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**	**HARRIS CORPORATION**			
	Address	221 Jefferson Ridge Parkway, Lynchburg, VA 24501 U.S.A.			
STANDARDS APPLIED	**FCC**	**47 CFR §2.1093**		**IC**	**Health Canada Safety Code 6**
PROCEDURES APPLIED	**FCC**	**KDB 447498 D01v05r02, KDB 865664 D01v01r03**		**IC**	**RSS 102 Issue 4**
	FCC	**KDB 865664 D02v01r01, KDB 643646 D01v01r01**		**IEC**	
	IEEE	**IEEE 1528-2013**		**IEC**	
DEVICE CLASSIFICATION	**FCC**	**Licensed Non-Broadcast Transmitter Held to Face (TNF) - FCC Part 90**			
	IC	**Land Mobile Radio Transmitter/Receiver (27.41-960 MHz) - RSS-119**			
DEVICE DESCRIPTION	Portable Multi-Band Digital Push-To-Talk (PTT) Radio Transceiver				
APPLICATION TYPE	**New Filing**				
DATE(S) OF EVALUATION	February 10 - 13, 2015		**SAMPLES RECEIVED**	**February 10, 2015**	

Devices Evaluated

FCC ID	IC Certification	Model	Type	Frequency Range	Manufacturer's Rated Output Power
OWDTR-0134-E	3636B-0134	XG-15P 7/800 P/N: RU-144770-001	System	768 - 861 MHz	3W

Antenna Type(s) Tested	KRE1011506/2						
Battery Type(s) Tested	14002-0214-01						
Body-worn Accessories Tested	See Section 6.0						
Audio Accessories Tested	See Section 6.0						
Maximum SAR Level Evaluated FCC	**Head**	**1.60**	**W/kg**	**1g**	**50% PTT Duty Factor**	**Occupational / Controlled Exposure**	
	Body	**2.98**					
Maximum SAR Level Evaluated IC	**Head**	**1.64**					
	Body	**3.23**					
FCC / IC Spatial Peak SAR Limit	**Head /Body**	**8.0**	**W/kg**	**1g**	**50% PTT Duty Factor**	**Occupational / Controlled Exposure**	

Statement of Compliance

Celltech Labs Inc. declares under its sole responsibility that the Harris Corporation Model XG-15P 7/800 Portable PTT Transceiver 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 Occupational/Controlled 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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1.0 DOCUMENT CONTROL

REVISION HISTORY			
REVISION NO.	**DESCRIPTION**	**IMPLEMENTED BY**	**RELEASE DATE**
1.0	1st Release	Art Voss	February 18, 2015
1.1	2nd Release – Changes per Mfgr	Art Voss	March 16, 2015

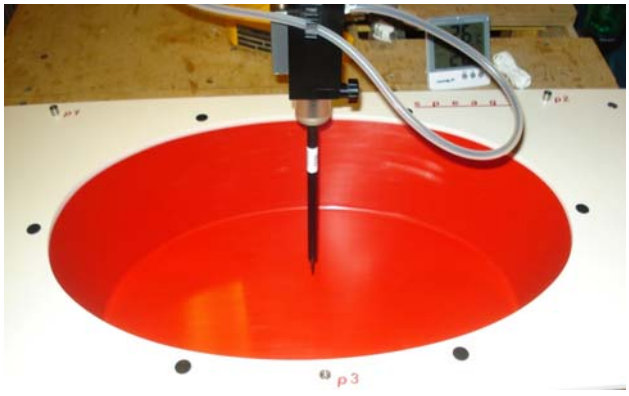
TEST REPORT SIGN-OFF			
DEVICE TESTED BY	**REPORT PREPARED BY**	**QA REVIEW BY**	**REPORT APPROVED BY**
Art Voss/Jasmeet Gill	Jasmeet Gill	Art Voss	Art Voss

2.0 INTRODUCTION

This measurement report demonstrates that the HARRIS Corporation XG-15P 7/800 Portable PTT Radio Transceivers complies with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6 for the Occupational / Controlled Exposure environment. The measurement procedures were in accordance of KDB 447498; KDB 865664; IC RSS-102 Issue 4 and IEEE Standard 1528-2013. 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. Subsequent addendums were applied to the following Radio Transceivers:

3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility employs a Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, a robot controller, a computer, a near-field probe, a probe alignment sensor, an Elliptical Planar Phantom (ELI) phantom and a specific anthropomorphic mannequin (SAM) phantom 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 and a teach pendant (Joystick) to control the robot's servo 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 form the DAE to digital electronic signal 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, a command decoder and a 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

4.0 RF CONDUCTED POWER MEASUREMENT

Table 4.0

RF Conducted Power Measurement

Average Conducted Power(1)

Frequency Band	Frequency (MHz)	System Radio Measured Power (dBM)	System Radio Measured Power (W)	Rated Power (dBm)	Rated Power (W)	Test Channel(2)
700 MHz	768	34.70	2.95	34.77	3.0	X
	798	34.70	2.95	34.77	3.0	
	805	34.55	2.85	34.77	3.0	
800 MHz	806	34.95	3.13	34.77	3.0	X
	811	34.95	3.13	34.77	3.0	
	816	35.10	3.23	34.77	3.0	X
	851	35.00	3.16	34.77	3.0	X
	861	35.00	3.16	34.77	3.0	X

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

(2) See Section 4.0

5.0 NUMBER OF TEST CHANNELS (N_C)

Table 5.0

Number of Test Channels (N_c)

Antenna P/N	Antenna Type	Frequency Range (MHz)	N_c (1)	N_c (2)
KRE1011506/2	1/4 Wave Whip	764-870	6	7

Notes

(1) In accordance with FCC KDB 447498

(2) In accordance with IEC 62209-1. Maximum number of test channels was used.

6.0 MANUFACTURER'S ACCESSORY LIST

Table 6.0

Manufacturer's Accessory List

Test Report ID Number	Manufacturer's Part Number	Description	SAR Evaluated
		Antennas	
T1	KRE 1011506/2	1/4 Wave Whip	X
		Batteries	
P1	14002-0214-01	Li-Ion	X
		Audio Accessories	
A1	MC-023933-001	Speaker-Microphone Non-Antenna Version	
A2	MC-023933-003	Speaker-Mic (SML), black, no ant.	
A3	EA-009580-001	Earphone Kit, Black	
A4	EA-009580-002	Earphone Kit, Beige	
A5	EA-009580-003	2-Wire Kit, Palm mic, Black	
A6	EA-009580-004	2-Wire Kit, Palm mic, Beige	
A7	EA-009580-005	3-Wire Kit, Mini-Lapel Mic, Black	
A8	EA-009580-006	3-Wire Kit, Mini-Lapel Mic, Beige	
A9	EA-009580-007	Explorer Headset w/ PTT	
A10	EA-009580-008	Lightweight headset single speaker w/ PTT	
A11	EA-009580-009	Breeze Headset w/ PTT	
A12	EA-009580-010	Headset, heavy duty, N/C behind the head w/ PTT	
A13	EA-009580-011	Ranger Headset w/ PTT	
A14	EA-009580-012	Skull mic w/ body PTT & earcup	
A15	EA-009580-013	Headset, heavy duty, N/C over the head w/ PTT	
A16	EA-009580-014	Throat mic w/ acoustic tube & body PTT	
A17	EA-009580-015	Throat mic w/ acoustic tube, body PTT, & ring PTT	
A18	EA-009580-016	Breeze headset w/ PTT & pigtail jack	

A19	EA-009580-017	Hurricane headset w/ PTT	
A20	EA-009580-018	Hurricane headset w/ PTT & pigtail jack	
A21	MC-009104-002	GPS Speaker-Microphone	**X**
A22	MC-023933-501	Speaker-Microphone with Noise-Canceling	
A23	MC-011617-601	Speaker-Microphone	
A24	MC-011617-701	Speaker-Microphone	
A25	MC-011617-611	Speaker-Microphone	
A26	LS103239V2	Earphone for speaker/mic	
A27	MC-011617-651	Rugged Speaker-Microphone w/ man-down	
A28	LS103239V1	Earphone for speaker/mic	
A29	EA-009580-031	Tac4 Headset	
A30	12150-4001-03	Fire Speaker MIC	
A31	12150-4001-04	Fire Speaker MIC	
A32	14002-0197-02	UDC to 6-pin Hirose adapter	
Audio Accessories - Requires UDC to 6-pin Hirose adapter 14002-0197-02			
A33	V1-10168	1 Wire Earphone Kit Black (Receive only no transmit)	
A34	V1-10167	1 Wire Earphone Kit Beige (Receive only no transmit)	
A35	V1-10166	2 Wire Palm Microphone Kit Black	
A36	V1-10165	2 Wire Palm Microphone Kit Beige	
A37	V1-10164	3 Wire Mini Lapel Microphone Kit Black	
A38	V1-10163	3 Wire Mini Lapel Microphone Kit Beige	
A39	V4-BA2MD1	Breeze, lightweight, behind-the-head, single spkr with std PTT	
A40	V4-BA2MD3B	Breeze, lightweight, behind-the-head, single spkr w/std. PTT & 2.5mm pigtail for PTT	
A41	V4-10190	Lightweight Single Spkr Padded Headband with std PTT	
A42	V4-NR2MD1	Ranger Single Speaker behind-the-head with std PTT	
A43	V4-10148	Over-the-head Dual Speaker Heavy Duty with std PTT	
A44	V4-10148-S	Over-the-head Dual Speaker Heavy Duty with std PTT-IS/ATEX	
A45	V4-10001	Behind-the-Head Dual Speaker Heavy Duty with std PTT	
A46	V4-10001-S	Behind-the-Head Dual Speaker Heavy Duty with std PTT-IS/ATEX	
A47	V1-T12MD137	Professional Throat Mic with Acoustic Tube & 80mm PTT	
A48	V4-10279	Professional Skull Mic with Earcup, Aviation Quality & 80 MM PTT	
Body-Worn Accessories			
B1	CC-23894	Metal Belt-Clip (standard)	**X**
B2	KRY 1011656/1	Nylon “T” Strap Holder	**X**
B3	14002-0217-01	Nylon Case (Olive Drab)	**X**
B4	CC-023931-003	Leather Case Kit 1: Leather Case w/o D-rings (P/N: CC-023931-001), Swivel-Mount (P/N: KRY 101 1608/2), Elastic Strap (P/N: FM-011820) and Belt Loop (P/N: KRY 101 1609/1)	
B5	CC-023931-004	Leather Case Kit 2: Leather Case w/ D-rings (P/N: CC-023931-002), Swivel-Mount (P/N: KRY 101 1608/2), Elastic Strap (P/N: FM-011820) and Belt Loop (P/N: KRY 101 1609/1)	
B6	CC-023931-002	Leather Case w/ D-rings, Elastic Strap (P/N: FM-011820), Shoulder Strap (P/N: CC103333V1)	
B7	CC-023932-001	Nylon (black) Case (w/ swivel) and Belt Loop (P/N: KRY 101 1609/1)	
B8	CC-011318	Metal Belt Clip (alternate)	
B9	CC-023932-002	Nylon Case (Orange) w/ Leather Belt Loop (P/N: KRY 101 1609/1)	
B10	CC-014534-001	Bee Nylon Case (Black) with Swivel	

B11	CC-014534-002	Bee Nylon Case (Black) with Integral Belt-Clip	
B12	CC-014528-001	Bee Leather Case with Swivel	
B13	CC-014528-002	Bee Leather Case with Swivel, D-Rings for Shoulder Strap	
B14	CC-014527	Bee Leather Belt Loop	
B15	CC-014524-001	Bee Shoulder Strap (used with Leather Cases with D-Rings)	
B16	CC-014524-002	Bee Short Leather Retaining Strap (used with Shoulder Strap)	
B17	14002-0218-01	Merzon Belt Loop	
B18	KRY 1011609/1	Leather Belt Loop and Metal Swivel Mount (P/N:KRY 1011608/2)	

7.0 SAR MEASUREMENT SUMMARY

Table 7.0

7/800 Band - FACE SAR Evaluation Results (FCC/IC)

Date	Radio Model		Plot #	Freq	Batt. Type	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift
	M/N	Type		(MHz)			Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle 100%	PTT Duty Cycle 50%	(dB)
Feb.11/15	XG-15	System	F8	768	Li-Ion	506/2	n/a	n/a	25	51	3.170	**1.585**	-0.118
Feb.11/15	XG-15	System	F9	798	Li-Ion	506/2	n/a	n/a	25	51	2.630	1.315	-0.010
Feb.11/15	XG-15	System	F10	805	Li-Ion	506/2	n/a	n/a	25	51	2.680	1.340	-0.111
Feb.11/15	XG-15	System	F11	806	Li-Ion	506/2	n/a	n/a	25	51	3.020	1.510	0.096
Feb.12/15	XG-15	System	F12	816	Li-Ion	506/2	n/a	n/a	25	51	2.960	1.480	-0.001
Feb.12/15	XG-15	System	F13	851	Li-Ion	506/2	n/a	n/a	25	51	2.720	1.360	-0.071
Feb.12/15	XG-15	System	F14	861	Li-Ion	506/2	n/a	n/a	25	51	2.790	1.395	-0.080

SAR LIMIT(S)		Head/Body	Spatial Peak	RF Exposure Category
FCC 47 CFR 2.1093	Health Canada Safety Code 6	8.0 W/kg	1g average	Occupational

Table 7.1

7/800 Band - Body SAR Evaluation Results (FCC/IC)

Date	Radio Model		Plot #	Freq	Batt. Type	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift
	M/N	Type		(MHz)			Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle 100%	PTT Duty Cycle 50%	(dB)
Feb.13/15	XG-15	System	B10	768	Li-Ion	506/2	B1	A21	14	21	3.500	1.750	0.036
Feb.13/15	XG-15	System	B11	798	Li-Ion	506/2	B1	A21	14	21	3.140	1.570	-0.057
Feb.1315	XG-15	System	B12	805	Li-Ion	506/2	B1	A21	14	21	3.000	1.500	-0.062
Feb.13/15	XG-15	System	B13	806	Li-Ion	506/2	B1	A21	14	21	3.990	1.995	-0.125
Feb.13/15	XG-15	System	B14	816	Li-Ion	506/2	B1	A21	14	21	3.300	1.650	-0.119
Feb.13/15	XG-15	System	B15	851	Li-Ion	506/2	B1	A21	14	21	4.700	2.350	-0.195
Feb.13/15	XG-15	System	B16	861	Li-Ion	506/2	B1	A21	14	21	4.750	2.375	-0.377
Feb.13/15	XG-15	System	B17	861	Li-Ion	506/2	B3	A21	21	28	4.980	2.490	-0.085
Feb.13/15	XG-15	System	B18	861	Li-Ion	506/2	B2	A21	14	21	5.950	**2.975**	-0.352

SAR LIMIT(S)		Head/Body	Spatial Peak	RF Exposure Category
FCC 47 CFR 2.1093	Health Canada Safety Code 6	8.0 W/kg	1g average	Occupational

8.0 SCALING OF MAXIMUM MEASURE SAR

Table 8.0

Scaling of Maximum Measured SAR

Plot ID	Configuration	Freq	Measured Fluid Deviation		Measured Conducted Power	Measured Drift	Measured SAR (1g)
		(MHz)	Permittivity	Conductivity	(dBm)	(dB)	(W/kg)
F8	Head	768	2.83%	-4.03%	34.70	-0.118	1.58
B18	Body	861	-0.42%	2.16%	35.00	-0.352	2.98

Step 1

Fluid Sensitivity Adjustment (1)

Plot ID	Scale Factor		Measured SAR		Adjusted SAR (1g)
	(%)	x	(W/kg)	=	(W/kg)
F8	n/a (5)	x	1.58	=	1.58
B18	n/a (5)	x	2.97	=	2.98

Step 2

Manufacturer's Tune-Up Tolerance (2)

Plot ID	Measured Conducted Power	Rated Power	Delta		Adjusted SAR		Reported SAR (1g)
	(dBm)	(dBm)	(dB)	+	(W/kg)	=	(W/kg)
F8	34.70	34.77	-0.07	+	1.58	=	1.60
B18	35.00	34.77	+0.23	+	2.97	=	2.98

Step 3 (6)

Simultaneous Transmission (3) - Bluetooth

Plot ID	Rated Output Power (Pmax)	Freq	Separation Distance	Estimated SAR		Reported SAR		Simultaneous Reported SAR
	(mW)	(GHz)	(mm)	(W/kg)	+	(W/kg)	=	(W/kg)
F8	n/a	n/a	n/a	n/a	+	1.60	=	1.60
B18	n/a	n/a	n/a	n/a	+	2.97	=	2.98

Step 4 (IC/EU/AU)

Drift Adjustment (4)

Plot ID	Measured Drift		Reported or Simultaneous Reported SAR		Scaled SAR (1g)
	(dB)	+	(W/kg)	=	(W/kg)
F8	-0.118	+	1.60	=	1.64
B18	-0.352	+	4.56	=	3.23

Notes

See Notes Below

Notes
(1) Per IEC-62209-1. Scaling required only when Measured Fluid Deviation is greater than 5% and only when the Scale Factor is (+) Positive. (2) Per KDB 447498. Scaling required only when Delta is (-) Negative. The absolute value of Delta is added to Adjusted SAR. (3) Per KDB 447498 4.3.2. (4) Per IEC 62209-1. Scaling required only when Measured Drift is (-) Negative. The absolute value of Measured Drift is added to Reported or Simultaneous Reported SAR. (5) Scaling the SAR for Fluid Sensitivity is not required as fluid deviation is less than 5%. (6) This device is not configured with BlueTooth.

9.0 SAR EXPOSURE LIMITS

Table 9.0

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 to individuals who have no knowledge or control of their potential exposure.			
Controlled environments are defined as locations where there is potential exposure to individuals who have knowledge of their potential exposure and can exercise control over their exposure.			

10.0 DETAILS OF SAR EVALUATION

EVALUATION DETAILS	
1	The test channels selected for the SAR evaluations were based test procedures FCC KDB 447498 and IEC 62209-1. The procedure yielding the highest channel count was applied.
2	The DUT was evaluated for SAR in accordance with the procedures described in FCC KDB 643646.
3	The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer, in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key continuously depressed. For a Push-To-Talk (PTT) device, the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
4	A single point SAR measurement was taken prior to the Area Scan and after the Zoom Scan and the SAR drift of the DUT was evaluated. The measured SAR drift was added to the measured SAR levels of the Maximum ***reported*** SAR (IC/EU only).
5	Each SAR evaluations were performed with a fully charged battery.
6	The fluid temperature remained within +/-2°C from the time of the fluid dielectric parameter measurement to the completion of the SAR evaluation.
7	The fluid temperature remained within +/-0.5°C throughout the test day.

SCAN PROCEDURE	
Maximum distance from the closest measurement point to phantom surface.	4 ± 1mm
Maximum probe angle normal to phantom surface.	5^o ± 1^o
Area Scan Spatial Resolution ΔX, ΔY	15mm
Zoom Scan Spatial Resolution ΔX, ΔY	7.5mm
Zoom Scan Spatial Resolution ΔZ	5mm
Zoom Scan Volume X, Y, Z	30mm x 30mm x 30mm
Phantom	Elliptical Planar (ELI)
Fluid Depth	150mm
An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima.	
A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1 gram and 10 gram peak spatial-average SAR	

11.0 MEASUREMENT UNCERTAINTIES

Table 11.0

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	6.6	Normal	1	1	1	6.60	6.60	∞
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	8.3	Rectangular	1.732050808	1	1	4.8	4.8	∞
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	1.0	Normal	1	1	1	1.0	1.0	∞
Response Time*	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time*	E.2.8	1.4	Rectangular	1.732050808	1	1	0.8	0.8	∞
RF Ambient Conditions - Noise	E.6.1	0.0	Rectangular	1.732050808	1	1	0.0	0.0	∞
RF Ambient Conditions - Reflection	E.6.1	0.0	Rectangular	1.732050808	1	1	0.0	0.0	∞
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	3.9	Rectangular	1.732050808	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	0.3	Normal	1	1	1	0.3	0.3	5
Device Holder Uncertainty*	E.4.1	3.6	Normal	1	1	1	3.6	3.6	∞
SAR Drift Measurement**	E.2.9	0.0	Rectangular	1.732050808	1	1	0.0	0.0	∞
SAR Scaling***	E.6.5	2.0	Rectangular	1.732050808	1	1	1.2	1.2	∞
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	1.2	Normal	1	1	0.84	1.2	1.0	∞
Liquid Conductivity (measurement)	E.3.3	6.8	Normal	1	0.78	0.71	5.3	4.8	10
Liquid Permittivity (measurement)	E.3.3	5.3	Normal	1	0.23	0.26	1.2	1.4	10
Liquid Conductivity (Temperature)	E.3.2	0.1	Rectangular	1.732050808	0.78	0.71	0.1	0.0	∞
Liquid Permittivity Temperature)	E.3.2	0.0	Rectangular	1.732050808	0.23	0.26	0.0	0.0	∞
Effective Degrees of Freedom(1)								**V_{eff} =**	**873.2**
Combined Standard Uncertainty			**RSS**				**12.59**	**12.40**	
Expanded Uncertainty (95% Confidence Interval)			**k=2**				**25.18**	**24.80**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003

(1) The Effective Degrees of Freedom is > 30 therefore a coverage factor of k=2 represents an approximate confidence level of 95%.

* Provided by SPEAG

Table 11.1

Calculation of the Degrees and Effective Degrees of Freedom

$v_i = n - 1$	$v_{eff} = \frac{u_c^4}{\sum_{i=1}^{m} \frac{c_i^4 u_i^4}{v_i}}$

12.0 TISSUE SIMULATING LIQUID (TSL) RECIPE

Table 12.0

Simulated Tissue Mixture	
Frequency:	**Fluid Type**
835 MHz	**HEAD**
Ingredient	**% by Weight**
Water	**40.71**
Sugar	**56.63**
Salt	**1.48**
HEC	**0.99**
Bacteriacide	**0.01**

Table 12.1

Simulated Tissue Mixture	
Frequency:	**Fluid Type**
835 MHz	**BODY**
Ingredient	**% by Weight**
Water	**53.79%**
Sugar	**45.13%**
Salt	**0.98%**
HEC	
Bacteriacide	**0.10%**

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, IEC 62209-1 and RSS 102. The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

13.0 FLUID DIELECTRIC PARAMETERS

Table 13.0

FLUID DIELECTRIC PARAMETERS

Date:	10 Feb 2015		Frequency:	835MHz	Tissue:	Head	Interpolated
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000	43.54	0.81	42.02	0.89	3.62%	-8.99%	
745.0000	43.28	0.84	41.97	0.89	3.12%	-5.62%	
755.0000	43.35	0.85	41.92	0.89	3.41%	-4.49%	
765.0000	43.04	0.86	41.86	0.89	2.82%	-3.37%	
768.0000	43.03	0.86	41.85	0.89	2.83%	-4.03%	X
775.0000	43.01	0.85	41.81	0.90	2.87%	-5.56%	
785.0000	42.88	0.88	41.76	0.90	2.68%	-2.22%	
795.0000	42.81	0.88	41.71	0.90	2.64%	-2.22%	
798.0000	42.81	0.89	41.70	0.90	2.67%	-1.56%	X
805.0000	42.80	0.90	41.66	0.90	2.74%	0.00%	X
806.0000	42.79	0.90	41.65	0.90	2.73%	0.00%	
815.0000	42.72	0.90	41.60	0.90	2.69%	0.00%	
816.0000	42.71	0.90	41.60	0.90	2.68%	0.00%	X
825.0000	42.61	0.90	41.55	0.90	2.55%	0.00%	
835.0000	42.17	0.93	41.50	0.90	1.61%	3.33%	
845.0000	42.25	0.93	41.50	0.91	1.81%	2.20%	
851.0000	41.93	0.94	41.50	0.92	1.03%	2.18%	X
855.0000	41.71	0.94	41.50	0.92	0.51%	2.17%	
861.0000	41.67	0.95	41.50	0.93	0.42%	2.16%	X
865.0000	41.65	0.95	41.50	0.93	0.36%	2.15%	
875.0000	42.07	0.97	41.50	0.94	1.37%	3.19%	
885.0000	41.54	0.97	41.50	0.95	0.10%	2.11%	
895.0000	41.81	0.98	41.50	0.96	0.75%	2.08%	
905.0000	41.70	0.99	41.50	0.97	0.48%	2.06%	
915.0000	41.66	1.01	41.50	0.98	0.39%	3.06%	
925.0000	41.51	1.01	41.48	0.98	0.07%	3.06%	
935.0000	41.36	1.01	41.46	0.99	-0.24%	2.02%	

X = Interpolated by DASY 4 System

= Test Channel Used

Table 13.1

FLUID DIELECTRIC PARAMETERS

Date:	12 Feb 2015		Frequency:	835MHz	Tissue:	Body	Interpolated
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000	55.54	0.93	55.59	0.96	-0.09%	-3.12%	
745.0000	55.07	0.93	55.55	0.96	-0.86%	-3.12%	
755.0000	55.15	0.94	55.51	0.96	-0.65%	-2.08%	
765.0000	55.14	0.95	55.47	0.96	-0.59%	-1.04%	
768.0000	55.00	0.95	55.46	0.96	-0.83%	-1.04%	X
775.0000	54.66	0.96	55.43	0.97	-1.39%	-1.03%	
785.0000	54.59	0.99	55.39	0.97	-1.44%	2.06%	
795.0000	54.94	0.98	55.36	0.97	-0.76%	1.03%	
798.0000	54.86	0.99	55.35	0.97	-0.88%	1.96%	X
805.0000	54.67	1.01	55.32	0.97	-1.17%	4.12%	X
806.0000	54.66	1.01	55.32	0.97	-1.19%	4.12%	X
815.0000	54.52	1.01	55.28	0.97	-1.37%	4.12%	
816.0000	54.53	1.01	55.28	0.97	-1.35%	4.02%	X
825.0000	54.60	1.00	55.24	0.97	-1.16%	3.09%	
835.0000	54.69	1.03	55.20	0.97	-0.92%	6.19%	
845.0000	54.59	1.05	55.17	0.98	-1.05%	7.14%	
851.0000	54.69	1.06	55.15	0.99	-0.84%	7.10%	X
855.0000	54.75	1.06	55.14	0.99	-0.71%	7.07%	
861.0000	54.62	1.07	55.12	1.00	-0.90%	6.39%	X
865.0000	54.54	1.07	55.11	1.01	-1.03%	5.94%	
875.0000	54.45	1.07	55.08	1.02	-1.14%	4.90%	
885.0000	54.97	1.08	55.05	1.03	-0.15%	4.85%	
895.0000	54.43	1.09	55.02	1.04	-1.07%	4.81%	
905.0000	54.21	1.10	55.00	1.05	-1.44%	4.76%	
915.0000	53.97	1.13	55.00	1.06	-1.87%	6.60%	
925.0000	54.17	1.12	54.98	1.06	-1.47%	5.66%	
935.0000	54.14	1.16	54.96	1.07	-1.49%	8.41%	

X = Interpolated by DASY 4 System

= Test Channel Used

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Tue 10/Feb/2015 10:50:55
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
0.7350	42.02	0.89	43.54	0.81
0.7450	41.97	0.89	43.28	0.84
0.7550	41.92	0.89	43.35	0.85
0.7650	41.86	0.89	43.04	0.86
0.7750	41.81	0.90	43.01	0.85
0.7850	41.76	0.90	42.88	0.88
0.7950	41.71	0.90	42.81	0.88
0.8050	41.66	0.90	42.80	0.90
0.8150	41.60	0.90	42.72	0.90
0.8250	41.55	0.90	42.61	0.90
0.8350	41.50	0.90	42.17	0.93
0.8450	41.50	0.91	42.25	0.93
0.8550	41.50	0.92	41.71	0.94
0.8650	41.50	0.93	41.65	0.95
0.8750	41.50	0.94	42.07	0.97
0.8850	41.50	0.95	41.54	0.97
0.8950	41.50	0.96	41.81	0.98
0.9050	41.50	0.97	41.70	0.99
0.9150	41.50	0.98	41.66	1.01
0.9250	41.48	0.98	41.51	1.01
0.9350	41.46	0.99	41.36	1.01

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Thu 12/Feb/2015 15:32:24
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
0.7350	55.59	0.96	55.54	0.93
0.7450	55.55	0.96	55.07	0.93
0.7550	55.51	0.96	55.15	0.94
0.7650	55.47	0.96	55.14	0.95
0.7750	55.43	0.97	54.66	0.96
0.7850	55.39	0.97	54.59	0.99
0.7950	55.36	0.97	54.94	0.98
0.8050	55.32	0.97	54.67	1.01
0.8150	55.28	0.97	54.52	1.01
0.8250	55.24	0.97	54.60	1.00
0.8350	55.20	0.97	54.69	1.03
0.8450	55.17	0.98	54.59	1.05
0.8550	55.14	0.99	54.75	1.06
0.8650	55.11	1.01	54.54	1.07
0.8750	55.08	1.02	54.45	1.07
0.8850	55.05	1.03	54.97	1.08
0.8950	55.02	1.04	54.43	1.09
0.9050	55.00	1.05	54.21	1.10
0.9150	55.00	1.06	53.97	1.13
0.9250	54.98	1.06	54.17	1.12
0.9350	54.96	1.07	54.14	1.16

14.0 SYSTEM VERIFICATION TEST RESULTS

Table 14.0

System Verification Test Results

Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source P/N	Validation Source S/N
10 Feb 2015	835	Head	24.3	25	20%	250	15	D835V2	4d075

SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.28	2.36	-3.39%	1.47	1.55	-5.16%	42.17	41.50	1.61%	0.93	0.90	3.33%

Table 14.1

System Verification Test Results

Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source P/N	Validation Source S/N
12 Feb 2015	835	Body	25.5	27	20%	250	15	D835V2	4d075

SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.64	2.47	6.88%	1.69	1.62	4.32%	54.69	55.20	-0.92%	1.03	0.97	6.19%

15.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 15.0

Measurement System Specification	
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	±)ζΗΓ 3 οτ ζΗΜ 03(Βδ 2.0
Phantom	
Type	ELI Elliptical Planar Phantom
Shell Material	Fiberglass
Thickness	2mm +/- .2mm
Volume	> 30 Liter

Table 15.1

Measurement System Specification (Continued)

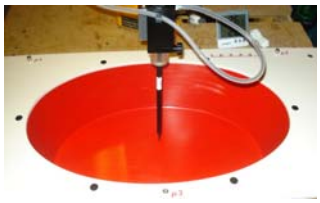
Probe Specification

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

EX3DV4 E-Field Probe

Phantom Specification

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 Elliptical Planar Phantom

Device Positioner Specification

The DASY4 device positioner 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^{O}. 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 Positioner

16.0 TEST EQUIPMENT LIST

Table 16.0

Test Equipment List

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
Schmid & Partner DASY4 System	-	-	-	-
-DASY4 Measurement Server	00158	1078	CNR	CNR
-Robot	00046	599396-01	CNR	CNR
-DAE4	00019	353	9 April 2014	Biennial
-EX3DV6 E-Field Probe	00017	3600	15 April 2014	Annual
-D450V3 Validation Dipole	00221	1068	27 April 2014	Triennial
ELI Elliptical Planar Phantom	00247	-	CNR	CNR
HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
Gigatronics 8652A Power Meter	00110	1835801	17 March 2014	Biennial
Gigatronics 80701A Power Sensor	00249	1834473	17 March 2014	Biennial
Gigatronics 80701A Power Sensor	00248	1833687	17 March 2014	Biennial
HP 8753ET Network Analyzer	00134	US39170292	22 Oct 2014	Biennial
Rohde & Schwarz SMR20 Signal Generator	00006	100104	8 May 2014	Biennial
Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR

CNR = Calibration Not Required

APPENDIX A - SAR MEASUREMENT PLOTS

Plot F8

Date/Time: 11/02/2015 3:59:02 PM

835 Head (506-2) 11 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 11 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 768 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 768 MHz; σ = 0.857 mho/m; ε_r = 43; ρ = 1000 kg/m^3

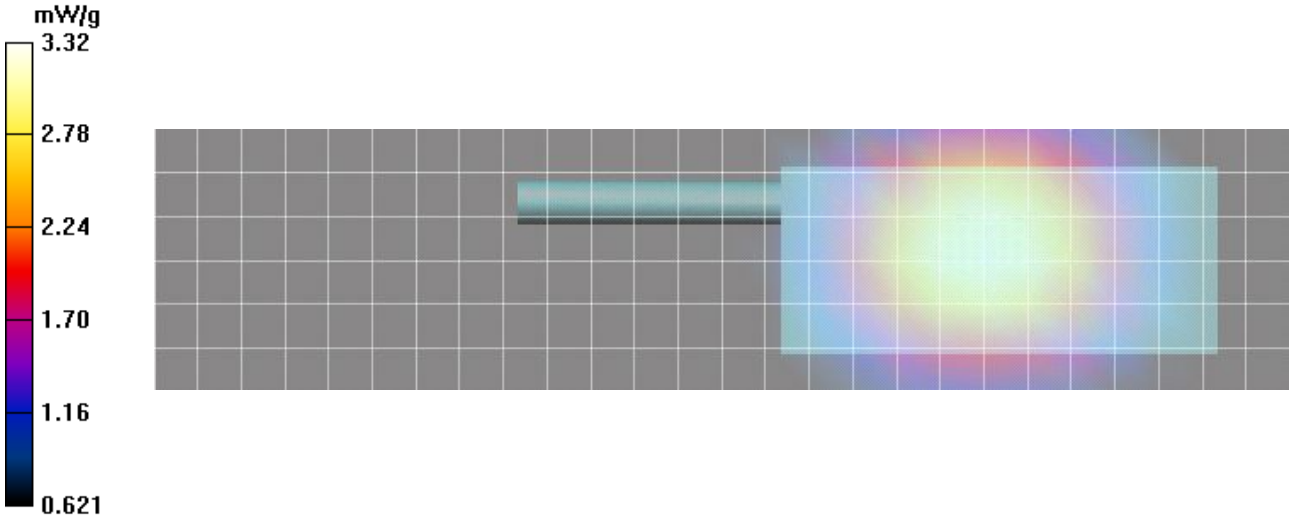
- Probe: EX3DV4 - SN3600; ConvF(8.55, 8.55, 8.55); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

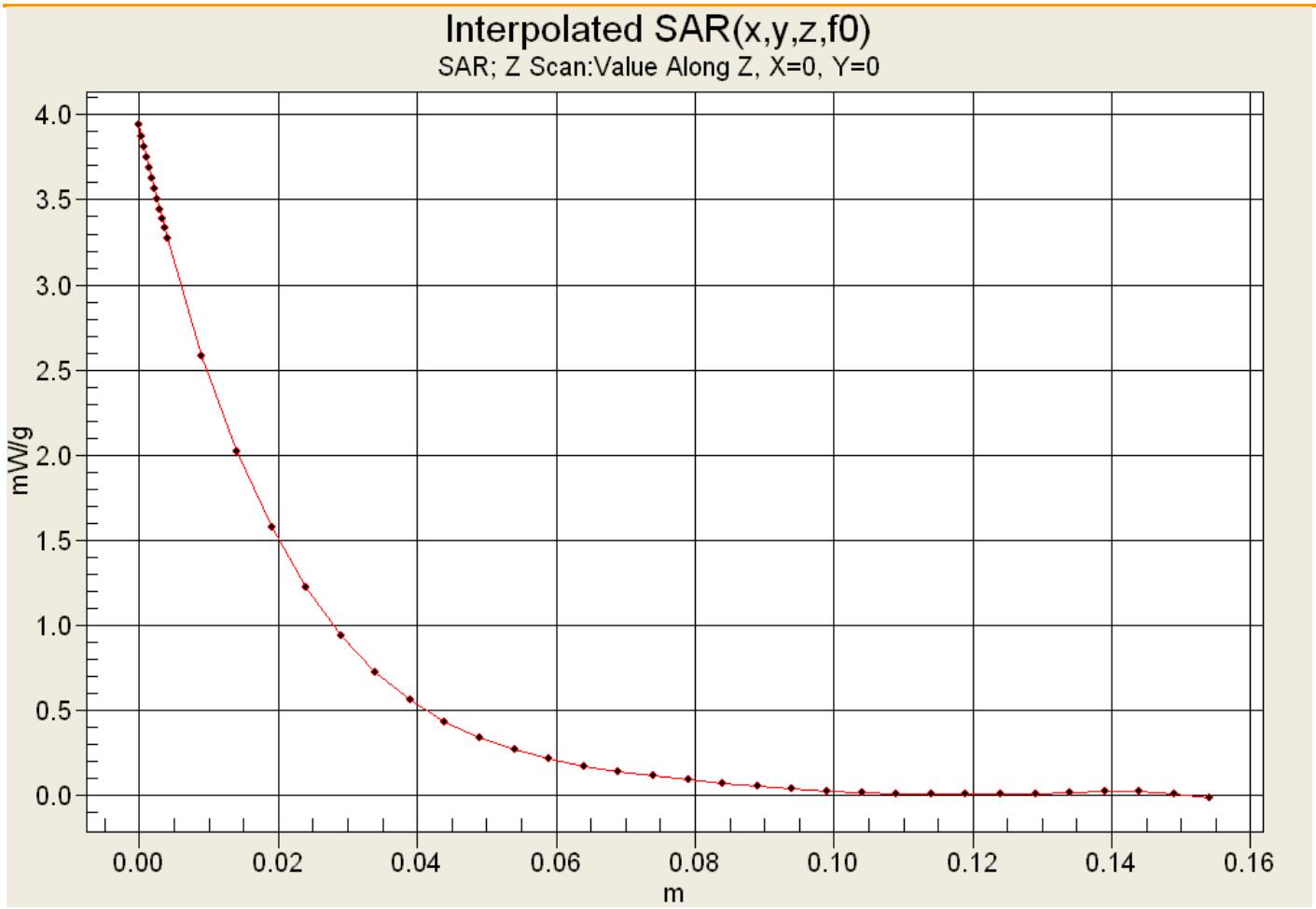
F8 Face XG-15, 768MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.27 mW/g

F8 Face XG-15, 768MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 31.2 V/m; Power Drift = -0.118 dB
Peak SAR (extrapolated) = 4.00 W/kg
SAR(1 g) = 3.17 mW/g; SAR(10 g) = 2.41 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.32 mW/g




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

Plot F9

Date/Time: 11/02/2015 4:18:36 PM

835 Head (506-2) 11 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 11 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 798 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 798 MHz; σ = 0.886 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

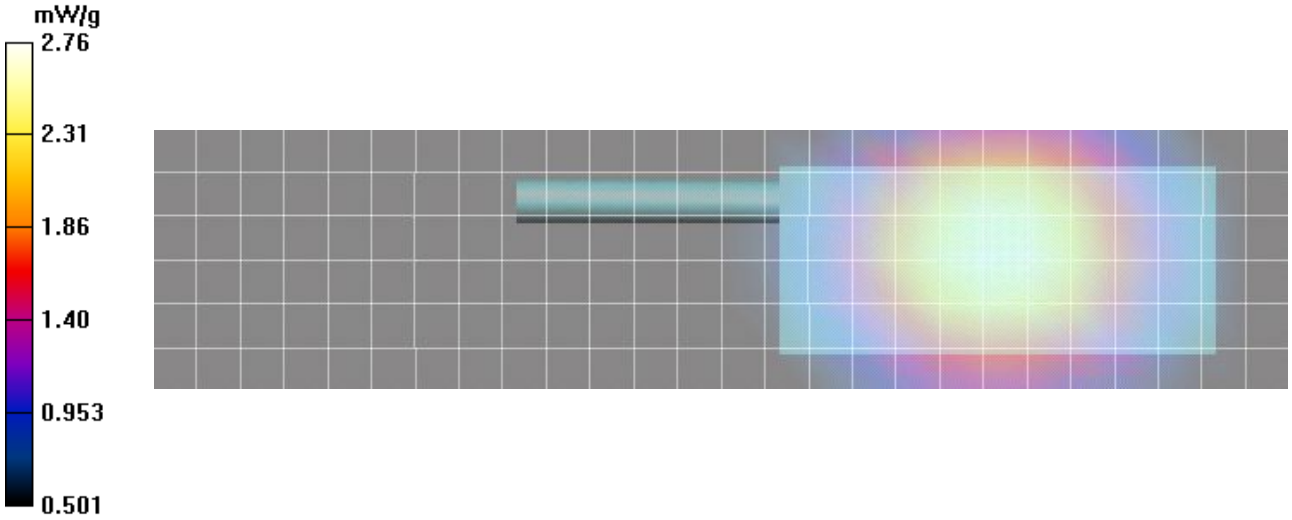
- Probe: EX3DV4 - SN3600; ConvF(8.55, 8.55, 8.55); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F9 Face XG-15, 798MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.72 mW/g

F9 Face XG-15, 798MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 28.4 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 3.38 W/kg
SAR(1 g) = 2.63 mW/g; SAR(10 g) = 1.98 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.76 mW/g



Plot F10

Date/Time: 11/02/2015 4:38:59 PM

835 Head (506-2) 11 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 11 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.6C; Humidity: 20%

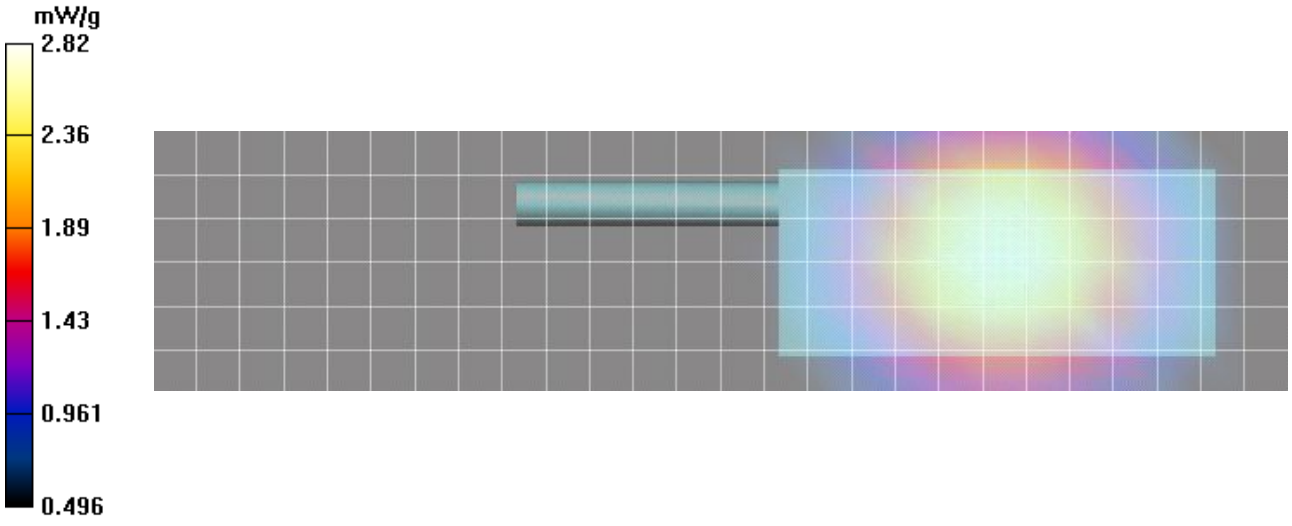
Procedure Notes:

Communication System: CW
Frequency: 805 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used: f = 805 MHz; σ = 0.9 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(8.55, 8.55, 8.55); 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

F10 Face XG-15, 805MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.78 mW/g

F10 Face XG-15, 805MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 26.2 V/m; Power Drift = -0.111 dB
Peak SAR (extrapolated) = 3.41 W/kg
SAR(1 g) = 2.68 mW/g; SAR(10 g) = 2.02 mW/g
Maximum value of SAR (measured) = 2.82 mW/g



Plot F11

Date/Time: 11/02/2015 4:58:51 PM

835 Head (506-2) 11 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 11 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 806 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 806 MHz; σ = 0.9 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

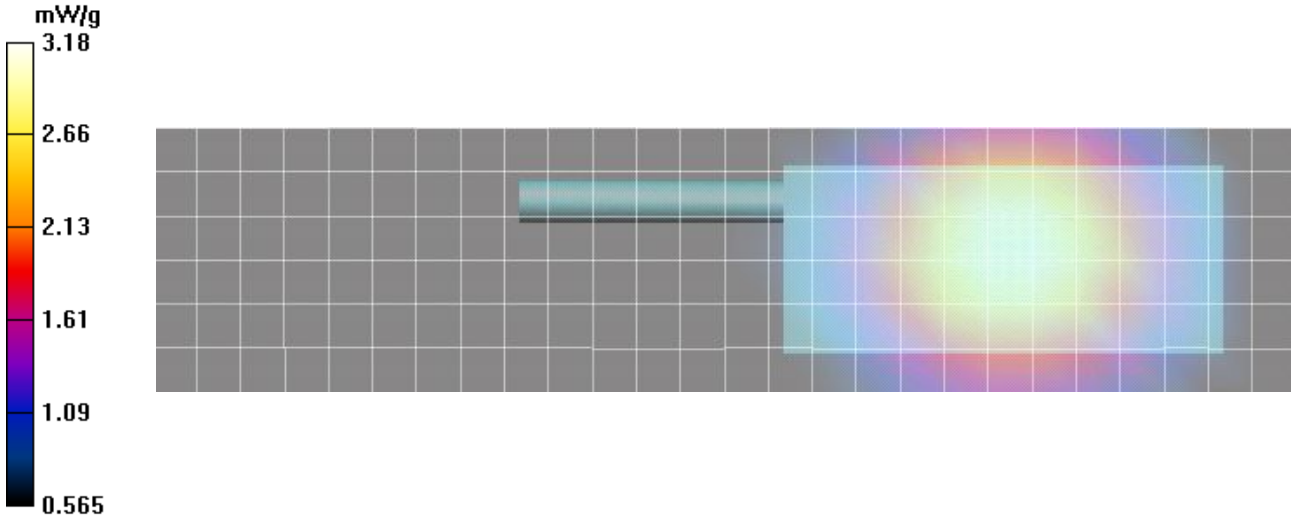
- Probe: EX3DV4 - SN3600; ConvF(8.55, 8.55, 8.55); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F11 Face XG-15, 806MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.10 mW/g

F11 Face XG-15, 806MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 28.5 V/m; Power Drift = 0.096 dB
Peak SAR (extrapolated) = 3.87 W/kg
SAR(1 g) = 3.02 mW/g; SAR(10 g) = 2.28 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.18 mW/g



Plot F12

Date/Time: 12/02/2015 10:17:45 AM

835 Head (506-2) 12 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 12 Feb 2015 Ambient Temp: 25C; Fluid Temp: 23.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 816 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 816 MHz; σ = 0.9 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

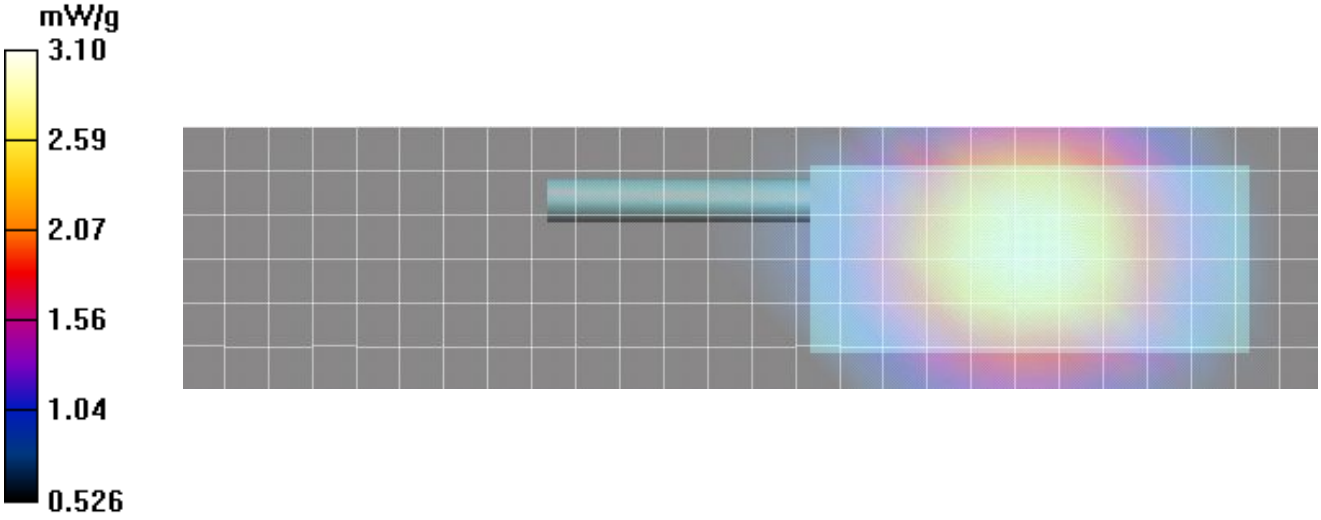
- Probe: EX3DV4 - SN3600; ConvF(8.23, 8.23, 8.23); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

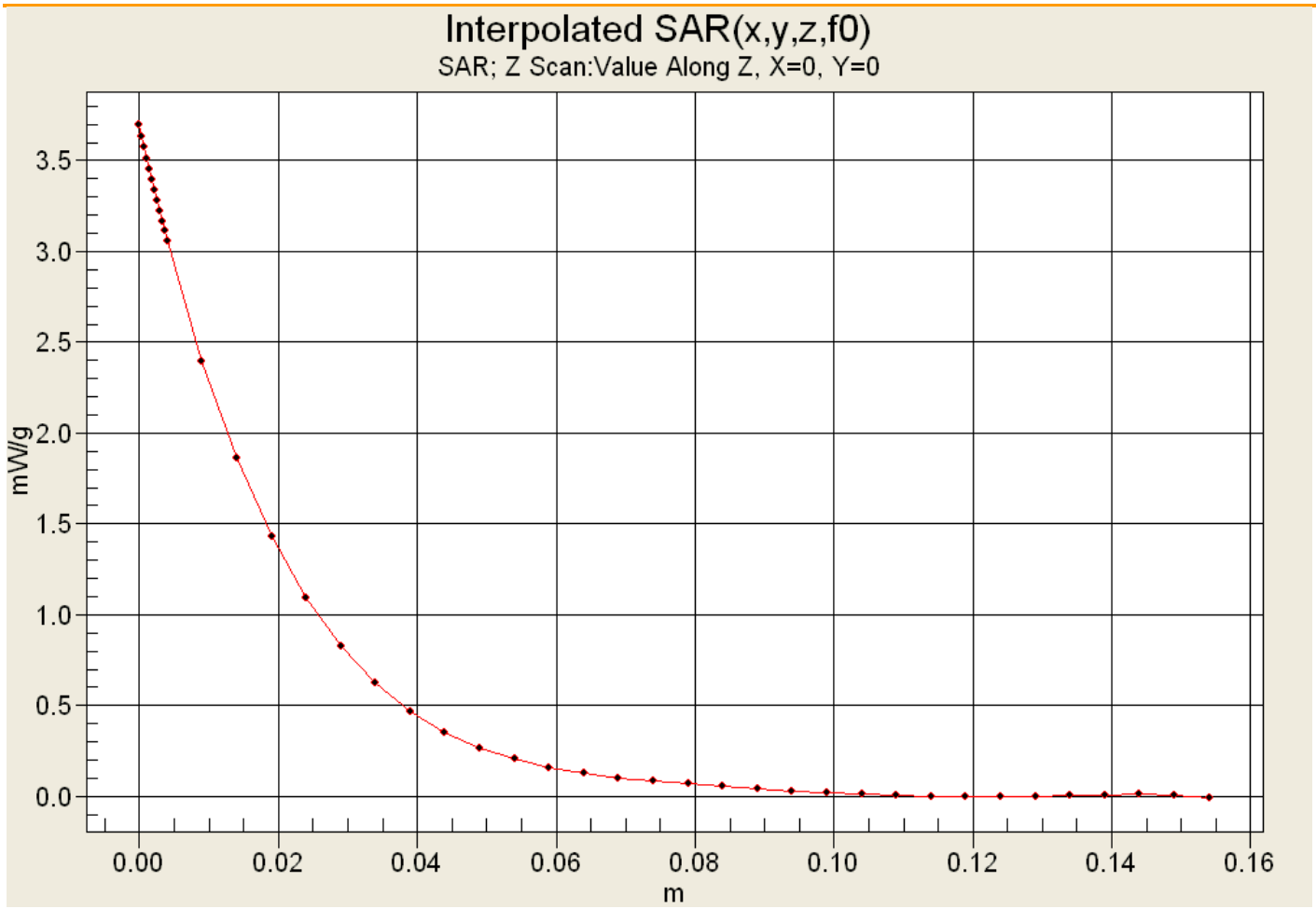
F12 Face XG-15, 816MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.03 mW/g

F12 Face XG-15, 816MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 31.2 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 2.96 mW/g; SAR(10 g) = 2.23 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.10 mW/g




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

Plot F13

Date/Time: 12/02/2015 10:38:24 AM

835 Head (506-2) 12 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 12 Feb 2015 Ambient Temp: 25C; Fluid Temp: 23.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 851 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 851 MHz; σ = 0.936 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

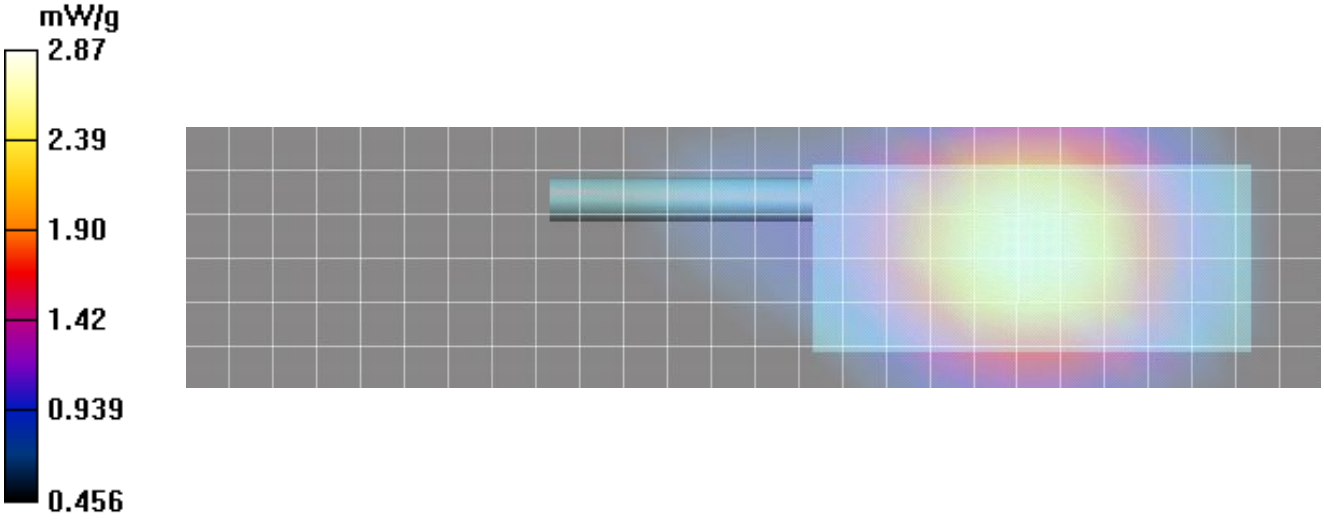
- Probe: EX3DV4 - SN3600; ConvF(8.23, 8.23, 8.23); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F13 Face XG-15, 851MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.80 mW/g

F13 Face XG-15, 851MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 31.8 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 3.50 W/kg
SAR(1 g) = 2.72 mW/g; SAR(10 g) = 2.02 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.87 mW/g



Plot F14

Date/Time: 12/02/2015 10:58:12 AM

835 Head (506-2) 12 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 12 Feb 2015 Ambient Temp: 25C; Fluid Temp: 23.6C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 861 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used (interpolated): f = 861 MHz; σ = 0.946 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3

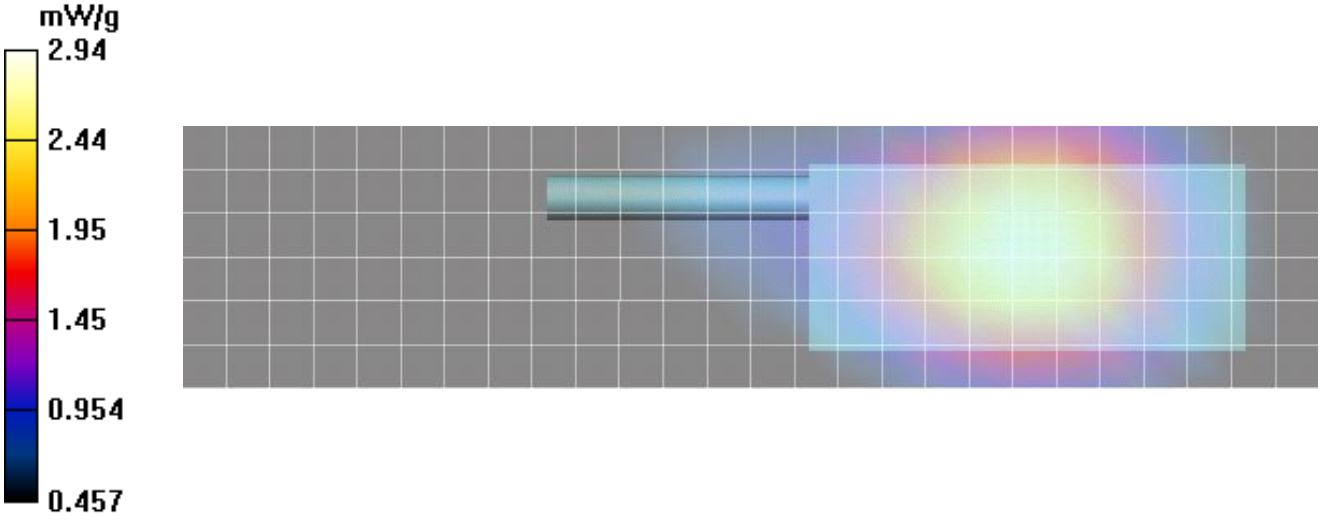
- Probe: EX3DV4 - SN3600; ConvF(8.09, 8.09, 8.09); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

F14 Face XG-15, 861MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.88 mW/g

F14 Face XG-15, 861MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 3.65 W/kg
SAR(1 g) = 2.79 mW/g; SAR(10 g) = 2.06 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.94 mW/g



Plot B10

Date/Time: 13/02/2015 2:53:18 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 768 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 768 MHz; σ = 0.953 mho/m; ε_r = 55; ρ = 1000 kg/m^3

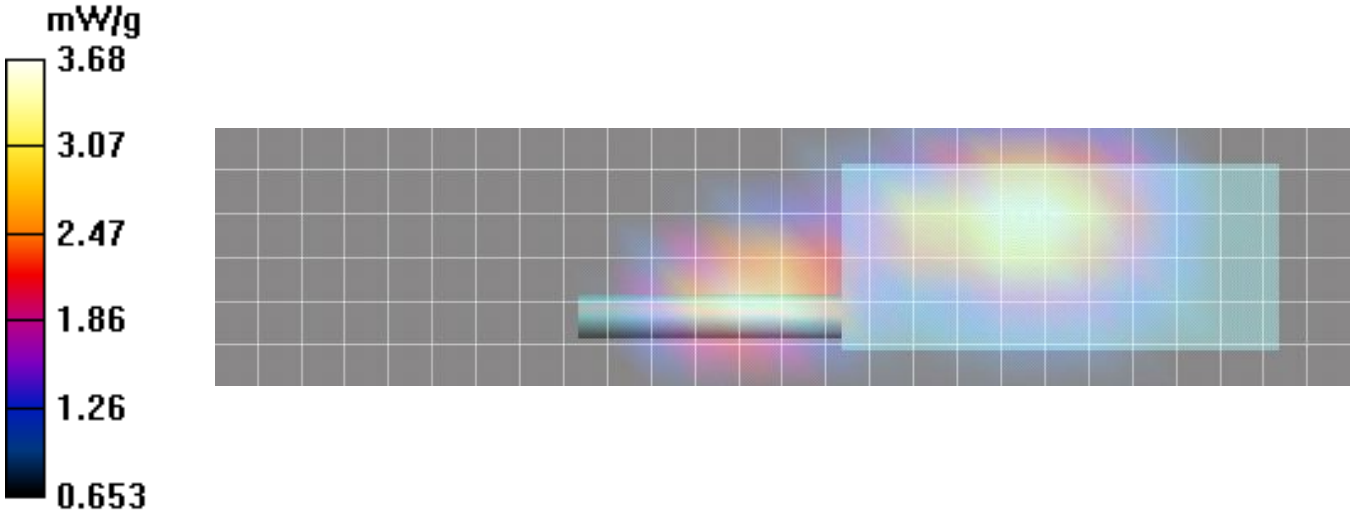
- Probe: EX3DV4 - SN3600; ConvF(8.14, 8.14, 8.14); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B10 Body XG-15, 768MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.55 mW/g

B10 Body XG-15, 768MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 45.8 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 4.40 W/kg
SAR(1 g) = 3.5 mW/g; SAR(10 g) = 2.65 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.68 mW/g



Plot B11

Date/Time: 13/02/2015 3:24:50 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 798 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 798 MHz; σ = 0.989 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3

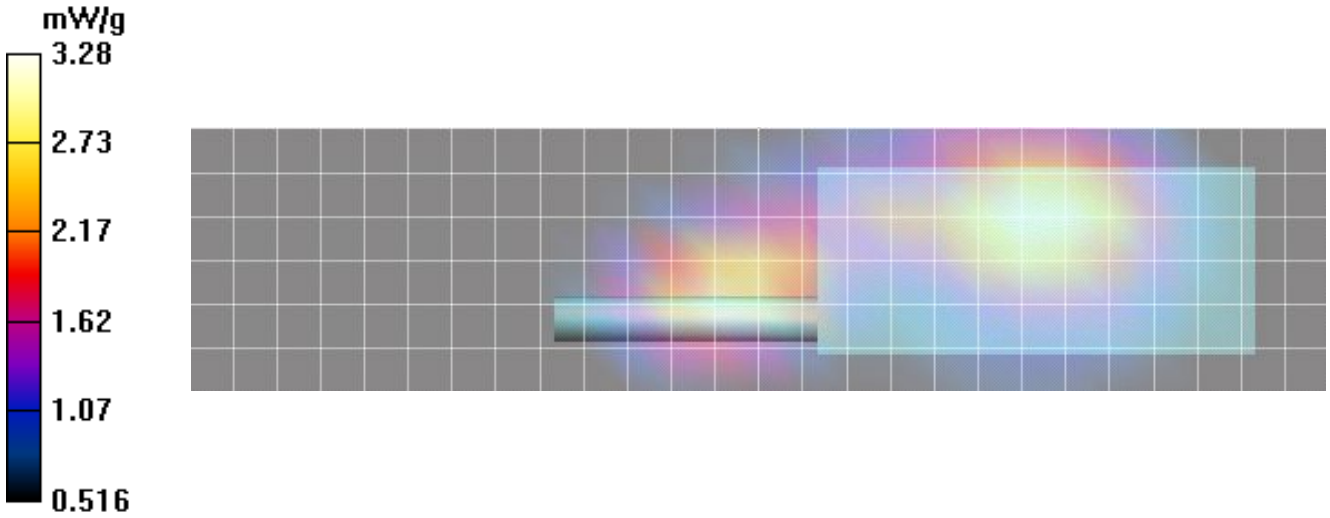
- Probe: EX3DV4 - SN3600; ConvF(8.14, 8.14, 8.14); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B11 Body XG-15, 798MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.25 mW/g

B11 Body XG-15, 798MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 45.3 V/m; Power Drift = -0.057 dB
Peak SAR (extrapolated) = 3.91 W/kg
SAR(1 g) = 3.14 mW/g; SAR(10 g) = 2.39 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.28 mW/g



Plot B12

Date/Time: 13/02/2015 3:55:19 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

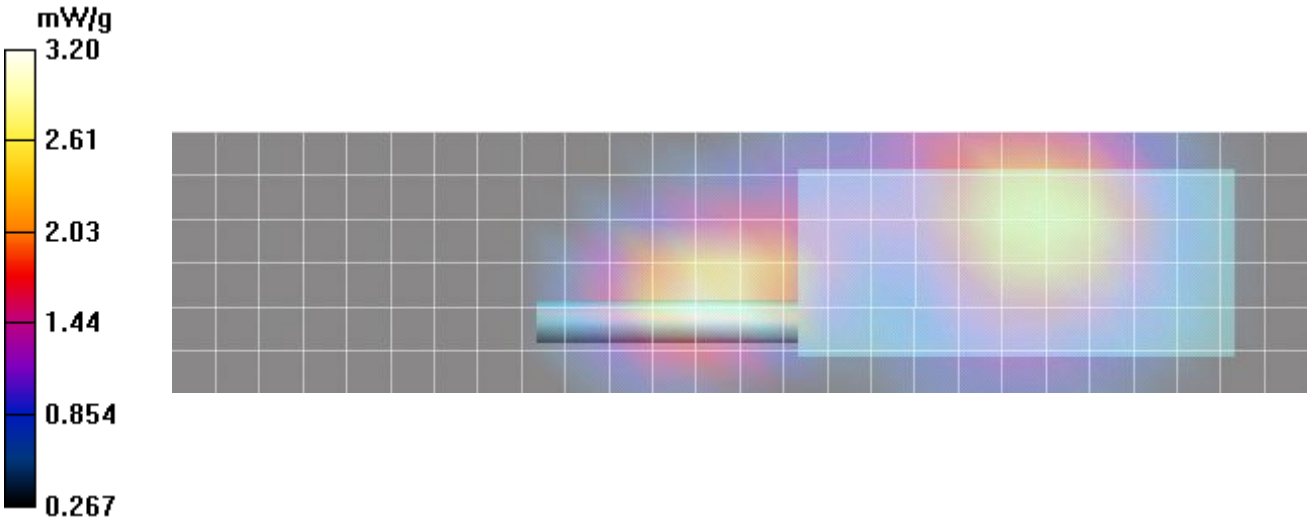
Procedure Notes:

Communication System: CW
Frequency: 805 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used: f = 805 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(8.14, 8.14, 8.14); 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

B12 Body XG-15, 805MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.02 mW/g

B12 Body XG-15, 805MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 44.1 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 4.20 W/kg
SAR(1 g) = 3 mW/g; SAR(10 g) = 2.06 mW/g
Maximum value of SAR (measured) = 3.20 mW/g



Plot B13

Date/Time: 13/02/2015 4:17:05 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 806 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 806 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

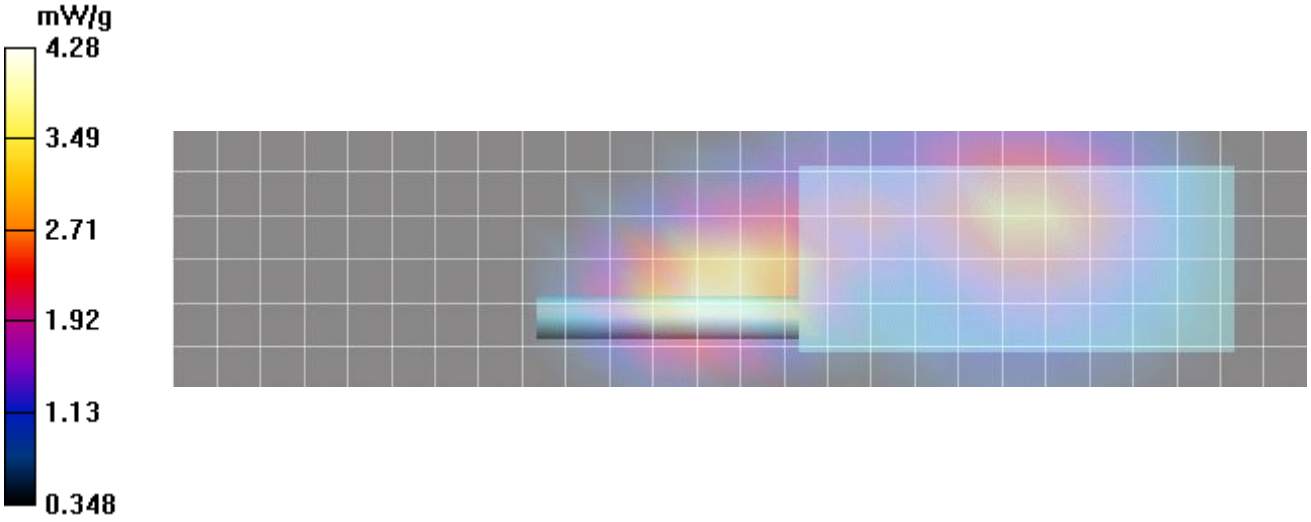
- Probe: EX3DV4 - SN3600; ConvF(8.14, 8.14, 8.14); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B13 Body XG-15, 806MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 4.05 mW/g

B13 Body XG-15, 806MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 53.1 V/m; Power Drift = -0.125 dB
Peak SAR (extrapolated) = 5.56 W/kg
SAR(1 g) = 3.99 mW/g; SAR(10 g) = 2.73 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 4.28 mW/g



Plot B14

Date/Time: 13/02/2015 4:37:38 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 816 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 816 MHz; σ = 1.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3

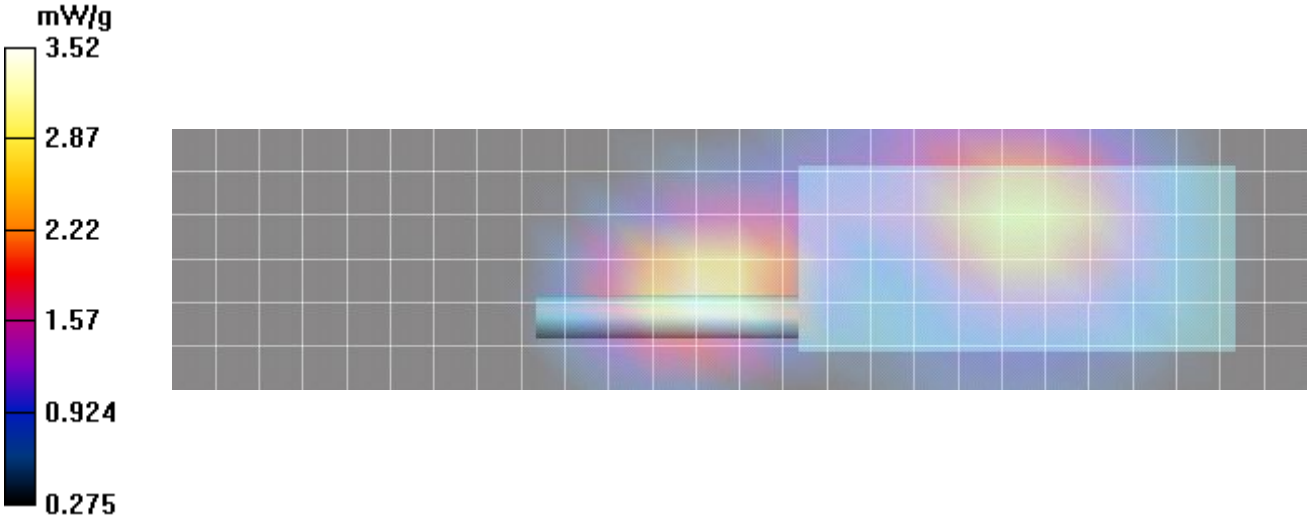
- Probe: EX3DV4 - SN3600; ConvF(8.11, 8.11, 8.11); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B14 Body XG-15, 816MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.37 mW/g

B14 Body XG-15, 816MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 43.7 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 4.64 W/kg
SAR(1 g) = 3.3 mW/g; SAR(10 g) = 2.25 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.52 mW/g



Plot B15

Date/Time: 13/02/2015 4:59:17 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 851 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 851 MHz; σ = 1.06 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

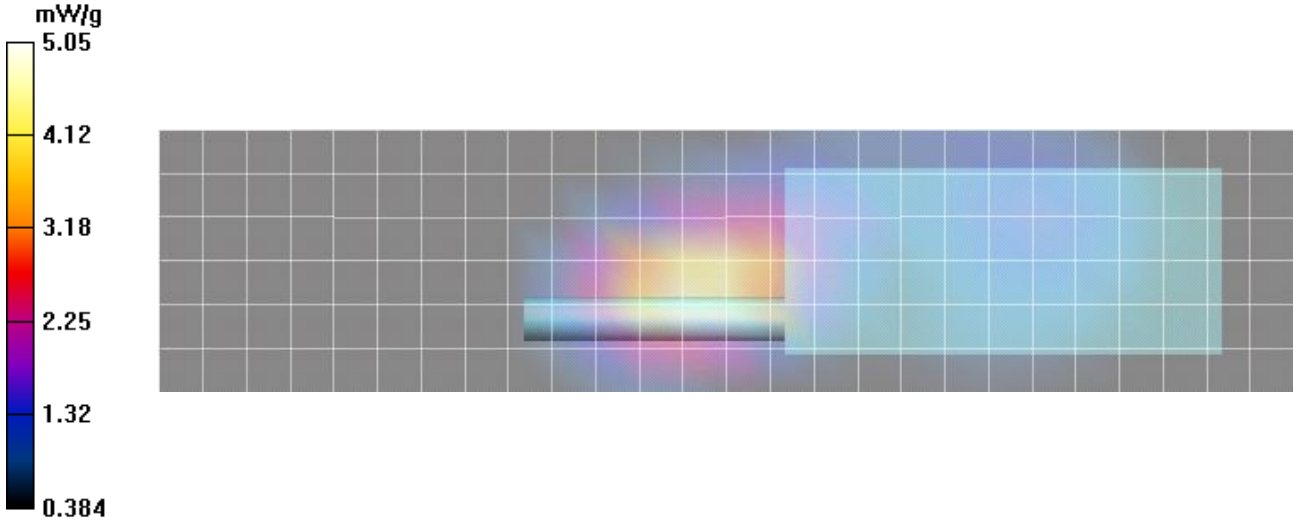
- Probe: EX3DV4 - SN3600; ConvF(8.11, 8.11, 8.11); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B15 Body XG-15, 851MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 4.77 mW/g

B15 Body XG-15, 851MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 54.0 V/m; Power Drift = -0.195 dB
Peak SAR (extrapolated) = 6.65 W/kg
SAR(1 g) = 4.7 mW/g; SAR(10 g) = 3.18 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.05 mW/g



Plot B16

Date/Time: 13/02/2015 5:24:50 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 861 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 861 MHz; σ = 1.07 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3

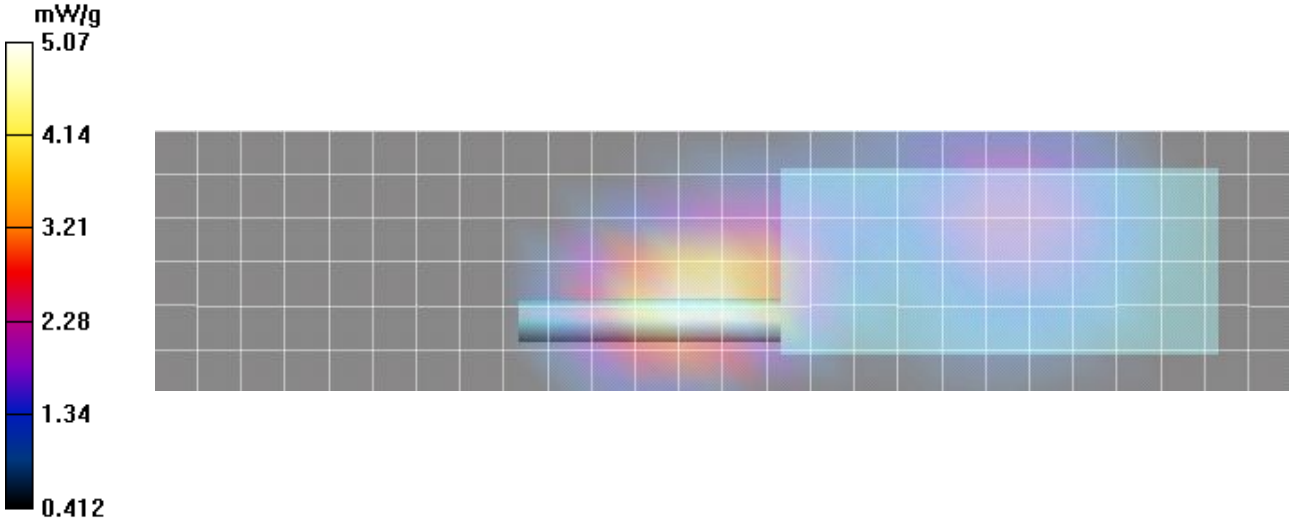
- Probe: EX3DV4 - SN3600; ConvF(7.92, 7.92, 7.92); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

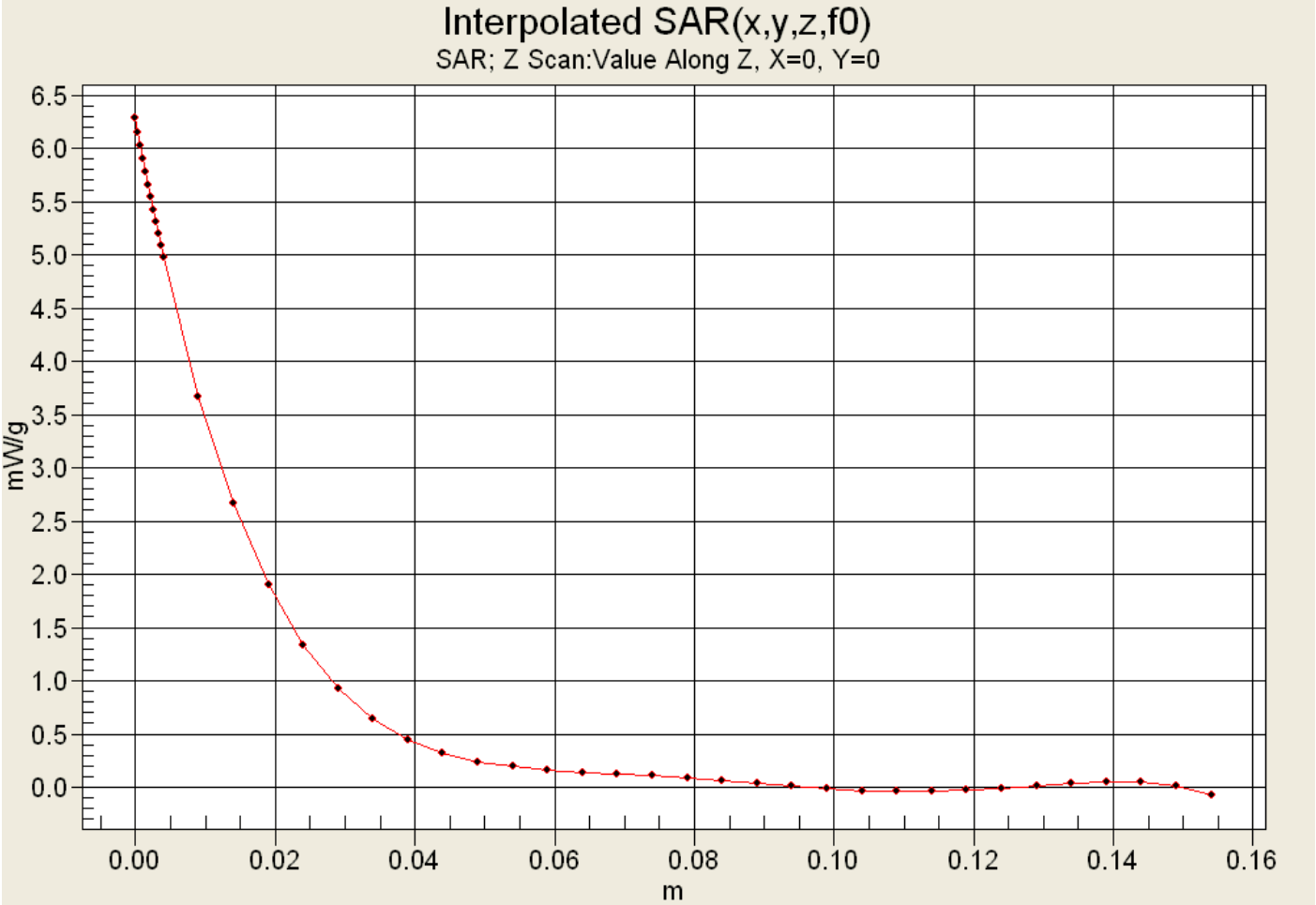
B16 Body XG-15, 861MHz 506-2 SYS/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.06 mW/g

B16 Body XG-15, 861MHz 506-2 SYS/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 54.0 V/m; Power Drift = -0.377 dB
Peak SAR (extrapolated) = 6.65 W/kg
SAR(1 g) = 4.75 mW/g; SAR(10 g) = 3.24 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.07 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
6.5
6.0
5.5
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

Plot B17

Date/Time: 13/02/2015 5:46:02 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 861 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 861 MHz; σ = 1.07 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3

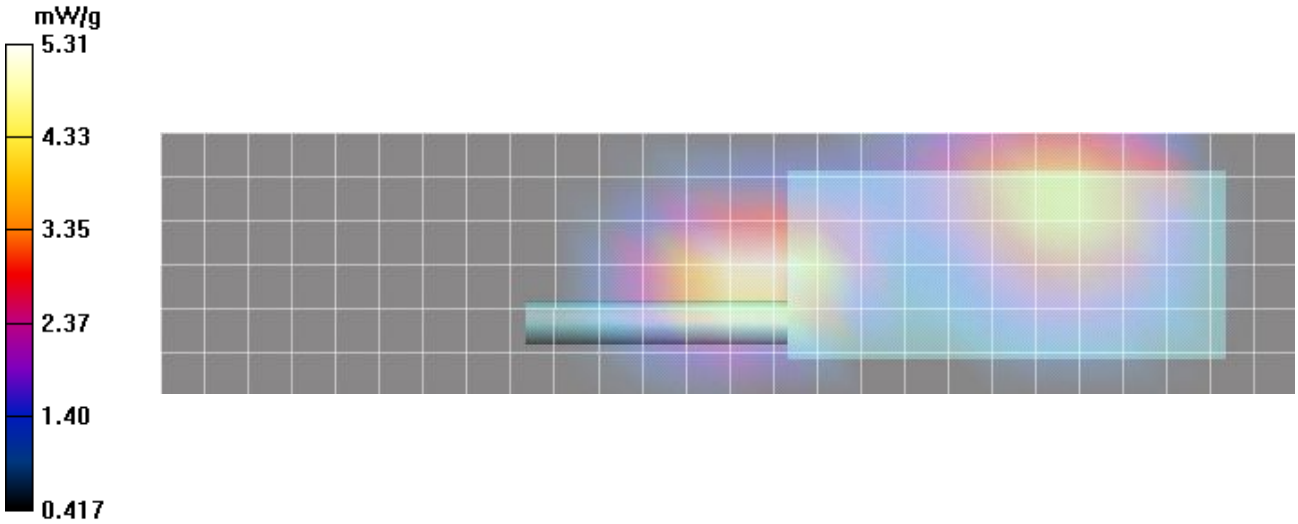
- Probe: EX3DV4 - SN3600; ConvF(7.92, 7.92, 7.92); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B17 Body XG-15, 861MHz 506-2 SYS OD/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.15 mW/g

B17 Body XG-15, 861MHz 506-2 SYS OD/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 68.2 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 6.97 W/kg
SAR(1 g) = 4.98 mW/g; SAR(10 g) = 3.4 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.31 mW/g



Plot B18

Date/Time: 13/02/2015 6:11:23 PM

835 Body (506-2) 13 Feb 2015

DUT: Harris XG-15; Type: PTT Radio Transceiver; Serial: Not Specified

Program Notes: 13 Feb 2015 Ambient Temp: 26C; Fluid Temp: 24.1C; Humidity: 20%

Procedure Notes:

Communication System: CW
Frequency: 861 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used (interpolated): f = 861 MHz; σ = 1.07 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3

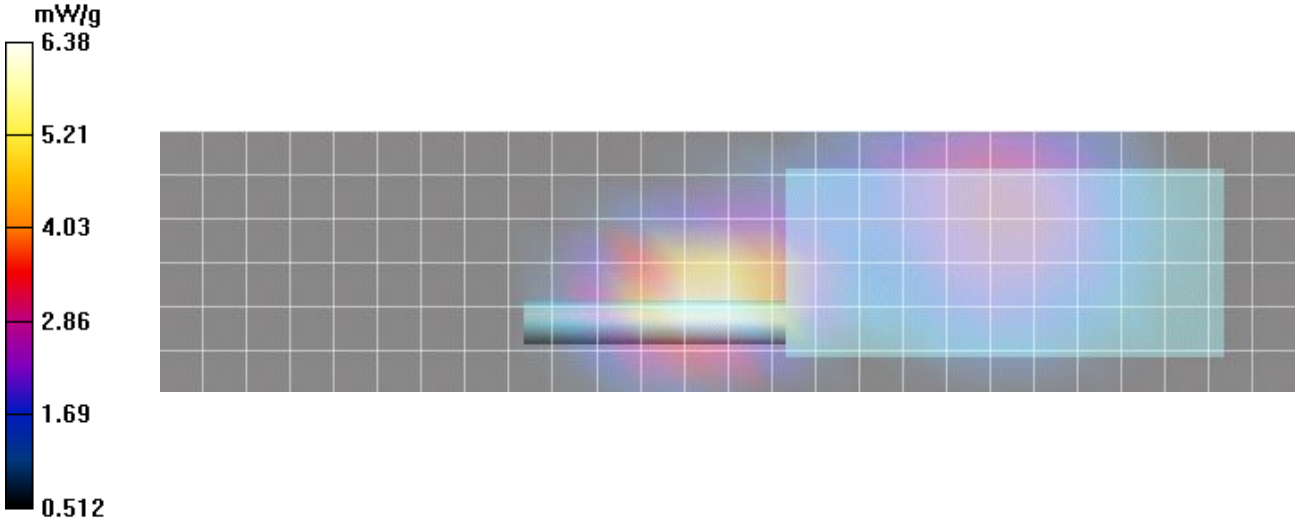
- Probe: EX3DV4 - SN3600; ConvF(7.92, 7.92, 7.92); Calibrated: 15/04/2014
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 09/04/2014
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

B18 Body XG-15, 861MHz 506-2 SYS T-strap/Area Scan (7x27x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 6.23 mW/g

B18 Body XG-15, 861MHz 506-2 SYS T-strap/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 58.6 V/m; Power Drift = -0.352 dB
Peak SAR (extrapolated) = 8.44 W/kg
SAR(1 g) = 5.95 mW/g; SAR(10 g) = 4.01 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 6.38 mW/g



APPENDIX B - SYSTEM VERIFICATION MEASUREMENT PLOTS

Date/Time: 10/02/2015 11:21:00 AM

SPC 835 Head - 10 Feb 2015

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d075; Calibrated: 04/20/2012

Program Notes: 10 Feb 2015 Ambient Temp: 25C; Fluid Temp: 24.3C; Humidity: 20%

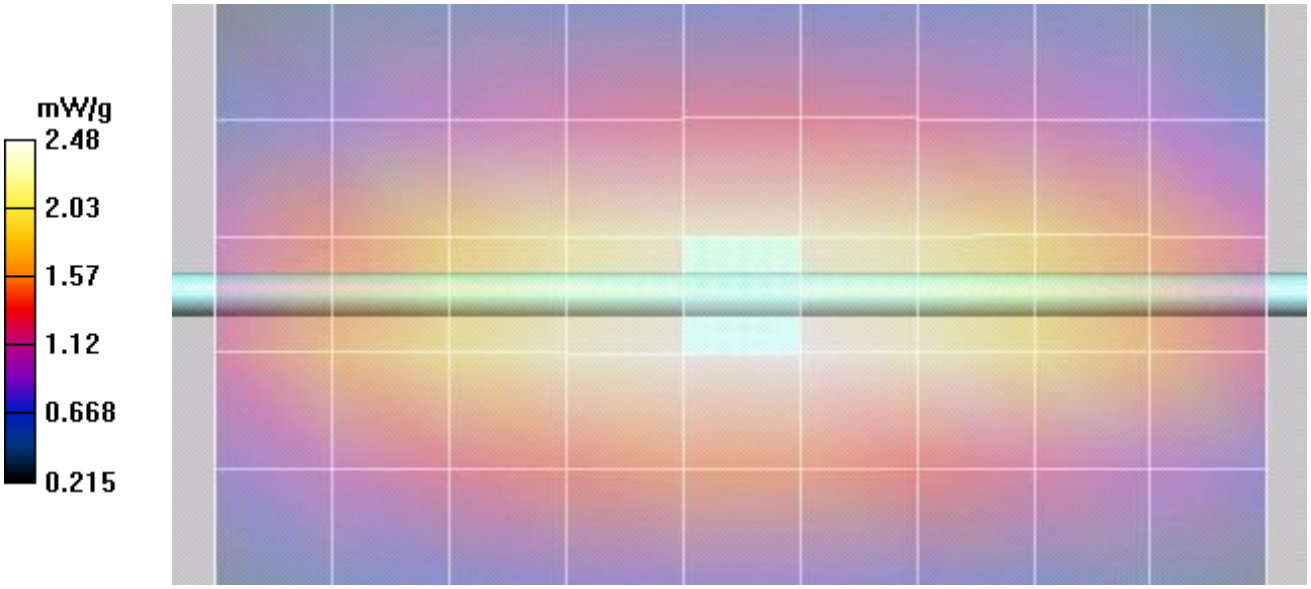
Procedure Notes:

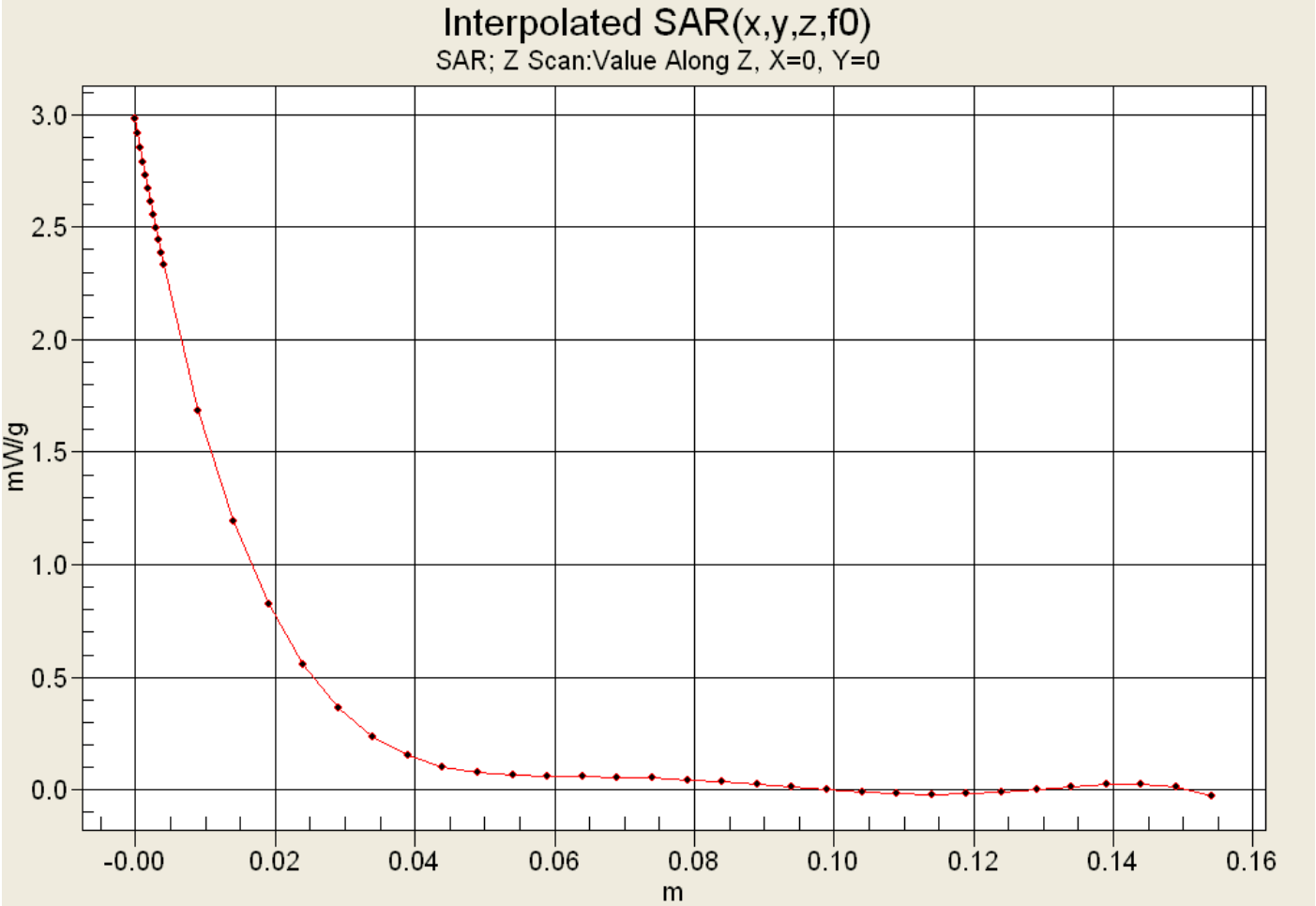
Communication System: CW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: TSL_835H Medium parameters used: f = 835 MHz; σ = 0.93 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(8.23, 8.23, 8.23); 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=250mW. TS=2.124/2.36/2.596 W/kg/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.48 mW/g

Head d=15mm Pin=250mW. TS=2.124/2.36/2.596 W/kg/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.1 V/m; Power Drift = -0.275 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.28 mW/g; SAR(10 g) = 1.47 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
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: 12/02/2015 4:15:30 PM

SPC - 835 Body - 12 Feb 2015

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d075; Calibrated: 04/20/2012

Program Notes: 12 Feb 2015 Ambient Temp: 27C; Fluid Temp: 25.5C; Humidity:20%

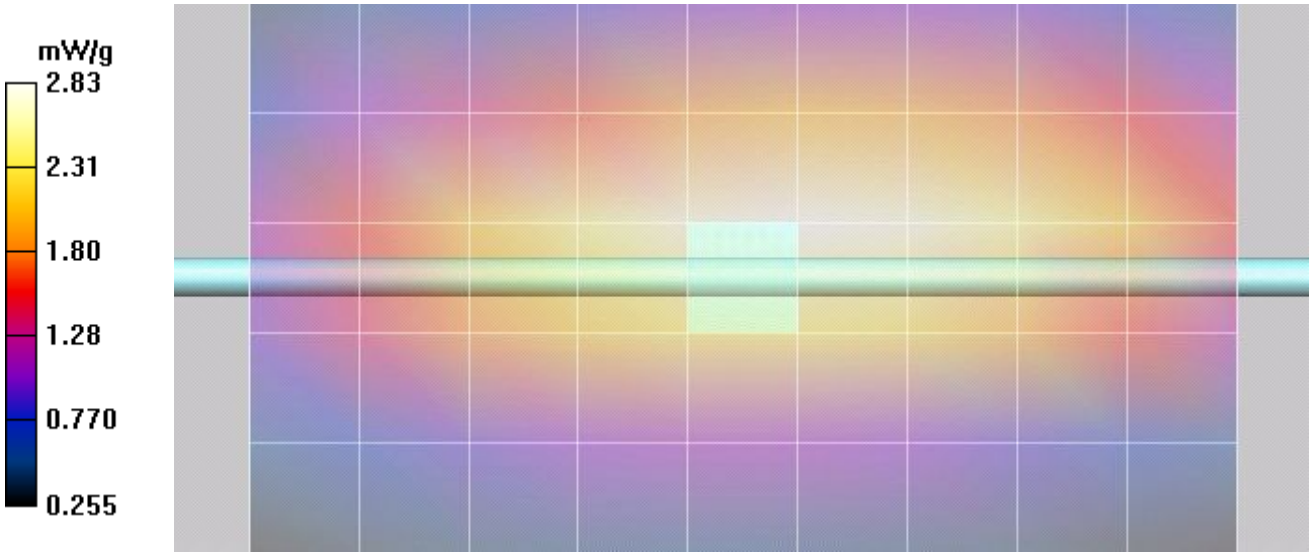
Procedure Notes:

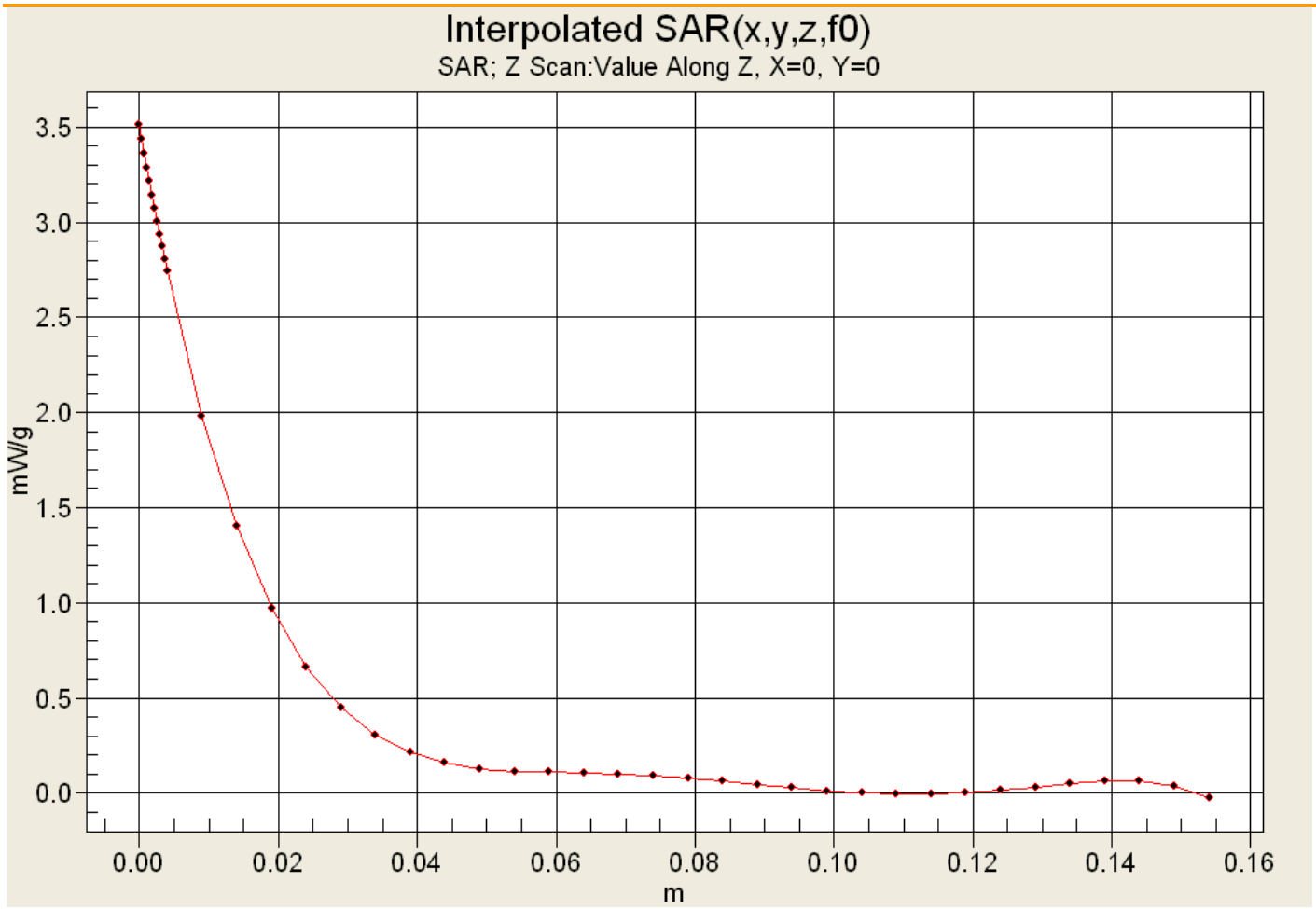
Communication System: CW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: TSL_835B Medium parameters used: f = 835 MHz; σ = 1.03 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

- Probe: EX3DV4 - SN3600; ConvF(8.11, 8.11, 8.11); 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=250mW. TS=2.47W/kg/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.83 mW/g

Body d=15mm Pin=250mW. TS=2.47W/kg/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 50.9 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 4.01 W/kg
SAR(1 g) = 2.64 mW/g; SAR(10 g) = 1.69 mW/g




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

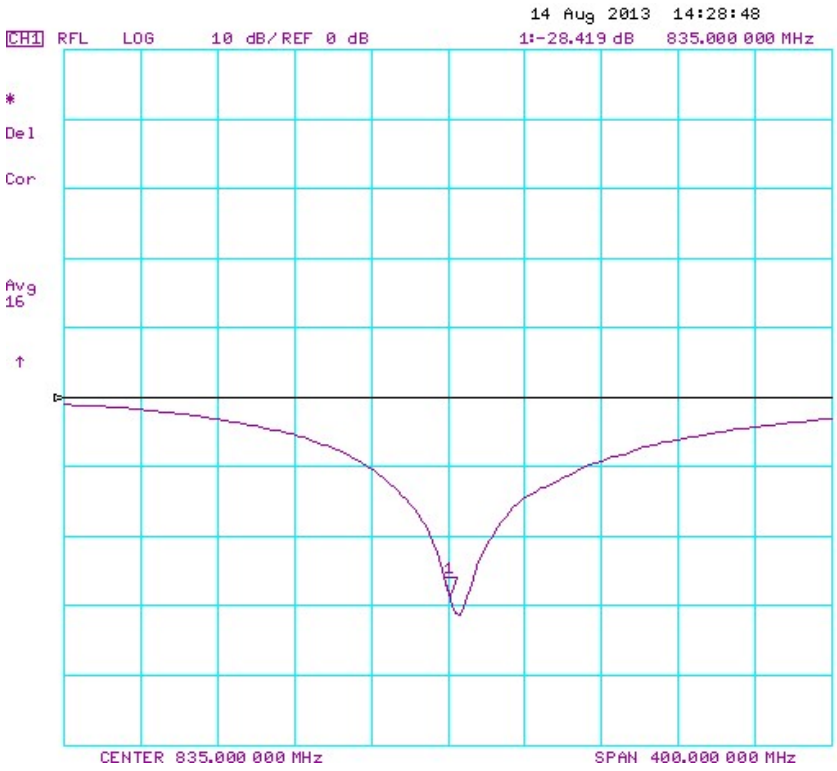
APPENDIX E – DIPOLE CALIBRATION

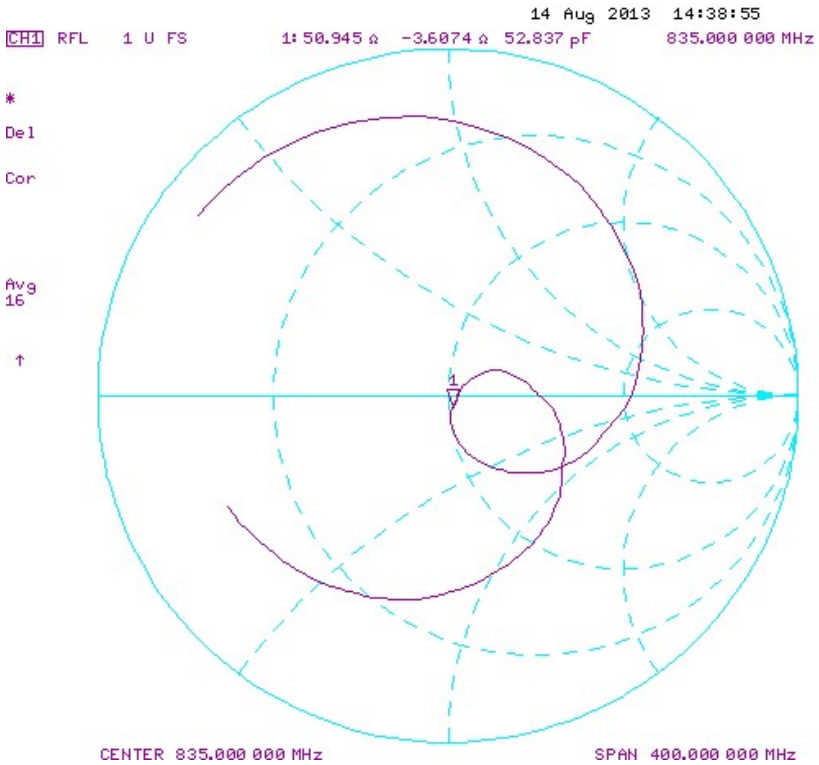
Dipole: D835V2
Serial Number: 4d075
Last Calibrated: Apr. 20, 2012

Antenna Parameters with Head TSL						
	Impedance Real (ohms)	Deviation from cal	Impedance Imaginary (ohms)	Deviation from cal	Return Loss (dB)	Deviation from Cal
Last Calibration	51.4	-	-4.6	-	-26.5	-
Extended Cal Aug 14, 2013	50.9	0.5	-3.6	1.0	-28.4	7.2%
Extended Cal July 25, 2014	55.6	4.2	-9.1	-4.5	-20.3	

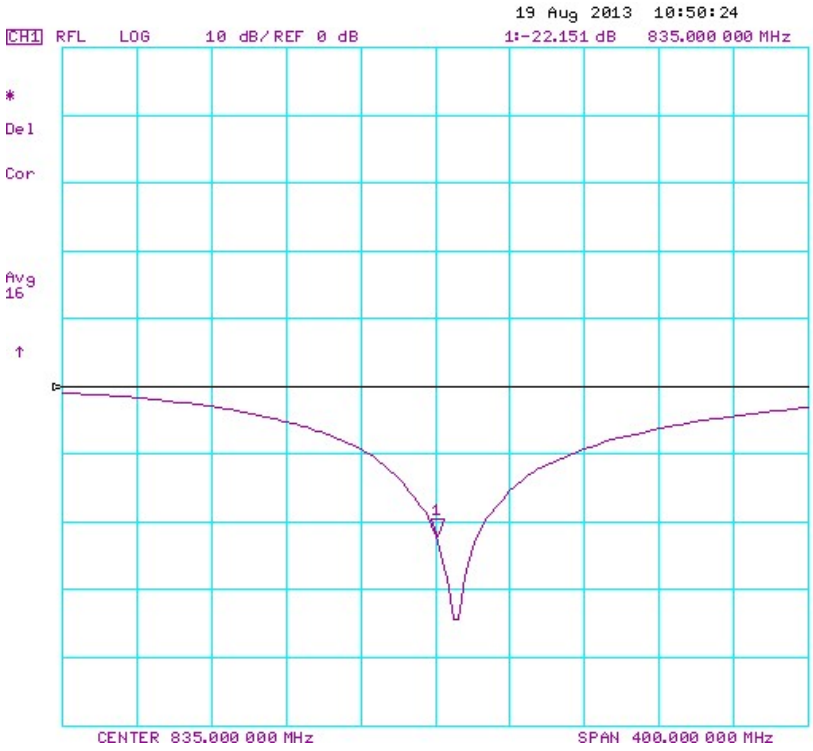
Antenna Parameters with Body TSL						
	Impedance Real (ohms)	Deviation from cal (ohms)	Impedance Imaginary (ohms)	Deviation from cal (ohms)	Return Loss (dB)	Deviation from Cal (%)
Last Calibration	46.8	-	-6.2	-	-22.8	-
Extended Cal Aug. 19, 2013	45.9	0.9	-6.3	0.1	-22.2	2.6%
Extended Cal July 22, 2014	46.6	0.2	-5.6	0.6	-23.4	2.6%

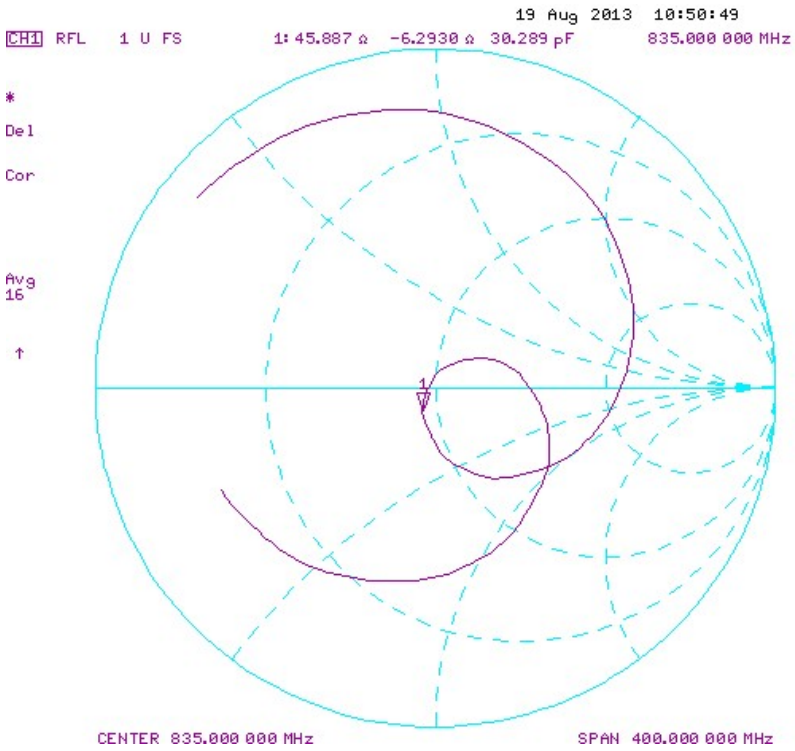
Antenna VSWR with Head TSL

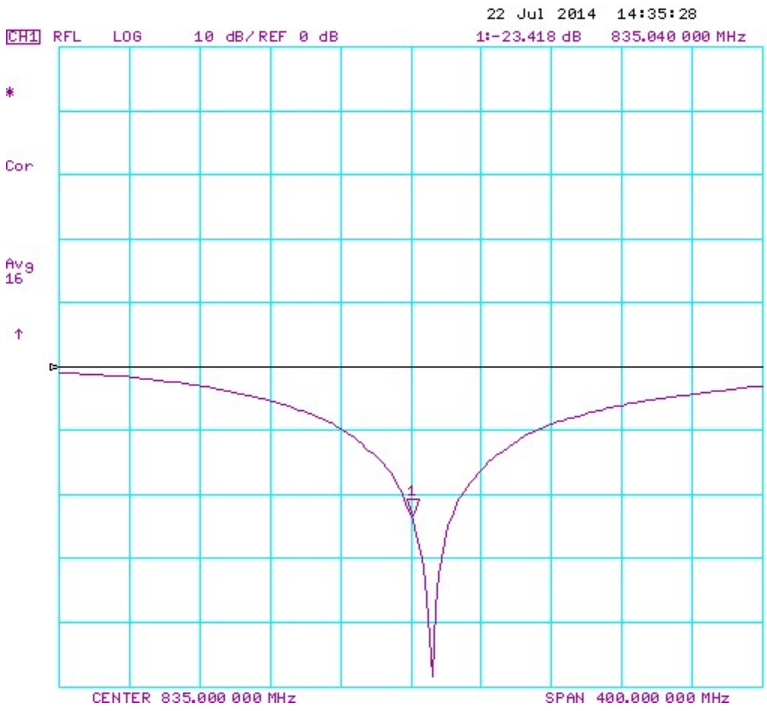


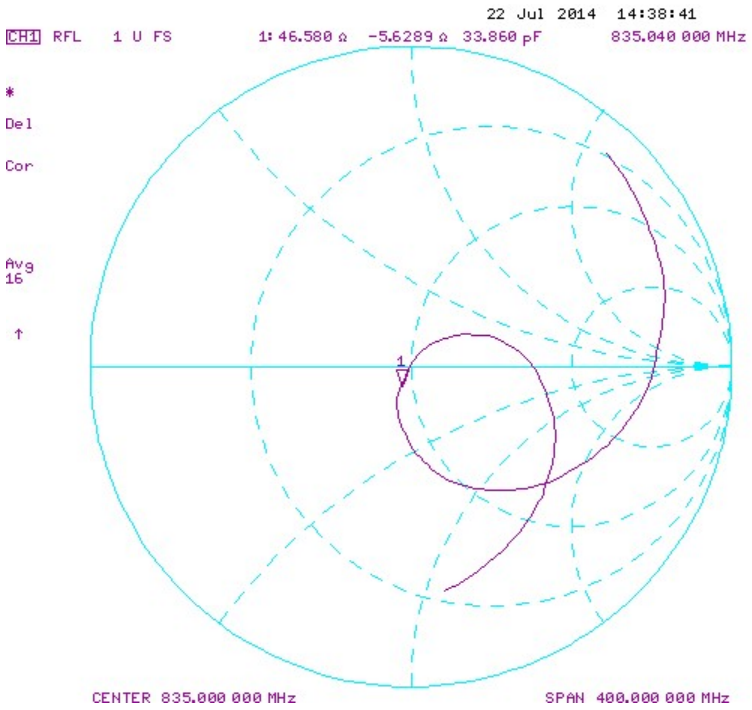


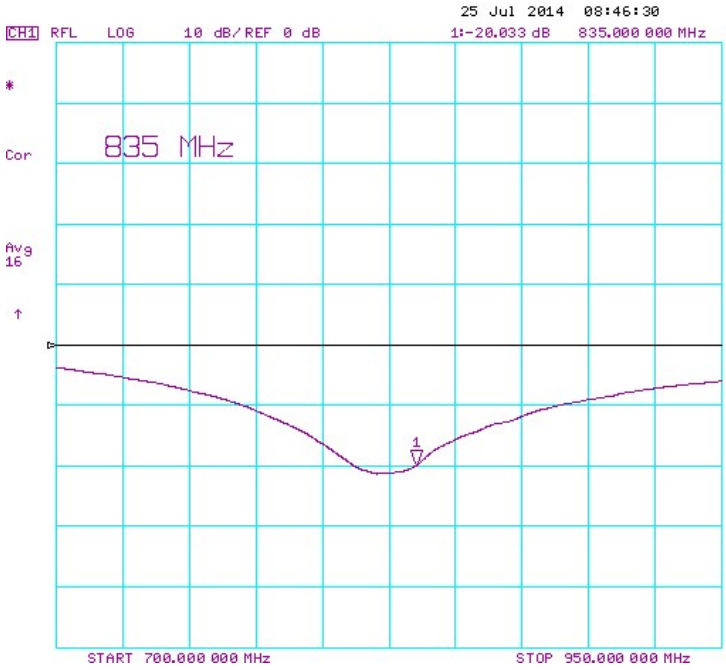
Antenna VSWR with Body TSL

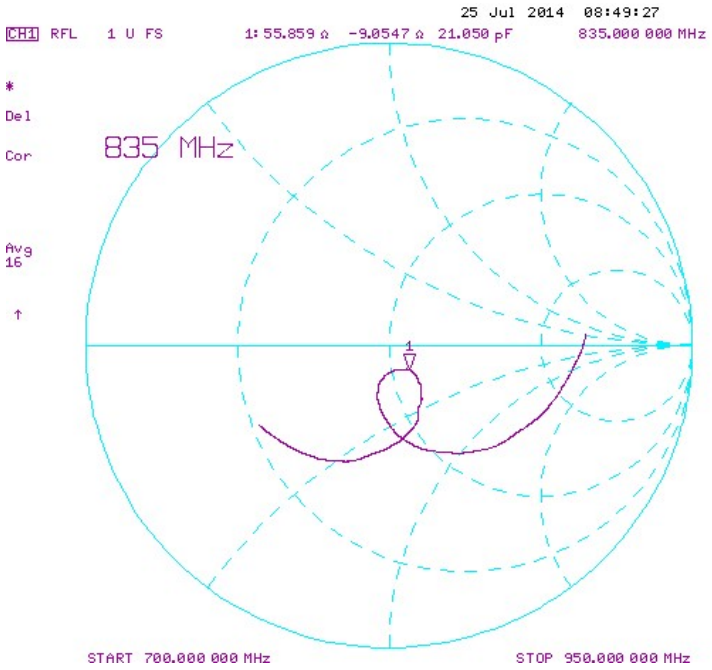





22 Jul 2014 14:35:28
CH1 RFL LOG 10 dB/ REF 0 dB
1:-23.418 dB 835.040 000 MHz
*
Cor
Avg
16
↑
1
CENTER 835.000 000 MHz
SPAN 400.000 000 MHz


22 Jul 2014 14:38:41
CH1 RFL 1 U FS
1: 46.580 Ω -5.6289 Ω 33.860 pF
835.040 000 MHz
*
Del
Cor
Avg
16
↑
1
CENTER 835.000 000 MHz
SPAN 400.000 000 MHz


25 Jul 2014 08:46:30
CH1 RFL LOG 10 dB/ REF 0 dB
1:-20.033 dB 835.000 000 MHz
*
Cor
835 MHz
Avg
16
↑
1
START 700.000 000 MHz
STOP 950.000 000 MHz


25 Jul 2014 08:49:27
CH1 RFL 1 U FS
1: 55.859 Ω -9.0547 Ω 21.050 pF
835.000 000 MHz
*
Del
Cor
835 MHz
Avg
16
↑
1
START 700.000 000 MHz
STOP 950.000 000 MHz

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: D835V2-4d075_Apr12

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d075

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

Calibration date: April 20, 2012

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israa El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 20, 2012

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.36 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.42 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.19 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.5 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.56 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.31 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.4 Ω - 4.6 jΩ
Return Loss	- 26.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.8 Ω - 6.2 jΩ
Return Loss	- 22.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.395 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 09, 2007

Date: 20.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d075

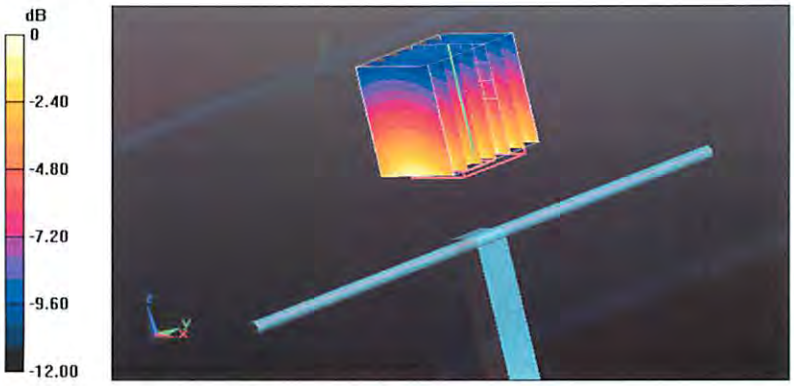
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

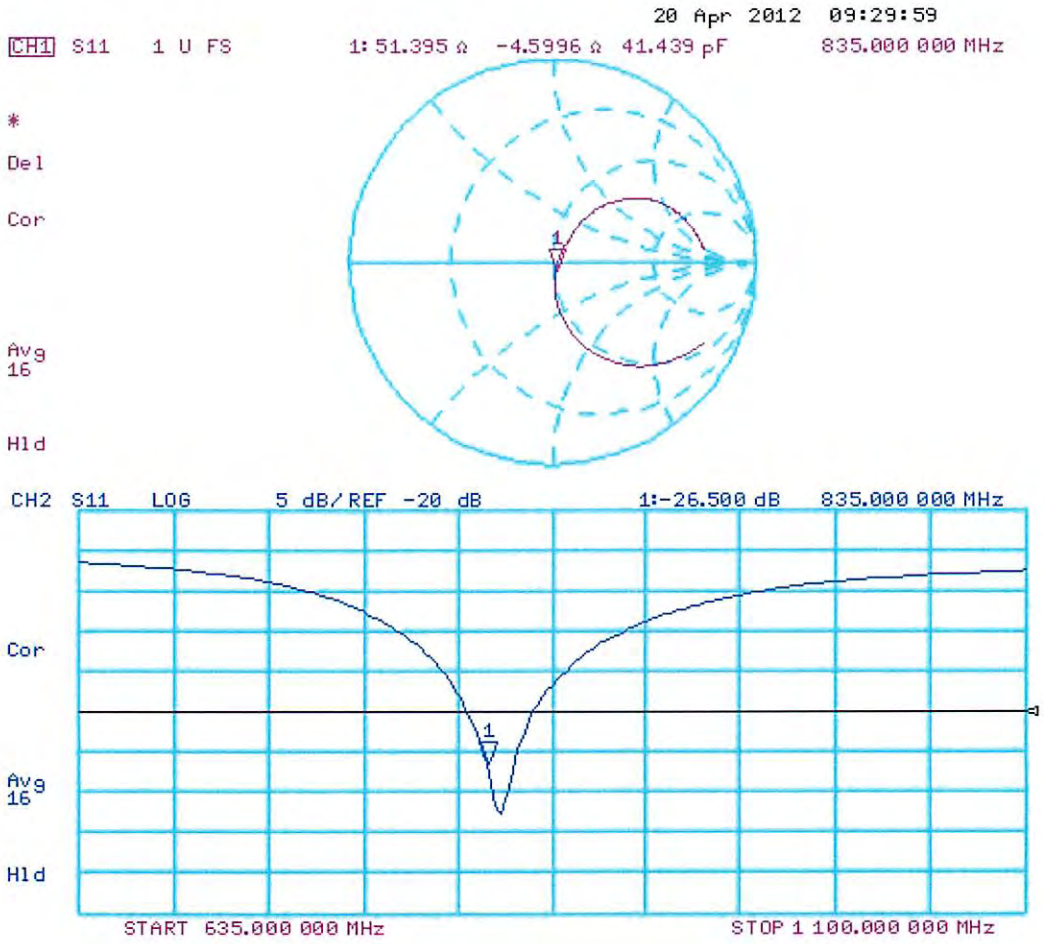
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.890 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.477 mW/g
SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 2.74 mW/g



0 dB = 2.74 mW/g = 8.76 dB mW/g

Impedance Measurement Plot for Head TSL



Date: 19.04.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d075

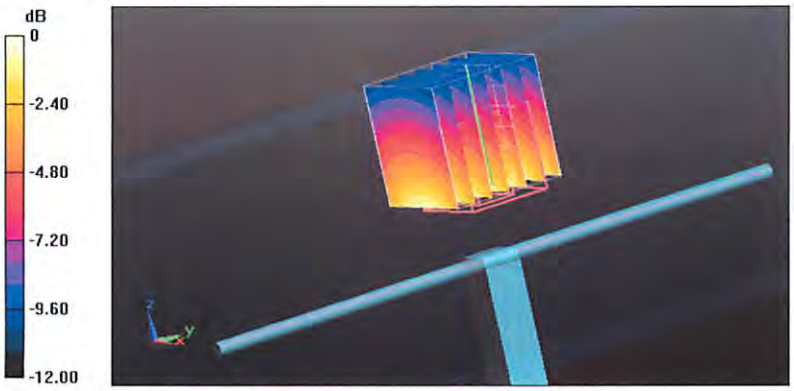
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

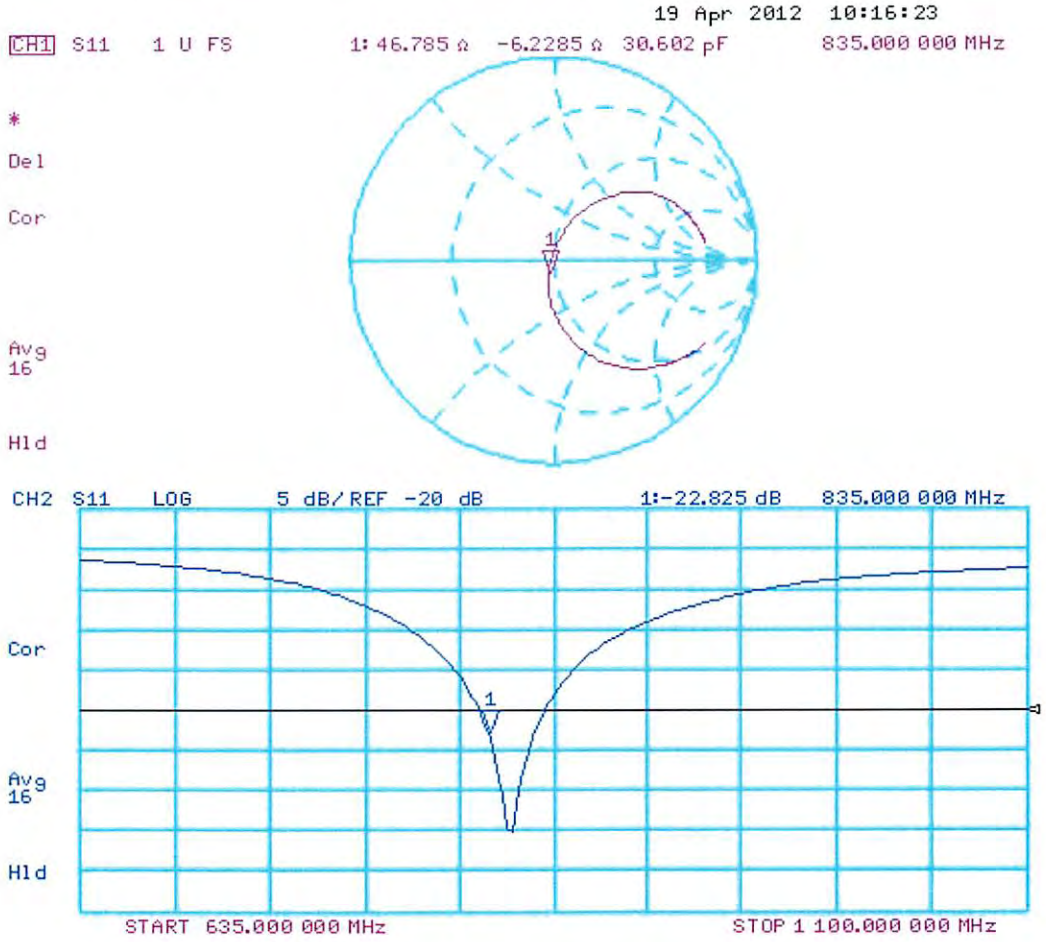
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.283 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.580 mW/g
SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.87 mW/g



0 dB = 2.87 mW/g = 9.16 dB mW/g

Impedance Measurement Plot for Body TSL



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
S 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

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
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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.

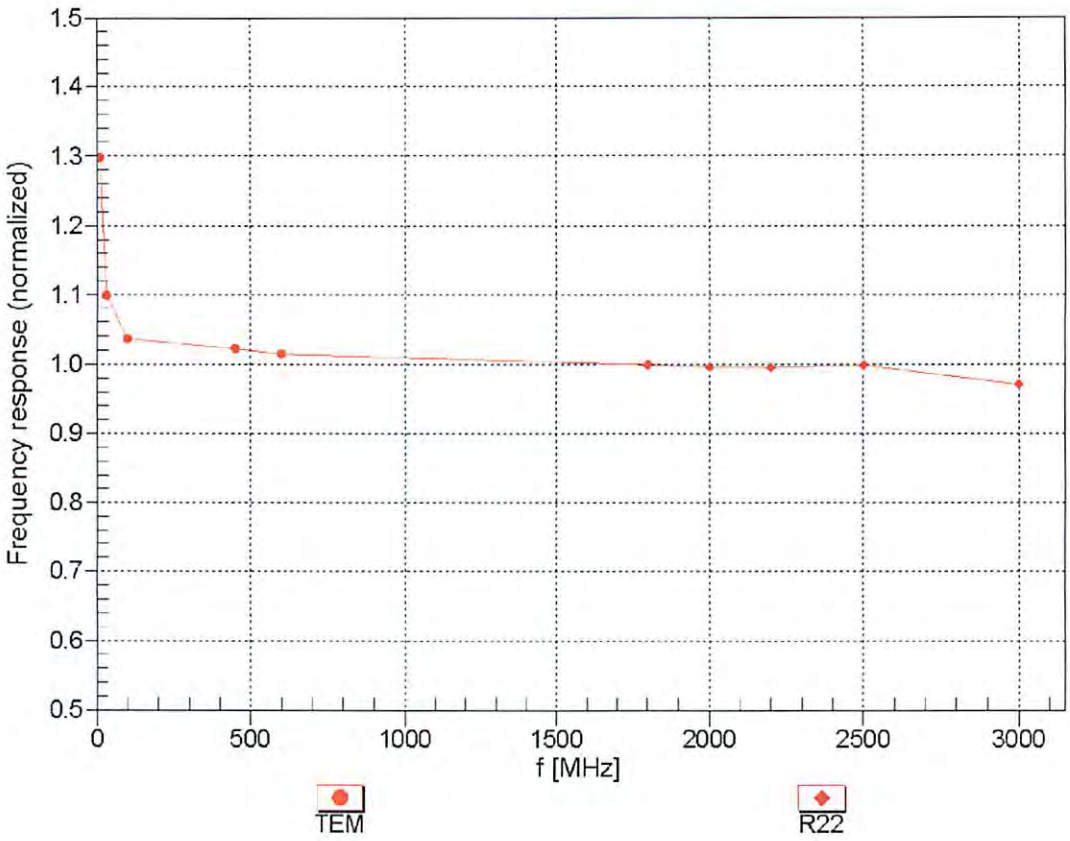
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3600

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.

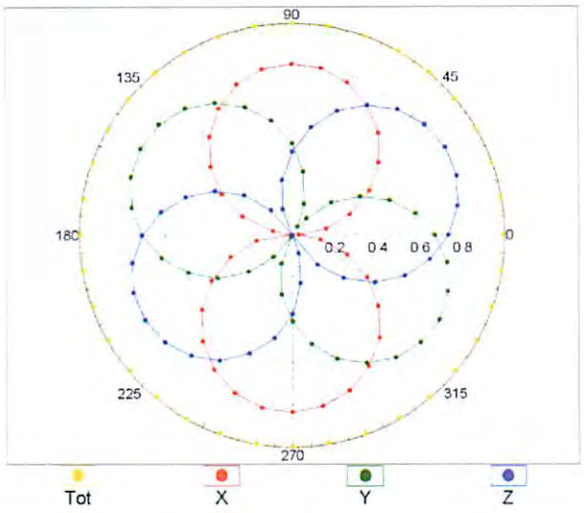
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



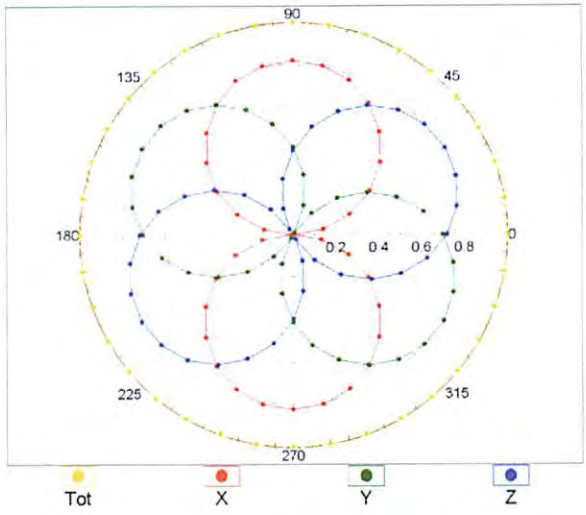
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

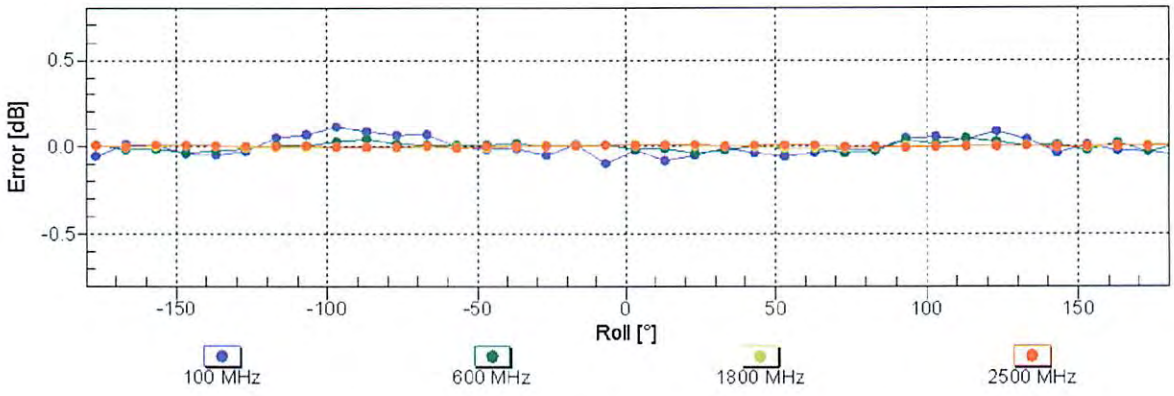
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



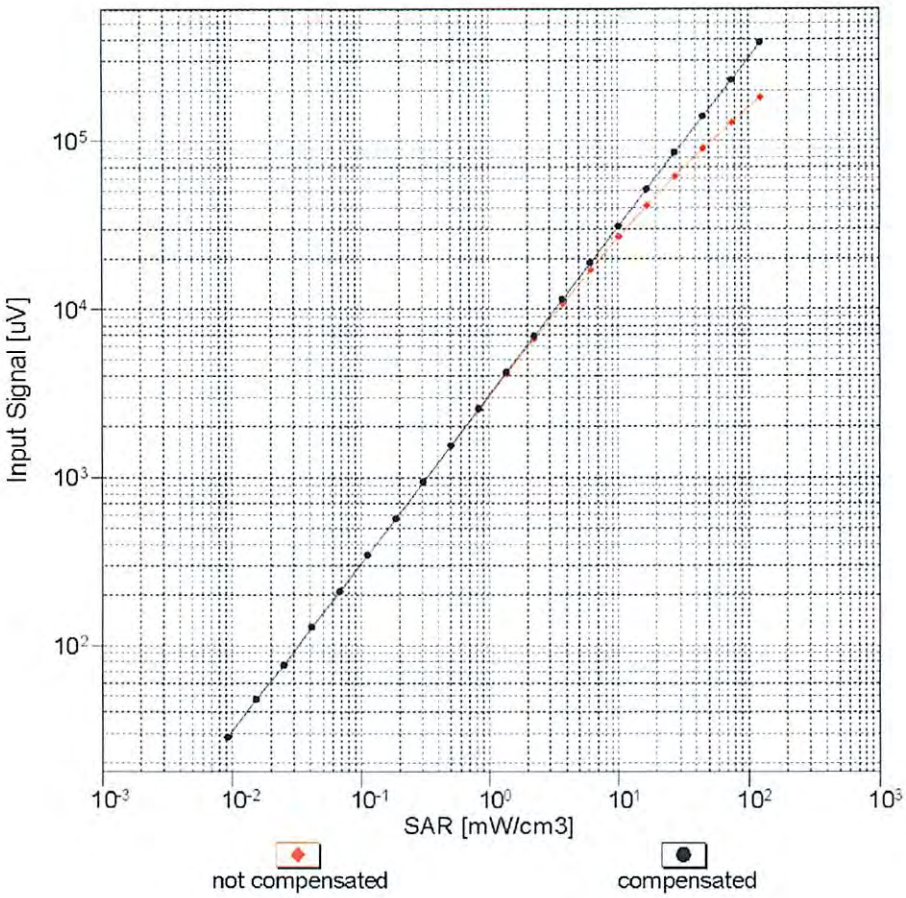
f=1800 MHz,R22

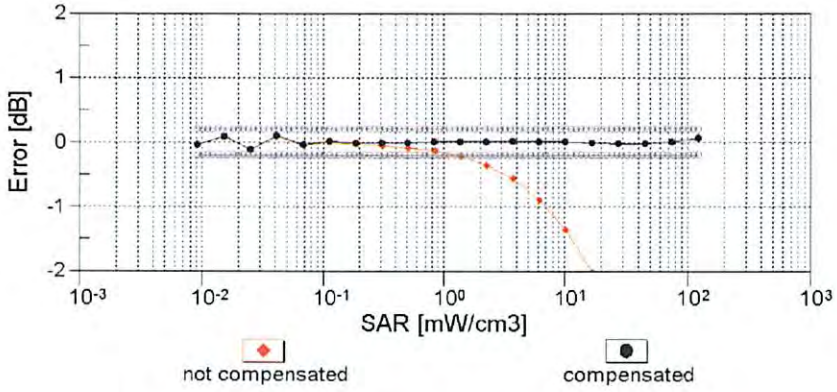




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)

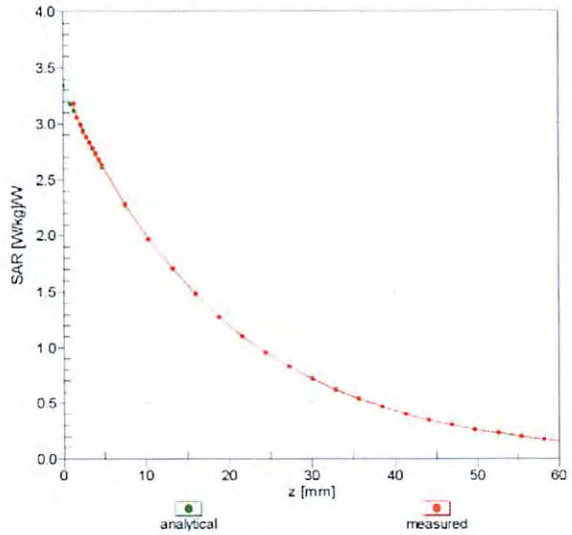




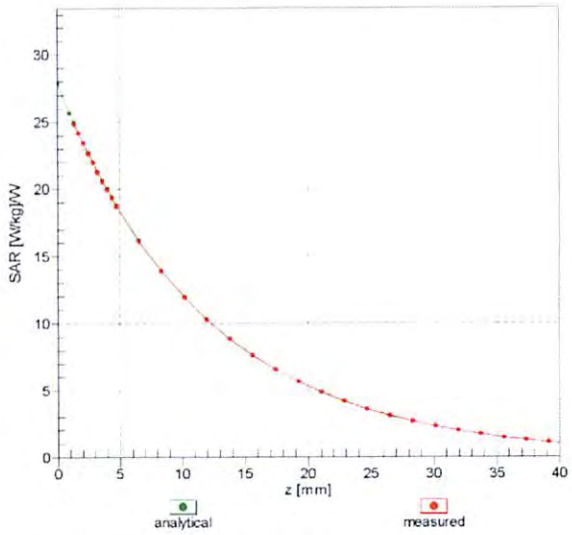
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

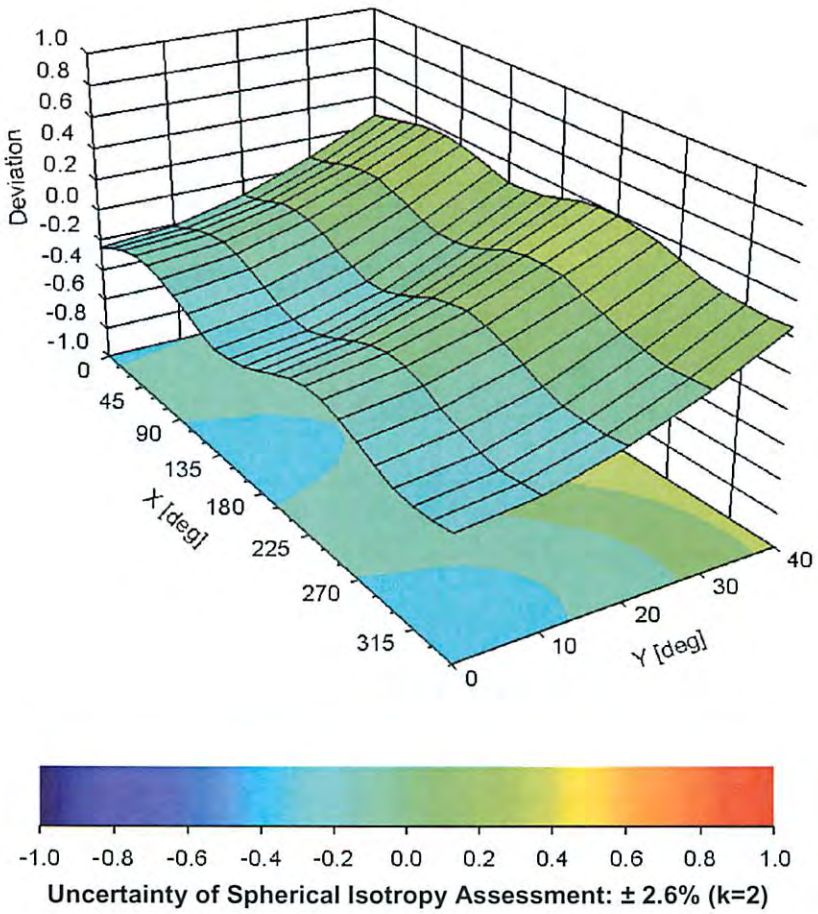


f = 1950 MHz,WGLS R22 (H_convF)



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

APPENDIX G – PHANTOM COC

Schmid & Partner Engineering AG

s p e a g

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Certificate of Conformity / First Article Inspection

Item	Oval Flat Phantom ELI 5.0
Type No	QD OVA 002 A
Series No	1108 and higher
Manufacturer	Untersee Composites Knebelstrasse 8, CH-8268 Mannenbach, Switzerland

Tests

Complete tests were made on the prototype units QD OVA 001 A, pre-series units QD OVA 001 B as well as on some series units QD OVA 001 B. Some tests are made on all series units QD OVA 002 A.

Test	Requirement	Details	Units tested
Shape	Internal dimensions, depth and sagging are compatible with standards	Bottom elliptical 600 x 400 mm, Depth 190 mm, dimension compliant with [1] for f > 375 MHz	Prototypes
Material thickness	Bottom: 2.0mm +/- 0.2mm	dimension compliant with [3] for f > 800 MHz	all
Material parameters	rel. permittivity 2 – 5, loss tangent ≤ 0.05, at f ≤ 6 GHz	rel. permittivity 3.5 +/- 0.5 loss tangent ≤ 0.05	Material samples
Material resistivity	Compatibility with tissue simulating liquids .	Compatible with SPEAG liquids. **	Phantoms, Material sample
Sagging	Sagging of the flat section in tolerance when filled with tissue simulating liquid.	within tolerance for filling height up to 155 mm	Prototypes, samples

** Note: Compatibility restrictions apply certain liquid components mentioned in the standard, containing e.g. DGBE, DGMHE or Triton X-100. Observe technical note on material compatibility.

Standards

[1] OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01
[2] IEEE 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003
[3] IEC 62209–1 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", 2005-02-18
[4] IEC 62209–2 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - 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)", 2010-03-30

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of **body-worn** SAR measurements and system performance checks as specified in [1 – 4] and further standards.

Date 25.7.2011

Signature / Stamp

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