| | |
|---|---|
| Test Report Serial Number: | 45461395 R2.1 |
| Test Report Date: | 15 August 2017 |
| Project Number: | 1373 |

# SAR Test Report - New Filing

Applicant:

HARRIS

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

| Maximum Reported 1g SAR | | | |
|---|---|---|---|
| FCC | HEAD: | 2.37 | W/kg |
| | BODY: | 4.87 | |
| ISEDC | HEAD: | 2.42 | |
| | BODY: | 5.10 | |
| General Pop. Limit: | | 8.00 | |

FCC ID: **OWDTR-0149-E**

Product Model Number / HVIN: **See Section 2.0**

IC Registration Number: **3636B-0149**

Product Name / PMN: **XL-185P**

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

ilac-MRA ACCREDITED

**Test Lab Certificate: 2470.01**

Industry Canada

**IC Registration 3874A-1**

**FCC Registration: 714830**

## Table of Contents



## 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<br>Corrected DUT Photos App. D | Art Voss | 10 July 2017 |
| 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):** | **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<br>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, ISEDC 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, ISEDC 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, ISEDC ID: 3636B-0149 is referenced as XL-185P

The XL-200P, FCC ID: OWDTR-0133-E, ISEDC 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 demostrated 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<br>Title 47:<br>Part 2.1093: | Code of Federal Regulations<br>Telecommunication<br>Radiofrequency Radiation Exposure Evaluation: Portable Devices |
| Health Canada<br>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<br>RSS-102 Issue 5: | Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) |
| IEEE International Committee on Electromagnetic Safety<br>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<br>IEC 62209-2 2010 | Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 2 |
| FCC KDB<br>KDB 865664 D01v01r04 | SAR Measurement Requirements for 100MHz to 6GHz |
| FCC KDB<br>KDB 447498 D01v06 | Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies |
| FCC KDB<br>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: | Product / PMN | |
|---|---|---|
| Harris Corporation | XL-185P | |
| **Standard(s) Applied:** | **Measurement Procedure(s):** | |
| FCC 47 CFR §2.1093<br>Health Canada's Safety Code 6 | FCC KDB 865664, FCC KDB 447498, FCC KDB 643646<br>Industry Canada RSS-102 Issue 5<br>IEEE Standard 1528-2013, IEC 62209-2 | |
| **Reason For Issue:** | **Use Group:** | **Limits Applied:** |
| [X] New Certification<br>[ ] Class I Permissive Change<br>[ ] Class II Permissive Change | [ ] General Population / Uncontrolled<br>[X] Occupational / Controlled | [ ] 1.6W/kg - 1g Volume<br>[X] 8.0W/kg - 1g Volume<br>[ ] 4.0W/kg - 10g Volume |
| **Reason for Change:** | | **Date(s) Evaluated:** |
| Original Filing | | 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/ISEDC) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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/ISEDC) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | | | |
| | reported SAR (W/kg) | Ratio to Limit | reported SAR (W/kg) | Ratio to Limit | reported SAR (W/kg) | Ratio to Limit | reported SAR (W/kg) | Ratio to Limit | reported 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:

[(Max Power, mW) / (Separation Distance, mm)] * [≐ f, GHz] ≤ 3.0 for 1g SAR
[(7)/(30)] * [(≐ 2.480)] = 0.362 ≤ 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:

[(Max Power, mW) / (Separation Distance, mm)] * [(≐ f, GHz) / (x)], where x = 7.5 for 1g SAR
[(7)/(30)] * [(≐ 2.480) / (7.5)] = 0.048W/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 (MHz) | Measured Fluid Deviation Permittivity | Measured Fluid Deviation Conductivity | Measured Conducted Power (dBm) | Measured Drift (dB) | Measured SAR (1g) (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 (%) | | Measured SAR (W/kg) | | Step 1 Adjusted SAR (1g) (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 (dBm) | Rated Power (dBm) | Delta (dB) | | Step 1 Adjusted SAR (W/kg) | | Step 2 Adjusted SAR (1g) (W/kg) |
|---|---|---|---|---|---|---|---|
| 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) (mW) | Freq (MHz) | Separation Distance (mm) | Estimated SAR (W/kg) | | Step 2 Adjusted SAR (W/kg) | | Step 3 Adjusted SAR (1g) (W/kg) |
|---|---|---|---|---|---|---|---|---|
| F1 | | | | 0.09 | + | 2.285 | = | 2.373 |
| B6 | | | | 0.09 | + | 4.778 | = | 4.866 |

**Step 4**

Drift Adjustment

| Plot ID | Measured Drift (dB) | | Step 3 Adjusted SAR (W/kg) | | Step 4 Adjusted SAR (1g) (W/kg) |
|---|---|---|---|---|---|
| F1 | -0.080 | + | 2.373 | = | 2.417 |
| B6 | -0.203 | + | 4.866 | = | 5.098 |

**Step 5**

Reported SAR

| Plot ID | FCC From Steps 1 through 3 1g SAR (W/kg) | IC From Steps 1 through 4 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 indentification 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**

**$Ce = (-0.0007854*F^3) + (0.009402*F^2) - (0.02742*F) - 0.2026$**

**$C\sigma = (0.009804*F^3) - (0.08661*F^2) + (0.02981*F) + 0.7829$**

| 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 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date | Ambient Temp °C | Fluid Temp °C | Humidity | TSL | Fluid Dielectric | SPC | Test |
| 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.<br><br>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.<br><br>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.<br><br>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 *reported SAR* was used, as per FCC KDB 447498 (6.1). This was applied only to the LMR bands.<br><br>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°C. The Active TSL temperature was maintained to within ±1.0°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 Aprel Dielectric Property Measurement System. A frequency range of ± 100MHz for frequencies > 300MHz and ± 50MHz for frequencies ≤ 300MHz 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 ≤ 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.<br>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 ≤ 10% of the measured and normalize SAR of the validation source's Calibration Certificate.<br>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 ± 1°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 ± 1 mm** |
| **Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)** | **5° ± 1°** |
| **Area Scan Spatial Resolution ΔX, ΔY** | **15 mm** |
| **Zoom Scan Spatial Resolution ΔX, ΔY** | **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 ± 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 | |

### 13.7 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 ΔX, ΔY** | **12 mm** |
| **Zoom Scan Spatial Resolution ΔX, ΔY** | **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 ΔX, ΔY** | **10 mm** |
| **Zoom Scan Spatial Resolution ΔX, ΔY** | **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 ±%** | **Probability Distribution** | **Divisor** | **ci 1g** | **ci 10g** | **Uncertainty Value ±% (1g)** | **Uncertainty Value ±% (10g)** | **$V_i$ or $V_{eff}$** |
| **Measurement System** | | | | | | | | | |
| Probe Calibration* | E.2.1 | 6.6 | Normal | 1 | 1 | 1 | 6.60 | 6.60 | ∞ |
| Axial Isotropy* | E.2.2 | 4.7 | Rectangular | 1.732050808 | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| Hemispherical Isotropy* | E.2.2 | 9.6 | Rectangular | 1.732050808 | 0.7 | 0.7 | 3.9 | 3.9 | ∞ |
| Boundary Effect* | E.2.3 | 8.3 | Rectangular | 1.732050808 | 1 | 1 | 4.8 | 4.8 | ∞ |
| Linearity* | E.2.4 | 4.7 | Rectangular | 1.732050808 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System Detection Limits* | E.2.4 | 1.0 | Rectangular | 1.732050808 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Modulation Response | E.2.5 | 4.0 | Rectangular | 1.732050808 | 1 | 1 | 2.3 | 2.3 | ∞ |
| Readout Electronics* | E.2.6 | 1.0 | Normal | 1 | 1 | 1 | 1.0 | 1.0 | ∞ |
| Response Time* | E.2.7 | 0.8 | Rectangular | 1.732050808 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Integration Time* | E.2.8 | 1.4 | Rectangular | 1.732050808 | 1 | 1 | 0.8 | 0.8 | ∞ |
| RF Ambient Conditions - Noise | E.6.1 | 0.0 | Rectangular | 1.732050808 | 1 | 1 | 0.0 | 0.0 | ∞ |
| RF Ambient Conditions - Reflection | E.6.1 | 0.0 | Rectangular | 1.732050808 | 1 | 1 | 0.0 | 0.0 | ∞ |
| Probe Positioner Mechanical Tolerance* | E.6.2 | 0.4 | Rectangular | 1.732050808 | 1 | 1 | 0.2 | 0.2 | ∞ |
| Probe Positioning wrt Phantom Shell* | E.6.3 | 2.9 | Rectangular | 1.732050808 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Extrapolation, interpolation & integration algorithms for max. SAR evaluation* | E.5 | 3.9 | Rectangular | 1.732050808 | 1 | 1 | 2.3 | 2.3 | ∞ |
| **Test Sample Related** | | | | | | | | | |
| Test Sample Positioning | E.4.2 | 0.3 | Normal | 1 | 1 | 1 | 0.3 | 0.3 | 5 |
| Device Holder Uncertainty* | E.4.1 | 3.6 | Normal | 1 | 1 | 1 | 3.6 | 3.6 | ∞ |
| SAR Drift Measurement** | E.2.9 | 0.0 | Rectangular | 1.732050808 | 1 | 1 | 0.0 | 0.0 | ∞ |
| SAR Scaling*** | E.6.5 | 2.0 | Rectangular | 1.732050808 | 1 | 1 | 1.2 | 1.2 | ∞ |
| **Phantom and Tissue Parameters** | | | | | | | | | |
| Phantom Uncertainty* | E.3.1 | 4.0 | Rectangular | 1.732050808 | 1 | 1 | 2.3 | 2.3 | ∞ |
| SAR Correction Uncertainty | E.3.2 | 1.2 | Normal | 1 | 1 | 0.84 | 1.2 | 1.0 | ∞ |
| Liquid Conductivity (measurement) | E.3.3 | 6.8 | Normal | 1 | 0.78 | 0.71 | 5.3 | 4.8 | 10 |
| Liquid Permittivity (measurement) | E.3.3 | 5.3 | Normal | 1 | 0.23 | 0.26 | 1.2 | 1.4 | 10 |
| Liquid Conductivity (Temperature) | E.3.2 | 0.1 | Rectangular | 1.732050808 | 0.78 | 0.71 | 0.1 | 0.0 | ∞ |
| Liquid Permittivity Temperature) | E.3.2 | 0.0 | Rectangular | 1.732050808 | 0.23 | 0.26 | 0.0 | 0.0 | ∞ |
| **Effective Degrees of Freedom(1)** | | | | | | | | **$V_{eff}$ =** | **873.2** |
| **Combined Standard Uncertainty** | | | **RSS** | | | | **12.59** | **12.40** | |
| **Expanded Uncertainty (95% Confidence Interval)** | | | **k=2** | | | | **25.18** | **24.80** | |
| **Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003** | | | | | | | | | |

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

* Provided by SPEAG

**Table 14.1 Calculation of Degrees of Freedom**

**Table 14.1**

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

## 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_eH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
**********

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|---|---|---|---|---|
| 0.3500 | 57.70 | 0.93 | 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_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
**********

| Freq | FCC_eH | FCC_sH | Test_e | Test_s |
|---|---|---|---|---|
| 0.3500 | 44.70 | 0.87 | 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_eH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
**********

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|---|---|---|---|---|
| 5.1500 | 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

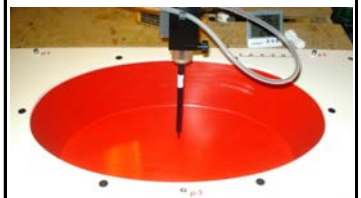
### Probe Specification

| | |
|---|---|
| Construction: | Symmetrical design with triangular core;<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, glycol) |
| Calibration: | In air from 10 MHz to 2.5 GHz<br>In head simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy ± 8%) |
| Frequency: | 10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz) |
| Directivity: | ± 0.2 dB in head tissue (rotation around probe axis)<br>± 0.4 dB in head tissue (rotation normal to probe axis) |
| Dynamic Range: | 5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB |
| Surface Detect: | ± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces |
| Dimensions: | Overall length: 330 mm; Tip length: 16 mm;<br>Body diameter: 12 mm; Tip diameter: 6.8 mm<br>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 +/- .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 $65^{O}$. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

**Device Positioner**

## 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) **H**ydroxy**E**thyl-**C**ellulose: Sigma-Aldrich P/N 54290-500g
(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

**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) **H**ydroxy**E**thyl-**C**ellulose: Sigma-Aldrich P/N 54290-500g
(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

**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) **H**ydroxy**E**thyl-**C**ellulose: Sigma-Aldrich P/N 54290-500g
(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

**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

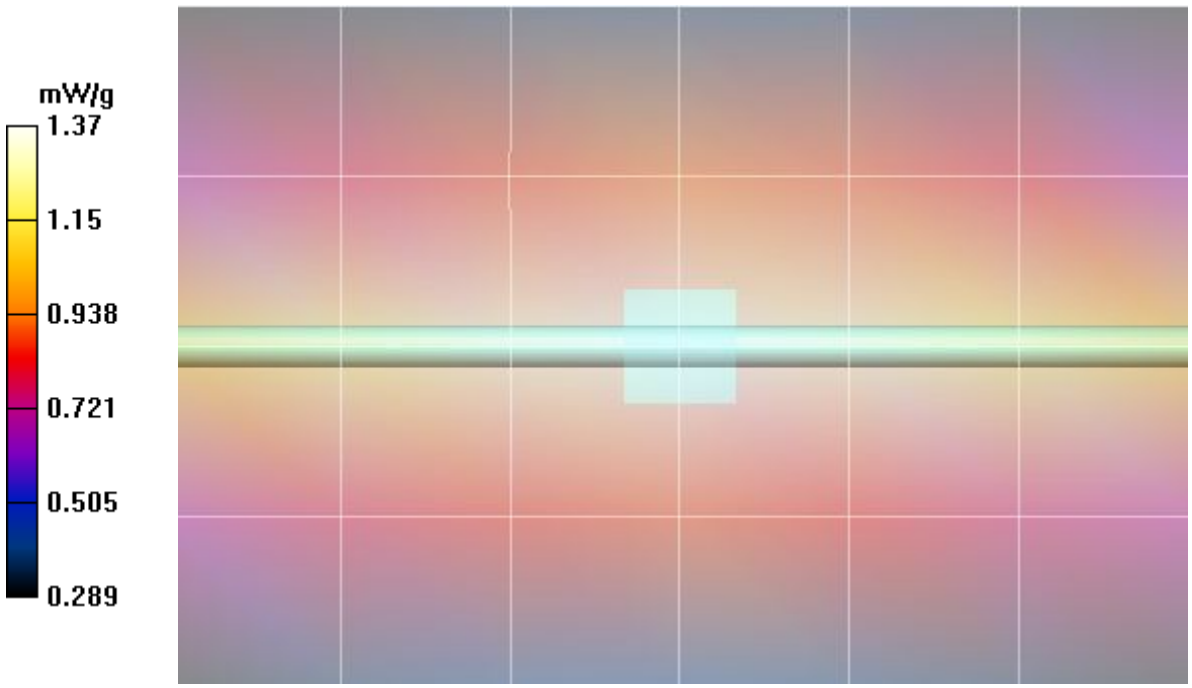
DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/15/2015
Program Name: SPC 450B

Communication System: CW; Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; $\sigma$ = 0.97 mho/m; $\varepsilon_r$ = 54.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

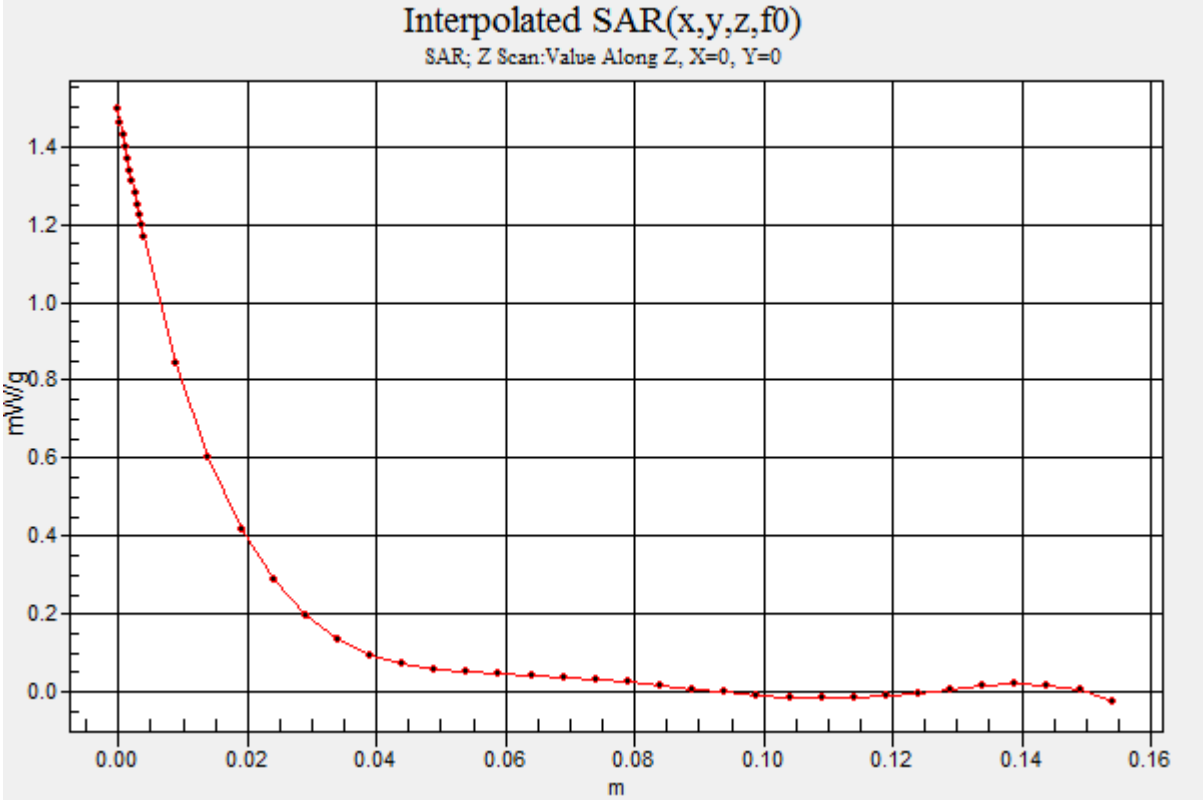
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing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




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

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

Test Laboratory: Celltech Labs

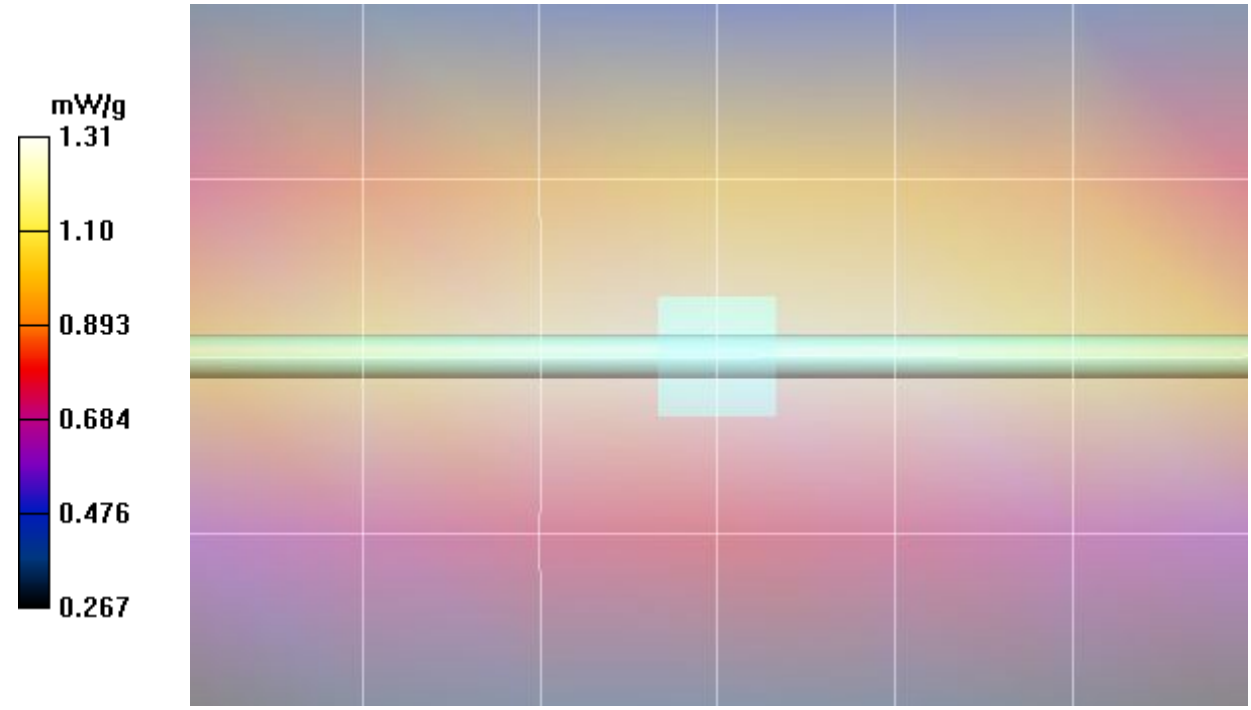
DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/15/2015
Program Name: SPC 450H

Communication System: CW; Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; $\sigma$ = 0.89 mho/m; $\varepsilon_r$ = 44.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

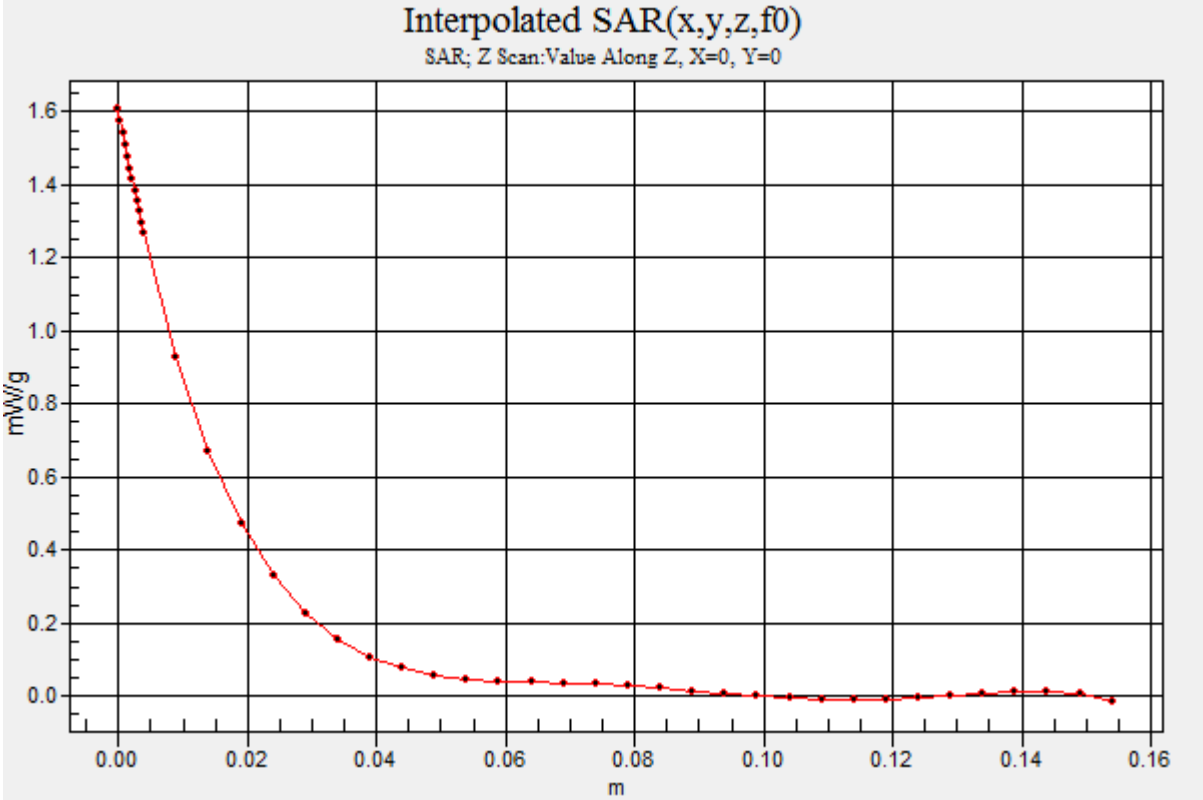
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(9.49, 9.49, 9.49); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY, V4.7 Build 80; Postprocessing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

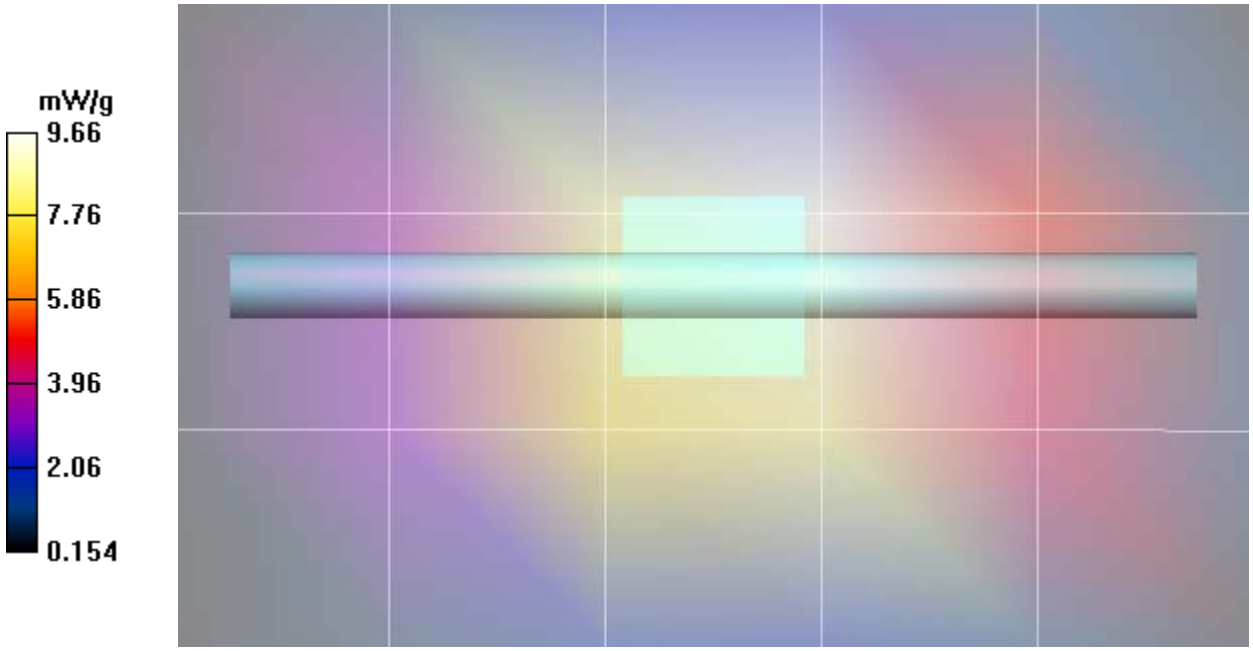
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 825; Calibrated: 15/04/2015
Program Name: 2450MHz Body SPC

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.92 mho/m; $\varepsilon_r$ = 49.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

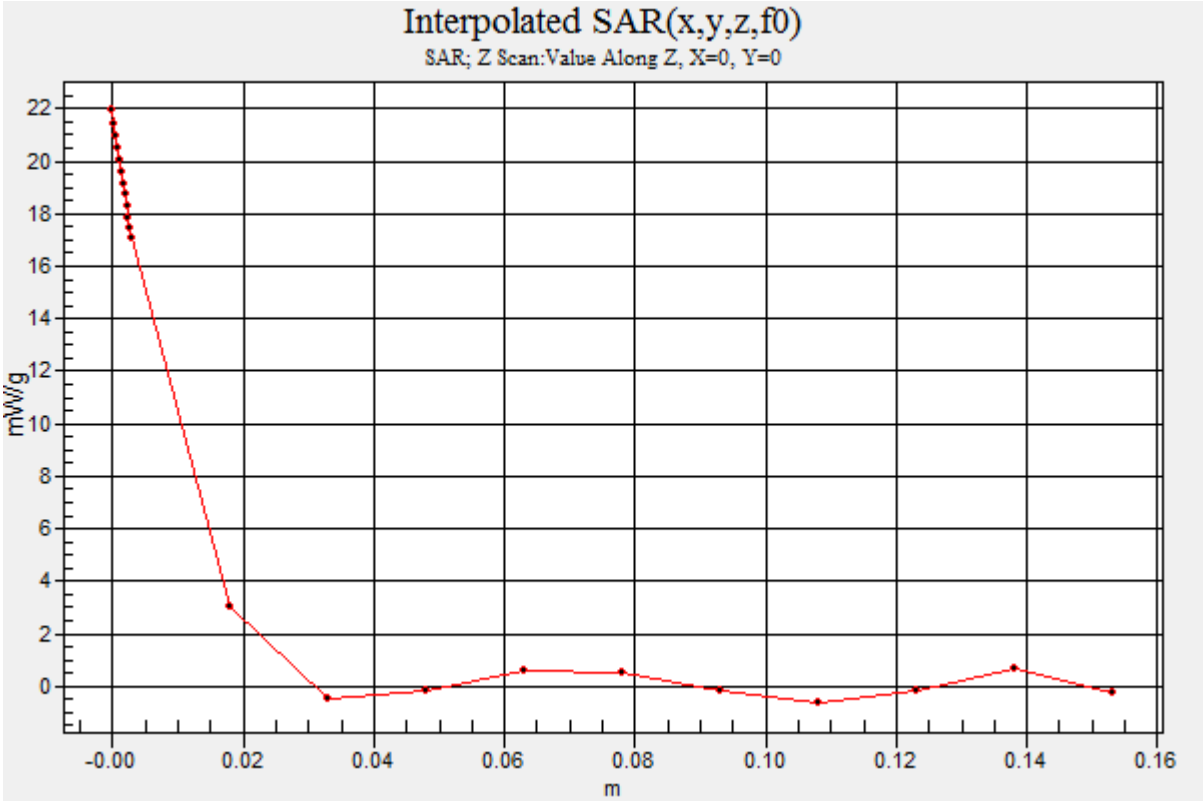
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 5mm (Mechanical Surface Detection)Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- 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

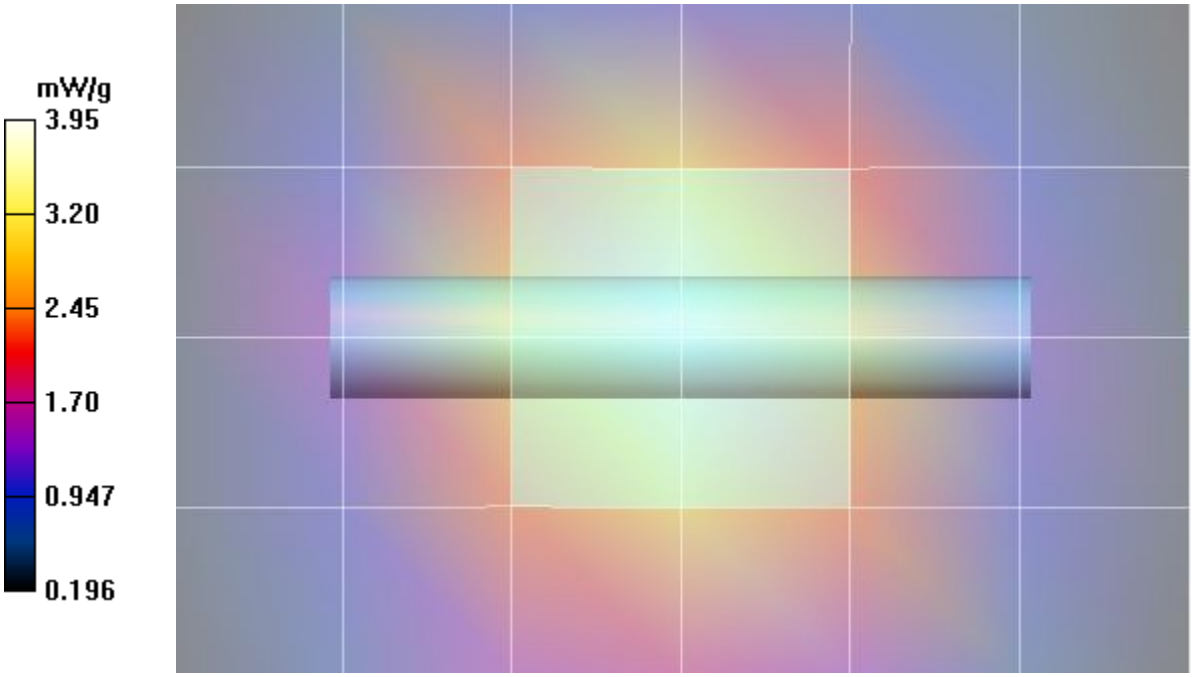
Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; $\sigma$ = 5.65 mho/m; $\varepsilon_r$ = 46.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

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

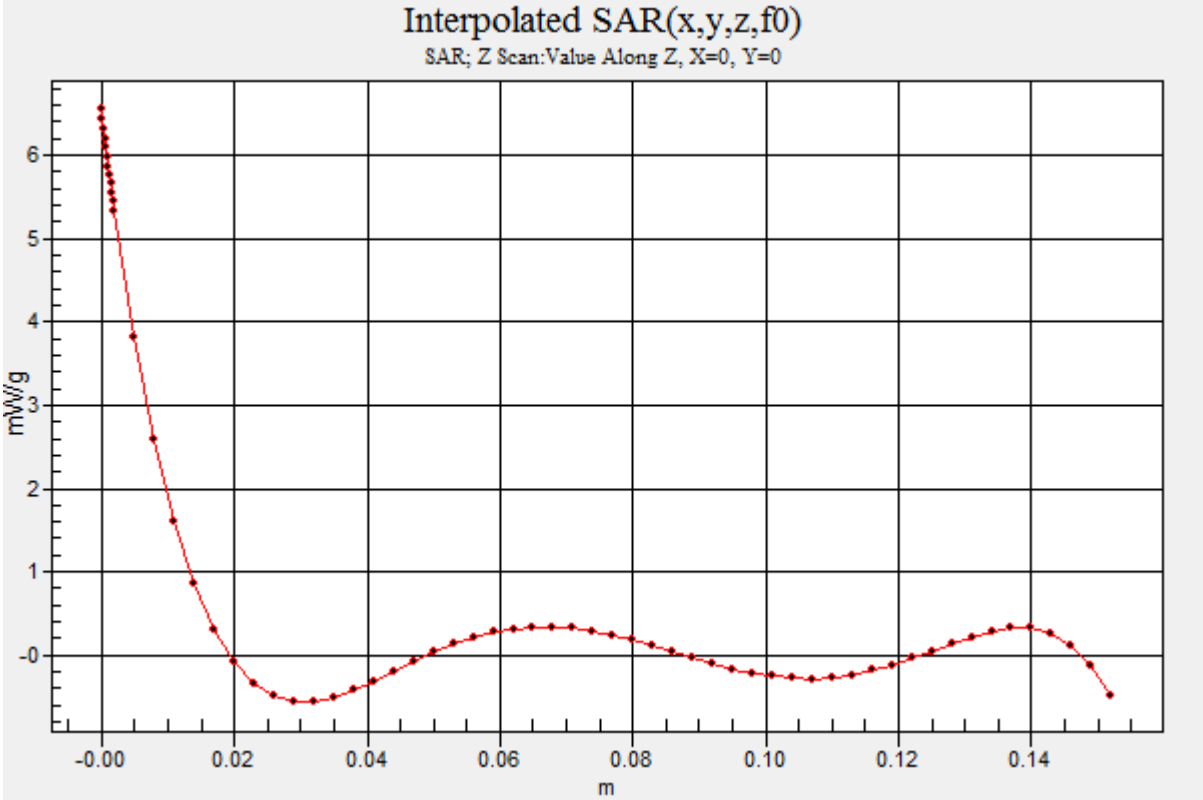
**5200-5800 MHz Dipole d=10mm P=50mW, TS=3.63/Area Scan (5x7x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 3.95 mW/g

**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; $\varepsilon_r$ = 55.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

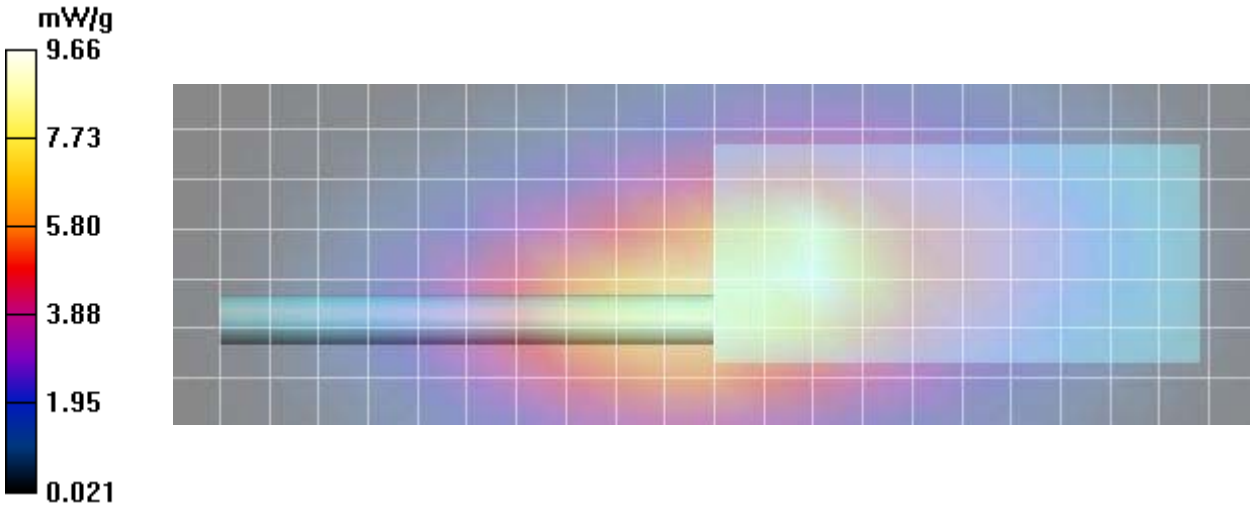
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0;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

**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 MHz; $\sigma$ = 0.918 mho/m; $\varepsilon_r$ = 55.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

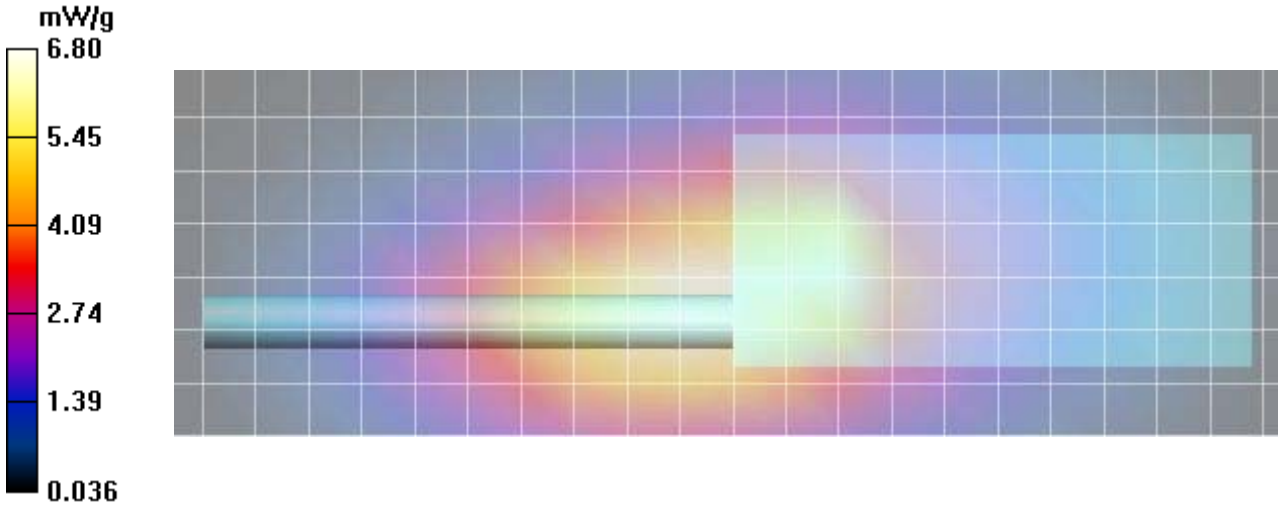
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(9.22, 9.22, 9.22); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0; 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 MHz; $\sigma$ = 0.956 mho/m; $\varepsilon_r$ = 55.1; $\rho$ = 1000 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

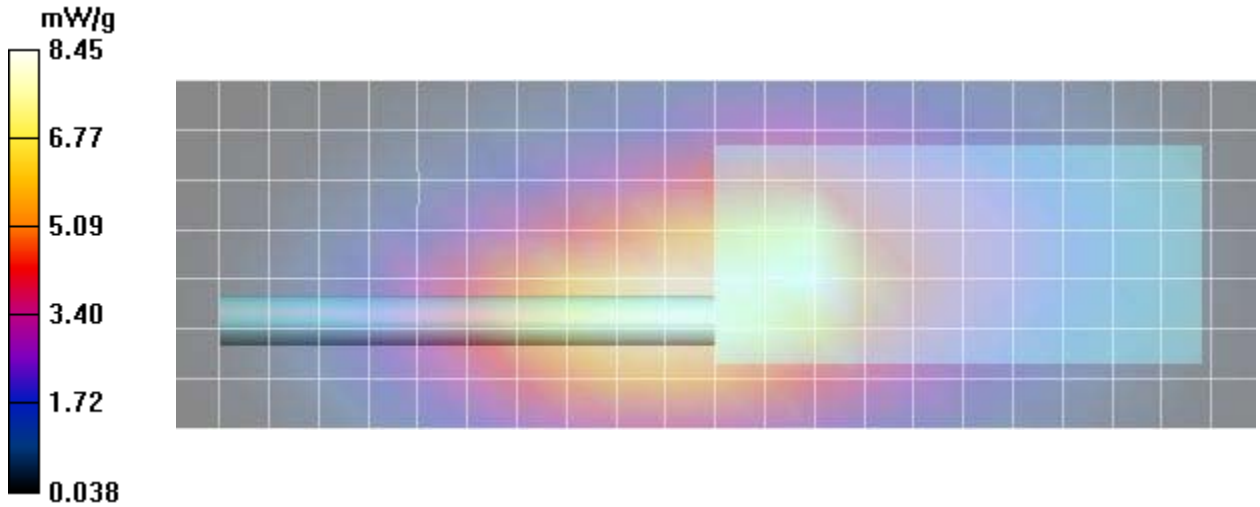
**B3 Body, SYS_Eclipse XL-185P UHF ,418 MHz, bc, spk-mic, ant 4420-01, bat 4010-01/Area Scan (8x23x1):** Measurement grid: dx=15mm, dy=15mm

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=7.5mm, dy=7.5mm, dz=5mm
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; $\varepsilon_r$ = 55.2; $\rho$ = 1000 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

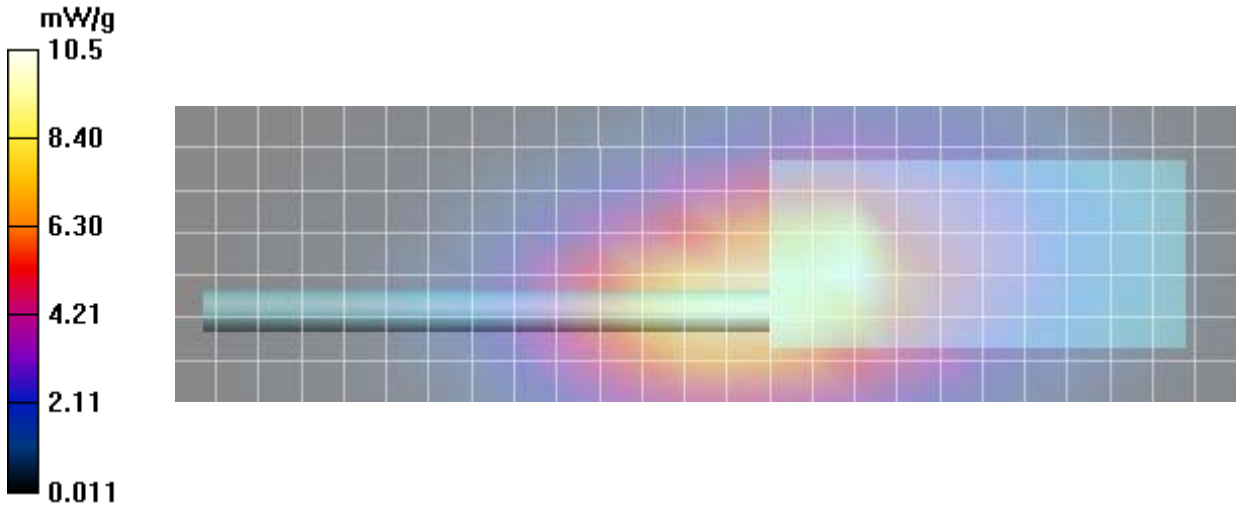
**B4 Body, SYS_Eclipse XL-185P UHF , 406MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

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 MHz; $\sigma$ = 0.918 mho/m; $\varepsilon_r$ = 55.8; $\rho$ = 1000 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

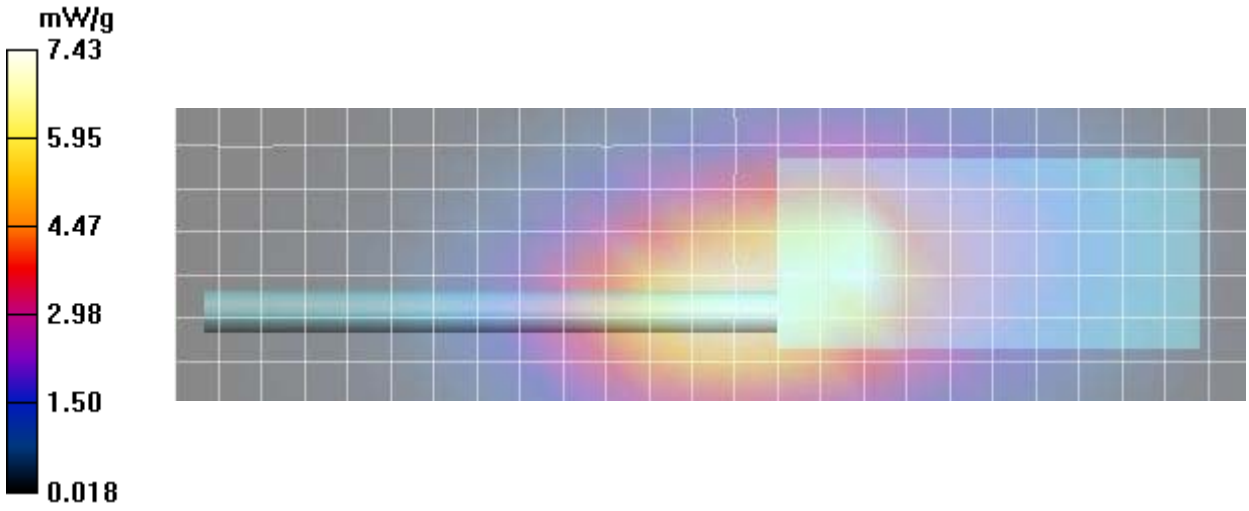
**B5 Body, SYS_Eclipse XL-185P UHF ,378MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

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=7.5mm, dy=7.5mm, dz=5mm
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 MHz; $\sigma$ = 0.956 mho/m; $\varepsilon_r$ = 55.1; $\rho$ = 1000 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

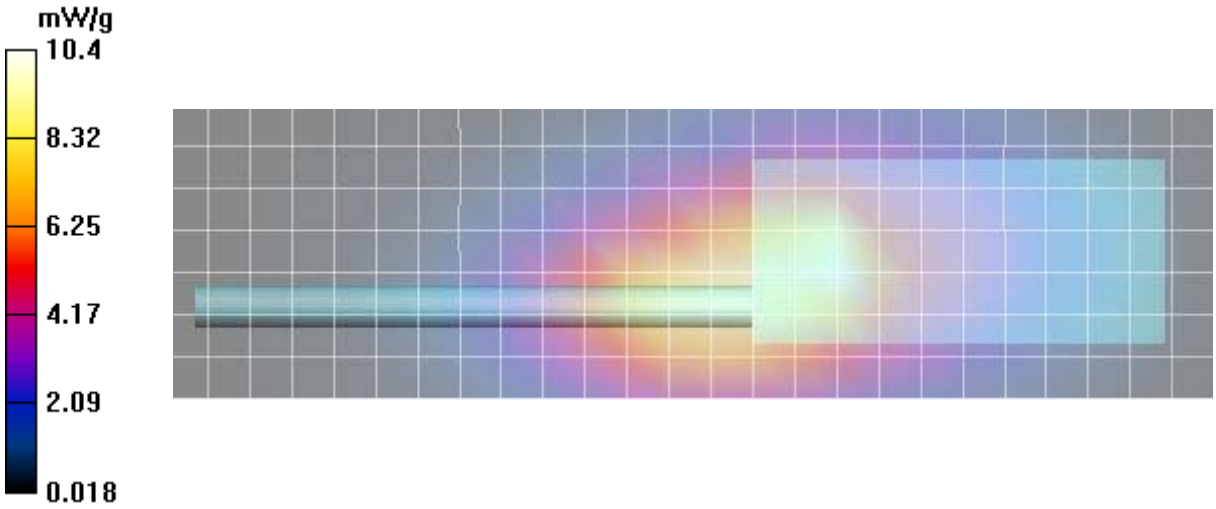
**B6 Body, SYS_Eclipse XL-185P UHF ,418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (measured) = 10.4 mW/g

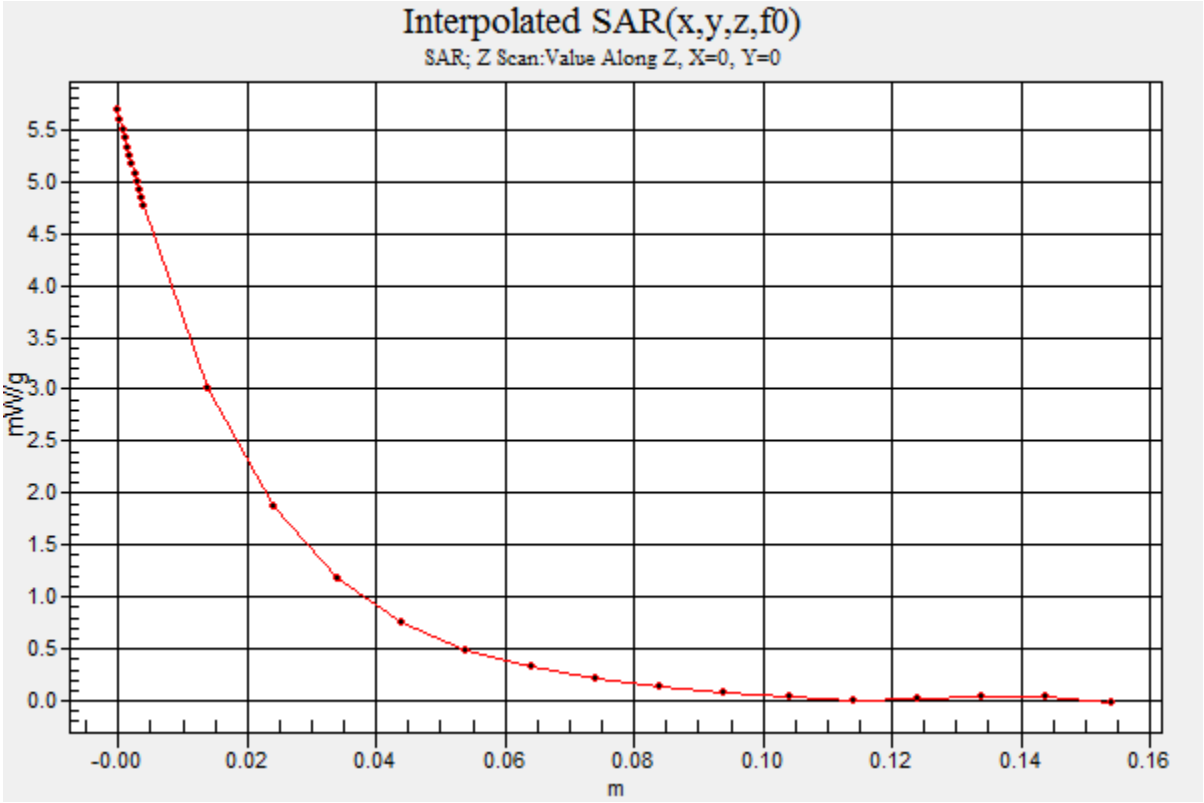
**B6 Body, SYS_Eclipse XL-185P UHF ,418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 95.3 V/m; Power Drift = -0.203 dB
Peak SAR (extrapolated) = 13.7 W/kg
**SAR(1 g) = 9.35 mW/g; SAR(10 g) = 6.57 mW/g**

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 MHz; $\sigma$ = 0.956 mho/m; $\varepsilon_r$ = 55.1; $\rho$ = 1000 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

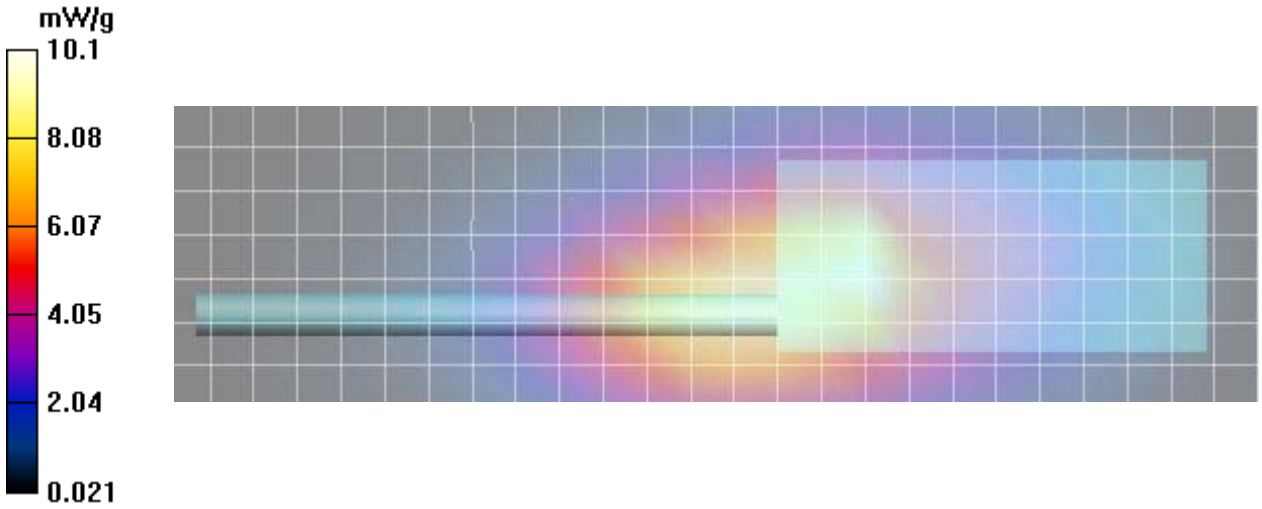
**B7 Body, SCAN_Eclipse XL-185P UHF , 418MHz, bc, spk-mic, ant 4000-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

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=7.5mm, dy=7.5mm, dz=5mm
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

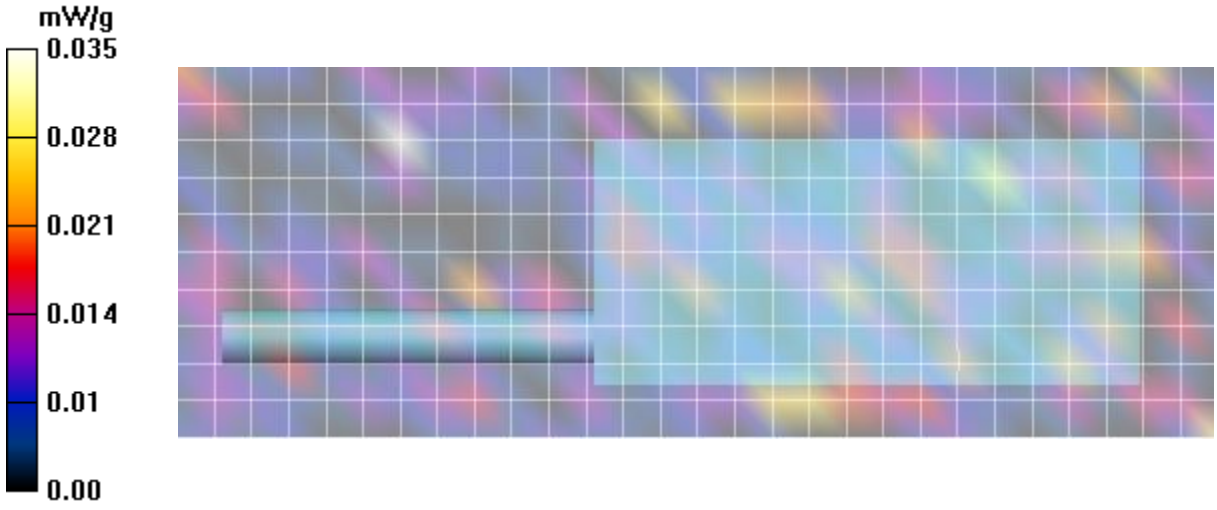
Communication System: Wifi; Frequency: 5260 MHz;Duty Cycle: 1:1.2
Medium parameters used: f = 5260 MHz; $\sigma$ = 5.73 mho/m; $\varepsilon_r$ = 46.5; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

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

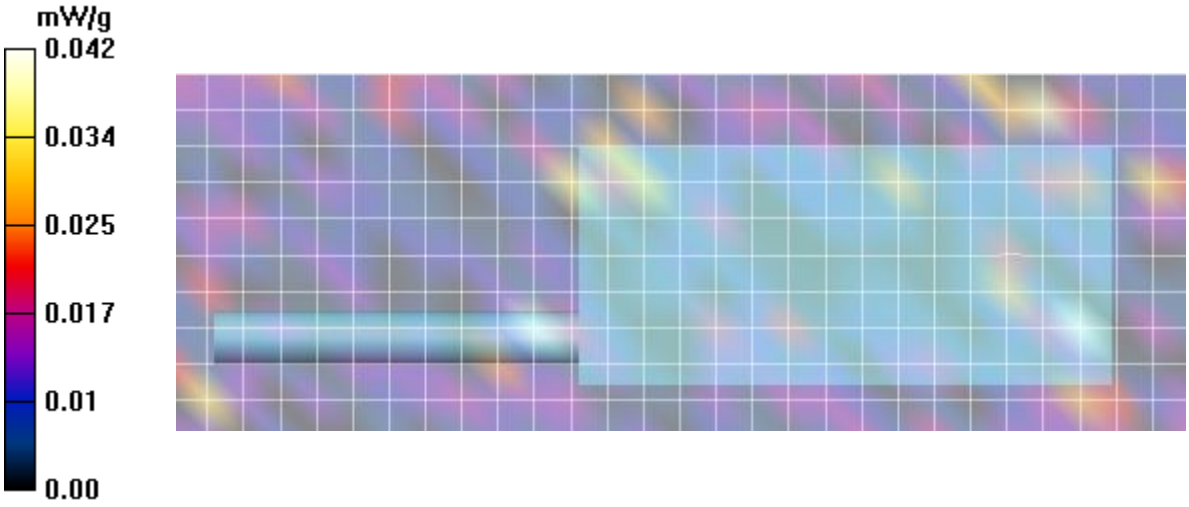
DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 5250B

Communication System: Wifi; Frequency: 5260 MHz;Duty Cycle: 1:1.2
Medium parameters used: f = 5260 MHz; $\sigma$ = 5.73 mho/m; $\varepsilon_r$ = 46.5; $\rho$ = 1000 kg/m$^3$
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

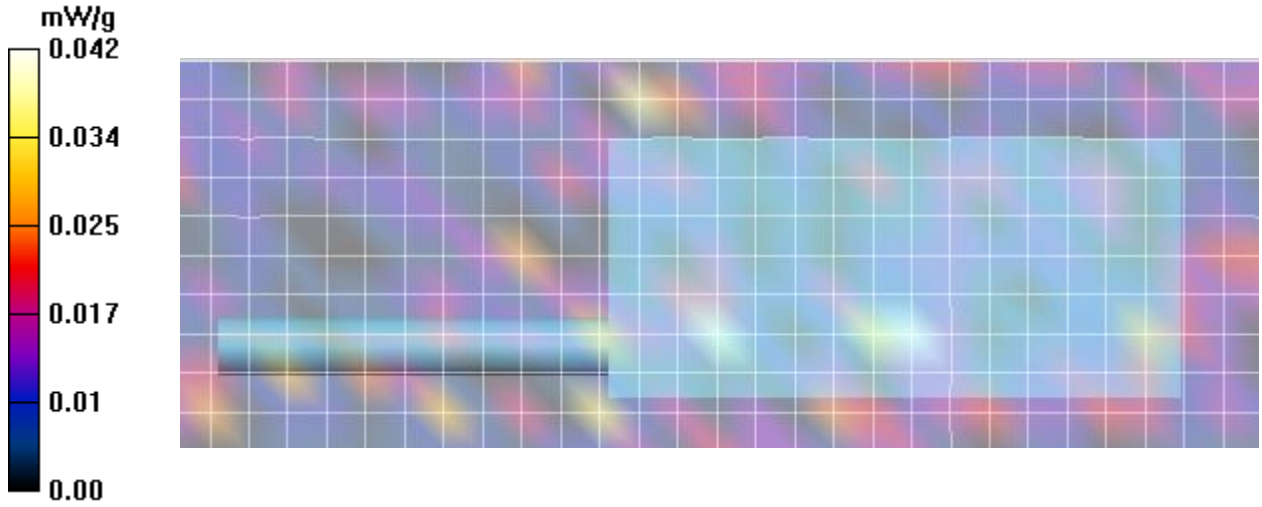
Communication System: Wifi; Frequency: 5260 MHz;Duty Cycle: 1:1.2
Medium parameters used: f = 5260 MHz; $\sigma$ = 5.73 mho/m; $\varepsilon_r$ = 46.5; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

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; $\varepsilon_r$ = 49.3; $\rho$ = 1000 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

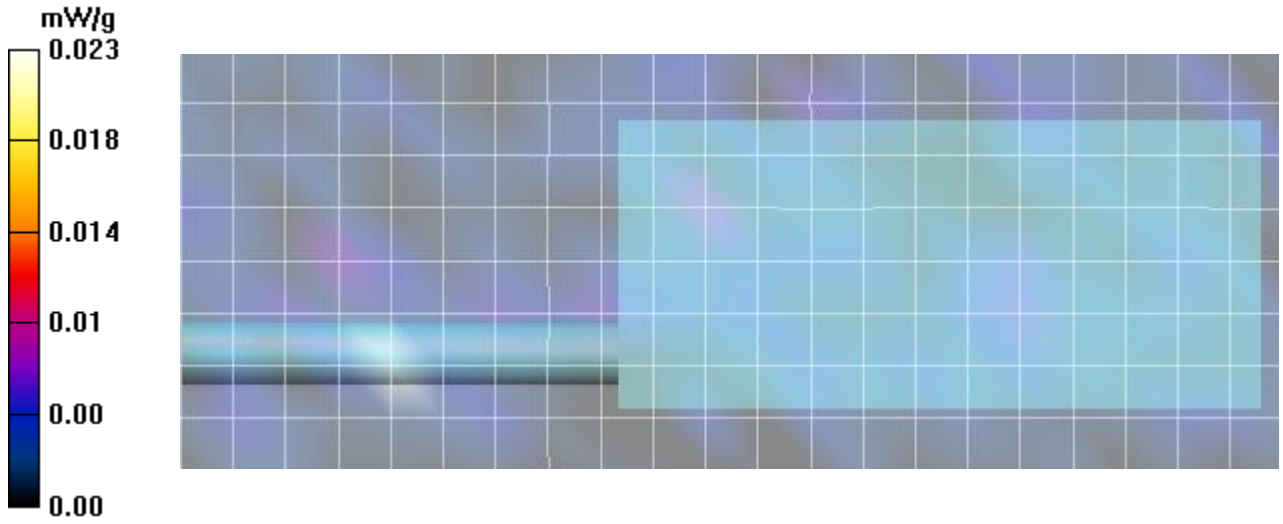
**B11 Body, SYS_UHF Eclipse XL-185P Wifi, 2437MHz, bc, spk-mic, ant 4440-02, bat 4010-01/Area Scan (9x24x1):** Measurement grid: dx=12mm, dy=12mm

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; $\varepsilon_r$ = 49.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

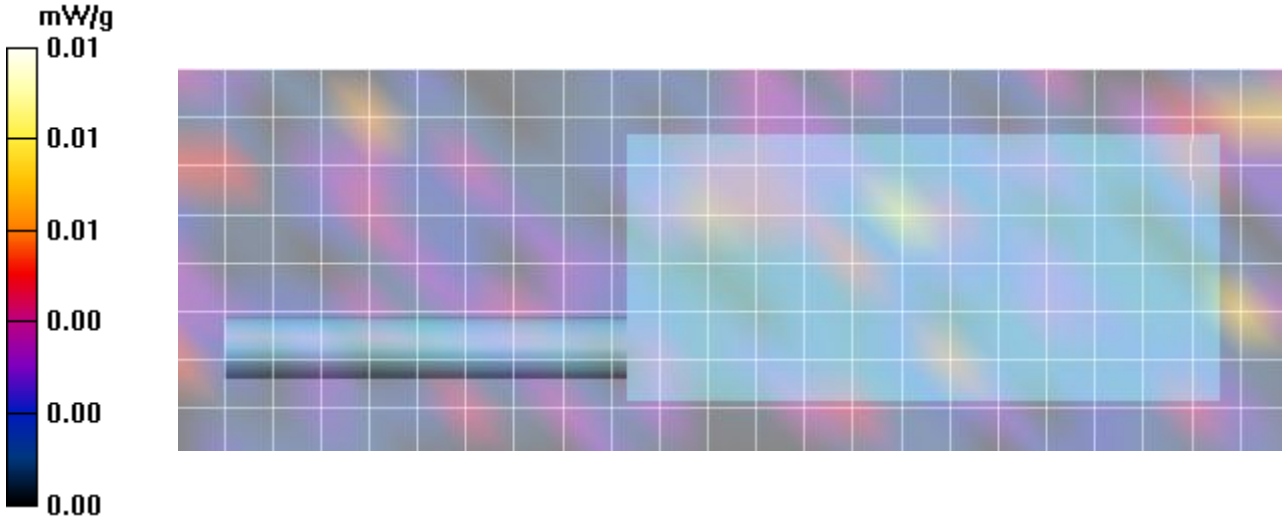
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0;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

**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; $\varepsilon_r$ = 49.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

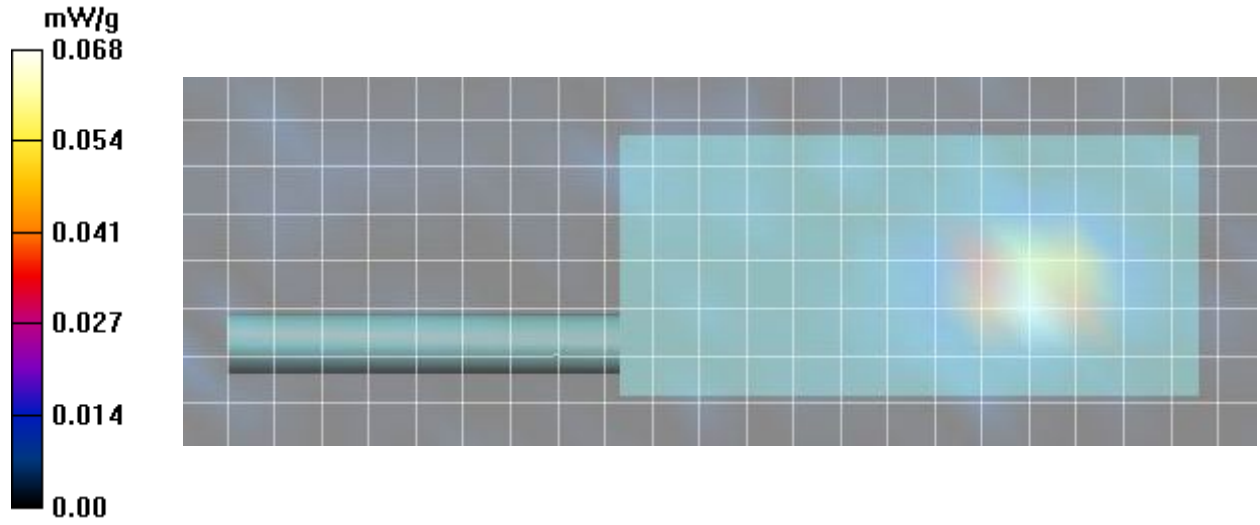
DASY Configuration:
- Probe: EX3DV4 - SN3600; ConvF(6.56, 6.56, 6.56); Calibrated: 27/04/2017
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 24/04/2017
- Phantom: ELI v5.0;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

**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

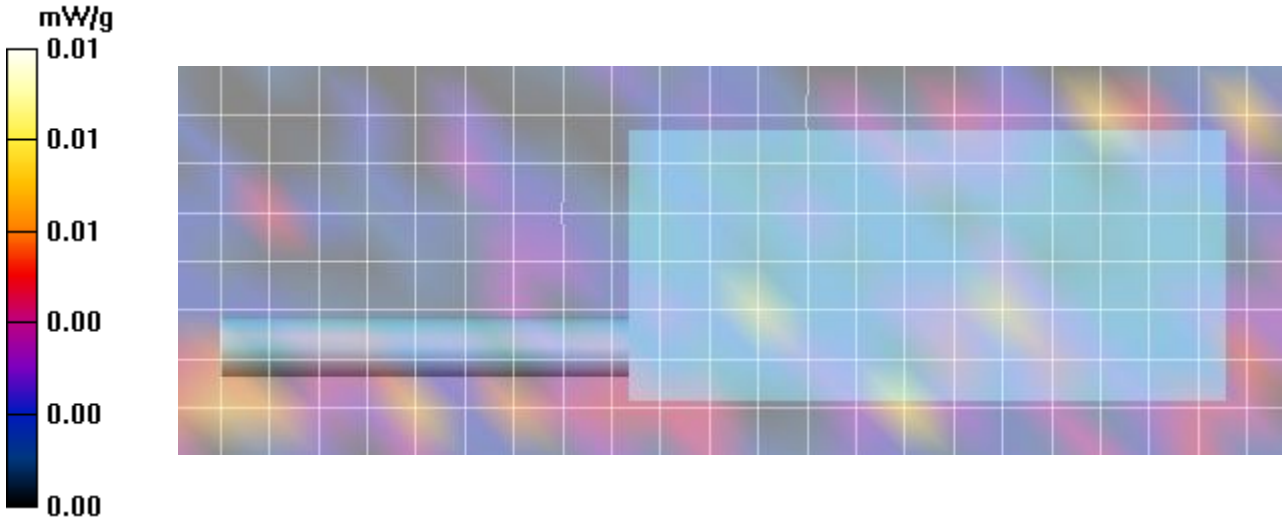
DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: Bluetooth; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; $\sigma$ = 1.96 mho/m; $\varepsilon_r$ = 49.3; $\rho$ = 1000 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

**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

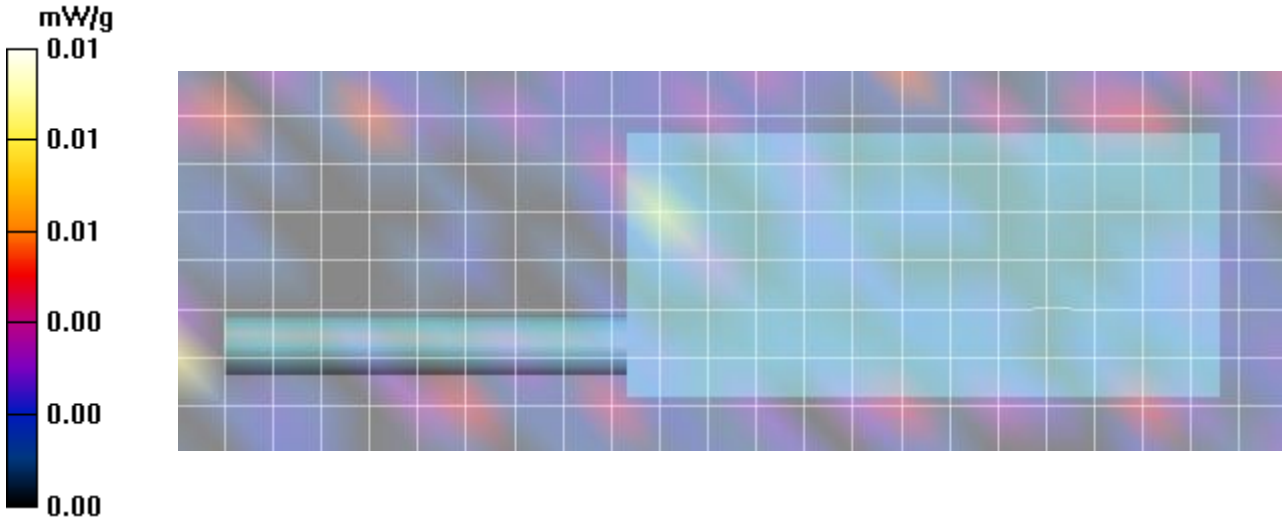
DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: Bluetooth; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; $\sigma$ = 1.96 mho/m; $\varepsilon_r$ = 49.3; $\rho$ = 1000 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=12mm, dy=12mm
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=5mm, dy=5mm, dz=5mm
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

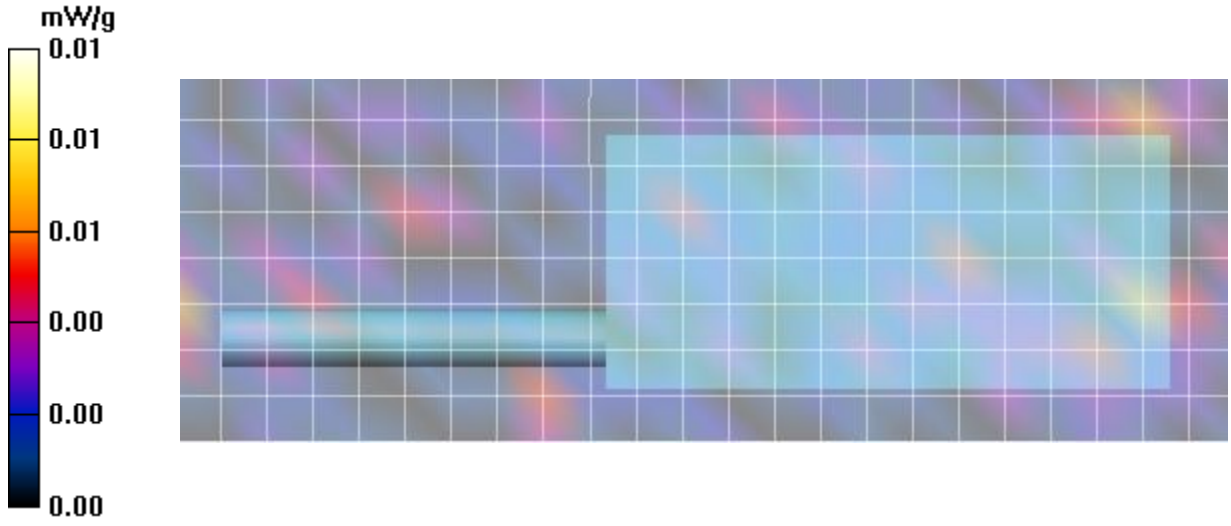
DUT: Harris; Type: PTT Radio Transceiver;
Program Name: 2450B

Communication System: Bluetooth; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; $\sigma$ = 1.96 mho/m; $\varepsilon_r$ = 49.3; $\rho$ = 1000 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

**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; $\varepsilon_r$ = 45.5; $\rho$ = 1000 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

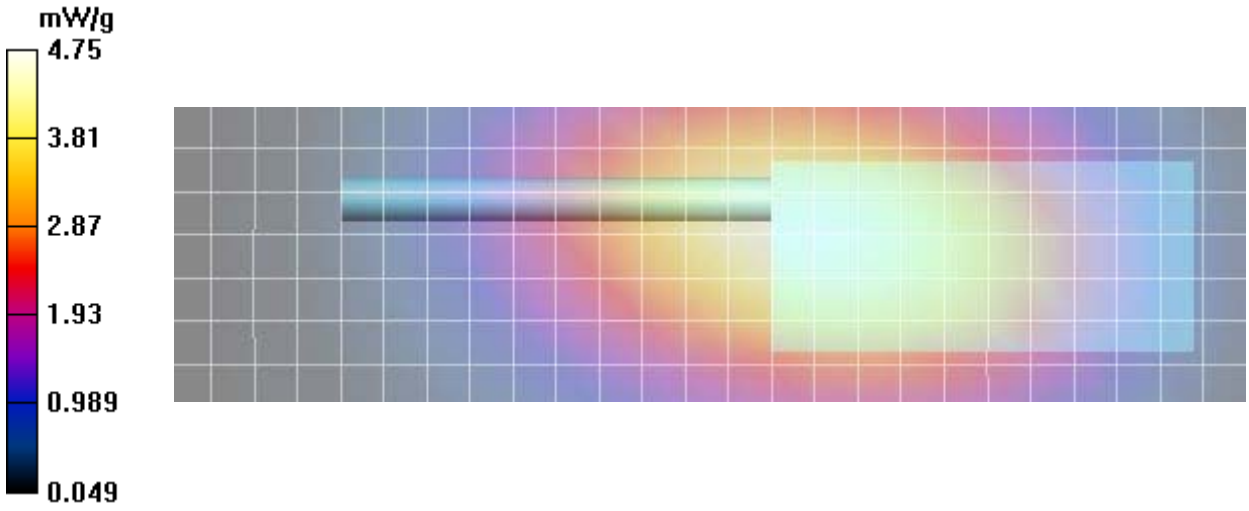
**F1 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation!
Maximum value of SAR (measured) = 4.75 mW/g

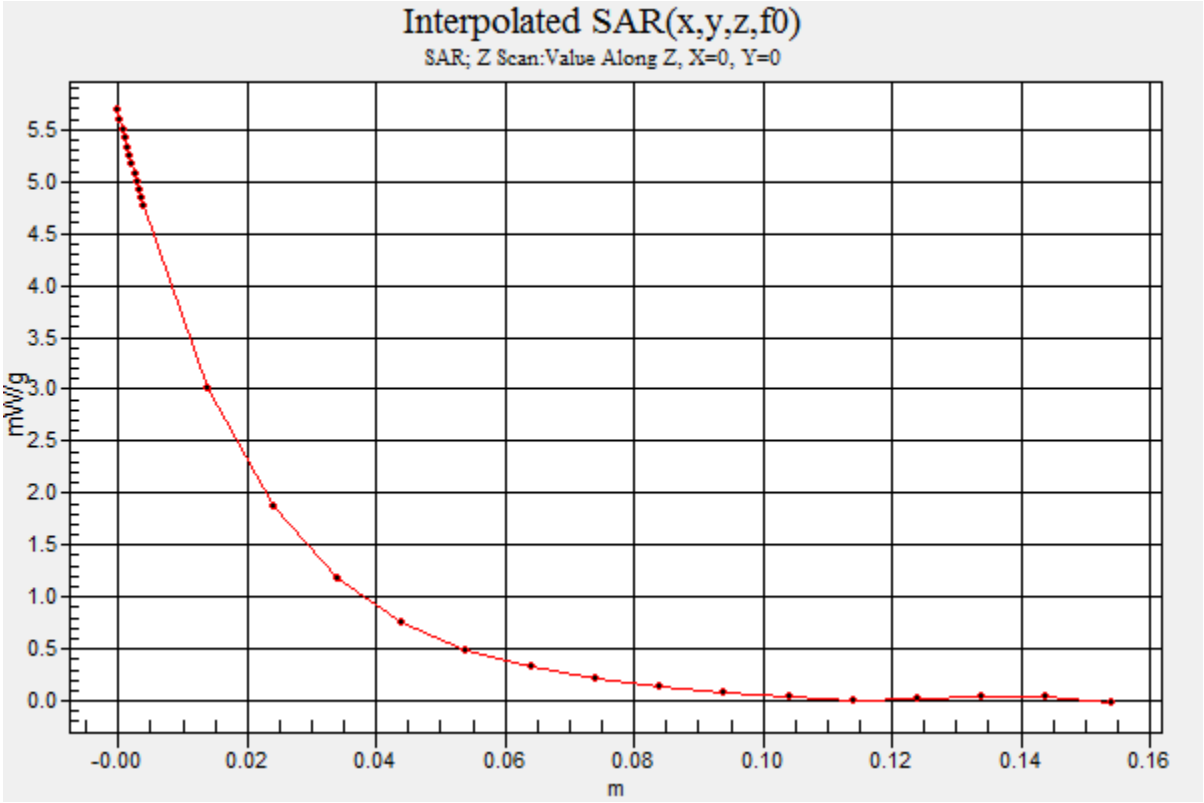
**F1 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4420-01, bat 4010-01/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 74.1 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 5.70 W/kg
**SAR(1 g) = 4.57 mW/g; SAR(10 g) = 3.57 mW/g**

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; $\varepsilon_r$ = 45.5; $\rho$ = 1000 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

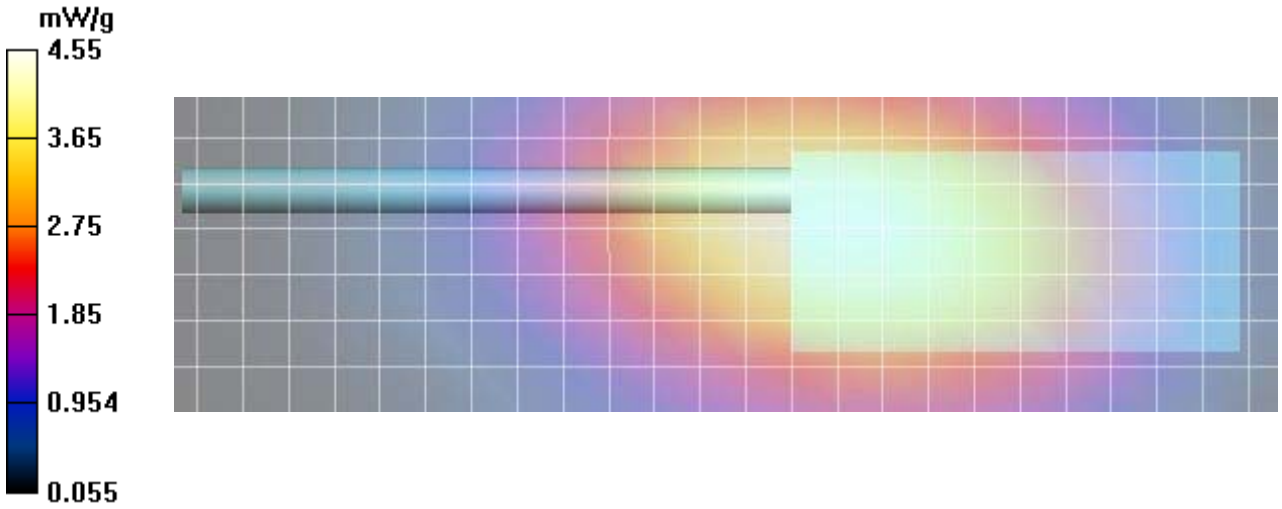
**F2 Face, SYS, Eclipse XL-185P w/ LTE, 406MHz, ant 4000-01, bat 4010-01/Area Scan (8x26x1):** Measurement grid: dx=15mm, dy=15mm

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 MHz; $\sigma$ = 0.844 mho/m; $\varepsilon_r$ = 45.5; $\rho$ = 1000 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=15mm, dy=15mm

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=7.5mm, dy=7.5mm, dz=5mm
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