

Intertek  
731 Enterprise Drive  
Lexington, KY 40510

Tel 859 226 1000  
Fax 859 226 1040

[www.intertek.com](http://www.intertek.com)

# Stryker Medical

# SAR TEST REPORT

## SCOPE OF WORK

SPECIFIC ABSORPTION RATE – B7000 Badge model B7000

## REPORT NUMBER

105964951LEX-040.1

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## SPECIFIC ABSORPTION RATE TEST REPORT

**Report Number:** 105964951LEX-040.1

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**Report Issue Date:** 2/6/2025

**Report Revised Date:** 4/22/2025

**Product Name:** B7000 Badge model B7000

**Standards:** FCC Part 2.1093  
RSS-102 Issue 6  
IEC/IEEE 62209-1528:2020

Tested by:  
Intertek Testing Services NA, Inc.  
731 Enterprise Drive  
Lexington, KY 40510  
USA

Client:  
Stryker Medical  
3030 Orchard Parkway  
San Jose, CA 95134  
USA

Report prepared by



Brian Lackey, Staff Engineer

Report reviewed by



Michael Carlson, Team Leader

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## 1 Introduction

At the request of Stryker Medical the B7000 Badge was evaluated for SAR in accordance with the requirements for FCC Part 2.1093, RSS-102 Issue 6, and IEC/IEEE 62209-1528. Testing was performed in accordance with IEEE Std 1528-2013, IEC/IEEE 62209-1528, and the Office of Engineering and Technology KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 and KDB 447498 D04 Interim General RF Exposure Guidance v01. Testing was performed at the Intertek facility in Lexington, Kentucky. The FCC test site designation number was US1112. The SAR lab ISED company number was 2042M, CAB identifier US0127. The SAR lab A2LA certification number was 1926.01.

For the evaluation, the dosimetric assessment system DASY52 was used. The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 1-g tissue mass had been assessed for this system to be  $\pm 22.3\%$  from 300MHz – 3GHz and  $24.6\%$  from 3GHz – 6GHz. The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 10-g tissue mass had been assessed for this system to be  $\pm 22.2\%$  from 300MHz – 3GHz and  $24.5\%$  from 3GHz – 6GHz.

The B7000 Badge was tested at the maximum output power measured by Intertek. Maximum output power measurements are tabulated under Section 8 Test Results. The maximum spatial peak SAR value for the sample device averaged over 1-g and 10-g is shown below.

Based on the worst-case data presented below, the B7000 Badge were found to be **compliant** with the 1.6 W/kg requirements for general population / uncontrolled exposure.

**Table 1: Worst Case Reported 1-g SAR per Exposure Condition – FCC, ISED**

| Device Position | Transmit Mode | Separation Distance | Channel | Conducted Output Power (dBm) | Reported 1-g SAR (W/kg) | 1-g SAR Limit (W/kg) |
|-----------------|---------------|---------------------|---------|------------------------------|-------------------------|----------------------|
| Front           | 802.11b       | 5mm                 | 6       | 17.98                        | 1.53                    | 1.6                  |
| Left            | 802.11a       | 5mm                 | 120     | 17.35                        | 1.15                    | 1.6                  |

**Table 2: Worst Case Reported 10-g SAR per Exposure Condition – FCC, ISED**

| Device Position | Transmit Mode | Separation Distance | Channel | Conducted Output Power (dBm) | Reported 10-g SAR (W/kg) | 10-g SAR Limit (W/kg) |
|-----------------|---------------|---------------------|---------|------------------------------|--------------------------|-----------------------|
| Front           | 802.11b       | 5mm                 | 6       | 17.98                        | 0.74                     | 4                     |
| Left            | 802.11a       | 5mm                 | 120     | 17.35                        | 0.48                     | 4                     |

**Table 3: Worst Case Reported SAR per Exposure Condition – ICNIRP**

| Device Position | Transmit Mode | Separation Distance | Channel | Conducted Output Power (dBm) | Reported 10-g SAR (W/kg) | 10-g SAR Limit (W/kg) |
|-----------------|---------------|---------------------|---------|------------------------------|--------------------------|-----------------------|
| Front           | 802.11b       | 5mm                 | 6       | 17.98                        | 0.74                     | 2                     |
| Left            | 802.11a       | 5mm                 | 120     | 17.35                        | 0.48                     | 2                     |



## 2 Test Site Description

The SAR test site located at 731 Enterprise Drive, Lexington KY 40510 is comprised of the SPEAG model DASY 5.2 automated near-field scanning system, which is a package, optimized for dosimetric evaluation of mobile radios [3]. This system is installed in an ambient-free shielded chamber. The ambient temperature is controlled to  $22.0 \pm 2^\circ\text{C}$ . During the SAR evaluations, the RF ambient conditions are monitored continuously for signals that might interfere with the test results. The tissue simulating liquid is also stored in this area in order to keep it at the same constant ambient temperature as the room.

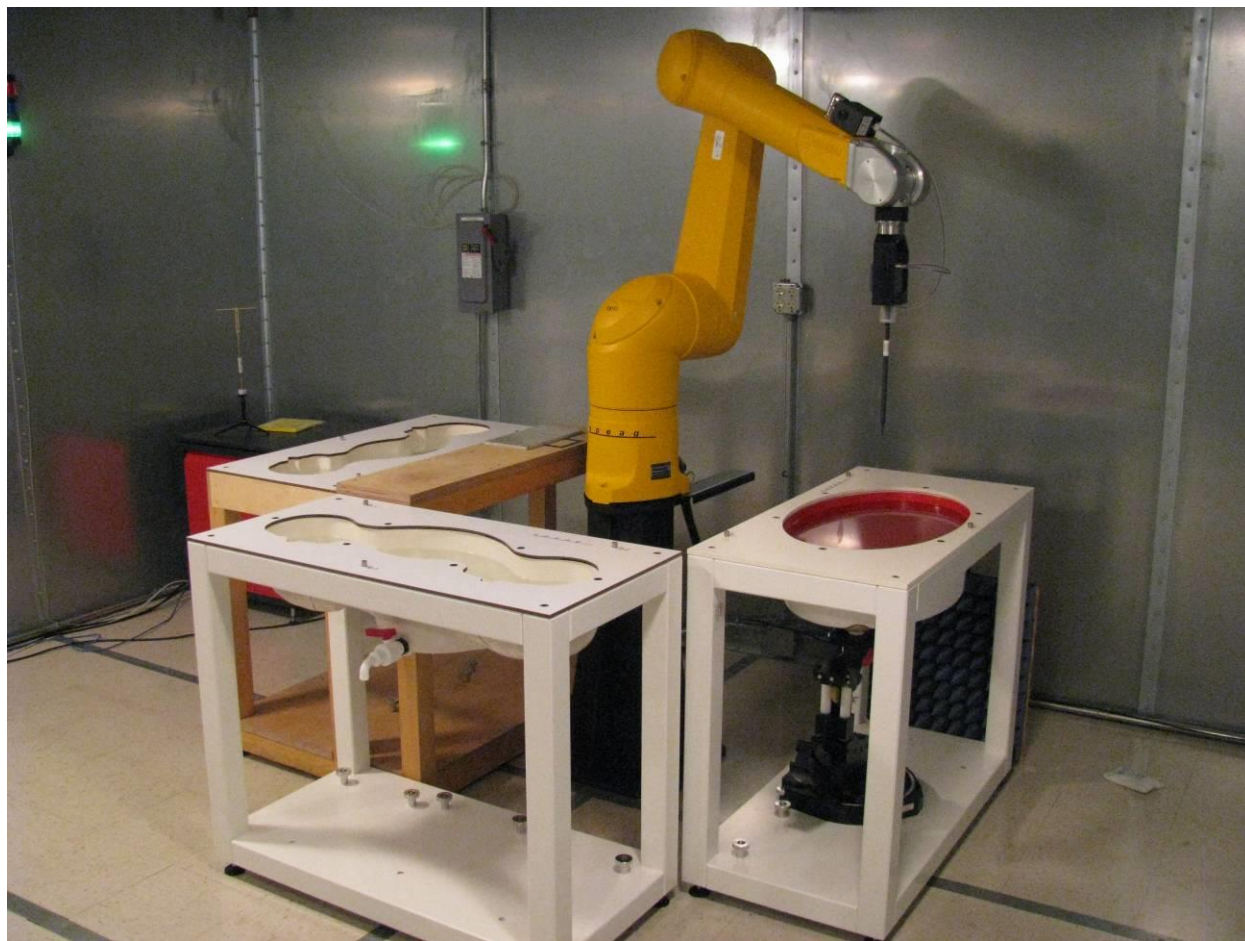


Figure 1: Intertek SAR Test Site



## 2.1 Measurement Equipment

The following major equipment/components were used for the SAR evaluation:

**Table 4: Test Equipment Used for SAR Evaluation**

| Description             | Asset | Manufacturer    | Model        | Cal. Date             | Cal. Due              |
|-------------------------|-------|-----------------|--------------|-----------------------|-----------------------|
| SAR Probe               | 3516  | Speag           | EX3DV3       | 11/18/2024            | 11/18/2025            |
| 2450MHz Dipole          | 3013  | Speag           | D2450V2      | 11/12/2024            | 11/12/2025            |
| 5GHz Dipole             | 3053  | Speag           | D5GHzV2      | 11/14/2024            | 11/14/2025            |
| DAE                     | 3269  | Speag           | DAE4         | 11/6/2024             | 11/6/2025             |
| Vector Signal Generator | 3884  | Rohde&Schwarz   | SMBV100A     | 9/21/2024             | 9/21/2025             |
| Broadband Amplifier     | 8294  | Rohde & Schwarz | BBA150       | Verify at Time of Use | Verify at Time of Use |
| Network Analyzer        | 8276  | Rohde & Schwarz | ZNB8         | 9/24/2024             | 9/24/2025             |
| Average Power Sensor    | 3975  | Rohde & Schwarz | NRP-Z31      | 9/22/2024             | 9/22/2025             |
| Dielectric Probe Kit    | 3968  | Speag           | DAK-3.5      | 11/5/2024             | 11/5/2025             |
| Spectrum Analyzer       | 8305  | Rohde & Schwarz | FSW26        | 9/20/2024             | 9/20/2025             |
| SAM Twin Phantom        | 3619  | Speag           | QD 000 P40 C | Verify at Time of Use | Verify at Time of Use |
| 6-axis robot            | 3608  | Staubli         | RX-909       | Verify at Time of Use | Verify at Time of Use |



## 2.2 Measurement Uncertainty

The Tables below includes the uncertainty budget suggested by the IEEE Std 1528-2013 and IEC/IEEE 62209-1528 as determined by SPEAG for the DASY5 measurement System.

| Error Description               | Uncertainty Value | Prob. Dist. | Div.       | $c_1$ (1-g) | $c_2$ (10-g) | Std.Unc. (1-g) | Std.Unc. (10-g) | $(v_1)$<br>$v_{eff}$ |
|---------------------------------|-------------------|-------------|------------|-------------|--------------|----------------|-----------------|----------------------|
| <b>Measurement System</b>       |                   |             |            |             |              |                |                 |                      |
| Probe Calibration               | ±6.0%             | N           | 1          | 1           | 1            | ±6.0%          | ±6.0%           | ∞                    |
| Axial Isotropy                  | ±4.7%             | R           | $\sqrt{3}$ | 0.7         | 0.7          | ±1.9%          | ±1.9%           | ∞                    |
| Hemispherical Isotropy          | ±9.6%             | R           | $\sqrt{3}$ | 0.7         | 0.7          | ±3.9%          | ±3.9%           | ∞                    |
| Boundary Effect                 | ±1.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±0.6%          | ±0.6%           | ∞                    |
| Linearity                       | ±4.7%             | R           | $\sqrt{3}$ | 1           | 1            | ±2.7%          | ±2.7%           | ∞                    |
| System Detection Limits         | ±1.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±0.6%          | ±0.6%           | ∞                    |
| Modulation Response             | ±2.4%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.4%          | ±1.4%           | ∞                    |
| Readout Electronics             | ±0.3%             | N           | 1          | 1           | 1            | ±0.3%          | ±0.3%           | ∞                    |
| Response Time                   | ±0.8%             | R           | $\sqrt{3}$ | 1           | 1            | ±0.5%          | ±0.5%           | ∞                    |
| Integration Time                | ±2.6%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.5%          | ±1.5%           | ∞                    |
| RF Ambient Noise                | ±3.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.7%          | ±1.7%           | ∞                    |
| RF Ambient Reflections          | ±3.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.7%          | ±1.7%           | ∞                    |
| Probe Positioner                | ±0.4%             | R           | $\sqrt{3}$ | 1           | 1            | ±0.2%          | ±0.2%           | ∞                    |
| Probe Positioning               | ±2.9%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.7%          | ±1.7%           | ∞                    |
| Max. SAR Eval.                  | ±2.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±1.2%          | ±1.2%           | ∞                    |
| <b>Test sample Related</b>      |                   |             |            |             |              |                |                 |                      |
| Device Positioning              | ±2.9%             | N           | 1          | 1           | 1            | ±2.9%          | ±2.9%           | 145                  |
| Device Holder                   | ±3.6%             | N           | 1          | 1           | 1            | ±3.6%          | ±3.6%           | 5                    |
| Power Drift                     | ±5.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±2.9%          | ±2.9%           | ∞                    |
| Power Scaling                   | ±0.0%             | R           | $\sqrt{3}$ | 1           | 1            | ±0%            | ±0%             | ∞                    |
| <b>Phantom and Setup</b>        |                   |             |            |             |              |                |                 |                      |
| Phantom Uncertainty             | ±6.1%             | R           | $\sqrt{3}$ | 1           | 1            | ±3.5%          | ±3.5%           | ∞                    |
| SAR Correction                  | ±1.9%             | R           | $\sqrt{3}$ | 1           | 0.84         | ±1.1%          | ±0.9%           | ∞                    |
| Liquid Conductivity (mea.)      | ±2.5%             | R           | $\sqrt{3}$ | 0.78        | 0.71         | ±1.1%          | ±1.0%           | ∞                    |
| Liquid Permittivity (mea.)      | ±2.5%             | R           | $\sqrt{3}$ | 0.26        | 0.26         | ±0.3%          | ±0.4%           | ∞                    |
| Temp unc. - Conductivity        | ±3.4%             | R           | $\sqrt{3}$ | 0.78        | 0.71         | ±1.5%          | ±1.4%           | ∞                    |
| Temp unc. - Permittivity        | ±0.4%             | R           | $\sqrt{3}$ | 0.23        | 0.26         | ±0.1%          | ±0.1%           | ∞                    |
| Combined Standard Uncertainty   |                   |             |            |             |              | ±11.2%         | ±11.1%          | 361                  |
| <b>Expanded STD Uncertainty</b> |                   |             |            |             |              | <b>±22.3%</b>  | <b>±22.2%</b>   |                      |

### Notes:

Worst Case uncertainty budget for DASY5 assessed according to IEEE Std 1528-2013 and IEC/IEEE 62209-1528. The budget is valid for the frequency range 300 MHz – 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerably smaller.



| Error Description               | Uncertainty Value | Prob. Dist. | Div. | $c_i$ (1-g) | $c_i$ (10-g) | Std.Unc. (1-g) | Std.Unc. (10-g) | ( $v_i$ )<br>$v_{eff}$ |
|---------------------------------|-------------------|-------------|------|-------------|--------------|----------------|-----------------|------------------------|
| <b>Measurement System</b>       |                   |             |      |             |              |                |                 |                        |
| Probe Calibration               | ±6.55%            | N           | 1    | 1           | 1            | ±6.55%         | ±6.55%          | ∞                      |
| Axial Isotropy                  | ±4.7%             | R           | √3   | 0.7         | 0.7          | ±1.9%          | ±1.9%           | ∞                      |
| Hemispherical Isotropy          | ±9.6%             | R           | √3   | 0.7         | 0.7          | ±3.9%          | ±3.9%           | ∞                      |
| Boundary Effect                 | ±2.0%             | R           | √3   | 1           | 1            | ±1.2%          | ±1.2%           | ∞                      |
| Linearity                       | ±4.7%             | R           | √3   | 1           | 1            | ±2.7%          | ±2.7%           | ∞                      |
| System Detection Limits         | ±1.0%             | R           | √3   | 1           | 1            | ±0.6%          | ±0.6%           | ∞                      |
| Modulation Response             | ±2.4%             | R           | √3   | 1           | 1            | ±1.4%          | ±1.4%           | ∞                      |
| Readout Electronics             | ±0.3%             | N           | 1    | 1           | 1            | ±0.3%          | ±0.3%           | ∞                      |
| Response Time                   | ±0.8%             | R           | √3   | 1           | 1            | ±0.5%          | ±0.5%           | ∞                      |
| Integration Time                | ±2.6%             | R           | √3   | 1           | 1            | ±1.5%          | ±1.5%           | ∞                      |
| RF Ambient Noise                | ±3.0%             | R           | √3   | 1           | 1            | ±1.7%          | ±1.7%           | ∞                      |
| RF Ambient Reflections          | ±3.0%             | R           | √3   | 1           | 1            | ±1.7%          | ±1.7%           | ∞                      |
| Probe Positioner                | ±0.8%             | R           | √3   | 1           | 1            | ±0.5%          | ±0.5%           | ∞                      |
| Probe Positioning               | ±6.7%             | R           | √3   | 1           | 1            | ±3.9%          | ±3.9%           | ∞                      |
| Max. SAR Eval.                  | ±4.0%             | R           | √3   | 1           | 1            | ±2.3%          | ±2.3%           | ∞                      |
| <b>Test sample Related</b>      |                   |             |      |             |              |                |                 |                        |
| Device Positioning              | ±2.9%             | N           | 1    | 1           | 1            | ±2.9%          | ±2.9%           | 145                    |
| Device Holder                   | ±3.6%             | N           | 1    | 1           | 1            | ±3.6%          | ±3.6%           | 5                      |
| Power Drift                     | ±5.0%             | R           | √3   | 1           | 1            | ±2.9%          | ±2.9%           | ∞                      |
| Power Scaling                   | ±0.0%             | R           | √3   | 1           | 1            | ±0%            | ±0%             | ∞                      |
| <b>Phantom and Setup</b>        |                   |             |      |             |              |                |                 |                        |
| Phantom Uncertainty             | ±6.6%             | R           | √3   | 1           | 1            | ±3.8%          | ±3.8%           | ∞                      |
| SAR Correction                  | ±1.9%             | R           | √3   | 1           | 0.84         | ±1.1%          | ±0.9%           | ∞                      |
| Liquid Conductivity (mea.)      | ±2.5%             | R           | √3   | 0.78        | 0.71         | ±1.1%          | ±1.0%           | ∞                      |
| Liquid Permittivity(meas.)      | ±2.5%             | R           | √3   | 0.26        | 0.26         | ±0.3%          | ±0.4%           | ∞                      |
| Temp unc. - Conductivity        | ±3.4%             | R           | √3   | 0.78        | 0.71         | ±1.5%          | ±1.4%           | ∞                      |
| Temp unc. - Permittivity        | ±0.4%             | R           | √3   | 0.23        | 0.26         | ±0.1%          | ±0.1%           | ∞                      |
| Combined Standard Uncertainty   |                   |             |      |             |              | ±12.3%         | ±12.2%          | 748                    |
| <b>Expanded STD Uncertainty</b> |                   |             |      |             |              | <b>±24.6%</b>  | <b>±24.5%</b>   |                        |

Notes:

Worst Case uncertainty budget for DASY5 assessed according to IEEE Std 1528-2013 and IEC/IEEE 62209-1528. The budget is valid for the frequency range 3 GHz – 6 GHz and represents a worst-case analysis. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerably smaller.





| Error Description             | Uncertainty Value | Prob. Dist. | Div. | $c_1$ (1-g) | $c_1$ (10-g) | Std.Unc. (1-g) | Std.Unc. (10-g) | ( $v_i$ )<br>$v_{eff}$ |
|-------------------------------|-------------------|-------------|------|-------------|--------------|----------------|-----------------|------------------------|
| <b>Measurement System</b>     |                   |             |      |             |              |                |                 |                        |
| Probe Calibration             | ±6.55%            | N           | 1    | 1           | 1            | ±6.55%         | ±6.55%          | ∞                      |
| Axial Isotropy                | ±4.7%             | R           | √3   | 0.7         | 0.7          | ±1.9%          | ±1.9%           | ∞                      |
| Hemispherical Isotropy        | ±9.6%             | R           | √3   | 0.7         | 0.7          | ±3.9%          | ±3.9%           | ∞                      |
| Boundary Effect               | ±2.0%             | R           | √3   | 1           | 1            | ±1.2%          | ±1.2%           | ∞                      |
| Linearity                     | ±4.7%             | R           | √3   | 1           | 1            | ±2.7%          | ±2.7%           | ∞                      |
| System Detection Limits       | ±1.0%             | R           | √3   | 1           | 1            | ±0.6%          | ±0.6%           | ∞                      |
| Modulation Response           | ±2.4%             | R           | √3   | 1           | 1            | ±1.4%          | ±1.4%           | ∞                      |
| Readout Electronics           | ±0.3%             | N           | 1    | 1           | 1            | ±0.3%          | ±0.3%           | ∞                      |
| Response Time                 | ±0.8%             | R           | √3   | 1           | 1            | ±0.5%          | ±0.5%           | ∞                      |
| Integration Time              | ±2.6%             | R           | √3   | 1           | 1            | ±1.5%          | ±1.5%           | ∞                      |
| RF Ambient Noise              | ±3.0%             | R           | √3   | 1           | 1            | ±1.7%          | ±1.7%           | ∞                      |
| RF Ambient Reflections        | ±3.0%             | R           | √3   | 1           | 1            | ±1.7%          | ±1.7%           | ∞                      |
| Probe Positioner              | ±0.8%             | R           | √3   | 1           | 1            | ±0.5%          | ±0.5%           | ∞                      |
| Probe Positioning             | ±6.7%             | R           | √3   | 1           | 1            | ±3.9%          | ±3.9%           | ∞                      |
| Post-Processing               | ±4.0%             | R           | √3   | 1           | 1            | ±2.3%          | ±2.3%           | ∞                      |
| <b>Test sample Related</b>    |                   |             |      |             |              |                |                 |                        |
| Device Positioning            | ±2.9%             | N           | 1    | 1           | 1            | ±2.9%          | ±2.9%           | 145                    |
| Device Holder                 | ±3.6%             | N           | 1    | 1           | 1            | ±3.6%          | ±3.6%           | 5                      |
| Power Drift                   | ±5.0%             | R           | √3   | 1           | 1            | ±2.9%          | ±2.9%           | ∞                      |
| Power Scaling                 | ±0.0%             | R           | √3   | 1           | 1            | ±0%            | ±0%             | ∞                      |
| <b>Phantom and Setup</b>      |                   |             |      |             |              |                |                 |                        |
| Phantom Uncertainty           | ±7.9%             | R           | √3   | 1           | 1            | ±4.6%          | ±4.6%           | ∞                      |
| SAR Correction                | ±1.9%             | R           | √3   | 1           | 0.84         | ±1.1%          | ±0.9%           | ∞                      |
| Liquid Conductivity (mea.)    | ±2.5%             | R           | √3   | 0.78        | 0.71         | ±1.1%          | ±1.0%           | ∞                      |
| Liquid Permittivity (mea.)    | ±2.5%             | R           | √3   | 0.26        | 0.26         | ±0.3%          | ±0.4%           | ∞                      |
| Temp unc. - Conductivity      | ±3.4%             | R           | √3   | 0.78        | 0.71         | ±1.5%          | ±1.4%           | ∞                      |
| Temp unc. - Permittivity      | ±0.4%             | R           | √3   | 0.23        | 0.26         | ±0.1%          | ±0.1%           | ∞                      |
| Combined Standard Uncertainty |                   |             |      |             |              | ±12.5%         | ±12.5%          | 748                    |
| Expanded STD Uncertainty      |                   |             |      |             |              | <b>±25.1%</b>  | <b>±25.0%</b>   |                        |

**Notes:**

Worst Case uncertainty budget for DASY5 assessed according to IEC/IEEE 62209-1528:2020. The budget is valid for the frequency range 30MHz – 6 GHz and represents a worst-case analysis. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerably smaller.



### 3 Description of Equipment under Test

| Equipment Under Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Product Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B7000 Badge                                   |
| Model Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B7000                                         |
| Serial Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | MA3304M58005E8                                |
| FCCID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Z7AB7000                                      |
| ICID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4919E-B7000                                   |
| Supported Transmit Modes <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 802.11a/b/g/n/ac/ax + Bluetooth 5.3           |
| Receive Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12/12/2025                                    |
| Test Start Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 12/12/2024                                    |
| Test End Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4/21/2025                                     |
| Device Received Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Good                                          |
| Test Sample Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Production                                    |
| Input Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | USB-C: 5VDC, 0.7A<br>Battery: 3.85VDC, 900mAH |
| Description of Equipment Under Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |
| <p>A small, lightweight, wearable communication device powered by a removable, rechargeable Lithium-Ion battery. It is designed to simplify hospital communication and workflow and improve staff safety. A user can “wake up” and operate the device using only their voice, to stay connected even under restrictive PPE. They can make and receive calls and listen and respond to messages and alarm notifications. The badge contains a 1.2” color display with an array of microphones, a hands-free speaker and an audio receiver. A headset can also be used with the badge either through the USB-C port or Bluetooth connection.</p> |                                               |

<sup>1</sup> All radios operate independently and cannot transmit simultaneously.



| Technology | Modulation                                             | Nominal Bandwidth (MHz) | 2400-2483.5 MHz | 5150-5250 MHz | 5250-5350 MHz | 5470-5725 MHz | 5725-5850 MHz |
|------------|--------------------------------------------------------|-------------------------|-----------------|---------------|---------------|---------------|---------------|
| 802.11a    | OFDM (BPSK, QPSK, 16-QAM, 64-QAM)                      | 20                      | -               | 17.5          | 17.5          | 17.5          | 17.5          |
| 802.11b    | DSSS (DBPSK, CCK)                                      | 20                      | 19.5            | -             | -             | -             | -             |
| 802.11g    | DSSS (DBPSK, CCK)<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM) | 20                      | 18.5            | -             | -             | -             | -             |
| 802.11n    | OFDM (BPSK, QPSK, 16-QAM, 64-QAM)                      | 20                      | 17.5            | 15.5          | 15.5          | 15.5          | 15.5          |
|            |                                                        | 40                      | -               | 15.5          | 15.5          | 15.5          | 15.5          |
| 802.11ac   | OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)             | 20                      | -               | 15.5          | 15.5          | 15.5          | 15.5          |
|            |                                                        | 40                      | -               | 15.5          | 15.5          | 15.5          | 15.5          |
|            |                                                        | 80                      | -               | 12.5          | 8.5           | 15.5          | 12.5          |
| 802.11ax   | OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)   | 20                      | 15.5            | 13.5          | 13.5          | 13.5          | 13.5          |
|            |                                                        | 40                      | -               | 13.5          | 13.5          | 13.5          | 13.5          |
|            |                                                        | 80                      | -               | 10.5          | 10.5          | 13.5          | 13.5          |

Table 5 - Nominal Maximum Output Power<sup>2</sup> (dBm)

<sup>2</sup> This information was provided by the client and may affect compliance. Intertek makes no claims of compliance for any device(s) other than those identified herein. Intertek cannot attest to the accuracy of any client-provided data.



## 4 System Verification

### 4.1 System Validation

Prior to the assessment, the system was verified to be within  $\pm 10\%$  of the specifications by using the system validation kit. The system validation procedure tests the system against reference SAR values and the performance of probe, readout electronics and software. The test setup utilizes a phantom and reference dipole.



Figure 2: System Verification Setup



Table 6: Dipole Validation

| Date       | Ambient Temp (C) | Fluid Temp (C) | Frequency (MHz) | Dipole  | Fluid Type | Phantom  | Dipole Power Input (W) | Target Power (W) |
|------------|------------------|----------------|-----------------|---------|------------|----------|------------------------|------------------|
| 12/11/2024 | 22.4             | 20.6           | 5200            | D5GHzV2 | Head       | SAM Twin | 0.1                    | 1                |
| 12/11/2024 | 23.1             | 20.6           | 5500            | D5GHzV2 | Head       | SAM Twin | 0.1                    | 1                |
| 12/11/2024 | 23.1             | 20.6           | 5800            | D5GHzV2 | Head       | SAM Twin | 0.1                    | 1                |
| 12/17/2024 | 23.0             | 20.1           | 2450            | D2450V2 | Head       | SAM Twin | 0.1                    | 1                |

| Measured 10-g SAR (W/kg) | Adjusted 10-g SAR (W/kg) | Cal. Lab 10-g SAR (W/kg) | 10-g SAR % Error | Measured 1-g SAR (W/kg) | Adjusted 1-g SAR (W/kg) | Cal. Lab 1-g SAR (W/kg) | 1-g SAR % Error | Power Drift (dB) |
|--------------------------|--------------------------|--------------------------|------------------|-------------------------|-------------------------|-------------------------|-----------------|------------------|
| 2.27                     | 22.7                     | 22.8                     | -0.44%           | 8.01                    | 80.1                    | 79.5                    | 0.75%           | 0.03             |
| 2.22                     | 22.2                     | 24.5                     | -9.39%           | 7.93                    | 79.3                    | 86.4                    | -8.22%          | 0.17             |
| 2.23                     | 22.3                     | 23.6                     | -5.51%           | 8.03                    | 80.3                    | 82.9                    | -3.14%          | 0.11             |
| 2.53                     | 25.3                     | 24.5                     | 3.27%            | 5.49                    | 54.9                    | 52.2                    | 5.17%           | -0.03            |



#### 4.2 Measurement Uncertainty for System Validation

| Source of Uncertainty                    | Value(dB) | Probability Distribution | Divisor | $c_i$ | $u_i(y)$     | $(u_i(y))^2$ |
|------------------------------------------|-----------|--------------------------|---------|-------|--------------|--------------|
| Measurement System                       |           |                          |         |       |              |              |
| Probe Calibration                        | 5.50      | n1                       | 1       | 1     | 5.50         | 30.250       |
| Axial Isotropy                           | 4.70      | r                        | 1.732   | 0.7   | 2.71         | 7.364        |
| Hemispherical Isotropy                   | 9.60      | r                        | 1.732   | 0.7   | 5.54         | 30.722       |
| Boundary Effect                          | 1.00      | r                        | 1.732   | 1     | 0.58         | 0.333        |
| Linearity                                | 4.70      | r                        | 1.732   | 1     | 2.71         | 7.364        |
| System Detection Limits                  | 1.00      | r                        | 1.732   | 1     | 0.58         | 0.333        |
| Readout Electronics                      | 0.30      | n1                       | 1       | 1     | 0.30         | 0.090        |
| Response Time                            | 0.80      | r                        | 1.732   | 1     | 0.46         | 0.213        |
| Integration Time                         | 2.60      | r                        | 1.732   | 1     | 1.50         | 2.253        |
| RF Ambient Noise                         | 3.00      | r                        | 1.732   | 1     | 1.73         | 3.000        |
| RF Ambient Reflections                   | 3.00      | r                        | 1.732   | 1     | 1.73         | 3.000        |
| Probe Positioner                         | 0.40      | r                        | 1.732   | 1     | 0.23         | 0.053        |
| Probe Positioning                        | 2.90      | r                        | 1.732   | 1     | 1.67         | 2.803        |
| Max. SAR Eval.                           | 1.00      | r                        | 1.732   | 1     | 0.58         | 0.333        |
| Dipole / Generator / Power Meter Related |           |                          |         |       |              |              |
| Dipole positioning                       | 2.90      | n1                       | 1       | 1     | 2.90         | 8.410        |
| Dipole Calibration Uncertainty           | 0.68      | r                        | 1.732   | 1     | 0.39         | 0.154        |
| Power Meter 1 Uncertainty (+20C to +25C) | 0.13      | n1                       | 1       | 2     | 0.13         | 0.017        |
| Power Meter 2 Uncertainty (+20C to +25C) | 0.04      | n1                       | 1       | 3     | 0.04         | 0.002        |
| Sig Gen VSWR Mismatch Error              | 1.80      | n1                       | 1       | 5     | 1.80         | 3.240        |
| Sig Gen Resolution Error                 | 0.01      | n1                       | 1       | 6     | 0.01         | 0.000        |
| Sig Gen Level Error                      | 0.90      | n1                       | 1       | 1     | 0.90         | 0.810        |
| Phantom and Setup                        |           |                          |         |       |              |              |
| Phantom Uncertainty                      | 4.00      | r                        | 1.732   | 1     | 2.31         | 5.334        |
| Liquid Conductivity (target)             | 5.00      | r                        | 1.732   | 0.43  | 2.89         | 8.334        |
| Liquid Conductivity (meas.)              | 2.50      | n1                       | 1       | 0.43  | 2.50         | 6.250        |
| Liquid Permittivity (target)             | 5.00      | r                        | 1.732   | 0.49  | 2.89         | 8.334        |
| Liquid Permittivity (meas.)              | 2.50      | n1                       | 1       | 0.49  | 2.50         | 6.250        |
| Combined Standard Uncertainty            |           | N1                       | 1       | 1     | 11.63        | 135.247      |
| Expanded Uncertainty                     |           | Normal k=                | 2       |       | <b>23.26</b> |              |



### 4.3 Tissue Simulating Liquid Description and Validation

The dielectric parameters were verified to be within 5% of the target values prior to assessment. The dielectric parameters ( $\epsilon_r$ ,  $\sigma$ ) are shown in Table 7. A recipe for the tissue simulating fluid used is shown in Table 8.

**Table 7: Dielectric Parameter Validations**

| Date       | Temperature (C) | Tissue Type | Frequency (MHz) | $\epsilon'$ Target | $\sigma$ Target | $\epsilon'$ Measured | $\sigma$ Measured | $\epsilon''$ Calculated | Dielectric % Deviation | Conductivity % Deviation |
|------------|-----------------|-------------|-----------------|--------------------|-----------------|----------------------|-------------------|-------------------------|------------------------|--------------------------|
| 12/10/2024 | 20.6            | Head        | 5200            | 35.99              | 4.655           | 36.1                 | 5.02              | 17.34                   | 0.19                   | 7.78                     |
| 12/10/2024 | 20.6            | Head        | 5500            | 35.64              | 4.963           | 35.4                 | 5.37              | 17.56                   | 0.81                   | 8.28                     |
| 12/10/2024 | 20.6            | Head        | 5800            | 35.3               | 5.27            | 34.5                 | 5.76              | 17.84                   | 2.15                   | 9.20                     |
| 12/17/2024 | 20.1            | Head        | 2450            | 39.2               | 1.8             | 39.9                 | 1.97              | 14.47                   | 1.73                   | 9.56                     |
| 4/21/2025  | 21.1            | Head        | 5200            | 35.99              | 4.655           | 33.8                 | 4.99              | 17.26                   | 5.96                   | 7.25                     |
| 4/21/2025  | 21.1            | Head        | 5500            | 35.64              | 4.963           | 33.0                 | 5.36              | 17.52                   | 7.36                   | 8.01                     |
| 4/21/2025  | 21.1            | Head        | 5800            | 35.3               | 5.27            | 32.3                 | 5.73              | 17.76                   | 8.59                   | 8.74                     |
| 4/21/2025  | 19.6            | Head        | 2450            | 39.2               | 1.8             | 36.9                 | 1.84              | 13.52                   | 5.84                   | 2.38                     |

**Table 8: Tissue Simulating Fluid Recipe**

| Composition of Ingredients for Liquid Tissue Phantoms (450MHz to 2450 MHz data only) |         |       |       |      |       |       |       |       |      |       |        |        |
|--------------------------------------------------------------------------------------|---------|-------|-------|------|-------|-------|-------|-------|------|-------|--------|--------|
| Ingredient<br>(% by weight)                                                          | f (MHz) |       |       |      |       |       |       |       |      |       |        |        |
|                                                                                      | 450     |       | 835   |      | 915   |       | 1900  |       | 2450 |       | 5500   |        |
| Tissue Type                                                                          | Head    | Body  | Head  | Body | Head  | Body  | Head  | Body  | Head | Body  | Head   | Body   |
| Water                                                                                | 38.56   | 51.16 | 41.45 | 52.4 | 41.05 | 56    | 54.9  | 70.45 | 62.7 | 68.64 | 65.53  | 78.67  |
| Salt (NaCl)                                                                          | 3.95    | 1.49  | 1.45  | 1.4  | 1.35  | 0.76  | 0.18  | 0.36  | 0.5  |       |        |        |
| Sugar                                                                                | 56.32   | 46.78 | 56    | 45   | 56.5  | 41.76 |       |       |      |       |        |        |
| HEC                                                                                  | 0.98    | 0.52  | 1     | 1    | 1     | 1.21  |       |       |      |       |        |        |
| Bactericide                                                                          | 0.19    | 0.05  | 0.1   | 0.1  | 0.1   | 0.27  |       |       |      |       |        |        |
| Triton X-100                                                                         |         |       |       |      |       |       |       |       | 36.8 |       | 17.235 | 10.665 |
| DGBE                                                                                 |         |       |       |      |       |       | 44.92 | 29.18 |      | 31.37 |        |        |
| DGHE                                                                                 |         |       |       |      |       |       |       |       |      |       | 17.235 | 10.665 |
| Dielectric Constant                                                                  | 43.42   | 58    | 42.54 | 56.1 | 42    | 56.8  | 39.9  | 53.3  | 39.8 | 52.7  |        |        |
| Conductivity (S/m)                                                                   | 0.85    | 0.83  | 0.91  | 0.95 | 1     | 1.07  | 1.42  | 1.52  | 1.88 | 1.95  |        |        |

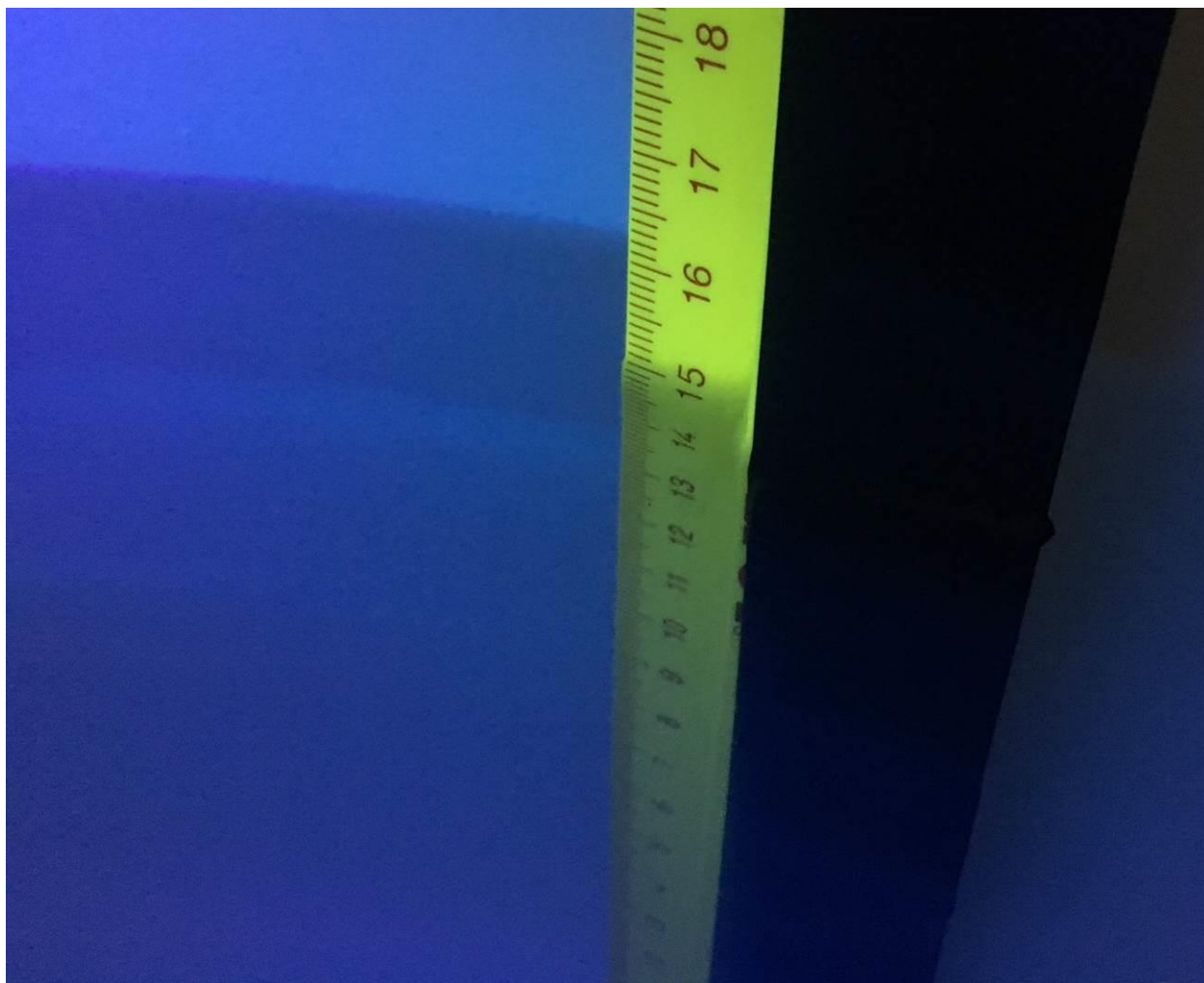
Tissue Simulating Liquid for 5GHz, MBBL3500-5800V5 Manufactured by SPEAG (proprietary mixture)

| Ingredients        | (% by weight) |
|--------------------|---------------|
| Water              | 78            |
| Mineral oil        | 11            |
| Emulsifiers        | 9             |
| Additives and Salt | 2             |



## 5 Evaluation Procedures

Prior to any testing, the appropriate fluid was used to fill the phantom to a depth of 15 cm  $\pm 0.2$ cm for testing  $\leq$  3GHz, and 10 cm  $\pm 0.2$ cm for testing above 3GHz. The fluid parameters were verified and the dipole validation was performed as described in the previous sections.



**Figure 3: Fluid Depth 15cm for 2.4GHz Head Simulating Liquid**





### 5.1 Test Positions:

The Device was positioned against the SAM phantom using the exact procedure described in IEEE Std 1528-2013, IEC/IEEE 62209-1528:2020, and the Office of Engineering and Technology KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 and KDB 447498 D04 Interim General RF Exposure Guidance v01.

### 5.2 Reference Power Measurement:

The measurement probe was positioned at a fixed location above the reference point. A power measurement was made with the probe above this reference position so it could be used for assessing the power drift later in the test procedure.

### 5.3 Area Scan:

A coarse area scan was performed to find the approximate location of the peak SAR value. This scan was performed with the measurement probe at a constant height in the simulating fluid. A two-dimensional spline interpolation algorithm was then used to determine the peaks and gradients within the scanned area. The area scan resolution conformed to the requirements of KDB 865664 as shown in Table 9.

### 5.4 Zoom Scan:

A zoom scan was performed around the approximate location of the peak SAR as determined from the area scan. Based on this data set, the spatial peak SAR value was evaluated with the following procedure. The zoom scan resolution conformed to the requirements of KDB 865664 as shown in Table 9.



Table 9: SAR Area and Zoom Scan Resolutions

|                                                                                                                                                                                                                                                                                                             |                                    |                                                                                      | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface                                                                                                                                                                                                      |                                    |                                                                                      | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm                            |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location                                                                                                                                                                                                                   |                                    |                                                                                      | $30^{\circ} \pm 1^{\circ}$                                                                                                                                                                                                                                             | $20^{\circ} \pm 1^{\circ}$                                                    |
| Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$                                                                                                                                                                                                                                 |                                    |                                                                                      | $\leq 2$ GHz: $\leq 15$ mm<br>2 – 3 GHz: $\leq 12$ mm                                                                                                                                                                                                                  | 3 – 4 GHz: $\leq 12$ mm<br>4 – 6 GHz: $\leq 10$ mm                            |
|                                                                                                                                                                                                                                                                                                             |                                    |                                                                                      | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device. |                                                                               |
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$ , $\Delta y_{Zoom}$                                                                                                                                                                                                                                 |                                    |                                                                                      | $\leq 2$ GHz: $\leq 8$ mm<br>2 – 3 GHz: $\leq 5$ mm*                                                                                                                                                                                                                   | 3 – 4 GHz: $\leq 5$ mm*<br>4 – 6 GHz: $\leq 4$ mm*                            |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                             | uniform grid: $\Delta z_{Zoom}(n)$ |                                                                                      | $\leq 5$ mm                                                                                                                                                                                                                                                            | 3 – 4 GHz: $\leq 4$ mm<br>4 – 5 GHz: $\leq 3$ mm<br>5 – 6 GHz: $\leq 2$ mm    |
|                                                                                                                                                                                                                                                                                                             | graded grid                        | $\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4$ mm                                                                                                                                                                                                                                                            | 3 – 4 GHz: $\leq 3$ mm<br>4 – 5 GHz: $\leq 2.5$ mm<br>5 – 6 GHz: $\leq 2$ mm  |
|                                                                                                                                                                                                                                                                                                             |                                    | $\Delta z_{Zoom}(n>1)$ : between subsequent points                                   | $\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$                                                                                                                                                                                                                                  |                                                                               |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                    | x, y, z                            |                                                                                      | $\geq 30$ mm                                                                                                                                                                                                                                                           | 3 – 4 GHz: $\geq 28$ mm<br>4 – 5 GHz: $\geq 25$ mm<br>5 – 6 GHz: $\geq 22$ mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.                                                                                                                                                           |                                    |                                                                                      |                                                                                                                                                                                                                                                                        |                                                                               |
| * When zoom scan is required and the <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. |                                    |                                                                                      |                                                                                                                                                                                                                                                                        |                                                                               |



## 5.5 Interpolation, Extrapolation and Detection of Maxima:

The probe is calibrated at the center of the dipole sensors which is located 1 to 2.7 mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search, and extrapolation routines. The interpolation, extrapolation and maximum search routines are all based on the modified Quadratic Shepard's method.

Thereby, the interpolation scheme combines a least square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. The DASY5 routines construct a once-continuously differentiable function that interpolates the measurement values as follows:

- For each measurement point a trivariate (3-D) / bivariate (2-D) quadratic is computed. It interpolates the measurement values at the data point and forms a least-square fit to neighboring measurement values.
- The spatial location of the quadratic with respect to the measurement values is attenuated by an inverse distance weighting. This is performed since the calculated quadratic will fit measurement values at nearby points more accurate than at points located further away.
- After the quadratics are calculated for all measurement points, the interpolating function is calculated as a weighted average of the quadratics.

There are two control parameters that govern the behavior of the interpolation method. One specifies the number of measurement points to be used in computing the least-square fits for the local quadratics. These measurement points are the ones nearest the input point for which the quadratic is being computed. The second parameter specifies the number of measurement points that will be used in calculating the weights for the quadratics to produce the final function. The input data points used there are the ones nearest the point at which the interpolation is desired. Appropriate defaults are chosen for each of the control parameters.

The trivariate quadratics that have been previously computed for the 3-D interpolation and whose input data are at the closest distance from the phantom surface, are used to extrapolate the fields to the surface of the phantom.

To determine all the field maxima in 2-D (Area Scan) and 3-D (Zoom Scan), the measurement grid is refined by a default factor of 10 and the interpolation function is used to evaluate all field values between corresponding measurement points. Subsequently, a linear search is applied to find all the candidate maxima. In a last step, non-physical maxima are removed and only those maxima which are within 2 dB of the global maximum value are retained.



## 5.6 Averaging and Determination of Spatial Peak SAR

The interpolated data is used to average the SAR over the 1-g and 10-g cubes by spatially discretizing the entire measured volume. The resolution of this spatial grid used to calculate the averaged SAR is 1mm or about 42875 interpolated points. The resulting volumes are defined as cubical volumes containing the appropriate tissue parameters that are centered at the location. The location is defined as the center of the incremental volume. The spatial-peak SAR must be evaluated in cubical volumes containing a mass that is within 5% of the required mass. The cubical volume centered at each location, as defined above, should be expanded in all directions until the desired value for the mass is reached, with no surface boundaries of the averaging volume extending beyond the outermost surface of the considered region. In addition, the cubical volume should not consist of more than 10% of air. If these conditions are not satisfied, then the center of the averaging volume is moved to the next location. Otherwise, the exact size of the final sampling cube is found using an inverse polynomial approximation algorithm, leading to results with improved accuracy. If one boundary of the averaging volume reaches the boundary of the measured volume during its expansion, it will not be evaluated at all. Reference is kept of all locations used and those not used for averaging the SAR. All average SAR values are finally assigned to the centered location in each valid averaging volume.

All locations included in an averaging volume are marked to indicate that they have been used at least once. If a location has been marked as used, but has never been assigned to the center of a cube, the highest averaged SAR value of all other cubical volumes which have used this location for averaging is assigned to this location. Only those locations that are not part of any valid averaging volume should be marked as unused. For the case of an unused location, a new averaging volume must be constructed which will have the unused location centered at one surface of the cube. The remaining five surfaces are expanded evenly in all directions until the required mass is enclosed, regardless of the amount of included air. Of the six possible cubes with one surface centered on the unused location, the smallest cube is used, which still contains the required mass.

If the final cube containing the highest averaged SAR touches the surface of the measured volume, an appropriate warning is issued within the post processing engine.

## 5.7 Power Drift Measurement:

The probe was positioned at precisely the same reference point and the reference power measurement was repeated. The difference between the initial reference power and the final one is referred to as the power drift. This value should not exceed 5%. The power drift measurement was used to assess the output power stability of the test sample throughout the SAR scan.

## 5.8 RF Ambient Activity:

During the entire SAR evaluation, the RF ambient activity was monitored using a spectrum analyzer with an antenna connected to it. The spectrum analyzer was tuned to the frequency of measurement and with one trace set to max hold mode. In this way, it was possible to determine if at any point during the SAR measurement there was an interfering ambient signal. If an ambient signal was detected, then the SAR measurement was repeated.



## 6 Criteria

The following ANSI/IEEE C95.1 – 1992 limits for SAR apply to portable devices operating in the General Population/Uncontrolled Exposure environment. Uncontrolled environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

| Exposure Type<br>(General Population/Uncontrolled Exposure environment) | SAR Limit<br>(W/kg or mW/g) |
|-------------------------------------------------------------------------|-----------------------------|
| Average over the whole body                                             | 0.08                        |
| Spatial Peak (1-g)                                                      | 1.60                        |
| Spatial Peak for hands, wrists, feet and ankles (10-g)                  | 4.00                        |

The following limits from the ICNIRP Guidelines For Limiting Exposure To Electromagnetic Fields (100 kHz To 300 GHz) for SAR apply to portable devices operating in the General Population/Uncontrolled Exposure environment.

| Exposure Type<br>(General Population/Uncontrolled Exposure environment) | SAR Limit<br>(W/kg or mW/g) |
|-------------------------------------------------------------------------|-----------------------------|
| Average over the whole body                                             | 0.08                        |
| Spatial Peak (10-g)                                                     | 2.00                        |
| Spatial Peak for hands, wrists, feet and ankles (10-g)                  | 4.00                        |

## 7 Test Configuration

The B7000 Badge was designed to be used on a lanyard, against the body. Therefore, the flat section of the SAM Twin phantom was used.

The device was evaluated according to the specific requirements found in the following KDBs and Standards:

- FCC KDB 447498 D04 v01, General RF Exposure Guidance
- FCC KDB 865664 D01 v01r04, SAR Measurement Requirements for 100MHz to 6GHz
- FCC KDB 248227 D01 v02r02, SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters
- RSS-102 Issue 6, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
- IEC/IEEE 62209-1528

## 8 Test Results

The worst case 1-g and 10-g SAR values were less than the 1.6W/kg FCC and ISED limit and 2.0W/kg ICNIRP limit.

## 9 SAR Data:

The results on the following page(s) were obtained when the device was transmitting at maximum output power. The worst case plots, which reveal information about the location of the maximum SAR with respect to the device, are referenced are shown in APPENDIX B – Worst Case SAR Plot. The measured conducted output power was compared to the power declared by the manufacturer and used for scaling the measured SAR values.



## SAR Test Report

## 9.1 Conducted Output Power

| Band     | Description                           | Raw Reading (dBm) | Cable Loss (dB) | Attenuator (dB) | Measured Average Power (dBm) | Nominal Average Power (dBm) | SAR Scaling Factor |
|----------|---------------------------------------|-------------------|-----------------|-----------------|------------------------------|-----------------------------|--------------------|
| 2.4GHz   | 802.11b, ch1, 20MHz, 1Mbps            | 4.80              | 0.74            | 9.90            | 15.44                        | 16.50                       | 1.28               |
| 2.4GHz   | 802.11b, ch11, 20MHz, 1Mbps           | 4.58              | 0.74            | 9.90            | 15.22                        | 16.50                       | 1.34               |
| 2.4GHz   | 802.11b, ch6, 20MHz, 1Mbps            | 7.34              | 0.74            | 9.90            | 17.98                        | 19.50                       | 1.42               |
| 2.4GHz   | 802.11g, ch1, 20MHz, 6Mbps            | 2.70              | 0.74            | 9.90            | 13.34                        | 14.50                       | 1.31               |
| 2.4GHz   | 802.11g, ch11, 20MHz, 6Mbps           | 2.67              | 0.74            | 9.90            | 13.31                        | 14.50                       | 1.31               |
| 2.4GHz   | 802.11g, ch6, 20MHz, 6Mbps            | 6.28              | 0.74            | 9.90            | 16.92                        | 18.50                       | 1.44               |
| 2.4GHz   | 802.11n, ch1, 20MHz, HT MCSO          | 2.75              | 0.74            | 9.90            | 13.39                        | 14.50                       | 1.29               |
| 2.4GHz   | 802.11n, ch11, 20MHz, HT MCSO         | 0.95              | 0.74            | 9.90            | 11.59                        | 13.50                       | 1.55               |
| 2.4GHz   | 802.11n, ch6, 20MHz, HT MCSO          | 5.23              | 0.74            | 9.90            | 15.87                        | 17.50                       | 1.45               |
| 2.4GHz   | Bluetooth <sup>3</sup>                | -                 | -               | -               | -                            | 4                           | -                  |
| U-NII-1  | 802.11a, ch36, 20MHz, 6Mbps           | 1.66              | 1.27            | 9.96            | 12.89                        | 14.50                       | 1.45               |
| U-NII-1  | 802.11a, ch44, 20MHz, 6Mbps           | 4.73              | 1.27            | 9.96            | 15.96                        | 17.50                       | 1.43               |
| U-NII-1  | 802.11a, ch48, 20MHz, 6Mbps           | 4.64              | 1.27            | 9.96            | 15.87                        | 17.50                       | 1.46               |
| U-NII-1  | 802.11ac, ch36, 20MHz, VHT MCSO       | -0.39             | 1.27            | 9.96            | 10.84                        | 12.50                       | 1.47               |
| U-NII-1  | 802.11ac, ch44, 20MHz, VHT MCSO       | 2.52              | 1.27            | 9.96            | 13.75                        | 15.50                       | 1.50               |
| U-NII-1  | 802.11ac, ch48, 20MHz, VHT MCSO       | 2.41              | 1.27            | 9.96            | 13.64                        | 15.50                       | 1.53               |
| U-NII-1  | 802.11acVHT40, ch38, 40MHz, VHT MCSO  | 0.18              | 1.27            | 9.96            | 11.41                        | 12.50                       | 1.29               |
| U-NII-1  | 802.11acVHT40, ch46, 40MHz, VHT MCSO  | 2.99              | 1.27            | 9.96            | 14.22                        | 15.50                       | 1.34               |
| U-NII-1  | 802.11acVHT80, ch42, 80MHz, VHT MCSO  | 0.25              | 1.27            | 9.96            | 11.48                        | 12.50                       | 1.26               |
| U-NII-1  | 802.11n, ch36, 20MHz, HT MCSO         | -0.53             | 1.27            | 9.96            | 10.70                        | 12.50                       | 1.51               |
| U-NII-1  | 802.11n, ch44, 20MHz, HT MCSO         | 2.53              | 1.27            | 9.96            | 13.76                        | 15.50                       | 1.49               |
| U-NII-1  | 802.11n, ch48, 20MHz, HT MCSO         | 2.50              | 1.27            | 9.96            | 13.73                        | 15.50                       | 1.50               |
| U-NII-1  | 802.11nHT40, ch38, 40MHz, HT MCSO     | 0.23              | 1.27            | 9.96            | 11.46                        | 12.50                       | 1.27               |
| U-NII-1  | 802.11nHT40, ch46, 40MHz, HT MCSO     | 2.88              | 1.27            | 9.96            | 14.11                        | 15.50                       | 1.38               |
| U-NII-2a | 802.11a, ch52, 20MHz, 6Mbps           | 5.50              | 1.24            | 9.96            | 16.70                        | 17.50                       | 1.20               |
| U-NII-2a | 802.11a, ch60, 20MHz, 6Mbps           | 2.16              | 1.24            | 9.96            | 13.36                        | 14.50                       | 1.30               |
| U-NII-2a | 802.11a, ch64, 20MHz, 6Mbps           | 2.11              | 1.24            | 9.96            | 13.31                        | 14.50                       | 1.31               |
| U-NII-2a | 802.11ac, ch52, 20MHz, VHT MCSO       | 3.12              | 1.24            | 9.96            | 14.32                        | 15.50                       | 1.31               |
| U-NII-2a | 802.11ac, ch60, 20MHz, VHT MCSO       | -0.02             | 1.24            | 9.96            | 11.18                        | 12.50                       | 1.35               |
| U-NII-2a | 802.11ac, ch64, 20MHz, VHT MCSO       | -0.08             | 1.24            | 9.96            | 11.12                        | 12.50                       | 1.37               |
| U-NII-2a | 802.11acVHT40, ch54, 40MHz, VHT MCSO  | 3.10              | 1.24            | 9.96            | 14.30                        | 15.50                       | 1.32               |
| U-NII-2a | 802.11acVHT40, ch62, 40MHz, VHT MCSO  | -4.02             | 1.24            | 9.96            | 7.18                         | 8.50                        | 1.35               |
| U-NII-2a | 802.11acVHT80, ch58, 80MHz, VHT MCSO  | -4.05             | 1.24            | 9.96            | 7.15                         | 8.50                        | 1.36               |
| U-NII-2a | 802.11n, ch52, 20MHz, HT MCSO         | 3.13              | 1.24            | 9.96            | 14.33                        | 15.50                       | 1.31               |
| U-NII-2a | 802.11n, ch60, 20MHz, HT MCSO         | 0.10              | 1.24            | 9.96            | 11.30                        | 12.50                       | 1.32               |
| U-NII-2a | 802.11n, ch64, 20MHz, HT MCSO         | 0.04              | 1.24            | 9.96            | 11.24                        | 12.50                       | 1.34               |
| U-NII-2a | 802.11nHT40, ch54, 40MHz, HT MCSO     | 2.89              | 1.24            | 9.96            | 14.09                        | 15.50                       | 1.38               |
| U-NII-2a | 802.11nHT40, ch62, 40MHz, HT MCSO     | -4.03             | 1.24            | 9.96            | 7.17                         | 8.50                        | 1.36               |
| U-NII-2c | 802.11a, ch100, 20MHz, 6Mbps          | 2.47              | 1.31            | 9.96            | 13.74                        | 14.50                       | 1.19               |
| U-NII-2c | 802.11a, ch120, 20MHz, 6Mbps          | 6.08              | 1.31            | 9.96            | 17.35                        | 17.50                       | 1.03               |
| U-NII-2c | 802.11a, ch140, 20MHz, 6Mbps          | 6.04              | 1.31            | 9.96            | 17.31                        | 17.50                       | 1.04               |
| U-NII-2c | 802.11ac, ch100, 20MHz, VHT MCSO      | 0.42              | 1.31            | 9.96            | 11.69                        | 12.50                       | 1.20               |
| U-NII-2c | 802.11ac, ch120, 20MHz, VHT MCSO      | 3.28              | 1.31            | 9.96            | 14.55                        | 15.50                       | 1.24               |
| U-NII-2c | 802.11ac, ch140, 20MHz, VHT MCSO      | 3.57              | 1.31            | 9.96            | 14.84                        | 15.50                       | 1.16               |
| U-NII-2c | 802.11acVHT40, ch102, 40MHz, VHT MCSO | -4.07             | 1.31            | 9.96            | 7.20                         | 8.50                        | 1.35               |
| U-NII-2c | 802.11acVHT40, ch118, 40MHz, VHT MCSO | 3.07              | 1.31            | 9.96            | 14.34                        | 15.50                       | 1.31               |
| U-NII-2c | 802.11acVHT40, ch142, 40MHz, VHT MCSO | 2.91              | 1.31            | 9.96            | 14.18                        | 15.50                       | 1.35               |
| U-NII-2c | 802.11acVHT80, ch106, 80MHz, VHT MCSO | -5.07             | 1.31            | 9.96            | 6.20                         | 7.50                        | 1.35               |
| U-NII-2c | 802.11acVHT80, ch122, 80MHz, VHT MCSO | 2.93              | 1.31            | 9.96            | 14.20                        | 15.50                       | 1.35               |
| U-NII-2c | 802.11acVHT80, ch138, 80MHz, VHT MCSO | 3.02              | 1.31            | 9.96            | 14.29                        | 15.50                       | 1.32               |
| U-NII-2c | 802.11n, ch100, 20MHz, HT MCSO        | 0.47              | 1.31            | 9.96            | 11.74                        | 12.50                       | 1.19               |
| U-NII-2c | 802.11n, ch120, 20MHz, HT MCSO        | 3.38              | 1.31            | 9.96            | 14.65                        | 15.50                       | 1.22               |
| U-NII-2c | 802.11n, ch140, 20MHz, HT MCSO        | 3.51              | 1.31            | 9.96            | 14.78                        | 15.50                       | 1.18               |

<sup>3</sup> Bluetooth radio was exempt per 47 CFR Part 2.1093, RSS-102 Issue 6, and EN IEC 62479.



|          |                                       |       |      |      |       |       |      |
|----------|---------------------------------------|-------|------|------|-------|-------|------|
| U-NII-2c | 802.11nHT40, ch102, 40MHz, HT MCS0    | -4.14 | 1.31 | 9.96 | 7.13  | 8.50  | 1.37 |
| U-NII-2c | 802.11nHT40, ch118, 40MHz, HT MCS0    | 3.07  | 1.31 | 9.96 | 14.34 | 15.50 | 1.31 |
| U-NII-2c | 802.11nHT40, ch142, 40MHz, HT MCS0    | 3.06  | 1.31 | 9.96 | 14.33 | 15.50 | 1.31 |
| U-NII-3  | 802.11a, ch149, 20MHz, 6Mbps          | 5.07  | 1.38 | 9.96 | 16.41 | 17.50 | 1.29 |
| U-NII-3  | 802.11a, ch157, 20MHz, 6Mbps          | 5.20  | 1.38 | 9.96 | 16.54 | 17.50 | 1.25 |
| U-NII-3  | 802.11a, ch165, 20MHz, 6Mbps          | 2.20  | 1.38 | 9.96 | 13.54 | 14.50 | 1.25 |
| U-NII-3  | 802.11ac, ch149, 20MHz, VHT MCS0      | 2.71  | 1.38 | 9.96 | 14.05 | 15.50 | 1.40 |
| U-NII-3  | 802.11ac, ch157, 20MHz, VHT MCS0      | 2.76  | 1.38 | 9.96 | 14.10 | 15.50 | 1.38 |
| U-NII-3  | 802.11ac, ch165, 20MHz, VHT MCS0      | 0.23  | 1.38 | 9.96 | 11.57 | 12.50 | 1.24 |
| U-NII-3  | 802.11acVHT40, ch151, 40MHz, VHT MCS0 | 2.92  | 1.38 | 9.96 | 14.26 | 15.50 | 1.33 |
| U-NII-3  | 802.11acVHT40, ch159, 40MHz, VHT MCS0 | 0.27  | 1.38 | 9.96 | 11.61 | 12.50 | 1.23 |
| U-NII-3  | 802.11acVHT80, ch155, 80MHz, VHT MCS0 | 0.29  | 1.38 | 9.96 | 11.63 | 12.50 | 1.22 |
| U-NII-3  | 802.11n, ch149, 20MHz, HT MCS0        | 2.90  | 1.38 | 9.96 | 14.24 | 15.50 | 1.34 |
| U-NII-3  | 802.11n, ch157, 20MHz, HT MCS0        | 2.76  | 1.38 | 9.96 | 14.10 | 15.50 | 1.38 |
| U-NII-3  | 802.11n, ch165, 20MHz, HT MCS0        | 0.23  | 1.38 | 9.96 | 11.57 | 12.50 | 1.24 |
| U-NII-3  | 802.11nHT40, ch151, 40MHz, HT MCS0    | 2.93  | 1.38 | 9.96 | 14.27 | 15.50 | 1.33 |
| U-NII-3  | 802.11nHT40, ch159, 40MHz, HT MCS0    | 0.33  | 1.38 | 9.96 | 11.67 | 12.50 | 1.21 |

## 9.2 Bluetooth SAR Exemption (FCC)

The following measurements were made and reported in Intertek report 105964951MPK-052:

| Mode                 | Frequency (MHz) | Conducted Peak Power (dBm) |
|----------------------|-----------------|----------------------------|
| GFSK, DH5            | 2402            | 1.24                       |
|                      | 2440            | 1.45                       |
|                      | 2480            | 1.35                       |
| $\pi/4$ -DQPSK, 2DH5 | 2402            | 0.91                       |
|                      | 2440            | 1.68                       |
|                      | 2480            | 2.18                       |
| 8-DPSK, 3DH5         | 2402            | 2.48                       |
|                      | 2440            | 2.31                       |
|                      | 2480            | 1.8                        |

The threshold power for exemption was calculated using the formula from 47 CFR Part 1.1307(3)(i)(B):

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

The calculated threshold power was 2.8 mW at 2.402 GHz and 5 mm separation distance. The maximum reported power was 1.77 mW. Therefore, the Bluetooth mode is exempt from routine SAR evaluation.



### 9.3 Bluetooth SAR Exemption (ISED)

The SAR exemption threshold was taken from Table 11 of RSS-102 Issue 6:

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

| Frequency (MHz) | ≤ 5 mm (mW) | 10 mm (mW) | 15 mm (mW) | 20 mm (mW) | 25 mm (mW) | 30 mm (mW) | 35 mm (mW) | 40 mm (mW) | 45 mm (mW) | > 50 mm (mW) |
|-----------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
| ≤ 300           | 45          | 116        | 139        | 163        | 189        | 216        | 246        | 280        | 319        | 362          |
| 450             | 32          | 71         | 87         | 104        | 124        | 147        | 175        | 208        | 248        | 296          |
| 835             | 21          | 32         | 41         | 54         | 72         | 96         | 129        | 172        | 228        | 298          |
| 1900            | 6           | 10         | 18         | 33         | 57         | 92         | 138        | 194        | 257        | 323          |
| 2450            | 3           | 7          | 16         | 32         | 56         | 89         | 128        | 170        | 209        | 245          |
| 3500            | 2           | 6          | 15         | 29         | 50         | 72         | 94         | 114        | 134        | 158          |
| 5800            | 1           | 5          | 13         | 23         | 32         | 41         | 54         | 74         | 102        | 128          |

For devices operating between 2402 MHz and 2480 MHz the exemption threshold is between 2 mW and 6 mW. The maximum reported power was 1.77 mW at 2402 MHz. Therefore, the Bluetooth mode is exempt from routine SAR evaluation. The estimated SAR was calculated to be:

$$(1.77 \text{ mW}) / (3.3 \text{ mW}) \times 0.25 \times (1.6 \text{ W/kg}) = 0.2145 \text{ W/kg}$$

### 9.4 EN 62479 SAR Exemption

The maximum output power of the Bluetooth radio was less than the threshold power of 20 mW (2 W/kg x 10 g).





## SAR Test Report

## 9.6 SAR

| Mode    | Channel            | Position | Separation (mm) | Power Drift (dB) | Measured 1-g SAR (W/kg) | Measured 10-g SAR (W/kg) | SAR Scaling Factor | Reported 1-g SAR (W/kg) | Reported 10-g SAR (W/kg) |
|---------|--------------------|----------|-----------------|------------------|-------------------------|--------------------------|--------------------|-------------------------|--------------------------|
| 802.11b | 1                  | Front    | 5               | 0.01             | 0.43                    | 0.21                     | 1.28               | 0.55                    | 0.27                     |
| 802.11b | 6                  | Front    | 5               | -0.06            | 1.08                    | 0.52                     | 1.42               | 1.53                    | 0.74                     |
| 802.11b | 6 <sup>(3)</sup>   | Front    | 5               | 0.08             | 0.73                    | 0.36                     | 1.42               | 1.04                    | 0.51                     |
| 802.11b | 6 <sup>(3)</sup>   | Front    | 5               | 0.07             | 0.73                    | 0.36                     | 1.42               | 1.04                    | 0.51                     |
| 802.11b | 11                 | Front    | 5               | -0.17            | 0.75                    | 0.35                     | 1.34               | 1.01                    | 0.47                     |
| 802.11g | 1                  | Front    | 5               | -0.03            | 0.24                    | 0.12                     | 1.31               | 0.32                    | 0.16                     |
| 802.11g | 6                  | Front    | 5               | 0.04             | 0.75                    | 0.36                     | 1.44               | 1.08                    | 0.52                     |
| 802.11g | 11 <sup>(2)</sup>  | -        | -               | -                | -                       | -                        | -                  | -                       | -                        |
| 802.11a | 36 <sup>(2)</sup>  | -        | -               | -                | -                       | -                        | -                  | -                       | -                        |
| 802.11a | 44                 | Left     | 5               | 0.08             | 0.30                    | 0.11                     | 1.43               | 0.43                    | 0.16                     |
| 802.11a | 48 <sup>(2)</sup>  | -        | -               | -                | -                       | -                        | -                  | -                       | -                        |
| 802.11a | 52                 | Left     | 5               | 0.05             | 0.46                    | 0.16                     | 1.20               | 0.55                    | 0.19                     |
| 802.11a | 60 <sup>(2)</sup>  | -        | -               | -                | -                       | -                        | -                  | -                       | -                        |
| 802.11a | 64 <sup>(2)</sup>  | -        | -               | -                | -                       | -                        | -                  | -                       | -                        |
| 802.11a | 100                | Left     | 5               | 0.07             | 0.38                    | 0.13                     | 1.19               | 0.45                    | 0.16                     |
| 802.11a | 120                | Left     | 5               | 0.11             | 1.11                    | 0.38                     | 1.03               | 1.15                    | 0.48                     |
| 802.11a | 120 <sup>(3)</sup> | Left     | 5               | 0.05             | 0.93                    | 0.32                     | 1.03               | 0.96                    | 0.33                     |
| 802.11a | 140                | Left     | 5               | 0.01             | 1.06                    | 0.35                     | 1.04               | 1.11                    | 0.37                     |
| 802.11a | 140 <sup>(3)</sup> | Left     | 5               | 0.02             | 0.92                    | 0.31                     | 1.04               | 0.96                    | 0.32                     |
| 802.11a | 149                | Left     | 5               | 0.25             | 0.88                    | 0.28                     | 1.29               | 1.13                    | 0.36                     |
| 802.11a | 149 <sup>(3)</sup> | Left     | 5               | 0.05             | 0.72                    | 0.25                     | 1.29               | 0.93                    | 0.32                     |
| 802.11a | 149 <sup>(3)</sup> | Left     | 5               | 0.01             | 0.72                    | 0.25                     | 1.29               | 0.92                    | 0.32                     |
| 802.11a | 157                | Left     | 5               | -0.15            | 0.90                    | 0.31                     | 1.25               | 1.13                    | 0.38                     |
| 802.11a | 157 <sup>(3)</sup> | Left     | 5               | 0.07             | 0.65                    | 0.23                     | 1.25               | 0.81                    | 0.29                     |
| 802.11a | 157 <sup>(3)</sup> | Left     | 5               | 0.03             | 0.73                    | 0.25                     | 1.25               | 0.92                    | 0.31                     |
| 802.11a | 165                | Left     | 5               | 0.08             | 0.42                    | 0.14                     | 1.29               | 0.54                    | 0.18                     |

Test Personnel: Brian Lackey  
Supervising/Reviewing Engineer: NA  
(Where Applicable)  
Signal Setup: Test Commands  
Power Method: ANSI C63.10  
Pretest Dipole Verification: Yes

Test Date: 12/12/2024-4/21/2025  
Tissue Depth: 15cm  
Ambient Temperature: 21.5 – 22.2 °C  
Relative Humidity: 27.0 – 34.0 %  
Atmospheric Pressure: 985.4 – 988.8 mbar

## Deviations, Additions, or Exclusions:

- 1) Per KDB 447468 D04v01 §3.2.1 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  $SAR \leq 0.8$  W/kg for 1-g, or  $SAR \leq 2.0$  W/kg for 10-g, when the transmission band span is  $\leq 100$  MHz
- 2) Per KDB 248227 D01 § 5.1.1 When the reported SAR of the initial test position is  $> 0.4$  W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is  $\leq 0.8$  W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) Per KDB 865664 D01 § 2.8.1, SAR measurements are repeated for configurations where the measured 1-g SAR is  $> 0.8$  W/kg, and repeated a second time if the first repeated measurement varies more than 20% from the original measurement.



## 10 APPENDIX A – System Validation Summary

Per FCC KDB 865664, a tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters have been included in the summary table below. The validation was performed with reference dipoles using the required tissue equivalent media for system validation according to KDB 865664. Each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point. All measurements were performed using probes calibrated for CW signals. Modulations in the table above represent test configurations for which the SAR system has been validated. The SAR system was also validated with modulated signals per KDB 865664.

Table 10: SAR System Validation Summary

| Frequency (MHz) | Date     | Probe (SN#) | Probe (Model #) | Probe Calibration Point |            | Dielectric Properties |              | CW Validation |                 |                | Modulation Validation |             |      |
|-----------------|----------|-------------|-----------------|-------------------------|------------|-----------------------|--------------|---------------|-----------------|----------------|-----------------------|-------------|------|
|                 |          |             |                 | Frequency (MHz)         | Fluid Type | $\sigma$              | $\epsilon_r$ | Sensitivity   | Probe Linearity | Probe Isotropy | Mod. Type             | Duty Factor | PAR  |
| 2450            | 2/7/2024 | 3516        | EX3DV3          | 2450                    | Body       | 50.65                 | 2.02         | Pass          | Pass            | Pass           | OFDM                  | N/A         | Pass |
| 5200            | 2/7/2024 | 3516        | EX3DV3          | 5200                    | Body       | 48.71                 | 5.54         | Pass          | Pass            | Pass           | OFDM                  | N/A         | Pass |
| 5500            | 2/7/2024 | 3516        | EX3DV3          | 5500                    | Body       | 47.68                 | 6.29         | Pass          | Pass            | Pass           | OFDM                  | N/A         | Pass |
| 5800            | 2/7/2024 | 3516        | EX3DV3          | 5800                    | Body       | 48.71                 | 5.54         | Pass          | Pass            | Pass           | OFDM                  | N/A         | Pass |
|                 |          |             |                 |                         |            |                       |              |               |                 |                |                       |             |      |
|                 |          |             |                 |                         |            |                       |              |               |                 |                |                       |             |      |
| Frequency (MHz) | Date     | Probe (SN#) | Probe (Model #) | Probe Calibration Point |            | Dielectric Properties |              | CW Validation |                 |                | Modulation Validation |             |      |
|                 |          |             |                 | Frequency (MHz)         | Fluid Type | $\sigma$              | $\epsilon_r$ | Sensitivity   | Probe Linearity | Probe Isotropy | Mod. Type             | Duty Factor | PAR  |
| 835             | 2/7/2024 | 3516        | EX3DV3          | 835                     | Body       | 54.2                  | 0.98         | Pass          | Pass            | Pass           | GMSK                  | Pass        | N/A  |
| 900             | 2/7/2024 | 3516        | EX3DV3          | 900                     | Body       | 54                    | 1.02         | Pass          | Pass            | Pass           | GMSK                  | Pass        | N/A  |
| 1750            | 2/7/2024 | 3516        | EX3DV3          | 1800                    | Body       | 52.9                  | 1.41         | Pass          | Pass            | Pass           | GMSK                  | Pass        | N/A  |
| 1900            | 2/7/2024 | 3516        | EX3DV3          | 1900                    | Body       | 52.7                  | 1.48         | Pass          | Pass            | Pass           | GMSK                  | Pass        | N/A  |



## 11 APPENDIX B – Worst Case SAR Plots

Date/Time: 12/18/2024 12:02:07 PM

Test Laboratory: Intertek

B7 Badge

Procedure Notes:

**DUT: B7 Badge; Serial: Production Sample P3**

Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: WLAN 2.4GHz (2412.0 - 2484.0 MHz); Frequency: 2437 MHz; Duty Cycle: 1:1.53886

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.958$  S/m;  $\epsilon_r = 39.947$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(8.56, 8.56, 8.56) @ 2437 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 1 with CRP v5.0; Type: QD000P40CD; Serial: TP: 1243
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**2024-12-18 2.4GHz/802.11b ch6 front/Area Scan (61x111x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.27 W/kg

**2024-12-18 2.4GHz/802.11b ch6 front/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.98 V/m; Power Drift = -0.06 dB

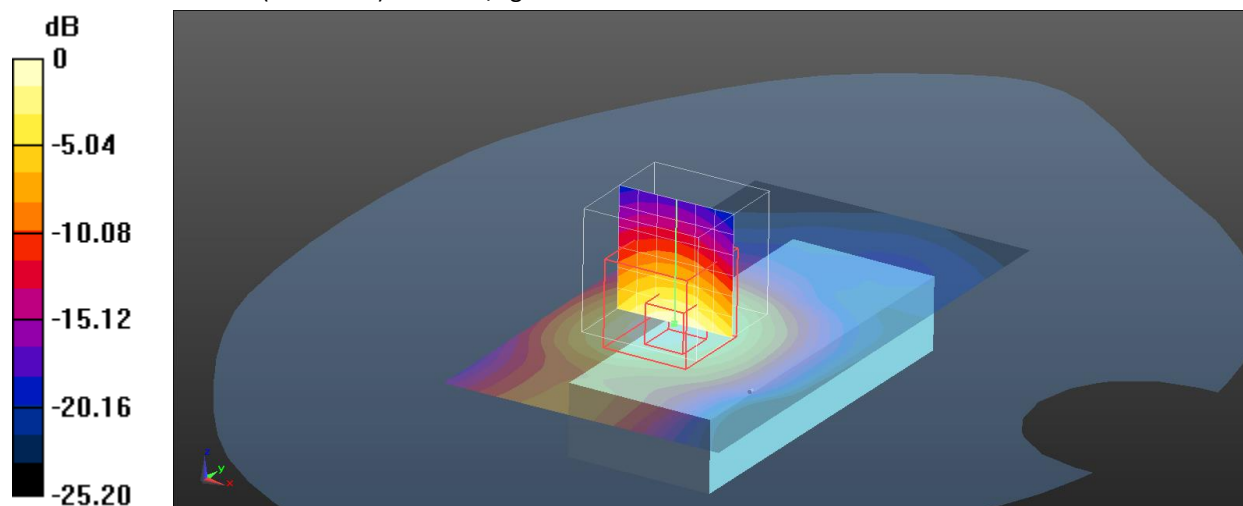
Peak SAR (extrapolated) = 2.15 W/kg

**SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.521 W/kg (SAR corrected for target medium)**

Smallest distance from peaks to all points 3 dB below = 11.4 mm

Ratio of SAR at M2 to SAR at M1 = 51.3%

Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

**12 APPENDIX C – Dipole Validation Plots****12.1 D2450V2**

Date/Time: 12/17/2024 3:34:33 PM

Test Laboratory: Intertek

2024-12-17 D2450V2

Procedure Notes:

**DUT: Dipole 2450 MHz D2450V2; Serial: D2450V2**

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.972$  S/m;  $\epsilon_r = 39.885$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(8.56, 8.56, 8.56) @ 2450 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 1 with CRP v5.0; Type: QD000P40CD; Serial: TP: 1243
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Configuration/Dipole Validation/Area Scan (81x81x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 6.27 W/kg

**Configuration/Dipole Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.40 V/m; Power Drift = -0.03 dB

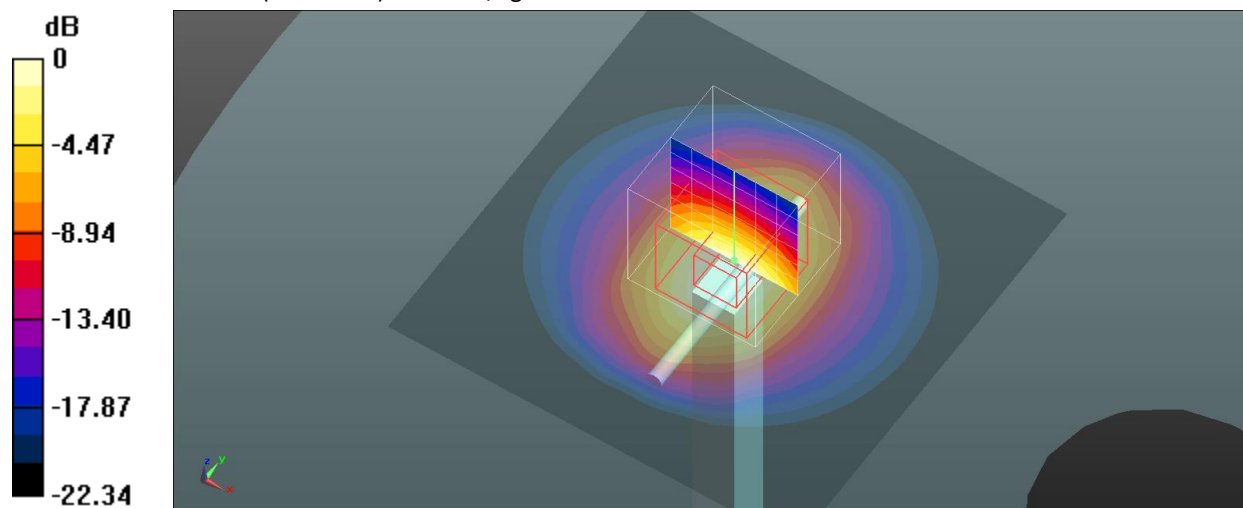
Peak SAR (extrapolated) = 11.6 W/kg

**SAR(1 g) = 5.49 W/kg; SAR(10 g) = 2.53 W/kg (SAR corrected for target medium)**

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

Ratio of SAR at M2 to SAR at M1 = 48.5%

Maximum value of SAR (measured) = 6.22 W/kg



0 dB = 6.22 W/kg = 7.94 dBW/kg



## 12.2 D5GHzV2, 5200MHz

Date/Time: 12/11/2024 10:31:11 AM

Test Laboratory: Intertek

2024-12-10 D5GHzV2

Procedure Notes:

**DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN**

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 5.017$  S/m;  $\epsilon_r = 36.065$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(5.27, 5.27, 5.27) @ 5200 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Configuration/Low Channel Verification/Area Scan (101x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 15.6 W/kg

**Configuration/Low Channel Verification/Zoom Scan (14x14x12)/Cube 0:** Measurement grid: dx=2mm, dy=2mm, dz=2mm

Reference Value = 40.05 V/m; Power Drift = 0.03 dB

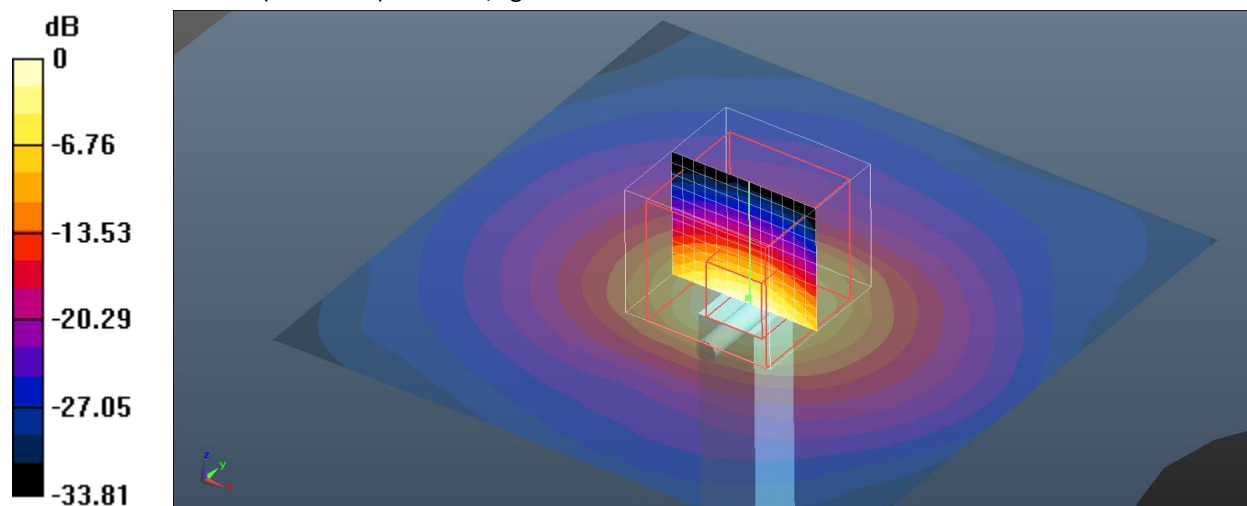
Peak SAR (extrapolated) = 34.9 W/kg

**SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.27 W/kg (SAR corrected for target medium)**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 52.3%

Maximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dBW/kg



### 12.3 D5GHzV2, 5500MHz

Date/Time: 12/11/2024 2:00:29 PM

Test Laboratory: Intertek

2024-12-10 D5GHzV2

Procedure Notes:

**DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN:xxx**

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5500$  MHz;  $\sigma = 5.374$  S/m;  $\epsilon_r = 35.352$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(5.09, 5.09, 5.09) @ 5500 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Configuration/Mid Channel Verification/Area Scan (81x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 16.3 W/kg

**Configuration/Mid Channel Verification/Zoom Scan (14x14x12)/Cube 0:** Measurement grid: dx=2mm, dy=2mm, dz=2mm

Reference Value = 38.31 V/m; Power Drift = 0.17 dB

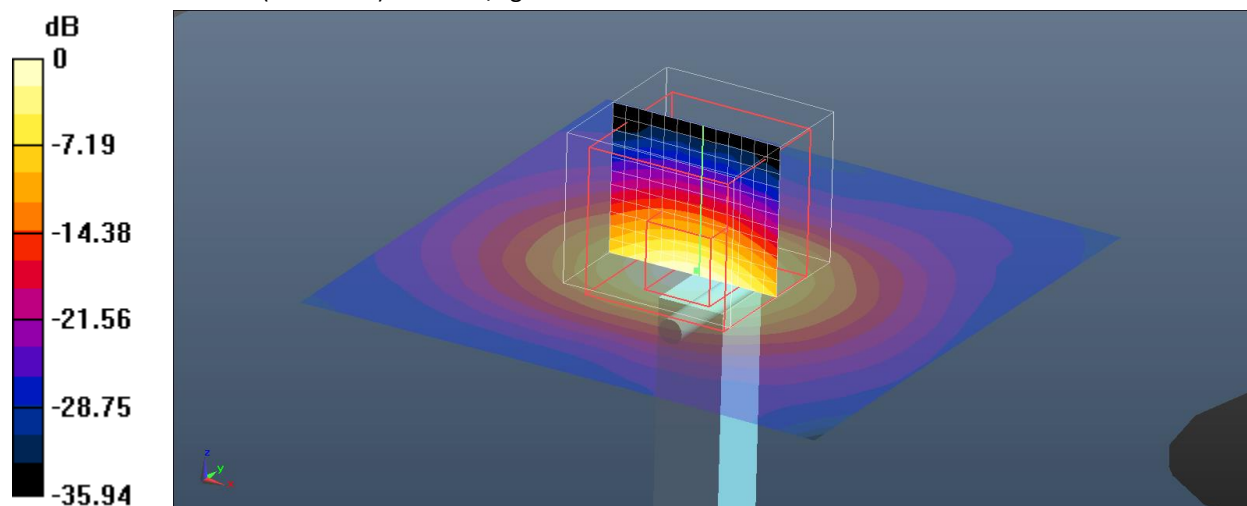
Peak SAR (extrapolated) = 37.3 W/kg

**SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.22 W/kg (SAR corrected for target medium)**

Smallest distance from peaks to all points 3 dB below = 7 mm

Ratio of SAR at M2 to SAR at M1 = 48.8%

Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg



## 12.4 D5GHzV2, 5800MHz

Date/Time: 12/11/2024 3:32:28 PM

Test Laboratory: Intertek

2024-12-10 D5GHzV2

Procedure Notes:

**DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN:xxx**

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5800$  MHz;  $\sigma = 5.755$  S/m;  $\epsilon_r = 34.538$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(4.76, 4.76, 4.76) @ 5800 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Configuration/High Channel Verification/Area Scan (81x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.0 W/kg

**Configuration/High Channel Verification/Zoom Scan (12x12x12)/Cube 0:** Measurement grid: dx=2mm, dy=2mm, dz=2mm

Reference Value = 36.47 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 40.6 W/kg

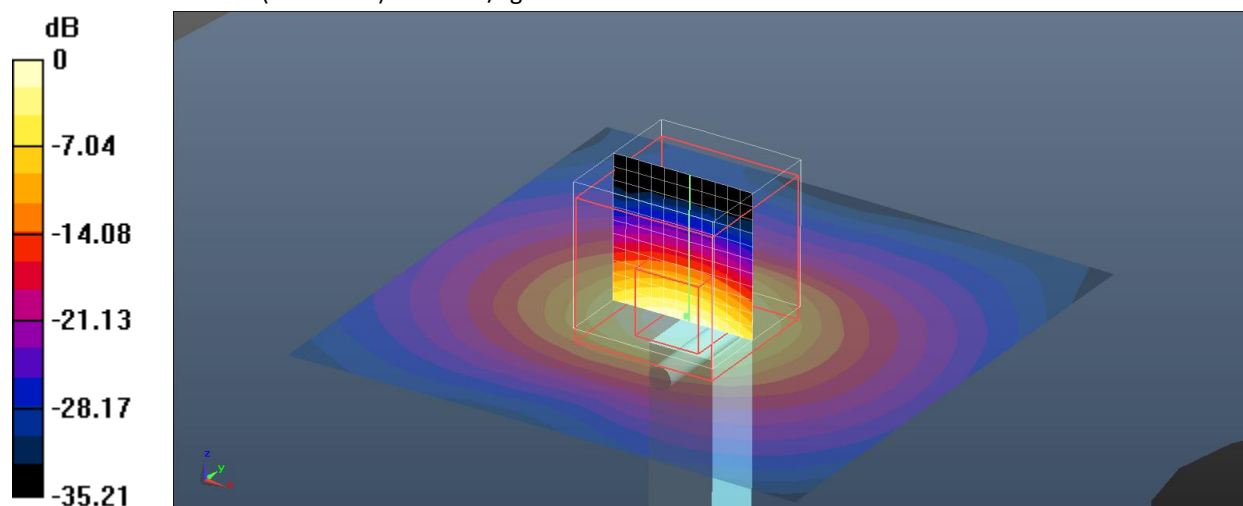
**SAR(1 g) = 8.03 W/kg; SAR(10 g) = 2.23 W/kg (SAR corrected for target medium)**

Smallest distance from peaks to all points 3 dB below = 7 mm

Ratio of SAR at M2 to SAR at M1 = 46.6%

Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.

Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg





13 APPENDIX D – Setup Photos



Figure 4 - Front Face, 5mm Separation





Figure 5 – Left Side, 5mm Separation



14 Revision History

| Revision Level | Date      | Report Number      | Prepared By | Reviewed By | Notes                                                                                                             |
|----------------|-----------|--------------------|-------------|-------------|-------------------------------------------------------------------------------------------------------------------|
| 0              | 2/6/2025  | 105964951LEX-040   | BZ          | MC          | Original Issue                                                                                                    |
| 1              | 4/22/2025 | 105964951LEX-040.1 | BZ          | MC          | Added repeated SAR measurements. Added probe calibration documents. Added SAR exemption calculation for Bluetooth |
|                |           |                    |             |             |                                                                                                                   |
|                |           |                    |             |             |                                                                                                                   |
|                |           |                    |             |             |                                                                                                                   |
|                |           |                    |             |             |                                                                                                                   |





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **Intertek**  
Lexington, USA

Certificate No. **D2450V2-718\_Nov24**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 718**

Calibration procedure(s) **QA CAL-05.v12**  
**Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**

Calibration date **November 12, 2024**

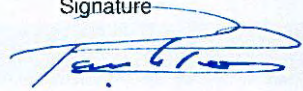
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)            | Scheduled Cal |
|--------------------------------------------|------------|---------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)             | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 22-Jul-24 (No. 4030A315008547)        | Jul-25        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 25-Jan-24 (No. 4030-315007551)        | Jan-25        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)             | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 24-Sep-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                                | SN: 1249   | 23-Sep-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4                     | SN: 7349   | 03-Jun-24 (No. EX3-7349_Jun24)        | Jun-25        |
| DAE4ip                                     | SN: 1836   | 28-Oct-24 (No. DAE4ip-1836_Oct24)     | Oct-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 675-CAL16-S4588-240528)     | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|               |            |                       |                                                                                       |
|---------------|------------|-----------------------|---------------------------------------------------------------------------------------|
|               | Name       | Function              | Signature                                                                             |
| Calibrated by | Paulo Pina | Laboratory Technician |  |
| Approved by   | Sven Kühn  | Technical Manager     |  |

Issued: November 12, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



## Calibration Laboratory of

Schmid & Partner  
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

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

## Calibration is Performed According to the Following Standards

- 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-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation

- DASY System Handbook

## Methods Applied and Interpretation of Parameters

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

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



## Measurement Conditions

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

|                                     |                          |                                     |
|-------------------------------------|--------------------------|-------------------------------------|
| <b>DASY Version</b>                 | DASY8 Module SAR         | 16.4.0                              |
| <b>Extrapolation</b>                | Advanced Extrapolation   |                                     |
| <b>Phantom</b>                      | Modular Flat Phantom     |                                     |
| <b>Distance Dipole Center - TSL</b> | 10 mm                    | with spacer                         |
| <b>Zoom Scan Resolution</b>         | dx, dy = 5mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| <b>Frequency</b>                    | 2450MHz $\pm$ 1MHz       |                                     |

## Head TSL parameters at 2450 MHz

The following parameters and calculations were applied.

|                                                | Temperature        | Permittivity  | Conductivity        |
|------------------------------------------------|--------------------|---------------|---------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C            | 39.2          | 1.80 mho/m          |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2)°C | 38.1 $\pm$ 6% | 1.85 mho/m $\pm$ 6% |
| <b>Head TSL temperature change during test</b> | < 0.5 °C           |               |                     |

## SAR result with Head TSL at 2450 MHz

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                               |
|-------------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                         | 24 dBm input power | 13.1 W/kg                     |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | 52.2 W/kg $\pm$ 17.0% (k = 2) |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                               |
|---------------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                           | 24 dBm input power | 6.16 W/kg                     |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | 24.5 W/kg $\pm$ 16.5% (k = 2) |



**Body TSL parameters at 2450 MHz**

The following parameters and calculations were applied.

|                                         | Temperature   | Permittivity | Conductivity   |
|-----------------------------------------|---------------|--------------|----------------|
| Nominal Body TSL parameters             | 22.0 °C       | 52.7         | 1.95 mho/m     |
| Measured Body TSL parameters            | (22.0 ±0.2)°C | 52.5 ±6%     | 2.00 mho/m ±6% |
| Body TSL temperature change during test | < 0.5 °C      |              |                |

**SAR result with Body TSL at 2450 MHz**

|                                                             |                    |                          |
|-------------------------------------------------------------|--------------------|--------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                          |
| SAR for nominal Body TSL parameters                         | 24 dBm input power | 12.2 W/kg                |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | 48.6 W/kg ±17.0% (k = 2) |

|                                                               |                    |                          |
|---------------------------------------------------------------|--------------------|--------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | Condition          |                          |
| SAR for nominal Body TSL parameters                           | 24 dBm input power | 5.71 W/kg                |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | 22.7 W/kg ±16.5% (k = 2) |



**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 2450 MHz**

|             |                             |
|-------------|-----------------------------|
| Impedance   | $53.9 \Omega + 2.2 j\Omega$ |
| Return Loss | -27.4 dB                    |

**Antenna Parameters with Body TSL at 2450 MHz**

|             |                             |
|-------------|-----------------------------|
| Impedance   | $49.8 \Omega + 4.3 j\Omega$ |
| Return Loss | -27.4 dB                    |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.146 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured. The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

**Additional EUT Data**

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|



## System Performance Check Report

## Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] |
|-----------------|-----------------|-----|-------------|
| D2450V2 - SN718 | 2450            | HSL | 24          |

## Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 |      | CW, 0--    | 2450, 0                         | 7.24              | 1.85                   | 38.1             |

## Hardware Setup

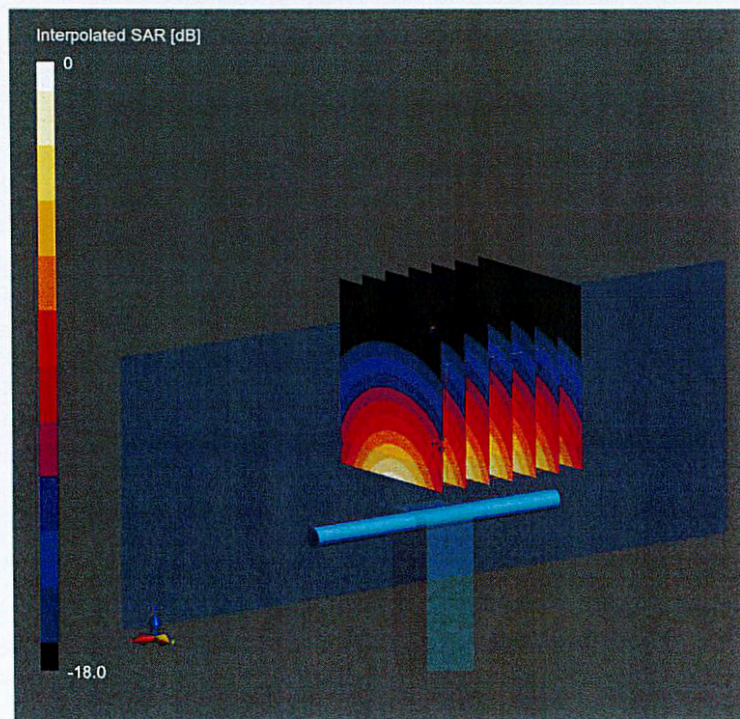
| Phantom        | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Right | HSL, 2024-11-07    | EX3DV4 - SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-10-28 |

## Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | All points      |
| Scan Method         | Measured        |

## Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-11-07          |
| psSAR1g [W/Kg]      | 13.1                |
| psSAR10g [W/Kg]     | 6.16                |
| Power Drift [dB]    | -0.01               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |

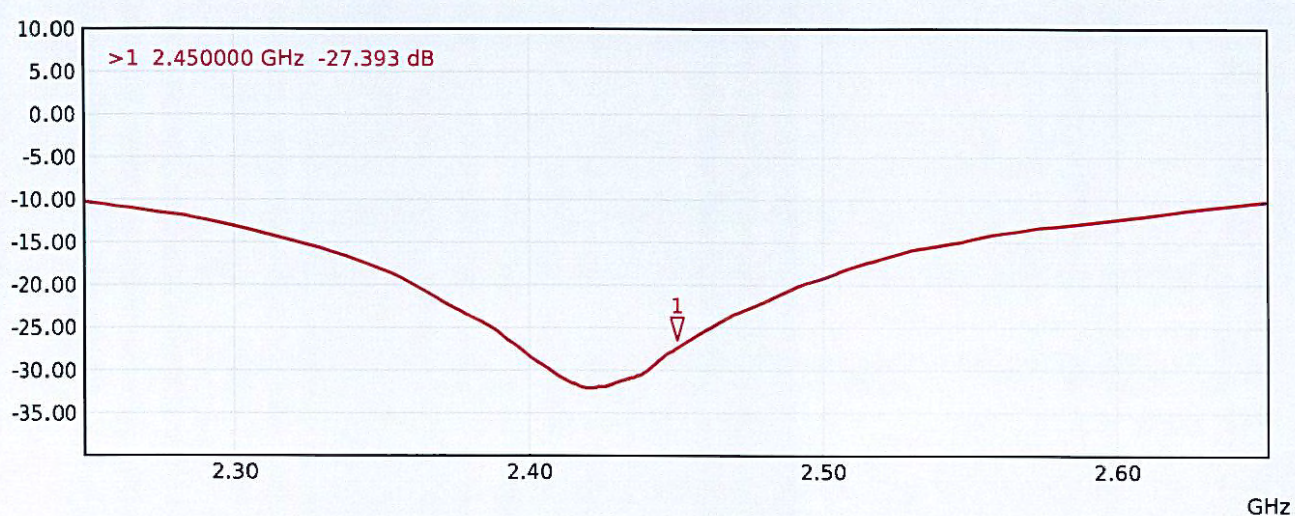
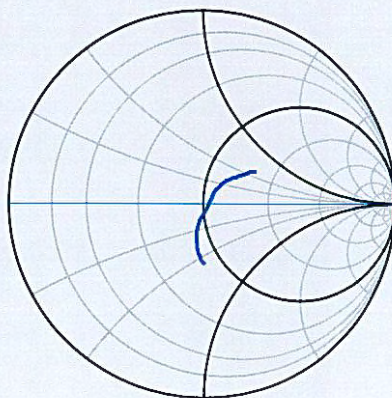


0 dB = 27.0 W/Kg



## Impedance Measurement Plot for Head TSL

S11 Smith (R+jX) Scale 1.00

>1 2.450000 GHz 53.856  $\Omega$  2.191  $j\Omega$ 



System Performance Check Report

Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] |
|-----------------|-----------------|-----|-------------|
| D2450V2 – SN718 | 2450            | MSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 |      | CW, 0--    | 2450, 0                         | 7.96              | 2.00                   | 52.5             |

Hardware Setup

| Phantom        | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Right | MSL, 2024-11-12    | EX3DV4 – SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-10-28 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS + 6p        |
| Scan Method         | Measured        |

Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-11-12          |
| psSAR1g [W/Kg]      | 12.2                |
| psSAR10g [W/Kg]     | 5.71                |
| Power Drift [dB]    | -0.01               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |

