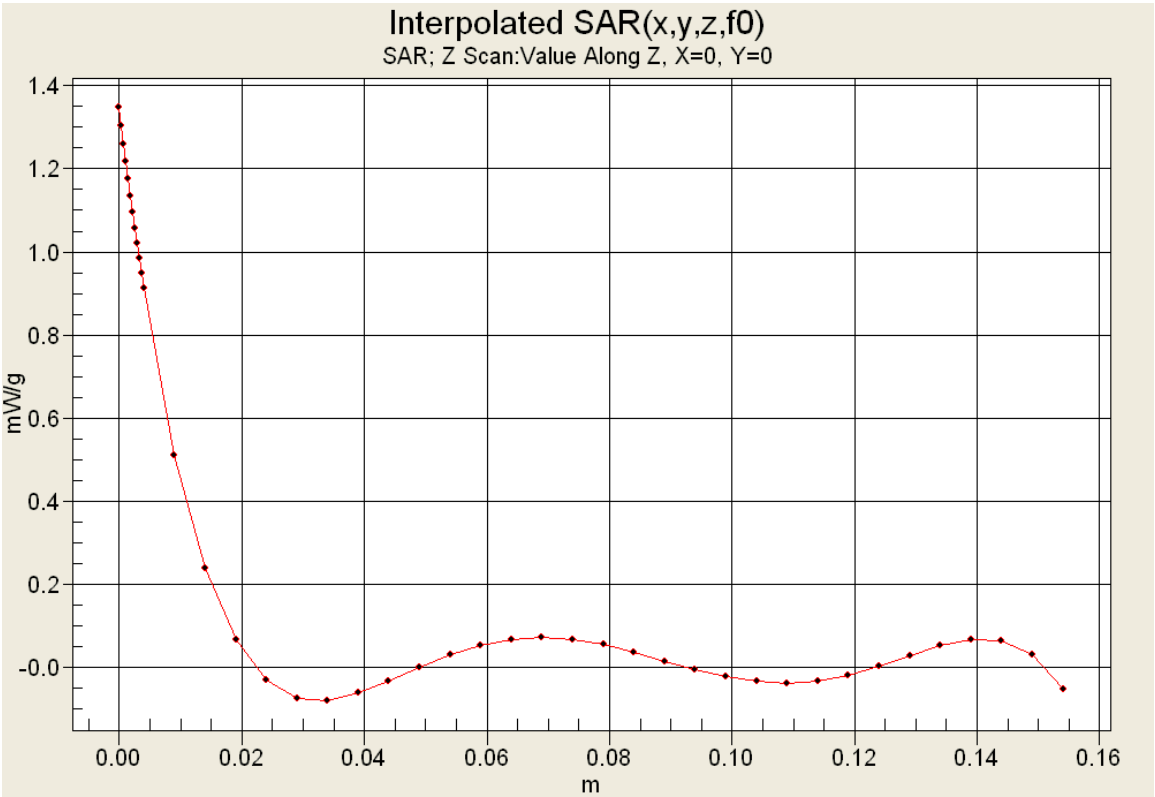
H16b, L-Touch, 802.11n Ch 60, 5300MHz, BW=40MHz, BR=MCS0 2/Area Scan 2 (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.36 mW/g

H16b, L-Touch, 802.11n Ch 60, 5300MHz, BW=40MHz, BR=MCS0 2/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.10 V/m; Power Drift = -0.197 dB
Peak SAR (extrapolated) = 3.83 W/kg
SAR(1 g) = 0.900 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 1.77 mW/g



Top of device = Right

Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot H18

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

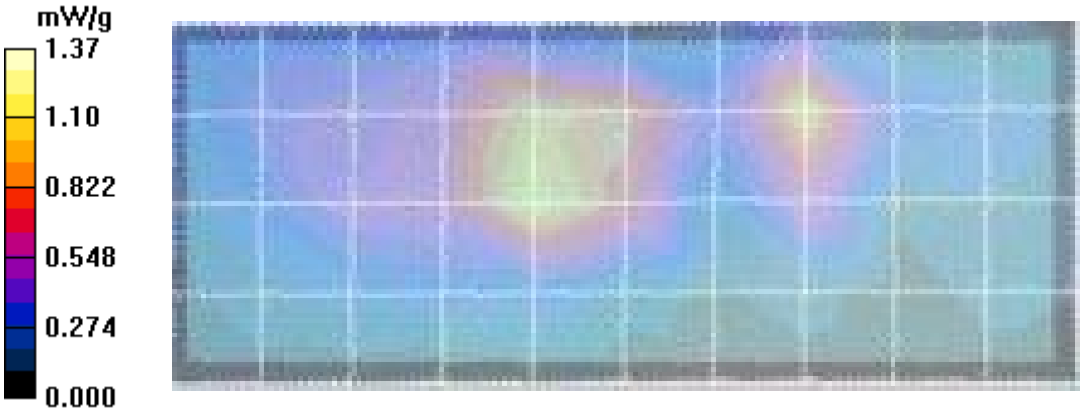
Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

Communication System: CW
Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5240 MHz; σ = 4.83 mho/m; ε_r = 35.9; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.08 mW/g

R-Touch, 802.11a Ch 48, 5240MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.59 V/m; Power Drift = 0.926 dB
Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 0.693 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 1.37 mW/g



Plot H19

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

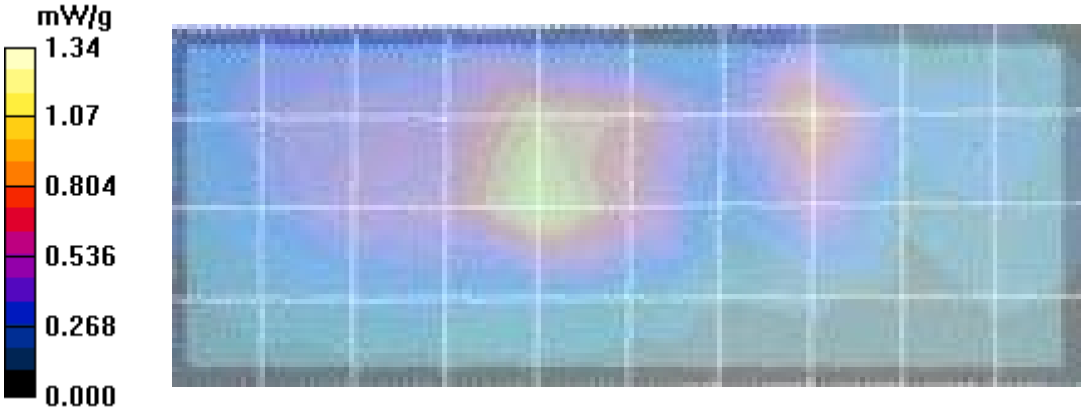
Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5200 MHz; σ = 4.81 mho/m; ε_r = 36.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.06 mW/g

R-Touch, 802.11a Ch 40, 5200MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.79 V/m; Power Drift = 0.863 dB
Peak SAR (extrapolated) = 2.70 W/kg
SAR(1 g) = 0.669 mW/g; SAR(10 g) = 0.220 mW/g.
Maximum value of SAR (measured) = 1.34 mW/g



Plot H20

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

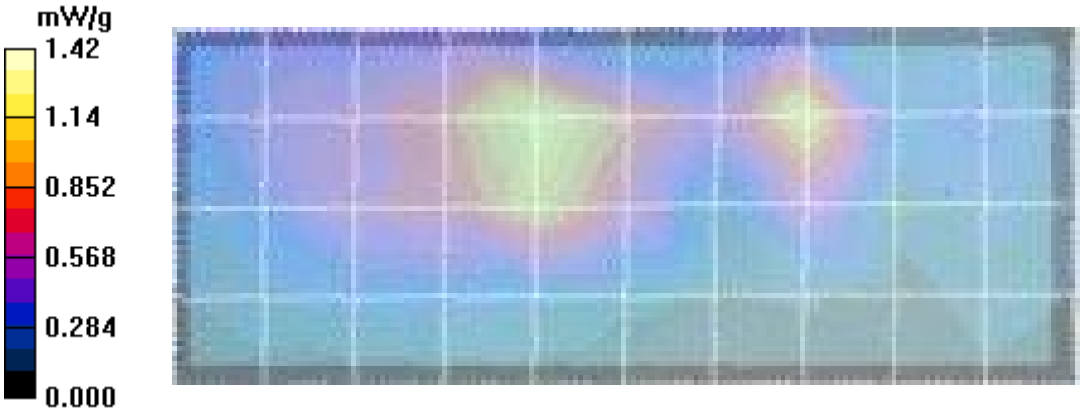
Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5280 MHz; σ = 4.89 mho/m; ε_r = 35.8; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

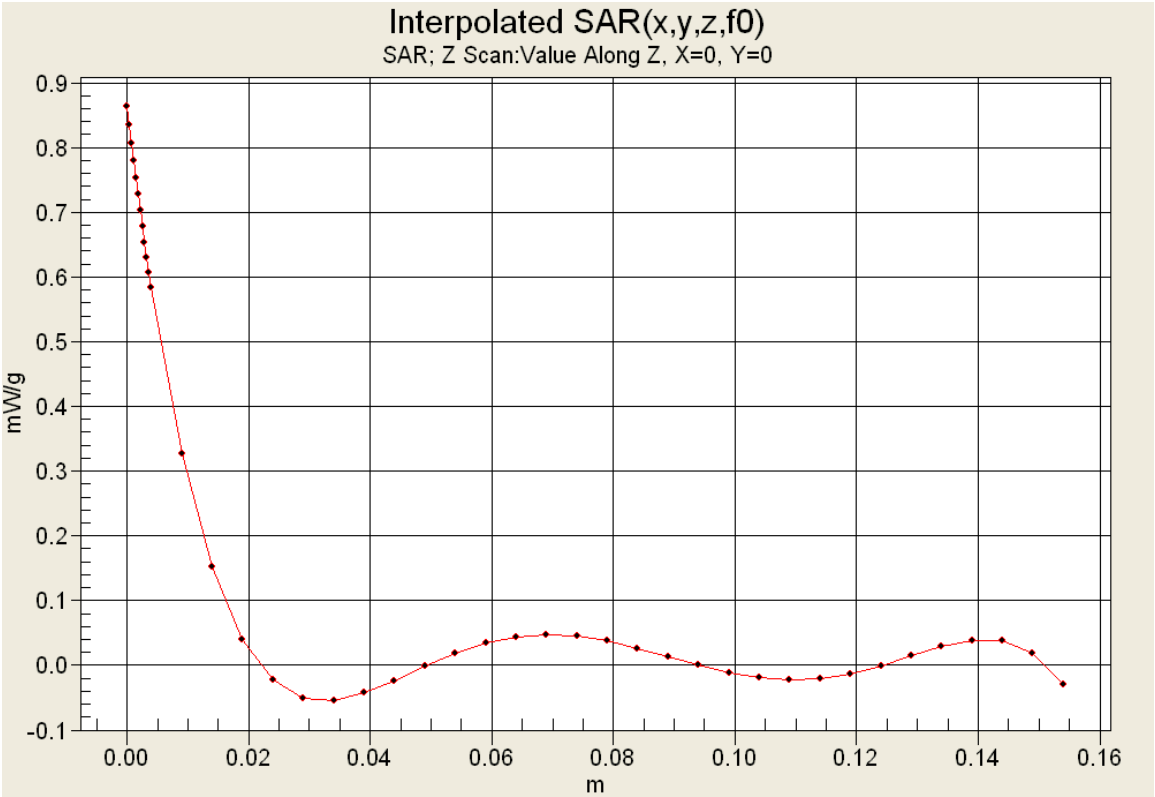
R-Touch, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.23 mW/g

R-Touch, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.88 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 2.75 W/kg
SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.255 mW/g

Maximum value of SAR (measured) = 1.42 mW/g



Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot H21

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

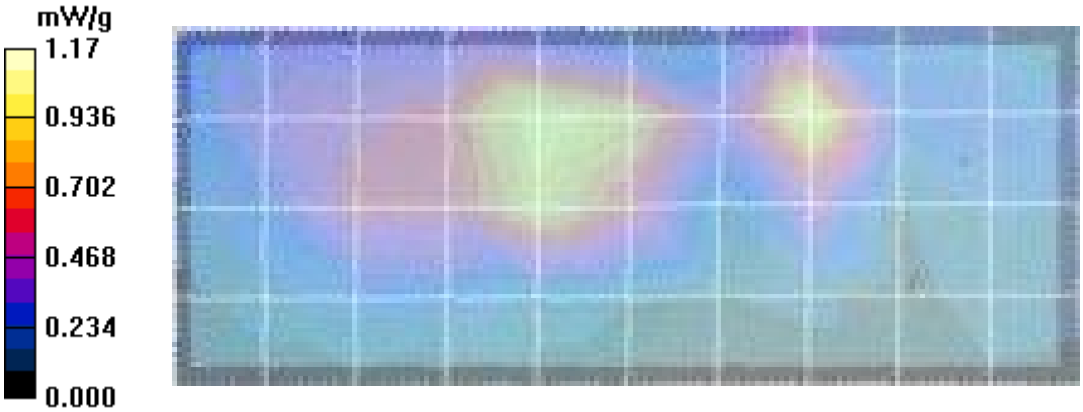
Communication System: CW
Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5300 MHz; σ = 4.89 mho/m; ε_r = 36.1; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11a Ch 60, 5300MHz, BW=40MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.03 mW/g

R-Touch, 802.11a Ch 60, 5300MHz, BW=40MHz, BR=6Mbps/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.71 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 2.28 W/kg
SAR(1 g) = 0.575 mW/g; SAR(10 g) = 0.206 mW/g

Maximum value of SAR (measured) = 1.17 mW/g



Plot H22

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

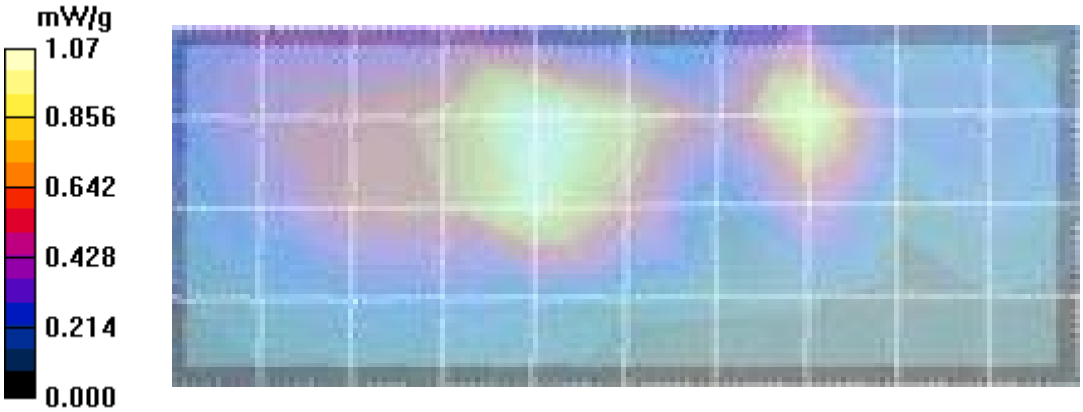
Communication System: CW
Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5240 MHz; σ = 4.83 mho/m; ε_r = 35.9; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11n Ch 48, 5240MHz, BW=40MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.13 mW/g

R-Touch, 802.11n Ch 48, 5240MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.92 V/m; Power Drift = -0.280 dB
Peak SAR (extrapolated) = 2.04 W/kg
SAR(1 g) = 0.554 mW/g; SAR(10 g) = 0.192 mW/g

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



Plot H23

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

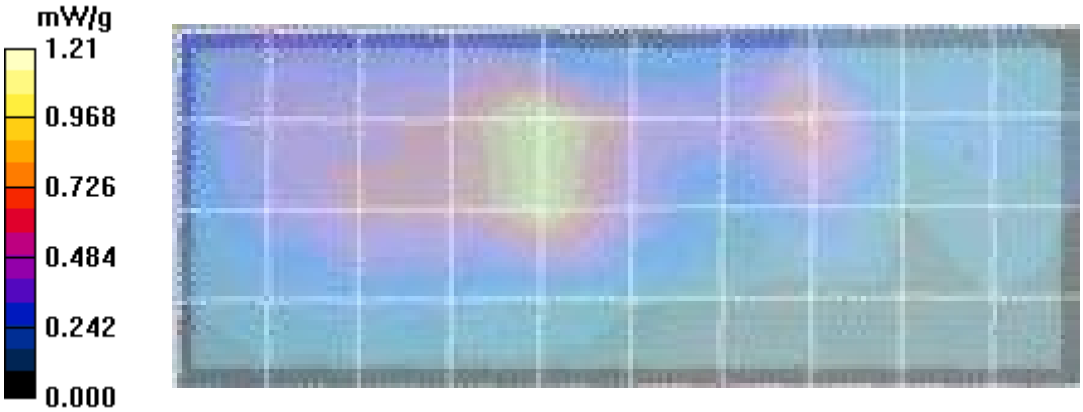
Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5200 MHz; σ = 4.81 mho/m; ε_r = 36.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11n Ch 40, 5200MHz, BW=40MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.937 mW/g

R-Touch, 802.11n Ch 40, 5200MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.22 V/m; Power Drift = 0.714 dB
Peak SAR (extrapolated) = 2.60 W/kg
SAR(1 g) = 0.633 mW/g; SAR(10 g) = 0.204 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



Plot H24

Date Tested: 06/05/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 5 June2014 Ambient Temp: 25C Fluid Temp: 24.1C Humidity: 18%

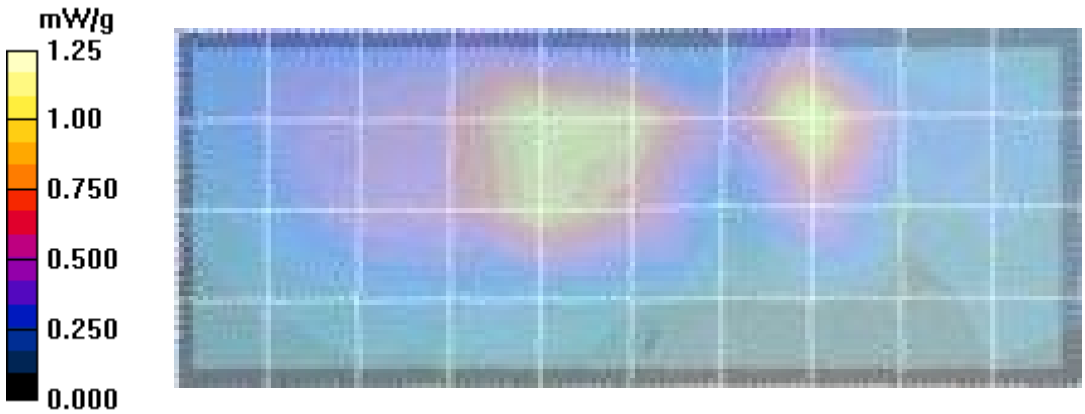
Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5280 MHz; σ = 4.89 mho/m; ε_r = 35.8; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.03 mW/g

R-Touch, 802.11n Ch 56, 5280MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.66 V/m; Power Drift = 0.130 dB
Peak SAR (extrapolated) = 2.54 W/kg
SAR(1 g) = 0.656 mW/g; SAR(10 g) = 0.225 mW/g

Maximum value of SAR (measured) = 1.25 mW/g



Plot H25

Date Tested: 06/06/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 6 June2014 Ambient Temp: 25C Fluid Temp: 24.0C Humidity: 21%

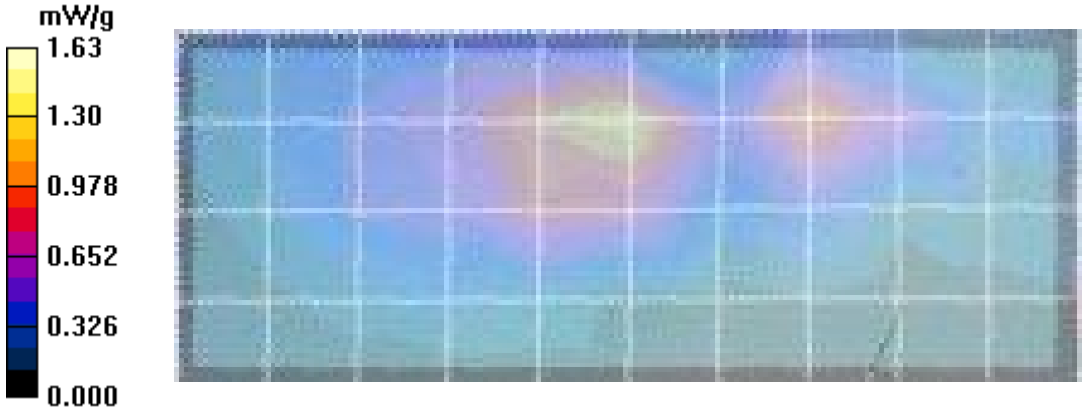
Communication System: CW
Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5300 MHz; σ = 4.89 mho/m; ε_r = 36.1; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

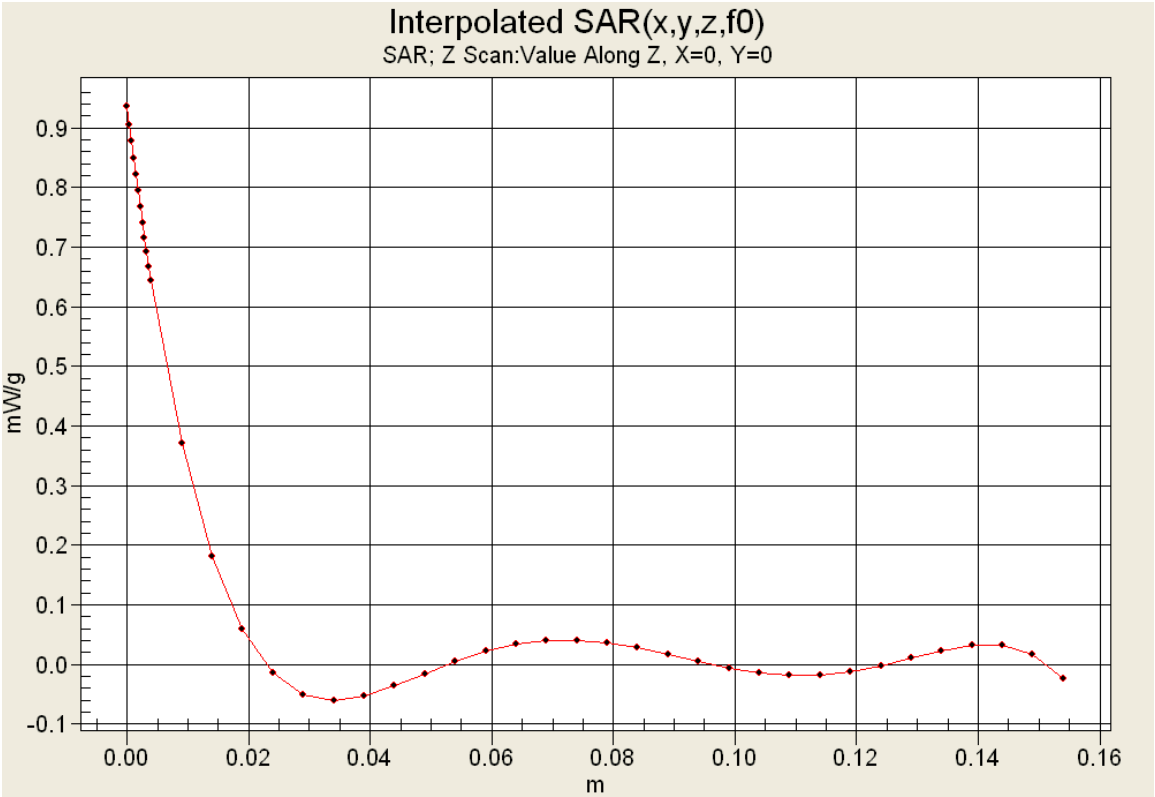
R-Touch, 802.11n Ch 60, 5300MHz, BW=40MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.20 mW/g

R-Touch, 802.11n Ch 60, 5300MHz, BW=40MHz, BR=MCS0/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.03 V/m; Power Drift = 0.527 dB
Peak SAR (extrapolated) = 3.34 W/kg
SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.289 mW/g

Maximum value of SAR (measured) = 1.63 mW/g



Z-Axis Scan



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Plot H26

Date Tested: 06/10/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 10 June2014 Ambient Temp: 24C Fluid Temp: 24.2C Humidity: 30%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

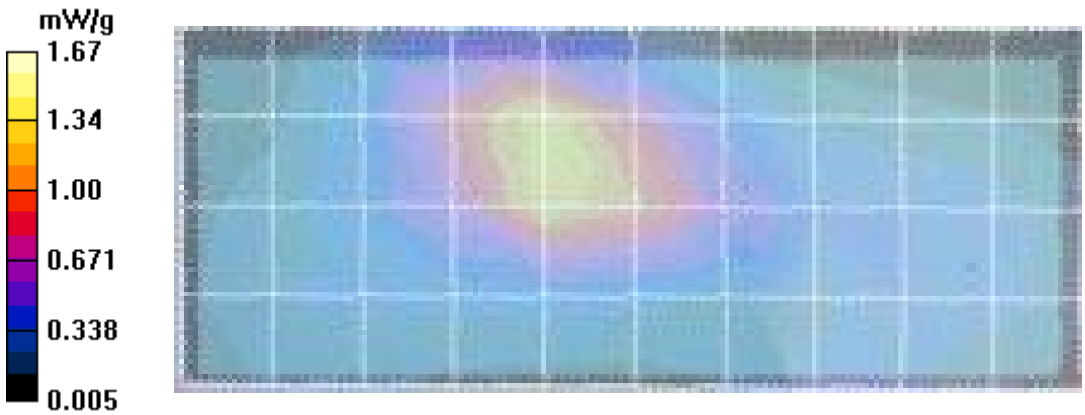
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Touch, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

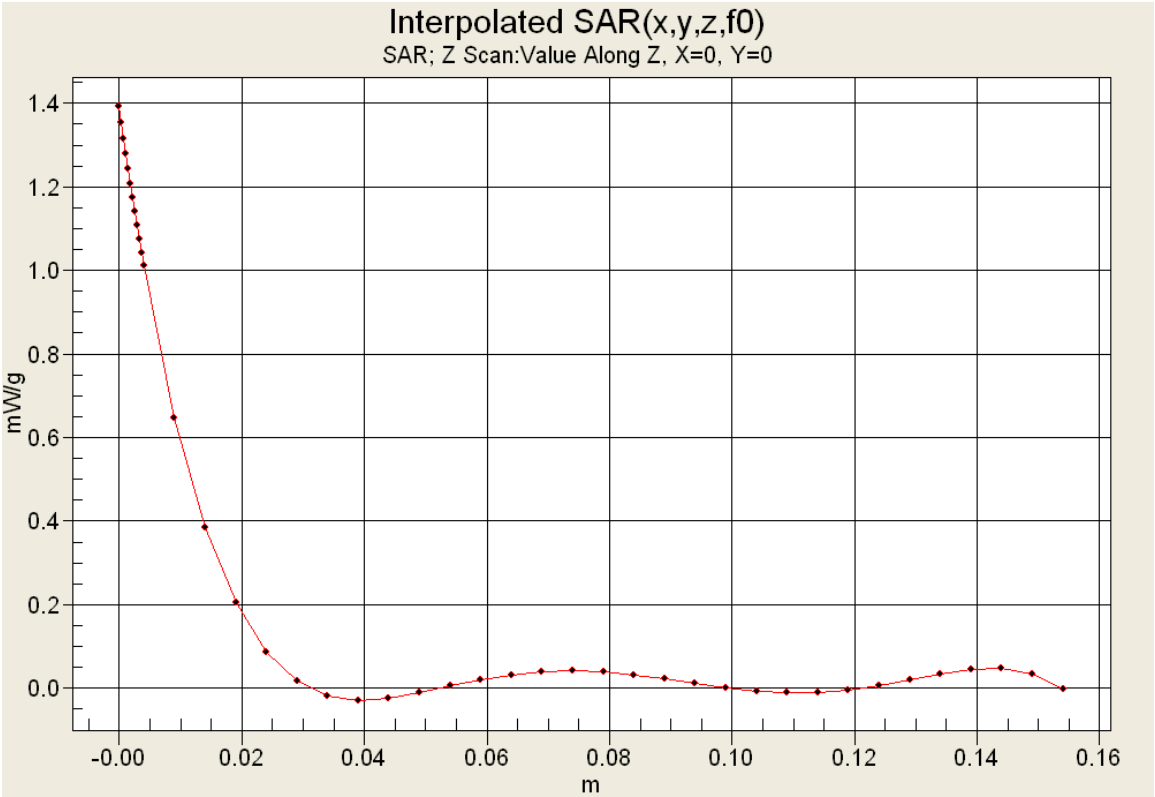
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.20 mW/g

L-Touch, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.538 dB
Peak SAR (extrapolated) = 2.37 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.431 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.67 mW/g



Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot H27

Date Tested: 06/10/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 10 June2014 Ambient Temp: 24C Fluid Temp: 24.2C Humidity: 30%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

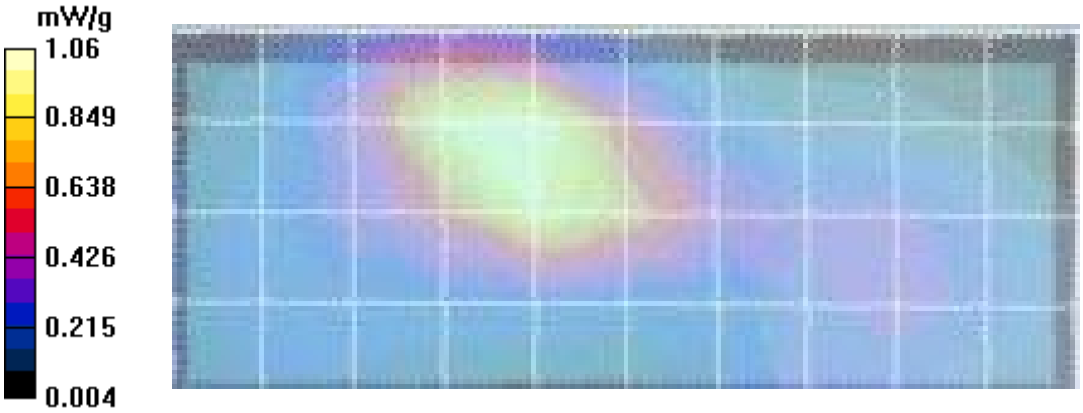
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Touch, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.984 mW/g

L-Touch, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.327 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.06 mW/g



Plot H28

Date Tested: 06/10/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 10 June2014 Ambient Temp: 24C Fluid Temp: 24.2C Humidity: 30%

Communication System: CW
Frequency: 2457 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2457 MHz; σ = 1.9 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

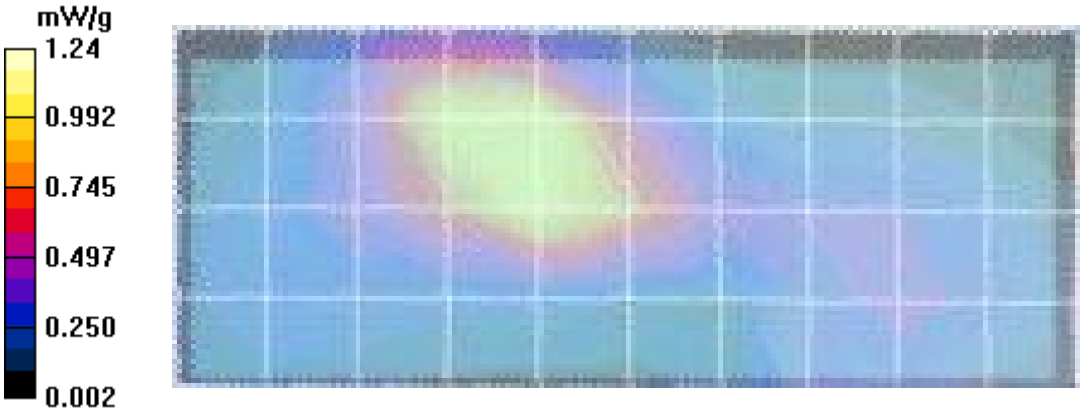
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Touch, 802.11b Ch 10, 2457MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.07 mW/g

L-Touch, 802.11b Ch 10, 2457MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = -0.710 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 0.777 mW/g; SAR(10 g) = 0.347 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.24 mW/g



Plot H30

Date Tested: 06/10/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 10 June2014 Ambient Temp: 24C Fluid Temp: 24.2C Humidity: 30%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

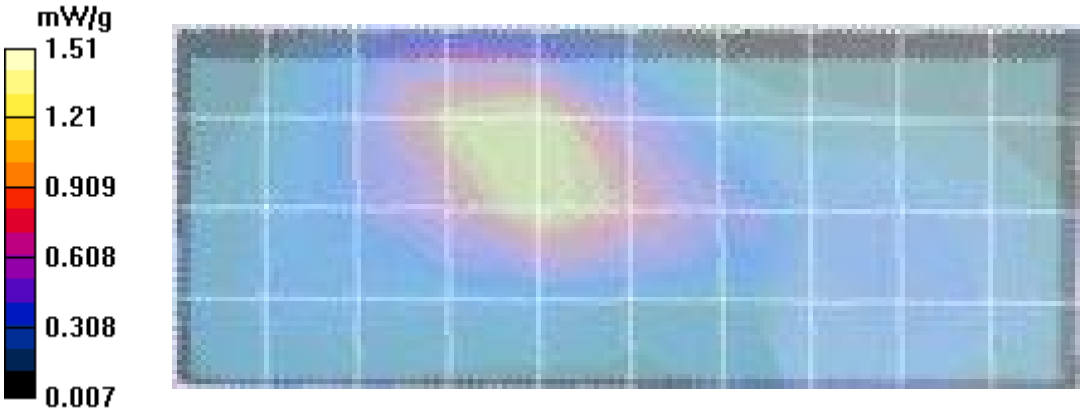
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Touch, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.11 mW/g

L-Touch, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = 0.572 dB
Peak SAR (extrapolated) = 2.14 W/kg
SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.401 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.51 mW/g



Plot H31

Date Tested: 06/11/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 11 June2014 Ambient Temp: 25C Fluid Temp: 24.2C Humidity: 23%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

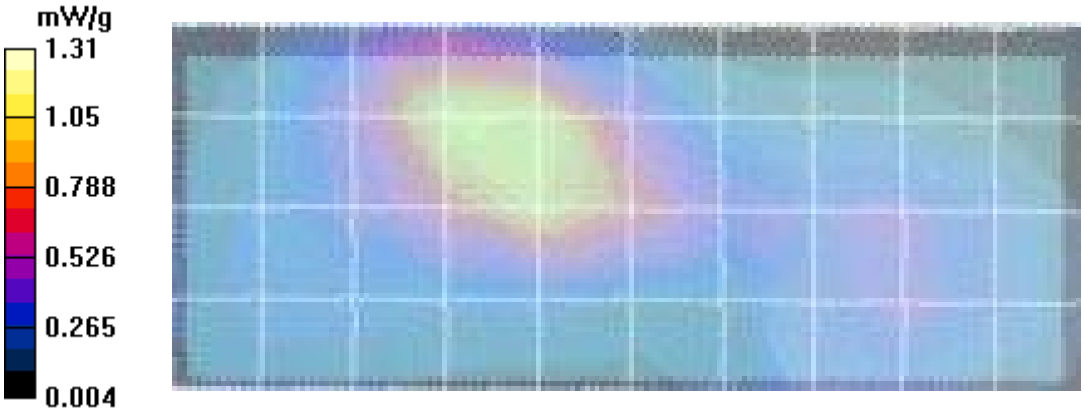
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Touch, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

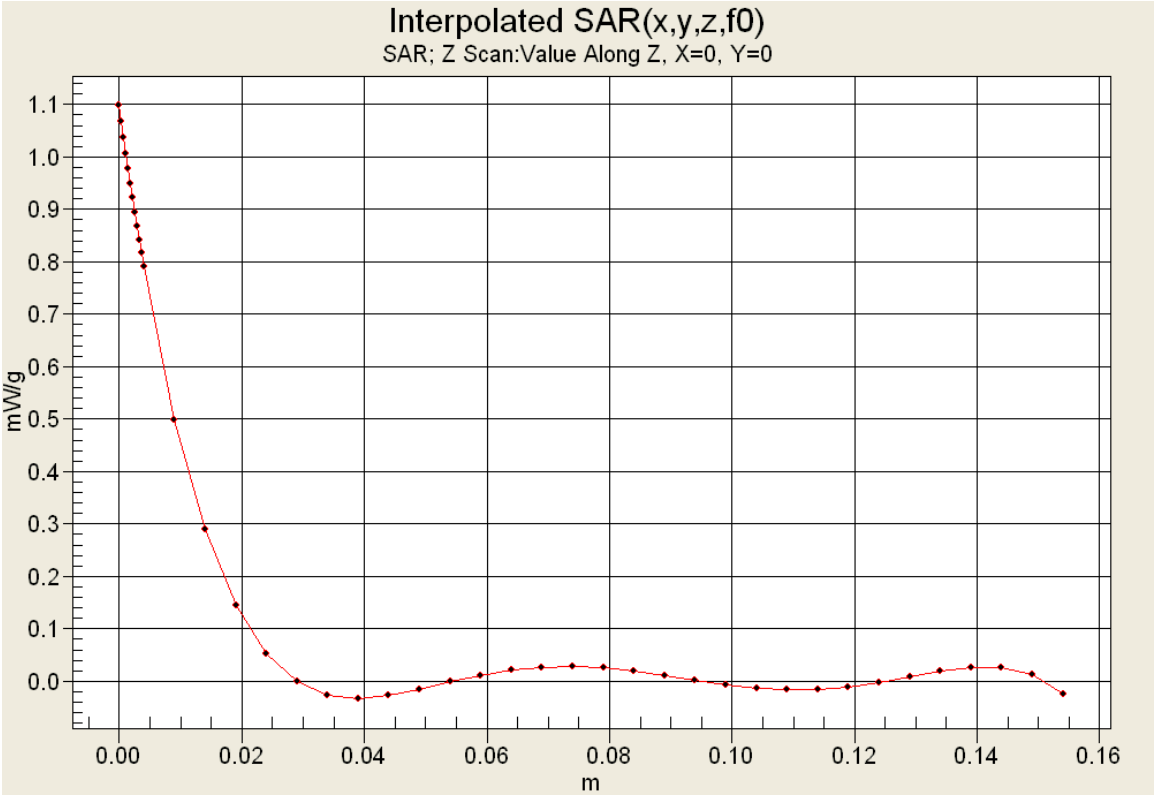
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.07 mW/g

L-Touch, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MCS0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 1.83 W/kg
SAR(1 g) = 0.820 mW/g; SAR(10 g) = 0.368 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.31 mW/g



Z-Axis Scan



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Plot H32

Date Tested: 06/11/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 11 June2014 Ambient Temp: 25C Fluid Temp: 24.2C Humidity: 23%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

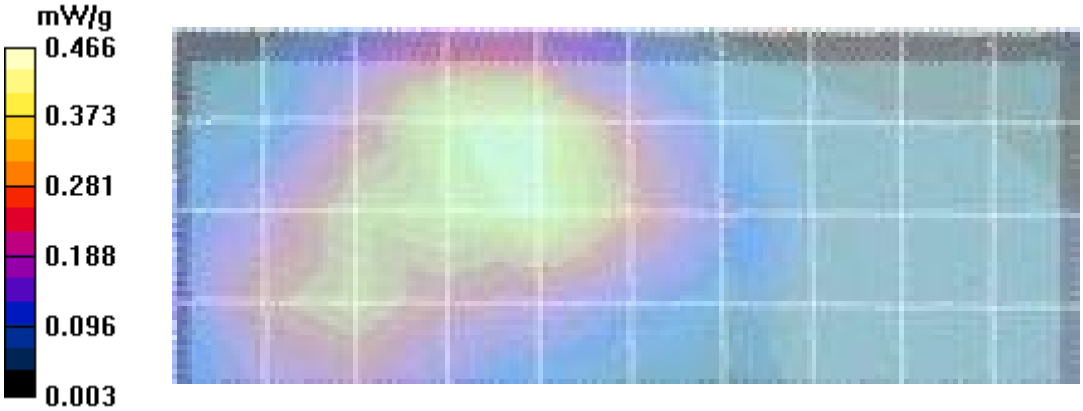
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.418 mW/g

L-Tilt, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -1.16 dB
Peak SAR (extrapolated) = 0.626 W/kg
SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.169 mW/g

Info: Interpolated medium parameters used for SAR evaluation..
Maximum value of SAR (measured) = 0.466 mW/g



Plot H33

Date Tested: 06/11/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 11 June2014 Ambient Temp: 25C Fluid Temp: 24.2C Humidity: 23%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

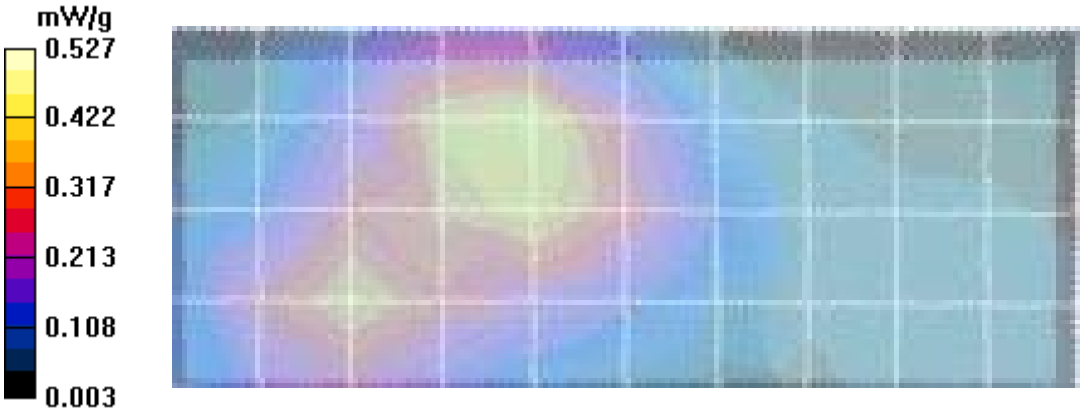
L-Tilt, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.394 mW/g

L-Tilt, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = 0.406 dB
Peak SAR (extrapolated) = 0.718 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.173 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.527 mW/g



Plot H35

Date Tested: 06/11/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 11 June2014 Ambient Temp: 25C Fluid Temp: 24.2C Humidity: 23%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

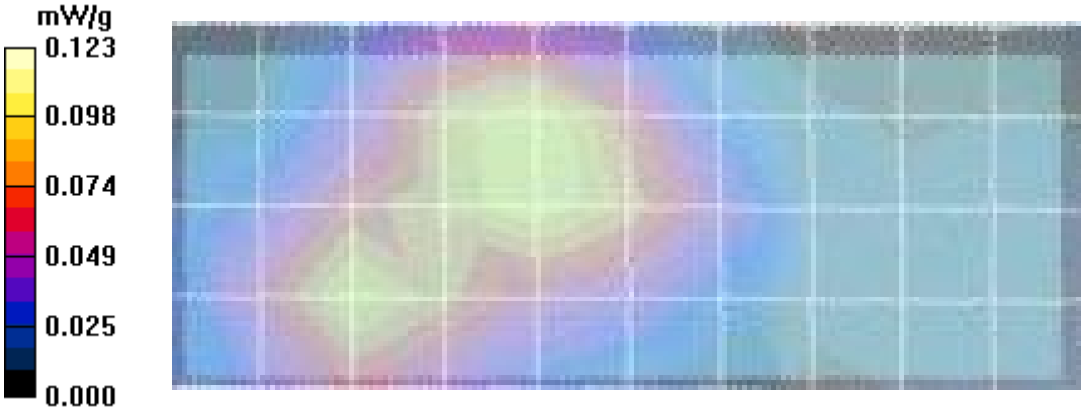
L-Tilt, 802.11g Ch 6, 2437MHz, BW=20MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.100 mW/g

L-Tilt, 802.11g Ch 6, 2437MHz, BW=20MHz, BR=6Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.59 V/m; Power Drift = -0.842 dB
Peak SAR (extrapolated) = 0.178 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.044 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.123 mW/g



Plot H36

Date Tested: 06/11/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 11 June2014 Ambient Temp: 25C Fluid Temp: 24.2C Humidity: 23%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

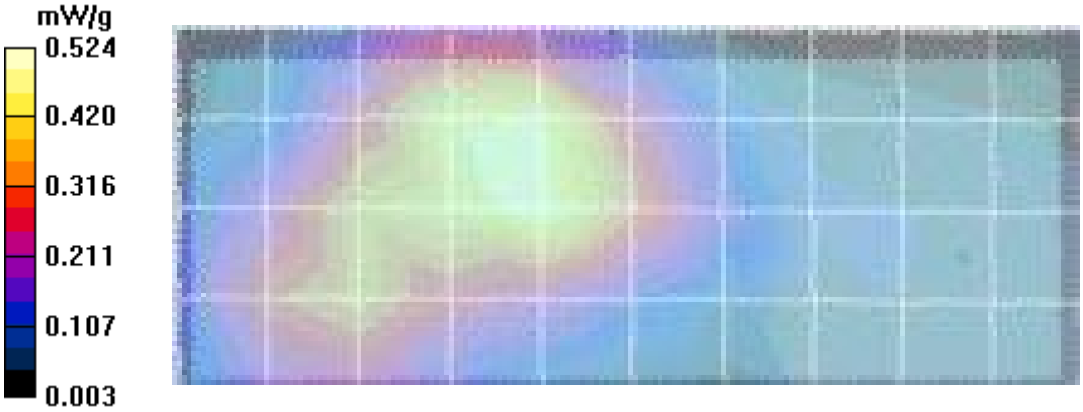
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

L-Tilt, 802.11n Ch 6, 2437MHz, BW=20MHz, BR=MCS0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.487 mW/g

L-Tilt, 802.11n Ch 6, 2437MHz, BW=20MHz, BR=MCS0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -1.08 dB
Peak SAR (extrapolated) = 0.709 W/kg
SAR(1 g) = 0.352 mW/g; SAR(10 g) = 0.181 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.524 mW/g



Plot H37

Date Tested: 06/12/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 12 June2014 Ambient Temp: 23C Fluid Temp: 24.0C Humidity: 27%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

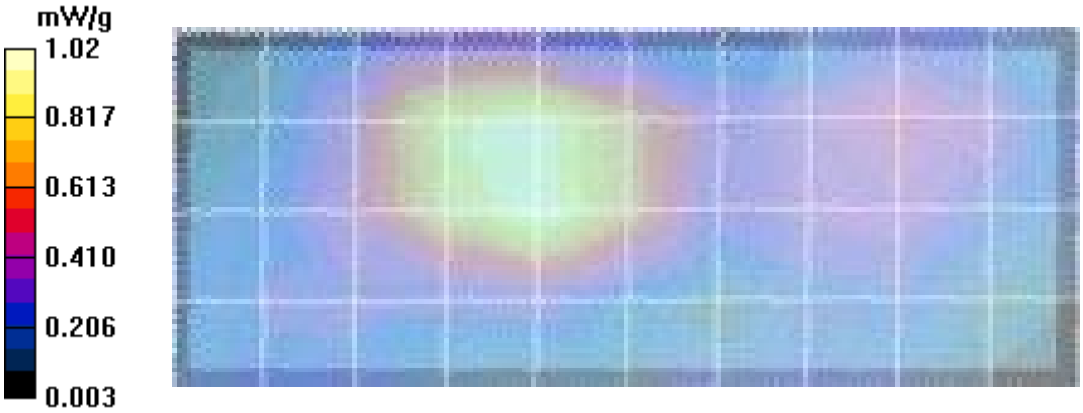
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.963 mW/g

R-Touch, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.974 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.701 mW/g; SAR(10 g) = 0.332 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.02 mW/g



Plot H38

Date Tested: 06/12/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 12 June2014 Ambient Temp: 23C Fluid Temp: 24.0C Humidity: 27%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

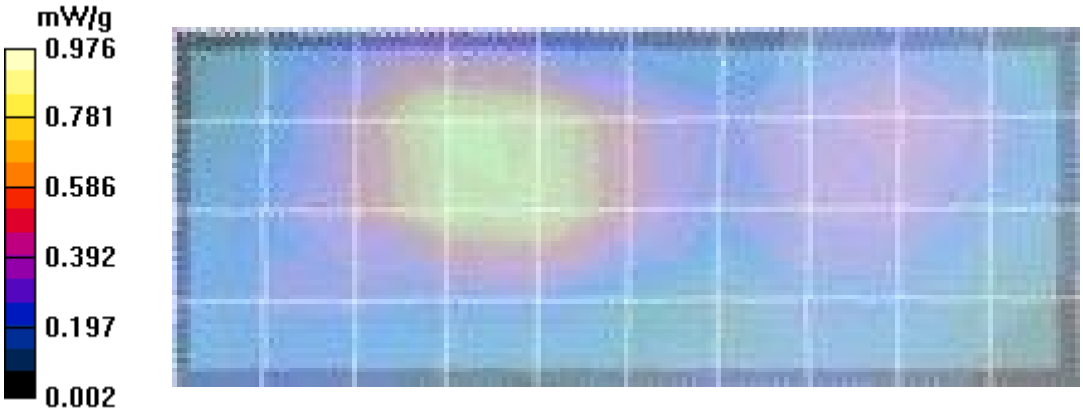
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.812 mW/g

R-Touch, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.706 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.619 mW/g; SAR(10 g) = 0.282 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.976 mW/g



Plot H40

Date Tested: 06/12/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 12 June2014 Ambient Temp: 23C Fluid Temp: 24.0C Humidity: 27%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

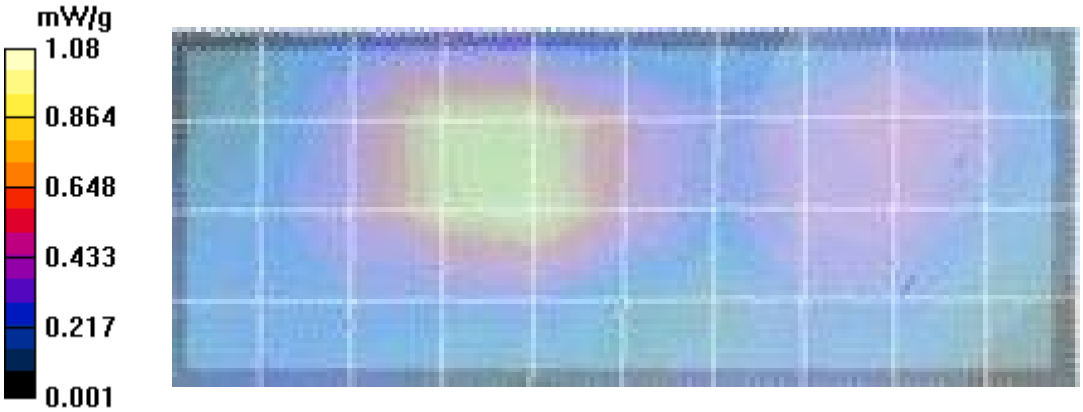
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.851 mW/g

R-Touch, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = -0.413 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.319 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.08 mW/g



Plot H41

Date Tested: 06/12/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 12 June2014 Ambient Temp: 23C Fluid Temp: 24.0C Humidity: 27%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

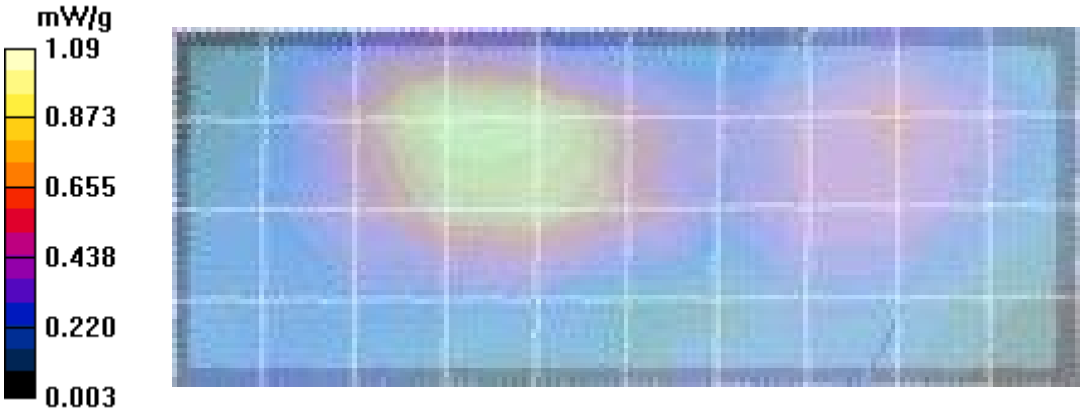
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Touch, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MSC0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.960 mW/g

R-Touch, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MSC0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.1 V/m; Power Drift = -0.550 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.666 mW/g; SAR(10 g) = 0.315 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.09 mW/g



Plot H42

Date Tested: 06/13/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 13 June2014 Ambient Temp: 24C Fluid Temp: 24.1C Humidity: 31%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

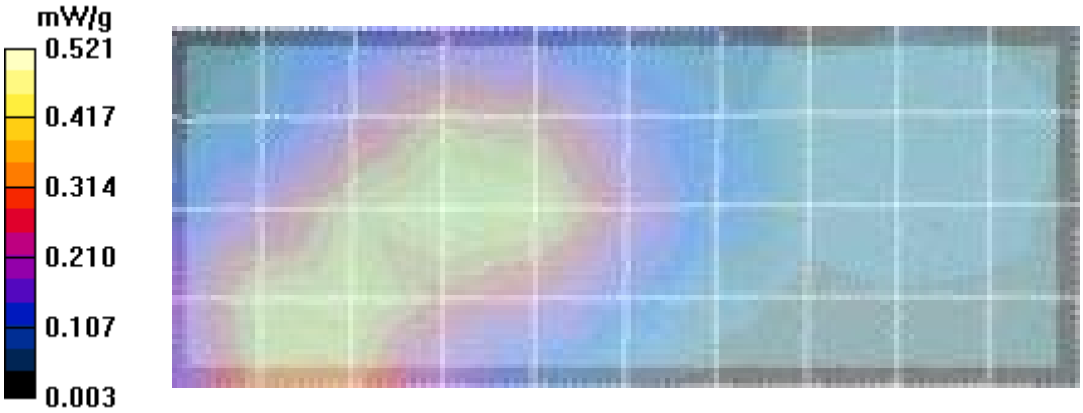
R-Tilt, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.430 mW/g

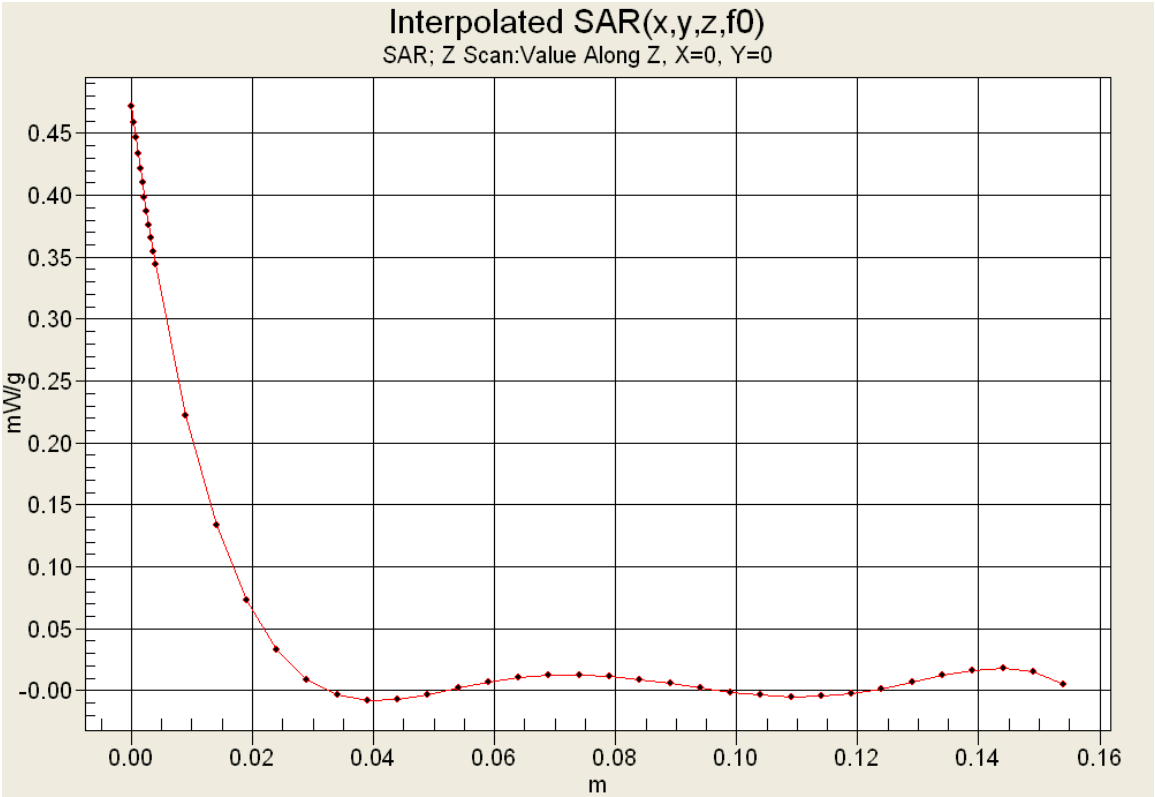
R-Tilt, 802.11b Ch 1, 2412MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 0.709 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.181 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.521 mW/g



Z-Axis Scan



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Plot H43

Date Tested: 06/13/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 13 June2014 Ambient Temp: 24C Fluid Temp: 24.1C Humidity: 31%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2437 MHz; σ = 1.88 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

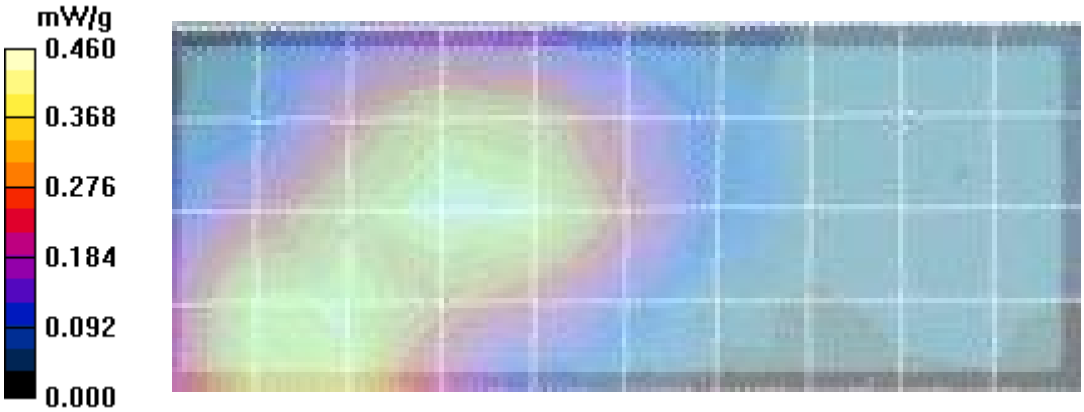
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Tilt, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.442 mW/g

R-Tilt, 802.11b Ch 6, 2437MHz, BW=20MHz, BR=1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.877 dB
Peak SAR (extrapolated) = 0.639 W/kg
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.171 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.460 mW/g



Plot H45

Date Tested: 06/13/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 13 June2014 Ambient Temp: 24C Fluid Temp: 24.1C Humidity: 31%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

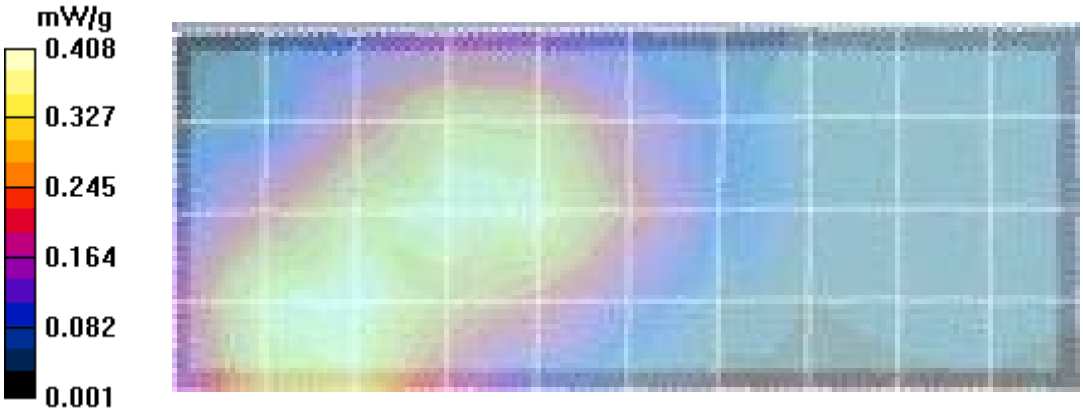
R-Tilt, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.400 mW/g

R-Tilt, 802.11g Ch 1, 2412MHz, BW=20MHz, BR=6Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.7 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.554 W/kg
SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.155 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.408 mW/g



Plot H46

Date Tested: 06/13/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 13 June2014 Ambient Temp: 24C Fluid Temp: 24.1C Humidity: 31%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used (interpolated): f = 2412 MHz; σ = 1.85 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

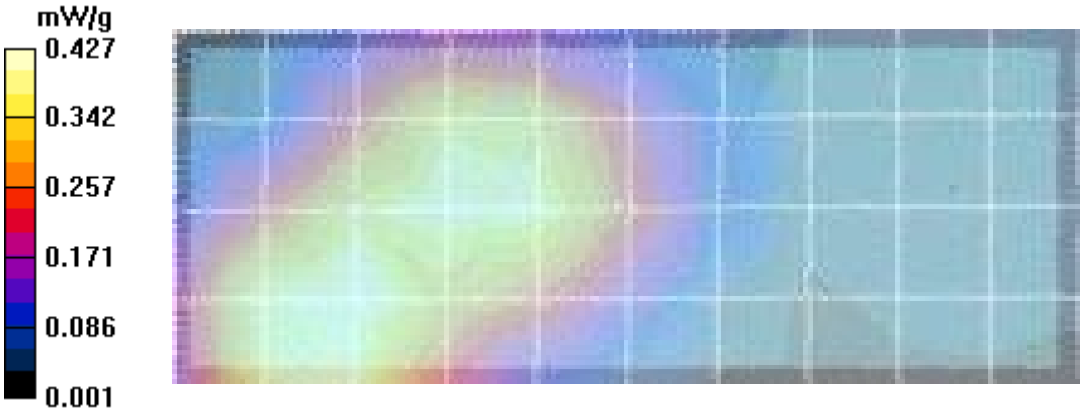
R-Tilt, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MSC0/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.430 mW/g

R-Tilt, 802.11n Ch 1, 2412MHz, BW=20MHz, BR=MSC0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = -1.40 dB
Peak SAR (extrapolated) = 0.597 W/kg
SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.160 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.427 mW/g



Plot B1

Date/Time: 26/05/2014 1:10:01 PM

1289 - Body SAR May 26

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 26 May 2014, Ambient Temp: 24C; Fluid Temp: 22.2C; Humidity: 31%

Procedure Notes:

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2412 MHz; σ = 1.87 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3

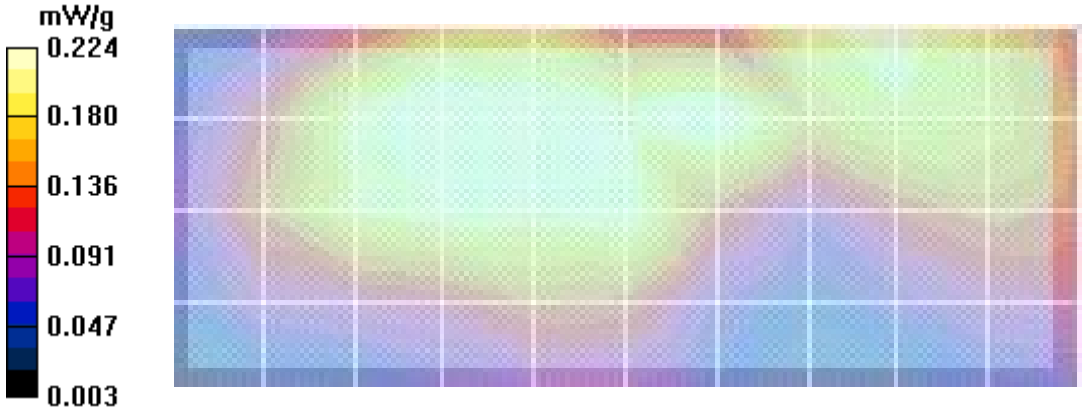
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B1, 802.11b Ch 1, 2412MHz, BW=20MHz, Bit Rate=1MBps, BC/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.247 mW/g

B1, 802.11b Ch 1, 2412MHz, BW=20MHz, Bit Rate=1MBps, BC/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.318 W/kg
SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.105 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.224 mW/g



Plot B5

Date Tested: 05/27/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 27 May 2014, Ambient Temp: 23C; Fluid Temp: 22.7C; Humidity: 24%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2437 MHz; σ = 1.92 mho/m; ε_r = 51; ρ = 1000 kg/m^3

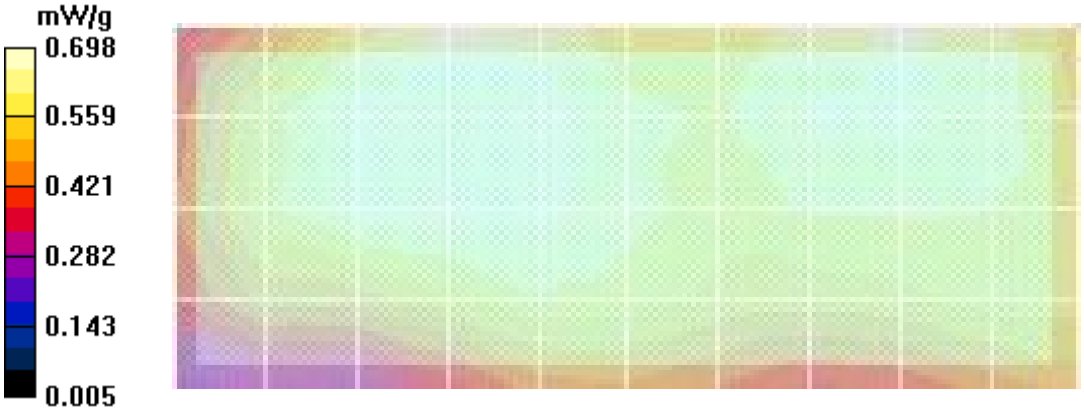
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Ch 6, 2437MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

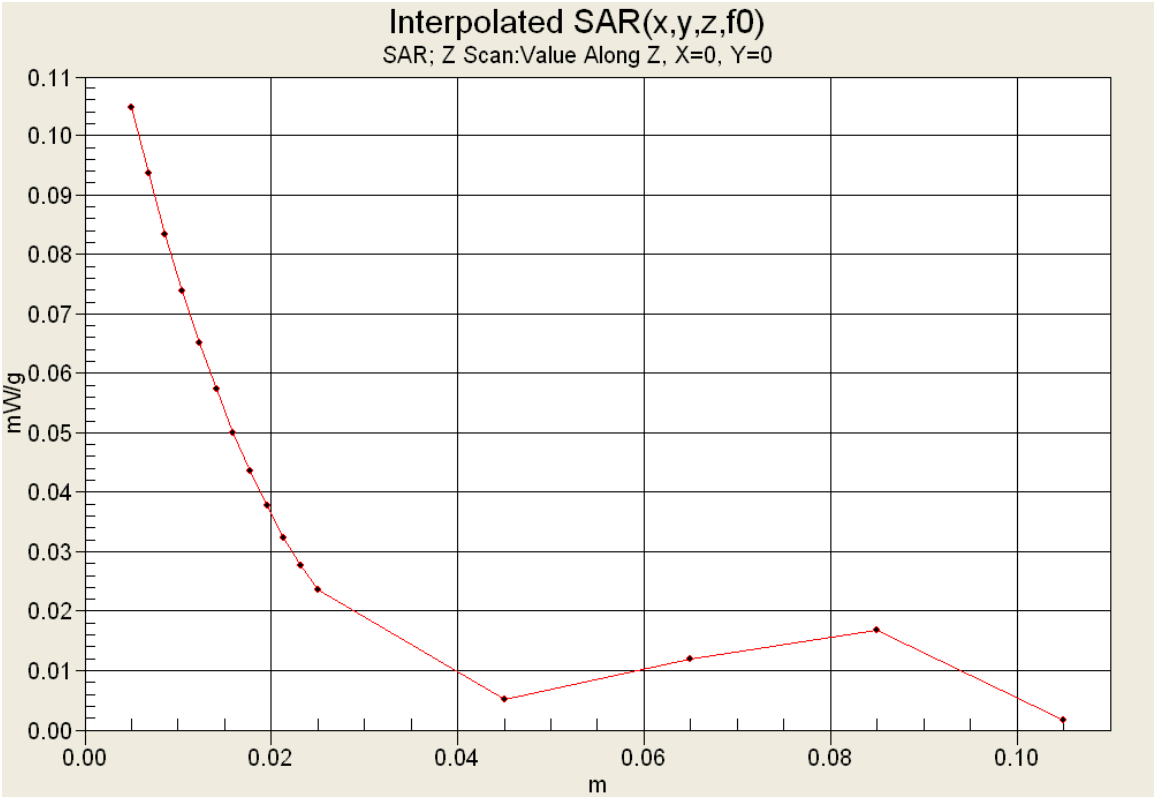
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.808 mW/g

802.11b Ch 6, 2437MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.189 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.315 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.698 mW/g



Z-Axis Scan



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Plot B6

Date Tested: 05/29/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 29 May 2014, Ambient Temp: 24C; Fluid Temp: 23.0C; Humidity: 31%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2412 MHz; σ = 1.87 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3

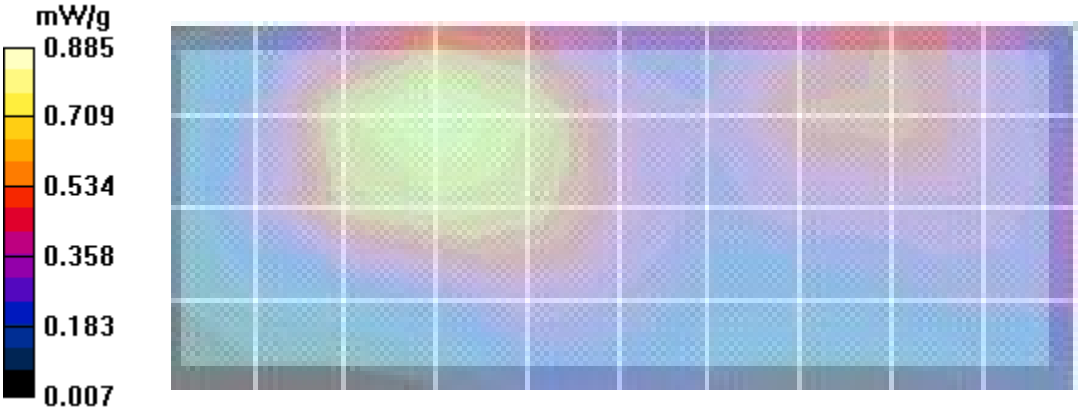
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Ch 1, 2412MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

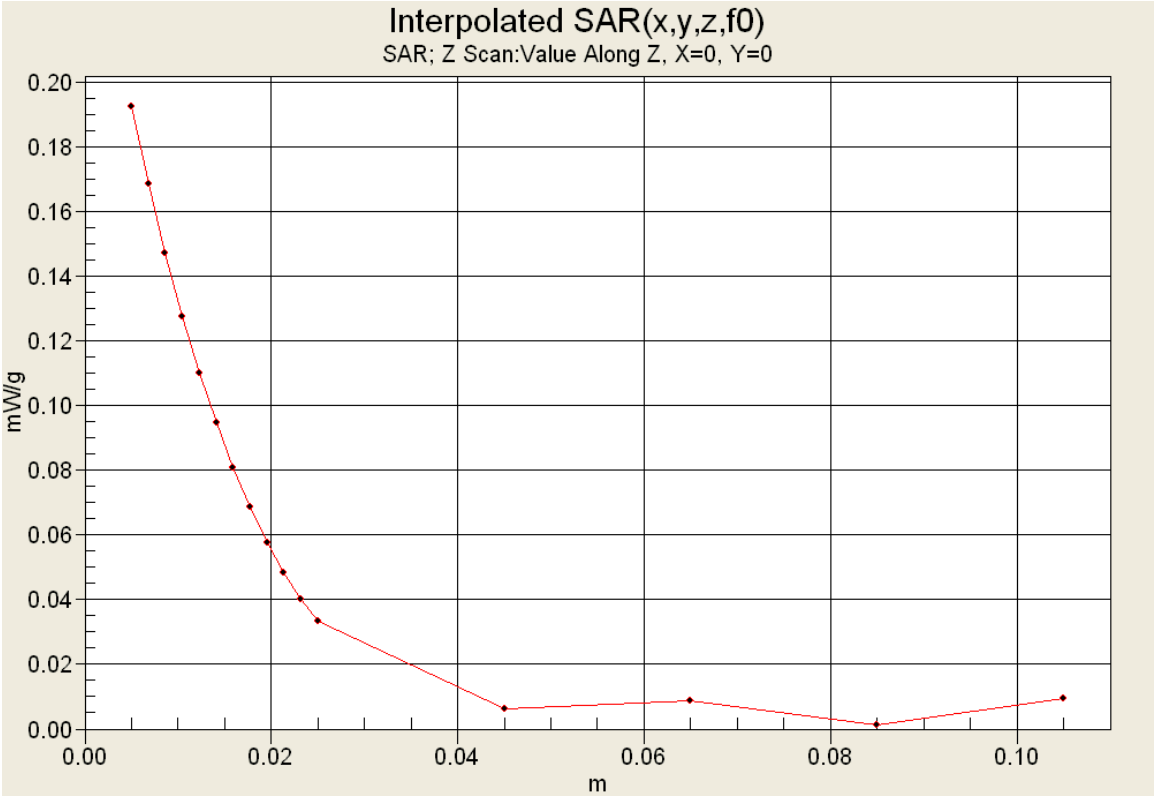
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.790 mW/g

802.11b Ch 1, 2412MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = 0.582 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.379 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.885 mW/g



Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
0.02
0.04
0.06
0.08
0.10
m

Plot B15

Date Tested: 05/31/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 31 May 2014, Ambient Temp: 24C; Fluid Temp: 23.0C; Humidity: 26%

Communication System: CW
Frequency: 2457 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2457 MHz; σ = 1.93 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3

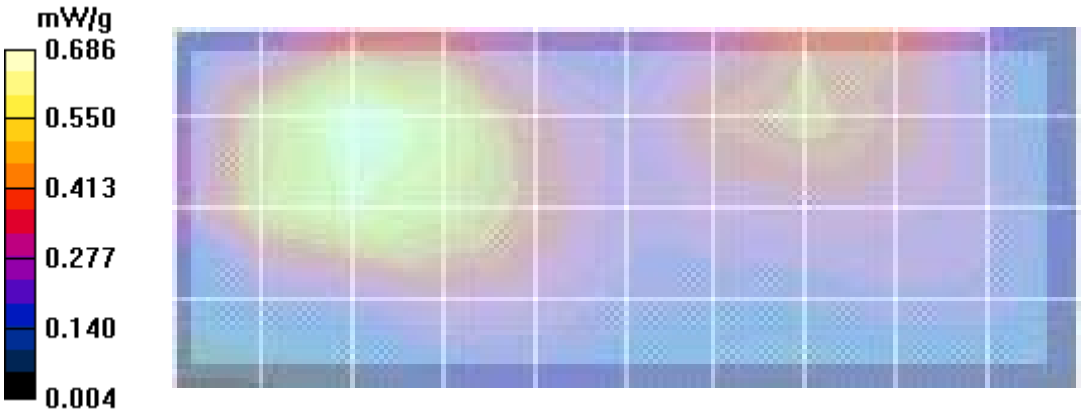
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11b Ch 10, 2457MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.732 mW/g

802.11b Ch 10, 2457MHz, BW=20MHz, Bit Rate=1MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.980 dB
Peak SAR (extrapolated) = 0.997 W/kg
SAR(1 g) = 0.553 mW/g; SAR(10 g) = 0.299 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.686 mW/g



Plot B9

Date Tested: 05/29/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 29 May 2014, Ambient Temp: 24C; Fluid Temp: 23.0C; Humidity: 31%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2412 MHz; σ = 1.87 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3

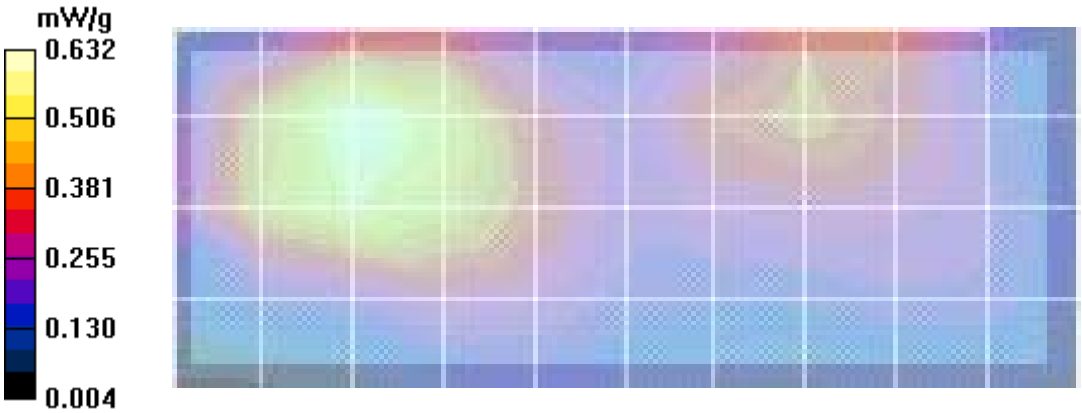
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11g Ch 1, 2412MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.622 mW/g

802.11g Ch 1, 2412MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.215 dB
Peak SAR (extrapolated) = 0.922 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.264 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.632 mW/g



Plot B10

Date Tested: 05/30/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 30 May 2014, Ambient Temp: 24C; Fluid Temp: 22.6C; Humidity: 27%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2437 MHz; σ = 1.92 mho/m; ε_r = 51; ρ = 1000 kg/m^3

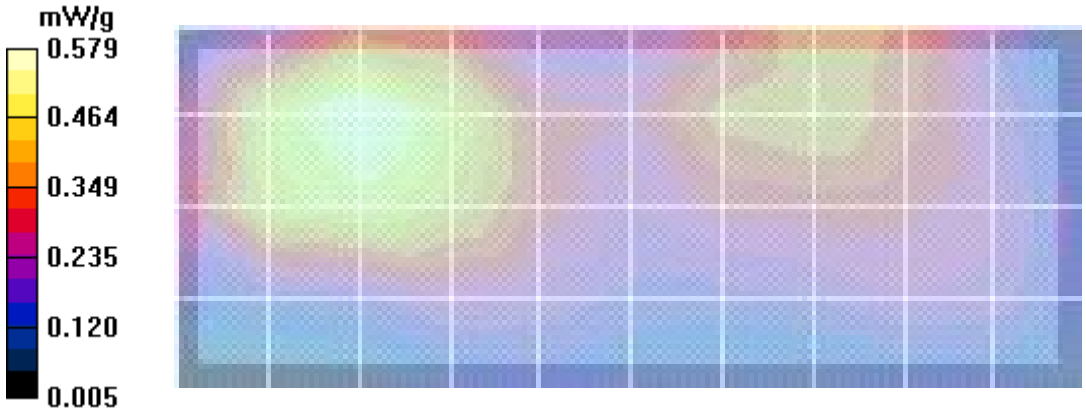
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11g Ch 6, 2437MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.589 mW/g

802.11g Ch 6, 2437MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = -0.558 dB
Peak SAR (extrapolated) = 0.854 W/kg
SAR(1 g) = 0.476 mW/g; SAR(10 g) = 0.258 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.579 mW/g



Plot B16

Date Tested: 05/31/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 31 May 2014, Ambient Temp: 24C; Fluid Temp: 23.0C; Humidity: 26%

Communication System: CW
Frequency: 2457 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2457 MHz; σ = 1.93 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3

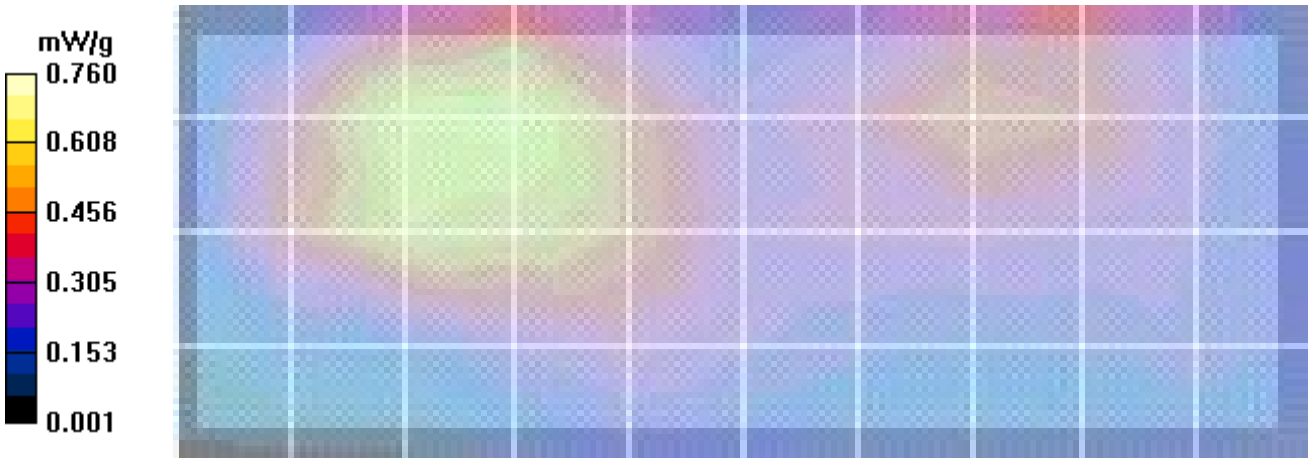
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11g Ch 10, 2457MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

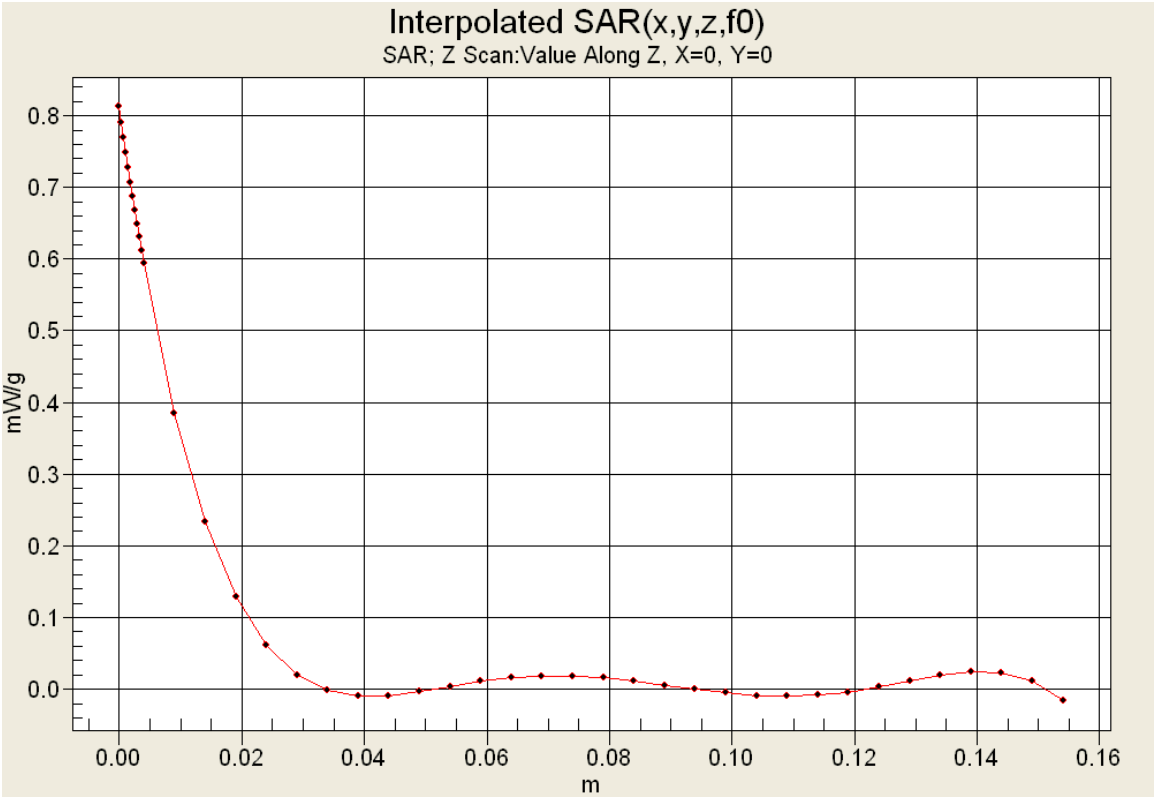
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.632 mW/g

802.11g Ch 10, 2457MHz, BW=20MHz, Bit Rate=6MBps, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.7 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.617 mW/g; SAR(10 g) = 0.329 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.760 mW/g



Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot B12

Date Tested: 05/30/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 30 May 2014, Ambient Temp: 24C; Fluid Temp: 22.6C; Humidity: 27%

Communication System: CW
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2412 MHz; σ = 1.87 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3

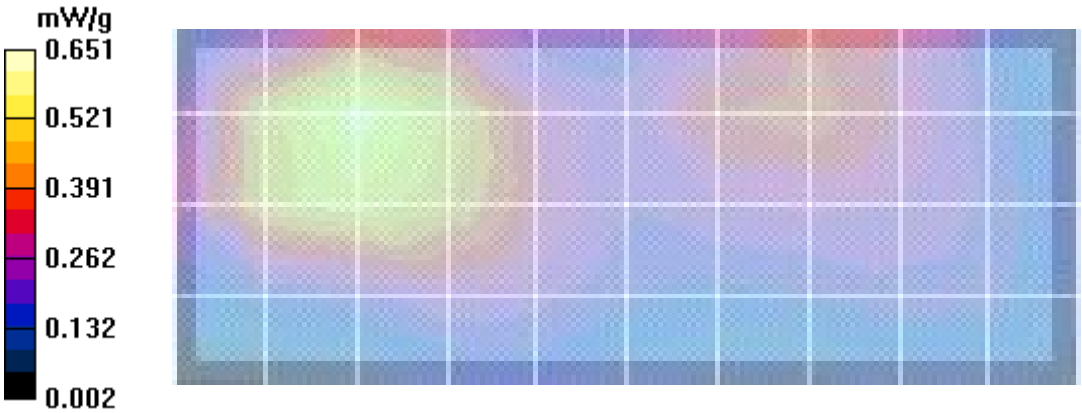
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11n Ch 1, 2412MHz, BW=20MHz, MCS0, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.591 mW/g

802.11n Ch 1, 2412MHz, BW=20MHz, MCS0, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.234 dB
Peak SAR (extrapolated) = 0.941 W/kg
SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.287 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.651 mW/g



Plot B13

Date Tested: 05/30/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 30 May 2014, Ambient Temp: 24C; Fluid Temp: 22.6C; Humidity: 27%

Communication System: CW
Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2437 MHz; σ = 1.92 mho/m; ε_r = 51; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

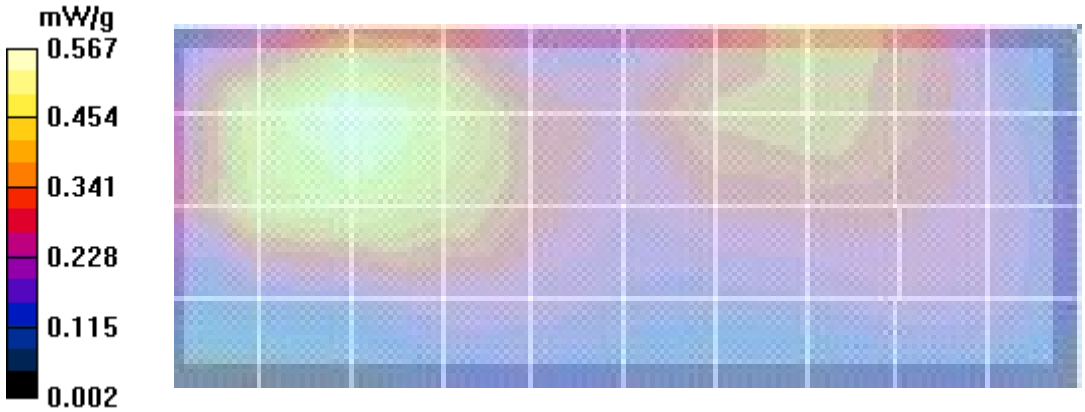
802.11n Ch 6, 2437MHz, BW=20MHz, MCS0, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.579 mW/g

802.11n Ch 6, 2437MHz, BW=20MHz, MCS0, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.772 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.469 mW/g; SAR(10 g) = 0.253 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.567 mW/g



Plot B17

Date Tested: 05/31/2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 31 May 2014, Ambient Temp: 24C; Fluid Temp: 23.0C; Humidity: 26%

Communication System: CW
Frequency: 2457 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used (interpolated): f = 2457 MHz; σ = 1.93 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3

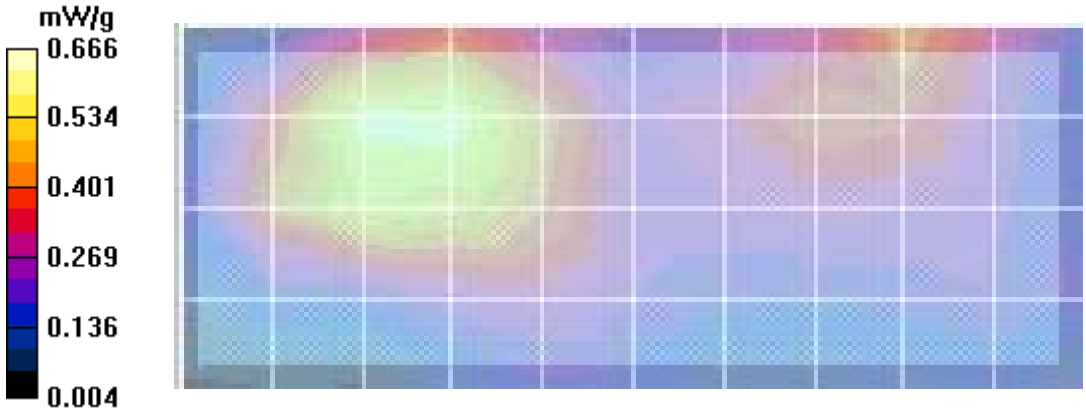
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

802.11n Ch 10, 2457MHz, BW=20MHz, Bit Rate=MCS0, Lanyard/Area Scan (5x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.618 mW/g

802.11n Ch 10, 2457MHz, BW=20MHz, Bit Rate=MCS0, Lanyard/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.290 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.666 mW/g



Plot B30b

Date/Time: 17/10/2014 5:29:18 PM

1289 - 5G Body SAR Oct 17 2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

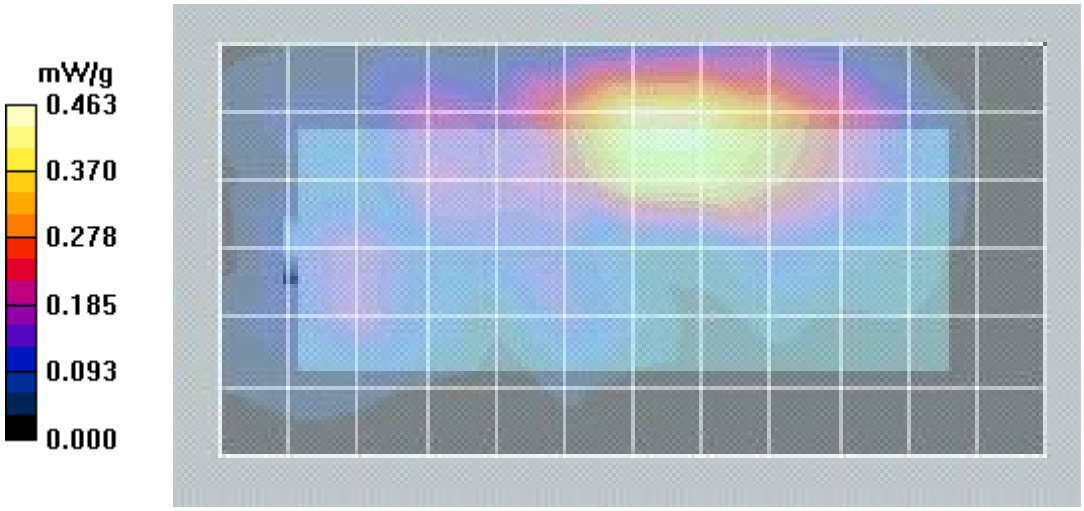
Procedure Notes:

Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: TSL_5200B Medium parameters used: f = 5280 MHz; σ = 5.59 mho/m; ε_r = 47.05; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.06, 4.06, 4.06); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B30b, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps, Lanyard/Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.441 mW/g

B30b, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=6Mbps, Lanyard/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.98 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.090 mW/g
Maximum value of SAR (measured) = 0.463 mW/g



Top of device = Left

Plot B31b

Date/Time: 17/10/2014 5:57:55 PM

1289 - 5G Body SAR Oct 17 2014

DUT: Vocera Communications; Model: NorthStar; Type: Body-Worn Communications Device (DSSS); Serial: 4A

Program Notes: 17 Oct 2014 Ambient Temp: 24C Fluid Temp: 20.8C Humidity: 29%

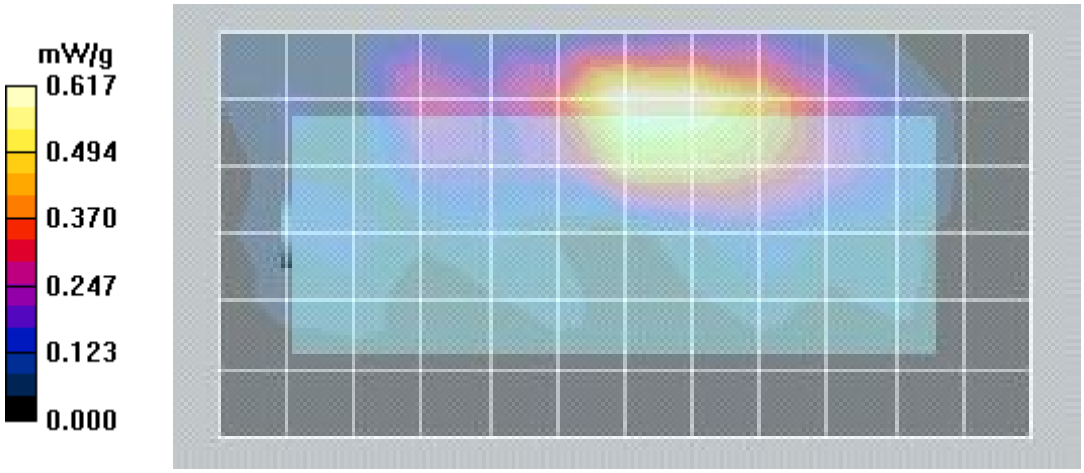
Procedure Notes:

Communication System: CW
Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: TSL_5200B Medium parameters used: f = 5280 MHz; σ = 5.59 mho/m; ε_r = 47.05; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.06, 4.06, 4.06); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

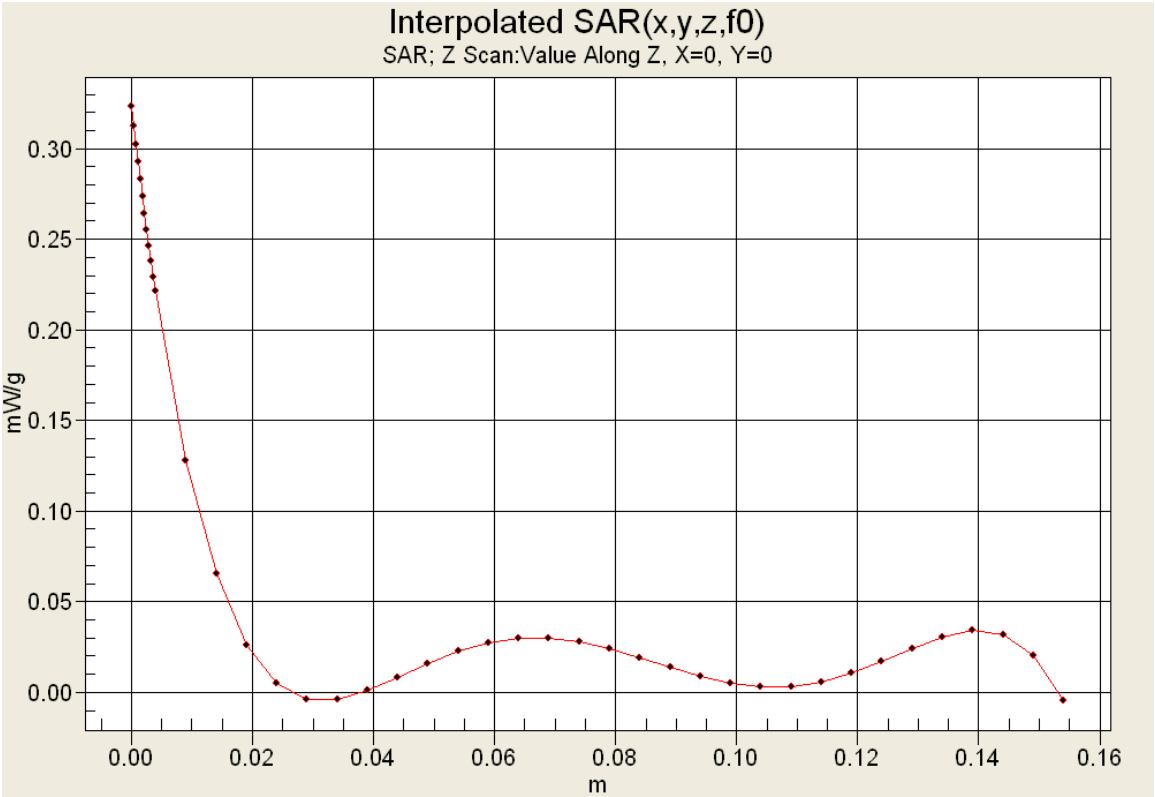
B31b, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=MCS0, Lanyard/Area Scan (7x13x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.650 mW/g

B31b, 802.11a Ch 56, 5280MHz, BW=40MHz, BR=MCS0, Lanyard/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.593 V/m; Power Drift = 0.849 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.121 mW/g
Maximum value of SAR (measured) = 0.617 mW/g



Top of device = Left

Z-Axis Scan


Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS

Date Tested: 05/26/2014

System Performance Check - 2450 MHz Body

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

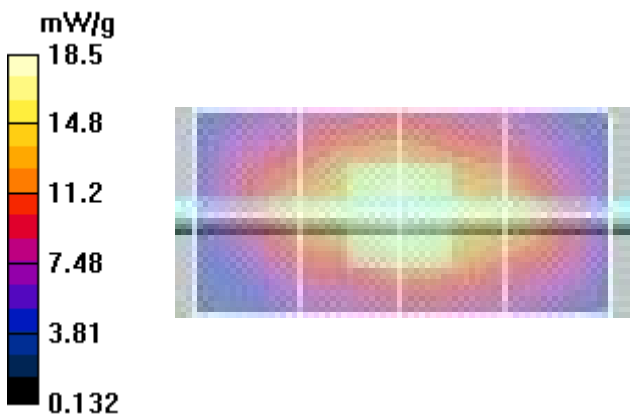
Program Notes: 26 May 2014, Ambient Temp: 23C; Fluid Temp: 23.0C; Humidity: 32%

Communication System: CW
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: M2450 Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 51; ρ = 1000 kg/m^3

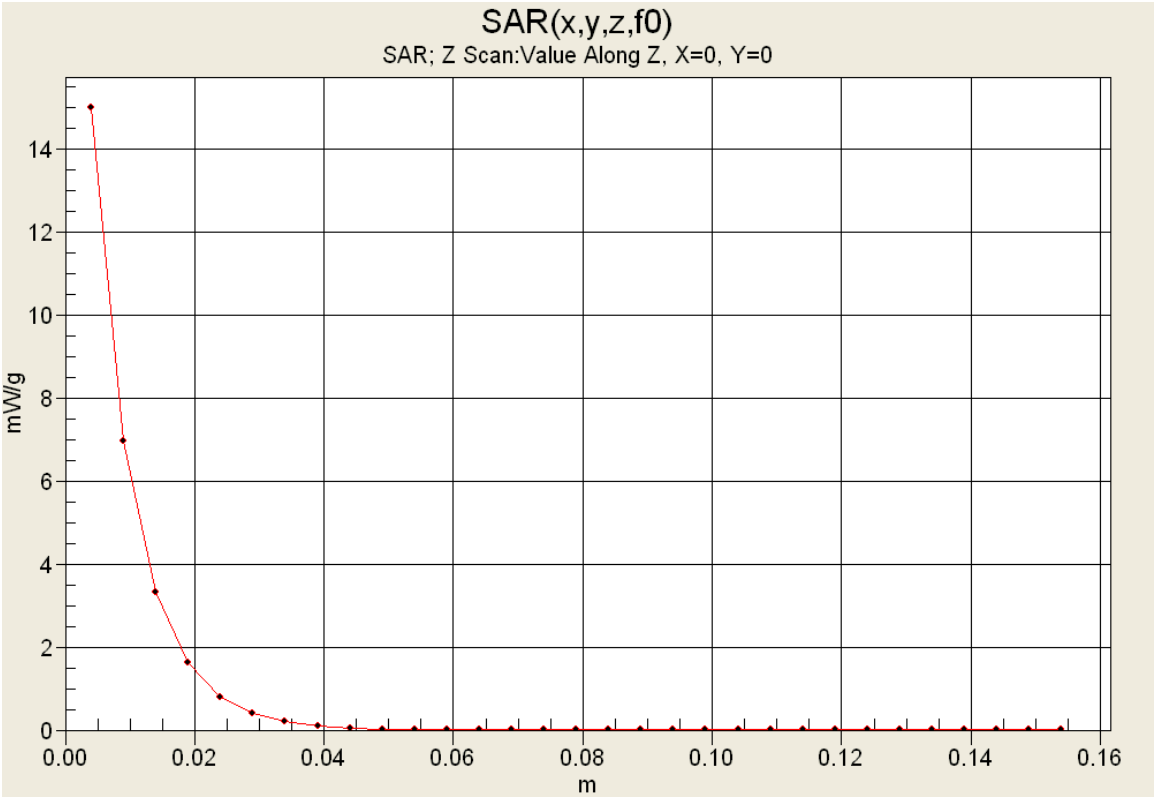
- Probe: EX3DV4 - SN3600; ConvF(6.26, 6.26, 6.26); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SPC 2450B 12.7W/kg 2/Area Scan (3x5x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 18.3 mW/g

SPC 2450B 12.7W/kg 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.4 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 29.0 W/kg
SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.39 mW/g
Maximum value of SAR (measured) = 18.5 mW/g



Z-Axis Scan



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Date Tested: 06/02/2014

System Performance Check - 5200 MHz Head

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Calibrated: 02/26/2014

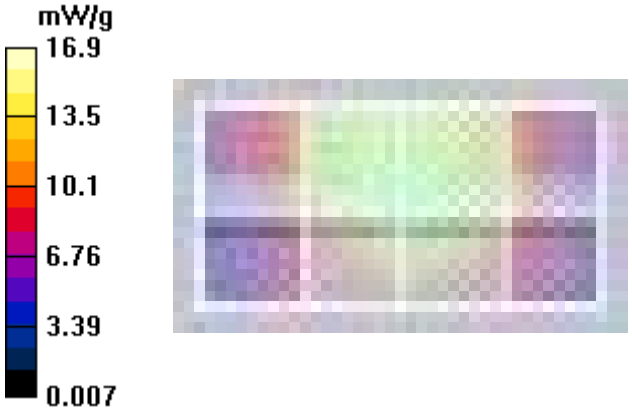
Program Notes: June 2, 2014 Ambient Temp: 25C Fluid Temp: 24.5C Humidity: 30%

Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: HSL5200-5800 Medium parameters used: f = 5200 MHz; σ = 4.81 mho/m; ε_r = 36.3; ρ = 1000 kg/m^3

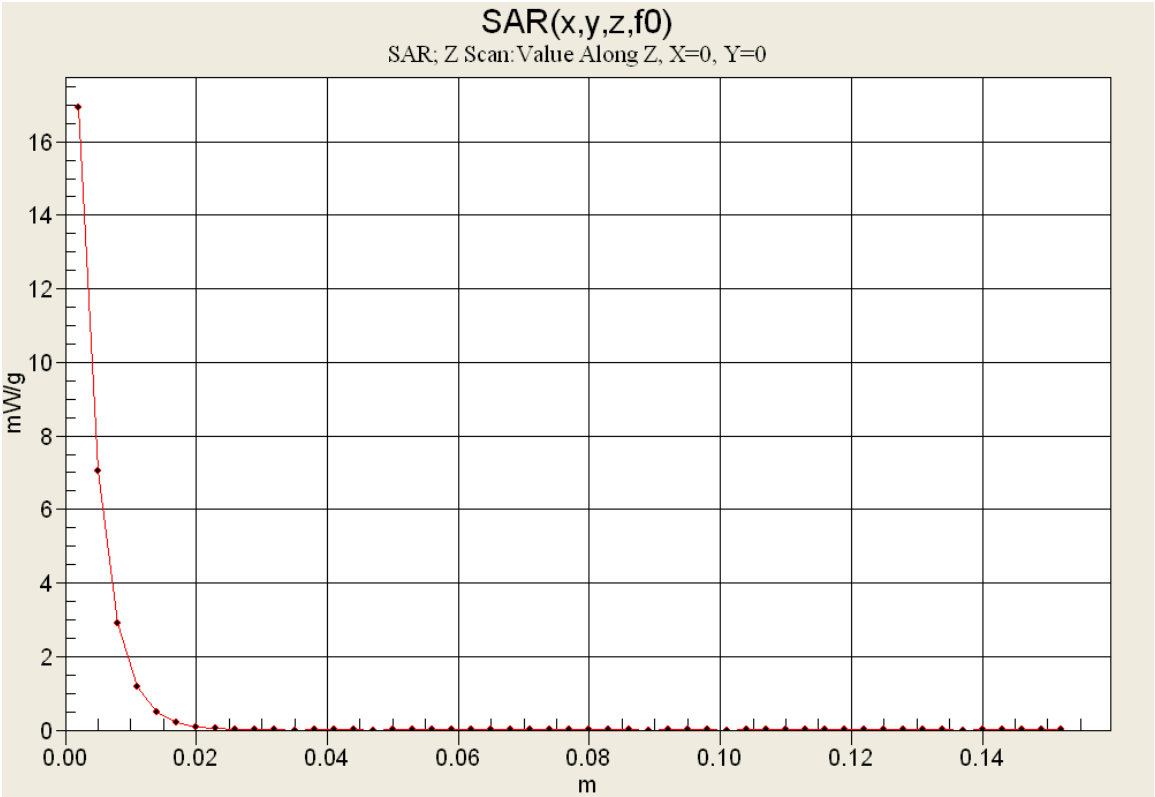
- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.69/Area Scan (3x5x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 15.0 mW/g

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.69/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 58.6 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 32.6 W/kg
SAR(1 g) = 8.07 mW/g; SAR(10 g) = 2.29 mW/g
Maximum value of SAR (measured) = 16.9 mW/g



Z-Axis Scan



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Date Tested: 06/09/2014

System Performance Check - 2450 MHz Head

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

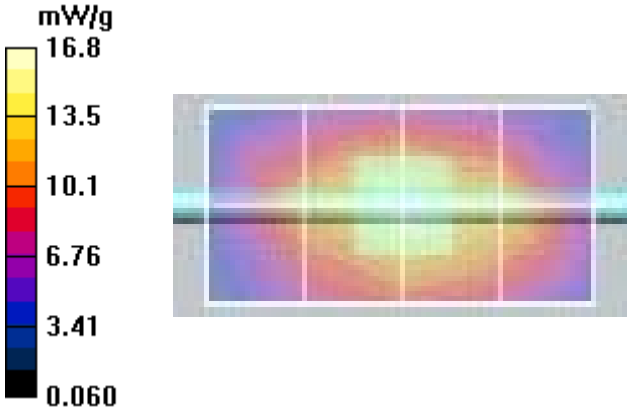
Program Notes: 9 June 2014, Ambient Temp: 24C; Fluid Temp: 24C; Humidity: 24%

Communication System: CW
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: TSL-2450H Medium parameters used: f = 2450 MHz; σ = 1.89 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

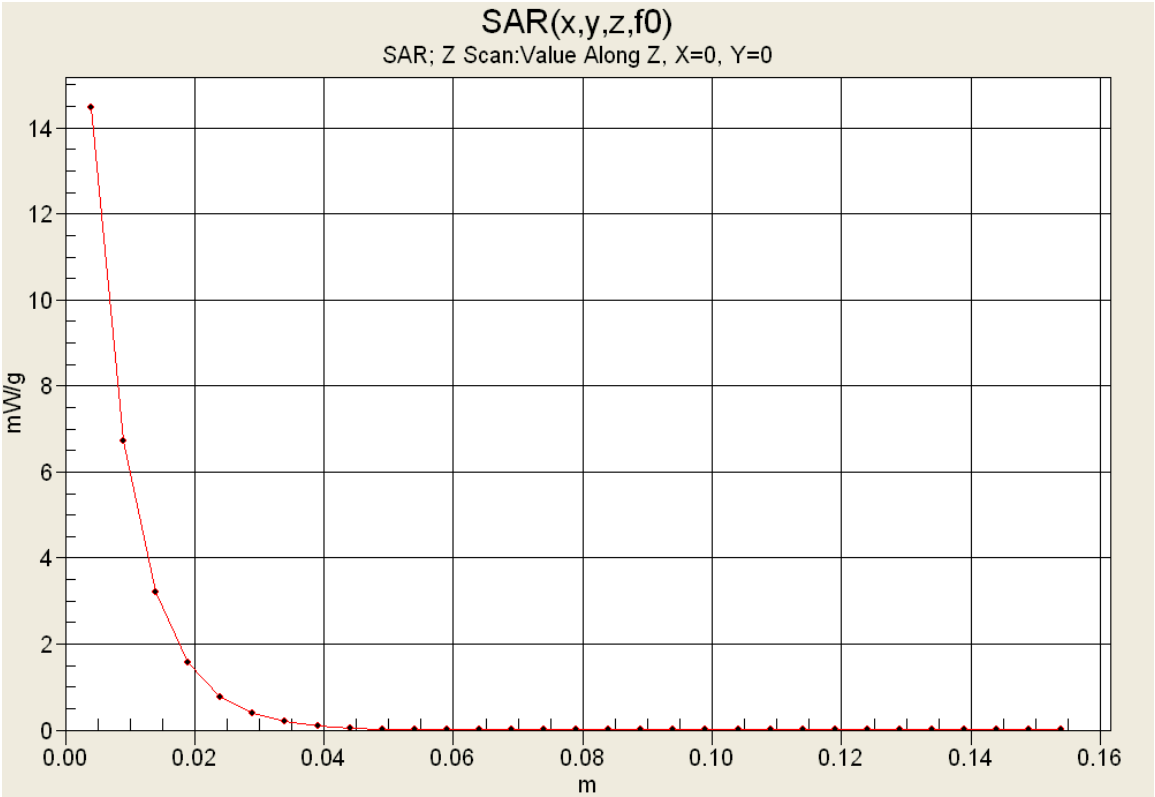
- Probe: EX3DV4 - SN3600; ConvF(6.19, 6.19, 6.19); Calibrated: 15/04/2014
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SPC 2450H, Pin=250mW, d=10mm, TS= 12.7W/kg 2/Area Scan (3x5x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.7 mW/g

SPC 2450H, Pin=250mW, d=10mm, TS= 12.7W/kg 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.2 V/m; Power Drift = 0.086 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.67 mW/g
Maximum value of SAR (measured) = 16.8 mW/g



Z-Axis Scan



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Date Tested: 06/18/2014

System Performance Check - 5200 MHz Body

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Calibrated: 04/18/2012

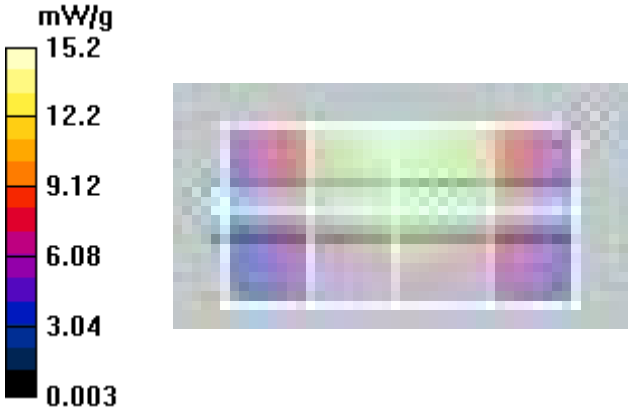
Program Notes: June 18, 2014 Ambient Temp: 24C Fluid Temp: 24.5C Humidity: 30%

Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: M5200-5800 Medium parameters used: f = 5200 MHz; σ = 5.61 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

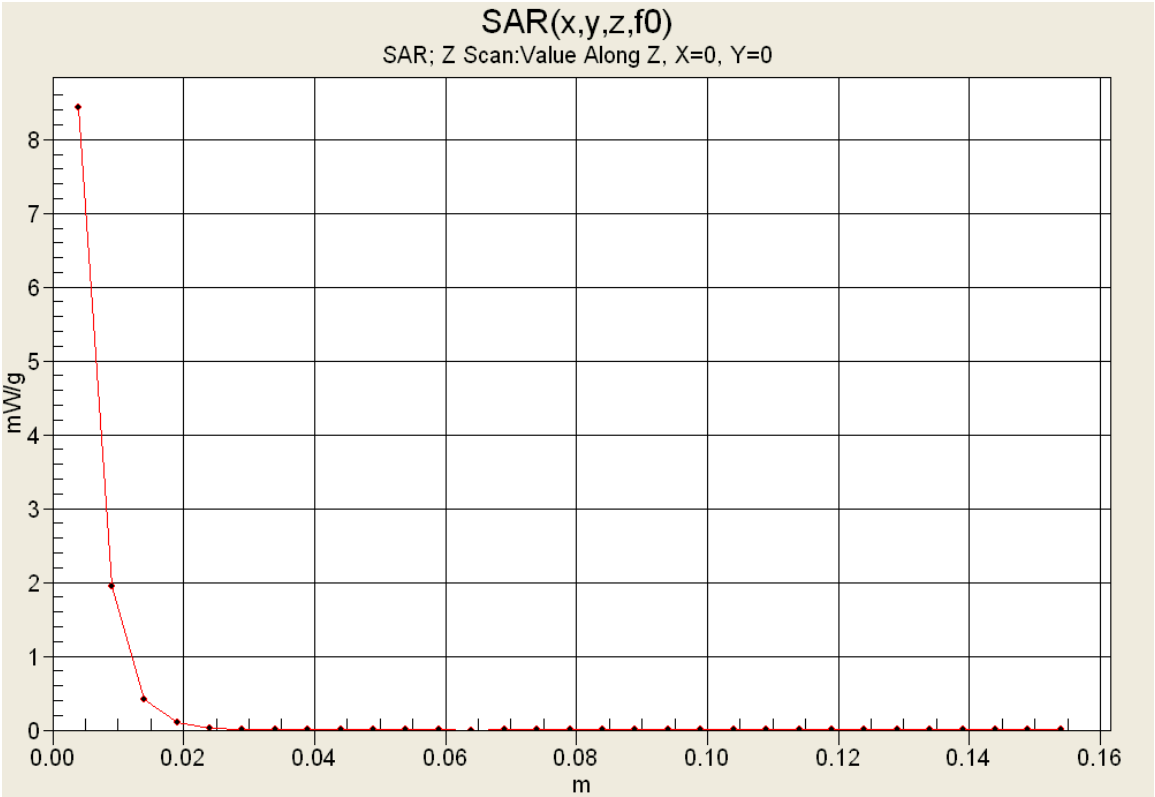
- Probe: EX3DV4 - SN3600; ConvF(4.06, 4.06, 4.06); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.32/Area Scan (3x5x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 14.1 mW/g

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.32/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 51.2 V/m; Power Drift = 0.075 dB
Peak SAR (extrapolated) = 28.1 W/kg
SAR(1 g) = 7.08 mW/g; SAR(10 g) = 1.99 mW/g
Maximum value of SAR (measured) = 15.2 mW/g



Z-Axis Scan



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Date/Time: 16/10/2014 1:39:41 PM

SPC 5200H Oct 16 2014

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Calibrated: 04/29/2009

Program Notes: Oct 16, 2014 Ambient Temp: 23C Fluid Temp: 19.6C Humidity: 33%

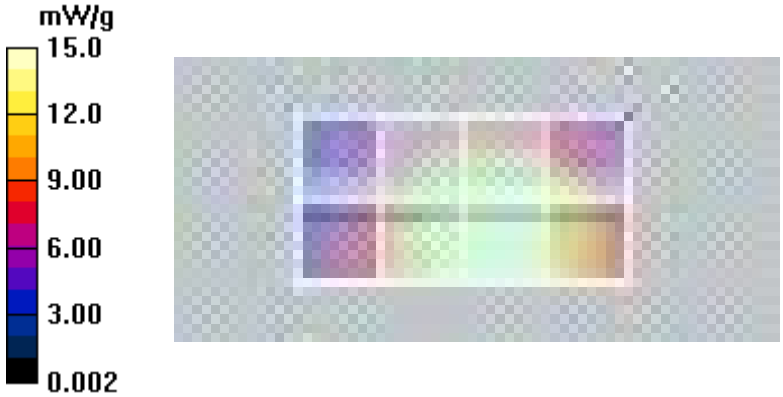
Procedure Notes:

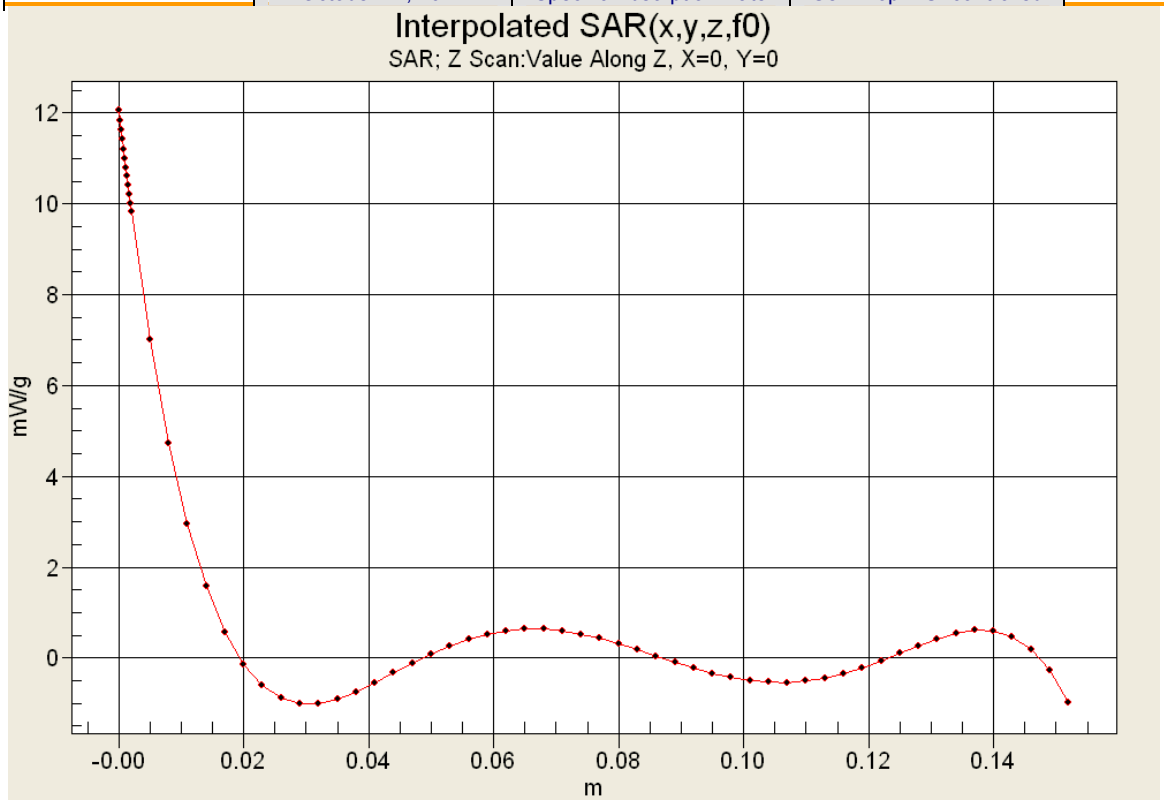
Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: TSL_5200H Medium parameters used: f = 5200 MHz; σ = 4.86 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.56, 4.56, 4.56); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.69/Area Scan (3x5x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 14.2 mW/g

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.69/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 54.5 V/m; Power Drift = -0.395 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 7.04 mW/g; SAR(10 g) = 2.02 mW/g
Maximum value of SAR (measured) = 15.0 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
12
10
8
6
4
2
0
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

Date/Time: 17/10/2014 3:12:21 PM

SPC - 5200 Body Oct 17 2014

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Calibrated: 04/29/2009

Program Notes: Oct 17, 2014 Ambient Temp: 24C Fluid Temp: 20.0C Humidity: 31%

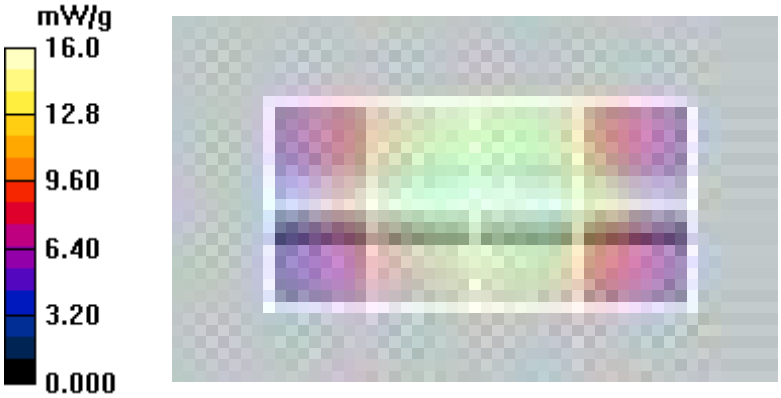
Procedure Notes:

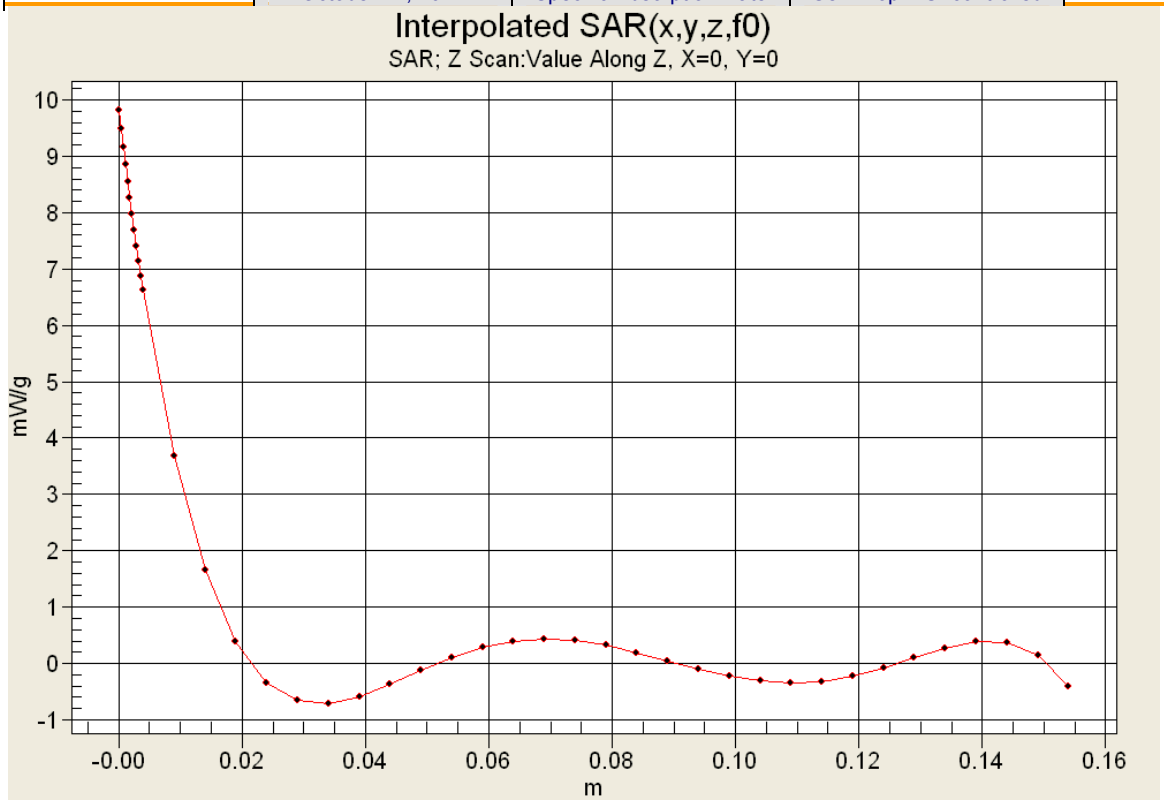
Communication System: CW
Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: TSL_5200B Medium parameters used: f = 5200 MHz; σ = 5.42 mho/m; ε_r = 46.9; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(4.06, 4.06, 4.06); Calibrated: 15/04/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: SAM with CRP; Type: SAM; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.32/Area Scan (3x5x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 15.1 mW/g

5200-5800 MHz Dipole d=10mm P=100mW, TS=7.32/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 56.2 V/m; Power Drift = 0.087 dB
Peak SAR (extrapolated) = 31.4 W/kg
SAR(1 g) = 7.61 mW/g; SAR(10 g) = 2.14 mW/g
Maximum value of SAR (measured) = 16.0 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
10
9
8
7
6
5
4
3
2
1
0
-1
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

2450 MHz Body

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
23/May/2014
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	51.40	1.78
2.3600	52.82	1.86	51.36	1.82
2.3700	52.81	1.87	51.21	1.80
2.3800	52.79	1.88	51.15	1.82
2.3900	52.78	1.89	51.23	1.83
2.4000	52.77	1.90	51.09	1.87
2.4100	52.75	1.91	51.27	1.87
2.4200	52.74	1.92	51.04	1.88
2.4300	52.73	1.93	50.88	1.91
2.4400	52.71	1.94	51.09	1.93
2.4500	52.70	1.95	51.00	1.94
2.4600	52.69	1.96	50.85	1.94
2.4700	52.67	1.98	51.10	1.93
2.4800	52.66	1.99	50.87	1.98
2.4900	52.65	2.01	50.73	1.98
2.5000	52.64	2.02	50.69	1.99
2.5100	52.62	2.04	50.76	1.99
2.5200	52.61	2.05	50.65	2.03
2.5300	52.60	2.06	50.54	2.01
2.5400	52.59	2.08	50.62	2.03
2.5500	52.57	2.09	50.54	2.06

5200 MHz Head

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
02/Jun/2014
Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
5.1000	36.10	4.55	36.25	4.72
5.1100	36.09	4.56	36.07	4.76
5.1200	36.08	4.57	36.14	4.77
5.1300	36.07	4.58	36.27	4.76
5.1400	36.05	4.59	36.15	4.78
5.1500	36.04	4.60	36.06	4.81
5.1600	36.03	4.61	36.14	4.86
5.1700	36.02	4.62	36.25	4.84
5.1800	36.01	4.63	36.11	4.80
5.1900	36.00	4.64	36.04	4.80
5.2000	35.99	4.65	36.25	4.81
5.2100	35.97	4.67	35.95	4.81
5.2200	35.96	4.68	36.04	4.80
5.2300	35.95	4.69	36.21	4.83
5.2400	35.94	4.70	35.90	4.83
5.2500	35.93	4.71	36.07	4.85
5.2600	35.92	4.72	35.73	4.89
5.2700	35.91	4.73	35.85	4.88
5.2800	35.89	4.74	35.77	4.97
5.2900	35.88	4.75	35.95	4.86
5.3000	35.87	4.76	36.12	4.89

2450 MHz Head

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
09/Jun/2014
Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
2.3500	39.38	1.71	40.99	1.75
2.3600	39.36	1.72	40.92	1.79
2.3700	39.34	1.73	40.87	1.77
2.3800	39.32	1.74	40.83	1.81
2.3900	39.31	1.75	40.76	1.81
2.4000	39.29	1.76	40.48	1.82
2.4100	39.27	1.76	40.53	1.84
2.4200	39.25	1.77	40.60	1.87
2.4300	39.24	1.78	40.28	1.87
2.4400	39.22	1.79	40.53	1.89
2.4500	39.20	1.80	40.36	1.89
2.4600	39.19	1.81	40.36	1.91
2.4700	39.17	1.82	40.38	1.91
2.4800	39.16	1.83	40.24	1.92
2.4900	39.15	1.84	40.31	1.95
2.5000	39.14	1.85	40.36	1.94
2.5100	39.12	1.87	40.11	1.97
2.5200	39.11	1.88	40.16	1.97
2.5300	39.10	1.89	40.11	1.98
2.5400	39.09	1.90	40.05	2.01
2.5500	39.07	1.91	40.00	2.02

5200 MHz Body

****

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
18/Jun/2014
Frequency(GHz)
FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eB	FCC_sB	Test_e	Test_s
5.1000	49.15	5.18	51.30	5.37
5.1100	49.14	5.19	51.18	5.38
5.1200	49.12	5.21	51.39	5.44
5.1300	49.11	5.22	50.89	5.48
5.1400	49.10	5.23	51.20	5.53
5.1500	49.08	5.24	51.35	5.78
5.1600	49.07	5.25	51.23	5.75
5.1700	49.06	5.26	51.60	5.74
5.1800	49.04	5.28	51.17	5.71
5.1900	49.03	5.29	51.68	5.70
5.2000	49.01	5.30	51.69	5.61
5.2100	49.00	5.31	51.40	5.54
5.2200	48.99	5.32	51.12	5.55
5.2300	48.97	5.33	50.83	5.45
5.2400	48.96	5.35	51.00	5.69
5.2500	48.95	5.36	50.74	5.84
5.2600	48.93	5.37	50.95	5.86
5.2700	48.92	5.38	50.93	5.90
5.2800	48.91	5.39	51.42	5.90
5.2900	48.89	5.40	51.43	5.79
5.3000	48.88	5.42	51.69	5.78

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Thu 16/Oct/2014 12:59:32
Freq Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
5.1000	36.10	4.55	35.45	4.73
5.1100	36.09	4.56	35.40	4.75
5.1200	36.08	4.57	35.42	4.78
5.1300	36.07	4.58	35.41	4.79
5.1400	36.05	4.59	35.35	4.80
5.1500	36.04	4.60	35.32	4.83
5.1600	36.03	4.61	35.35	4.82
5.1700	36.02	4.62	35.35	4.81
5.1800	36.01	4.63	35.36	4.85
5.1900	36.00	4.64	35.25	4.86
5.2000	35.99	4.65	35.21	4.86
5.2100	35.97	4.67	35.24	4.91
5.2200	35.96	4.68	35.28	4.93
5.2300	35.95	4.69	35.31	4.94
5.2400	35.94	4.70	35.19	4.95
5.2500	35.93	4.71	35.26	4.95
5.2600	35.92	4.72	35.16	4.93
5.2700	35.91	4.73	35.09	4.95
5.2800	35.89	4.74	35.03	4.94
5.2900	35.88	4.75	35.06	4.97
5.3000	35.87	4.76	35.05	4.98

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Fri 17/Oct/2014 14:05:35
Freq Frequency(GHz)
FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

****

Freq	FCC_eB	FCC_sB	Test_e	Test_s
5.1000	49.15	5.18	46.65	5.28
5.1100	49.14	5.19	46.63	5.29
5.1200	49.12	5.21	46.71	5.33
5.1300	49.11	5.22	46.74	5.34
5.1400	49.10	5.23	46.78	5.34
5.1500	49.08	5.24	46.78	5.35
5.1600	49.07	5.25	46.82	5.34
5.1700	49.06	5.26	46.80	5.39
5.1800	49.04	5.28	46.81	5.38
5.1900	49.03	5.29	46.91	5.42
5.2000	49.01	5.30	46.89	5.42
5.2100	49.00	5.31	46.86	5.47
5.2200	48.99	5.32	46.94	5.49
5.2300	48.97	5.33	47.01	5.51
5.2400	48.96	5.35	46.79	5.52
5.2500	48.95	5.36	46.98	5.55
5.2600	48.93	5.37	46.94	5.53
5.2700	48.92	5.38	47.03	5.53
5.2800	48.91	5.39	47.05	5.59
5.2900	48.89	5.40	46.93	5.60
5.3000	48.88	5.42	46.99	5.62

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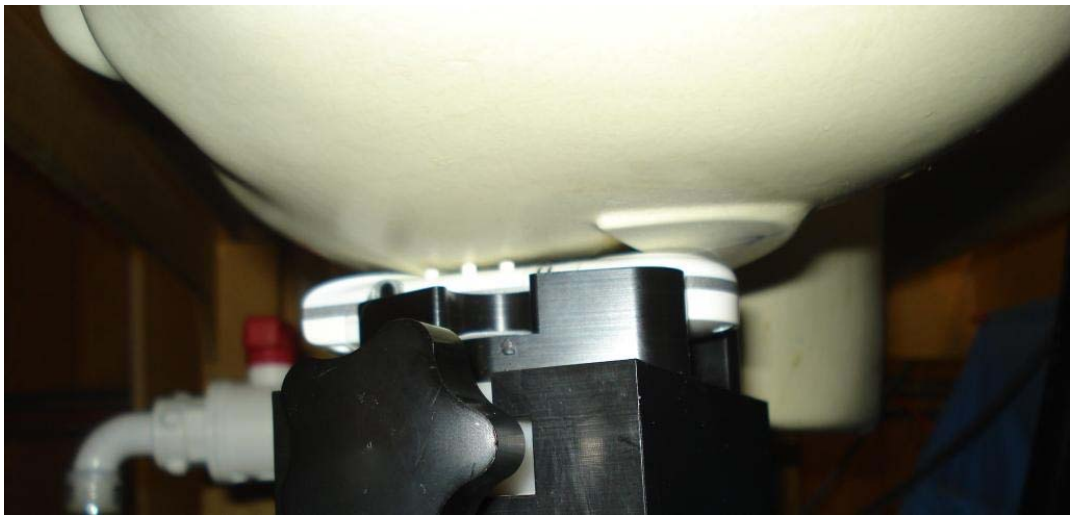
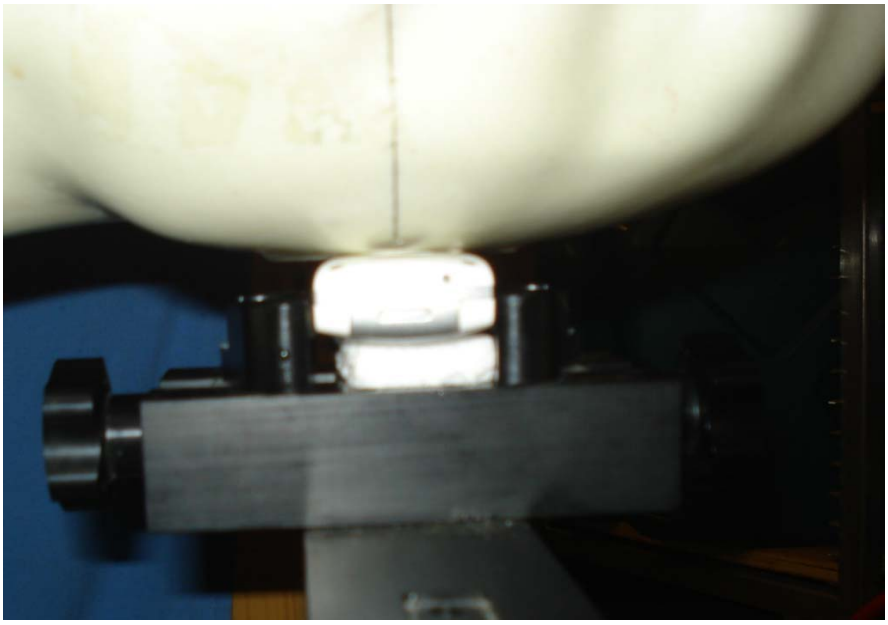
APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

HEAD SAR TEST SETUP PHOTOGRAPHS

Left Head Section / Cheek-Touch Position





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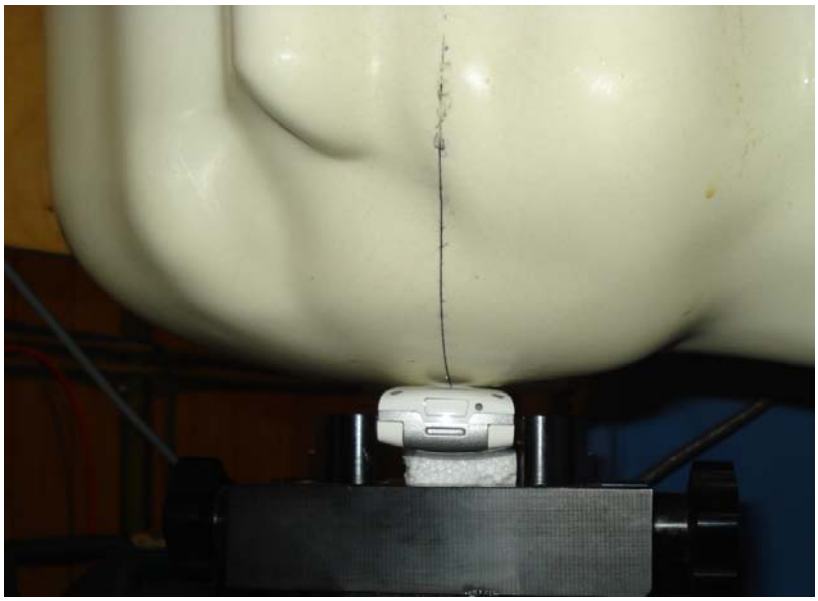
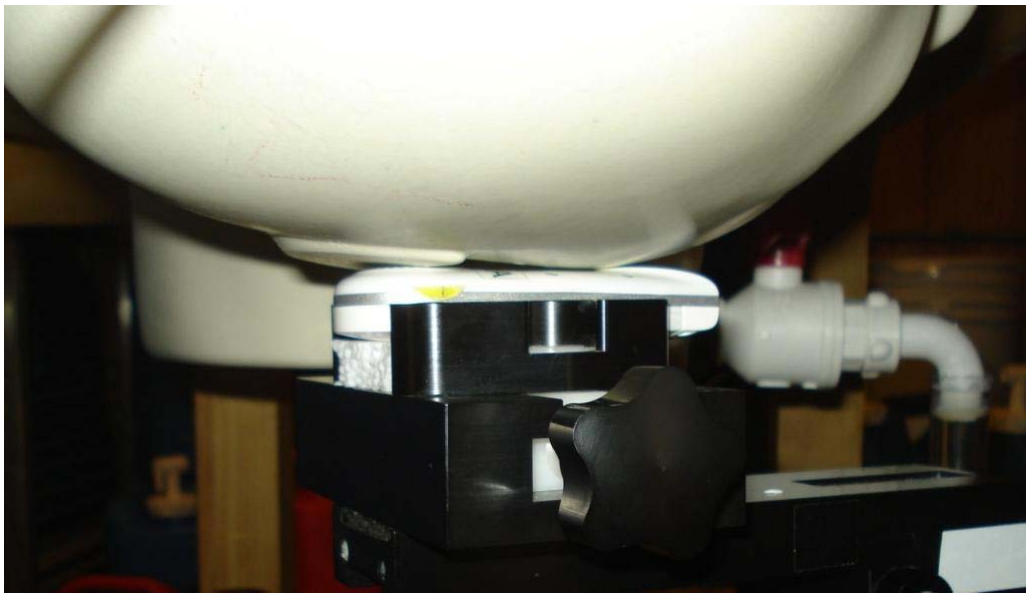
HEAD SAR TEST SETUP PHOTOGRAPHS

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

HEAD SAR TEST SETUP PHOTOGRAPHS

Right Head Section / Cheek-Touch Position





HEAD SAR TEST SETUP PHOTOGRAPHS

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

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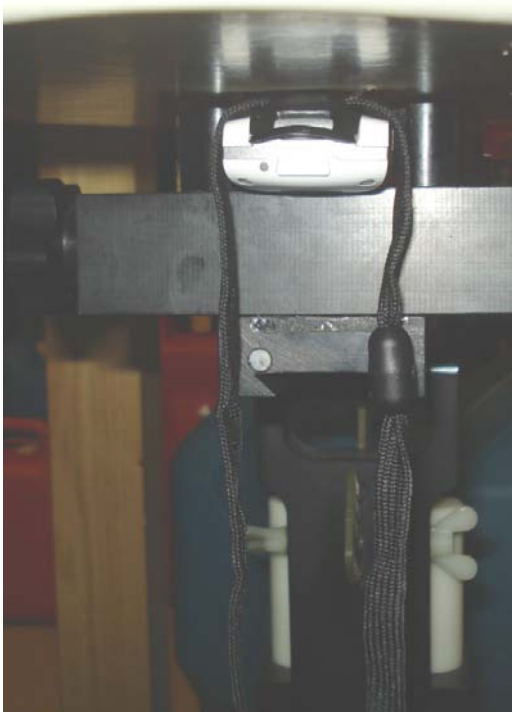
BODY SAR TEST SETUP PHOTOGRAPHS

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



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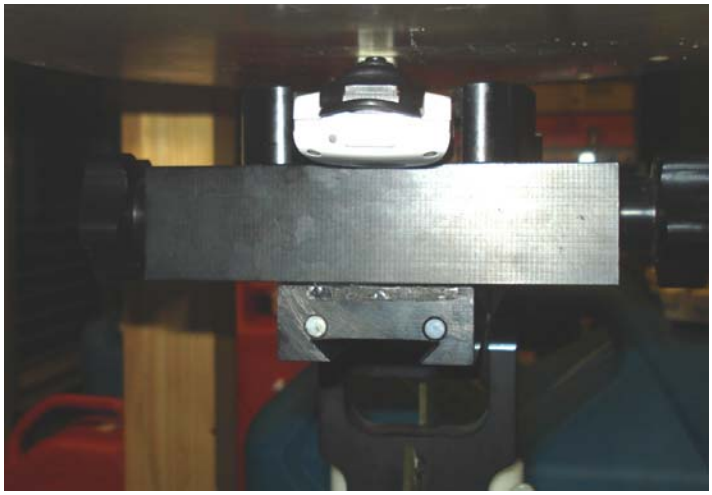
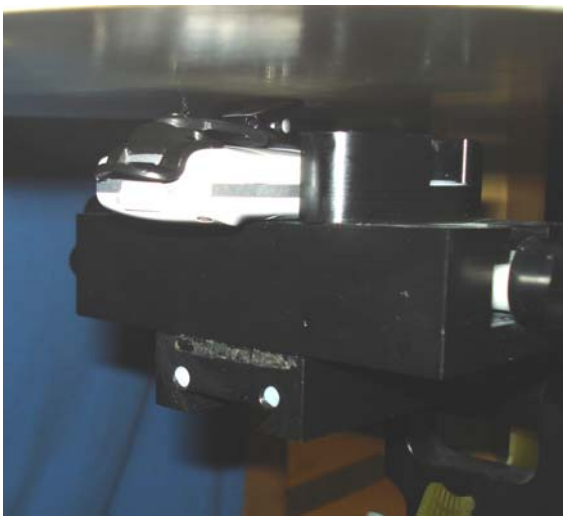
BODY SAR TEST SETUP PHOTOGRAPHS

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





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DUT PHOTOGRAPHS

Front Side of DUT

Back Side of DUT

Left Side of DUT

Right Side of DUT

Bottom end of DUT

Top end of DUT

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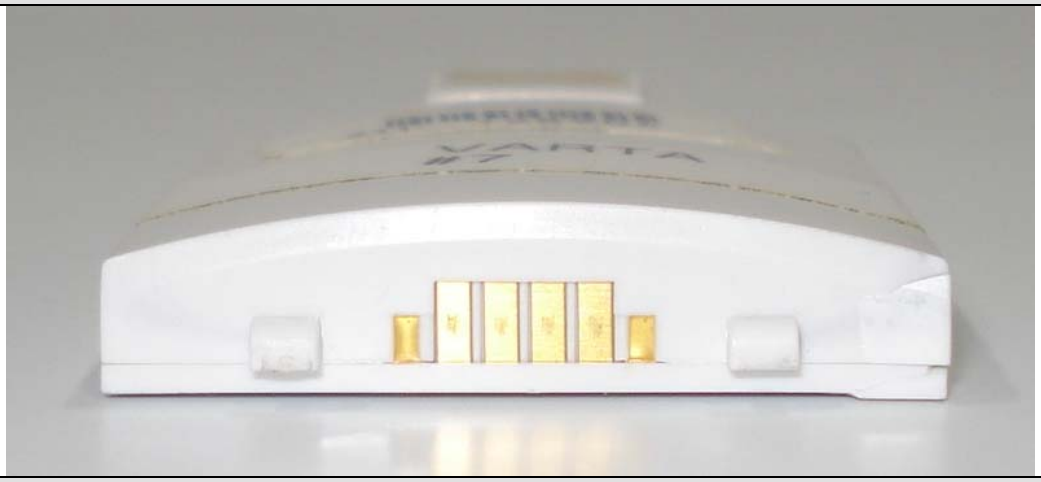
DUT PHOTOGRAPHS

Back Side of DUT (batt. removed)



Battery Top Side

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DUT PHOTOGRAPHS

Body-worn Accessory #1 (Lanyard)

Body-worn Accessory #2 (Universal Clip)

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DUT PHOTOGRAPHS

Audio Accessory #1 (Headset)

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DUT PHOTOGRAPHS

Bluetooth Headset Ear Side

Bluetooth Headset Back Side

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APPENDIX E - SAM PHANTOM CERTIFICATE OF CONFORMITY

Schmid & Partner
Engineering AG

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

Certificate of conformity / First Article Inspection

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

Tests

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

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

Standards

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

Conformity

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

Date 18.11.2001

Signature / Stamp

Schmid & Partner
Engineering AG
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

APPENDIX F - PROBE CALIBRATION

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

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: EX3-3600_Apr14

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3600
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	April 15, 2014

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 ± 3)°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	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 15, 2014

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

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	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., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) 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:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 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 *NORMx,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.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Probe EX3DV4

SN:3600

Manufactured: January 10, 2007
Calibrated: April 15, 2014

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 ($\mu V/(V/m)^2$)[A]	0.50	0.49	0.40	± 10.1 %
DCP (mV)[B]	99.8	92.9	97.6	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	122.9	±3.3 %
		Y	0.0	0.0	1.0		125.6	
		Z	0.0	0.0	1.0		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 E^2-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 [G]	Depth [G] (mm)	Unct. (k=2)
150	52.3	0.76	9.80	9.80	9.80	0.00	1.00	± 13.3 %
300	45.3	0.87	9.02	9.02	9.02	0.11	1.10	± 13.3 %
450	43.5	0.87	9.40	9.40	9.40	0.20	1.30	± 13.3 %
750	41.9	0.89	8.55	8.55	8.55	0.28	1.13	± 12.0 %
835	41.5	0.90	8.23	8.23	8.23	0.24	1.30	± 12.0 %
900	41.5	0.97	8.09	8.09	8.09	0.38	0.85	± 12.0 %
1950	40.0	1.40	6.56	6.56	6.56	0.73	0.60	± 12.0 %
2450	39.2	1.80	6.19	6.19	6.19	0.29	0.91	± 12.0 %
5200	36.0	4.66	4.56	4.56	4.56	0.30	1.80	± 13.1 %
5500	35.6	4.96	4.31	4.31	4.31	0.35	1.80	± 13.1 %
5800	35.3	5.27	4.01	4.01	4.01	0.40	1.80	± 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.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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

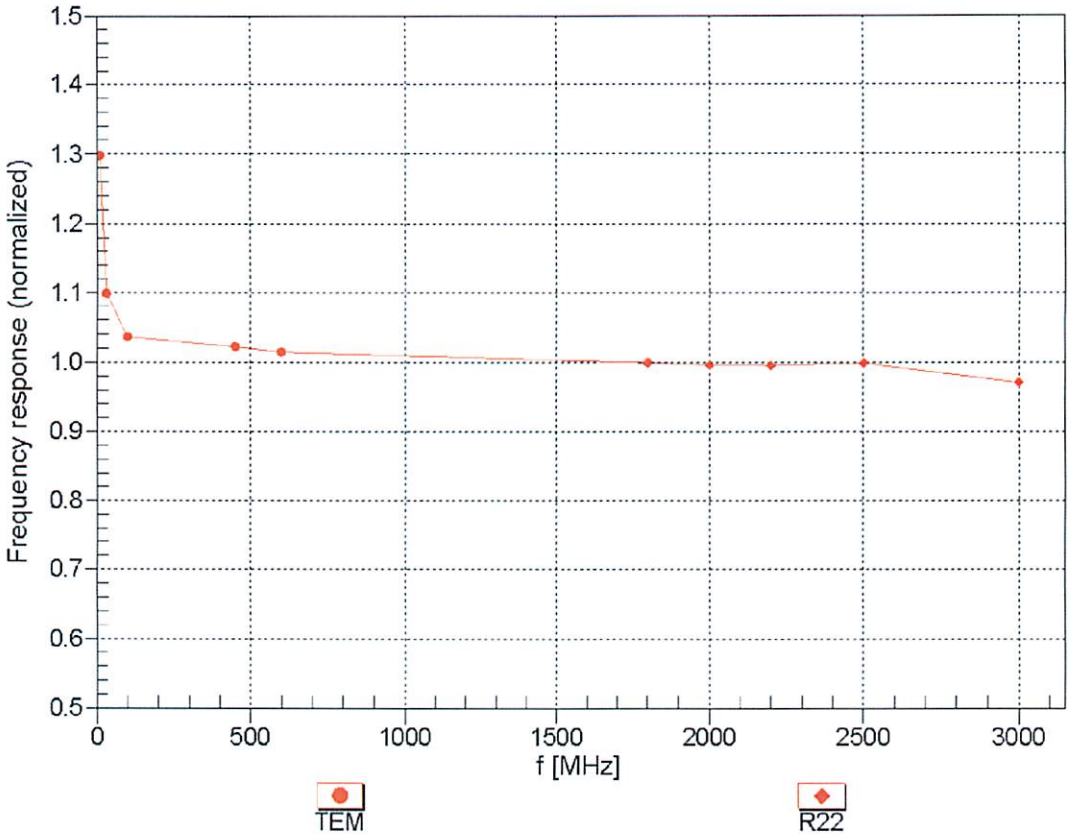
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
150	61.9	0.80	8.81	8.81	8.81	0.00	1.00	± 13.3 %
300	58.2	0.92	9.20	9.20	9.20	0.09	1.15	± 13.3 %
450	56.7	0.94	9.05	9.05	9.05	0.12	1.30	± 13.3 %
750	55.5	0.96	8.14	8.14	8.14	0.35	0.97	± 12.0 %
835	55.2	0.97	8.11	8.11	8.11	0.50	0.82	± 12.0 %
900	55.0	1.05	7.92	7.92	7.92	0.41	0.92	± 12.0 %
1950	53.3	1.52	6.79	6.79	6.79	0.56	0.73	± 12.0 %
2450	52.7	1.95	6.26	6.26	6.26	0.77	0.57	± 12.0 %
5200	49.0	5.30	4.06	4.06	4.06	0.40	1.90	± 13.1 %
5500	48.6	5.65	3.65	3.65	3.65	0.40	1.90	± 13.1 %
5800	48.2	6.00	3.65	3.65	3.65	0.50	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.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Frequency Response of E-Field

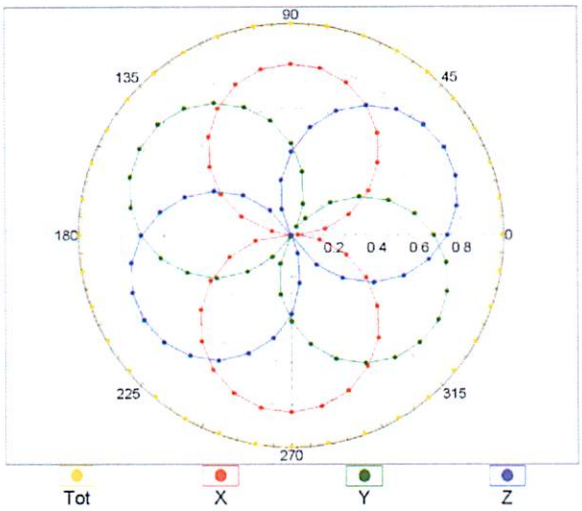
(TEM-Cell:ifi110 EXX, Waveguide: R22)



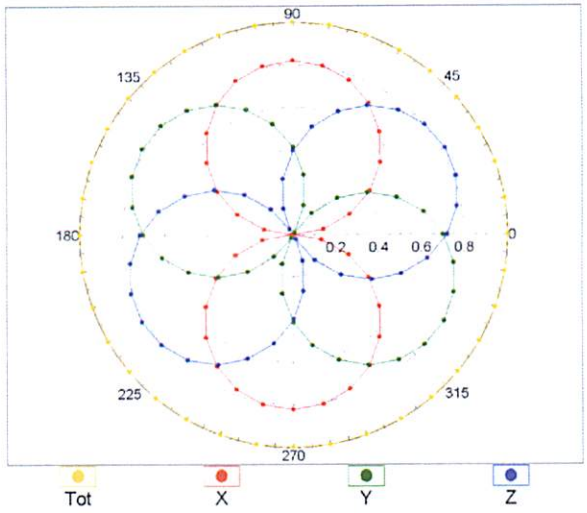
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

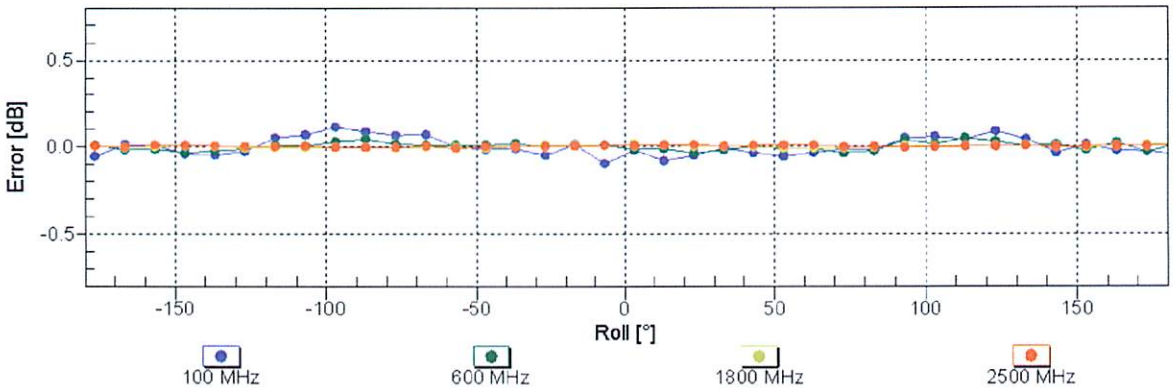
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22

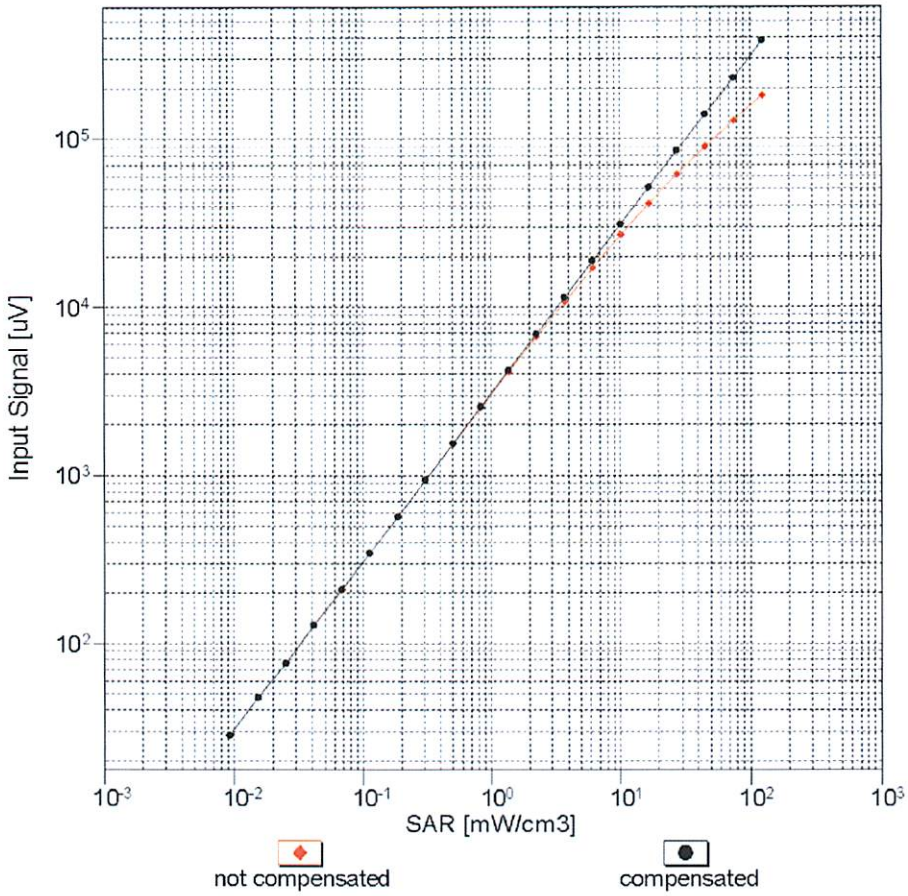


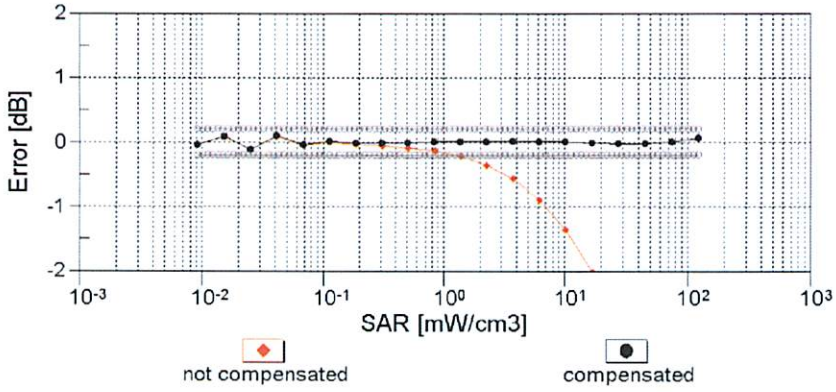


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

(TEM cell , f_{eval}= 1900 MHz)

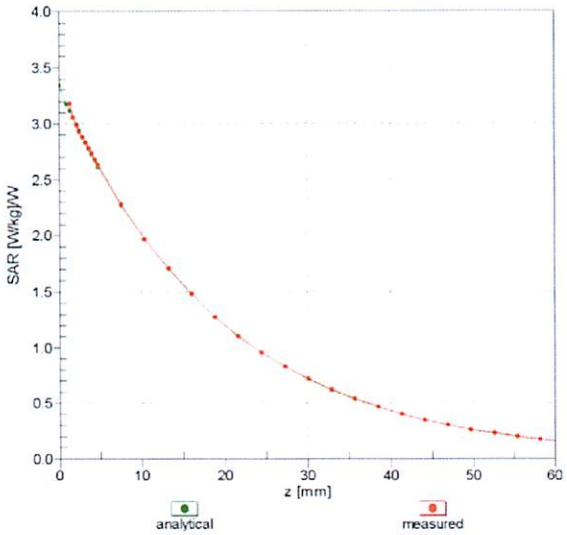




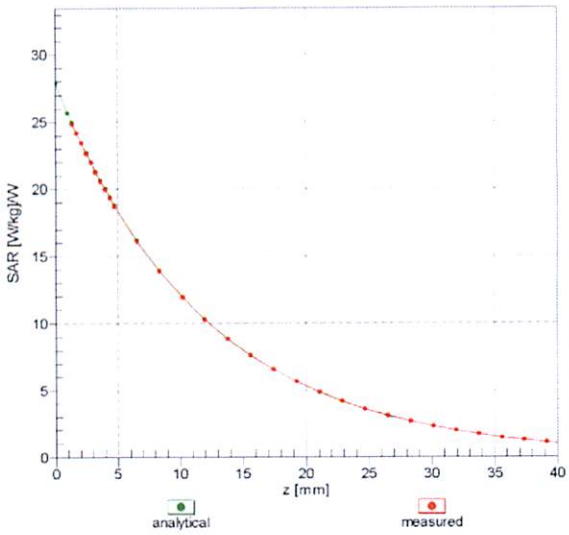
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

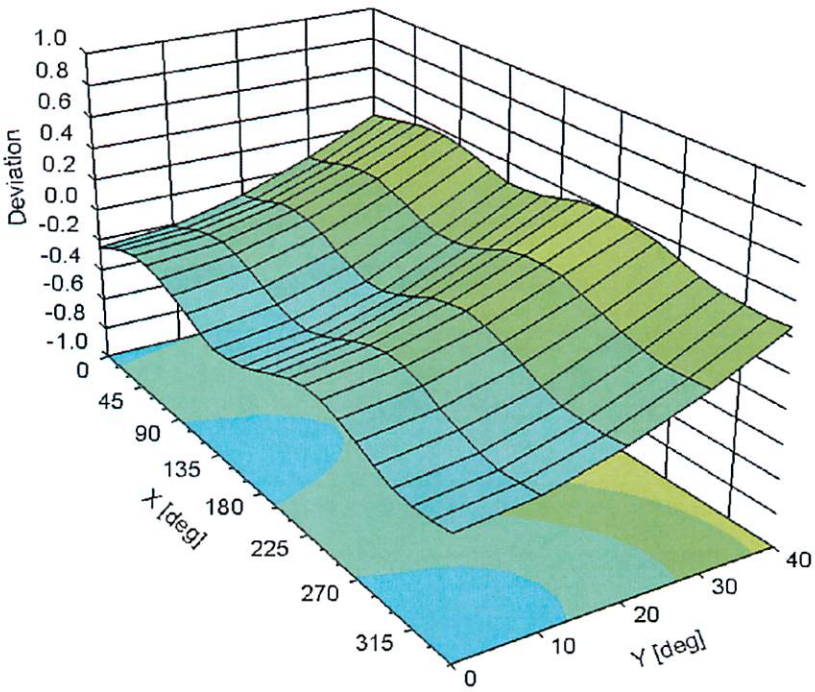


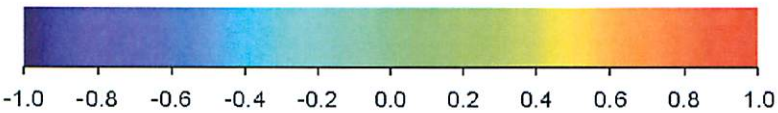
f = 1950 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-146.9
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