

SAR Test Report - New Filing

Applicant:



Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA, 24501
USA

FCC ID:

OWDTR-0149-E

Product Model Number / HVIN

See Section 2.0

IC Registration Number

3636B-0149

Product Name / PMN

XL-185P

Maximum Reported 1g SAR

FCC	HEAD:	2.37	W/kg
	BODY:	4.87	
ISED	HEAD:	2.42	
	BODY:	5.10	
General Pop. Limit:		8.00	

In Accordance With:

FCC 47 CFR §2.1093

Radiofrequency Radiation Exposure Evaluation: Portable Devices

IC RSS-102 Issue 5

Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Approved By:



Ben Hewson, President

Celltech Labs Inc.
 21-364 Lougheed Rd.
 Kelowna, BC, V1X 7R8
 Canada



Test Lab Certificate: 2470.01



Industry
Canada

IC Registration 3874A-1



FCC Registration: 714830

This report shall not be reproduced in any form without the expressed written consent of Celltech Labs Inc.

Table of Contents

1.0 DOCUMENT CONTROL.....	4
2.0 CLIENT AND DEVICE INFORMATION.....	5
3.0 SCOPE OF EVALUATION.....	6
3.1 PREVIOUS XL-200P TEST DATA.....	6
4.0 NORMATIVE REFERENCES.....	7
5.0 STATEMENT OF COMPLIANCE.....	8
6.0 RF CONDUCTED POWER MEASUREMENT.....	9
TABLE 6.0 CONDUCTED POWER MEASUREMENTS (SYSTEM).....	9
TABLE 6.1 CONDUCTED POWER MEASUREMENTS (SCAN).....	10
7.0 NUMBER OF TEST CHANNELS (N_C).....	10
8.0 ACCESSORIES EVALUATED.....	11
TABLE 8.0 MANUFACTURER'S ACCESSORY LIST.....	11
9.0 SAR MEASUREMENT SUMMARY.....	14
TABLE 9.0: MEASURED RESULTS - BODY.....	14
TABLE 9.1: MEASURED RESULTS - FACE.....	15
10.0 ANALYSIS OF SIMULTANEOUS TRANSMISSION.....	16
TABLE 10.0 LIST OF POSSIBLE TRANSMITTERS.....	16
TABLE 10.1 LIST OF POSSIBLE TRANSMITTERS COMBINATIONS.....	16
TABLE 10.2 ANALYSIS OF SUM-OF-THE-RATIOS.....	17
11.0 SCALING OF MAXIMUM MEASURE SAR.....	18
TABLE 11.0 SAR SCALING.....	18
TABLE 11.1: FLUID SENSITIVITY CALCULATION.....	19
12.0 SAR EXPOSURE LIMITS.....	20
TABLE 12.0 EXPOSURE LIMITS.....	20
13.0 DETAILS OF SAR EVALUATION.....	21
13.1 DAY LOG.....	21
13.2 DUT SETUP AND CONFIGURATION.....	22
13.3 DUT POSITIONING.....	22
13.4 GENERAL PROCEDURES AND REPORT.....	23
13.5 FLUID DIELECTRIC AND SYSTEMS PERFORMANCE CHECK.....	24
13.6 SCAN RESOLUTION 100MHZ TO 2GHZ.....	24
13.7 SCAN RESOLUTION 2GHZ TO 3GHZ.....	25
13.8 SCAN RESOLUTION 5GHZ TO 6GHZ.....	25

14.0 MEASUREMENT UNCERTAINTIES.....	26
TABLE 14.0 MEASUREMENT UNCERTAINTY.....	26
TABLE 14.1 CALCULATION OF DEGREES OF FREEDOM.....	27
15.0 FLUID DIELECTRIC PARAMETERS	28
TABLE 15.0 FLUID DIELECTRIC PARAMETERS 450MHz BODY TSL	28
TABLE 15.1 FLUID DIELECTRIC PARAMETERS 450MHz HEAD TSL.....	30
TABLE 15.2 FLUID DIELECTRIC PARAMETERS 2450MHz BODY TSL	32
TABLE 15.3 FLUID DIELECTRIC PARAMETERS 5200MHz BODY TSL	34
16.0 SYSTEM VERIFICATION TEST RESULTS	36
TABLE 16.0 SYSTEM VERIFICATION RESULTS 450MHz BODY TSL	36
TABLE 16.1 SYSTEM VERIFICATION RESULTS 450MHz HEAD TSL.....	37
TABLE 16.2 SYSTEM VERIFICATION RESULTS 2450MHz BODY TSL	38
TABLE 16.3 SYSTEM VERIFICATION RESULTS 5250MHz BODY TSL	39
17.0 MEASUREMENT SYSTEM SPECIFICATIONS.....	40
TABLE 17.0 MEASUREMENT SYSTEM SPECIFICATIONS.....	40
18.0 TEST EQUIPMENT LIST.....	42
TABLE 18.0 EQUIPMENT LIST AND CALIBRATION	42
19.0 FLUID COMPOSITION	43
TABLE 19.1 FLUID COMPOSITION 450MHz HEAD TSL	43
TABLE 19.2 FLUID COMPOSITION 450MHz BODY TSL	43
TABLE 19.3 FLUID COMPOSITION 2450MHz BODY TSL	43
TABLE 19.4 FLUID COMPOSITION 5250MHz BODY TSL	43
APPENDIX A – SYSTEM VERIFICATION PLOTS.....	44
APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR.....	52
APPENDIX C - SETUP PHOTOS.....	73
APPENDIX D – DUT PHOTOS.....	79
APPENDIX E – PROBE CALIBRATION.....	84
APPENDIX F – DIPOLE CALIBRATION	85
APPENDIX G - PHANTOM.....	86

1.0 DOCUMENT CONTROL

Report Prepared By:	Art Voss		
Report Reviewed By:	Ben Hewson		
Report Issue Number	Description	By	Report Issue Date
R1.0	Initial Release	Art Voss	30 June 2017
R1.1	Added Complete List of Variant Descriptions to Section 2.0	Art Voss	6 July 2017
R1.2	Corrected Variant HVIN Section 2.0	Art Voss	7 July 2017
R2.0	Added ISEDC Info, Cover, Sect. 2.0	Art Voss	10 July 2017
	Corrected DUT Photos App. D		
R2.1	Revised Scope Sect. 3.0	Art Voss	15 August 2017

2.0 CLIENT AND DEVICE INFORMATION

Client Information					
Applicant Name	Harris Corporation				
Applicant Address	221 Jefferson Ridge Parkway Lynchburg, VA, 24501 USA				
DUT Information					
Device Identifier(s):	<table border="1"> <tr> <td>FCC ID:</td> <td>OWDTR-0149-E</td> </tr> <tr> <td>IC:</td> <td>3636B-0149</td> </tr> </table>	FCC ID:	OWDTR-0149-E	IC:	3636B-0149
FCC ID:	OWDTR-0149-E				
IC:	3636B-0149				
Type of Equipment:	Licensed Non-Broadcast Transmitter Held to Face (TNF) FCC Part 90 Land Mobile Radio Transmitter/Receiver (27.41-960MHz) RSS-119 Digital Transmission System (DTS) FCC Part 15, RSS 247 Unlicensed National Information Infrastructure (NII) FCC Part 15 Spread Spectrum Transmitter (DSS) FCC Part 15				
Device Model(s) / HVIN:	XS-PFSUM XS-PFSUY XS-PPSUM XS-PPSUY				
Device Marketing Name / PMN:	XL-185P				
Test Sample Serial No.:	T/A Sample - Identical Prototype				
Transmit Frequency Range:	UHF: 378 - 522MHz WLAN: 2412-2462MHz, 5180-5825MHz BT: 2402-2480MHz				
Number of Channels:	Programmable				
Manuf. Max. Rated Output Power:	UHF Band: 5W, BT: 18.6mW, BLE: 7mW WLAN 2.4G: 230mW / WLAN 5G: 15 mW				
Modulation:	LMR: FM				
Duty Cycle:	50% PTT Duty Cycle				
DUT Power Source:	7.2 VDC Li-Ion 22Wh Rechargeable Battery				
Deviation(s) from standard/procedure:	None				
Modification of DUT:	None				

3.0 SCOPE OF EVALUATION

The XL-185P, FCC ID: OWDTR-0149-E, ISED ID: 3636B-0149 is a single-band, Push-To-Talk (PTT) Licensed Mobile Radio (LMR) transceiver intended for Occupational Use. It incorporates WiFi and Bluetooth transmitters. The XL-185P is identical in RF circuitry to the XL-200P, FCC ID: OWDTR-0133-E, ISED ID: 3636B-0133 multi-band radio with the exception that components have been depopulated to make it a single band radio.

In this document, the following DUT references are made:

The XL-185P, FCC ID: OWDTR-0149-E, ISED ID: 3636B-0149 is referenced as XL-185P

The XL-200P, FCC ID: OWDTR-0133-E, ISED ID: 3636B-0133 is referenced as XL-200P

The Test Plan developed for this evaluation leverages SAR test data from previous evaluations of the XL-200P and is based on test channels, configurations and accessories which produced the highest (*worst case*) SAR. The previous *worst case* configurations of the XL-200P were re-evaluated during the course of this investigation to establish a base-line for comparison of test data from the XL-185P. The basis for the *worst case* configurations of the XL-200P are as follows:

3.1 Previous XL-200P Test Data

Worst Case Test Data from XL-200P							
Model:	XL-200P						
FCC ID:	OWDTR-0133-E						
Variant:	System Radio						
Date Evaluated:	March 2015						
Reference Report:	031315OWD-1302-S						
Frequency	Configuration	Antenna	Accessory 1	Accessory 1	SAR (50% PTT)	Band	Spot Check
136	Head	14035-4000-01	n/a	n/a	0.69	LMR	
156.8	Body	14035-4000-01	B1	A1	1.35		
406	Head	14035-4420-01	n/a	n/a	1.85		Y
406	Body	14035-4420-01	B1	A1	4.63		Y
824	Head	14035-4420-01	n/a	n/a	1.06		
806	Body	14035-4420-01	B1	A1	3.86		
Frequency	Configuration	Antenna**	Accessory 1	Accessory 1	SAR (100%)	Band	Spot Check
2412	Head	14035-4000-01	n/a	n/a	0.004	WiFi	
2437	Body	14035-4000-01	B1	A1	0.005		Y
5240	Head	14035-4000-01	n/a	n/a	0.020		
5260*	Body	14035-4000-01	B1	A1	0.019		Y
2480	Head	14035-4000-01	n/a	n/a	0.003	BT	
2480	Body	14035-4000-01	B1	A1	0.006		Y

*The highest reported SAR from this evaluation in the WiFi and BT bands was on the Scan Variant of the XL-200P in the Body Configuration. The highest SAR values in the WiFi and Bluetooth bands on the System and Scan Variants were in the Body configurations. Spot checks in these bands will be in the Body configuration.

** It has been demonstrated on evaluations of similar variants that the LMR antennas have no impact on the WiFi or BT SAR.

4.0 NORMATIVE REFERENCES

Normative References*	
ANSI / ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
FCC CFR Title 47 Part 2 Title 47: Part 2.1093:	Code of Federal Regulations Telecommunication Radiofrequency Radiation Exposure Evaluation: Portable Devices
Health Canada Safety Code 6 (2015)	Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3kHz to 300GHz
Industry Canada Spectrum Management & Telecommunications Policy RSS-102 Issue 5:	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
IEEE International Committee on Electromagnetic Safety IEEE 1528-2013:	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEC International Standard IEC 62209-2 2010	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 2
FCC KDB KDB 865664 D01v01r04	SAR Measurement Requirements for 100MHz to 6GHz
FCC KDB KDB 447498 D01v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
FCC KDB KDB 643646 D01v01r03	SAR Test Reduction Considerations for Occupational PTT Radios
* When the issue number or issue date is omitted, the latest version is assumed.	

5.0 STATEMENT OF COMPLIANCE

This measurement report demonstrates that samples of the product model(s) were evaluated for Specific Absorption Rate (SAR) on the date(s) shown, in accordance with the Measurement Procedures cited and were found to comply with the Standard(s) Applied based on the Exposure Limits of the Use Group indicated for which the product is intended to be used.

Applicant: Harris Corporation	Product / PMN XL-185P	
Standard(s) Applied: FCC 47 CFR §2.1093 Health Canada's Safety Code 6	Measurement Procedure(s): FCC KDB 865664, FCC KDB 447498, FCC KDB 643646 Industry Canada RSS-102 Issue 5 IEEE Standard 1528-2013, IEC 62209-2	
Reason For Issue: ☒ New Certification ☐ Class I Permissive Change ☐ Class II Permissive Change	Use Group: ☐ General Population / Uncontrolled ☒ Occupational / Controlled	Limits Applied: ☐ 1.6W/kg - 1g Volume ☒ 8.0W/kg - 1g Volume ☐ 4.0W/kg - 10g Volume
Reason for Change: Original Filing		Date(s) Evaluated: 01 Jun 2017 to 28 June 2017

The results of this investigation are based solely on the test sample(s) provided by the applicant which was not adjusted, modified or altered in any manner whatsoever except as required to carry out specific tests or measurements. A description of the device, operating configuration, detailed summary of the test results, methodologies and procedures used during this evaluation, the equipment used and the various provisions of the rules are included in this test report.

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.



Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.

30 June 2017

Date



6.0 RF CONDUCTED POWER MEASUREMENT

Table 6.0 Conducted Power Measurements (System)

Conducted Power Measurements						
Channel	Frequency (MHz)	Measured Power (dBm)	Rated Power (dBm)	Rated Power (W)	Delta (dBm)	SAR Test Channel (Y/N)
1	378.0000	37.18	37.00	5.00	0.18	Y
2	406.0000	37.17	37.00	5.00	0.17	Y
3	418.0000	37.13	37.00	5.00	0.13	Y
4	430.0000	37.13	37.00	5.00	0.13	N
5	450.0000	37.13	37.00	5.00	0.13	N
6	454.0000	37.15	37.00	5.00	0.15	N
7	456.0000	37.13	37.00	5.00	0.13	N
8	459.0000	37.13	37.00	5.00	0.13	N
9	470.0000	37.13	37.00	5.00	0.13	N
10	512.0000	37.13	37.00	5.00	0.13	N
11	522.0000	37.19	37.00	5.00	0.19	N
Notes: The Conducted Power of the DUT was measured at the antenna port, with a fully charged battery and transmitting at 100% duty cycle.						

Table 6.1 Conducted Power Measurements (Scan)

Conducted Power Measurements						
Channel	Frequency (MHz)	Measured Power (dBm)	Rated Power (dBm)	Rated Power (W)	Delta (dBm)	SAR Test Channel (Y/N)
1	378.0000	37.18	37.00	5.00	0.18	Y
2	406.0000	37.17	37.00	5.00	0.17	Y
3	418.0000	37.13	37.00	5.00	0.13	Y
4	430.0000	37.13	37.00	5.00	0.13	N
5	450.0000	37.13	37.00	5.00	0.13	N
6	454.0000	37.15	37.00	5.00	0.15	N
7	456.0000	37.13	37.00	5.00	0.13	N
8	459.0000	37.13	37.00	5.00	0.13	N
9	470.0000	37.13	37.00	5.00	0.13	N
10	512.0000	37.13	37.00	5.00	0.13	N
11	522.0000	37.19	37.00	5.00	0.19	N
Notes: The Conducted Power of the DUT was measured at the antenna port, with a fully charged battery and transmitting at 100% duty cycle.						

7.0 NUMBER OF TEST CHANNELS (N_c)

This device is identical to the XL-200P, FCC ID: OWDTR-0133-E, ISEDC ID: 3636B-0133. The number of channels and channel frequencies tested are based on *worst case* configurations from previous test data from the original filing of this device. Reference **Section 3.0 Scope of Evaluation**.

8.0 ACCESSORIES EVALUATED

Table 8.0 Manufacturer's Accessory List

Change History			
Change ID	Date	Change Type	Description of Change
1	30 Mar 2012	Initial	Initial Filing
2	13 Feb 2013	C2PC	Added BlueTooth and WiFi Features
3	29 Jun 2015	C2PC	Added 14035-4440-01 Antenna and Other Accessories
4	09 Oct 2015	C1PC	Added 14035-4440-02 Antenna (Identical to KRE1011506/2 Antenna) Added Modified 14035-4440-01 Antenna (Identical to KRE1011506/1 Antenna)
5	31-Dec-15	C1PC	Added 14035-4420-01 Antenna
6	4-Jun-16	C1PC	Added 12082-0600-03 Antenna/Spr/MIC
7	19-Aug-16	C1PC	Added 14035-4010-04 Li-Ion Battery

Manufacturer's Accessory List							
Test Report ID Number	Manufacturer's Part Number	Description	Change ID ⁽¹⁾	UDC Group ⁽²⁾	Type II Group ⁽³⁾	SAR ⁽⁴⁾ Evaluated	SAR ⁽⁵⁾ Tested
Antenna							
T4	14035-4000-01	Full Spectrum Whip Antenna	1			Y	Y
T5	14035-4420-01	Wideband Whip, UHF, 7/800 MHz	5			Y	Y
Battery							
P1	14034-4010-01	Li-Ion Battery 7.2VDC, 3300mAh	1			Y	Y
P2	14034-4010-04	Li-Ion Battery 7.2VDC, 3100mAh, 22Wh	7			Y	N
P5	14034-4010-05	Li-Ion Battery 7.2VDC, 3100mAh, 22Wh, UL	7			Y	N

Manufacturer's Accessory List							
Test Report ID Number	Manufacturer's Part Number	Description	Change ID ⁽¹⁾	UDC Group ⁽²⁾	Type II Group ⁽³⁾	SAR ⁽⁴⁾ Evaluated	SAR ⁽⁵⁾ Tested
Audio Accessory							
A1	12082-0600-01	Standard Speaker Microphone	1	7A	PB	Y	Y
A2	12082-0600-02	Storm Speaker Microphone	1	7A	PB	Y	Y
A28	12082-0600-03	Storm Speaker Microphone	6	7A	PB	Y	Y
A3	12150-1000-01	Premium Speaker MIC, Fire, NC	1	9	PB	Y	Y
A29	12150-1000-05	Premium Speaker MIC, Fire, NC, Hi-Vis Yellow	1	9	PB	Y	Y
A4	12082-0650-01	Microphone, Palm, 2-Wire Black	1	7A	IL	Y	Y
A5	12082-0650-02	Microphone, Palm, 2-Wire Beige	3	7A	IL	Y	-
A6	12082-0650-03	Microphone, Mini Lapel, 3-Wire Black	1	7A	IL	Y	Y
A7	12082-0650-04	Microphone, Mini Lapel, 3-Wire Beige	3	7A	IL	Y	-
A8	12082-0650-05	Earphone Kit, Black, XG-100P	**			Y	-
A9	12082-0650-06	Earphone Kit, Beige, XG-100P	**			Y	-
A10	12082-0650-07	Headset, In-Ear, Boom MIC, In-Line PTT	3	7A	IL	Y	-
A11	12082-0650-08	Headset, LTWT, OTH, Single Ear, IN-Line PTT	3	7A	IL	Y	-
A12	12082-0650-09	Headset, LTWT, BTH, Dual Ear, In_Line PTT	3	7A	IL	Y	-
A13	12082-0650-10	Headset, LTWT, BTH, Dual Ear, Pig Tail PTT	3	7A	PT	Y	Y
A14	12082-0650-11	Headset, LTWT, BTH, Dual In-Ear, In_Line PTT	3	7A	IL	Y	-
A15	12082-0650-12	Headset, LTWT, BTH, Dual In-Ear, Pig Tail PTT	3	7A	PT	Y	Y
A16	12082-0650-13	Headset, Heavy Duty, BTH, w/PTT, XG-100P	3	7A	IL	Y	Y
A17	12082-0650-14	Headset, Heavy Duty, OTH, w/PTT, XG-100P	3	7A	IL	Y	-
A18	12082-0650-15	Headset, BTH, Boom MIC, Earpiece, w/PTT	**			Y	-
A19	12082-0650-16	Headset, Tactical, Boom MIC, Earpiece, w/PTT	3	7A	PT	Y	-
A20	12082-0650-17	Skull MIC, w/Body PTT, Earcup, XG-100P	3	9	BB	Y	Y
A21	12082-0650-18	Throat MIC, w/Acoustic Tube, Body PTT	3	9	BB	Y	-
A22	12082-0650-19	Throat MIC, w/Acoustic Tube, Body & Ring PTT	3	9	RB	Y	-
A23	12082-0681-01	Speaker MIC, Wireless Bluetooth	3	BT	PB	Y	-
A24	12082-0684-01	BlueTooth, Covert, Earpiece, MIC, PTT	3	BT	n/a	Y	-
A25	14002-0197-01	Hirose to Unity Adapter	1	7B	n/a	Y	Y
A26	LS103239V1	Earphone, Lapel MIC, 2.5mm	3	n/a	n/a	Y	Y
A27	LS103239V2	Earphone, Lapel MIC, 2.5mm, Right Angle	4	n/a	n/a	Y	-

Manufacturer's Accessory List							
Test Report ID Number	Manufacturer's Part Number	Description	Change ID ⁽¹⁾	UDC Group ⁽²⁾	Type II Group ⁽³⁾	SAR ⁽⁴⁾ Evaluated	SAR ⁽⁵⁾ Tested
Body-Worn Accessory							
B1	12082-1290-01	Metal Belt Clip	1			Y	Y
B17	12082-1398-01	Side Connector Cover	1			Y	Y
B2	12082-3230-01	D-Swivel (Used w/ 14002-0218-01 and KRY 1011609/1)	1			Y	Y
B3	14002-0218-01	Premium Belt Loop	1			Y	Y
B4	14035-4200-01	Holster, Leather, Radio, Premium	3			Y	Y
B5	14035-4200-02	Holster, Leather w/Rings for Shoulder Strap, Radio, Premium	3			Y	Y
B6	14035-4200-03	Holster, Nylon, Black, Radio, Premium	**			Y	-
B7	14035-4200-04	Holster, Ring, Leather, Radio, Premium	**			Y	-
B8	14035-4201-01	Kit, 14035-4200-01 Holster Assy w/ 14002-0218-01 Belt Loop	**			Y	-
B16	14035-4201-02	Case, Leather, Premium, Shoulder Strap	**			Y	-
B9	14035-4202-02	Kit, 14035-4200-02 Holster Assy w/ 14002-0218-01 Belt Loop	**			Y	-
B10	14035-4202-01	Holster, Leather, Radio, Standard	**			Y	-
B11	14035-4202-02	Holster, Leather w/Rings for Shoulder Strap, Radio, Standard	**			Y	-
B12	14035-4202-03	Holster, Nylon, Black, Radio, Standard	**			Y	-
B13	14035-4202-04	Holster, Ring, Leather, Radio, Standard	**			Y	-
B18	14036-4000-01	Holster, Leather, Premium	**			Y	-
B19	14036-4000-02	Holster, Leather, Rings, Premium	**			Y	-
B14	CC103333V1	Shoulder Strap	1			Y	Y
B15	KRY 1011609/1	Leather Belt Loop	1			Y	Y

(1) From Table 6.0 - Indicates which change the item was introduced or tested. A "****" in this column indicates these accessories were evaluated on similar product and are deemed compliant.

(2) UDC Group: 9 = 9 Pin, 7A = 7 Pin, 7B = 7 Pin Modified

(3) Type II Group: PB = Palm Button, IL = In-Line Pushbutton, PT = Pigtail Pushbutton, RB = Ring Pushbutton, BB = Body Button, BT = Bluetooth

(4) Accessories are categorized into groups of similar design and construction. Samples of individual groups are SAR Tested and the SAR results apply to ALL members of the Accessory Group. A "Y" in this column indicates the accessory is deemed acceptable.

9.0 SAR MEASUREMENT SUMMARY

Table 9.0: Measured Results - BODY

Measured SAR Results (1g) - BODY Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (10g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
UHF Band LMR															
07 Jun 2017	SC5*	XL-200P	0133-E	406	CW	4420-01	4010-01	B1	A1	0	30	37	8.710	4.355	-0.092
07 Jun 2017	SC6*	XL-200P	sys/RB	406	CW	4420-01	4010-01	B1	A1	0	30	36.89	7.860	3.930	-0.320
08 Jun 2017	B1	XL-185P UHF	System	406	CW	4420-01	4010-01	B1	A1	0	30	37.07	8.370	4.185	-0.154
08 Jun 2017	B2**	XL-185P UHF	System	378	CW	4420-01	4010-01	B1	A1	0	30	37.13	6.440	3.220	-0.321
08 Jun 2017	B3**	XL-185P UHF	System	418	CW	4420-01	4010-01	B1	A1	0	30	37.1	8.150	4.075	-0.063
08 Jun 2017	B4	XL-185P UHF	System	406	CW	4000-01	4010-01	B1	A1	0	30	37.07	8.870	4.435	-0.441
08 Jun 2017	B5**	XL-185P UHF	System	378	CW	4000-01	4010-01	B1	A1	0	30	37.13	7.020	3.510	-0.105
08 Jun 2017	B6**	XL-185P UHF	System	418	CW	4000-01	4010-01	B1	A1	0	30	37.1	9.350	4.675	-0.203
8 Jun 2017	B7	XL-185P UHF	SCAN	418	CW	4000-01	4010-01	B1	A1	0	30	37.13	8.920	4.460	-0.390
5GHZ WiFi															
16 Jun 2017	B8	XL-185P UHF	System	5260	CW	4440-02	4010-01	n/a	n/a	0	30	11.8	<0.1	-	(a)
16 Jun 2017	B9	XL-185P UHF	SCAN	5260	CW	4440-02	4010-01	n/a	n/a	0	30	11.8	<0.1	-	(a)
16 Jun 2017	B10	XL-185P UHF	System	5260	CW	4440-02	4010-01	n/a	n/a	0	30	11.8	<0.1	-	(a)
2.4GHZ WiFi															
27 Jun 2017	B11	XL-185P UHF	System	2437	CW	4440-02	4010-01	B1	A1	0	30	23.7	<0.1	-	(a)
27 Jun 2017	B12	XL-185P UHF	SCAN	2437	CW	4440-02	4010-01	B1	A1	0	30	23.7	<0.1	-	(a)
27 Jun 2017	B13	XL-185P UHF	System	2437	CW	4440-02	4010-01	B1	A1	0	30	23.7	<0.1	-	(a)
BlueTooth															
27 Jun 2017	B15	XL-185P UHF	SCAN	2480	CW	4440-02	4010-01	B1	A1	0	30	12.7	<0.1	-	(a)
27 Jun 2017	B16	XL-185P UHF	System	2480	CW	4440-02	4010-01	B1	A1	0	30	12.7	<0.1	-	(a)
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			8.0 W/kg		Occupational/User Aware			

Table 9.1: Measured Results - FACE

Measured SAR Results (1g) - FACE Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (10g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
UHF Band LMR															
09 Jun 2017	SC7*	XL-200P	0133-E	406	CW	4420-01	4010-01	n/a	n/a	25	55	37	3.950	1.975	-0.059
09 Jun 2017	SC8*	XL-200P	sys/RB	406	CW	4420-01	4010-01	n/a	n/a	25	55	36.89	3.890	1.945	-0.102
11 Jun 2017	F1	XL-185P UHF	System	406	CW	4420-01	4010-01	n/a	n/a	25	55	37.07	4.570	2.285	-0.080
11 Jun 2017	F2	XL-185P UHF	System	406	CW	4000-01	4010-01	n/a	n/a	25	55	37.07	4.300	2.150	-0.371
11 Jun 2017	F3	XL-185P UHF	SCAN	406	CW	4420-01	4010-01	n/a	n/a	25	55	37.17	3.960	1.980	-0.064
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			8.0 W/kg		Occupational/User Aware			

* Baseline Measurements

** As per FCC KDB 643664, When SAR for an antenna is > 4.0, testing of immediately adjacent channels is required.

(a) The Bluetooth and WiFi antennas are located on the side of the DUT. Due to the location of the Bluetooth and WiFi antennas, the minimum phantom separation distance in the BODY or FACE configurations that could be achieved is greater than 30mm. The measured SAR values approximated noise floor measurements resulting in inconsistent power drift measurements and are omitted in this table.

Note: The WiFi and Bluetooth channels evaluated on the XL-185P produced worst case SAR in the BODY Configurations.

10.0 ANALYSIS OF SIMULTANEOUS TRANSMISSION

Simultaneous Transmission Analysis

Introduction

The XL-185P incorporates integrated WiFi and Bluetooth transmitters capable of simultaneously transmitting, in any combination, with the LMR transmitter. As per FCC KDB 447498, simultaneous transmission analysis is required for devices capable of simultaneous transmission. The WiFi and BT 1g SAR are subject to General Population limits of 1.6W/kg. The LMR 1g SAR is subject to Occupational of 8.0W/kg. To determine compliance when different SAR limits are applied to the different transmit modes, the Sum-of-the-Ratios of the SAR to the respective SAR limit is applied. When the Sum-of-the-Ratios is ≤ 1.0 , simultaneous SAR test exclusion may be applied.

SAR for each transmission band, transmission mode and/or equipment class was evaluated with Body-Worn and Audio Accessories in the BODY and HEAD configurations. Only the Maximum maximum reported SAR for each is used in the Sum-of-the-Ratios calculation and the worst case of all possible combinations is considered.

Table 10.0 List of Possible Transmitters

List of Possible Transmitters				
Type	Class	Frequency Range		Rated Output Power (dBm)
		Lower (MHz)	Upper (MHz)	
LMR UHF	TNF	378.0	522.0	37.0
Bluetooth	DSS	2402.0	2480.0	12.7
BLE	DTS	2402.0	2480.0	8.4
WiFi 2.4	DTS	2412.0	2462.0	23.7
WiFi 5	NII	5150.0	5850.0	11.8

Table 10.1 List of Possible Transmitters Combinations

Simultaneous Transmitter Combinations HEAD and BODY Configuration					
Configuration Number					
	UHF Band	Bluetooth	BLE	WiFi 2.4	WiFi 5
1	X	X		X	
2	X	X			X
3	X		X	X	
4	X		X		X

Table 10.2 Analysis of Sum-of-the-Ratios

Analysis of Sum-of-the-Ratios For All Transmitters and Configurations												
Config.	Transmitter Type										Sum of Ratios	Sum of SARs
	UHF Band		BlueTooth		BLE		WiFi 2.4		WiFi 5			
	<u>reported</u> SAR (W/kg)	Ratio to Limit	<u>reported</u> SAR (W/kg)	Ratio to Limit	<u>reported</u> SAR (W/kg)	Ratio to Limit	<u>reported</u> SAR (W/kg)	Ratio to Limit	<u>reported</u> SAR (W/kg)	Ratio to Limit		
	SAR Limit = 8.0W/kg (Occupational)		SAR Limit = 1.6W/kg (General Population)									(W/kg)
HEAD	2.285	0.286	0.006	0.004			0.040	0.025			0.314	2.331
	2.285	0.286	0.006	0.004					0.031	0.019	0.309	2.322
	2.285	0.286			0.048	0.030	0.040	0.025			0.341	2.373
	2.285	0.286			0.048	0.030			0.031	0.019	0.335	2.364
BODY	4.778	0.597	0.006	0.004			0.040	0.025			0.626	4.824
	4.778	0.597	0.006	0.004					0.031	0.019	0.620	4.815
	4.778	0.597	0.006		0.048	0.030	0.040	0.025			0.652	4.866
	4.778	0.597	0.006		0.048	0.030			0.031	0.019	0.647	4.857

 Indicates this combination is not possible.

Test Exclusion of the BlueTooth Low Energy (BLE) transmitter is evaluated using Max Power = 8.4dBm (7mW), Separation Distance = 30mm*, Transmit Frequency = 2.480GHz.

Per KDB 447498 D01v06 [4.3.1(a)], SAR Test Exclusion is given by:

$$[(\text{Max Power, mW}) / (\text{Separation Distance, mm})] * [(\frac{f}{f_0})] \leq 3.0 \text{ for } 1\text{g SAR}$$

$$[(7)/(30)] * [(\frac{2.480}{2.4})] = 0.362 \leq 3.0$$

Therefore the BlueTooth transmitter meets the SAR Test Exclusion criteria.

For reference only, per KDB 447498 D01v06 [4.3.2(b)], the estimated BlueTooth SAR is given by:

$$[(\text{Max Power, mW}) / (\text{Separation Distance, mm})] * [(\frac{f}{f_0}) / (x)], \text{ where } x = 7.5 \text{ for } 1\text{g SAR}$$

$$[(7)/(30)] * [(\frac{2.480}{2.4}) / (7.5)] = 0.048\text{W/kg}$$

From Table 10.2, the Sum-of-the-Ratios for any given simultaneous transmission combination, when applied to their respective SAR limit, does not exceed 1.0. No further analysis is required.

Note: The WiFi and BlueTooth SAR values shown in this table are the highest worst case SAR values from all configurations and transmission modes from all variants of the XL-185P series of radios. They are applied in this table to illustrate the most conservative ratio.

* Due to the location of the BlueTooth and WiFi antennas, the minimum phantom separation distance in the BODY or FACE configurations that could be achieved is greater than 30mm.

11.0 SCALING OF MAXIMUM MEASURE SAR

Table 11.0 SAR Scaling

Scaling of Maximum Measured SAR ⁽¹⁾								
Plot ID	Configuration	Freq	Measured Fluid Deviation		Measured Conducted Power	Measured Drift	Measured SAR (1g)	
		(MHz)	Permittivity	Conductivity	(dBm)	(dB)	(W/kg)	
F1	Face	406	3.28%	-2.99%	37.1	-0.080	2.285	
B6	Body	418	-3.34%	1.92%	37.1	-0.203	4.675	
Step 1								
Fluid Sensitivity Adjustment								
Plot ID	Scale Factor		X	Measured SAR		=	Step 1 Adjusted SAR (1g)	
	(%)			(W/kg)			(W/kg)	
F1	1.000%		X	2.285		=	2.285	
B6	2.210%		X	4.675		=	4.778	
Step 2								
Manufacturer's Tune-Up Tolerance								
Plot ID	Measured Conducted Power		Rated Power		Delta	Step 1 Adjusted SAR	=	Step 2 Adjusted SAR (1g)
	(dBm)		(dBm)		(dB)			+
F1	37.1		37.0		0.07	+	2.285	2.285
B6	37.1		37.0		0.1	+	4.778	4.778
Step 3								
Simultaneous Transmission - Bluetooth and/or WiFi								
Plot ID	Rated Output Power (Pmax)	Freq	Separation Distance	Estimated SAR	+	Step 2 Adjusted SAR	=	Step 3 Adjusted SAR (1g)
	(mW)	(MHz)	(mm)	(W/kg)		(W/kg)		(W/kg)
F1				0.09	+	2.285	=	2.373
B6				0.09	+	4.778	=	4.866
Step 4								
Drift Adjustment								
Plot ID	Measured Drift		+	Step 3 Adjusted SAR		=	=	Step 4 Adjusted SAR (1g)
	(dB)			(W/kg)				(W/kg)
F1	-0.080		+	2.373		=	=	2.417
B6	-0.203		+	4.866		=	=	5.098
Step 5								
Reported SAR								
Plot ID	FCC				IC			
	From Steps 1 through 3				From Steps 1 through 4			
	1g SAR (W/kg)				1g SAR (W/kg)			
F1	2.37				2.42			
B6	4.87				5.10			

NOTES to Table 10.0

(1) Scaling of the Maximum Measured SAR is based on the highest, 100% duty cycle, Face, Body and/or Head SAR measured of ALL test channels, configurations and accessories used during THIS evaluation. The Measured Fluid Deviation parameters apply only to deviation of the tissue equivalent fluids used at the frequencies which produced the highest measured SAR. The Measured Conducted Power applies to the Conducted Power measured at the frequencies producing the highest Face and Body SAR. The Measured Drift is the SAR drift associated with that specific SAR measurement. The Reported SAR is the accumulation of all SAR Adjustments from the applicable Steps 1 through 4. The Plot ID is for identification of the SAR Measurement Plots in Annex A of this report.

NOTE: Some of the scaling factors in Steps 1 through 4 may not apply and are identified by light gray text.

Step 1

Per IEC-62209-1 and FCC KDB 865664. Scaling required only when Measured Fluid Deviation is greater than 5%. If the Measured Fluid Deviation is greater than 5%, Table 10.1 will be shown and will indicate the SAR scaling factor in percent (%). SAR is MULTIPLIED by this scaling factor only when the scaling factor is positive (+).

Step 2

Per KDB 447498. Scaling required only when the difference (Delta) between the Measured Conducted Power and the Manufacturer's Rated Conducted Power is (-) Negative. The absolute value of Delta is ADDED to the SAR.

Step 3

Per KDB 447498 4.3.2. The SAR, either measured or calculated, of ANY and ALL simultaneous transmitters must be added together and includes all contributors.

Step 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.

Step 5

The Reported SAR is the Maximum Final Adjusted Cumulative SAR from the applicable Steps 1 through 4 and are reported on Page 1 of this report.

Table 11.1: Fluid Sensitivity Calculation

Fluid Sensitivity Calculation (1g)				
Delta SAR = Ce * Δe + Cσ*Δσ				
Ce = (-0.0007854*F ³) + (0.009402*F ²) - (0.02742*F) - 0.2026				
Cσ = (0.009804*F ³) - (0.08661*F ²) + (0.02981*F) + 0.7829				
Attribute	Plot ID	Freq. [F] (GHz)	Plot ID	Freq. [F] (GHz)
	F1	0.406	B6	0.418
Ce	-0.2122		-0.2125	
Cσ	0.7814		0.7809	
Δe	3.28%		-3.34%	
Δσ	-2.99%		1.92%	
ΔSAR	-3.03%		2.21%	
Scaling of SAR only required for Positive ΔSAR				

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.



Trevor Whillock
Test Lab Engineer
Celltech Labs Inc.

30 June 2017
Date

12.0 SAR EXPOSURE LIMITS

Table 12.0 Exposure Limits

SAR RF EXPOSURE LIMITS			
FCC 47 CFR§2.1093	Health Canada Safety Code 6	General Population / Uncontrolled Exposure ⁽⁴⁾	Occupational / Controlled Exposure ⁽⁵⁾
Spatial Average ⁽¹⁾ (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak ⁽²⁾ (Head and Trunk averaged over any 1 g of tissue)		1.6 W/kg	8.0 W/kg
Spatial Peak ⁽³⁾ (Hands/Wrists/Feet/Ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
(1) The Spatial Average value of the SAR averaged over the whole body.			
(2) 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.			
(3) 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.			
(4) Uncontrolled environments are defined as locations where there is potential exposure to individuals who have no knowledge or control of their potential exposure.			
(5) 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.			

13.0 DETAILS OF SAR EVALUATION

13.1 Day Log

DAY LOG					Fluid Dielectric	SPC	Test
Date	Ambient Temp °C	Fluid Temp °C	Humidity	TSL			
06 Jun 2017	22	22.9	22%	450B	X	X	
07 Jun 2017	25	22.9	21%	450H			X
07 Jun 2017	25	23.2	21%	450H			X
08 Jun 2017	25	22.7	22%	450H			X
09 Jun 2017	22	22.4	22%	450H			X
09 Jun 2017	25	23.5	18%	450H			X
13 Jun 2017	25	23.9	0.18	2450B	X	X	
13 Jun 2017	25	24.0	0.19	2450B			X
14 Jun 2017	24	23.1	0.15	2450B			X
14 Jun 2017	24	23.1	0.15	2450B			X
14 Jun 2017	25	20.9	0.14	5250B	X	X	
15 Jun 2017	21	21.9	0.17	5250B			X

13.2 DUT Setup and Configuration

DUT Setup and Configuration	
Overview	The XL-185P is identical in electronic circuitry to the XL-200P with the exception that it had been designed to be a Single Band Radio. The number of test channels and test configurations performed on this device were based on the antenna and accessory combinations which produced the highest, or worst case, SAR from previous SAR evaluations of the XL-200P, FCC ID: OWDTR-0133-E, ISEDC ID: 3636B-0133. Section 3.0 identifies those test channels and each channel was tested in the BODY and FACE configuration. Sample measurements of the original XL-200P in the worst case configurations were made and compared to previous measurement data taken from the same XL-200P in the same configurations from the original filing and used to establish a base-line. Measurements from the XL-185P in the same configurations were compared to the base-line measurements and were found to be within 5% of the base-line. From this, justification is made for the determination of test channels, configurations and accessory combinations. The XL-185P was evaluated at the maximum conducted output power level, preset by the manufacturer, with a fully charged battery 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 with a manually operated transmit pushbutton, a 50% duty cycle compensation for the <u>reported SAR</u> was used, as per FCC KDB 447498 (6.1). This was applied only to the LMR bands. The test procedures outlined in FCC KDB 643646 "SAR Test Reduction Considerations for Occupational PTT Radios" as well as FCC KDB 865664, ISEDC RSS-102 and IEEE 1528 were used throughout the evaluation of this device in the LMR bands.

13.3 DUT Positioning

DUT Positioning	
Positioning	The DUT Positioner was securely fastened to the Phantom Platform. Registration marks were placed on the DUT and the Positioner to ensure consistent positioning of the DUT for each test evaluation.
FACE Configuration	The DUT was securely clamped into the device holder with the surface of the DUT normally held to the user's face facing the phantom. The device holder was adjusted to ensure that the horizontal axis of the DUT was parallel to the bottom of the phantom. A 25mm spacer block was used to set the separation distance between the DUT and the phantom to 25mm. When applicable and unless by design, the antenna of the DUT was prevented from sagging away from the phantom. The spacer block was removed before testing.
BODY Configuration	Body-Worn and Audio Accessories were affixed to the DUT in the manner in which they are intended to be used. The DUT, with its accessories, were securely clamped into the device holder with the surface of the DUT normally in contact with the body in direct contact with the bottom of the phantom, or 0mm separation from the DUT's accessory to the phantom. Body-Worn Accessory straps, linkages, etc. were positioned in a fashion resembling that for which they were intended to be used. Audio Accessory cables, etc., were positioned in a fashion resembling that for which they were intended to be used.
HEAD Configuration	This device is not intended to be held to the ear and was not tested in the HEAD configuration.

13.4 General Procedures and Report

General Procedures and Reporting

General Procedures

The fluid dielectric parameters of the Active Tissue Simulating Liquid (TSL) were measured as described in this Section, recorded and entered into the DASY Measurement Server. Active meaning the TSL used during the SAR evaluation of the DUT. The temperature of the Active TSL was measured and recorded prior to performing a System Performance Check (SPC). An SPC was performed with the Active TSL prior to the start of the test series. The temperature of the Active TSL was measured throughout the day and the Active TSL temperature was maintained to $\pm 0.5^{\circ}\text{C}$. The Active TSL temperature was maintained to within $\pm 1.0^{\circ}\text{C}$ throughout the test series. TSL analysis and SPC were repeated when the Active TSL use exceeded 84 hours.

An Area Scan exceeding the length and width of the DUT projection was performed and the locations of all maximas within 2dB of the Peak SAR recorded. A Zoom Scan centered over the Peak SAR location(s) was performed and the 1g and 10g SAR values recorded. The resolutions of the Area Scan and Zoom Scan are described in the Scan Resolution table(s) in this Section. A Power Reference Measurement was taken at the phantom reference point immediately prior to the Area Scan. A Power Drift measurement was taken at the phantom reference point immediately following the Zoom Scan to determine the power drift. A Z-Scan from the Maximum Distance to Phantom Surface to the fluid surface was performed following the power drift measurement.

Reporting

The 1g SAR, 10g SAR and power drift measurements are recorded in the SAR Measurement Summary tables in the SAR Measurement Summary Section of this report. The SAR values shown in the 100% DC (Duty Cycle) column are the SAR values reported by the SAR Measurement Server with the DUT operating at 100% transmit duty cycle. The SAR values in the 50% DC column have been scaled by 50% for 50% Push-To-Talk duty cycle compensation. These tables also include other information such as transmit channel and frequency, modulation, accessories tested and DUT-phantom separation distance.

In the Scaling of Maximum Measured SAR Section of this report, the highest measured SAR in the BODY and FACE configurations, within the entire scope of this assessment, are, when applicable, scaled for Fluid Sensitivity, Manufacturer's Tune-Up Tolerance, Simultaneous Transmission and Drift. With the exception of Duty Cycle correction/compensation, SAR values are ONLY scaled up, not down. The final results of this scaling is the reported SAR which appears on the Cover Page of this report.

13.5 Fluid Dielectric and Systems Performance Check

Fluid Dielectric and Systems Performance Check	
Fluid Dielectric Measurement Procedure	The fluid dielectric parameters of the Tissue Simulating Liquid (TSL) are measured using the Open-Ended Coax Method connected to an Agilent 8753ET Network Analyzer connected to a measurement server running April Dielectric Property Measurement System. A frequency range of $\pm 100\text{MHz}$ for frequencies $> 300\text{MHz}$ and $\pm 50\text{MHz}$ for frequencies $\leq 300\text{MHz}$ with frequency step size of 10MHz is used. The center frequency is centered around the SAR measurement probe's calibration point for that TSL frequency range. A calibration of the setup is performed using a short-open-deionized water (at 23°C in a 300ml beaker) method. A sample of the TSL is placed in a 300ml beaker and the open-ended coax is submerged approximately 8mm below the fluid surface in the approximate center of the beaker. A check of the setup is made to ensure no air is trapped under the open-ended coax. The sample of TSL is measured and compared to the FCC OET Bulletin 65 Supplement C targets for HEAD or BODY for the entire fluid measurement range. Fluid adjustment are made if the dielectric parameters are $> 5\%$ in range that the DUT is to be tested. If the adjustments fail to bring the parameters to $\leq 5\%$ but are $< 10\%$, the SAR Fluid Sensitivity as per IEC 62201-1 and FCC KDB 865664 are applied to the highest measured SAR. A TSL with dielectric parameters $> 10\%$ in the DUT test frequency range are not used.
Systems Performance Check	The fluid dielectric parameters of the Active TSL are entered into the DASY Measurement Server at each of the 10MHz step size intervals. Active meaning the TSL used during the SAR evaluation of the DUT. The DASY Measurement System will automatically interpolate the dielectric parameters for DUT test frequencies that fall between the 10MHz step intervals. A Systems Performance Check (SPC) is performed in accordance with IEEE 1528 "System Check" and FCC KDB 865664 "System Verification". A validation source, dipole or Confined Loop Antenna (CLA), is placed under the geometric center of the phantom and separated from the phantom in accordance to the validation source's Calibration Certificate data. A CW signal set to the frequency of the validate source's and SAR measurement probe's calibration frequency with a forward power set to the validation source's Calibration Certificate data power setting is applied to the validation source. An Area Scan is centered over the projection of the validation source's feed point and an Area Scan is taken. A Zoom Scan centered over the Peak SAR measurement of the Area Scan and the 1g and 10g SAR is measured. The measured 1g and 10g SAR is compared to the 1g and 10g SAR measurements from the validation source's Calibration Certificate. When required, the measured SAR is normalized to 1.0W and compared to the normalized SAR indicated on the validation source's Calibration Certificate. The SPC is considered valid when the measured and normalized SAR is $\leq 10\%$ of the measured and normalize SAR of the validation source's Calibration Certificate. The fluid dielectric parameters of the Active TSL and SPC are repeated when the Active TSL has been in use for greater than 84 hours or if the Active TSL temperature has exceed $\pm 1^{\circ}\text{C}$ of the initial fluid analysis.

13.6 Scan Resolution 100MHz to 2GHz

Scan Resolution 100MHz to 2GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	$4 \pm 1 \text{ mm}$
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	$5^{\circ} \pm 1^{\circ}$
Area Scan Spatial Resolution $\Delta X, \Delta Y$	15 mm
Zoom Scan Spatial Resolution $\Delta X, \Delta Y$	7.5 mm
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	5 mm
Zoom Scan Volume X, Y, Z	30 mm
Phantom	ELI
Fluid Depth	$150 \pm 5 \text{ mm}$
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	

13.7 Scan Resolution 2GHz to 3GHz

Scan Resolution 2GHz to 3GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	4 ± 1 mm
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	5° ± 1°
Area Scan Spatial Resolution $\Delta X, \Delta Y$	12 mm
Zoom Scan Spatial Resolution $\Delta X, \Delta Y$	5 mm
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	5 mm
Zoom Scan Volume X, Y, Z	30 mm
Phantom	ELI
Fluid Depth	150 ± 5 mm
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	

13.8 Scan Resolution 5GHz to 6GHz

Scan Resolution 5GHz to 6GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	4 ± 1 mm
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	5° ± 1°
Area Scan Spatial Resolution $\Delta X, \Delta Y$	10 mm
Zoom Scan Spatial Resolution $\Delta X, \Delta Y$	4 mm
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	2 mm
Zoom Scan Volume X, Y, Z	22 mm
Phantom	ELI
Fluid Depth	100 ± 5 mm
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	

14.0 MEASUREMENT UNCERTAINTIES

Table 14.0 Measurement Uncertainty

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2013 Table 9)									
Uncertainty Component	IEEE 1528 Section	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value $\pm\%$ (1g)	Uncertainty Value $\pm\%$ (10g)	V_i or V_{eff}
Measurement System									
Probe Calibration*	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 14.1 Calculation of Degrees of Freedom

Table 14.1	
Calculation of the Degrees and Effective Degrees of Freedom	
$v_i = n - 1$	$v_{\text{eff}} = \frac{u_c^4}{m \sum_{i=1} \frac{c_i^4 u_i^4}{v_i}}$

15.0 FLUID DIELECTRIC PARAMETERS

Table 15.0 Fluid Dielectric Parameters 450MHz BODY TSL

Aprel Laboratory				
Test Result for UIM Dielectric Parameter				
Fri 06/Jun/2017 09:39:39				
Freq Frequency(GHz)				
FCC_eHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon				
FCC_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma				
FCC_eB FCC Limits for Body Epsilon				
FCC_sB FCC Limits for Body Sigma				
Test_e Epsilon of UIM				
Test_s Sigma of UIM				

Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.3500	57.70	0.93	56.26	0.88
0.3600	57.60	0.93	55.46	0.91
0.3700	57.50	0.93	56.48	0.91
0.3800	57.40	0.93	55.63	0.92
0.3900	57.30	0.93	54.98	0.92
0.4000	57.20	0.93	54.97	0.93
0.4100	57.10	0.93	55.33	0.94
0.4200	57.00	0.94	55.06	0.96
0.4300	56.90	0.94	55.13	0.95
0.4400	56.80	0.94	55.32	0.96
0.4500	56.70	0.94	54.84	0.97
0.4600	56.66	0.94	54.59	0.98
0.4700	56.62	0.94	54.52	1.00
0.4800	56.58	0.94	54.23	1.00
0.4900	56.54	0.94	53.83	1.00
0.5000	56.51	0.94	53.94	1.01
0.5100	56.47	0.94	53.79	1.04
0.5200	56.43	0.95	53.68	1.02
0.5300	56.39	0.95	53.65	1.06
0.5400	56.35	0.95	53.66	1.05
0.5500	56.31	0.95	53.00	1.06

FLUID DIELECTRIC PARAMETERS							
Date: 6 Jun 2017		Fluid Temp: 22.2		Frequency: 450MHz		Tissue: Body	
Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000		56.2600	0.8800	57.7000	0.93	-2.50%	-5.38%
360.0000		55.4600	0.9100	57.6000	0.93	-3.72%	-2.15%
370.0000		56.4800	0.9100	57.5000	0.93	-1.77%	-2.15%
378.0000	*	55.8000	0.9180	57.4200	0.93	-2.82%	-1.29%
380.0000		55.6300	0.9200	57.4000	0.93	-3.08%	-1.08%
390.0000		54.9800	0.9200	57.3000	0.93	-4.05%	-1.08%
400.0000		54.9700	0.9300	57.2000	0.93	-3.90%	0.00%
406.0000	*	55.1860	0.9360	57.1400	0.93	-3.42%	0.65%
410.0000		55.3300	0.9400	57.1000	0.93	-3.10%	1.08%
418.0000	*	55.1140	0.9560	57.0200	0.94	-3.34%	1.92%
420.0000		55.0600	0.9600	57.0000	0.94	-3.40%	2.13%
430.0000		55.1300	0.9500	56.9000	0.94	-3.11%	1.06%
440.0000		55.3200	0.9600	56.8000	0.94	-2.61%	2.13%
450.0000		54.8400	0.9700	56.7000	0.94	-3.28%	3.19%
460.0000		54.5900	0.9800	56.6600	0.94	-3.65%	4.26%
470.0000		54.5200	1.0000	56.6200	0.94	-3.71%	6.38%
480.0000		54.2300	1.0000	56.5800	0.94	-4.15%	6.38%
490.0000		53.8300	1.0000	56.5400	0.94	-4.79%	6.38%
500.0000		53.9400	1.0100	56.5100	0.94	-4.55%	7.45%
510.0000		53.7900	1.0400	56.4700	0.94	-4.75%	10.64%
520.0000		53.6800	1.0200	56.4300	0.95	-4.87%	7.37%
530.0000		53.6500	1.0600	56.3900	0.95	-4.86%	11.58%
540.0000		53.6600	1.0500	56.3500	0.95	-4.77%	10.53%
550.0000		53.0000	1.0600	56.3100	0.95	-5.88%	11.58%

*Channel Frequency Tested

Table 15.1 Fluid Dielectric Parameters 450MHz HEAD TSL

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Mon 09/Jun/2017 06:51:49
Freq Frequency(GHz)
FCC_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	47.20	0.80
0.3600	44.58	0.87	46.65	0.82
0.3700	44.46	0.87	46.58	0.82
0.3800	44.34	0.87	46.77	0.83
0.3900	44.22	0.87	46.07	0.82
0.4000	44.10	0.87	45.86	0.85
0.4100	43.98	0.87	45.21	0.84
0.4200	43.86	0.87	44.62	0.85
0.4300	43.74	0.87	44.92	0.87
0.4400	43.62	0.87	43.94	0.88
0.4500	43.50	0.87	44.25	0.89
0.4600	43.45	0.87	44.46	0.89
0.4700	43.40	0.87	44.71	0.91
0.4800	43.34	0.87	43.70	0.92
0.4900	43.29	0.87	44.28	0.91
0.5000	43.24	0.87	43.78	0.92
0.5100	43.19	0.87	43.11	0.95
0.5200	43.14	0.88	43.21	0.95
0.5300	43.08	0.88	43.08	0.94
0.5400	43.03	0.88	43.02	0.96
0.5500	42.98	0.88	42.65	0.97

FLUID DIELECTRIC PARAMETERS							
Date:	9 Jun 2017	Fluid Temp:	23.5	Frequency:	450MHz	Tissue:	Head
Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000		47.2000	0.8000	44.7000	0.87	5.59%	-8.05%
360.0000		46.6500	0.8200	44.5800	0.87	4.64%	-5.75%
370.0000		46.5800	0.8200	44.4600	0.87	4.77%	-5.75%
378.0000	*	46.7320	0.8280	44.3640	0.87	5.34%	-4.83%
380.0000		46.7700	0.8300	44.3400	0.87	5.48%	-4.60%
390.0000		46.0700	0.8200	44.2200	0.87	4.18%	-5.75%
400.0000		45.8600	0.8500	44.1000	0.87	3.99%	-2.30%
406.0000	*	45.4700	0.8440	44.0280	0.87	3.28%	-2.99%
410.0000		45.2100	0.8400	43.9800	0.87	2.80%	-3.45%
418.0000	*	44.7380	0.8480	43.8840	0.87	1.95%	-2.53%
420.0000		44.6200	0.8500	43.8600	0.87	1.73%	-2.30%
430.0000		44.9200	0.8700	43.7400	0.87	2.70%	0.00%
440.0000		43.9400	0.8800	43.6200	0.87	0.73%	1.15%
450.0000		44.2500	0.8900	43.5000	0.87	1.72%	2.30%
460.0000		44.4600	0.8900	43.4500	0.87	2.32%	2.30%
470.0000		44.7100	0.9100	43.4000	0.87	3.02%	4.60%
480.0000		43.7000	0.9200	43.3400	0.87	0.83%	5.75%
490.0000		44.2800	0.9100	43.2900	0.87	2.29%	4.60%
500.0000		43.7800	0.9200	43.2400	0.87	1.25%	5.75%
510.0000		43.1100	0.9500	43.1900	0.87	-0.19%	9.20%
520.0000		43.2100	0.9500	43.1400	0.88	0.16%	7.95%
530.0000		43.0800	0.9400	43.0800	0.88	0.00%	6.82%
540.0000		43.0200	0.9600	43.0300	0.88	-0.02%	9.09%
550.0000		42.6500	0.9700	42.9800	0.88	-0.77%	10.23%

*Channel Frequency Tested

Table 15.2 Fluid Dielectric Parameters 2450MHz BODY TSL

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Tue 27/Jun/2017 10:34:18
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
2.3500	52.83	1.85	49.65	1.79
2.3600	52.82	1.86	49.65	1.81
2.3700	52.81	1.87	49.50	1.82
2.3800	52.79	1.88	49.56	1.82
2.3900	52.78	1.89	49.45	1.82
2.4000	52.77	1.90	49.52	1.87
2.4100	52.75	1.91	49.39	1.87
2.4200	52.74	1.92	49.45	1.87
2.4300	52.73	1.93	49.32	1.92
2.4400	52.71	1.94	49.26	1.93
2.4500	52.70	1.95	49.31	1.92
2.4600	52.69	1.96	49.26	1.91
2.4700	52.67	1.98	49.44	1.96
2.4800	52.66	1.99	49.30	1.96
2.4900	52.65	2.01	49.29	1.94
2.5000	52.64	2.02	49.06	1.99
2.5100	52.62	2.04	49.08	2.00
2.5200	52.61	2.05	49.04	2.01
2.5300	52.60	2.06	49.11	2.02
2.5400	52.59	2.08	49.09	2.05
2.5500	52.57	2.09	49.02	2.06

FLUID DIELECTRIC PARAMETERS							
Date:	27 Jun 2017	Fluid Temp:	24.3	Frequency:	2450MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
2350.0000	49.6500	1.7900	52.8300	1.85	-6.02%	-3.24%	
2360.0000	49.6500	1.8100	52.8200	1.86	-6.00%	-2.69%	
2370.0000	49.5000	1.8200	52.8100	1.87	-6.27%	-2.67%	
2380.0000	49.5600	1.8200	52.7900	1.88	-6.12%	-3.19%	
2390.0000	49.4500	1.8200	52.7800	1.89	-6.31%	-3.70%	
2400.0000	49.5200	1.8700	52.7700	1.90	-6.16%	-1.58%	
2410.0000	49.3900	1.8700	52.7500	1.91	-6.37%	-2.09%	
2420.0000	49.4500	1.8700	52.7400	1.92	-6.24%	-2.60%	
2430.0000	49.3200	1.9200	52.7300	1.93	-6.47%	-0.52%	
2440.0000	49.2600	1.9300	52.7100	1.94	-6.55%	-0.52%	
2450.0000	49.3100	1.9200	52.7000	1.95	-6.43%	-1.54%	
2460.0000	49.2600	1.9100	52.6900	1.96	-6.51%	-2.55%	
2470.0000	49.4400	1.9600	52.6700	1.98	-6.13%	-1.01%	
2480.0000	49.3000	1.9600	52.6600	1.99	-6.38%	-1.51%	
2490.0000	49.2900	1.9400	52.6500	2.01	-6.38%	-3.48%	
2500.0000	49.0600	1.9900	52.6400	2.02	-6.80%	-1.49%	
2510.0000	49.0800	2.0000	52.6200	2.04	-6.73%	-1.96%	
2520.0000	49.0400	2.0100	52.6100	2.05	-6.79%	-1.95%	
2530.0000	49.1100	2.0200	52.6000	2.06	-6.63%	-1.94%	
2540.0000	49.0900	2.0500	52.5900	2.08	-6.66%	-1.44%	
2550.0000	49.0200	2.0600	52.5700	2.09	-6.75%	-1.44%	

*Channel Frequency Tested

Table 15.3 Fluid Dielectric Parameters 5200MHz BODY TSL

 Aprel Laboratory
 Test Result for UIM Dielectric Parameter
 Wed 14/Jun/2017 17:47:59
 Freq Frequency(GHz)
 FCC_eHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
 FCC_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
 FCC_eBFCC Limits for Body Epsilon
 FCC_sBFCC Limits for Body Sigma
 Test_e Epsilon of UIM
 Test_s Sigma of UIM

Freq	FCC_eB	FCC_sB	Test_e	Test_s
5.1500	49.08	5.24	47.19	5.47
5.1600	49.07	5.25	46.85	5.63
5.1700	49.06	5.26	47.02	5.67
5.1800	49.04	5.28	46.97	5.69
5.1900	49.03	5.29	47.02	5.75
5.2000	49.01	5.30	46.78	5.71
5.2100	49.00	5.31	47.04	5.59
5.2200	48.99	5.32	46.72	5.56
5.2300	48.97	5.33	46.66	5.69
5.2400	48.96	5.35	46.62	5.64
5.2500	48.95	5.36	46.38	5.65
5.2600	48.93	5.37	46.45	5.73
5.2700	48.92	5.38	46.23	5.75
5.2800	48.91	5.39	46.21	5.82
5.2900	48.89	5.40	46.34	5.78
5.3000	48.88	5.42	46.33	5.87
5.3100	48.87	5.43	46.11	5.82
5.3200	48.85	5.44	46.11	5.69
5.3300	48.84	5.45	46.03	5.77
5.3400	48.82	5.46	45.83	5.76
5.3500	48.81	5.47	45.88	5.72

FLUID DIELECTRIC PARAMETERS							
Date:	14 Jun 2017	Fluid Temp:	20.9	Frequency:	5250MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
5150.0000	47.1900	5.4700	49.0800	5.24	-3.85%	4.39%	
5160.0000	46.8500	5.6300	49.0700	5.25	-4.52%	7.24%	
5170.0000	47.0200	5.6700	49.0600	5.26	-4.16%	7.79%	
5180.0000	46.9700	5.6900	49.0400	5.28	-4.22%	7.77%	
5190.0000	47.0200	5.7500	49.0300	5.29	-4.10%	8.70%	
5200.0000	46.7800	5.7100	49.0100	5.30	-4.55%	7.74%	
5210.0000	47.0400	5.5900	49.0000	5.31	-4.00%	5.27%	
5220.0000	46.7200	5.5600	48.9900	5.32	-4.63%	4.51%	
5230.0000	46.6600	5.6900	48.9700	5.33	-4.72%	6.75%	
5240.0000	46.6200	5.6400	48.9600	5.35	-4.78%	5.42%	
5250.0000	46.3800	5.6500	48.9500	5.36	-5.25%	5.41%	
5260.0000	46.4500	5.7300	48.9300	5.37	-5.07%	6.70%	
5270.0000	46.2300	5.7500	48.9200	5.38	-5.50%	6.88%	
5280.0000	46.2100	5.8200	48.9100	5.39	-5.52%	7.98%	
5290.0000	46.3400	5.7800	48.8900	5.40	-5.22%	7.04%	
5300.0000	46.3300	5.8700	48.8800	5.42	-5.22%	8.30%	
5310.0000	46.1100	5.8200	48.8700	5.43	-5.65%	7.18%	
5320.0000	46.1100	5.6900	48.8500	5.44	-5.61%	4.60%	
5330.0000	46.0300	5.7700	48.8400	5.45	-5.75%	5.87%	
5340.0000	45.8300	5.7600	48.8200	5.46	-6.12%	5.49%	
5350.0000	45.8800	5.7200	48.8100	5.47	-6.00%	4.57%	

*Channel Frequency Tested

16.0 SYSTEM VERIFICATION TEST RESULTS

Table 16.0 System Verification Results 450MHz BODY TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N	S/N	
06 Jun 2017		450	D450V3	1068	
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Body	21.9	22	22%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
54.84	56.70	-3.28%	0.97	0.94	3.19%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
1.13	1.12	0.89%	0.76	0.74	2.85%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
4.52	4.42	2.26%	3.04	2.92	3.97%
Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224 and IEC 62209-1. The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer. The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value. The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.					

Table 16.1 System Verification Results 450MHz HEAD TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N	S/N	
09 Jun 2017		450	D450V3	1068	
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	23.5	25	18%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
44.25	43.50	1.72%	0.89	0.87	2.30%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
1.23	1.16	6.03%	0.83	0.78	6.30%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
4.92	4.49	9.58%	3.31	3.02	9.54%
Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224 and IEC 62209-1. The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer. The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value. The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.					

Table 16.2 System Verification Results 2450MHz BODY TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N	S/N	
13 Jun 2017		2450	D2450V2	825	
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Body	24.0	25	19%	250	10
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
50.34	52.70	-4.48%	2.03	1.95	4.10%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
13.20	13.00	1.54%	6.08	6.05	0.50%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
52.80	50.70	4.14%	24.32	23.80	2.18%
Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224 and IEC 62209-1. The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer. The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value. The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.					

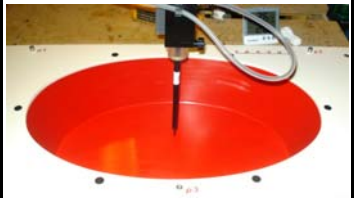
Table 16.3 System Verification Results 5250MHz BODY TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N	S/N	
14 Jun 2017		5250	D5GHzV2	1031	
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Body	20.9	25	14%	50	10
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
46.38	48.95	-5.25%	5.65	5.36	5.41%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
3.57	3.63	-1.70%	0.99	1.02	-3.00%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
71.40	72.20	-1.10%	19.78	20.30	-2.60%
Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224 and IEC 62209-1. The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer. The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value. The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.					

17.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 17.0 Measurement System Specifications

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: DASY
	Postprocessing Software: SEMCAD, V1.8 Build 186
Connecting Lines	Optical downlink for data and status info., Optical uplink for commands and clock
DASY Measurement Server	
Function	Real-time data evaluation for field measurements and surface detection
Hardware	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
Connections	COM1, COM2, DAE, Robot, Ethernet, Service Interface
E-Field Probe	
Model	EX3DV4
Serial No.	3600
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
Phantom	
Type	ELI Elliptical Planar Phantom
Shell Material	Fiberglass
Thickness	2mm +/- .2mm
Volume	> 30 Liter

Measurement System Specification		
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 $\pm 8\%$)	
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 μ W/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 SAM V5.0 phantom is an elliptical planar fiberglass shell phantom with a shell thickness of 2.0mm $\pm$.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 Phantom
Device Positioner Specification		
The DASY 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°. 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

18.0 TEST EQUIPMENT LIST

Table 18.0 Equipment List and Calibration

Test Equipment List				
DESCRIPTION	ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
Schmid & Partner DASY System	-	-	-	-
-DASY Measurement Server	158	1078	CNR	CNR
-Robot	46	599396-01	CNR	CNR
-DAE4	19	353	24-Apr-17	Annual
-EX3DV4 E-Field Probe	213	3600	27-Apr-17	Annual
-CLA150 Validation Source	251	4007	27-Apr-17	Triennial
-D835V2 Validation Dipole	217	4D075	23-Apr-15	Triennial
-D450V3 Validation Dipole	221	1068	21-Apr-15	Triennial
-D2450V2 Validation Dipole	219	825	23-Apr-15	Triennial
-D5GHzV2 Validation Dipole	126	1031	20-Apr-15	Triennial
ELI Phantom	247	-	CNR	CNR
HP 85070C Dielectric Probe Kit	33	none	CNR	CNR
Gigatronics 8652A Power Meter	110	1835801	29-Feb-16	Triennial
Gigatronics 80701A Power Sensor	248	1833687	29-Feb-16	Triennial
HP 8753ET Network Analyzer	134	US39170292	22-Oct-14	Triennial
Rohde & Schwarz SMR20 Signal Generator	6	100104	29-May-17	Triennial
Amplifier Research 5S1G4 Power Amplifier	106	26235	CNR	CNR

CNR = Calibration Not Required

19.0 FLUID COMPOSITION

Table 19.1 Fluid Composition 450MHz HEAD TSL

450			450MHz Head	
Tissue Simulating Liquid (TSL) Composition				
Component by Percent Weight				
Water	Sugar	Salt ⁽¹⁾	HEC ⁽²⁾	Bacteriacide ⁽³⁾
38.56	56.32	3.95	0.98	0.19

(1) Non-Iodinized

(2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g

(3) Dow Chemical DOWICIL 75 Antimicrobial Preservative

Table 19.2 Fluid Composition 450MHz BODY TSL

450			450MHz Body	
Tissue Simulating Liquid (TSL) Composition				
Component by Percent Weight				
Water	Sugar	Salt ⁽¹⁾	HEC ⁽²⁾	Bacteriacide ⁽³⁾
52.0	45.65	1.75	0.5	0.1

(1) Non-Iodinized

(2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g

(3) Dow Chemical DOWICIL 75 Antimicrobial Preservative

Table 19.3 Fluid Composition 2450MHz BODY TSL

2450			2450MHz Body	
Tissue Simulating Liquid (TSL) Composition				
Component by Percent Weight				
Water	Glycol	Salt ⁽¹⁾	HEC ⁽²⁾	Bacteriacide ⁽³⁾
69.98	30.0	0.02	0.0	0.0

(1) Non-Iodinized

(2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g

(3) Dow Chemical DOWICIL 75 Antimicrobial Preservative

Table 19.4 Fluid Composition 5250MHz BODY TSL

This is a proprietary composition by SPEAG.

APPENDIX A – SYSTEM VERIFICATION PLOTS

Date/Time: 07/06/2017 8:44:19 AM

Test Laboratory: Celltech Labs

DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/15/2015
Program Name: SPC 450B

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 450$ MHz; $\sigma = 0.97$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

Body d=15mm Pin=250mW, TS=[1.008][1.12][1.232]/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.37 mW/g

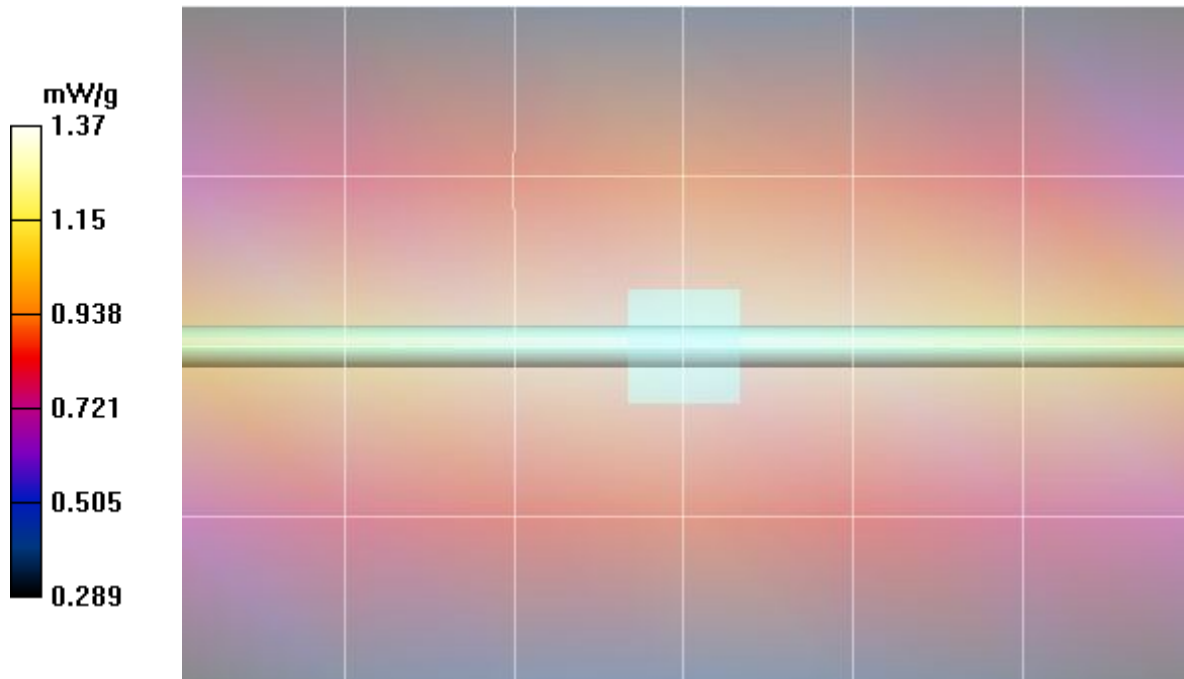
Body d=15mm Pin=250mW, TS=[1.008][1.12][1.232]/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

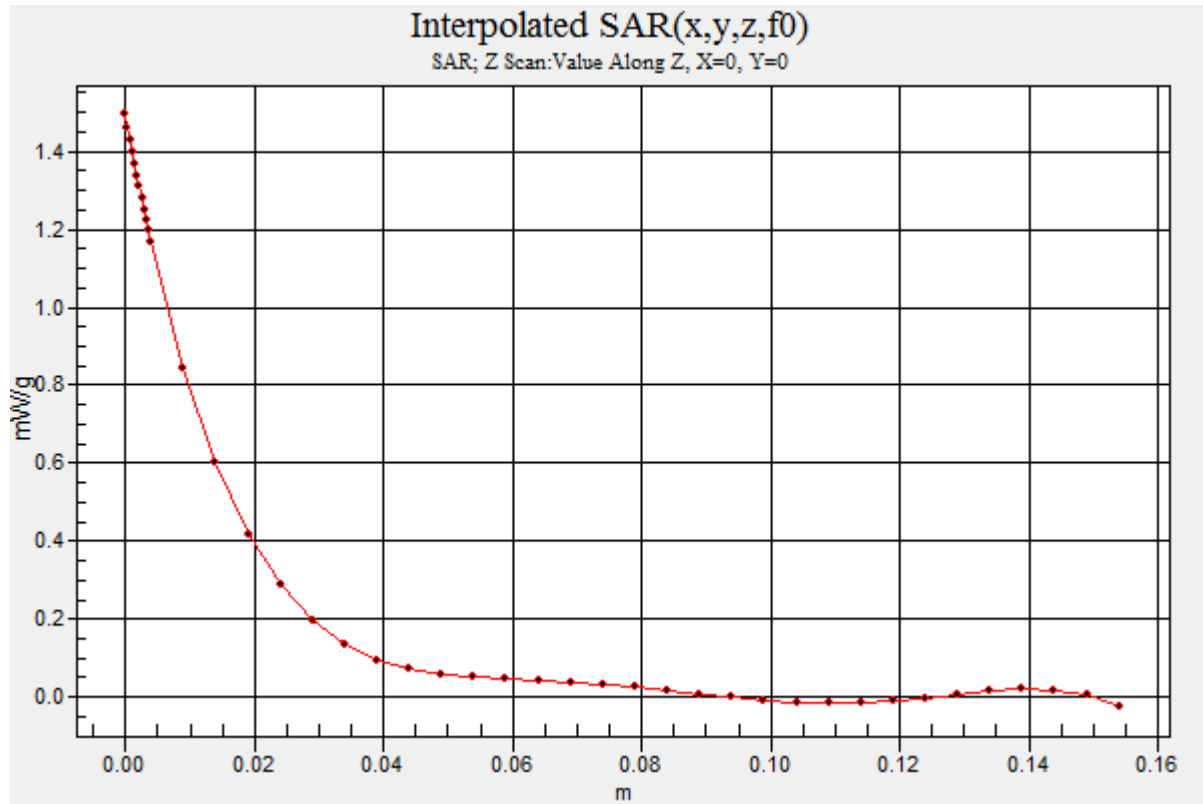
Reference Value = 37.9 V/m; Power Drift = -0.225 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.759 mW/g

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





Date/Time: 09/06/2017 1:18:04 PM

Test Laboratory: Celltech Labs

DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/15/2015
Program Name: SPC 450H

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 450$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 44.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.49, 9.49, 9.49); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

Head d=15mm Pin=250mW, TS=[1.044][1.16][1.276]/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

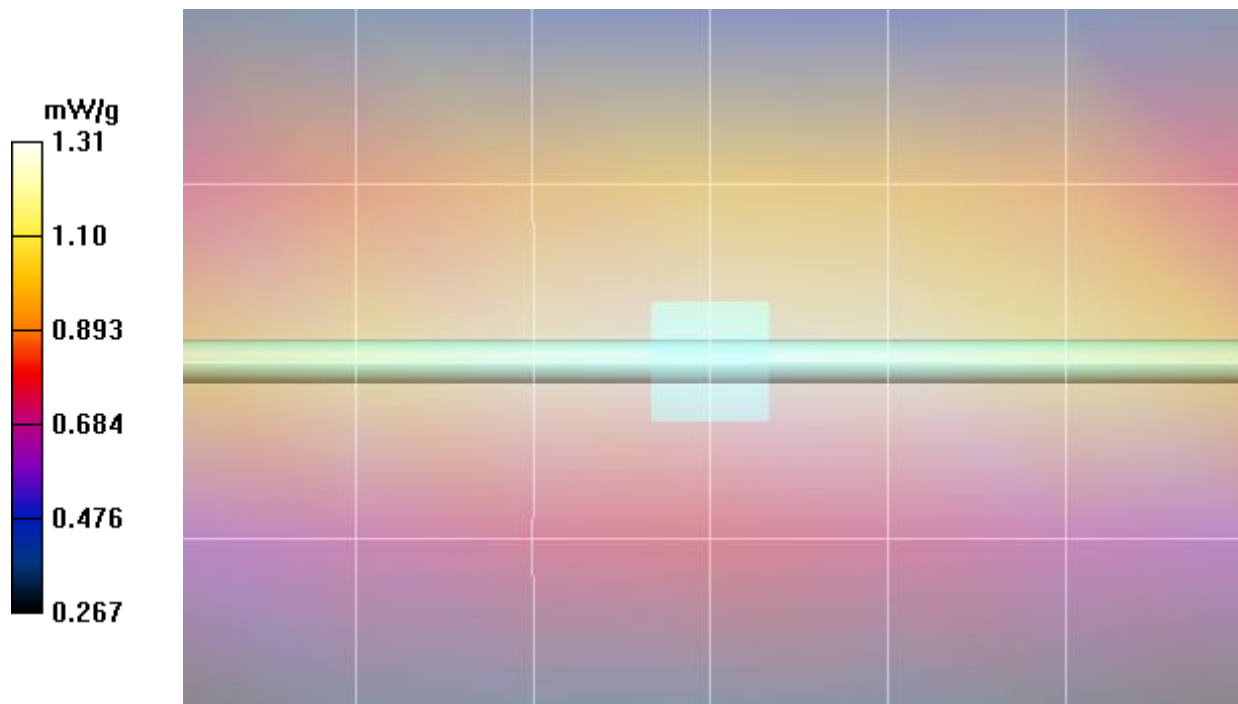
Maximum value of SAR (measured) = 1.31 mW/g

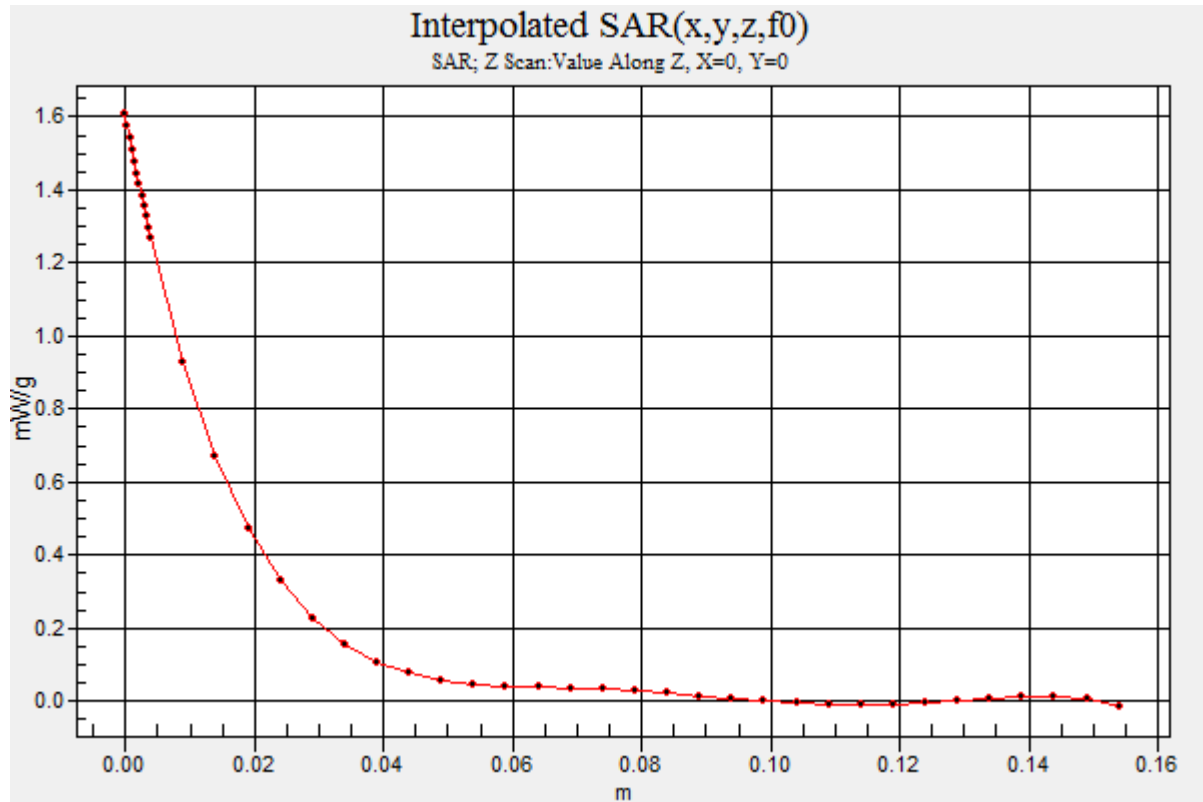
Head d=15mm Pin=250mW, TS=[1.044][1.16][1.276]/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 38.5 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.827 mW/g





Date/Time: 27/06/2017 10:46:14 AM

Test Laboratory: Celltech Labs

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 825; Calibrated: 15/04/2015
Program Name: 2450MHz Body SPC

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2450$ MHz; $\sigma = 1.92$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 5mm (Mechanical Surface Detection) Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

2450MHz Body Dipole d=10mm P=250mW TS=[11.7][13.0][14.3]/Area Scan (4x6x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 9.66 mW/g

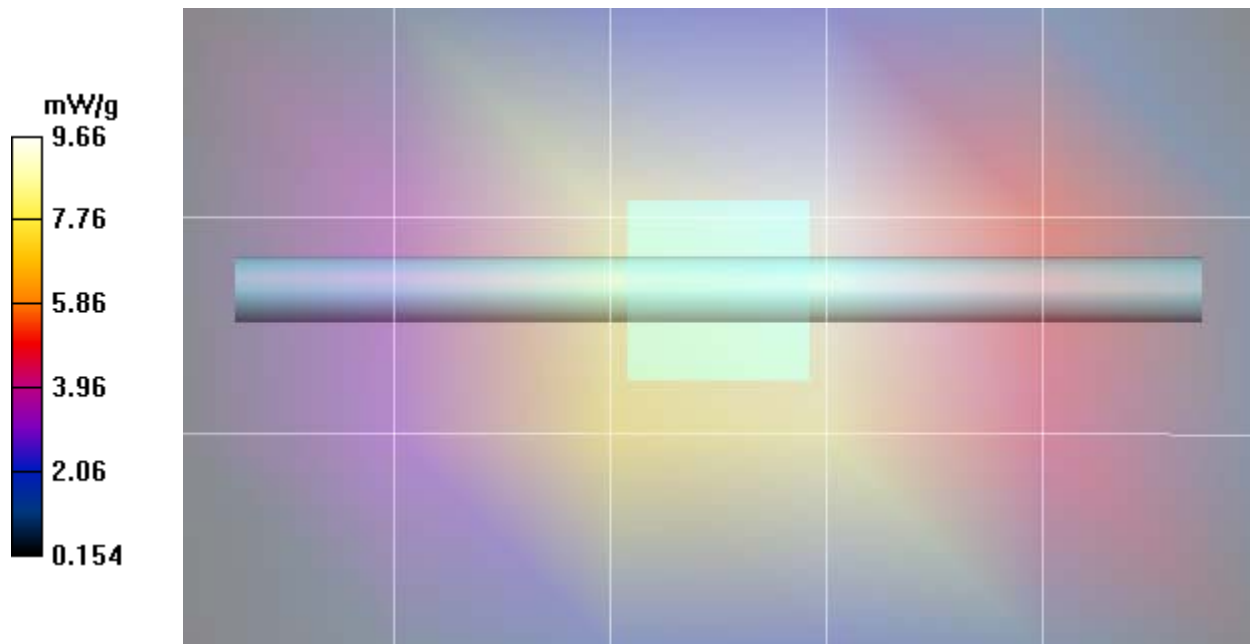
2450MHz Body Dipole d=10mm P=250mW TS=[11.7][13.0][14.3]/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

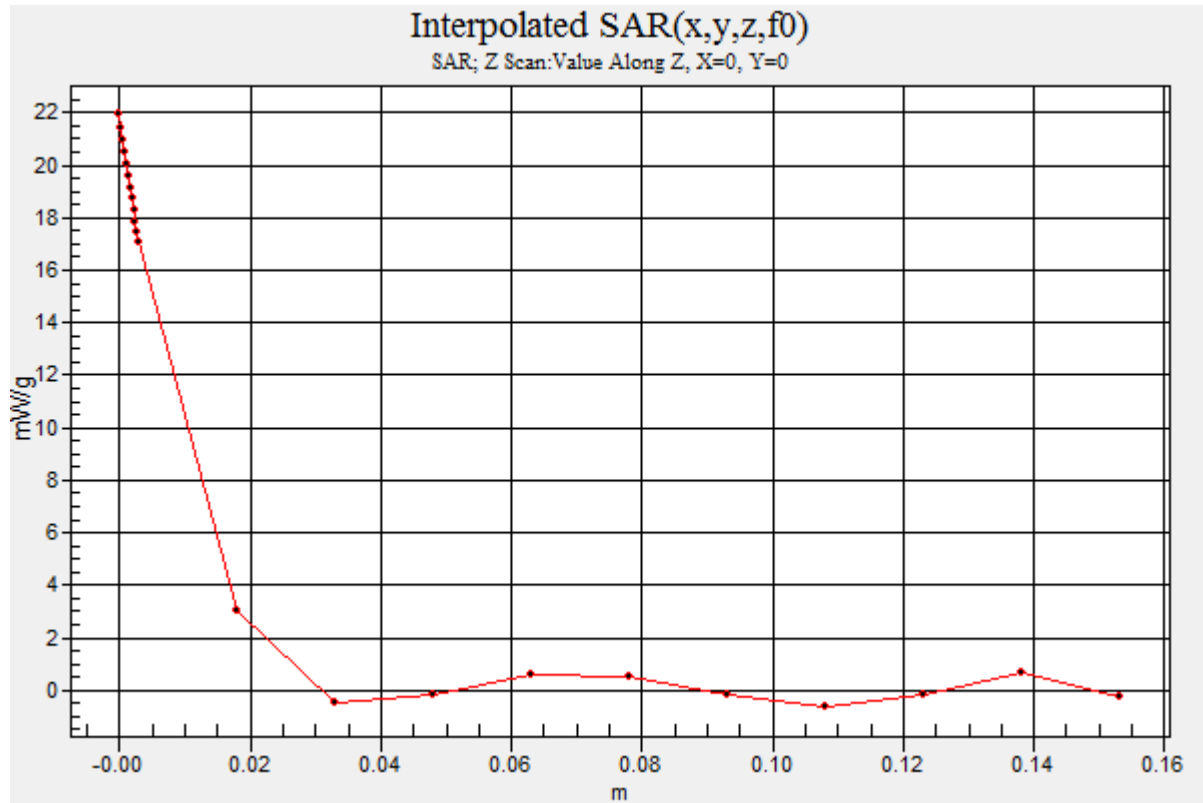
Reference Value = 95.0 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 27.6 W/kg

SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.07 mW/g

Maximum value of SAR (measured) = 17.2 mW/g





Date/Time: 14/06/2017 7:00:38 PM

Test Laboratory: Celltech Labs

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Calibrated: 04/15/2015
Program Name: 5250 MHz SPC

Communication System: CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5250$ MHz; $\sigma = 5.65$ mho/m; $\epsilon_r = 46.4$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

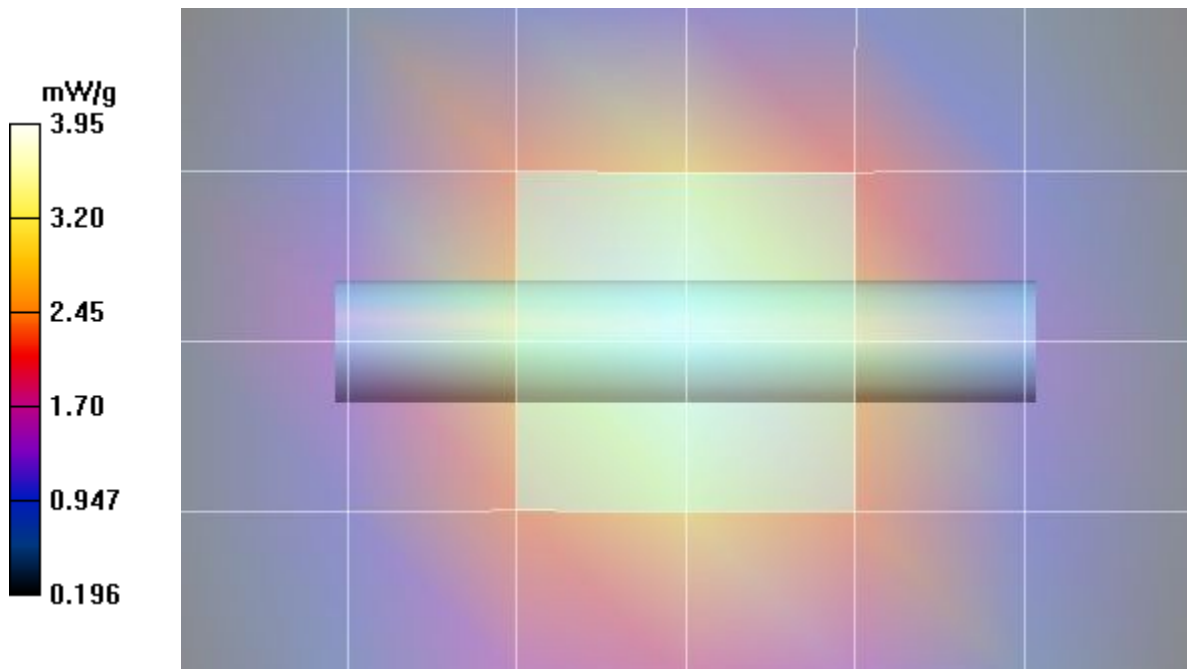
DASY Configuration:

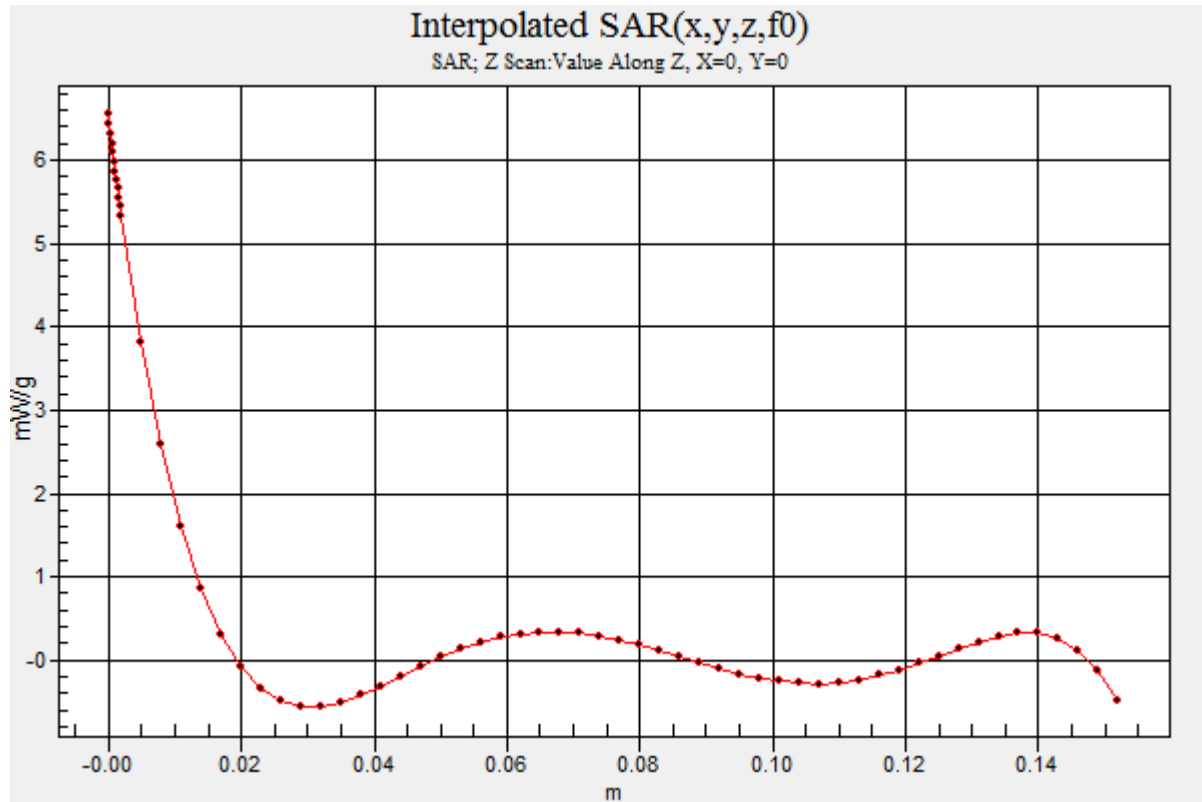
- Probe: EX3DV4 - SN3600; ConvF(4.18, 4.18, 4.18); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

5200-5800 MHz Dipole d=10mm P=50mW, TS=3.63/Area Scan (5x7x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 3.95 mW/g

5200-5800 MHz Dipole d=10mm P=50mW, TS=3.63/Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 39.0 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 3.57 mW/g; SAR(10 g) = 0.989 mW/g

Maximum value of SAR (measured) = 7.69 mW/g





APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR

Plot B1

Date/Time: 08/06/2017 12:06:38 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450B

Communication System: Harris UHF; Frequency: 406 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 406$ MHz; $\sigma = 0.936$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B1 Body, SYS_Eclipse XL-185P UHF , 406MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Area Scan (8x23x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 9.66 mW/g

B1 Body, SYS_Eclipse XL-185P UHF , 406MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

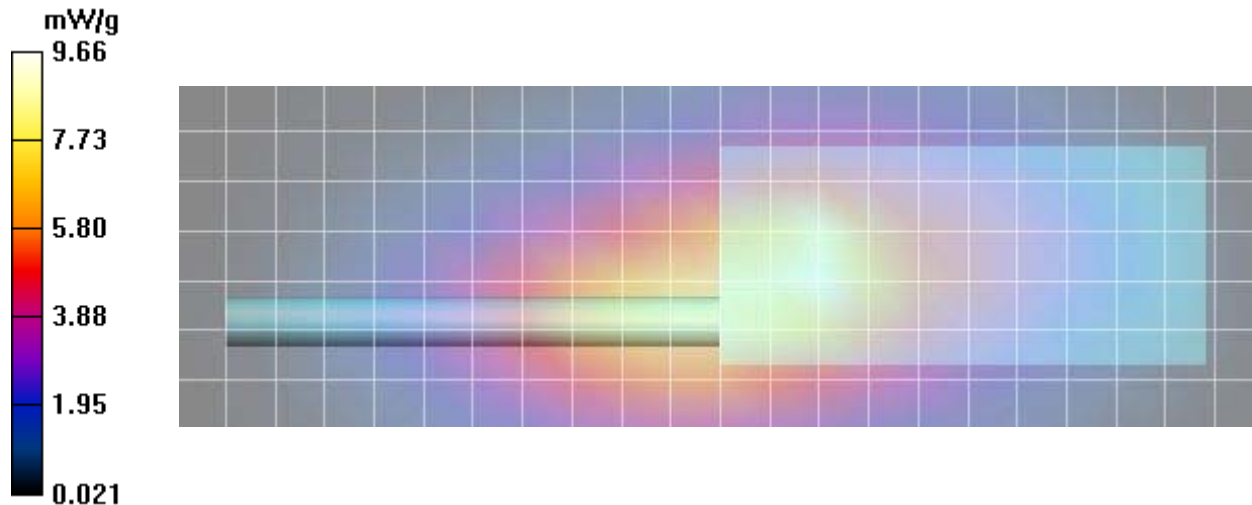
Reference Value = 89.2 V/m; Power Drift = -0.154 dB

Peak SAR (extrapolated) = 12.4 W/kg

SAR(1 g) = 8.37 mW/g; SAR(10 g) = 5.83 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 8.78 mW/g



Plot B2

Date/Time: 08/06/2017 1:50:16 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450B

Communication System: Harris UHF; Frequency: 378 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 378 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 55.8$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

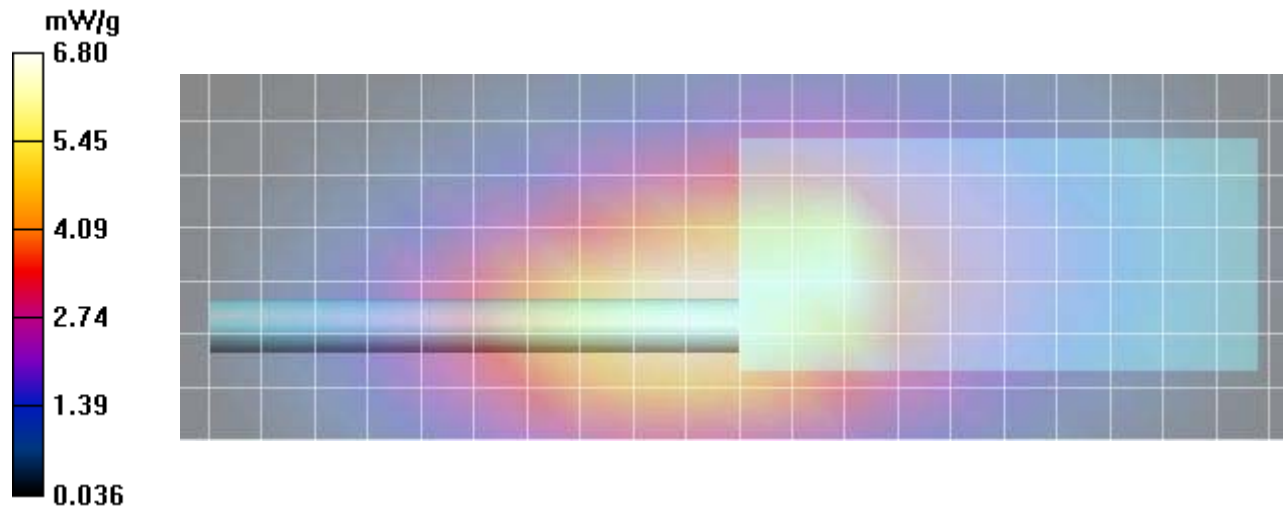
B2 Body, SYS_Eclipse XL-185P UHF , 378 MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Area Scan (8x23x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 6.80 mW/g

B2 Body, SYS_Eclipse XL-185P UHF , 378 MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 81.9 V/m; Power Drift = -0.321 dB
Peak SAR (extrapolated) = 8.66 W/kg
SAR(1 g) = 6.44 mW/g; SAR(10 g) = 4.7 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)



Plot B3

Date/Time: 08/06/2017 2:12:29 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver; Serial:
Program Name: 450B

Communication System: Harris UHF; Frequency: 418 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 418 \text{ MHz}$; $\sigma = 0.956 \text{ mho/m}$; $\epsilon_r = 55.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B3 Body, SYS_Eclipse XL-185P UHF ,418 MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Area Scan (8x23x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 8.45 mW/g

B3 Body, SYS_Eclipse XL-185P UHF ,418 MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

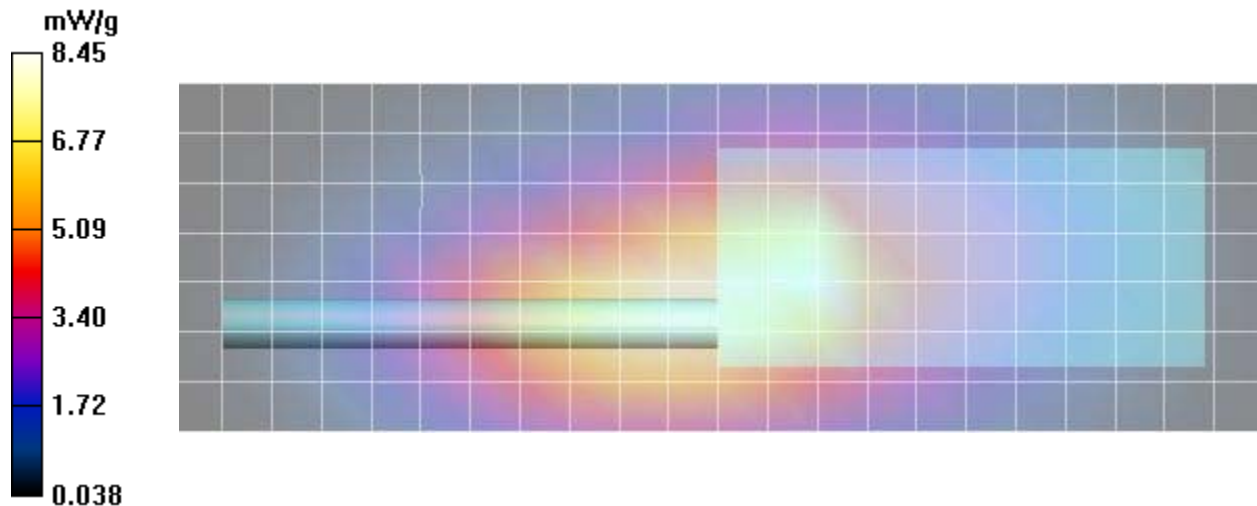
Reference Value = 88.4 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 12.0 W/kg

SAR(1 g) = 8.15 mW/g; SAR(10 g) = 5.71 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 8.86 mW/g



Plot B4

Date/Time: 08/06/2017 12:30:33 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450B

Communication System: Harris UHF; Frequency: 406 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 406$ MHz; $\sigma = 0.936$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B4 Body, SYS_Eclipse XL-185P UHF , 406MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 10.5 mW/g

B4 Body, SYS_Eclipse XL-185P UHF , 406MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

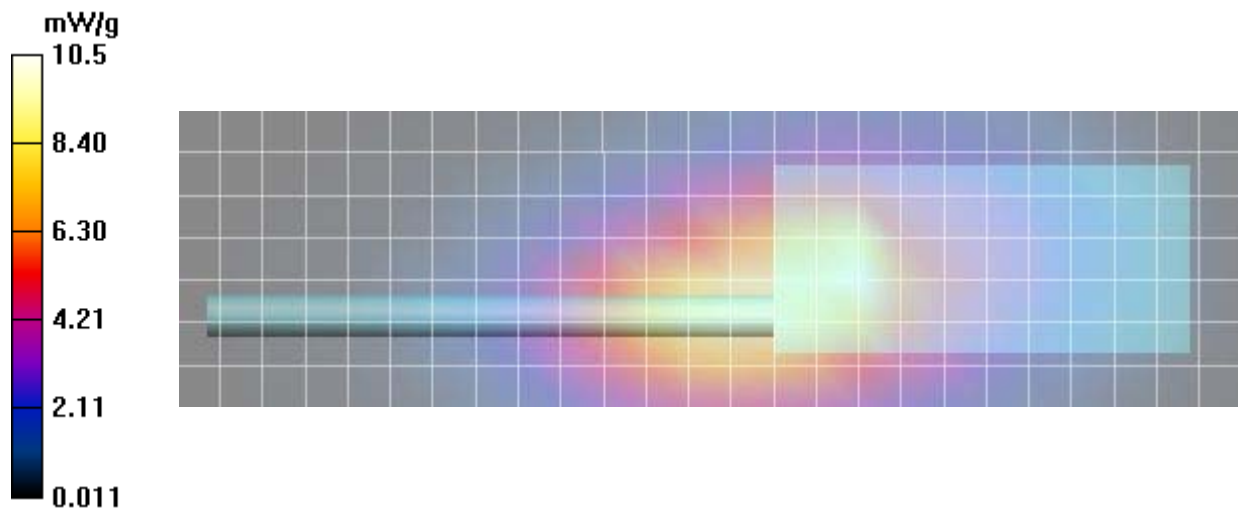
Reference Value = 95.7 V/m; Power Drift = -0.441 dB

Peak SAR (extrapolated) = 13.0 W/kg

SAR(1 g) = 8.87 mW/g; SAR(10 g) = 6.22 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 9.66 mW/g



Plot B5

Date/Time: 08/06/2017 2:39:58 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450B

Communication System: Harris UHF; Frequency: 378 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 378 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 55.8$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B5 Body, SYS_Eclipse XL-185P UHF ,378MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 7.43 mW/g

B5 Body, SYS_Eclipse XL-185P UHF ,378MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

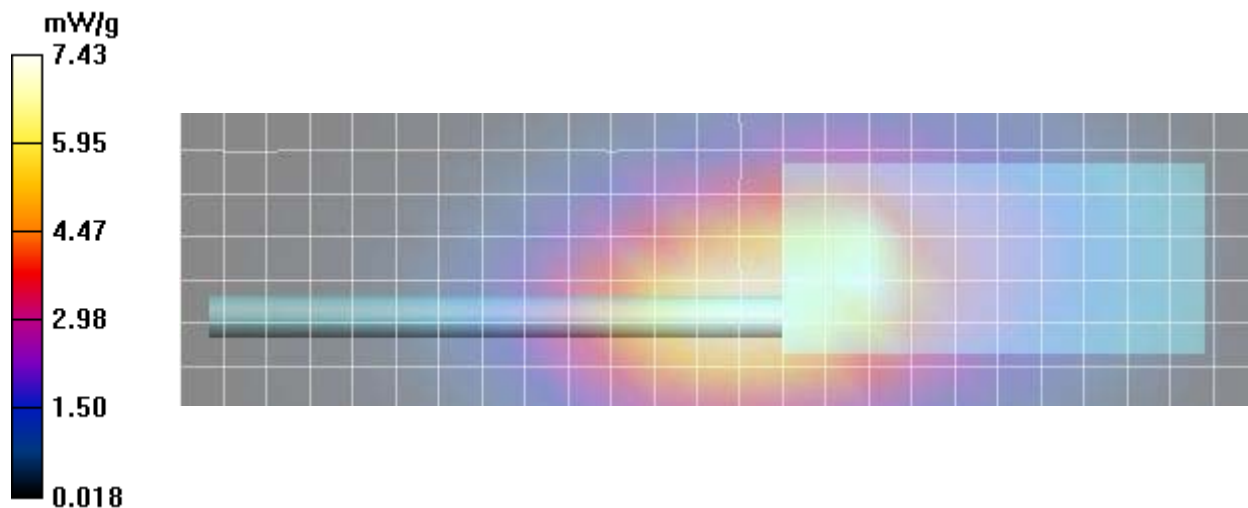
Reference Value = 84.0 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 7.02 mW/g; SAR(10 g) = 4.99 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 7.65 mW/g



Plot B6

Date/Time: 08/06/2017 3:01:21

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver
Program Name: 450B

Communication System: Harris UHF; Frequency: 418 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 418 \text{ MHz}$; $\sigma = 0.956 \text{ mho/m}$; $\epsilon_r = 55.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B6 Body, SYS_Eclipse XL-185P UHF ,418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

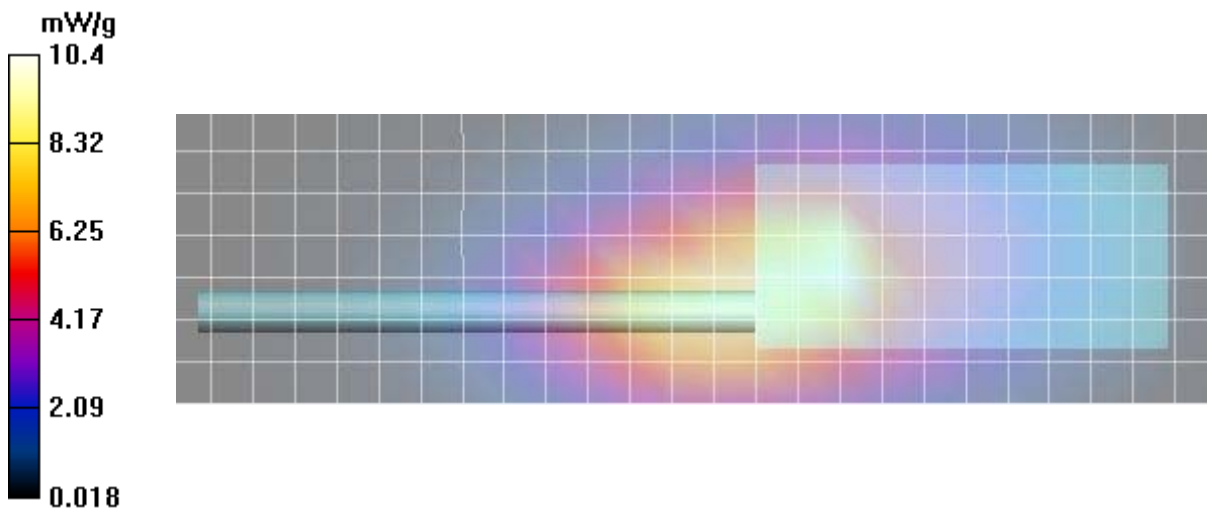
[Info: Interpolated medium parameters used for SAR evaluation!](#)

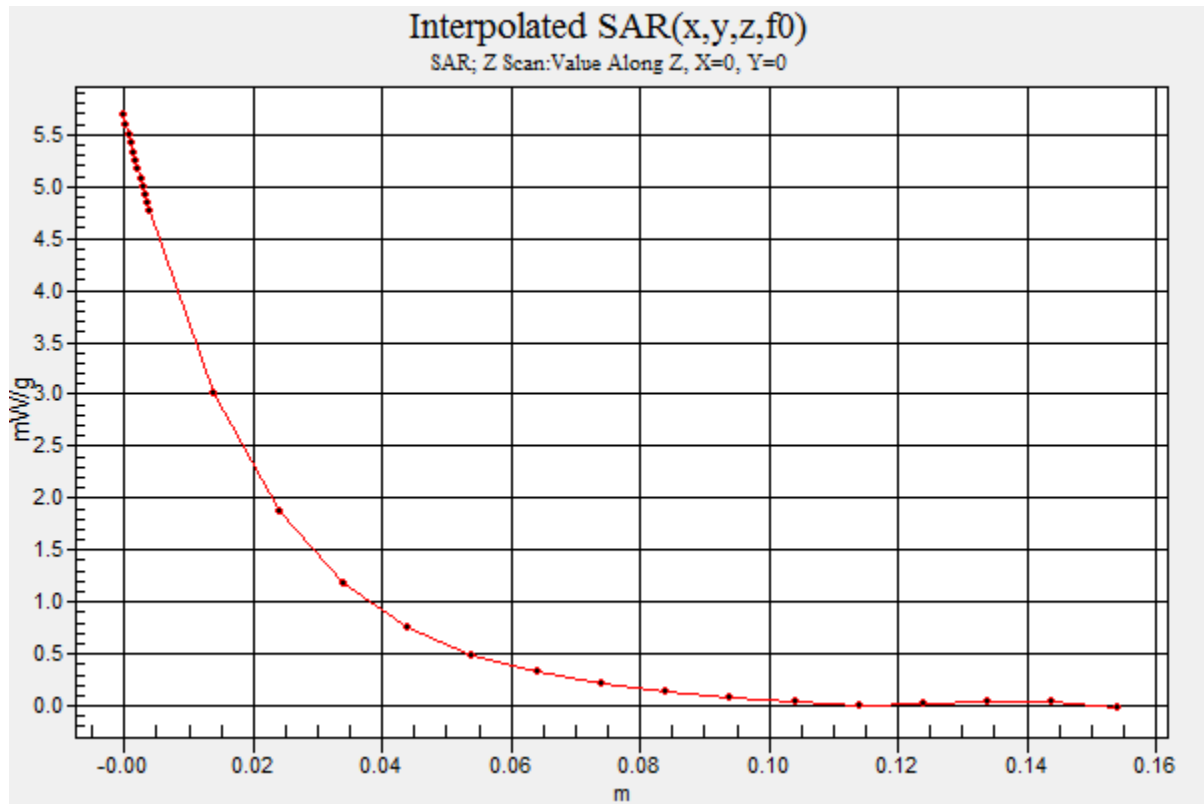
Maximum value of SAR (measured) = 10.4 mW/g

B6 Body, SYS_Eclipse XL-185P UHF ,418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$
Reference Value = 95.3 V/m; Power Drift = -0.203 dB
Peak SAR (extrapolated) = 13.7 W/kg
SAR(1 g) = 9.35 mW/g; SAR(10 g) = 6.57 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 10.2 mW/g





Plot B7

Date/Time: 08/06/2017 3:19:27 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450B

Communication System: Harris UHF; Frequency: 418 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 418 \text{ MHz}$; $\sigma = 0.956 \text{ mho/m}$; $\epsilon_r = 55.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B7 Body, SCAN_Eclipse XL-185P UHF , 418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

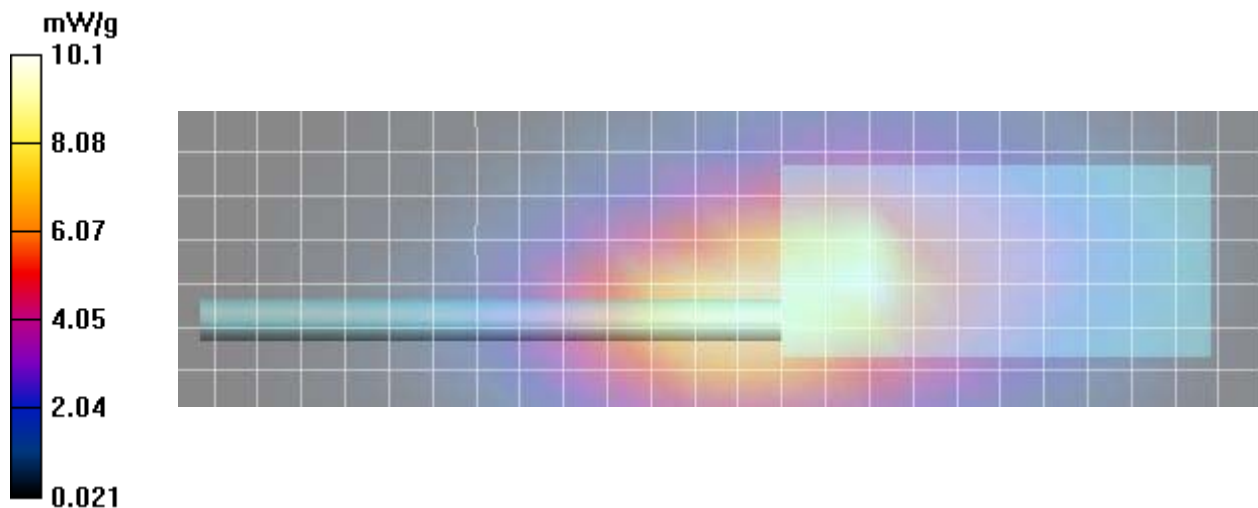
Maximum value of SAR (measured) = 10.1 mW/g

B7 Body, SCAN_Eclipse XL-185P UHF , 418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$
Reference Value = 95.0 V/m; Power Drift = -0.390 dB
Peak SAR (extrapolated) = 13.1 W/kg
SAR(1 g) = 8.92 mW/g; SAR(10 g) = 6.22 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 9.72 mW/g



Plot B8

Date/Time: 16/06/2017 2:43:10 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 5250B

Communication System: Wifi; Frequency: 5260 MHz; Duty Cycle: 1:1.2
Medium parameters used: $f = 5260$ MHz; $\sigma = 5.73$ mho/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(4.18, 4.18, 4.18); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B8 Body, SYS, Eclipse XL-185P UHF w/LTE, Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (11x29x1):

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.035 mW/g

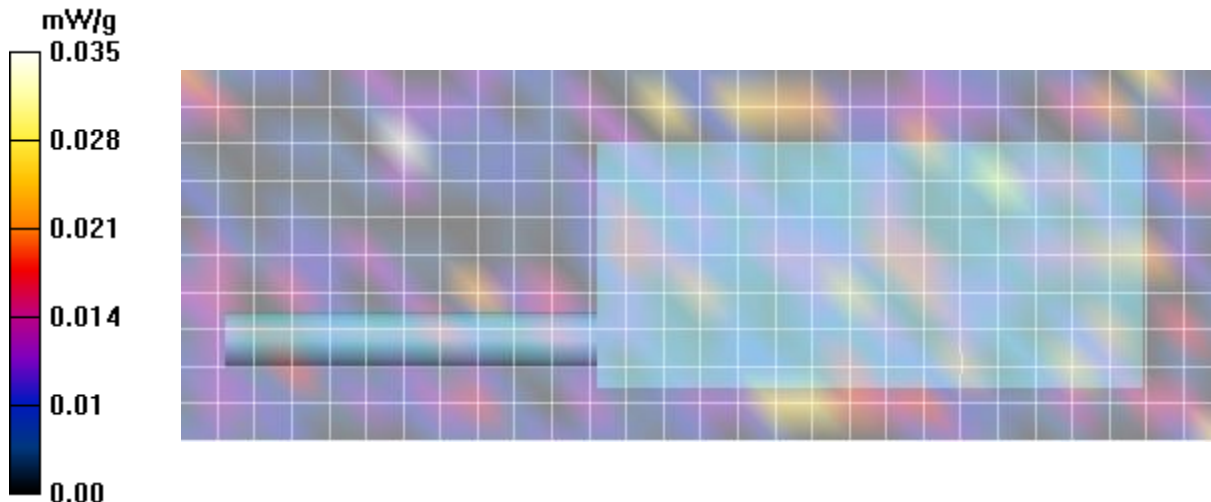
B8 Body, SYS, Eclipse XL-185P UHF w/LTE, Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=4mm

Reference Value = 0.406 V/m; Power Drift = 5.60 dB

Peak SAR (extrapolated) = 0.112 W/kg

SAR(1 g) = 0.0033 mW/g; SAR(10 g) = 0.00047 mW/g



Plot B9

Date/Time: 16/06/2017 3:12:02 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 5250B

Communication System: Wifi; Frequency: 5260 MHz; Duty Cycle: 1:1.2
Medium parameters used: $f = 5260$ MHz; $\sigma = 5.73$ mho/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(4.18, 4.18, 4.18); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B9 Body, SCAN, Eclipse XL-185P UHF w/LTE,Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (11x29x1):

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.042 mW/g

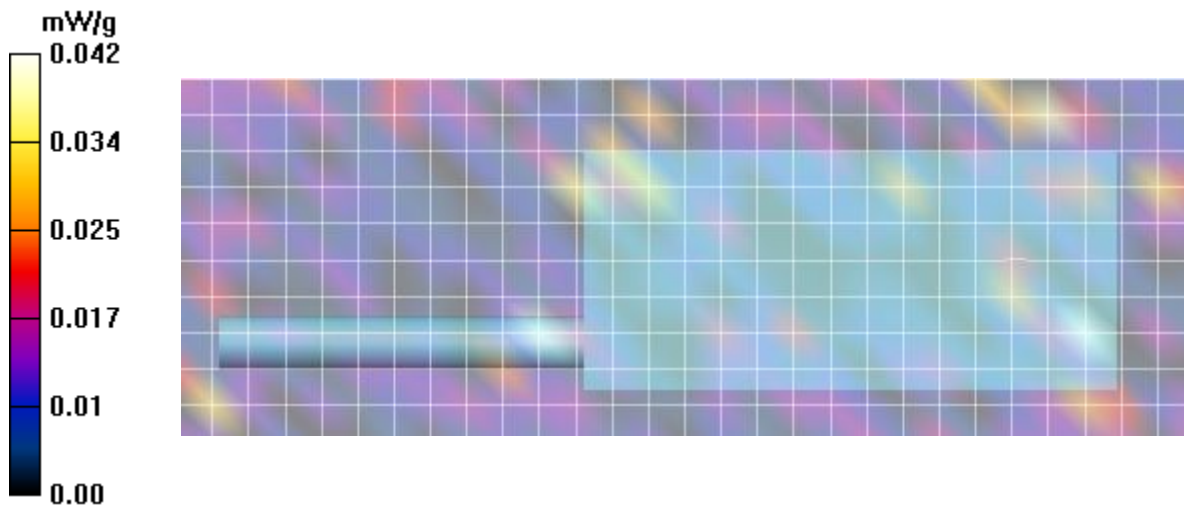
B9 Body, SCAN, Eclipse XL-185P UHF w/LTE,Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=4mm

Reference Value = 0.588 V/m; Power Drift = 8.78 dB

Peak SAR (extrapolated) = 0.045 W/kg

SAR(1 g) = 0.00302 mW/g; SAR(10 g) = 0.000489 mW/g



Plot B10

Date/Time: 19/06/2017 9:58:04 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 5250B

Communication System: Wifi; Frequency: 5260 MHz; Duty Cycle: 1:1.2
Medium parameters used: $f = 5260$ MHz; $\sigma = 5.73$ mho/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(4.18, 4.18, 4.18); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B10 Body/Side, SYS, Eclipse XL-185P UHF w/LTE,Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (11x29x1):

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.042 mW/g

B10 Body/Side, SYS, Eclipse XL-185P UHF w/LTE,Wifi 5260 MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan

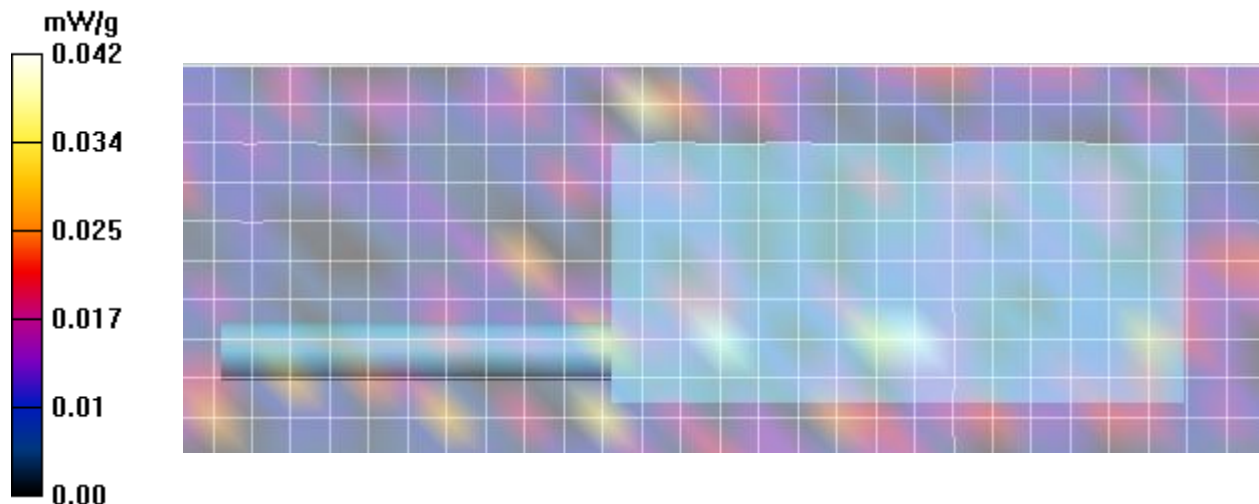
(7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=4mm

Reference Value = 0.412 V/m; Power Drift = -999.0 dB

Peak SAR (extrapolated) = 0.077 W/kg

SAR(1 g) = 0.00109 mW/g; SAR(10 g) = 0.00021 mW/g

Maximum value of SAR (measured) = 0.029 mW/g



Plot B11

Date/Time: 28/06/2017 10:35:01 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: WiFi; Frequency: 2437 MHz; Duty Cycle: 1:1.2
Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.93$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B11 Body, SYS_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1): Measurement grid: dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.023 mW/g

B11 Body, SYS_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:

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

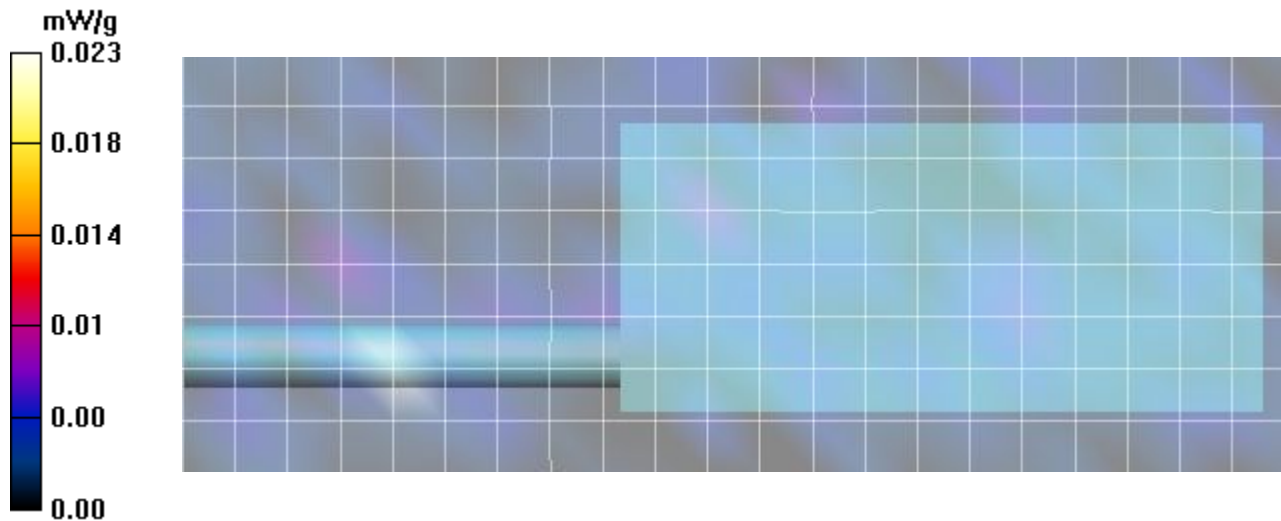
Reference Value = 0.889 V/m; Power Drift = -999.0 dB

Peak SAR (extrapolated) = 0.01 W/kg

SAR(1 g) = 0.00014 mW/g; SAR(10 g) = 3.88e-005 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.01 mW/g



Plot B12

Date/Time: 28/06/2017 10:56:10 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: WiFi; Frequency: 2437 MHz; Duty Cycle: 1:1.2
Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.93$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B12 Body,SCAN_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1): Measurement grid: dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.01 mW/g

B12 Body,SCAN_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:

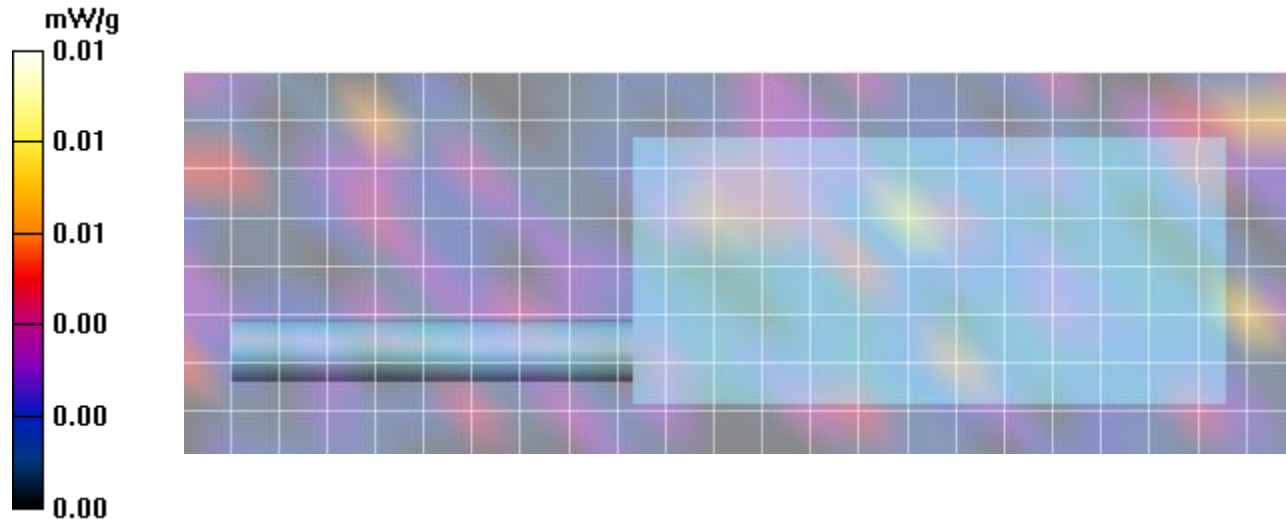
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.645 V/m; Power Drift = 1.45 dB

Peak SAR (extrapolated) = 0.01 W/kg

SAR(1 g) = 5.63e-005 mW/g; SAR(10 g) = 2.06e-005 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)



Plot B13

Date/Time: 28/06/2017 11:18:30 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: WiFi; Frequency: 2437 MHz; Duty Cycle: 1:1.2
Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.93$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B13 Body/Side, SYS_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1):
Measurement grid: dx=12mm, dy=12mm

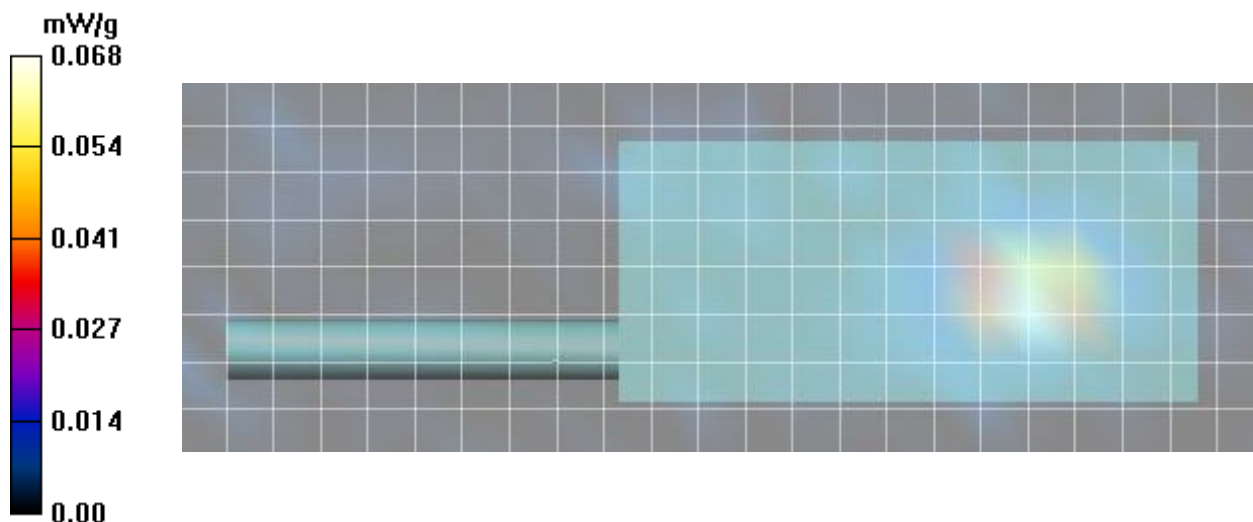
[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.068 mW/g

B13 Body/Side, SYS_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.00 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.160 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.029 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 0.078 mW/g



Plot B14

Date/Time: 28/06/2017 11:49:02 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

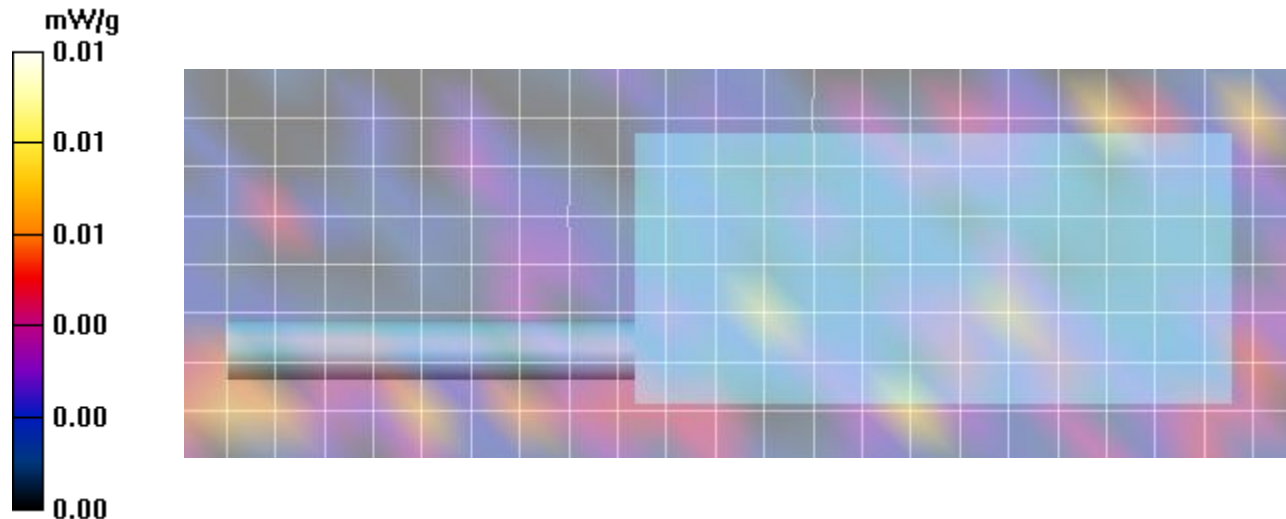
Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2480$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B14 Body, SYS_UHF Eclipse XL-185P BT, 2480MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.01 mW/g

B14 Body, SYS_UHF Eclipse XL-185P BT, 2480MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.00 V/m; Power Drift = 999.0 dB
Peak SAR (extrapolated) = 0.012 W/kg
SAR(1 g) = 0.000397 mW/g; SAR(10 g) = 0.000118 mW/g



Plot B15

Date/Time: 28/06/2017 12:12:47 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

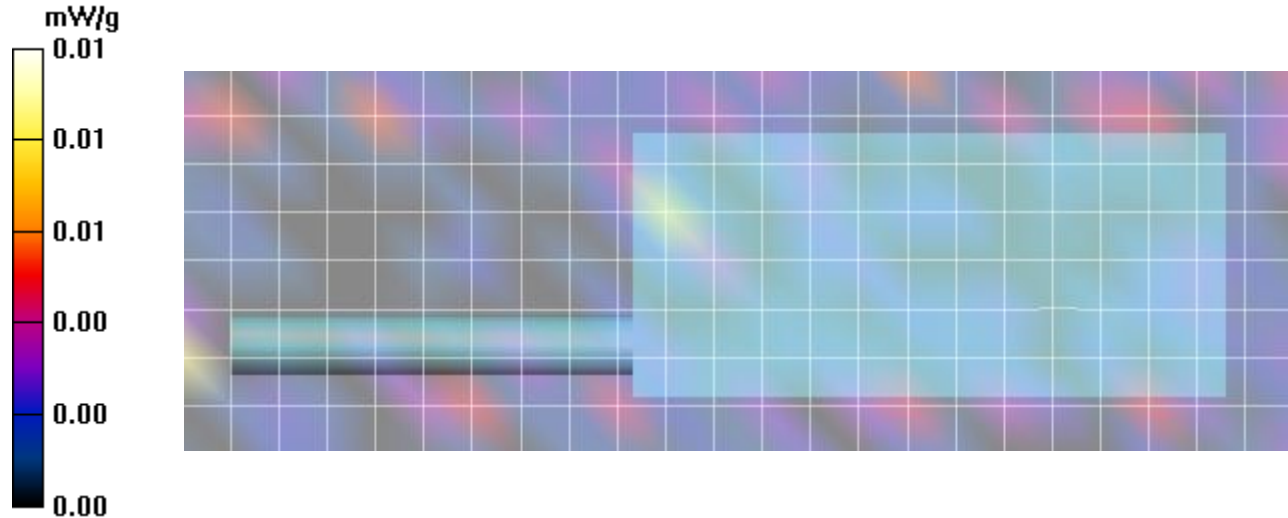
Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2480 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B15 Body,SCAN_UHF Eclipse XL-185P BT, 2480MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$
Maximum value of SAR (measured) = 0.01 mW/g

B15 Body,SCAN_UHF Eclipse XL-185P BT, 2480MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 0.135 V/m; Power Drift = 11.7 dB
Peak SAR (extrapolated) = 0.013 W/kg
SAR(1 g) = 0.000285 mW/g; SAR(10 g) = 4.2e-005 mW/g



Plot B16

Date/Time: 28/06/2017 12:38:50 PM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2480$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 49.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

B16 Body/Side, SYS_UHF Eclipse XL-185P BT, 2480MHz, no bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1):

Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.01 mW/g

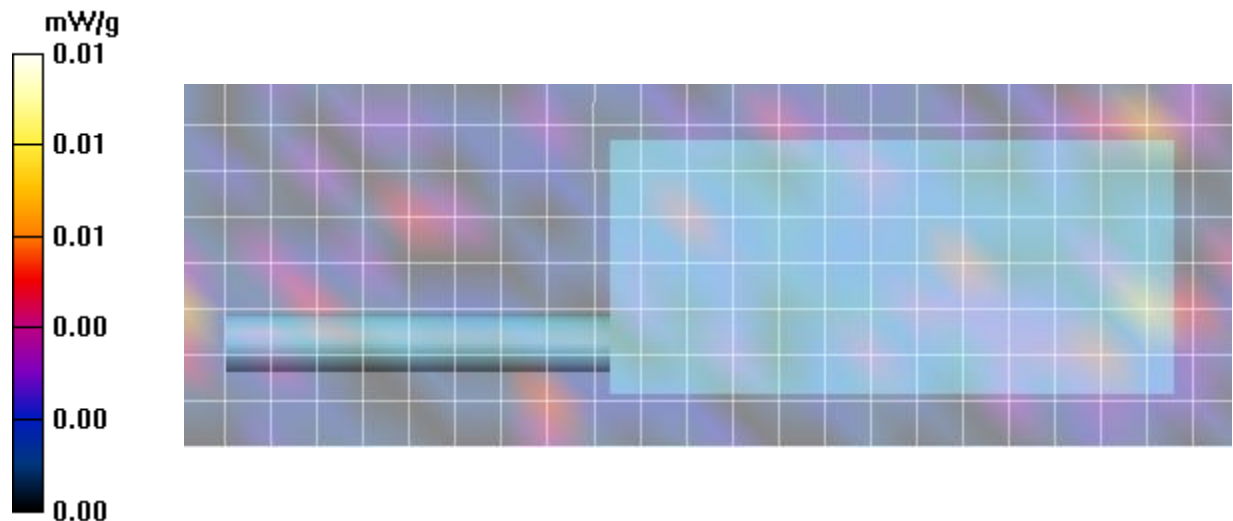
B16 Body/Side, SYS_UHF Eclipse XL-185P BT, 2480MHz, no bc, spk-mic, ant 4440-02, bat 4010-01/Zoom Scan (7x7x7)/Cube 0:

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

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

Peak SAR (extrapolated) = 0.013 W/kg

SAR(1 g) = 0.000599 mW/g; SAR(10 g) = 0.00016 mW/g.



Plot F1

Date/Time: 11/06/2017 10:57:12 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450H TSL

Communication System: Harris; Frequency: 406 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 406$ MHz; $\sigma = 0.844$ mho/m; $\epsilon_r = 45.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.49, 9.49, 9.49); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

F1 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.75 mW/g

F1 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

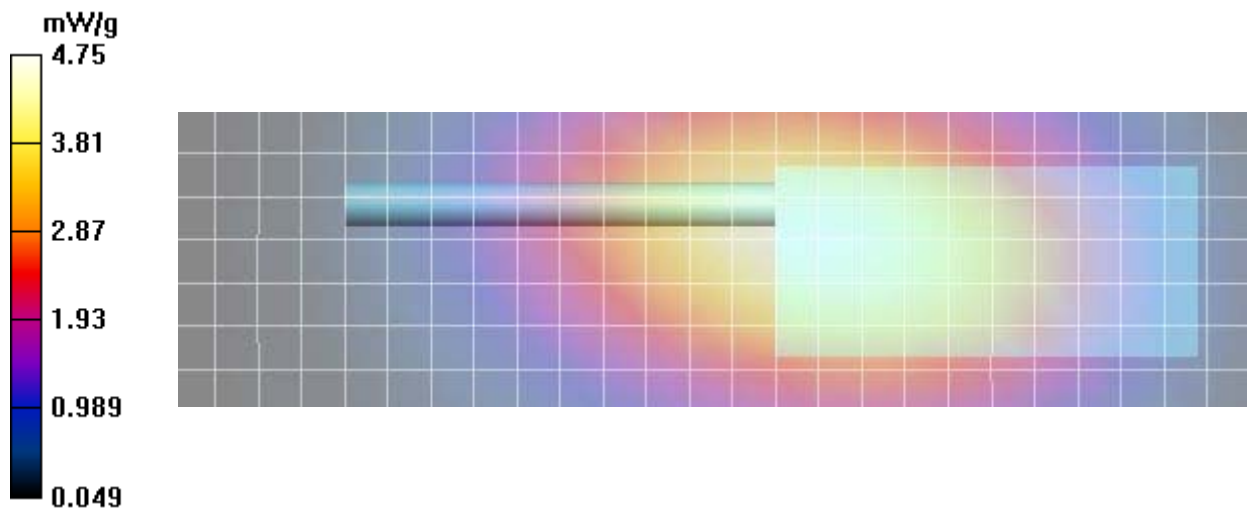
Reference Value = 74.1 V/m; Power Drift = -0.080 dB

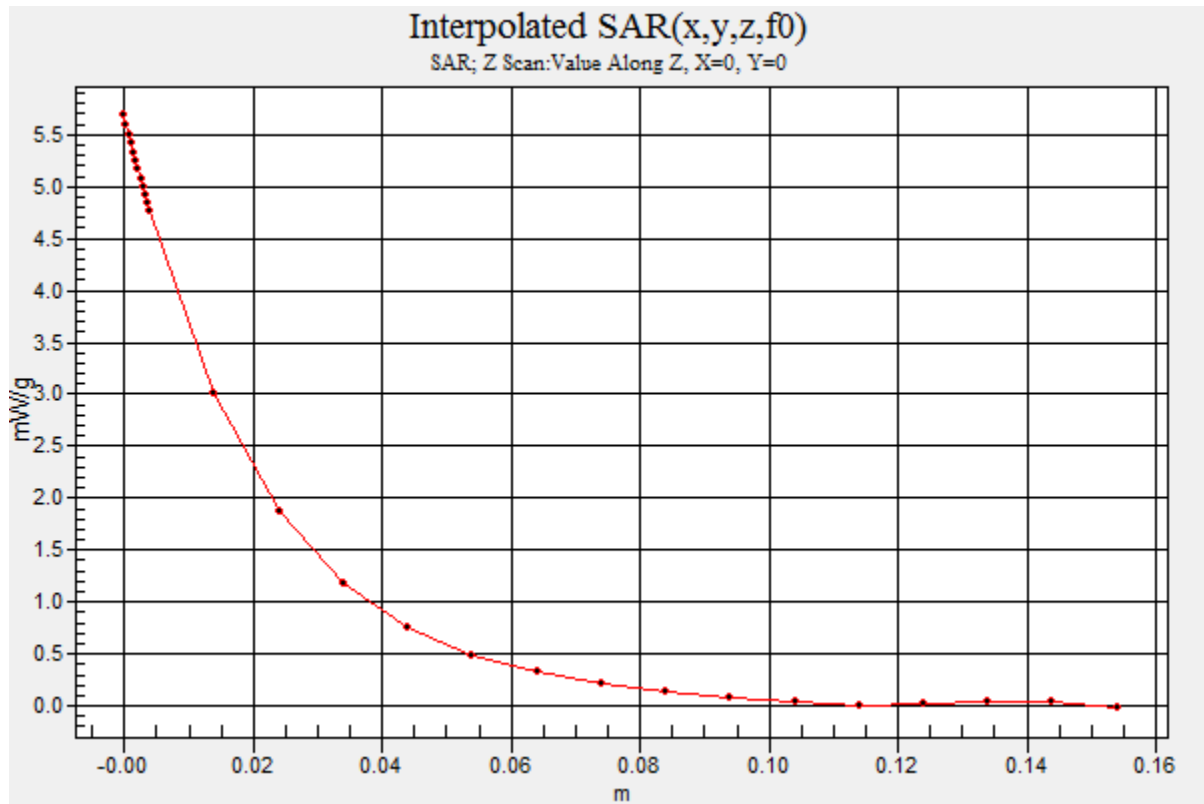
Peak SAR (extrapolated) = 5.70 W/kg

SAR(1 g) = 4.57 mW/g; SAR(10 g) = 3.57 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.77 mW/g





Plot F2

Date/Time: 11/06/2017 11:28:56 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450H TSL

Communication System: Harris; Frequency: 406 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 406$ MHz; $\sigma = 0.844$ mho/m; $\epsilon_r = 45.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.49, 9.49, 9.49); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

F2 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4000-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.55 mW/g

F2 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

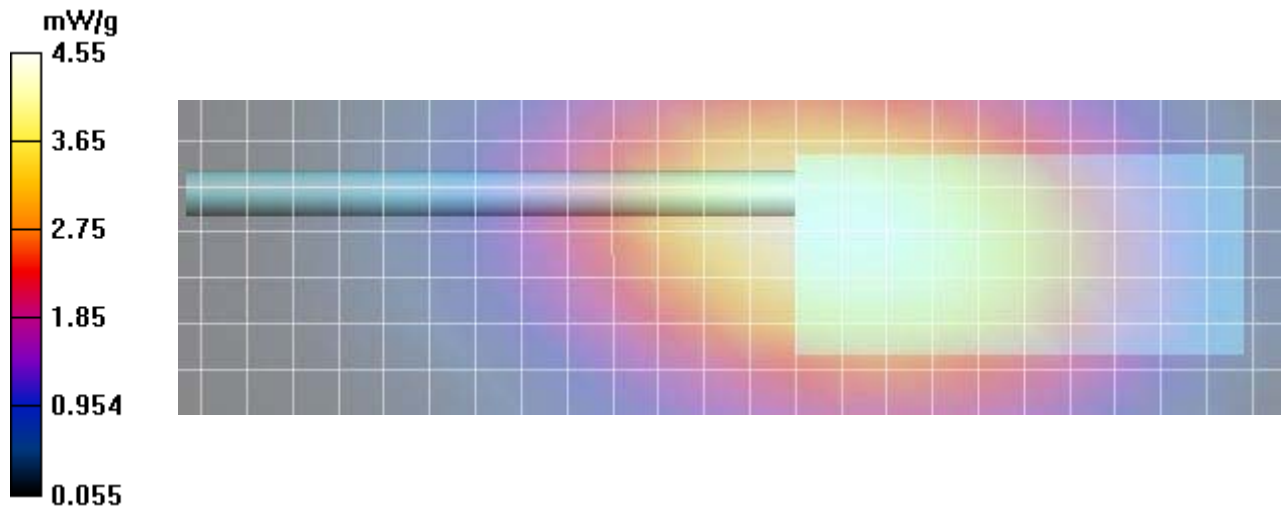
Reference Value = 73.6 V/m; Power Drift = -0.371 dB

Peak SAR (extrapolated) = 5.53 W/kg

SAR(1 g) = 4.3 mW/g; SAR(10 g) = 3.33 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.49 mW/g



Plot F3

Date/Time: 11/06/2017 11:49:07 AM

Test Laboratory: Celltech Labs

DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 450H TSL

Communication System: Harris; Frequency: 406 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 406 \text{ MHz}$; $\sigma = 0.844 \text{ mho/m}$; $\epsilon_r = 45.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3600; ConvF(9.49, 9.49, 9.49); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 145

F3 Face, SCAN, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Area Scan (8x26x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.23 mW/g

F3 Face, SCAN, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

$dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 68.3 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 4.94 W/kg

SAR(1 g) = 3.96 mW/g; SAR(10 g) = 3.1 mW/g

[Info: Interpolated medium parameters used for SAR evaluation!](#)

Maximum value of SAR (measured) = 4.14 mW/g

