

## SAR Test Report - New Application

Applicant:



**Garmin International Inc.**  
**Olathe, KS, 66062**  
**USA**

| Maximum Reported 10g SAR |              |                |             |
|--------------------------|--------------|----------------|-------------|
| Extremity<br>(wrist)     | Wifi (DTS)   | <b>0.33</b>    | <b>W/kg</b> |
|                          | BT/BLE (DSS) | <b>&lt;0.1</b> |             |
| General Pop. Limit:      |              | <b>4.00</b>    |             |

FCC ID:

**IPH-A04596**

Product Model Number / HVIN

**A04596**

IC Registration Number

Product Name / PMN

**A04596**

In Accordance With:

**FCC 47 CFR §2.1093**

Radiofrequency Radiation Exposure Evaluation: Portable Devices

Approved By:



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Test Lab Certificate: 2470.01



**Industry  
Canada**

IC Registration 3874A



FCC Registration: CA3874

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## 1.0 DOCUMENT CONTROL

| Revision History    |                         |                            |                        |            |                                         |
|---------------------|-------------------------|----------------------------|------------------------|------------|-----------------------------------------|
| Samples Tested By:  |                         | Ben Hewson/Trevor Whillock | Date(s) of Evaluation: |            | 15-16 December 2022 & 4-12 January 2023 |
| Report Prepared By: |                         | Ben Hewson                 | Report Reviewed By:    |            | Art Voss                                |
| Report Revision     | Description of Revision |                            | Revised Section        | Revised By | Revision Date                           |
| 0.1                 | Draft                   |                            | n/a                    | Ben Hewson | 13 Feb 2023                             |
| 1.0                 | Initial Release         |                            | n/a                    | Ben Hewson | 23 Feb 2023                             |

## 2.0 CLIENT AND DEVICE INFORMATION

| Client Information                    |                                                        |
|---------------------------------------|--------------------------------------------------------|
| Applicant Name                        | Garmin International Inc.                              |
| Applicant Address                     | 1200 East 151 St                                       |
|                                       | Olathe, KS, 66062                                      |
|                                       | USA                                                    |
| DUT Information                       |                                                        |
| Device Identifier(s):                 | FCC ID: IPH-A04596                                     |
|                                       | ISED ID:                                               |
| Device Model(s) / HVIN:               | A04596                                                 |
| EUT Name:                             | A04596                                                 |
| Test Sample Serial No.:               | 3431589962 - Conducted, 3431589964 - OTA               |
| Device Type:                          | Extremity Worn Digital Device                          |
| Equipment Class                       | Digital Transmission System (DTS)                      |
|                                       | Spread Spectrum Transmission System (DSS)              |
|                                       | Low Power Communication Device (DXX)                   |
|                                       | Global Navigation Satellite System (GNSS) Receivers    |
|                                       | NFC - Low Power Communication Device Transmitter (DXX) |
| Transmit Frequency Range:             | ANT (DXX): 2402-2480MHz                                |
|                                       | BT (DTS, DSS): 2402-2480MHz                            |
|                                       | WiFi (DTS): 2412-2462MHz                               |
| Manuf. Max. Rated Output Power:       | ANT (DXX): 1.6mW (2.1dBm)                              |
|                                       | BT BR (DSS): 12.97mW (11.13dBm)                        |
|                                       | BT 2EDR (DTS): 10.5mW (10.23dBm)                       |
|                                       | BT 3EDR (DTS): 10.3mW (10.12dBm)                       |
|                                       | BT LE1 (DTS): 1.5mW (1.65dBm)                          |
|                                       | BT LE2 (DTS): 1.6mW (1.95dBm)                          |
|                                       | 802.11b (DTS): 0.04W (18.25dBm)                        |
|                                       | 802.11g (DTS): 0.05W (18.24dBm)                        |
|                                       | 802.11n (DTS): 0.04W (15.91dBm)                        |
| Antenna Type and Gain:                | 2.4GHz: -3.21 dBi PIFA                                 |
| Modulation:                           | ANT: GFSK                                              |
|                                       | BT BR: GFSK                                            |
|                                       | BT 2EDR: $\pi/4$ -DQPSK                                |
|                                       | BT 3EDR: 8DPSK                                         |
|                                       | BLE: GMSK                                              |
|                                       | WiFi: CCK, DSSS, OFDM, MCS                             |
| DUT Power Source:                     | 5V USB, Internal Li-Ion Battery                        |
| DUT Dimensions [LxWxH]                | L x W x H: 49mm x 45mm x 11mm                          |
| Deviation(s) from standard/procedure: | None                                                   |
| Modification of DUT:                  | None                                                   |

### 3.0 SCOPE OF EVALUATION

This Certification Report was prepared on behalf of:

**Garmin International Inc.**

.(the '*Applicant*'), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 (the '*Rules*'). The scope of this investigation was limited to only the equipment, devices and accessories (the '*Equipment*') supplied by the *Applicant*. The tests and measurements performed on this *Equipment* were only those set forth in the applicable *Rules* and/or the Test and Measurement Standards they reference. The *Rules* applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable *Rules* were applied to the measurement results obtained during this evaluation and ,unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the *Equipment* tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

As per FCC 47 CFR Part §2.1091 and §2.1093, an RF Exposure evaluation report is required for this *Equipment* and the results of the RF Exposure evaluation appear in this report.

The A04596 FCC ID: IPH-A04596, is a wrist-worn transceiver that is capable of operating in the 2.4GHz WiFi, ANT/Bluetooth frequency bands and has an additional NFC feature that operates at a fixed transmit frequency of 13.56MHz. The device is not capable of simultaneous transmission between transmitters. The device is intended for General Population Use. The product operates from an internal proprietary Li-ion rechargeable battery which can be connected to a compliant USB interface port, AC or DC adapter for charging. Test samples provided by the manufacturer were capable of transmitting at select frequencies and modulations preset by the manufacturer. An additional antenna modification was prepared for one sample allowing the ability to connect test equipment for antenna port conducted power analysis.

## 4.0 NORMATIVE REFERENCES

| Normative References*                                                              |                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANSI / ISO 17025                                                                   | General Requirements for competence of testing and calibration laboratories                                                                                                                                                                                                     |
| FCC CFR Title 47 Part 2                                                            | Code of Federal Regulations                                                                                                                                                                                                                                                     |
| Title 47:                                                                          | Telecommunication                                                                                                                                                                                                                                                               |
| Part 2.1093:                                                                       | Radiofrequency Radiation Exposure Evaluation: Portable Devices                                                                                                                                                                                                                  |
| IEC International Standard /IEEE International Committee on Electromagnetic Safety |                                                                                                                                                                                                                                                                                 |
| IEC/IEEE 62209-1528                                                                | Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528; Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz) |
| FCC KDB                                                                            |                                                                                                                                                                                                                                                                                 |
| KDB 865664 D01v01r04                                                               | SAR Measurement Requirements for 100MHz to 6GHz                                                                                                                                                                                                                                 |
| FCC KDB                                                                            |                                                                                                                                                                                                                                                                                 |
| KDB 447498 D01v06                                                                  | Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies                                                                                                                                                                                         |
| FCC KDB                                                                            |                                                                                                                                                                                                                                                                                 |
| KDB 248227 D01v02r02                                                               | SAR Guidance for IEEE 802.11 (WiFi) Transmitters                                                                                                                                                                                                                                |
| * 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.

|                                                                                                                                                                                                |  |                                                                                                                                                                                    |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Applicant:</b><br>Garmin International Inc.                                                                                                                                                 |  | <b>Model / HVIN:</b><br>A04596                                                                                                                                                     |  |
| <b>Standard(s) Applied:</b><br>FCC 47 CFR §2.1093                                                                                                                                              |  | <b>Measurement Procedure(s):</b><br>FCC KDB 865664, FCC KDB 447498, FCC KDB 248227<br>IEC/IEEE Standard 62209-1528                                                                 |  |
| <b>Reason For Issue:</b><br><input checked="" type="checkbox"/> New Certification<br><input type="checkbox"/> Class I Permissive Change<br><input type="checkbox"/> Class II Permissive Change |  | <b>Use Group:</b><br><input checked="" type="checkbox"/> General Population / Uncontrolled<br><input type="checkbox"/> Occupational / Controlled                                   |  |
| <b>Reason for Change:</b>                                                                                                                                                                      |  | <b>Limits Applied:</b><br><input type="checkbox"/> 1.6W/kg - 1g Volume<br><input type="checkbox"/> 8.0W/kg - 1g Volume<br><input checked="" type="checkbox"/> 4.0W/kg - 10g Volume |  |
|                                                                                                                                                                                                |  | <b>Date(s) Evaluated:</b><br>15-16 December 2022 & 4-12 January 2023                                                                                                               |  |

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.

  
Trevor Whillock  
Test Lab Engineer  
Celltech Labs Inc.  
10 February 2023  
Date



## 6.0 SAR MEASUREMENT SYSTEM

### SAR Measurement System

Celltech Labs Inc. SAR measurement facility employs a Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY6 measurement system is comprised of the measurement server, a robot controller, a computer, a near-field probe, a probe alignment sensor, an Elliptical Planar Phantom (ELI) phantom and a specific anthropomorphic mannequin (SAM) phantom for Head and/or Body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller and a teach pendant (Joystick) to control the robot's servo motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical form the DAE to digital electronic signal and transfers data to the DASY6 measurement server. The DAE4 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter, a command decoder and a control logic unit. Transmission to the DASY6 measurement server is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot utilizes a controller with built in VME-bus computer.



**DASY 6 SAR System with SAM Phantom**



**DASY 6 Measurement Controller**

## 7.0 RF CONDUCTED POWER MEASUREMENT

Table 7.0 Conducted Power Measurements – 2.4GHz WiFi

| A04596-Conducted Power Measurements |                    |                            |                         |               |                              |           |             |              |         |
|-------------------------------------|--------------------|----------------------------|-------------------------|---------------|------------------------------|-----------|-------------|--------------|---------|
| Channel                             | Frequency<br>(MHz) | Measured<br>Power<br>(dBm) | Rated<br>Power<br>(dBm) | Delta<br>(dB) | SAR Test<br>Channel<br>(Y/N) | Mode      | BW<br>(MHz) | Modulation   |         |
| 6                                   | 2437               | 18.21                      |                         |               | -                            | WLAN 2.4G | 20          | DSSS-1Mbps   | 802.11b |
|                                     |                    | 18.14                      |                         |               | -                            |           |             | DSSS-2Mbps   |         |
|                                     |                    | 18.25                      |                         |               | -                            |           |             | DSSS-5.5Mbps |         |
|                                     |                    | 18.04                      |                         |               | -                            |           |             | DSSS-11Mbps  |         |
| 1                                   | 2412               | 17.74                      | 18.25                   | -0.51         | Y                            | WLAN 2.4G | 20          | DSSS-5.5Mbps | 802.11g |
| 6                                   | 2437               | 18.25                      | 18.25                   | 0.00          | Y                            |           |             |              |         |
| 11                                  | 2462               | 18.14                      | 18.25                   | -0.11         | Y                            |           |             |              |         |
| 1                                   | 2412               | 12.23                      | 18.24                   | -6.01         | -                            | WLAN 2.4G | 20          | OFDM-12Mbps  | 802.11g |
| 6                                   | 2437               | 18.24                      | 18.24                   | 0.00          | -                            |           |             |              |         |
| 11                                  | 2462               | 13.77                      | 18.24                   | -4.47         | -                            | WLAN 2.4G | 20          |              | 802.11n |
| 1                                   | 2412               | 14.34                      | 15.91                   | -1.57         | -                            |           |             |              |         |
| 6                                   | 2437               | 15.91                      | 15.91                   | 0.00          | -                            |           |             | MCS-0        |         |
| 11                                  | 2462               | 13.68                      | 15.91                   | -2.23         | -                            |           |             |              |         |

**Table 7.1 Conducted Power Measurements – BT**

| A04596- Conducted Power Measurements |                |         |                 |                      |                     |                  |            |                  |
|--------------------------------------|----------------|---------|-----------------|----------------------|---------------------|------------------|------------|------------------|
| Mode                                 | Modulation     | Channel | Frequency (MHz) | Measured Power (dBm) | Measured Power (mW) | Rated Power (mW) | Delta (mW) | SAR test Channel |
| ANT                                  | GFSK           | 0       | 2402.00         | -1.06                | 0.8                 | 1.6              | 0.82       | -                |
|                                      |                | 39      | 2440.00         | 2.10                 | 1.6                 | 1.6              | -0.02      | -                |
|                                      |                | 79      | 2480.00         | -1.22                | 0.8                 | 1.6              | 0.84       | -                |
| BT BR                                | GFSK           | 0       | 2402.00         | 11.04                | 12.70               | 12.97            | 0.27       | Y                |
|                                      |                | 38      | 2441.00         | 11.11                | 12.90               | 12.97            | 0.07       | Y                |
|                                      |                | 78      | 2480.00         | 11.13                | 12.97               | 12.97            | 0.00       | Y                |
| BT 2EDR                              | $\pi/4$ -DQPSK | 3       | 2402.00         | 10.11                | 10.30               | 10.50            | 0.20       | -                |
|                                      |                | 38      | 2441.00         | 10.21                | 10.50               | 10.50            | 0.00       | -                |
|                                      |                | 78      | 2480.00         | 10.23                | 10.50               | 10.50            | 0.00       | -                |
| BT 3EDR                              | 8DPSK          | 3       | 2402.00         | 10.11                | 10.30               | 10.30            | 0.00       | -                |
|                                      |                | 38      | 2441.00         | 10.11                | 10.30               | 10.30            | 0.00       | -                |
|                                      |                | 78      | 2480.00         | 10.12                | 10.30               | 10.30            | 0.00       | -                |
| BT 3EDR                              | 8DPSK          | 3       | 2402.00         | 10.11                | 10.30               | 10.30            | 0.00       | -                |
|                                      |                | 38      | 2441.00         | 10.11                | 10.30               | 10.30            | 0.00       | -                |
|                                      |                | 78      | 2480.00         | 10.12                | 10.30               | 10.30            | 0.00       | -                |
| BT LE1                               | GMSK           | 37      | 2402.00         | -1.88                | 0.7                 | 1.5              | 0.82       | -                |
|                                      |                | 17      | 2440.00         | 1.65                 | 1.5                 | 1.5              | 0.04       | -                |
|                                      |                | 39      | 2480.00         | -1.50                | 0.7                 | 1.5              | 0.79       | -                |
| BT LE2                               | GMSK           | 37      | 2402.00         | 1.95                 | 1.6                 | 1.6              | 0.00       | -                |
|                                      |                | 17      | 2440.00         | 1.75                 | 1.5                 | 1.6              | 0.10       | -                |
|                                      |                | 39      | 2480.00         | -2.00                | 0.6                 | 1.6              | 1.00       | -                |

The rated power and tolerance are stated for typical transmission modes and data rates. Some modes and data rates may produce lower than rated conducted power levels. Power measurements taken across the various channels, modes and data rates did not produce levels in excess of the Rated Power plus Tolerance. SAR was evaluated using the power level setting and duty cycle specified by the manufacturer to be the max output power and produce the most conservative SAR. SAR was evaluated at the maximum average tune up tolerance. See section 2.0 Client and Device Information for details. The reported SAR was not scaled down.

## 8.0 NUMBER OF TEST CHANNELS ( $N_c$ )

### WiFi SAR Evaluation:

SAR was evaluated in DSSS mode with a sample rate of 5.5 Mbps at a 100% duty cycle. The power level setting selected was specified by the manufacturer to be the max output power and produce the most conservative SAR.

As per FCC KDB 248227, the required 802.11 test channels are Ch 1, Ch 6 and Ch 11.  
When applicable, SAR test reduction methods may be utilized.

802.11b DSSS SAR test reduction is determined according to the following:

- When the reported SAR of the highest measured maximum output power channel is  $\leq$  to 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- When the reported SAR is  $> 0.8$  W/kg, SAR is required for that exposure configuration using the next highest output power channel. When any reported SAR is  $> 1.2$  W/kg, SAR is required for the third channel.

While 1-g SAR thresholds are specified in the procedures for SAR test reduction and exclusion, these thresholds should be multiplied by 2.5 when 10-g extremity SAR is considered.

### 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

- When KDB Publication 248227 SAR test exclusion applies to the OFDM configuration.
- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

When applying this formula to EU Extremity limits the adjusted SAR is  $\leq 1.5$ W/kg, and for Body limits is  $\leq 3.0$ W/kg.

See 13.1 for details.

### BT/BLE/ANT SAR Test Evaluation:

Bluetooth was evaluated for SAR at a transmit duty cycle of 100 % in the worst-case configuration from the WiFi test evaluation. The duty cycle cannot be altered in test mode or by the user.

### General SAR Test Reduction Considerations:

As per KDB 447498D01 4.4.1,

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid band or highest output power channel is:

- $\leq 0.8$ W/kg or 2.0W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$ Mhz

BLE/ANT was not evaluated for SAR.

Per FCC KDB 447498 4.3.1 the BLE/ANT transmitter meets the standalone SAR test exclusion criteria. See section 11.0 for details.

NOTE: This device is not capable of simultaneous transmission between the BT/BLE/ANT and WiFi transmitters. Due to the nature of this device, WiFi and Bluetooth were evaluated for standalone SAR only.

### NFC:

The RFID transmitter is a low power communication device transmitter and does not require standalone SAR evaluation. Simultaneous transmission evaluation with it and the 802.11b/g/n is not required

## 9.0 ACCESSORIES EVALUATED

Table 9.0 Accessories Evaluated

| Accessory List        |                            |               |               |            |
|-----------------------|----------------------------|---------------|---------------|------------|
| Test Report ID Number | Manufacturer's Part Number | Description   | SAR Evaluated | SAR Tested |
| B1                    | 010-01988-04               | Silicone Band | Y             | Y          |
| B2                    | 010-12740-02               | Metal Band    | Y             | Y          |

## 10.0 SAR MEASUREMENT SUMMARY

Table 10.0: Measured Results

| Measured 10g SAR Results - EXTREMITY Configuration |         |                      |                             |            |    |         |     |                                 |          |              |                     |                |                  |                |                     |                     |
|----------------------------------------------------|---------|----------------------|-----------------------------|------------|----|---------|-----|---------------------------------|----------|--------------|---------------------|----------------|------------------|----------------|---------------------|---------------------|
| Date                                               | Plot ID | Test Frequency (MHz) | DUT Configuration           |            |    |         |     | Accessories                     | Spacing  |              | Measured SAR (W/kg) | SAR Drift (dB) | Delta Power (dB) | Crest Factor n | Fluid Sensitivity n | reported SAR (W/kg) |
|                                                    |         |                      | Pos                         | Mode       | BW | Mod     | BR  |                                 | DUT (mm) | Antenna (mm) |                     |                |                  |                |                     |                     |
| 12/15/2022                                         | E1      | 2412                 | Extremity                   | 802.11b    | 20 | DSSS    | 5.5 | B1                              | 0        | 1            | 0.252               | -0.600         | -0.510           | 1.000          | 1.000               | 0.325               |
| 12/16/2022                                         | E2      | 2437                 | Extremity                   | 802.11b    | 20 | DSSS    | 5.5 | B1                              | 0        | 1            | 0.246               | -0.260         | 0.000            | 1.000          | 1.000               | 0.261               |
| 12/16/2022                                         | E3      | 2462                 | Extremity                   | 802.11b    | 20 | DSSS    | 5.5 | B1                              | 0        | 1            | 0.164               | -0.200         | -0.110           | 1.000          | 1.000               | 0.176               |
| 12/16/2022                                         | E4      | 2412                 | Extremity                   | 802.11b    | 20 | DSSS    | 5.5 | B2                              | 0        | 1            | 0.244               | -0.130         | -0.510           | 1.000          | 1.000               | 0.283               |
| 1/4/2023                                           | E5      | 2402                 | Extremity                   | BT Classic | 1  | BT-GFSK | -   | B1                              | 0        | 1            | 0.076               | 0.070          | -0.090           | 1.000          | 1.000               | 0.077               |
| 1/4/2023                                           | E6      | 2440                 | Extremity                   | BT Classic | 1  | BT-GFSK | -   | B1                              | 0        | 1            | 0.075               | 0.060          | -0.020           | 1.000          | 1.000               | 0.075               |
| 1/4/2023                                           | E7      | 2480                 | Extremity                   | BT Classic | 1  | BT-GFSK | -   | B1                              | 0        | 1            | 0.074               | 0.140          | 0.000            | 1.000          | 1.000               | 0.074               |
| Applicable SAR Limit                               |         |                      |                             |            |    |         |     | Use Group                       |          |              |                     | Limit          |                  |                |                     |                     |
| FCC CFR 2.1093                                     |         |                      | Health Canada Safety Code 6 |            |    |         |     | General Population/User Unaware |          |              |                     | 4 W/kg         |                  |                |                     |                     |

## 11.0 SCALING OF MAXIMUM MEASURE SAR

Table 11.0 SAR Scaling – Extremity

| Scaling of Maximum Measured SAR (10g) |                     |               |           |        |
|---------------------------------------|---------------------|---------------|-----------|--------|
| Measured Parameters                   |                     | Configuration |           |        |
|                                       |                     | Extremity     | Extremity |        |
| Plot ID                               |                     | E1            | E5        |        |
| Maximum Measured SAR <sub>M</sub>     |                     | 0.252         | 0.076     | (W/kg) |
| Frequency                             |                     | 2412          | 2402      | (MHz)  |
| Drift                                 | Power Drift         | -0.600        | 0.070 (1) | (dB)   |
| Conducted Power                       |                     | 17.740        | 11.040    | (dBm)  |
| DC                                    | Transmit Duty Cycle | 100.000       | 100.0     | (%)    |
| Fluid Deviation from Target           |                     |               |           |        |
| Δe                                    | Permittivity        | -7.33%        | -7.27%    |        |
| Δσ                                    | Conductivity        | 3.18%         | 2.84%     |        |

Note(1): Power Drift is Positive, Drift Adjustment not Required.

| Fluid Sensivity Calculation (10g)                       |                 |           | IEC/IEEE 62209-1528 7.8.2 |     |
|---------------------------------------------------------|-----------------|-----------|---------------------------|-----|
| Delta SAR = Ce * Δe + Cσ * Δσ                           |                 |           | (8)                       |     |
| Ce = (0.003456*f³) - (0.03531*f²) + (0.07675*f) - 0.186 |                 |           | (11)                      |     |
| Cσ = (0.004479*f³) - (0.01586*f²) - (0.1972*f) + 0.7717 |                 |           | (12)                      |     |
| f                                                       | Frequency (GHz) | 2.412     | 2.402                     |     |
| Ce                                                      |                 | -0.158    | -0.157                    |     |
| Cσ                                                      |                 | 0.267     | 0.269                     |     |
| Ce * Δe                                                 |                 | 0.012     | 0.011                     |     |
| Cσ * Δσ                                                 |                 | 0.008     | 0.008                     |     |
| ΔSAR                                                    |                 | 0.020 (3) | 0.019 (3)                 | (%) |

Note(3): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529

| Manufacturer's Tuneup Tolerance |  |        |        |       |
|---------------------------------|--|--------|--------|-------|
| Measured Conducted Power        |  | 17.740 | 11.040 | (dBm) |
| Rated Conducted Power           |  | 18.250 | 11.130 | (dBm) |
| ΔP                              |  | -0.510 | -0.090 | (dB)  |

Note(4): SAR was Evaluated at the Maximum Tuneup Tolerance. SAR Adjustment is not Required.

| Crest Factor             |  |           |          |     |
|--------------------------|--|-----------|----------|-----|
| Transmit Duty Cycle (DC) |  | 100.000   | 100.0    | (%) |
| CF (1/DC)                |  | 1.000 (5) | 1.00 ### |     |

Note(5): Crest Factor = 1 (100% Duty Cycle), Crest Factor Adjustment not Required.

| SAR Adjustment for Fluid Sensitivity          |  |       |       |        |
|-----------------------------------------------|--|-------|-------|--------|
| SAR <sub>1</sub> = SAR <sub>M</sub> X [ΔSAR]  |  | 0.252 | 0.076 | (W/kg) |
| SAR Adjustment for Tuneup Tolerance           |  |       |       |        |
| SAR <sub>2</sub> = SAR <sub>1</sub> + [ΔP]    |  | 0.283 | 0.077 | (W/kg) |
| SAR Adjustment for Drift                      |  |       |       |        |
| SAR <sub>3</sub> = SAR <sub>2</sub> + [Drift] |  | 0.325 | 0.077 | (W/kg) |
| SAR Adjustment for Crest Factor               |  |       |       |        |
| SAR <sub>4</sub> = SAR <sub>3</sub> x [CF]    |  | 0.325 | 0.077 | (W/kg) |
| reported 10g SAR                              |  |       |       |        |
| SAR <sub>4</sub>                              |  | 0.33  | 0.08  | (W/kg) |

The SAR test exclusion threshold for the BLE/ANT transmitter as per FCC KDB 447498 4.3.1 is as follows:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times [\sqrt{f(\text{GHz})}] \leq 7.5 \text{ for 10-g SAR}$$

$$[1.9)/(5)] \times [\sqrt{2.441}] = 0.496 \leq 7.5$$

Where:

max. power of channel, including tune-up tolerance, mW = 1.6 mW

min. test separation distance, mm = 5mm

f(GHz) = 2.402 GHz

Therefore; the BLE/ANT Transmitter meets the SAR test exclusion criteria.

NOTE: This device is not capable of simultaneous transmission between the BT/BLE/ANT and WiFi transmitters. Due to the nature of this device, WiFi and Bluetooth were evaluated for standalone SAR only.

The NFC transmitter is a low power communication device transmitter and does not require standalone SAR evaluation. Simultaneous transmission evaluation with it and the 802.11b/g/n or BT 802.15 is not required. When applying this formula to EU Extremity limits the adjusted SAR is  $\leq 1.5\text{W/kg}$ , and for Body limits is  $\leq 3.0\text{W/kg}$ .

| NOTES to Table 11.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Scaling of the Maximum Measured SAR is based on the highest, 100% duty cycle, Face, Body and/or Head SAR measured of ALL test channels, configurations and accessories used during THIS evaluation. The Measured Fluid Deviation parameters apply only to deviation of the tissue equivalent fluids used at the frequencies which produced the highest measured SAR. The Measured Conducted Power applies to the Conducted Power measured at the frequencies producing the highest Face and Body SAR. The Measured Drift is the SAR drift associated with that specific SAR measurement. The Reported SAR is the accumulation of all SAR Adjustments from the applicable Steps 1 through 4. The Plot ID is for identification of the SAR Measurement Plots in Annex A of this report.<br>NOTE: Some of the scaling factors in Steps 1 through 4 may not apply and are identified by light gray text. |                                                                                                                                                                                                                                                                                                                                                 |
| <b>Step 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Per IEC/IEEE 62209-1528 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 9.1 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 (+). |
| <b>Step 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 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.                                                                                                                           |
| <b>Step 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Per IEC/IEEE 62209-1528. Scaling required only when Measured Drift is (-) Negative. The absolute value of Measured Drift is added to Reported or Simultaneous Reported SAR.                                                                                                                                                                     |
| <b>Step 4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 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.                                                                                                                                                                                    |
| <b>Step 5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 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.                                                                                                                                                                                                  |



## 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 /<br>Uncontrolled Exposure <sup>(4)</sup> | Occupational /<br>Controlled Exposure <sup>(5)</sup> |
| <b>Spatial Average<sup>(1)</sup></b><br>(averaged over the whole body)                                                                                                                             |                             | 0.08 W/kg                                                    | 0.4 W/kg                                             |
| <b>Spatial Peak<sup>(2)</sup></b><br>(Head and Trunk averaged over any 1 g of tissue)                                                                                                              |                             | 1.6 W/kg                                                     | 8.0 W/kg                                             |
| <b>Spatial Peak<sup>(3)</sup></b><br>(Hands/Wrists/Feet/Ankles averaged over 10 g)                                                                                                                 |                             | <b>4.0 W/kg</b>                                              | 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

### 13.0 Day Log

| DAY LOG     |                   |                 |                       |                           | Fluid Dielectric | SPC | Test | Task                          |
|-------------|-------------------|-----------------|-----------------------|---------------------------|------------------|-----|------|-------------------------------|
| Date        | Ambient Temp (°C) | Fluid Temp (°C) | Relative Humidity (%) | Barometric Pressure (kPa) |                  |     |      |                               |
| 15 Dec 2022 | 23.6              | 23.7            | 19%                   | 102.8                     | X                | X   | X    | 2450H Fluids&SPC, SAR Testing |
| 16 Dec 2022 | 22.9              | 20.5            | 18%                   | 102.9                     |                  |     | X    | 2450H SAR Testing             |
| 18 Dec 2022 | 22.5              | 21.6            | 17%                   | 102.2                     |                  |     | X    | 2450H SAR Testing             |
| 4 Jan 2023  | 25.4              | 23.6            | 18%                   | 102.0                     | X                | X   | X    | 2450H Fluids&SPC, SAR Testing |
| 12 Jan 2023 | 24.7              | 23.1            | 23%                   | 102.0                     | X                | X   | X    | 2450H Fluids&SPC, SAR Testing |

\*Per IEC/IEEE 62209-1528, test series was started within 24 hours of Fluid Parameter Measurement

### 13.1 DUT Setup and Configuration

| DUT Setup and Configuration |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                           | The device was evaluated for Extremity (wrist worn), from a flat phantom filled with head tissue-equivalent medium. The DUT was evaluated for SAR in accordance with the procedures as described in FCC KDB 447498, 248227, 865664 and IEC/IEEE 62209-1528, ACMA Radiocommunications and ICNIRP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2                           | <p>2.4GHz 802.11g/n OFDM SAR Test Exclusion</p> <p>As Per KDB 248227 D01v02r02 - 5.2.2,<br/>b) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is <math>\leq 1.2\text{W/kg}</math></p> <p>When applying this formula to EU Extremity limits the adjusted SAR is <math>\leq 1.5\text{W/kg}</math>, and for Body limits is <math>\leq 3.0\text{W/kg}</math>.</p> <p>Maximum 802.11g/n OFDM specified power(POFDM)= 18.24 dBm (66.68mW)<br/>Maximum 802.11b DSSS specified power (PDSSS)= 18.25 dBm (36.83mW)<br/>Ratio OFDM/DSSS power = -0.01 dBm (99.9%)<br/>Highest reported SAR (SARMAX)= 0.33W/kg</p> <p>POFDM/PDSSS X SARMAX = 0.33 W/kg <math>\leq 3.0\text{ W/kg}</math> (Extremity) and <math>\leq 1.5\text{ W/kg}</math> (Body) and SAR test exclusion applies.</p> |
| 3                           | The Device was capable of transmitting at various modulations, data rates and duty cycles. The Conducted Power was highest when measured in DSSS Mode-5.5 Mbps at 100% Duty cycle than any other configuration in the 2.4GHz Band. The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4                           | Bluetooth was evaluated for SAR in BT BR (GFSK) mode with a transmit duty cycle of 100% in the worst-case configuration from the WiFi test evaluation. The Duty cycle could not be altered in test mode or by the user. The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5                           | Each SAR evaluation was performed with a fully charged battery.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### 13.2 DUT Positioning

| DUT Positioning                |                                                                                                                                                                                                                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Positioning</b>             | 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.                                                                                                         |
| <b>FACE Configuration</b>      | Devices that are designed to be worn on the wrist and may operate with in speaker mode for voice communication, with the device positioned next to the mouth. When next-to-mouth SAR evaluation is required, the device is positioned at 10mm from a flat phantom filled with head tissue-equivalent medium. |
| <b>BODY Configuration</b>      | The DUT was securely clamped into the device holder with the surface of the DUT being 2mm from bottom of the phantom in the Body configuration.                                                                                                                                                              |
| <b>HEAD Configuration</b>      | This device is not intended to be held to the ear and was not tested in the HEAD configuration.                                                                                                                                                                                                              |
| <b>Limb Worn Configuration</b> | The DUT was positioned with the back side directly against the phantom surface with the strap opened to allow direct contact or 0mm of the DUT and watch band to the phantom surface.                                                                                                                        |

### 13.3 General Procedures and Report

| General Procedures and Reporting |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Procedures</b>        | <p>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 <math>\pm 0.5^{\circ}\text{C}</math>. The Active TSL temperature was maintained to within <math>\pm 2.0^{\circ}\text{C}</math> throughout the test series. The liquid parameters shall be measured within 24 hours before the start of a test series and if it takes longer than 48 hours, the liquid parameters shall also be measured at the end of the test series.</p> <p>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 <u>Maximum Distance to Phantom Surface</u> to the fluid surface was performed following the power drift measurement.</p> |
| <b>Reporting</b>                 | <p>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. These tables also include other information such as transmit channel and frequency, modulation, accessories tested and DUT-phantom separation distance.</p> <p>In the Scaling of Maximum Measured SAR Section of this report, the highest measured SAR in the BODY configuration, 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 <u>ONLY</u> scaled up, not down. The final results of this scaling is the <u>reported SAR</u> which appears on the Cover Page of this report.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### 13.4 Fluid Dielectric and Systems Performance Check

| Fluid Dielectric and Systems Performance Check |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fluid Dielectric Measurement Procedure</b>  | <p>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 <math>\pm 100\text{MHz}</math> for frequencies <math>&gt; 300\text{MHz}</math> and <math>\pm 50\text{MHz}</math> for frequencies <math>\leq 300\text{MHz}</math> with frequency step size of <math>10\text{MHz}</math> 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 <math>23^{\circ}\text{C}</math> in a <math>300\text{ml}</math> beaker) method. A sample of the TSL is placed in a <math>300\text{ml}</math> beaker and the open-ended coax is submerged approximately <math>8\text{mm}</math> 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 KDB 865664 targets for HEAD or BODY for the entire fluid measurement range. Fluid adjustment are made if the dielectric parameters are <math>&gt; 5\%</math> in range that the DUT is to be tested. If the adjustments fail to bring the parameters to <math>\leq 5\%</math> but are <math>&lt; 10\%</math>, the SAR Fluid Sensitivity as per IEC\IEEE 62209-1528 and FCC KDB 865664 are applied to the highest measured SAR. A TSL with dielectric parameters <math>&gt; 10\%</math> in the DUT test frequency range are not used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Systems Performance Check</b>               | <p>The fluid dielectric parameters of the Active TSL are entered into the DASY Measurement Server at each of the <math>10\text{MHz}</math> 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 <math>10\text{MHz}</math> step intervals.</p> <p>A Systems Performance Check (SPC) is performed in accordance with IEC\IEEE 62209-1528 "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 <math>1\text{g}</math> and <math>10\text{g}</math> SAR is measured. The measured <math>1\text{g}</math> and <math>10\text{g}</math> SAR is compared to the <math>1\text{g}</math> and <math>10\text{g}</math> SAR measurements from the validation source's Calibration Certificate. When required, the measured SAR is normalized to <math>1.0\text{W}</math> 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 <math>\leq 10\%</math> of the measured and normalize SAR of the validation source's Calibration Certificate.</p> <p>The fluid dielectric parameters of the Active TSL and SPC are repeated when the Active TSL has been in use for greater than <math>84</math> hours or if the Active TSL temperature has exceed <math>\pm 1^{\circ}\text{C}</math> of the initial fluid analysis.</p> |

### 13.5 Scan Resolution 100MHz to 2GHz

| Scan Resolution 100MHz to 2GHz                                                                                                                       |                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Maximum distance from the closest measurement point to phantom surface:<br>(Geometric Center of Probe Center)                                        | $4 \pm 1 \text{ mm}$      |
| Maximum probe angle normal to phantom surface.<br>(Flat Section ELI Phantom)                                                                         | $5^{\circ} \pm 1^{\circ}$ |
| Area Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | $15 \text{ mm}$           |
| Zoom Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | $7.5 \text{ mm}$          |
| Zoom Scan Spatial Resolution $\Delta Z$<br>(Uniform Grid)                                                                                            | $5 \text{ mm}$            |
| Zoom Scan Volume X, Y, Z                                                                                                                             | $30 \text{ mm}$           |
| Phantom                                                                                                                                              | ELI                       |
| Fluid Depth                                                                                                                                          | $150 \pm 5 \text{ mm}$    |
| An Area Scan with an area extending beyond the device was used to locate the candidate maximas within $2\text{dB}$ 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 |                           |

### 13.6 Scan Resolution 2GHz to 3GHz

| Scan Resolution 2GHz to 3GHz                                                                                                                         |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Maximum distance from the closest measurement point to phantom surface:<br>(Geometric Center of Probe Center)                                        | 4 ± 1 mm   |
| Maximum probe angle normal to phantom surface.<br>(Flat Section ELI Phantom)                                                                         | 5° ± 1°    |
| Area Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | 12 mm      |
| Zoom Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | 5 mm       |
| Zoom Scan Spatial Resolution $\Delta Z$<br>(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 5GHz to 6GHz

| Scan Resolution 5GHz to 6GHz                                                                                                                         |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Maximum distance from the closest measurement point to phantom surface:<br>(Geometric Center of Probe Center)                                        | 4 ± 1 mm   |
| Maximum probe angle normal to phantom surface.<br>(Flat Section ELI Phantom)                                                                         | 5° ± 1°    |
| Area Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | 10 mm      |
| Zoom Scan Spatial Resolution $\Delta X, \Delta Y$                                                                                                    | 4 mm       |
| Zoom Scan Spatial Resolution $\Delta Z$<br>(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

Measurement uncertainty table is not required per KDB 865664 D01 v01r04 section 2.8.2 page 12. SAR measurement uncertainty analysis is required in SAR reports only when the highest measured SAR in a frequency band is  $\geq 1.5$  W/kg for 1-g SAR.21 The equivalent ratio (1.5/1.6) should be applied to extremity and occupational exposure conditions. The highest reported SAR value is less than 1.5W/kg. Therefore, the measurement uncertainty table is not required.

## 15.0 FLUID DIELECTRIC PARAMETERS

Table 15.0 Fluid Dielectric Parameters 2450MHz HEAD TSL

\*\*\*\*\*  
Aprel Laboratory  
Test Result for UIM Dielectric Parameter  
Tue 15/Dec/2022 04:40:03  
Freq Frequency(GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM  
\*\*\*\*\*

| Freq   | FCC_eHFCC | sHFCC | Test_e | Test_s |
|--------|-----------|-------|--------|--------|
| 2.4000 | 39.29     | 1.76  | 36.24  | 1.80   |
| 2.4100 | 39.27     | 1.76  | 36.37  | 1.81   |
| 2.4200 | 39.25     | 1.77  | 36.45  | 1.85   |
| 2.4300 | 39.24     | 1.78  | 36.22  | 1.83   |
| 2.4400 | 39.22     | 1.79  | 36.17  | 1.82   |
| 2.4500 | 39.20     | 1.80  | 36.13  | 1.85   |
| 2.4600 | 39.19     | 1.81  | 35.83  | 1.86   |
| 2.4700 | 39.17     | 1.82  | 35.89  | 1.89   |
| 2.4800 | 39.16     | 1.83  | 35.94  | 1.92   |

| FLUID DIELECTRIC PARAMETERS |             |             |                 |          |                   |                           |                           | Fluid Sensitivity Calculation<br>IEC/IEEE 62209-1528 7.8.2 |            |             |                |       |
|-----------------------------|-------------|-------------|-----------------|----------|-------------------|---------------------------|---------------------------|------------------------------------------------------------|------------|-------------|----------------|-------|
| Date:                       | 15-Dec-2022 | Fluid Temp: |                 | 23.7     | Frequency:        | 2450MHz                   | Tissue:                   | Head                                                       | ΔSAR<br>1g | ΔSAR<br>10g | SAR Correction |       |
| Freq<br>(MHz)               |             | Test ε      | Test σ<br>(S/m) | Target ε | Target σ<br>(S/m) | Deviation<br>Permittivity | Deviation<br>Conductivity | Factor (1)                                                 |            |             |                |       |
|                             |             |             |                 |          |                   |                           |                           | 1g                                                         |            |             | 10g            |       |
| 2400.0000                   |             |             | 36.2400         | 1.8000   | 39.2900           | 1.76                      | -7.76%                    | 2.27%                                                      | 0.029      | 0.018       | 1.000          | 1.000 |
| 2402.0000                   |             | *           | 36.2660         | 1.8020   | 39.2860           | 1.76                      | -7.69%                    | 2.39%                                                      | 0.029      | 0.019       | 1.000          | 1.000 |
| 2410.0000                   |             |             | 36.3700         | 1.8100   | 39.2700           | 1.76                      | -7.38%                    | 2.84%                                                      | 0.031      | 0.019       | 1.000          | 1.000 |
| 2412.0000                   |             | *           | 36.3860         | 1.8180   | 39.2660           | 1.76                      | -7.33%                    | 3.18%                                                      | 0.032      | 0.020       | 1.000          | 1.000 |
| 2420.0000                   |             |             | 36.4500         | 1.8500   | 39.2500           | 1.77                      | -7.13%                    | 4.52%                                                      | 0.038      | 0.023       | 1.000          | 1.000 |
| 2430.0000                   |             |             | 36.2200         | 1.8300   | 39.2400           | 1.78                      | -7.70%                    | 2.81%                                                      | 0.031      | 0.020       | 1.000          | 1.000 |
| 2437.0000                   |             | *           | 36.1850         | 1.8230   | 39.2260           | 1.79                      | -7.75%                    | 2.01%                                                      | 0.027      | 0.018       | 1.000          | 1.000 |
| 2440.0000                   |             | *           | 36.1700         | 1.8200   | 39.2200           | 1.79                      | -7.78%                    | 1.68%                                                      | 0.026      | 0.017       | 1.000          | 1.000 |
| 2450.0000                   |             |             | 36.1300         | 1.8500   | 39.2000           | 1.80                      | -7.83%                    | 2.78%                                                      | 0.031      | 0.020       | 1.000          | 1.000 |
| 2460.0000                   |             |             | 35.8300         | 1.8600   | 39.1900           | 1.81                      | -8.57%                    | 2.76%                                                      | 0.032      | 0.021       | 1.000          | 1.000 |
| 2462.0000                   |             | *           | 35.8420         | 1.8660   | 39.1860           | 1.81                      | -8.53%                    | 2.98%                                                      | 0.033      | 0.021       | 1.000          | 1.000 |
| 2470.0000                   |             |             | 35.8900         | 1.8900   | 39.1700           | 1.82                      | -8.37%                    | 3.85%                                                      | 0.037      | 0.023       | 1.000          | 1.000 |
| 2480.0000                   |             | *           | 35.9400         | 1.9200   | 39.1600           | 1.83                      | -8.22%                    | 4.92%                                                      | 0.042      | 0.026       | 1.000          | 1.000 |

\*Channel Frequency Tested



**Table 15.1 Fluid Dielectric Parameters 2450MHz HEAD TSL**

\*\*\*\*\*  
Aprel Laboratory  
Test Result for UIM Dielectric Parameter  
Wed 04/Jan/2023 15:57:42  
Freq Frequency(GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM  
\*\*\*\*\*

| Freq   | FCC_eHFCC | FCC_sHFCC | Test_e | Test_s |
|--------|-----------|-----------|--------|--------|
| 2.4000 | 39.29     | 1.76      | 36.44  | 1.81   |
| 2.4100 | 39.27     | 1.76      | 36.39  | 1.81   |
| 2.4200 | 39.25     | 1.77      | 36.32  | 1.83   |
| 2.4300 | 39.24     | 1.78      | 36.13  | 1.83   |
| 2.4400 | 39.22     | 1.79      | 36.34  | 1.86   |
| 2.4500 | 39.20     | 1.80      | 36.31  | 1.88   |
| 2.4600 | 39.19     | 1.81      | 36.25  | 1.88   |
| 2.4700 | 39.17     | 1.82      | 36.32  | 1.88   |
| 2.4800 | 39.16     | 1.83      | 36.34  | 1.88   |

| FLUID DIELECTRIC PARAMETERS |            |             |                 |            |                   |                           |                           | Fluid Sensitivity Calculation<br>IEC/IEEE 62209-1528 7.8.2 |       |                |       |
|-----------------------------|------------|-------------|-----------------|------------|-------------------|---------------------------|---------------------------|------------------------------------------------------------|-------|----------------|-------|
| Date:                       | 4-Jan-2023 | Fluid Temp: | 23.6            | Frequency: | 2450MHz           | Tissue:                   | Head                      | ΔSAR                                                       | ΔSAR  | SAR Correction |       |
| Freq<br>(MHz)               |            | Test ε      | Test σ<br>(S/m) | Target ε   | Target σ<br>(S/m) | Deviation<br>Permittivity | Deviation<br>Conductivity | 1g                                                         | 10g   | Factor (1)     |       |
|                             |            |             |                 |            |                   |                           |                           |                                                            |       | 1g             | 10g   |
| 2400.0000                   |            | 36.4400     | 1.8100          | 39.2900    | 1.76              | -7.25%                    | 2.84%                     | 0.030                                                      | 0.019 | 1.000          | 1.000 |
| 2402.0000                   | *          | 36.4300     | 1.8100          | 39.2860    | 1.76              | -7.27%                    | 2.84%                     | 0.030                                                      | 0.019 | 1.000          | 1.000 |
| 2410.0000                   |            | 36.3900     | 1.8100          | 39.2700    | 1.76              | -7.33%                    | 2.84%                     | 0.030                                                      | 0.019 | 1.000          | 1.000 |
| 2412.0000                   | *          | 36.3760     | 1.8140          | 39.2660    | 1.76              | -7.36%                    | 2.95%                     | 0.031                                                      | 0.019 | 1.000          | 1.000 |
| 2420.0000                   |            | 36.3200     | 1.8300          | 39.2500    | 1.77              | -7.46%                    | 3.39%                     | 0.033                                                      | 0.021 | 1.000          | 1.000 |
| 2430.0000                   |            | 36.1300     | 1.8300          | 39.2400    | 1.78              | -7.93%                    | 2.81%                     | 0.031                                                      | 0.020 | 1.000          | 1.000 |
| 2437.0000                   | *          | 36.2770     | 1.8510          | 39.2260    | 1.79              | -7.52%                    | 3.58%                     | 0.034                                                      | 0.021 | 1.000          | 1.000 |
| 2440.0000                   | *          | 36.3400     | 1.8600          | 39.2200    | 1.79              | -7.34%                    | 3.91%                     | 0.035                                                      | 0.022 | 1.000          | 1.000 |
| 2450.0000                   |            | 36.3100     | 1.8800          | 39.2000    | 1.80              | -7.37%                    | 4.44%                     | 0.038                                                      | 0.023 | 1.000          | 1.000 |
| 2460.0000                   |            | 36.2500     | 1.8800          | 39.1900    | 1.81              | -7.50%                    | 3.87%                     | 0.035                                                      | 0.022 | 1.000          | 1.000 |
| 2462.0000                   | *          | 36.2640     | 1.8800          | 39.1860    | 1.81              | -7.46%                    | 3.75%                     | 0.035                                                      | 0.022 | 1.000          | 1.000 |
| 2470.0000                   |            | 36.3200     | 1.8800          | 39.1700    | 1.82              | -7.28%                    | 3.30%                     | 0.032                                                      | 0.020 | 1.000          | 1.000 |
| 2480.0000                   | *          | 36.3400     | 1.8800          | 39.1600    | 1.83              | -7.20%                    | 2.73%                     | 0.029                                                      | 0.018 | 1.000          | 1.000 |

\*Channel Frequency Tested

**Table 15.2 Fluid Dielectric Parameters 2450MHz HEAD TSL**

\*\*\*\*\*  
Aprel Laboratory  
Test Result for UIM Dielectric Parameter  
Wed 12/Jan/2023 10:14:03  
Freq Frequency(GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM  
\*\*\*\*\*

| Freq   | FCC_eHFCC | FCC_sHFCC | Test_e | Test_s |
|--------|-----------|-----------|--------|--------|
| 2.4000 | 39.29     | 1.76      | 36.56  | 1.76   |
| 2.4100 | 39.27     | 1.76      | 36.45  | 1.77   |
| 2.4200 | 39.25     | 1.77      | 36.40  | 1.80   |
| 2.4300 | 39.24     | 1.78      | 36.38  | 1.84   |
| 2.4400 | 39.22     | 1.79      | 36.38  | 1.80   |
| 2.4500 | 39.20     | 1.80      | 36.38  | 1.83   |
| 2.4600 | 39.19     | 1.81      | 36.40  | 1.84   |
| 2.4700 | 39.17     | 1.82      | 36.46  | 1.87   |
| 2.4800 | 39.16     | 1.83      | 36.40  | 1.87   |

| FLUID DIELECTRIC PARAMETERS |             |                 |                        |                   |                          |                           |                           | Fluid Sensitivity Calculation<br>IEC/IEEE 62209-1528 7.8.2 |       |                |       |
|-----------------------------|-------------|-----------------|------------------------|-------------------|--------------------------|---------------------------|---------------------------|------------------------------------------------------------|-------|----------------|-------|
| Date:                       | 12-Jan-2023 | Fluid Temp:     | 23.8                   | Frequency:        | 2450MHz                  | Tissue:                   | Head                      | ASAR                                                       | ASAR  | SAR Correction |       |
| Freq<br>(MHz)               |             | Test $\epsilon$ | Test $\sigma$<br>(S/m) | Target $\epsilon$ | Target $\sigma$<br>(S/m) | Deviation<br>Permittivity | Deviation<br>Conductivity | 1g                                                         | 10g   | Factor (1)     |       |
|                             |             |                 |                        |                   |                          |                           |                           |                                                            |       | 1g             | 10g   |
| 2400.0000                   |             | 36.5600         | 1.7600                 | 39.2900           | 1.76                     | -6.95%                    | 0.00%                     | 0.016                                                      | 0.011 | 1.000          | 1.000 |
| 2402.0000                   | *           | 36.5380         | 1.7620                 | 39.2860           | 1.76                     | -6.99%                    | 0.11%                     | 0.016                                                      | 0.011 | 1.000          | 1.000 |
| 2410.0000                   |             | 36.4500         | 1.7700                 | 39.2700           | 1.76                     | -7.18%                    | 0.57%                     | 0.019                                                      | 0.013 | 1.000          | 1.000 |
| 2412.0000                   | *           | 36.4400         | 1.7760                 | 39.2660           | 1.76                     | -7.20%                    | 0.79%                     | 0.020                                                      | 0.013 | 1.000          | 1.000 |
| 2420.0000                   |             | 36.4000         | 1.8000                 | 39.2500           | 1.77                     | -7.26%                    | 1.69%                     | 0.025                                                      | 0.016 | 1.000          | 1.000 |
| 2430.0000                   |             | 36.3800         | 1.8400                 | 39.2400           | 1.78                     | -7.29%                    | 3.37%                     | 0.033                                                      | 0.020 | 1.000          | 1.000 |
| 2437.0000                   | *           | 36.3800         | 1.8120                 | 39.2260           | 1.79                     | -7.26%                    | 1.40%                     | 0.023                                                      | 0.015 | 1.000          | 1.000 |
| 2440.0000                   | *           | 36.3800         | 1.8000                 | 39.2200           | 1.79                     | -7.24%                    | 0.56%                     | 0.019                                                      | 0.013 | 1.000          | 1.000 |
| 2450.0000                   |             | 36.3800         | 1.8300                 | 39.2000           | 1.80                     | -7.19%                    | 1.67%                     | 0.024                                                      | 0.016 | 1.000          | 1.000 |
| 2460.0000                   |             | 36.4000         | 1.8400                 | 39.1900           | 1.81                     | -7.12%                    | 1.66%                     | 0.024                                                      | 0.016 | 1.000          | 1.000 |
| 2462.0000                   | *           | 36.4120         | 1.8460                 | 39.1860           | 1.81                     | -7.08%                    | 1.88%                     | 0.025                                                      | 0.016 | 1.000          | 1.000 |
| 2470.0000                   |             | 36.4600         | 1.8700                 | 39.1700           | 1.82                     | -6.92%                    | 2.75%                     | 0.029                                                      | 0.018 | 1.000          | 1.000 |
| 2480.0000                   | *           | 36.4000         | 1.8700                 | 39.1600           | 1.83                     | -7.05%                    | 2.19%                     | 0.026                                                      | 0.017 | 1.000          | 1.000 |

\*Channel Frequency Tested

## 16.0 SYSTEM VERIFICATION TEST RESULTS

Table 16.0 System Verification Results 2450MHz HEAD TSL

| System Verification Test Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|-------------------------|-----------------------|------------------------|
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  | Frequency<br>(MHz) | Validation Source       |                       |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    | P/N                     | S/N                   |                        |
| 15 Dec 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  | 2450               | D2450V2                 | 825                   |                        |
| Fluid Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fluid Temp<br>°C | Ambient Temp<br>°C | Ambient Humidity<br>(%) | Forward Power<br>(mW) | Source Spacing<br>(mm) |
| Head                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 23.7             | 24                 | 19%                     | 250                   | 10                     |
| Fluid Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
| Permittivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    | Conductivity            |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 36.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 39.20            | -7.83%             | 1.85                    | 1.80                  | 2.78%                  |
| Measured SAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 12.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.18            | -4.40%             | 5.70                    | 6.01                  | -5.08%                 |
| Measured SAR Normalized to 1.0W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Normalized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Target           | Deviation          | Normalized              | Target                | Deviation              |
| 50.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 52.72            | -4.40%             | 22.80                   | 24.02                 | -5.06%                 |
| <p>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 IEC\IEEE 62209-1528, FCC KDB 846224.</p> <p>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.</p> <p>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.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> |                  |                    |                         |                       |                        |

**Table 16.1 System Verification Results 2450MHz HEAD TSL**

| System Verification Test Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|-------------------------|-----------------------|------------------------|
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  | Frequency<br>(MHz) | Validation Source       |                       |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    | P/N                     | S/N                   |                        |
| 4 Jan 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  | 2450               | D2450V2                 | 825                   |                        |
| Fluid Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fluid Temp<br>°C | Ambient Temp<br>°C | Ambient Humidity<br>(%) | Forward Power<br>(mW) | Source Spacing<br>(mm) |
| Head                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 23.6             | 25                 | 18%                     | 250                   | 10                     |
| Fluid Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
| Permittivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    | Conductivity            |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 36.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 39.20            | -7.37%             | 1.88                    | 1.80                  | 4.44%                  |
| Measured SAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 14.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.18            | 6.22%              | 6.38                    | 6.01                  | 6.24%                  |
| Measured SAR Normalized to 1.0W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Normalized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Target           | Deviation          | Normalized              | Target                | Deviation              |
| 56.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 52.72            | 6.22%              | 25.52                   | 24.02                 | 6.27%                  |
| <p>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 IEC\IEEE 62209-1528, FCC KDB 846224.</p> <p>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.</p> <p>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.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> |                  |                    |                         |                       |                        |

**Table 16.2 System Verification Results 2450MHz HEAD TSL**

| System Verification Test Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|-------------------------|-----------------------|------------------------|
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  | Frequency<br>(MHz) | Validation Source       |                       |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    | P/N                     | S/N                   |                        |
| 12 Jan 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  | 2450               | D2450V2                 | 825                   |                        |
| Fluid Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fluid Temp<br>°C | Ambient Temp<br>°C | Ambient Humidity<br>(%) | Forward Power<br>(mW) | Source Spacing<br>(mm) |
| Head                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 23.1             | 25                 | 23%                     | 250                   | 10                     |
| Fluid Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                    |                         |                       |                        |
| Permittivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    | Conductivity            |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 36.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 39.20            | -7.19%             | 1.83                    | 1.80                  | 1.67%                  |
| Measured SAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Target           | Deviation          | Measured                | Target                | Deviation              |
| 13.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.18            | -1.37%             | 5.88                    | 6.01                  | -2.08%                 |
| Measured SAR Normalized to 1.0W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                    |                         |                       |                        |
| 1 gram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                    | 10 gram                 |                       |                        |
| Normalized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Target           | Deviation          | Normalized              | Target                | Deviation              |
| 52.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 52.72            | -1.36%             | 23.52                   | 24.02                 | -2.06%                 |
| <p>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 IEC/IEEE 62209-1528, FCC KDB 846224.</p> <p>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.</p> <p>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.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> |                  |                    |                         |                       |                        |

## 17.0 SYSTEM VALIDATION SUMMARY

Table 17.0 System Validation Summary

| SAR Validation SummaryChart |                   |            |                      |        |           |          |               |
|-----------------------------|-------------------|------------|----------------------|--------|-----------|----------|---------------|
| Validation Date             | Validation Source | Source S/N | Validation Frequency | Tissue | Linearity | Isotropy | Extrapolation |
| 3-May-22                    | D2450V2           | 825        | 2450                 | Head   | ✓         | ✓        | ✓             |

## 18.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 18.0 Measurement System Specifications

| Measurement System Specification                |                                                                                   |
|-------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Specifications</b>                           |                                                                                   |
| Positioner                                      | Stäubli Unimation Corp. Robot Model: TX90XL                                       |
| Repeatability                                   | +/- 0.035 mm                                                                      |
| No. of axis                                     | 6.0                                                                               |
| <b>Data Acquisition Electronic (DAE) System</b> |                                                                                   |
| <b>Cell Controller</b>                          |                                                                                   |
| Processor                                       | Intel(R) Core(TM) i7-7700                                                         |
| Clock Speed                                     | 3.60 GHz                                                                          |
| Operating System                                | Windows 10 Professional                                                           |
| <b>Data Converter</b>                           |                                                                                   |
| Features                                        | Signal Amplifier, multiplexer, A/D converter, and control logic                   |
| Software                                        | Measurement Software: DASY6, V 6.4.0.12171 / DASY52 V10.2(1504)                   |
|                                                 | Postprocessing Software: SEMCAD X, V14.6.12(7470)                                 |
| Connecting Lines                                | Optical downlink for data and status info., Optical uplink for commands and clock |
| <b>DASY Measurement Server</b>                  |                                                                                   |
| Function                                        | Real-time data evaluation for field measurements and surface detection            |
| Hardware                                        | Intel ULV Celeron CPU 400 MHz; 128 MB chip disk; 128 MB RAM                       |
| Connections                                     | COM1, COM2, DAE, Robot, Ethernet, Service Interface                               |
| <b>E-Field Probe</b>                            |                                                                                   |
| 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)                                                         |
| <b>Phantom</b>                                  |                                                                                   |
| Type                                            | ELI Elliptical Planar Phantom                                                     |
| Shell Material                                  | Fiberglass                                                                        |
| Thickness                                       | 2mm +/- .2mm                                                                      |
| Volume                                          | > 30 Liter                                                                        |

**Table 18.1**

| <b>Measurement System Specification (Continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                   |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Probe Specification</b>                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                   |                                                                                                                   |
| Construction:                                                                                                                                                                                                                                                                                                                                                                                                                                      | Symmetrical design with triangular core;<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents (e.g. DGBE)                                                       |                                |
| Calibration:                                                                                                                                                                                                                                                                                                                                                                                                                                       | ISO/IEC 17025                                                                                                                                                                                                     |                                                                                                                   |
| Frequency:                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4 MHz - 10 GHz; Linearity: $\pm 0.2$ dB (30 MHz - 10 GHz)                                                                                                                                                         |                                                                                                                   |
| Directivity:                                                                                                                                                                                                                                                                                                                                                                                                                                       | $\pm 0.1$ dB in TSL (rotation around probe axis)<br>$\pm 0.3$ dB in TSL (rotation normal to probe axis)                                                                                                           |                                                                                                                   |
| Dynamic Range:                                                                                                                                                                                                                                                                                                                                                                                                                                     | 10 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB (noise: typically <1 mW/g)                                                                                                                                    |                                                                                                                   |
| Dimensions:                                                                                                                                                                                                                                                                                                                                                                                                                                        | Overall length: 337 mm; (tip: 20 mm)<br>Tip diameter: 2.5 mm; Tip (body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm                                                                        |                                                                                                                   |
| Application:                                                                                                                                                                                                                                                                                                                                                                                                                                       | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better than 30% | <b>EX3DV4 E-Field Probe</b>                                                                                       |
| <b>Phantom Specification</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |                                                                                                                   |
| The ELI V5.0 phantom is an elliptical planar fiberglass shell phantom with a shell thickness of 2.0mm +/- .2mm at the planar area. This phantom conforms to OET Bulletin 65, Supplement C, IEC/IEEE 62209-1528.                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   | <br><b>ELI Phantom</b>        |
| <b>Phantom Specification</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |                                                                                                                   |
| The SAM V4.0 phantom is a flat 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, IEC/IEEE 62209-1528.                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   | <br><b>SAM Phantom</b>       |
| <b>Phantom Specification</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |                                                                                                                   |
| The MFP V5.1C phantom is a flat 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, IEC/IEEE 62209-1528.                                                                                                                                                                                                                                          |                                                                                                                                                                                                                   | <br><b>MFP Phantom</b>       |
| <b>Device Positioner Specification</b>                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                   |                                                                                                                   |
| The DASY device positioner has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. |                                                                                                                                                                                                                   | <br><b>Device Positioner</b> |

## 19.0 TEST EQUIPMENT LIST

**Table 19.0 Equipment List and Calibration**

| Test Equipment List                         |           |             |                 |                 |
|---------------------------------------------|-----------|-------------|-----------------|-----------------|
| DESCRIPTION                                 | ASSET NO. | SERIAL NO.  | DATE CALIBRATED | CALIBRATION DUE |
| Schmid & Partner DASY 6 System              | -         | -           | -               | -               |
| -DASY Measurement Server                    | 00158     | 1078        | CNR             | CNR             |
| -Robot                                      | 00046     | 599396-01   | CNR             | CNR             |
| -DAE4                                       | 00019     | 353         | 14-Apr-22       | 14-Apr-23       |
| -EX3DV4 E-Field Probe                       | 00213     | 3600        | 20-Apr-22       | 20-Apr-23       |
| -D2450V2 Validation Dipole                  | 00219     | 825         | 24-Apr-21       | 24-Apr-24       |
| MFP Phantom                                 | 00355     | 1177/2      | CNR             | CNR             |
| HP 85070C Dielectric Probe Kit              | 00033     | none        | CNR             | CNR             |
| HP 8753ET Network Analyzer                  | 00134     | US39170292  | 6-Jan-21        | 6-Jan-24        |
| Rohde & Schwarz SMR20 Signal Generator      | 00006     | 100104      | 11-Aug-20       | 11-Aug-23       |
| Amplifier Research 10W1000C Power Amplifier | 00041     | 27887       | CNR             | CNR             |
| Amplifier Research 5S1G4 Power Amplifier    | 00106     | 26235       | CNR             | CNR             |
| Narda Directional Coupler 3020A             | 00064     | -           | CNR             | CNR             |
| Kangaroo VWR Humidity/Thermometer           | 00334     | 192385455   | 5-Aug-19        | 5-Jan-23        |
| Digital Multi Meter DMR-1800                | 00250     | TE182       | 23-Jun-20       | 23-Jun-23       |
| Bipolar Power Supply 6299A                  | 00086     | 1144A02155  | CNR             | CNR             |
| DC-18G 10W 30db Attenuator                  | 00102     | -           | COU             | COU             |
| R&S FSP40 Spectrum Analyzer                 | 00241     | 100500      | 9-Aug-21        | 9-Aug-24        |
| HP 8566B Spectrum Analyzer                  | 00051     | 2747A055100 | 29-Jun-20       | 29-Jun-23       |
| RF Cable-SMA                                | 00311     | -           | CNR             | CNR             |
| HP Calibration Kit                          | 00145     | -           | CNR             | CNR             |

CNR = Calibration Not Required

COU = Calibrate on Use

Note: Per KDB 865664, Dipoles are evaluated annually for return loss and impedance. The dipole's SAR target can only be assessed by the SAR equipment manufacturer and remains the target until the dipole is recalibrated by the manufacturer. The dipole's SAR is evaluated and compared to this target during each and every System Verification which is performed prior to and/or during each DUT SAR evaluation. The results of these verifications are shown in Section 16.0



## 20.0 FLUID COMPOSITION

Table 20.0 Fluid Composition 2450MHz HEAD TSL

| Tissue Simulating Liquid (TSL) Composition |        |                     |                    | 2450MHz Head                |
|--------------------------------------------|--------|---------------------|--------------------|-----------------------------|
| Component by Percent Weight                |        |                     |                    |                             |
| Water                                      | Glycol | Salt <sup>(1)</sup> | HEC <sup>(2)</sup> | Bacteriacide <sup>(3)</sup> |
| 52.0                                       | 48.0   | 0.0                 | 0.0                | 0.0                         |

(1) Non-Iodinized

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

(3) Dow Chemical DOWICIL 75 Antimicrobial Preservative

**END OF REPORT**

## APPENDIX A – SYSTEM VERIFICATION PLOTS

**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:825**  
**Procedure Name: SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2 2**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.85$  S/m;  $\epsilon_r = 36.13$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Date/Time: 12/15/2022 6:42:11 PM

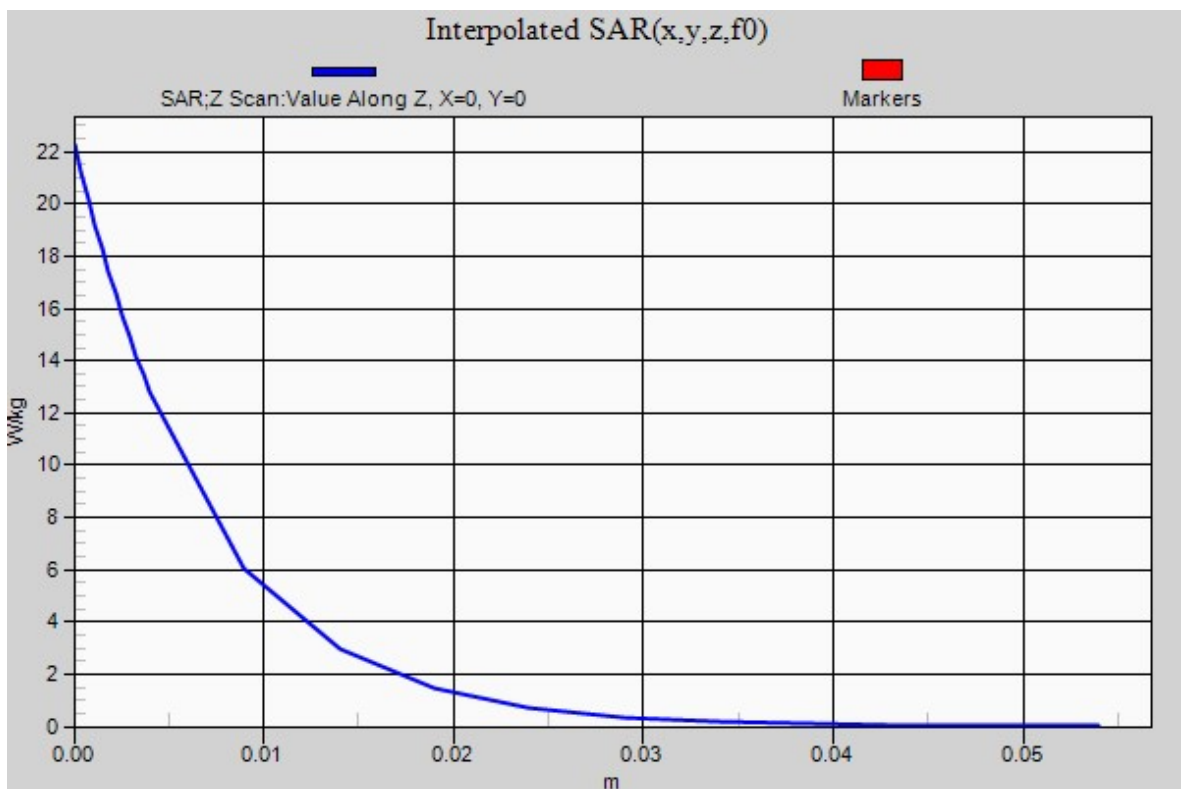
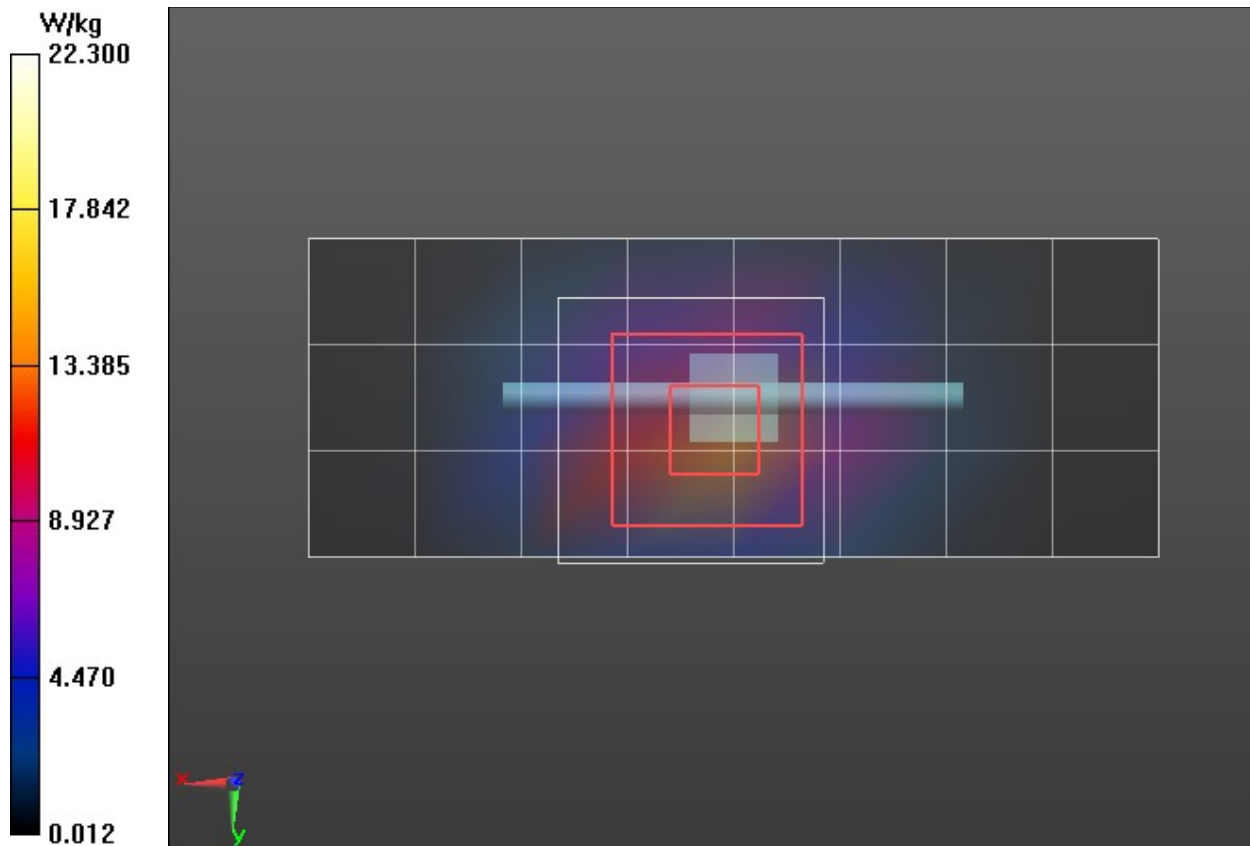
DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.58, 6.58, 6.58) @ 2450 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 00355
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2 2/Area Scan (9x4x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (measured) = 13.4 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2 2/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 83.16 V/m; Power Drift = 0.04 dB  
Peak SAR (extrapolated) = 27.8 W/kg  
**SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.7 W/kg**  
Smallest distance from peaks to all points 3 dB below = 10.4 mm  
Ratio of SAR at M2 to SAR at M1 = 46.3%  
Maximum value of SAR (measured) = 14.1 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2 2/Z Scan (1x1x22):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Penetration depth = 6.885 (6.712, 6.948) [mm]  
Maximum value of SAR (interpolated) = 22.3 W/kg



**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:825**  
**Procedure Name: SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_ 2 2 2**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.88$  S/m;  $\epsilon_r = 36.31$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Date/Time: 1/4/2023 4:48:04 PM

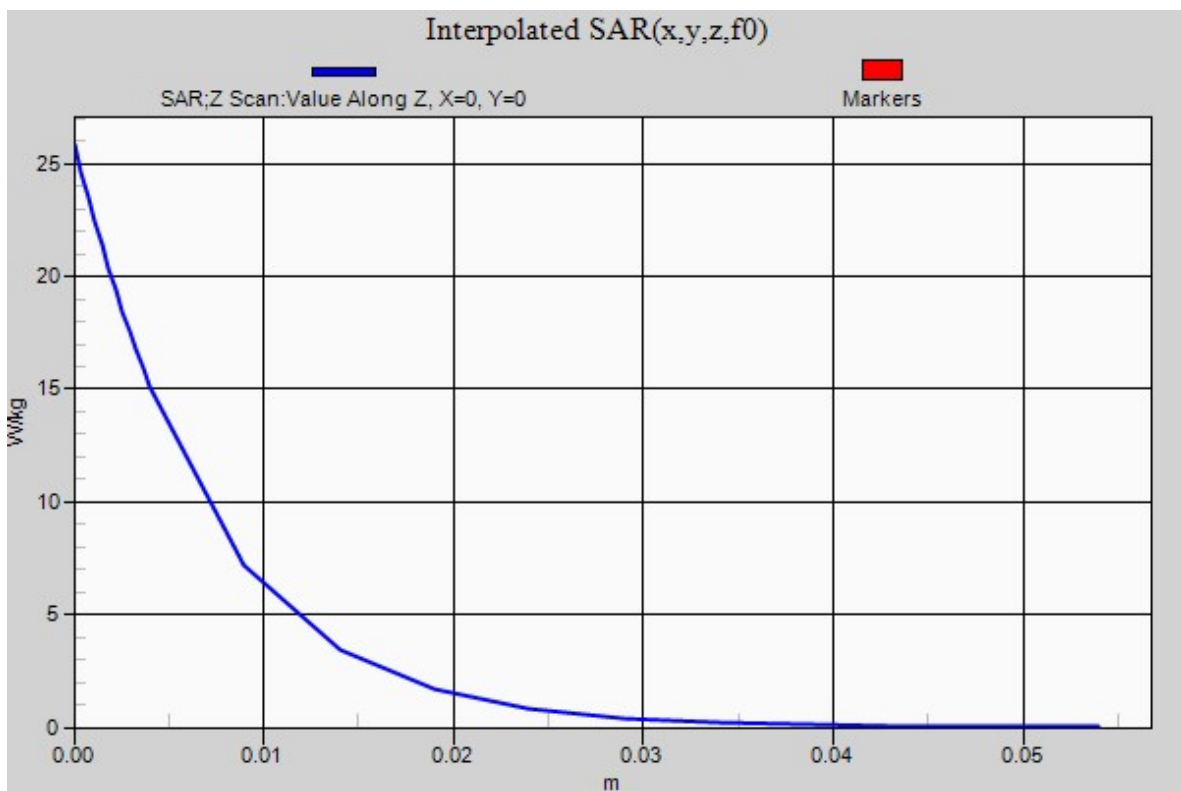
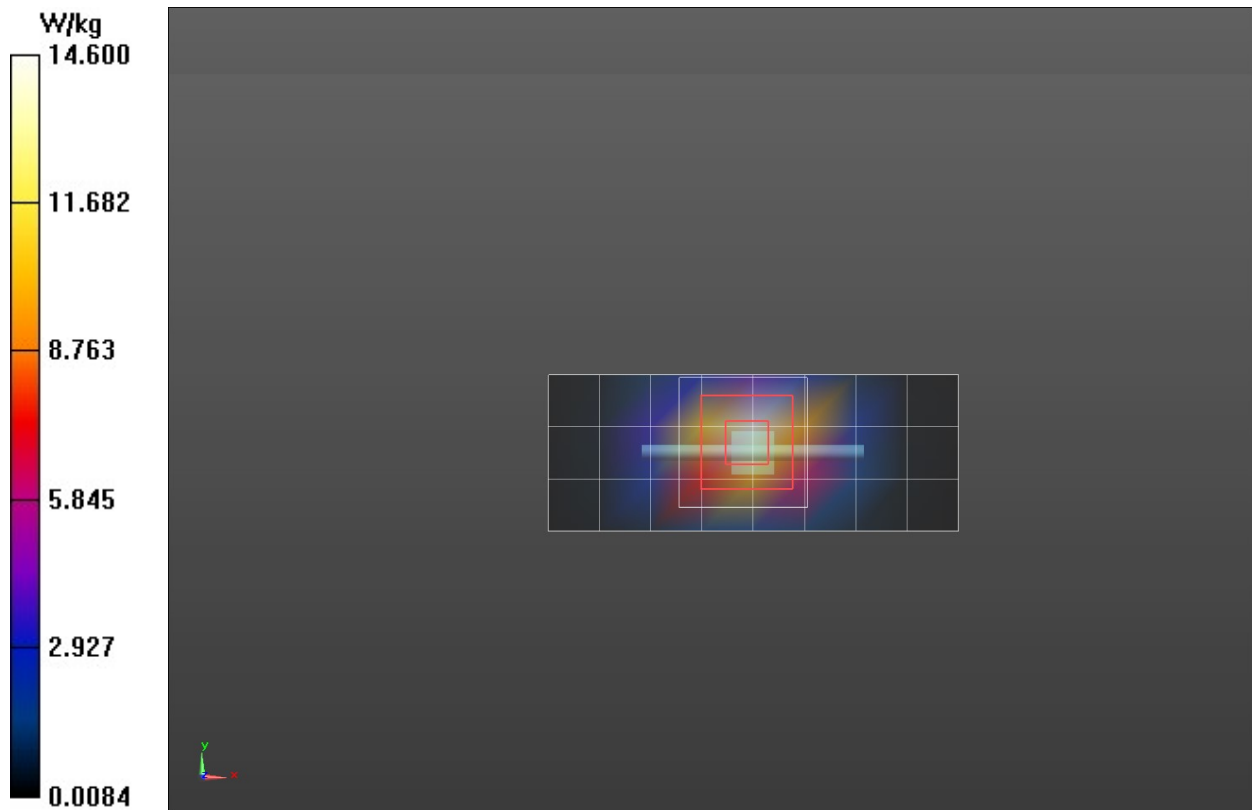
DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.58, 6.58, 6.58) @ 2450 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 00355
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_ 2 2 2/Area Scan (9x4x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (measured) = 14.6 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_ 2 2 2/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 90.07 V/m; Power Drift = -0.02 dB  
Peak SAR (extrapolated) = 30.6 W/kg  
**SAR(1 g) = 14 W/kg; SAR(10 g) = 6.38 W/kg**  
Smallest distance from peaks to all points 3 dB below = 10.8 mm  
Ratio of SAR at M2 to SAR at M1 = 46.8%  
Maximum value of SAR (measured) = 15.8 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_ 2 2 2/Z Scan (1x1x22):** Measurement grid: dx=20mm, dy=20mm, dz=5mm  
Penetration depth = 6.919 (6.667, 7.038) [mm]  
Maximum value of SAR (interpolated) = 25.8 W/kg





**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:825**  
**Procedure Name: SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.83$  S/m;  $\epsilon_r = 36.38$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Date/Time: 1/12/2023 6:30:32 PM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.58, 6.58, 6.58) @ 2450 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 00355
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2/Area Scan (9x4x1):** Measurement grid: dx=12mm, dy=12mm  
Maximum value of SAR (measured) = 14.0 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.50 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 28.7 W/kg

**SAR(1 g) = 13 W/kg; SAR(10 g) = 5.88 W/kg**

Smallest distance from peaks to all points 3 dB below = 10 mm

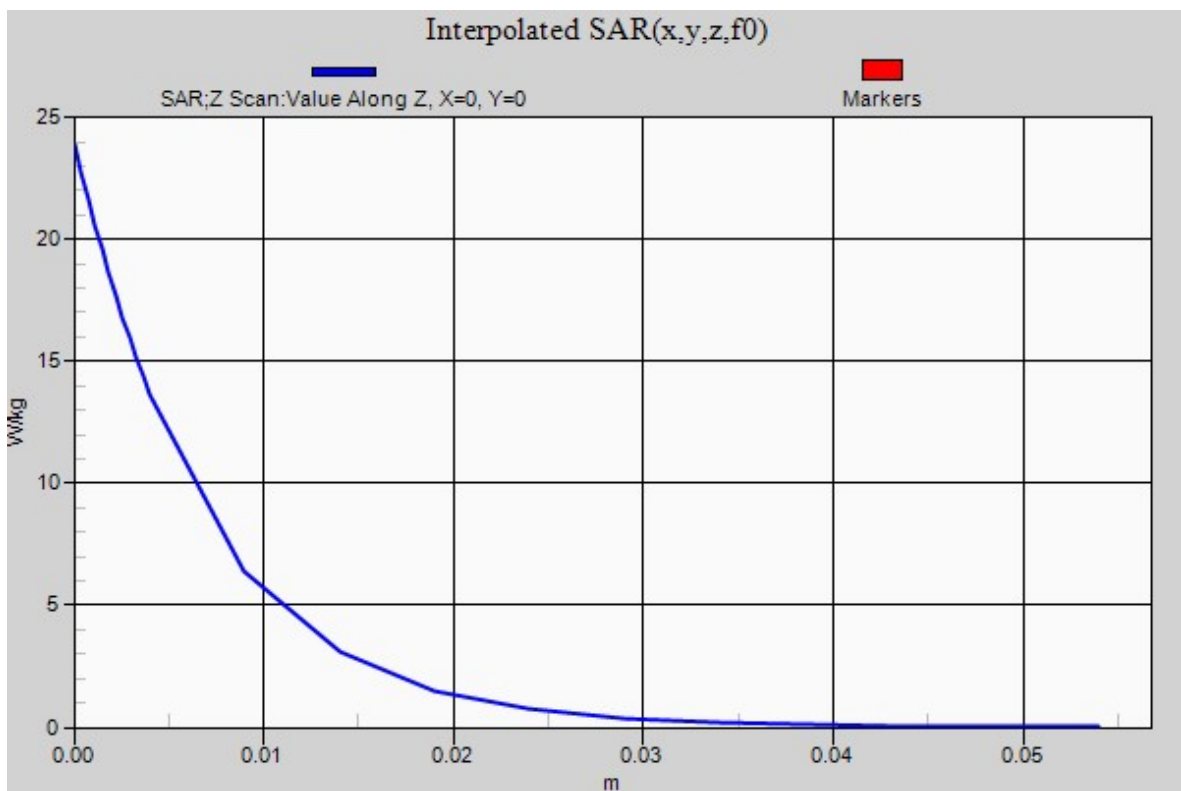
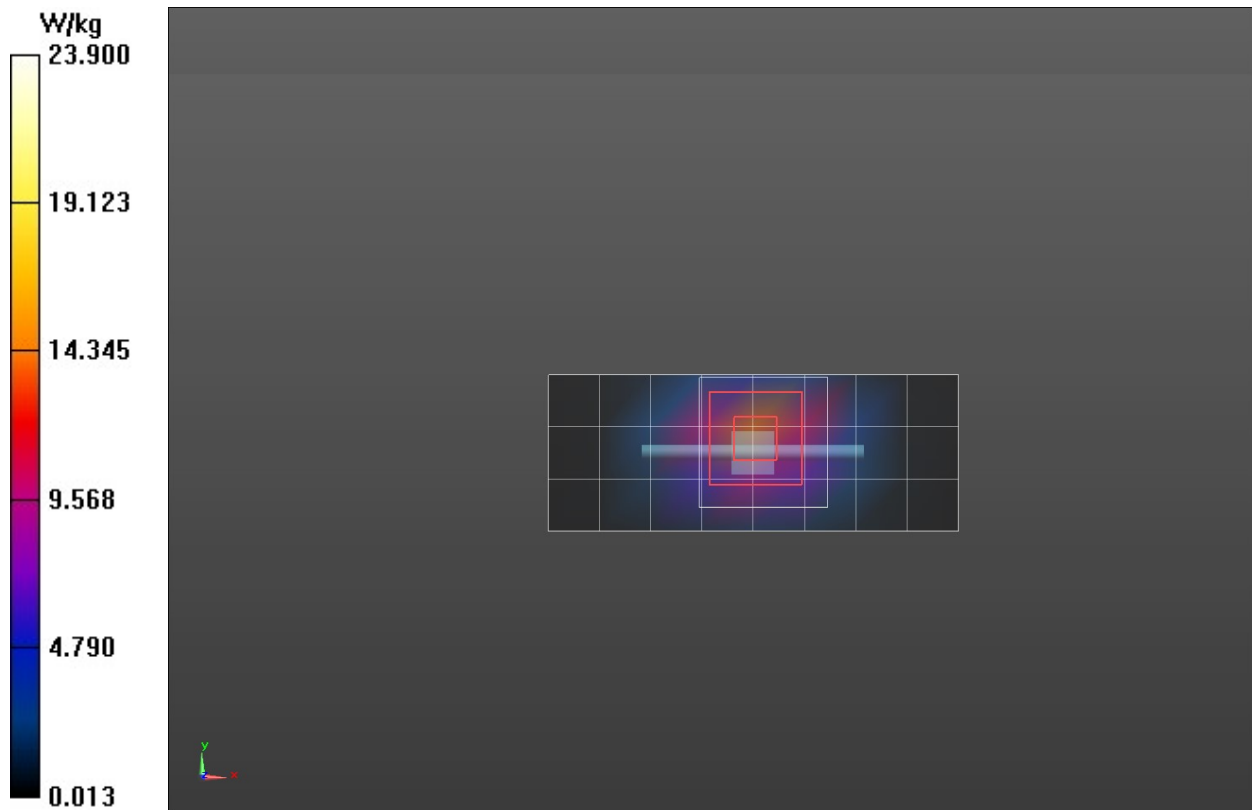
Ratio of SAR at M2 to SAR at M1 = 46.1%

Maximum value of SAR (measured) = 14.6 W/kg

**SPC/SPC 2450H\_Input=250mw, Target=[11.86]13.18[14.50]W/kg\_2/Z Scan (1x1x22):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Penetration depth = 6.826 (6.611, 6.925) [mm]

Maximum value of SAR (interpolated) = 23.9 W/kg





## APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR

### Plot E1

**DUT: A04596; Type: Extremity Worn Transmitter; Serial: 3431589964**

**Procedure Name: E1-A04596,Extremity-Back Side, 2412 MHz, Silicone Band-WIFI, DSSS-5.5Mbps**

Communication System: UID 0, CW (0); Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 2412$  MHz;  $\sigma = 1.818$  S/m;  $\epsilon_r = 36.386$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Date/Time: 12/15/2022 8:17:28 PM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.58, 6.58, 6.58) @ 2412 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 00355
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**2450H/E1-A04596,Extremity-Back Side, 2412 MHz, Silicone Band-WIFI, DSSS-5.5Mbps/Area Scan (8x8x1):**

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

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

Maximum value of SAR (measured) = 0.688 W/kg

**2450H/E1-A04596,Extremity-Back Side, 2412 MHz, Silicone Band-WIFI, DSSS-5.5Mbps/Zoom Scan (7x7x7)/Cube 0:**

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

Reference Value = 15.71 V/m; Power Drift = -0.60 dB

Peak SAR (extrapolated) = 0.990 W/kg

**SAR(1 g) = 0.536 W/kg; SAR(10 g) = 0.252 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.2 mm

Ratio of SAR at M2 to SAR at M1 = 55.4%

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

Maximum value of SAR (measured) = 0.605 W/kg

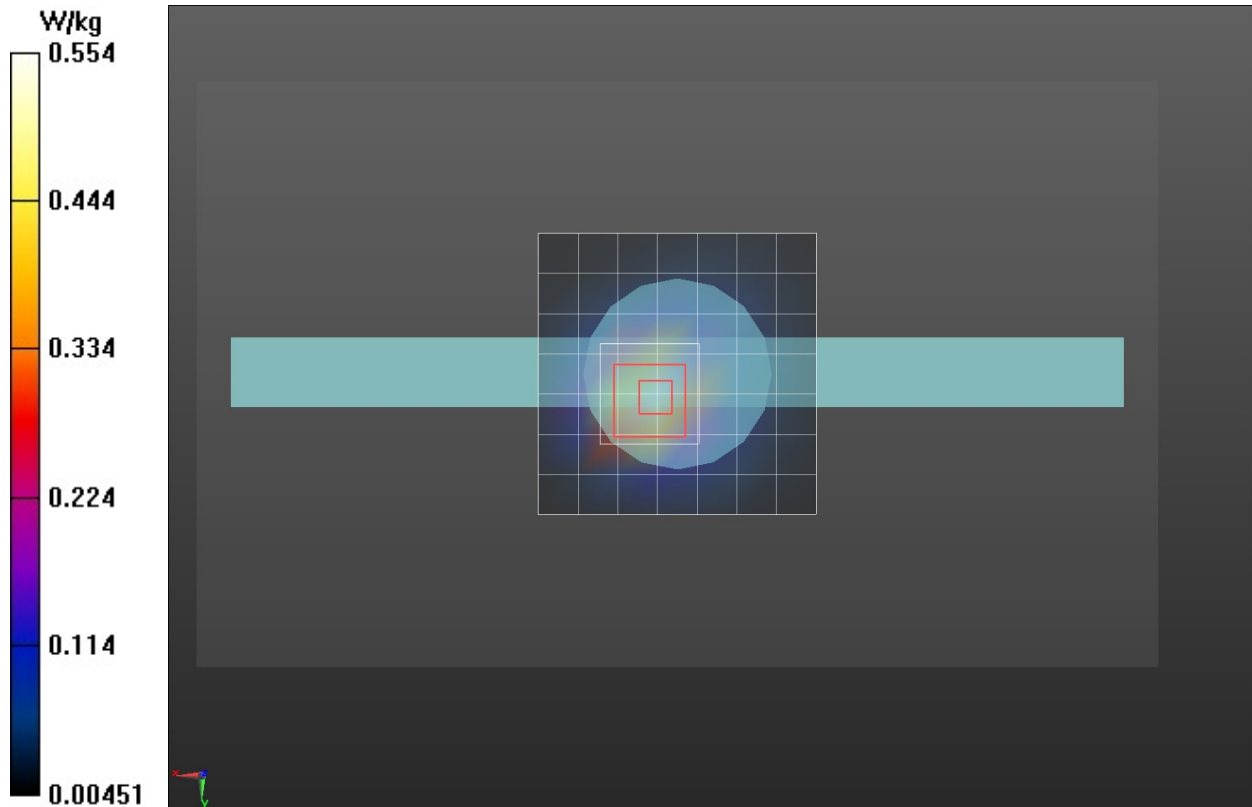
**2450H/E1-A04596,Extremity-Back Side, 2412 MHz, Silicone Band-WIFI, DSSS-5.5Mbps/Z Scan (1x1x17):**

Measurement grid: dx=20mm, dy=20mm, dz=20mm

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

Penetration depth =  $n/a$  ( $n/a$ , 7.335) [mm]

Maximum value of SAR (interpolated) = 0.554 W/kg



## Plot E5

**DUT: A04596; Type: Extremity Worn Transmitter; Serial: 3431589964**  
**Procedure Name: E5-A04596,Extremity-Back Side,ch-0 2402 MHz, B1,BT, GFSK**

Communication System: UID 0, CW (0); Frequency: 2402 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2402$  MHz;  $\sigma = 1.81$  S/m;  $\epsilon_r = 36.43$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Date/Time: 1/4/2023 8:38:12 PM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(6.58, 6.58, 6.58) @ 2402 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 00355
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**2450H-1619- A04596 /E5-A04596,Extremity-Back Side,ch-0 2402 MHz, B1,BT, GFSK/Area Scan (6x6x1):**  
Measurement grid: dx=12mm, dy=12mm

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

Maximum value of SAR (measured) = 0.150 W/kg

**2450H-1619- A04596 /E5-A04596,Extremity-Back Side,ch-0 2402 MHz, B1,BT, GFSK/Zoom Scan (7x7x7)/Cube 0:**

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

Reference Value = 10.28 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.311 W/kg

**SAR(1 g) = 0.162 W/kg; SAR(10 g) = 0.076 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.8 mm

Ratio of SAR at M2 to SAR at M1 = 55.6%

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

Maximum value of SAR (measured) = 0.190 W/kg

**2450H-1619- A04596 /E5-A04596,Extremity-Back Side,ch-0 2402 MHz, B1,BT, GFSK/Z Scan (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=20mm

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

Penetration depth = n/a (n/a, 7.686) [mm]

Maximum value of SAR (interpolated) = 0.271 W/kg

