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	UNIDEN AMERICA CORPORATION			
	Address	6225 North State Highway 161, Suite 300, Irving, Texas, 75038			
STANDARDS APPLIED	FCC	47 CFR §2.1093	IC	Health Canada Safety Code 6	
PROCEDURES APPLIED	FCC	KDB 447498 D01v05r02, KDB 865664 D01v01r03	IC	RSS102 Issue 4	
	FCC	KDB 643646 D01v01r01	IEC	62209-1:2005	
	IEEE	IEEE 1528-2013	IEC	62209-2:2010	
DEVICE CLASSIFICATION	FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF) - FCC Part 95A (GMRS)			
	FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF) - FCC Part 80 (VHF)			
	IC	General Radio Service Equipment Operating in Band 26.960 to 27.410 (Citizen Band) RRS-236			
DEVICE DESCRIPTION	Portable Push-To-Talk (PTT) Multi-Band Radio Transceiver				
APPLICATION TYPE	Original Filing				
DATE(S) OF EVALUATION	November 11 – December 12, 2014	SAMPLES RECEIVED			

Devices Tested

FCC ID	IC Certification	Model	Type	Frequency Range	Manufacturer's Rated Output Power
AMWUT650	513C-UT650	Atlantis 295	System	156.025-157.425 MHz 462.550-462.725MHz	37.8dBm 34.8dBm

Antennas Tested

Part Number	Frequency Range (MHz)	Length (mm)	Diameter (mm)
Default			

Batteries Tested

Part Number	Output Voltage	Capacity (mAh)
N/A	7.4VDC	1100mAh

Body-Warn Accessories Tested

Part Number	Description
N/A	Belt Clip

Audio Accessories Tested

Part Number	Description
N/A	Speaker Mic

EVALUATION RESULTS

Maximum SAR Level Evaluated FCC	Head	1.028	W/kg	1g	50% PTT Duty Factor	General Public / Uncontrolled
	Body	1.251				
Maximum SAR Level Evaluated IC	Head	1.168				
	Body	1.468				
FCC / IC Spatial Peak SAR Limit	Head /Body	1.6	W/kg	1g	50% PTT Duty Factor	General Public / Uncontrolled

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.

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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REVISION HISTORY			
REVISION NO.	**DESCRIPTION**	**IMPLEMENTED BY**	**RELEASE DATE**
1.0	1st Release	Art Voss	December 12, 2014
1.1	Correction to first page	Art Voss	December 19, 2014

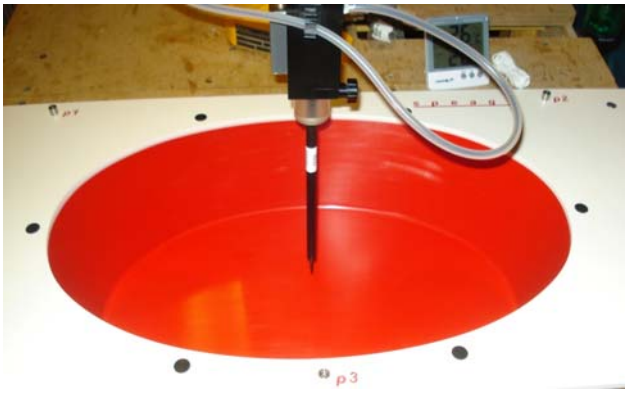
TEST REPORT SIGN-OFF			
DEVICE TESTED BY	**REPORT PREPARED BY**	**QA REVIEW BY**	**REPORT APPROVED BY**
Art Voss	Art Voss	Glen Westwell	Art Voss

1.0 INTRODUCTION

This measurement report demonstrates that the Uniden America Corporation Model: Atlantis 295 Portable VHF/GMRS PTT Radio Transceiver 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.

2.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for Head and/or Body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the DASY4 measurement server. The DAE4 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the DASY4 measurement server is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot utilizes a controller with built in VME-bus computer.



DASY4 SAR System with ELI Planar Phantom

DASY4 Measurement Server

3.0 RF CONDUCTED OUTPUT POWER MEASUREMENT

Band	Frequency	Channel	Mode	Measured Power Level		Method
				dBm	Watts	
VHF	156.05 MHz	01A	CW	37.6	5.75	Average Conducted
VHF	156.7 MHz	14	CW	37.6	5.75	
VHF	156.4 MHz	88	CW	37.4	5.49	
GMRS	462.56 MHz	1	CW	34.2	2.63	

Notes

1. The test channel was selected in accordance with the procedures specified in FCC KDB 447498 (see reference [7]).

2. The RF conducted output power levels of the DUT were measured by Celltech prior to the SAR evaluations using a Gigatronics 8652A Universal Power Meter at the external antenna connector of the radio in accordance with FCC 47 CFR §2.1046 (see reference [15]) and IC RSS-Gen (see reference [16]).

4.0 NO. OF TEST CHANNELS (N_c)

Device Frequency Range	Band	N_c	Test Frequencies (MHz)
156.025 - 157.425 MHz	VHF	3	156.025 – 157-425 MHz
462.550 – 467.7125 MHz	GMRS*	1	462.550 MHz
Note: The number of test channels (*Nc*) was calculated in accordance with the procedures specified in FCC KDB 447498 (see reference [8]).			

*GMRS Band had only one programmable channel with High Power setting.

5.0 SAR PROBE CALIBRATION & MEASUREMENT FREQUENCIES

The following procedures are recommended for measurements at 150 MHz - 3 GHz to minimize probe calibration and tissue dielectric parameter discrepancies. In general, SAR measurements below 300 MHz should be within ±50 MHz of the probe calibration frequency. At 300 MHz to 3 GHz, measurements should be within ±100 MHz of the probe calibration frequency. Measurements exceeding 50% of these intervals, ±25 MHz < 300 MHz and ±50 MHz ≥300 MHz, require additional steps (per FCC KDB 450824, SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz - 3 GHz - see reference [9]).

Probe Calibration Freq.	Device Measurement Freq.	Frequency Interval	±25 MHz ≤ 300 MHz
150 MHz	156.025 – 157.425 MHz	6.8 MHz	< 25 MHz
Note: The probe calibration and measurement frequency interval is < 25 MHz; therefore additional steps were not required.			

6.0 FLUID DIELECTRIC PARAMETERS

FLUID DIELECTRIC PARAMETERS

Date:	15 Nov 2014		Frequency:	150MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
100.0000	54.63	0.72	50.67	0.70	7.82%	2.86%
110.0000	54.17	0.73	54.00	0.69	0.31%	5.80%
120.0000	53.70	0.74	52.83	0.75	1.65%	-1.33%
130.0000	53.23	0.75	52.90	0.73	0.62%	2.74%
140.0000	52.77	0.75	52.75	0.77	0.04%	-2.60%
150.0000	52.30	0.76	51.33	0.73	1.89%	4.11%
156.0550	52.02	0.77	51.59	0.75	0.82%	2.39%
156.7050	51.98	0.77	51.62	0.75	0.71%	2.21%
157.4150	51.95	0.77	51.65	0.75	0.59%	2.02%
160.0000	51.83	0.77	51.76	0.76	0.14%	1.32%
170.0000	51.37	0.77	48.97	0.78	4.90%	-1.28%
180.0000	50.90	0.78	48.33	0.78	5.32%	0.00%
190.0000	50.43	0.79	48.04	0.77	4.98%	2.60%
200.0000	49.97	0.80	49.25	0.80	1.46%	0.00%

**interpolated using DASY4 software*

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Nov 15	150 Head	24 °C	22.0 °C	≥ 15 cm	n/a	25%	1000

FLUID DIELECTRIC PARAMETERS

Date:	10 Dec 2014		Frequency:	150MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
100.0000	65.51	0.77	63.13	0.76	3.77%	1.32%
110.0000	63.77	0.75	62.89	0.77	1.40%	-2.60%
120.0000	64.37	0.79	62.64	0.78	2.76%	1.28%
130.0000	65.04	0.75	62.39	0.78	4.25%	-3.85%
140.0000	63.45	0.78	62.15	0.79	2.09%	-1.27%
150.0000	62.71	0.79	61.90	0.80	1.31%	-1.25%
156.0550	62.31	0.80	61.75	0.81	0.91%	-1.24%
156.7050	62.27	0.80	61.73	0.81	0.87%	-1.24%
157.4400	62.22	0.80	61.71	0.81	0.82%	-1.24%
160.0000	62.05	0.80	61.65	0.81	0.65%	-1.23%
170.0000	62.69	0.79	61.41	0.82	2.08%	-3.66%
180.0000	62.94	0.80	61.16	0.82	2.91%	-2.44%
190.0000	61.52	0.81	60.91	0.83	1.00%	-2.41%
200.0000	62.59	0.83	60.67	0.84	3.16%	-1.19%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Dec 10	150 Body	23 °C	22.9 °C	≥ 15 cm	n/a	17%	1000

FLUID DIELECTRIC PARAMETERS

Date:	12 Dec 2014		Frequency:	450MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000	55.26	0.81	57.70	0.93	-4.23%	-12.90%
360.0000	55.41	0.82	57.60	0.93	-3.80%	-11.83%
370.0000	55.61	0.83	57.50	0.93	-3.29%	-10.75%
380.0000	55.50	0.84	57.40	0.93	-3.31%	-9.68%
390.0000	55.06	0.85	57.30	0.93	-3.91%	-8.60%
400.0000	54.91	0.86	57.20	0.93	-4.00%	-7.53%
410.0000	55.29	0.85	57.10	0.93	-3.17%	-8.60%
420.0000	54.21	0.88	57.00	0.94	-4.89%	-6.38%
430.0000	54.41	0.87	56.90	0.94	-4.38%	-7.45%
440.0000	54.36	0.91	56.80	0.94	-4.30%	-3.19%
450.0000	54.09	0.90	56.70	0.94	-4.60%	-4.26%
460.0000	53.96	0.90	56.66	0.94	-4.77%	-4.26%
462.5500	53.98	0.90	56.65	0.94	-4.71%	-3.98%
470.0000	54.05	0.91	56.62	0.94	-4.54%	-3.19%
480.0000	54.17	0.93	56.58	0.94	-4.26%	-1.06%
490.0000	53.06	0.92	56.54	0.94	-6.15%	-2.13%
500.0000	53.12	0.94	56.51	0.94	-6.00%	0.00%
510.0000	53.22	0.95	56.47	0.94	-5.76%	1.06%
520.0000	53.35	0.96	56.43	0.95	-5.46%	1.05%
530.0000	53.13	0.97	56.39	0.95	-5.78%	2.11%
540.0000	53.36	0.97	56.35	0.95	-5.31%	2.11%
550.0000	52.64	0.98	56.31	0.95	-6.52%	3.16%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Dec 12	450 Body	23 °C	22.9 °C	≥ 15 cm	n/a	15%	1000

FLUID DIELECTRIC PARAMETERS

Date:	12 Dec 2014		Frequency:	450MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000	45.41	0.79	44.70	0.87	1.59%	-9.20%
360.0000	44.87	0.81	44.58	0.87	0.65%	-6.90%
370.0000	44.76	0.83	44.46	0.87	0.67%	-4.60%
380.0000	45.25	0.84	44.34	0.87	2.05%	-3.45%
390.0000	44.56	0.84	44.22	0.87	0.77%	-3.45%
400.0000	44.46	0.84	44.10	0.87	0.82%	-3.45%
410.0000	44.50	0.86	43.98	0.87	1.18%	-1.15%
420.0000	43.79	0.85	43.86	0.87	-0.16%	-2.30%
430.0000	43.32	0.87	43.74	0.87	-0.96%	0.00%
440.0000	43.23	0.90	43.62	0.87	-0.89%	3.45%
450.0000	43.73	0.90	43.50	0.87	0.53%	3.45%
460.0000	43.24	0.90	43.45	0.87	-0.48%	3.45%
462.5500	43.16	0.90	43.44	0.87	-0.63%	3.45%
470.0000	42.94	0.90	43.40	0.87	-1.06%	3.45%
480.0000	42.35	0.92	43.34	0.87	-2.28%	5.75%
490.0000	41.96	0.93	43.29	0.87	-3.07%	6.90%
500.0000	42.07	0.94	43.24	0.87	-2.71%	8.05%
510.0000	42.15	0.95	43.19	0.87	-2.41%	9.20%
520.0000	42.21	0.96	43.14	0.88	-2.16%	9.09%
530.0000	42.14	0.96	43.08	0.88	-2.18%	9.09%
540.0000	41.76	0.97	43.03	0.88	-2.95%	10.23%
550.0000	41.81	0.98	42.98	0.88	-2.72%	11.36%

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m^3)
Dec 12	450 Head	23 °C	23.0 °C	≥ 15 cm	n/a	15%	1000

7.0 SAR MEASUREMENT SUMMARY

Plot.	Test Date	Freq.	Ch.	Configuaration	Accessories		Device Distance to Planar Phantom		Measured SAR 1g (W/kg) PTT Duty Factor		SAR Drift During Test
		MHz			Body-worn	Audio	DUT	Antenna	100%	50%	dB
F1	17 Nov	156.05	01A	Face	n/a	n/a	25	55	0.145	0.073	-0.834
F2	17 Nov	156.7	14	Face	n/a	n/a	25	55	0.103	0.052	-0.980
F3	17 Nov	157.4	88	Face	n/a	n/a	25	55	0.135	0.068	-1.140
B1	10 Dec	156.05	01A	Body	Belt Clip	Spkr-MIC	25	30	0.178	0.089	-1.240
B2	11 Dec	156.7	14	Body	Belt Clip	Spkr-MIC	25	30	0.224	0.112	-0.993
B3	11 Dec	157.4	88	Body	Belt Clip	Spkr-MIC	25	30	0.156	0.078	-1.060
B4	12 Dec	462.5	01	Body	Belt Clip	Spkr-MIC	25	30	2.180	1.090	-0.692
F4	12 Dec	462.5	01	Face	n/a	n/a	25	55	1.790	.0895	-0.555

SAR LIMIT(S)		HEAD	SPATIAL PEAK
FCC 47 CFR 2.1093	Health Canada Safety Code 6	1.6 W/kg	averaged over 1 gram

8.0 SAR SCALING (MANUFACTURER TOLERANCE)

Scaling of Maximum Measured SAR

Plot ID	Configuration	Freq	Measured Flluid Deviation		Measured Conducted Power	Measured Drift	Measured SAR
		(MHz)	Permitivity	Conductivity	(dBm)	(dBm)	(W/kg)
F4	Face	462.5	-0.63%	3.45%	34.2	-0.555	0.895
B4	Body	462.5	-4.71%	-3.98%	34.2	-0.692	1.090

Step 1

Fluid Sensitivity Adjustment (1)

Plot ID	Measured SAR (W/kg)	X	Scale Factor (%)	=	Adjusted SAR (W/kg)
F4	0.895	X	n/a	=	**0.895**
B4	1.090	X	n/a	=	**1.090**

Step 2

Manufacturer's Tune-Up Tolerance (2)

Plot ID	Measured Conducted Power (dBm)	Rated Conducted Power (dBm)	Delta (dB)	+	Adjusted SAR (W/kg)	=	Reported SAR (W/kg)
F4	34.2	34.8	-0.6	+	**0.895**	=	**1.028**
B4	34.2	34.8	-0.6	+	**1.090**	=	**1.251**

Step 3

Simultaneous Transmission (3) – Bluetooth (Not Applicable)

Plot ID	Output Power Pmax (mW)	Freq (GHz)	Separation Distance (mm)	Estimated SAR (W/kg)	+	Reported SAR (W/kg)	=	Simultaneous Reported SAR (W/kg)
					+		=	**1.028**
					+		=	**1.251**

Step 4 (IC/EU/AU)

Drift Adjustment (4)

Plot ID	Measured Drift (dBm)	+	Reported or Simultaneous Reported SAR (W/kg)	=	Scaled SAR (W/kg)
F4	-0.555	+	**1.028**	=	**1.168**
B4	-0.692	+	**1.251**	=	**1.468**

Notes:

1. Only the highest SAR values for face 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 Population SAR Limit of 1.6 W/kg.
4. IC requires that the reported SAR also be scaled for the measured drift, therefore the above table calculates the SAR separately for IC.

9.0 DETAILS OF SAR EVALUATION

The DUT was compliant for localized Specific Absorption Rate (General Population / Uncontrolled Exposure) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix D.

1. The face-held SAR evaluation was performed with the front of the DUT placed parallel to the outer surface of the planar phantom. A 2.5 cm spacing was maintained between the front side of the DUT and the outer surface of the planar phantom.
2. The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was allowed to cool for 10 minutes prior to the zoom scan evaluation.
3. The DUT was evaluated for SAR in an unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
4. The SAR drift of the DUT was measured by the DASY4 system for the duration of the SAR evaluation and a SAR-versus-Time power droop evaluation was performed (see Appendix A).
5. The fluid temperature remained within +/-2°C from the fluid dielectric parameter measurement to the completion of the SAR evaluation.
6. The dielectric parameters of the simulated tissue mixture were measured prior to the SAR evaluation using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).

10.0 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.

11.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations, system verifications were performed with a planar phantom and SPEAG 150MHz CLA and SPEAG 450MHz dipole (see Appendix B) in accordance with the procedures described in FCC KDB 865664 (see reference [9]).

System Verification Test Resluts

Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Input Power (mW)	Dipole Spacing (mm)	Validation Source P/N	Validation Source S/N
16 Nov 2014	150	Head	22.0	23	25%	1000	0	CLA-150	4007

SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
4.15	3.86	7.51%	**2.76**	2.55	8.24%	52.30	51.33	1.89%	0.76	0.73	4.11%

System Verification Test Resluts

Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Input Power (mW)	Dipole Spacing (mm)	Validation Source P/N	Validation Source S/N
10 Dec 2014	150	Body	22.9	23	17%	1000	0	CLA-150	4007

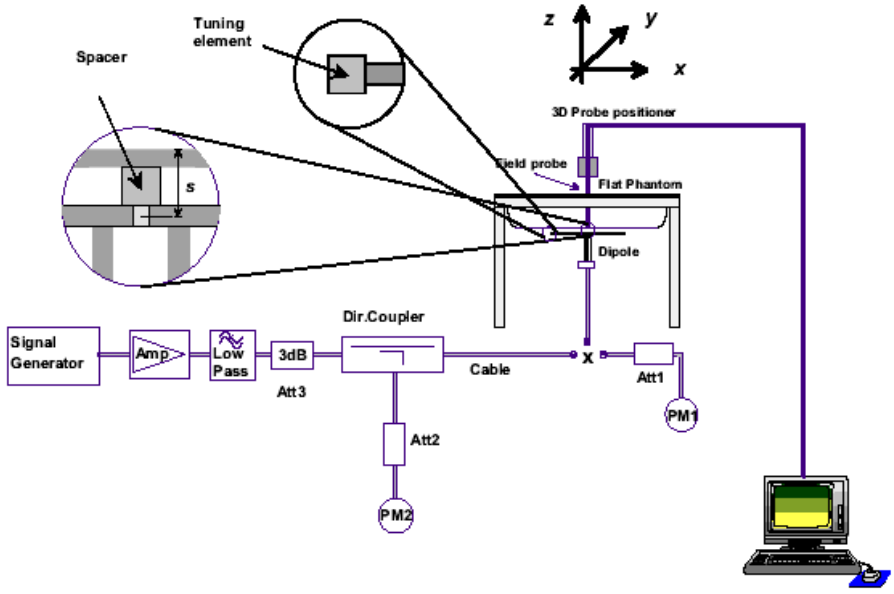
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
3.81	3.90	-2.31%	**2.55**	2.60	-1.92%	62.71	61.90	1.31%	0.79	0.80	-1.25%

System Verification Test Resluts

Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Input Power (mW)	Dipole Spacing (mm)	Validation Source P/N	Validation Source S/N
12 Dec 2014	450	Body	22.9	23	15%	398	15	D450V3	1068

SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
1.97	1.81	8.84%	**1.34**	1.21	10.74%	54.09	56.70	-4.60%	0.90	0.94	-4.26%

Notes	1.	The 150MHz SAR values have a coefficient of variation < 3%.
	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 (IEEE Standard 1528-2003)

SPEAG 450 MHz Validation Dipole Setup

12.0 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 [12] and [13]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2013 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [6]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

SIMULATED TISSUE MIXTURES	
INGREDIENT	**150 MHz HEAD**
Water	38.35 %
Sugar	55.5%
Salt	5.15%
HEC	0.9%
Bactericide	0.1%

SIMULATED TISSUE MIXTURES	
INGREDIENT	**150 MHz Body**
Water	46.6%
Sugar	49.7%
Salt	2.6%
HEC	1%
Bactericide	0.1%

SIMULATED TISSUE MIXTURES	
INGREDIENT	**450 MHz HEAD**
Water	38.56%
Sugar	56.32%
Salt	3.95%
HEC	0.98%
Bactericide	0.19%
SIMULATED TISSUE MIXTURES	
INGREDIENT	**450 MHz Body**
Water	52%
Sugar	45.65%
Salt	1.75%
HEC	0.5%
Bactericide	0.1%

13.0 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.			

14.0 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	ELI Planar Phantom
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 70 liters

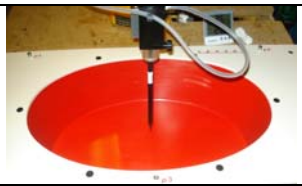
15.0 PROBE SPECIFICATION (ET3DV6)

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

EX3DV4 E-Field Probe

16.0 ELI PLANAR PHANTOM

The ELI V5.0 phantom is an elliptical planar fiberglass shell phantom with a shell thickness of 2.0mm +/- .2mm at the planar area. This phantom conforms to OET Bulletin 65, Supplement C, IEEE 1528-2013, IEC 62209-1 and IEC 62209-2.



ELI Planar Phantom

17.0 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. Face-held SAR evaluations (PTT radios) are performed with the device holder in the body axis.

Device Holder

18.0 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	-EX$DV4-Field Probe	00213	3600	15-Apr-14	Annual
x	-D450V3 Validation Dipole	00221	1068	27-Apr-12**	Triennial
x	ELI Elliptical Phantom	00247	03-01	CNR	CNR
x	HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
x	Gigatronics 8652A Power Meter	00007	1835272	17-June-14	Biennial
x	Gigatronics 80701A Power Sensor	00248	1833687	18 March-14	Biennial
x	HP 8753ET Network Analyzer	00134	US39170292	22 Oct 14	Biennial
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	08-May-14	Biennial
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
x	Schmid & Partner DASY4 System	-	-	-	-
x	-DASY4 Measurement Server	00158	1078	CNR	CNR
Abbr.	CNR = Calibration Not Required				

19.0 MEASUREMENT UNCERTAINTIES (IC ONLY)

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2013 Table 9)

Uncertainty Component	IEEE 1528 Section	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value ±% (1g)	Uncertainty Value ±% (10g)	V_i or V_{eff}
Measurement System									
Probe Calibration	E.2.1	6.7	Normal	1	1	1	6.65	6.65	∞
Axial Isotropy*	E.2.2	4.7	Rectangular	1.732050808	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy*	E.2.2	9.6	Rectangular	1.732050808	0.7	0.7	3.9	3.9	∞
Boundary Effect*	E.2.3	1.0	Rectangular	1.732050808	1	1	0.6	0.6	∞
Linearity*	E.2.4	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
System Detection Limits*	E.2.4	1.0	Rectangular	1.732050808	1	1	0.6	0.6	∞
Modulation Response	E.2.5	4.0	Rectangular	1.732050808	1	1	2.3	2.3	∞
Readout Electronics*	E.2.6	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time*	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time*	E.2.8	2.6	Rectangular	1.732050808	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise*	E.6.1	3.0	Rectangular	1.732050808	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflection*	E.6.1	3.0	Rectangular	1.732050808	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance*	E.6.2	0.4	Rectangular	1.732050808	1	1	0.2	0.2	∞
Probe Positioning wrt Phantom Shell*	E.6.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	∞
Extrapolation, interpolation & integration algorithms for max. SAR evaluation*	E.5	1.0	Rectangular	1.732050808	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning*	E.4.2	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty*	E.4.1	3.6	Normal	1	1	1	3.6	3.6	8
SAR Drift Measurement**	E.2.9	0.0	Rectangular	1.732050808	1	1	0.0	0.0	∞
SAR Scaling***	E.6.5	0.0	Rectangular	1.732050808	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty*	E.3.1	4.0	Rectangular	1.732050808	1	1	2.3	2.3	∞
SAR Correction Uncertainty	E.3.2	1.9	Normal	1	1	0.84	1.9	1.6	∞
Liquid Conductivity (measurement)	E.3.3	5.3	Normal	1	0.78	0.71	4.2	3.8	∞
Liquid Permittivity (measurement)	E.3.3	6.8	Normal	1	0.23	0.26	1.6	1.8	∞
Liquid Conductivity (Temperature)	E.3.2	0.0	Rectangular	1.732050808	0.78	0.71	0.0	0.0	∞
Liquid Permittivity Temperature)	E.3.2	0.1	Rectangular	1.732050808	0.23	0.26	0.0	0.0	∞
Combined Standard Uncertainty			**RSS**				**11.75**	**11.60**	
Expanded Uncertainty (95% Confidence Interval)			**k=2**				**23.50**	**23.21**	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003									

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

*Provided by SPEAG for DASY4

**SAR is Compensated for Drift

***SAR Scaling not Required

20.0 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.

[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] 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.”

[7] 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)”.

[8] Federal Communications Commission, Office of Engineering and Technology - “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”; KDB 447498 D01 v05: October 2012.

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

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

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

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

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

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

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

APPENDIX A - SAR MEASUREMENT PLOTS

Plot F1

Date/Time: 17/11/2014 1:34:56 PM

1313 - 150H 17 Nov 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 17 Nov 2014, Ambient Temp: 23C; Fluid Temp: 22.0C; Humidity: 25%

Procedure Notes:

Communication System: CW
Frequency: 156.055 MHz; Duty Cycle: 1:1
Medium: TSL_150H Medium parameters used (interpolated): f = 156.055 MHz; σ = 0.766 mho/m; ε_r = 52; ρ = 1000 kg/m^3

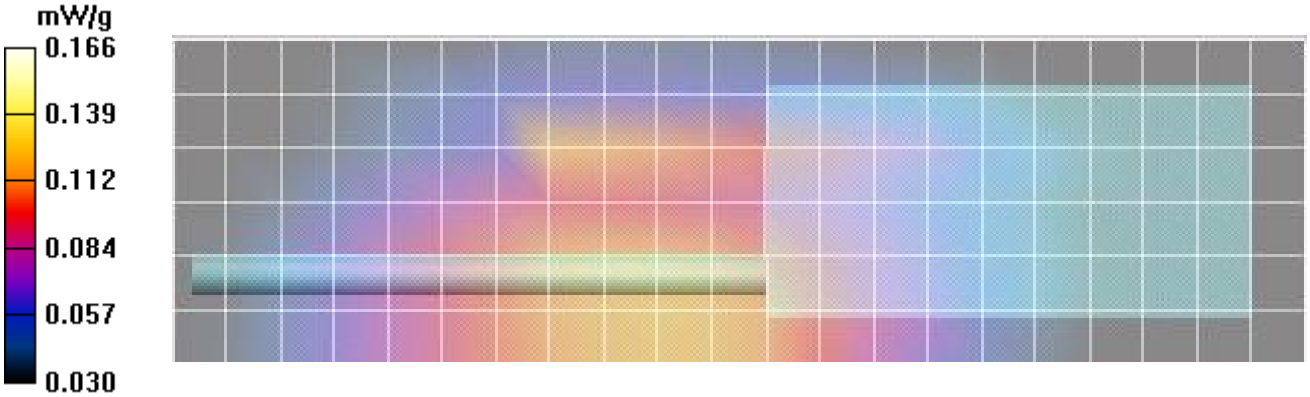
- Probe: EX3DV4 - SN3600; ConvF(9.8, 9.8, 9.8); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

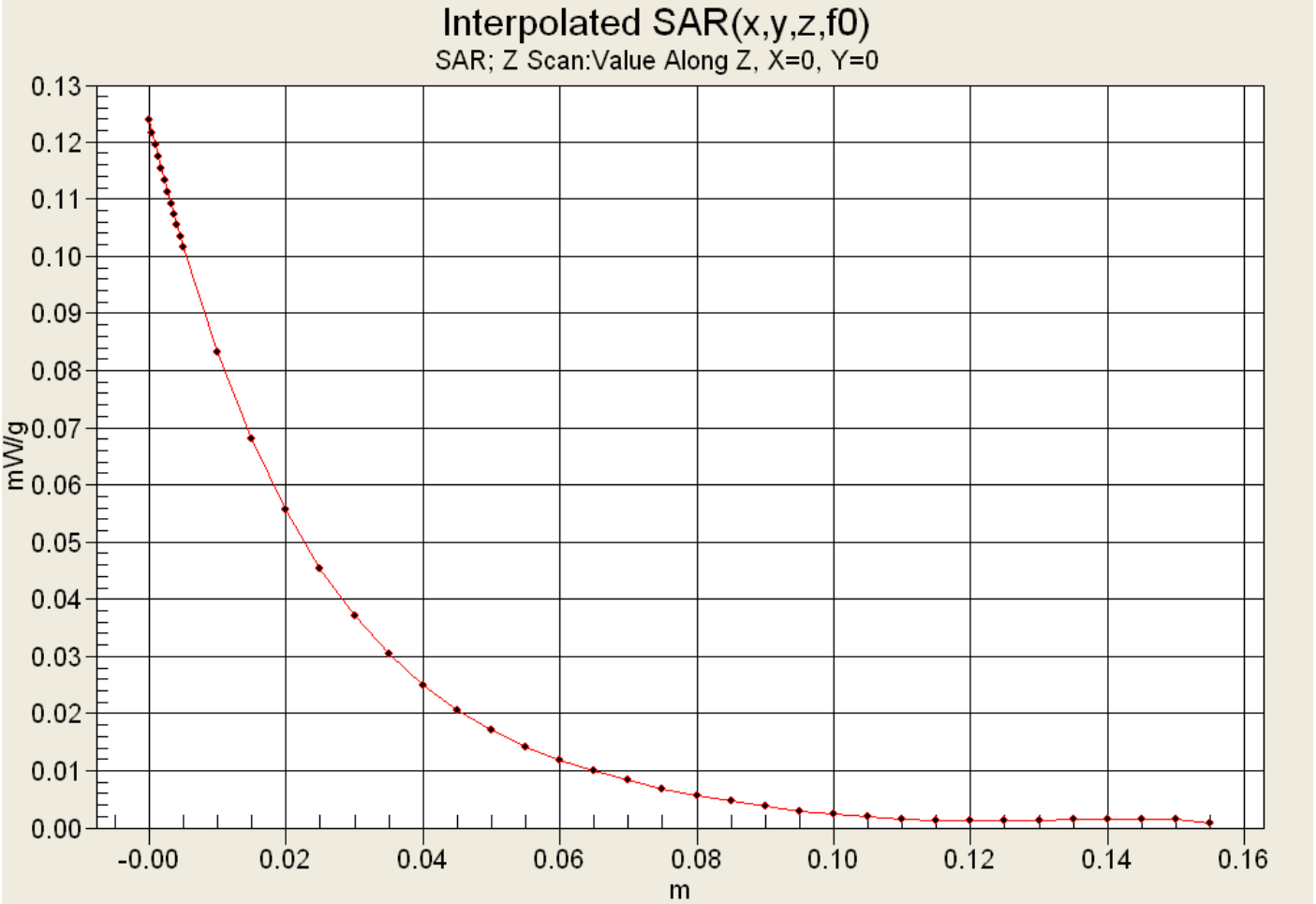
F1 - 156.055MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.126 mW/g

F1 - 156.055MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = -0.83 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.145 mW/g; SAR(10 g) = 0.107 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.166 mW/g





Plot F2

Date/Time: 17/11/2014 3:40:43 PM

1313 - 150H 17 Nov 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 17 Nov 2014, Ambient Temp: 23C; Fluid Temp: 22.0C; Humidity: 25%

Procedure Notes:

Communication System: CW
Frequency: 156.705 MHz; Duty Cycle: 1:1
Medium: TSL_150H Medium parameters used (interpolated): f = 156.705 MHz; σ = 0.767 mho/m; ε_r = 52; ρ = 1000 kg/m^3

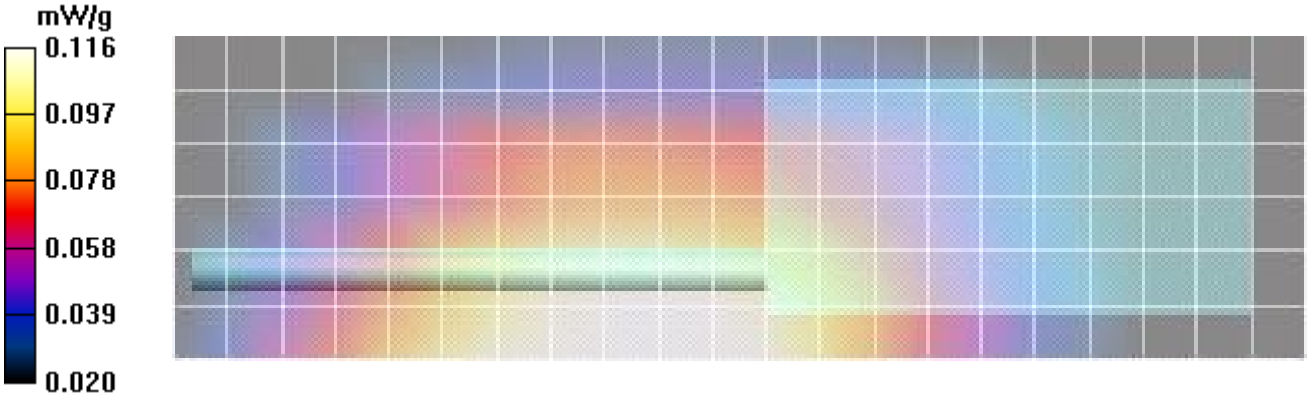
- Probe: EX3DV4 - SN3600; ConvF(9.8, 9.8, 9.8); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F2 - 156.705MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.128 mW/g

F2 - 156.705MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = -0.98 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.103 mW/g; SAR(10 g) = 0.077 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.116 mW/g



Plot F3

Date/Time: 17/11/2014 5:21:54 PM

1313 - 150H 17 Nov 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 17 Nov 2014, Ambient Temp: 23C; Fluid Temp: 22.0C; Humidity: 25%

Procedure Notes:

Communication System: CW
Frequency: 157.44 MHz; Duty Cycle: 1:1
Medium: TSL_150H Medium parameters used (interpolated): f = 157.44 MHz; σ = 0.769 mho/m; ε_r = 52; ρ = 1000 kg/m^3

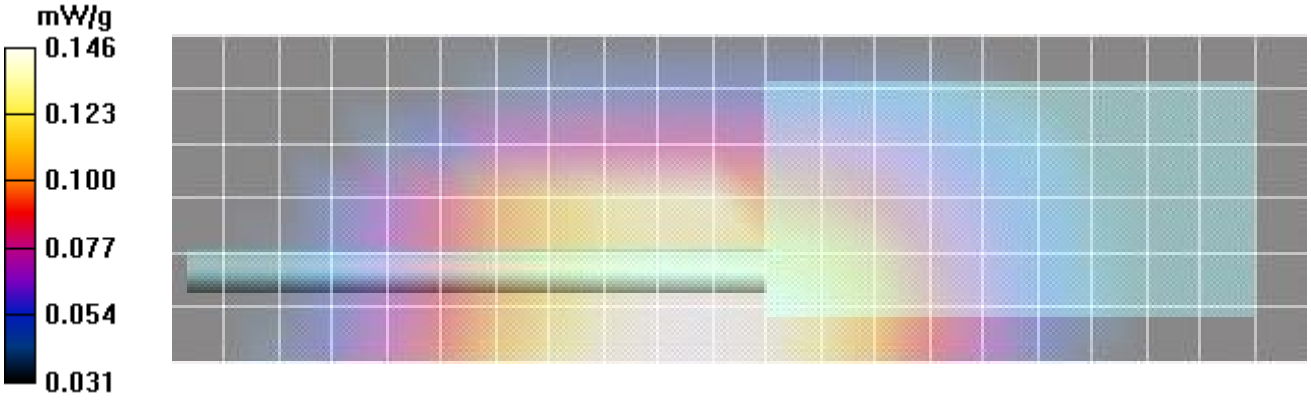
- Probe: EX3DV4 - SN3600; ConvF(9.8, 9.8, 9.8); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F3 - 157.440MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.149 mW/g

F3 - 157.440MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = -1.14 dB
Peak SAR (extrapolated) = 0.175 W/kg
SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.098 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.146 mW/g



Plot B1

Date/Time: 10/12/2014 3:21:22 PM

1313 - 150B 10 Dec 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 10 Dec 2014, Ambient Temp: 23C; Fluid Temp: 22.9C; Humidity: 17%

Procedure Notes:

Communication System: CW
Frequency: 156.055 MHz; Duty Cycle: 1:1
Medium: TSL_150B Medium parameters used (interpolated): f = 156.055 MHz; σ = 0.796 mho/m; ε_r = 62.3; ρ = 1000 kg/m^3

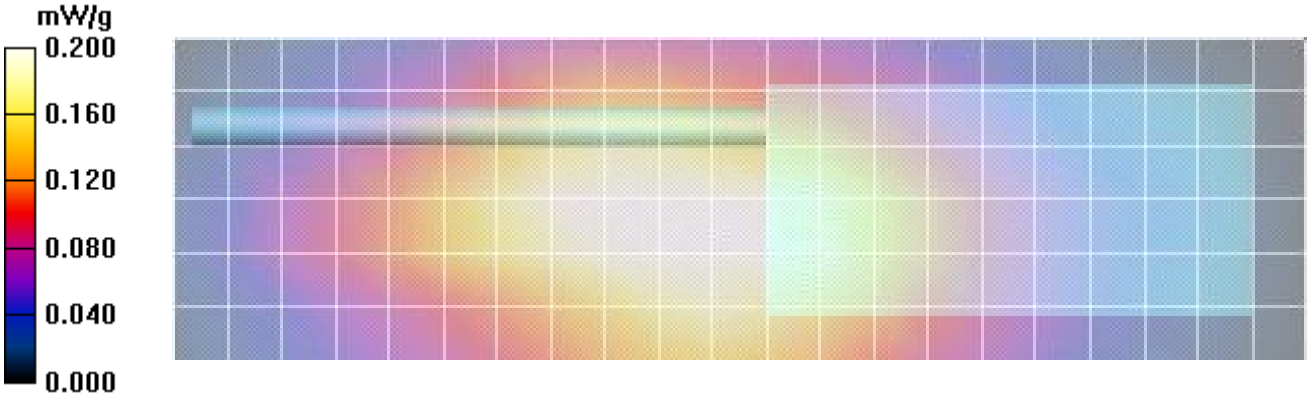
- Probe: EX3DV4 - SN3600; ConvF(8.81, 8.81, 8.81); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B1 - 156.055MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.221 mW/g

B1 - 156.055MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 16.3 V/m; Power Drift = -1.24 dB
Peak SAR (extrapolated) = 0.241 W/kg
SAR(1 g) = 0.178 mW/g; SAR(10 g) = 0.121 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.200 mW/g



Plot B2

Date/Time: 11/12/2014 9:53:36 AM

1313 - 150B 11 Dec 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 11 Dec 2014, Ambient Temp: 23C; Fluid Temp: 23.4C; Humidity: 17%

Procedure Notes:

Communication System: CW
Frequency: 156.705 MHz; Duty Cycle: 1:1
Medium: TSL_150B Medium parameters used (interpolated): f = 156.705 MHz; σ = 0.797 mho/m; ε_r = 62.3; ρ = 1000 kg/m^3

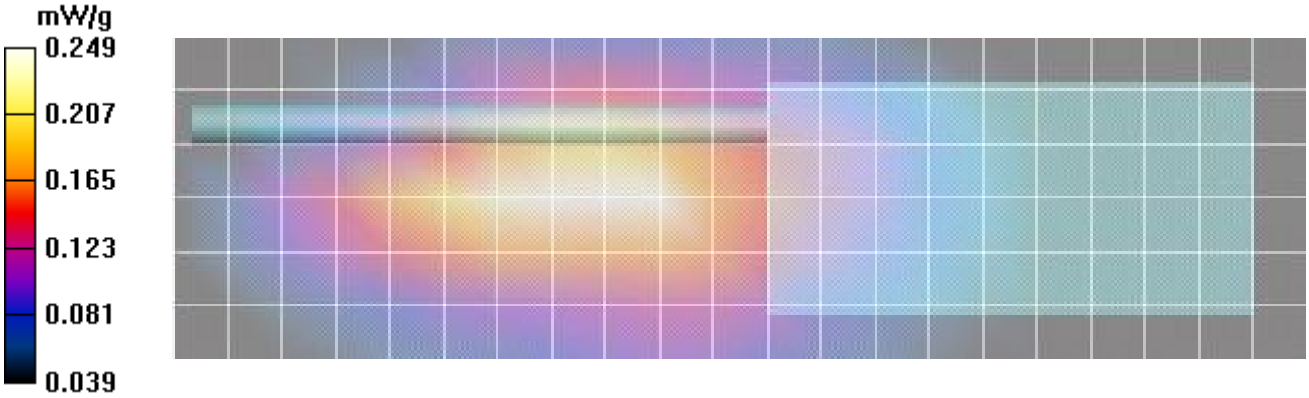
- Probe: EX3DV4 - SN3600; ConvF(8.81, 8.81, 8.81); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

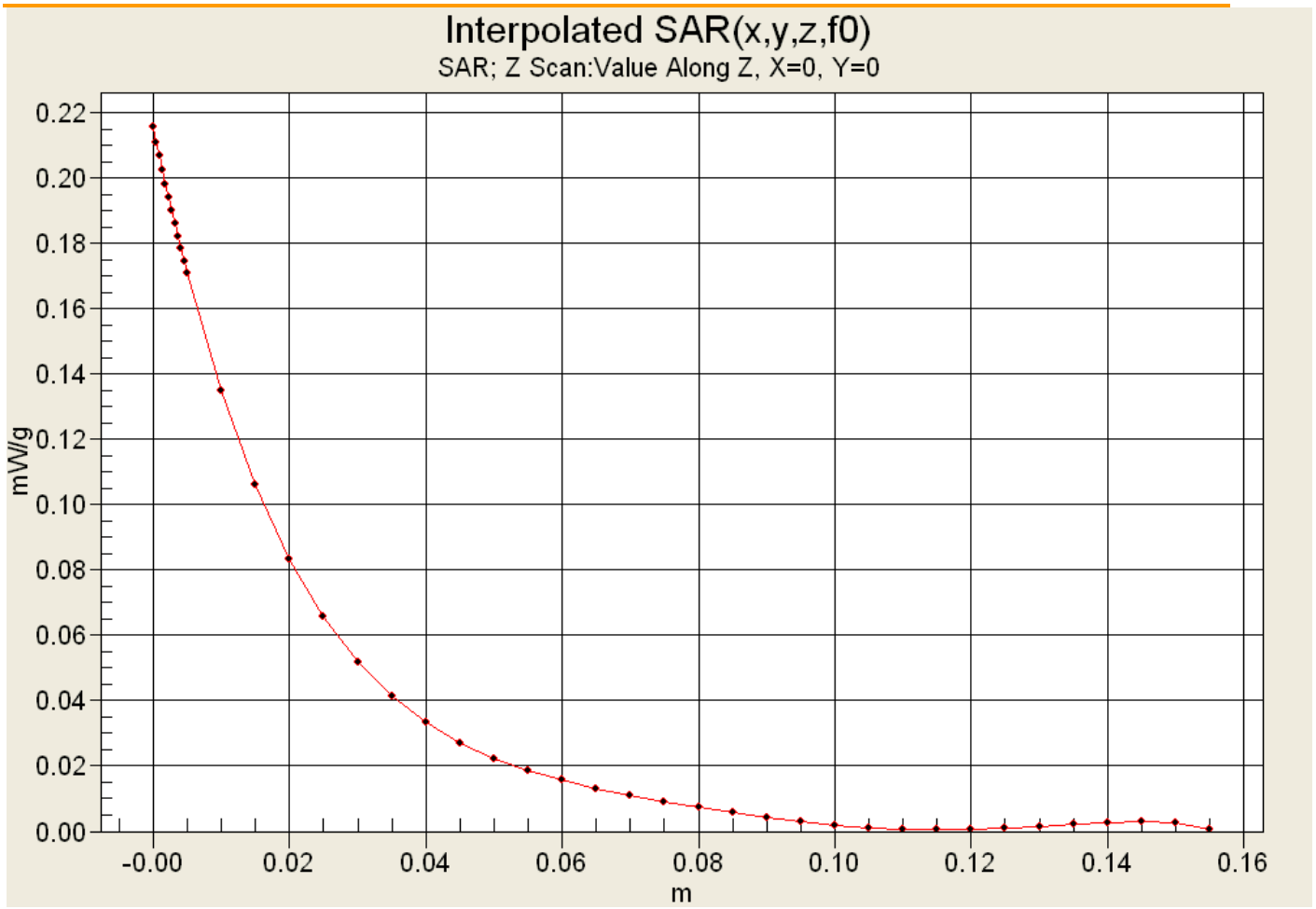
B2 - 156.705MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.259 mW/g

B2 - 156.705MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = -0.993 dB
Peak SAR (extrapolated) = 0.317 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.151 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.249 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.22
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
0.12
0.14
0.16
m

Plot B3

Date/Time: 11/12/2014 11:03:46 AM

1313 - 150B 11 Dec 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 11 Dec 2014, Ambient Temp: 23C; Fluid Temp: 23.4C; Humidity: 17%

Procedure Notes:

Communication System: CW
Frequency: 157.44 MHz; Duty Cycle: 1:1
Medium: TSL_150B Medium parameters used (interpolated): f = 157.44 MHz; σ = 0.797 mho/m; ε_r = 62.2; ρ = 1000 kg/m^3

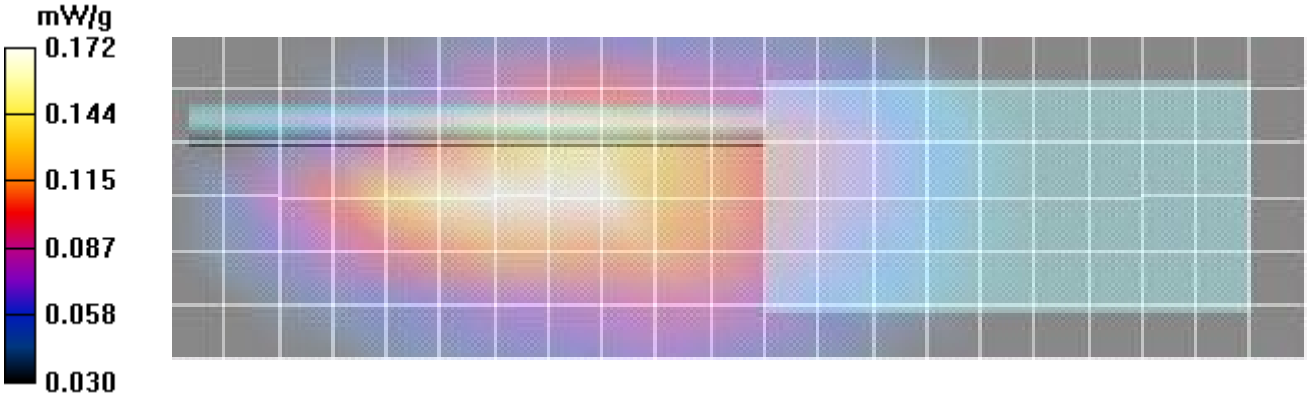
- Probe: EX3DV4 - SN3600; ConvF(8.81, 8.81, 8.81); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B3 - 157.440MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.193 mW/g

B3 - 157.440MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -1.06 dB
Peak SAR (extrapolated) = 0.216 W/kg
SAR(1 g) = 0.156 mW/g; SAR(10 g) = 0.108 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.172 mW/g



Plot B4

Date/Time: 12/12/2014 12:41:41 PM

1313 - 450B 12 Dec 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 12 Dec 2014, Ambient Temp: 23C; Fluid Temp: 22.9C; Humidity: 15%

Procedure Notes:

Communication System: CW
Frequency: 462.55 MHz; Duty Cycle: 1:1
Medium: TSL_450B Medium parameters used (interpolated): f = 462.55 MHz; σ = 0.903 mho/m; ε_r = 54; ρ = 1000 kg/m^3

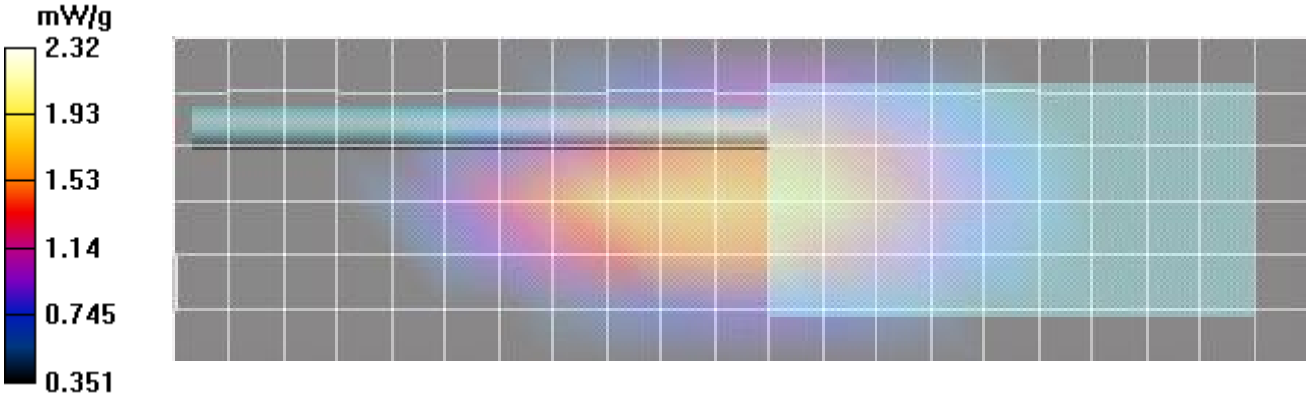
- Probe: EX3DV4 - SN3600; ConvF(9.05, 9.05, 9.05); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

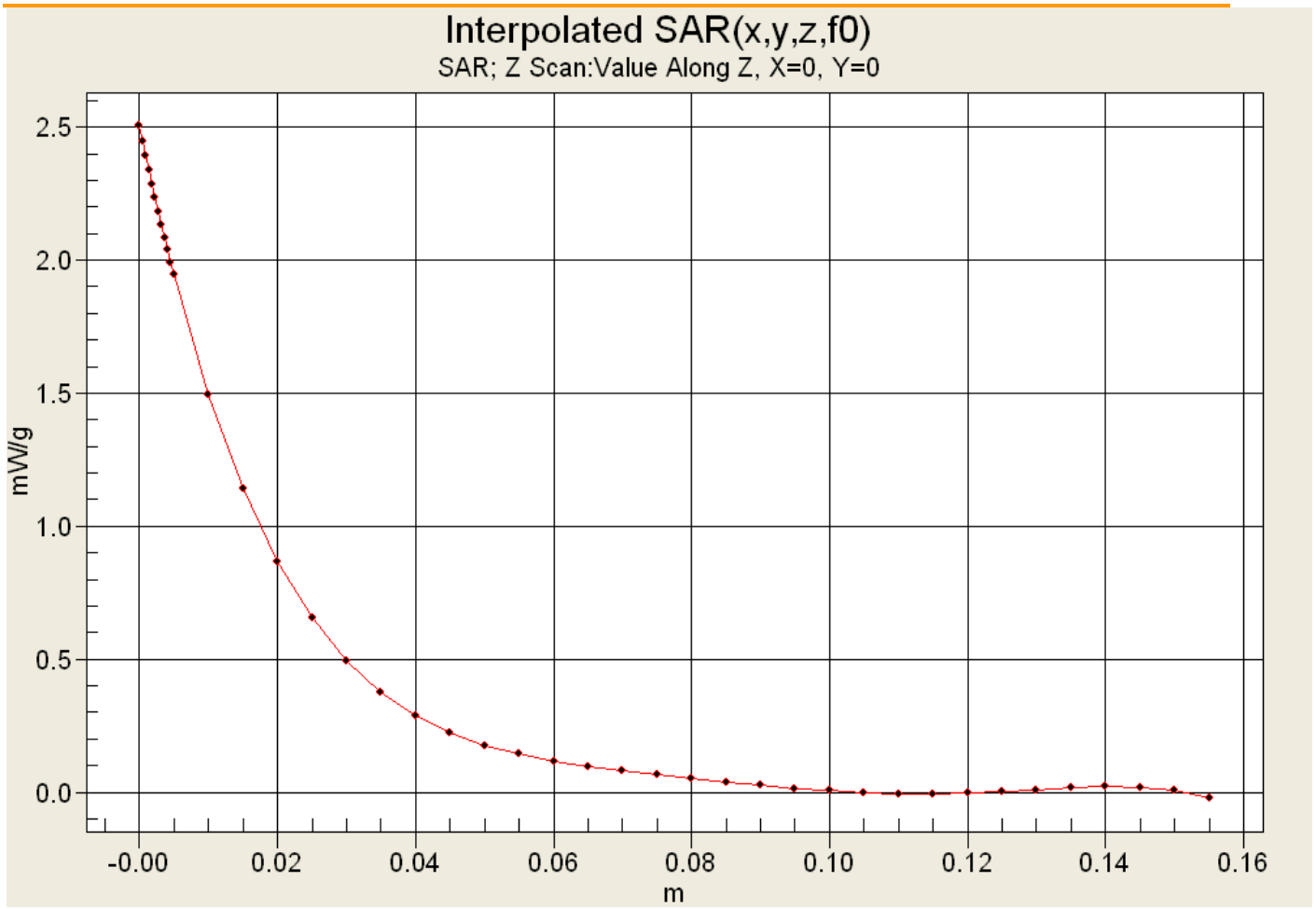
B4 462.55MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

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

B4 462.55MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 34.8 V/m; Power Drift = -0.692 dB
Peak SAR (extrapolated) = 2.88 W/kg
SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.58 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.32 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Plot F4

Date/Time: 12/12/2014 3:44:59 PM

1313 - 450H 12 Dec 2014

DUT: Uniden; Type: Portable VHF PTT Radio Transceiver; Serial: n/a

Program Notes: 12 Dec 2014, Ambient Temp: 23C; Fluid Temp: 23.0C; Humidity: 15%

Procedure Notes:

Communication System: CW
Frequency: 462.55 MHz; Duty Cycle: 1:1
Medium: TSL_450H Medium parameters used (interpolated): f = 462.55 MHz; σ = 0.9 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3

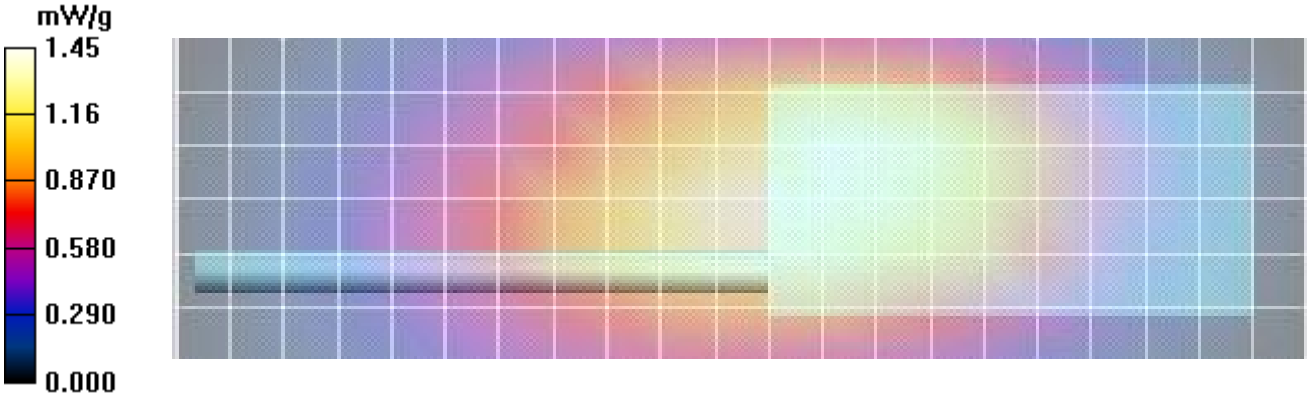
- Probe: EX3DV4 - SN3600; ConvF(9.4, 9.4, 9.4); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

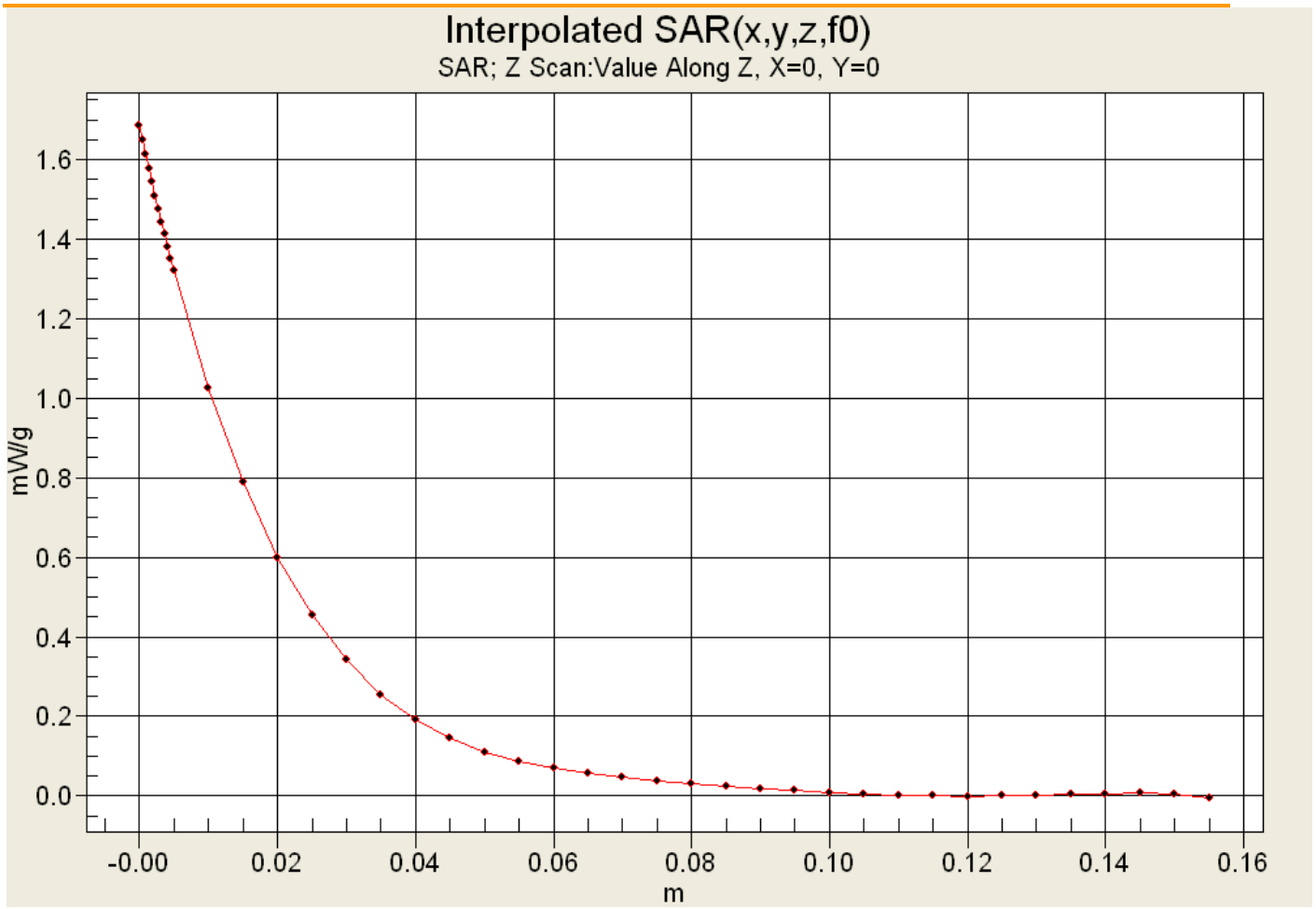
F4 462.55MHz/Area Scan (7x22x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.47 mW/g

F4 462.55MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 43.4 V/m; Power Drift = -0.555 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 1.79 mW/g; SAR(10 g) = 0.886 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.45 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS

Date/Time: 16/11/2014 12:11:51 PM

SPC 150H - 16 Nov 2014

DUT: Dipole 150 MHz CLA-150; Type: CLA-150; Serial: 4007; Calibrated: 4 March 2014

Program Notes: 16 Nov 2014 Ambient Temp: 23C; Fluid Temp: 22.0C; Humidity: 25%

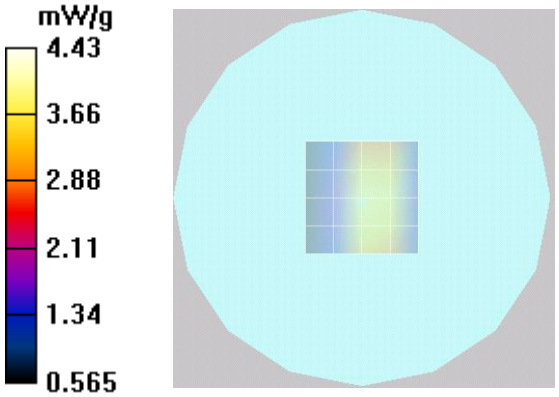
Procedure Notes: 150MHz CLA, 1.0W Input, 150B TSL, TS=3.89

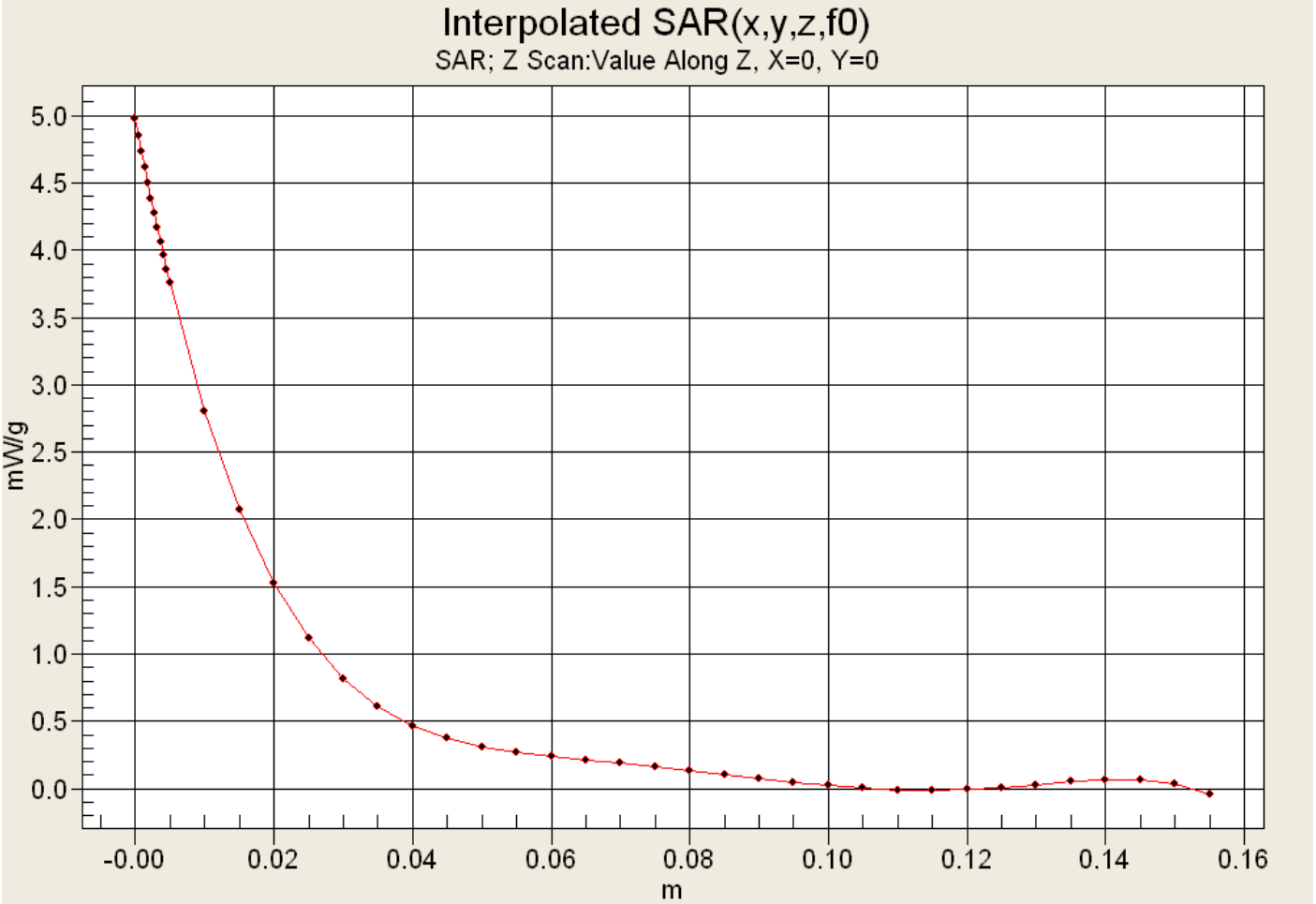
Communication System: CW
Frequency: 150 MHz; Duty Cycle: 1:1
Medium: TSL_150H Medium parameters used: f = 150 MHz; σ = 0.76 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(9.8, 9.8, 9.8); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body d=0mm, Pin = 1.0W, TS = [3.474][3.86][4.246]/Area Scan (5x5x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.79 mW/g

Body d=0mm, Pin = 1.0W, TS = [3.474][3.86][4.246]/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 72.0 V/m; Power Drift = -0.190 dB
Peak SAR (extrapolated) = 6.42 W/kg
SAR(1 g) = 4.15 mW/g; SAR(10 g) = 2.76 mW/g
Maximum value of SAR (measured) = 4.43 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 10/12/2014 2:29:20 PM

SPC 150B - 10 Dec 2014

DUT: Dipole 150 MHz CLA-150; Type: CLA-150; Serial: 4007; Calibrated: 4 March 2014

Program Notes: 10 Dec 2014 Ambient Temp: 23C; Fluid Temp: 22.9C; Humidity: 17%

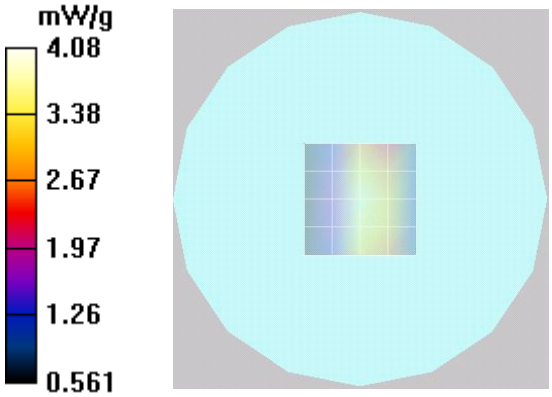
Procedure Notes: 150MHz CLA, 1.0W Input, 150B TSL, TS=3.89

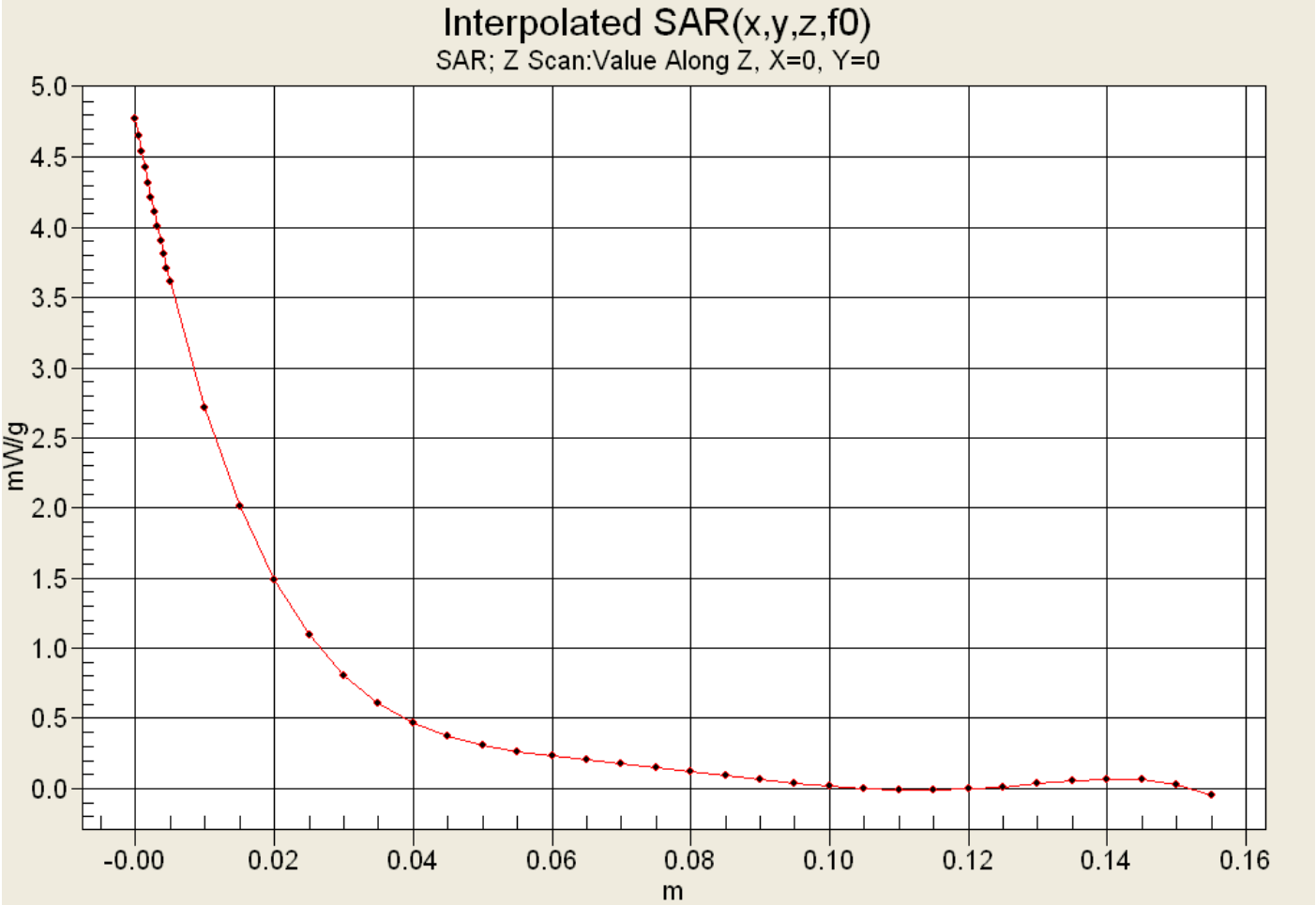
Communication System: CW
Frequency: 150 MHz; Duty Cycle: 1:1
Medium: TSL_150B Medium parameters used: f = 150 MHz; σ = 0.79 mho/m; ε_r = 62.7; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(8.81, 8.81, 8.81); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body d=0mm, Pin = 1.0W, TS = [3.501][3.89][4.279]/Area Scan (5x5x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.72 mW/g

Body d=0mm, Pin = 1.0W, TS = [3.501][3.89][4.279]/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 69.4 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 5.81 W/kg
SAR(1 g) = 3.81 mW/g; SAR(10 g) = 2.55 mW/g
Maximum value of SAR (measured) = 4.08 mW/g





Date/Time: 12/12/2014 9:44:23 AM

SPC 450B - 11 Dec 2014

DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/27/2012

Program Notes: May 17 2014, Ambient Temp: 23C; Fluid Temp: 23.0C; Humidity: 28%

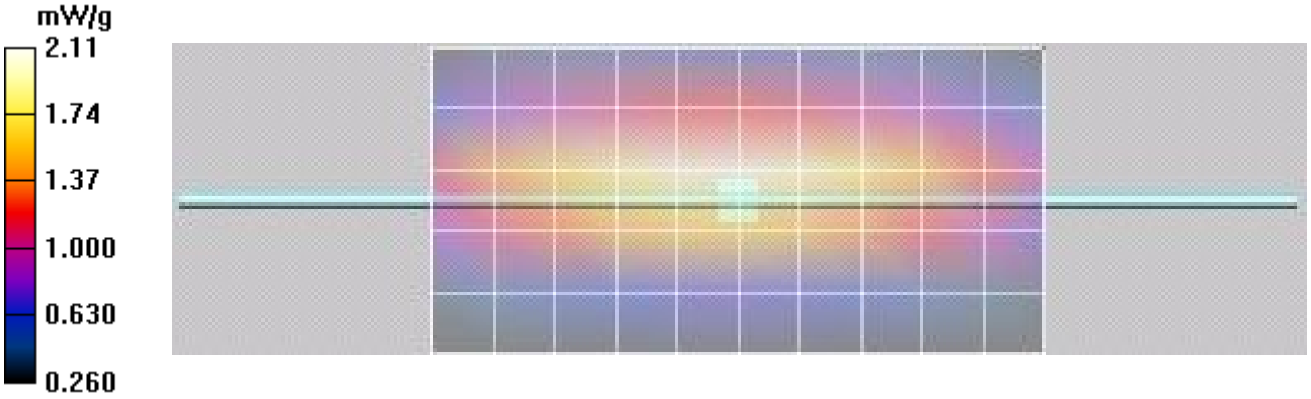
Procedure Notes:

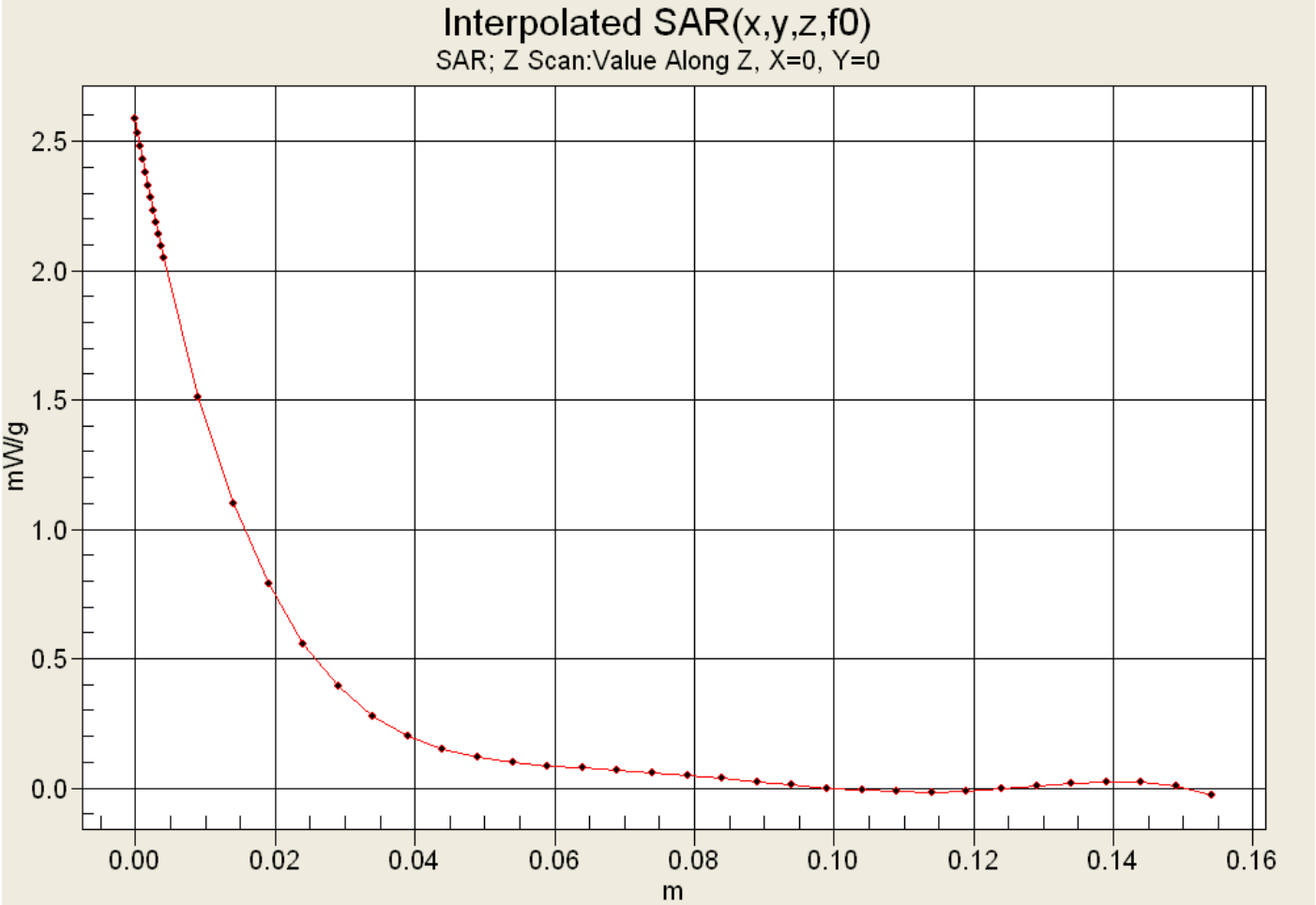
Communication System: CW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: TSL_450B Medium parameters used: f = 450 MHz; σ = 0.9 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(9.05, 9.05, 9.05); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body d=15mm Pin=398mW, TS=[1.629][1.81][1.991]/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.05 mW/g

Body d=15mm Pin=398mW, TS=[1.629][1.81][1.991]/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 47.7 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 2.87 W/kg
SAR(1 g) = 1.97 mW/g; SAR(10 g) = 1.34 mW/g
Maximum value of SAR (measured) = 2.11 mW/g




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

Date/Time: 12/12/2014 3:15:33 PM

SPC 450H - 12 Dec 2014

DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/27/2012

Program Notes: 12 Dec 2014, Ambient Temp: 23C; Fluid Temp: 23.0C; Humidity: 17%

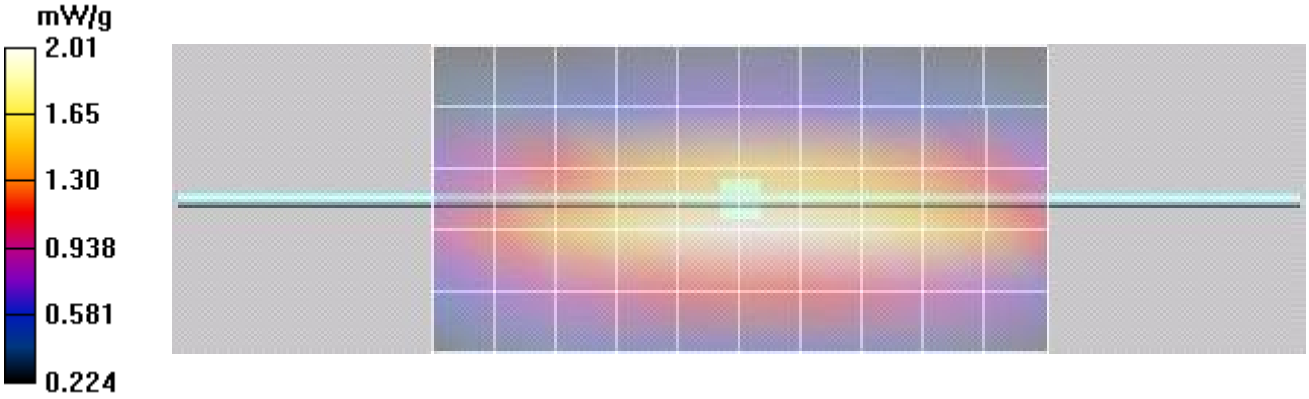
Procedure Notes:

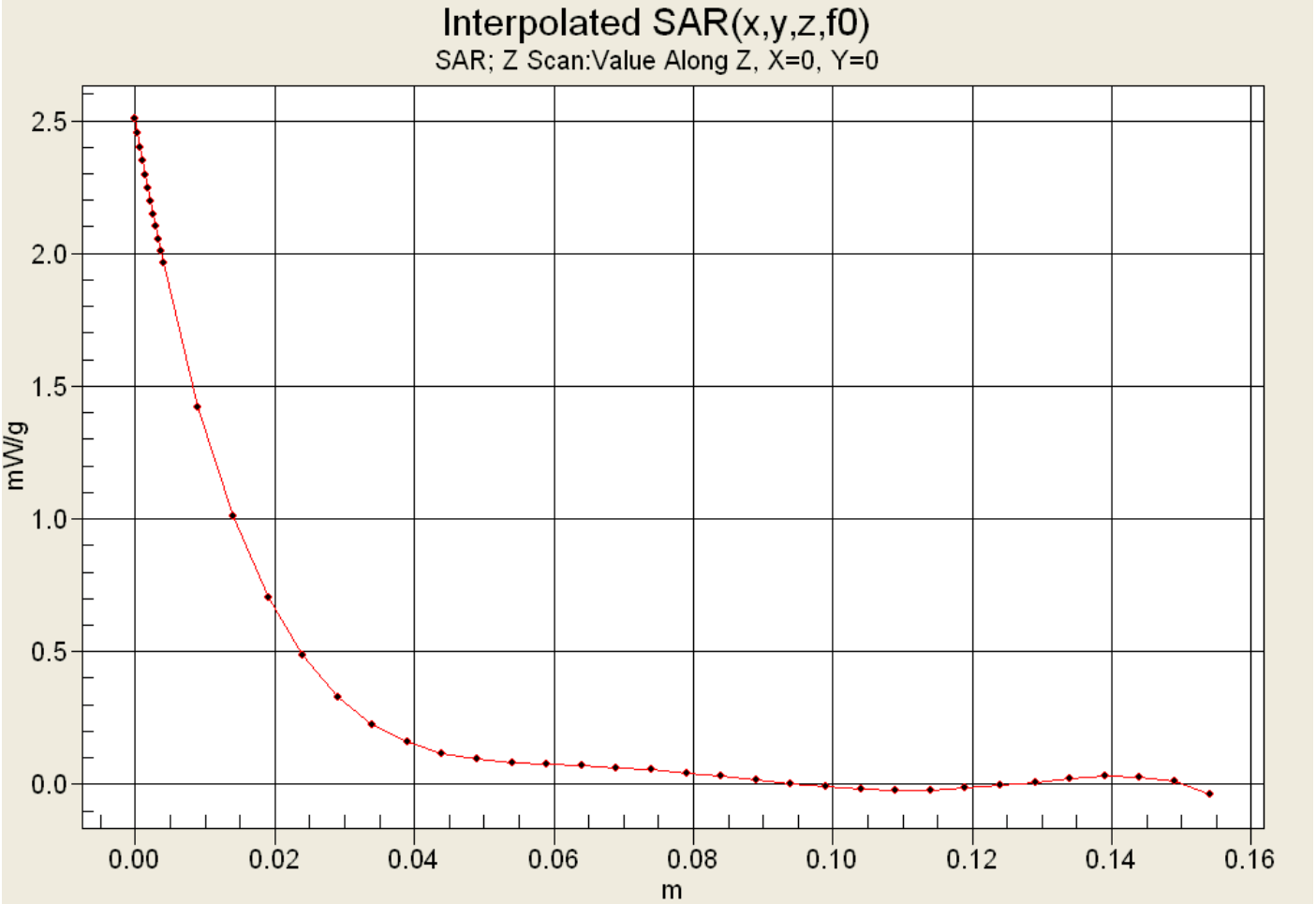
Communication System: CW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: TSL_450H Medium parameters used: f = 450 MHz; σ = 0.9 mho/m; ε_r = 43.7; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(9.4, 9.4, 9.4); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head d=15mm Pin=398mW, TS=[1.683][1.87][2.057]/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.99 mW/g

Head d=15mm Pin=398mW, TS=[1.683][1.87][2.057]/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 47.0 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 2.74 W/kg
SAR(1 g) = 1.88 mW/g; SAR(10 g) = 1.27 mW/g
Maximum value of SAR (measured) = 2.01 mW/g




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

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

****
Aprel Laboratory
Test Result for UIM Dielectric Parameter
Sat 15/Nov/2014 15:49:58
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
0.1000	50.67	0.70	54.63	0.72
0.1100	54.00	0.69	54.17	0.73
0.1200	52.83	0.75	53.70	0.74
0.1300	52.90	0.73	53.23	0.75
0.1400	52.75	0.77	52.77	0.75
0.1500	51.33	0.73	52.30	0.76
0.1600	51.76	0.76	51.83	0.77
0.1700	48.97	0.78	51.37	0.77
0.1800	48.33	0.78	50.90	0.78
0.1900	48.04	0.77	50.43	0.79
0.2000	49.25	0.80	49.97	0.80

****
Aprel Laboratory
Test Result for UIM Dielectric Parameter
Wed 10/Dec/2014 14:47:01
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
0.1000	63.13	0.76	65.51	0.77
0.1100	62.89	0.77	63.77	0.75
0.1200	62.64	0.78	64.37	0.79
0.1300	62.39	0.78	65.04	0.75
0.1400	62.15	0.79	63.45	0.78
0.1500	61.90	0.80	62.71	0.79
0.1600	61.65	0.81	62.05	0.80
0.1700	61.41	0.82	62.69	0.79
0.1800	61.16	0.82	62.94	0.80
0.1900	60.91	0.83	61.52	0.81
0.2000	60.67	0.84	62.59	0.83

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Fri 12/Dec/2014 16:12:00
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
0.3500	44.70	0.87	45.41	0.79
0.3600	44.58	0.87	44.87	0.81
0.3700	44.46	0.87	44.76	0.83
0.3800	44.34	0.87	45.25	0.84
0.3900	44.22	0.87	44.56	0.84
0.4000	44.10	0.87	44.46	0.84
0.4100	43.98	0.87	44.50	0.86
0.4200	43.86	0.87	43.79	0.85
0.4300	43.74	0.87	43.32	0.87
0.4400	43.62	0.87	43.23	0.90
0.4500	43.50	0.87	43.73	0.90
0.4600	43.45	0.87	43.24	0.90
0.4700	43.40	0.87	42.94	0.90
0.4800	43.34	0.87	42.35	0.92
0.4900	43.29	0.87	41.96	0.93
0.5000	43.24	0.87	42.07	0.94
0.5100	43.19	0.87	42.15	0.95
0.5200	43.14	0.88	42.21	0.96
0.5300	43.08	0.88	42.14	0.96
0.5400	43.03	0.88	41.76	0.97
0.5500	42.98	0.88	41.81	0.98

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Fri 12/Dec/2014 10:19:33
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
0.3500	57.70	0.93	55.26	0.81
0.3600	57.60	0.93	55.41	0.82
0.3700	57.50	0.93	55.61	0.83
0.3800	57.40	0.93	55.50	0.84
0.3900	57.30	0.93	55.06	0.85
0.4000	57.20	0.93	54.91	0.86
0.4100	57.10	0.93	55.29	0.85
0.4200	57.00	0.94	54.21	0.88
0.4300	56.90	0.94	54.41	0.87
0.4400	56.80	0.94	54.36	0.91
0.4500	56.70	0.94	54.09	0.90
0.4600	56.66	0.94	53.96	0.90
0.4700	56.62	0.94	54.05	0.91
0.4800	56.58	0.94	54.17	0.93
0.4900	56.54	0.94	53.06	0.92
0.5000	56.51	0.94	53.12	0.94
0.5100	56.47	0.94	53.22	0.95
0.5200	56.43	0.95	53.35	0.96
0.5300	56.39	0.95	53.13	0.97
0.5400	56.35	0.95	53.36	0.97
0.5500	56.31	0.95	52.64	0.98

APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

Figure	FACE			
1				
DUT	**Antenna**	**Battery**	**Body Accessory**	**Audio Accessory**
Atlantis 295	n/a	n/a	n/a	n/a
DUT	**Separation Distance to Phantom**			**Antenna**
25mm				55mm

Set-Up

DUT

Figure	BODY			
2				
DUT	**Antenna**	**Battery**	**Body Accessory**	**Audio Accessory**
Atlantis 295	**n/a**	**n/a**	**Belt Clip**	**Speaker MIC**
DUT	**Separation Distance to Phantom**			**Antenna**
0/25mm				**30mm**

Set-Up

DUT

DUT PHOTOGRAPHS

Figure 3	Atlantis 295

Front w/ Antenna	Back w/ Antenna	Left w/ Antenna	Right w/ Antenna
			

Top w/ Antenna	Bottom
	

Figure 4	Uniden Accessories

Speaker MIC

Belt Clip (Top)

Belt Clip Side