

SAR Test Report - New Application

Applicant:



Garmin International Inc.
1200 East 151 St.
Olathe, KS, 66062
USA

FCC ID:

IPH-04939

Product Model Number / HVIN

A04939

| Maximum reported SAR | | |
|----------------------|--------------|------|
| Body (1g) | DTS | 0.04 |
| | DSS | 0.39 |
| | UNII | 0.86 |
| | Simultaneous | 0.90 |
| General Pop. Limit: | | 1.60 |
| Extremity (10g) | DTS | 0.03 |
| | DSS | 0.38 |
| | UNII | 0.48 |
| | Simultaneous | 0.51 |
| General Pop. Limit: | | 4.00 |

W/kg

IC Registration Number

Product Name / PMN

A04939

In Accordance With:

FCC 47 CFR §2.1093

Radiofrequency Radiation Exposure Evaluation: Portable Devices

Approved By:



Ben Hewson, President
Celltech Labs Inc.
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Canada



**Industry
Canada**



Test Lab Certificate: 2470.01

IC Registration 3874A

FCC Registration: CA3874

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1.0 REVISION HISTORY

| Revision History | | | | | |
|----------------------------|------------------------------------|----------------------------|-------------------------------|-------------------|---------------------------|
| Samples Tested By: | | Ben Hewson/Trevor Whillock | Date(s) of Evaluation: | | 5-7, 10-12 September 2024 |
| Report Prepared By: | | Ben Hewson | Report Reviewed By: | | Art Voss |
| Report Revision | Description of Revision | Revised Section | Revised By | Revision Date | |
| 1.0 | Initial Release | n/a | Ben Hewson | 20 September 2024 | |
| 2.0 | Revised to Include ANT Transmitter | all | Art Voss | 24 October 2024 | |

2.0 CLIENT AND DEVICE INFORMATION

| Client Information | |
|--|---|
| Applicant Name | Garmin International Inc. |
| Applicant Address | 1200 East 151 St |
| | Olathe, KS, 66062 |
| | USA |
| DUT Information | |
| Device Identifier(s): | FCC ID: IPH-04939 |
| Device Model(s) / HVIN: | A04939 |
| Device Marketing Name / PMN: | A04939 |
| Software Ver #/ SVIN: | 1.28 |
| Test Sample Serial No.: | OTA: 3474385385 COND: 3474385546 |
| Device Type: | Personal Navigation Device |
| FCC Equipment Class: | PCS Licensed Transmitter (PCB) |
| | Digital Transmission System (DTS) |
| | Part 15 Spread Spectrum Transmitter (DSS) |
| | Unlicensed National Information Infrastructure (NII) |
| | Short Range Devices (SRD) |
| Transmit Frequency Range: | BT (DTS, DSS): 2402-2480MHz |
| | ANT (DTS): 2402-2480MHz |
| | WiFi (DTS): 2412-2462MHz |
| | U-NII-1: 5180 - 5240, U-NII-3: 5745-5825 |
| Manuf. Max. Rated Output Power: | BT BR (DSS): 8.5 dBm |
| | BT 2EDR (DTS): 6 dBm |
| | BT 3EDR (DTS): 5 dBm |
| | BT LE (DTS): 7 dBm |
| | ANT (DTS): 7.25 dBm |
| | 802.11b (DTS): 17.5 dBm |
| | 802.11g (DTS): 17.5 dBm |
| | 802.11n (DTS): 17.5 dBm |
| | U-NII-1/802.11a20: 14 dBm |
| | U-NII-1/802.11n20: 14 dBm |
| | U-NII-1/802.11n40: 13 dBm |
| | U-NII-1/802.11ac80: 12.5 dBm |
| | U-NII-3/802.11a20: 18.5 dBm |
| | U-NII-3/802.11n20: 18.5 dBm |
| | U-NII-3/802.11n40: 17 dBm |
| U-NII-3/802.11ac80: 17 dBm | |
| Antenna Type and Gain: | PIFA 2.4GHz: -0.5dBi, 5GHz UNII-1: 3.2dBi, UNII-3: 3.6dBi |
| Modulation: | BT BR: GFSK |
| | BT 2EDR: $\pi/4$ -DQPSK |
| | Bt 3EDR: 8DPSK |
| | BLE: GMSK |
| | WiFi: CCK, DSSS, OFDM, CCK, MCS |
| DUT Power Source: | 5V USB, Internal Li-Ion Battery |
| DUT Dimensions [LxWxH] | L x W x H: 157mm x 90mm x 26mm |
| Deviation(s) from standard/procedure: | None |
| Modification of DUT: | None |

* Information on antenna gain provided by applicant.

3.0 SCOPE OF EVALUATION

This Certification Report was prepared on behalf of:

Garmin International Inc.

The A04939 FCC ID: IPH-A04939, is a Low Power Digital Transmitter that offers use as a hand-held, transportation mounted or portable configuration, with a Wi-Fi transceiver that is capable of operating in the 2.4GHz WiFi, 5GHz U-NII-1 & 3 frequency bands as well as 2.4Ghz BT/BLE frequency bands. The device has two antennas covering the 2.4GHZ and a 5Ghz frequencies, and is capable of simultaneous transmission with the 2.4GHz BT/BLE and 5GHz frequencies. The device is intended for General Population Use. The product operates from an internal proprietary Li-ion rechargeable battery which can be connected to a compliant USB interface port, AC or DC adapter for charging. Test samples provided by the manufacturer were capable of transmitting at select frequencies and modulations preset by the manufacturer. An additional antenna modification was prepared for one sample allowing the ability to connect test equipment for antenna port conducted power analysis.

Application:

This is an application for a new device certification.

Scope:

The scope of this evaluation limited to the evaluation of SAR for intended and non-intended applications. It will include evaluation of the 2.4 GHz WiFi, U-NII transmitters for all required RF exposure configurations including Extremity and certain Body Configuration as the device may be operational while in hand or on person.

The Test Plan developed for this evaluation is based on the required test channels and configurations which produced the highest worst case SAR and where applicable, SAR test reduction and/or SAR test exclusion may be utilized. The DUT was evaluated for SAR at the maximum tune up tolerance and conducted output power level, preset by the manufacturer and in accordance with the procedures described in IEC/IEEE 62209-1528, FCC KDB 447498 and FCC KDB 248227.

4.0 NORMATIVE REFERENCES

| Normative References* | |
|---|---|
| ANSI / ISO 17025 | General Requirements for competence of testing and calibration laboratories |
| FCC CFR Title 47 Part 2 Title 47: Part 2.1093: | Code of Federal Regulations Telecommunication Radiofrequency Radiation Exposure Evaluation: Portable Devices |
| IEC International Standard /IEEE International Committee on Electromagnetic Safety IEC/IEEE 62209-1528 | Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528; Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz) |
| FCC KDB KDB 865664 D01v01r04 | SAR Measurement Requirements for 100MHz to 6GHz |
| FCC KDB KDB 447498 D04v01 | Interim General RF Exposure Guidance |
| FCC KDB KDB 248227 D01v02r02 | SAR Guidance for IEEE 802.11 (WiFi) Transmitters |
| * When the issue number or issue date is omitted, the latest version is assumed. | |

5.0 STATEMENT OF COMPLIANCE

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

| | | | |
|--|--|---|--|
| Applicant: Garmin International Inc. | | Model / HVIN: A04939 | |
| Standard(s) Applied: FCC 47 CFR §2.1093 | | Measurement Procedure(s): FCC KDB 865664, FCC KDB 447498, FCC KDB 248227 IEC/IEEE Standard 62209-1528 | |
| Reason For Issue: <input checked="" type="checkbox"/> New Certification <input type="checkbox"/> Class I Permissive Change <input type="checkbox"/> Class II Permissive Change | | Use Group: <input checked="" type="checkbox"/> General Population / Uncontrolled <input type="checkbox"/> Occupational / Controlled | |
| Reason for Change: | | Limits Applied: <input checked="" type="checkbox"/> 1.6W/kg - 1g Volume <input type="checkbox"/> 8.0W/kg - 1g Volume <input checked="" type="checkbox"/> 4.0W/kg - 10g Volume | |
| | | Date(s) Evaluated: 5-7, 10-12 September 2024 | |

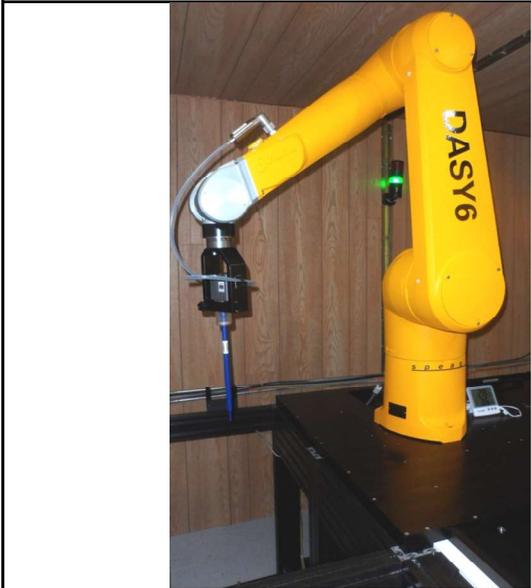
The results of this investigation are based solely on the test sample(s) provided by the applicant which was not adjusted, modified or altered in any manner whatsoever except as required to carry out specific tests or measurements. A description of the device, operating configuration, detailed summary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

| | |
|---|---|
| <p>I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.</p> |  |
| | <p>Ben Hewson Celltech Labs Inc.</p> |
| | <p>20 September 2024 Date</p> |

6.0 SAR MEASUREMENT SYSTEM

SAR Measurement System

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



DASY 6 SAR System



DASY 6 Measurement Controller

7.0 RF CONDUCTED POWER MEASUREMENT

Table 7.1 Conducted Power Measurements, WLAN, BT, U-NII

| Conducted Power Measurements | | | | | | | | | | | | | |
|------------------------------|------------|--------------------|---------|--------------------|------------|--------------------|-------------------------|----------------------|--------------------|---------------|-------------------|------------------------|------------------------------|
| Band | Mode | Bandwidth (MHz) | Channel | Frequency (MHz) | Modulation | Bit Rate (Mbps) | Measured Power (dBm) | Rated Power (dBm) | Rated Power (W) | Delta (dB) | Duty Cycle (%) | Crest Factor (1/DC) | SAR Test Channel (Y/-) |
| WLAN 2.4G | 802.11b | 20 | 1 | 2412 | DSSS | 11 | 17.21 | 17.50 | 0.056 | -0.29 | 99.9 | 1.00 | Y |
| | | | 6 | 2437 | | | 16.89 | 17.50 | 0.056 | -0.61 | 99.9 | 1.00 | - |
| | | | 11 | 2462 | | | 17.17 | 17.50 | 0.056 | -0.33 | 99.9 | 1.00 | - |
| | 802.11g | 20 | 1 | 2412 | OFDM | 6 | 16.11 | 17.50 | 0.056 | -1.39 | 97.5 | 1.03 | - |
| | | | 6 | 2437 | | | 15.70 | 17.50 | 0.056 | -1.80 | 97.5 | 1.03 | - |
| | | | 11 | 2462 | | | 15.83 | 17.50 | 0.056 | -1.67 | 97.5 | 1.03 | - |
| | 802.11n | 20 | 1 | 2412 | MCS | 0 | 17.00 | 17.50 | 0.056 | -0.50 | 97.5 | 1.03 | - |
| | | | 6 | 2437 | | | 16.71 | 17.50 | 0.056 | -0.79 | 97.5 | 1.03 | - |
| | | | 11 | 2462 | | | 16.74 | 17.50 | 0.056 | -0.76 | 97.5 | 1.03 | - |
| BT | BR | 1 | 2 | 2402 | GFSK | - | 7.57 | 8.50 | 0.007 | -0.93 | 76.9 | 1.30 | - |
| | | | 41 | 2441 | | | 8.30 | 8.50 | 0.007 | -0.20 | 76.9 | 1.30 | Y |
| | | | 80 | 2480 | | | 7.02 | 8.50 | 0.007 | -1.48 | 76.9 | 1.30 | - |
| | 2EDR | 1 | 2 | 2402 | Pi/4-DQPSK | - | 5.22 | 6.00 | 0.004 | -0.78 | 76.9 | 1.30 | - |
| | | | 41 | 2441 | | | 4.89 | 6.00 | 0.004 | -1.11 | 76.9 | 1.30 | - |
| | | | 80 | 2480 | | | 3.66 | 6.00 | 0.004 | -2.34 | 76.9 | 1.30 | - |
| | 3EDR | 1 | 2 | 2402 | 8DPSK | - | 4.82 | 5.00 | 0.003 | -0.18 | 76.9 | 1.30 | - |
| | | | 41 | 2441 | | | 4.35 | 5.00 | 0.003 | -0.65 | 76.9 | 1.30 | - |
| | | | 80 | 2480 | | | 3.41 | 5.00 | 0.003 | -1.59 | 76.9 | 1.30 | - |
| | LE | 1 | 37 | 2402 | GFSK | - | 6.81 | 7.00 | 0.005 | -0.19 | 76.9 | 1.30 | - |
| | | | 17 | 2440 | | | 6.44 | 7.00 | 0.005 | -0.56 | 76.9 | 1.30 | - |
| | | | 39 | 2480 | | | 5.40 | 7.00 | 0.005 | -1.60 | 76.9 | 1.30 | - |
| U-NII-1 | 802.11a | 20 | 36 | 5180 | OFDM | 6 | 13.80 | 14.00 | 0.025 | -0.20 | 97.0 | 1.03 | Y |
| | | | 40 | 5200 | | | 13.79 | 14.00 | 0.025 | -0.21 | 97.0 | 1.03 | - |
| | | | 44 | 5220 | | | 13.80 | 14.00 | 0.025 | -0.20 | 97.0 | 1.03 | - |
| | | | 48 | 5240 | | | 13.49 | 14.00 | 0.025 | -0.51 | 97.0 | 1.03 | - |
| | | | 36 | 5180 | | | 13.15 | 14.00 | 0.025 | -0.85 | 97.4 | 1.03 | - |
| | 802.11n | 20 | 40 | 5200 | MCS | 0 | 13.29 | 14.00 | 0.025 | -0.71 | 97.4 | 1.03 | - |
| | | | 44 | 5220 | | | 13.17 | 14.00 | 0.025 | -0.83 | 97.4 | 1.03 | - |
| | | | 48 | 5240 | | | 12.79 | 14.00 | 0.025 | -1.21 | 97.4 | 1.03 | - |
| | 802.11n40 | 40 | 38 | 5190 | MCS | 0 | 12.48 | 13.00 | 0.020 | -0.52 | 91.2 | 1.10 | - |
| | 802.11ac80 | 80 | 46 | 5230 | MCS | 0 | 12.49 | 13.00 | 0.020 | -0.51 | 91.2 | 1.10 | - |
| U-NII-3 | 802.11a | 20 | 42 | 5210 | MCS | 0 | 11.81 | 12.50 | 0.018 | -0.69 | 91.7 | 1.09 | - |
| | | | 149 | 5745 | OFDM | 6 | 18.20 | 18.50 | 0.071 | -0.30 | 97.0 | 1.03 | Y |
| | | | 153 | 5765 | | | 17.90 | 18.50 | 0.071 | -0.60 | 97.0 | 1.03 | - |
| | | | 157 | 5785 | | | 18.16 | 18.50 | 0.071 | -0.34 | 97.0 | 1.03 | - |
| | | | 161 | 5805 | | | 18.15 | 18.50 | 0.071 | -0.35 | 97.0 | 1.03 | - |
| | 165 | 5825 | 18.14 | 18.50 | | | 0.071 | -0.36 | 97.0 | 1.03 | - | | |
| | 802.11n | 20 | 149 | 5745 | MCS | 0 | 17.66 | 18.50 | 0.071 | -0.84 | 97.4 | 1.03 | - |
| | | | 153 | 5765 | | | 17.59 | 18.50 | 0.071 | -0.91 | 97.4 | 1.03 | - |
| | | | 157 | 5785 | | | 17.74 | 18.50 | 0.071 | -0.76 | 97.4 | 1.03 | - |
| | | | 161 | 5805 | | | 17.71 | 18.50 | 0.071 | -0.79 | 97.4 | 1.03 | - |
| | | | 165 | 5825 | | | 17.88 | 18.50 | 0.071 | -0.62 | 97.4 | 1.03 | - |
| | 802.11n40 | 40 | 151 | 5755 | MCS | 0 | 16.58 | 17.00 | 0.050 | -0.42 | 91.2 | 1.10 | - |
| | 159 | 5795 | 16.75 | 17.00 | | | 0.050 | -0.25 | 91.7 | 1.09 | - | | |
| | 802.11ac80 | 80 | 155 | 5775 | MCS | 0 | 16.42 | 17.00 | 0.050 | -0.58 | 91.7 | 1.09 | - |

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

Note: Since the ANT transmitter occupies the same spectrum as the Bluetooth transmitter and the ANT rated power is less than the Bluetooth transmitter, the ANT transmitter was not considered for SAR evaluation.

8.0 NUMBER OF TEST CHANNELS (N_c)

Table 8.1 Number of Test Channels

The intended use of the device is to be mounted on a vehicle' dashboard; however, the device could transmit while held in hand or on person. As such the device was evaluated for both Body and Extremity use.

Wi-Fi SAR Evaluation:

SAR was evaluated in DSSS mode at the maximum duty cycle. The power level setting selected was specified by the manufacturer to be the max output power and produce the most conservative SAR.

As per FCC KDB 248227, the required 802.11 test channels are Ch1, Ch 6 and Ch 11; Channel 1 was the highest power channel and was selected for the initial SAR evaluation.

SAR test reduction methodology was applied to reduce the total number of required test channels from the SAR test evaluation.

When applicable, SAR test reduction methods may be utilized.

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

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

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

- a) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- b) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is \leq 1.2 W/kg.

The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. An initial test position was established for Both UNII1 and UNII 3 bands.

When the reported SAR of the initial test configuration is $>$ 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until reported SAR is \leq 1.2 W/kg or all required channels are tested.

Note: Since the ANT transmitter occupies the same spectrum as the Bluetooth transmitter and the ANT rated power is less than the Bluetooth transmitter, the ANT transmitter was not considered for SAR evaluation.

Table 8.2 Antenna Distances

As per KDB 447498 D04V01, Appendix B, Sec B.4 SAR -based Exemption where appropriate SAR test exclusion based on antenna test separation distances may be applied.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. For mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula for available time-averaged power or ERP, whichever is greater, of less than or equal to threshold P_{th} (mW) is given at 1.1307(b)3(i)(B) and is repeated as B.2 (method is for separation distances from 0.5 to 40 cm, and at freq from 0.3 to 6 GHz)

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad \text{(B.1)}$$

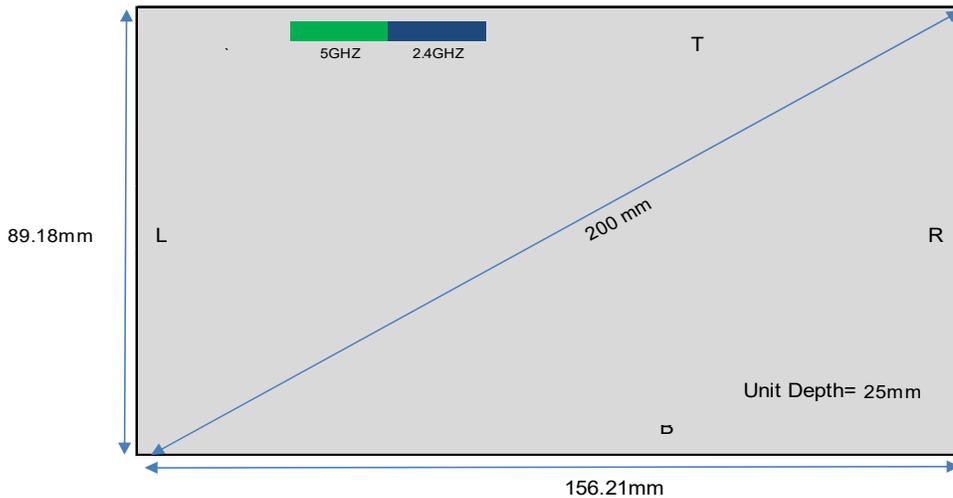
$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad \text{(B.2)}$$

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Topographic View
Front Facing



| Antenna | Top Edge (mm) | Left Edge (mm) | Bottom Edge (mm) | Right Edge (mm) | Front Depth (mm) | Back Depth (mm) |
|----------------|---------------|----------------|------------------|-----------------|------------------|-----------------|
| 2.4GHz/WLAN/BT | 10.90 | 21.86 | 78.30 | 134.00 | 11.78 | 13.72 |
| 5GHz/UNII-1&3 | 10.90 | 21.86 | 78.30 | 134.00 | 12.81 | 12.70 |

Table 8.3 Body SAR test Exclusion Workchart

| X | Head, Face, Body | 1g | SAR Test Exclusion Analysis | | | | | |
|---------------|-------------------------------|-----------------|--|-----------|-----------|-------|-------|-------|
| | Extremity | 10g | Antenna Separation to Phantom Surface (DUT+ 5mm) | | | | | |
| X | FCC | Band | | | | | | |
| | ISED | 2.4GHz | 2.4GHz | 5GHz WLAN | 5GHz WLAN | Other | Other | Other |
| X | EU | BT/ANT | WiFi | U-NII-1 | U-NII-3 | | | |
| | DUT Power | Frequency (MHz) | 2480 | 2462 | 5240 | 5825 | | |
| Power (mW) OR | | 6.76 | 53.70 | 23.99 | 66.07 | | | |
| DUT Position | Power (dBm) | 8.30 | 17.30 | 13.80 | 18.20 | | | |
| | Antenna Gain (dBi) | -0.50 | -0.50 | 3.20 | 3.60 | | | |
| | Total ERP (mW) | 6.03 | 47.86 | 50.12 | 151.36 | | | |
| Back Side | Separation Distance (mm) | 18.72 | 18.72 | 17.70 | 17.70 | | | |
| | Exclusion Threshold (Pth)(mW) | 33.59 | 33.72 | 20.36 | 19.26 | | | |
| | Testing Required | No | Yes | Yes | Yes | | | |

~ Pth(mW) = ERP_{20cm}(mW) = 2040f for 0.3GHz ≤ f < 1.5GHz
 ~ Pth(mW) = ERP_{20cm}(mW) = 3060 for 1.5GHz ≤ f ≤ 6GHz
 ~ Pth(mW) = ERP_{20cm}(mW) * (d / 20cm)^x where x = -log10(60 / ERP_{20cm} √f) for d ≤ 20cm
 ~ Pth(mW) = ERP_{20cm}(mW) for 20cm < d ≤ 40cm
 ~ Total ERP = Power + Gain(dBd)
 ~ Gain(dBd) = Gain(dBi) - 0.5 and 3.2 and 3.6

Table 8.4 Extremity SAR test Exclusion Workchart

| X | Head, Face, Body | 1g | SAR Test Exclusion Analysis | | | | | |
|---------------|-------------------------------|-----------------|------------------------------------|-----------|-----------|-------|-------|-------|
| | Extremity | 10g | Antenna Separation to DUT Surfaces | | | | | |
| X | FCC | Band | | | | | | |
| | ISED | 2.4GHz | 2.4GHz | 5GHz WLAN | 5GHz WLAN | Other | Other | Other |
| X | EU | BT/ANT | WiFi | U-NII-1 | U-NII-3 | | | |
| | DUT Power | Frequency (MHz) | 2450 | 2462 | 5240 | 5825 | | |
| Power (mW) OR | | 6.76 | 53.70 | 23.99 | 66.07 | | | |
| DUT Position | Power (dBm) | 8.30 | 17.30 | 13.80 | 18.20 | | | |
| | Antenna Gain (dBi) | -0.50 | -0.50 | 3.20 | 3.60 | | | |
| | Total ERP (mW) | 6.03 | 47.86 | 50.12 | 151.36 | | | |
| Front Side | Separation Distance (mm) | 11.78 | 11.78 | 12.81 | 12.81 | | | |
| | Exclusion Threshold (Pth)(mW) | 87.53 | 87.27 | 65.22 | 61.23 | | | |
| | Testing Required | No | No | No | Yes | | | |
| Back Side | Separation Distance (mm) | 13.72 | 13.72 | 12.70 | 12.70 | | | |
| | Exclusion Threshold (Pth)(mW) | 116.98 | 116.65 | 64.07 | 60.14 | | | |
| | Testing Required | No | No | No | Yes | | | |
| Top Edge | Separation Distance (mm) | 10.90 | 10.90 | 10.90 | 10.90 | | | |
| | Exclusion Threshold (Pth)(mW) | 75.52 | 75.28 | 46.71 | 43.69 | | | |
| | Testing Required | No | No | Yes | Yes | | | |
| Bottom Edge | Separation Distance (mm) | 78.30 | 78.30 | 78.30 | 78.30 | | | |
| | Exclusion Threshold (Pth)(mW) | 3213.03 | 3209.84 | 2752.21 | 2693.53 | | | |
| | Testing Required | No | No | No | No | | | |
| Left Edge | Separation Distance (mm) | 21.86 | 21.86 | 21.86 | 21.86 | | | |
| | Exclusion Threshold (Pth)(mW) | 283.73 | 283.07 | 196.88 | 187.11 | | | |
| | Testing Required | No | No | No | No | | | |
| Right Edge | Separation Distance (mm) | 134.00 | 134.00 | 134.00 | 134.00 | | | |
| | Exclusion Threshold (Pth)(mW) | 8928.31 | 8924.51 | 8357.13 | 8280.56 | | | |
| | Testing Required | No | No | No | No | | | |

~ Pth(mW) = ERP_{20cm}(mW) = 2040f for 0.3GHz ≤ f < 1.5GHz
 ~ Pth(mW) = ERP_{20cm}(mW) = 3060 for 1.5GHz ≤ f ≤ 6GHz
 ~ Pth(mW) = ERP_{20cm}(mW) * (d / 20cm)^x where x = -log10(60 / ERP_{20cm} √f) for d ≤ 20cm
 ~ Pth(mW) = ERP_{20cm}(mW) for 20cm < d ≤ 40cm
 ~ Total ERP = Power + Gain(dBd)
 ~ Gain(dBd) = Gain(dBi) - 2.15 and 3.2 and 3.6

9.0 ACCESSORIES EVALUATED

Table 9.1 Manufacturer’s Accessory List

There are no manufacturer’s accessories available when used in a portable application.

10.0 SAR MEASUREMENT SUMMARY

Table 10.1: Measured Results – Body 1g – 2.4GHz

| Measured 1g SAR Results - BODY Configuration | | | | | | | | | | | | | | | | | |
|--|---------|----------------------|-----------------------------|------------|----|------|----|---------------------------------|-----------|--------------|---------------------|----------------|------------------|------------------|-----------------------|-----------------|---------------------|
| Date | Plot ID | Test Frequency (MHz) | DUT Configuration | | | | | Accessories | Spacing | | Measured SAR (W/kg) | SAR Drift (dB) | Delta Power (dB) | Crest Factor (n) | Fluid Sensitivity (n) | Duty Factor (%) | reported SAR (W/kg) |
| | | | Pos | Mode | BW | Mod | BR | | DUT (mm) | Antenna (mm) | | | | | | | |
| Area Scan | | | | | | | | | | | | | | | | | |
| 9/11/2024 | B20 | 2412 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 5 | 17.7 | 0.446 | 0.100 | -0.290 | 1.001 | 1.000 | 100.000 | 0.477 |
| 9/12/2024 | B21 | 2437 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 5 | 17.7 | 0.344 | -0.090 | -0.610 | 1.001 | 1.000 | 100.000 | 0.405 |
| 9/12/2024 | B22 | 2462 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 5 | 17.7 | 0.375 | 0.140 | -0.330 | 1.001 | 1.000 | 100.000 | 0.405 |
| 9/12/2024 | B23 | 2441 | Back | BT BR | | GFSK | | ---- | 5 | 17.7 | 0.029 | 0.880 | -0.200 | 1.300 | 1.000 | 100.000 | 0.039 |
| Zoom Scan | | | | | | | | | | | | | | | | | |
| 9/11/2024 | B20Z | 2412 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 5 | 17.7 | 0.361 | 0.130 | -0.290 | 1.001 | 1.000 | 100.000 | 0.386 |
| 9/12/2024 | B23Z | 2441 | Back | BT BR | | GFSK | | ---- | 5 | 17.7 | 0.026 | 0.220 | -0.200 | 1.300 | 1.000 | 100.000 | 0.035 |
| Applicable SAR Limit | | | | | | | | | Use Group | | | | | | Limit | | |
| FCC CFR 2.1093 | | | Health Canada Safety Code 6 | | | | | General Population/User Unaware | | | | | | 1.6 W/kg | | | |

Table 10.2: Measured Results – Body 1g – U-NII

| Measured 1g SAR Results - BODY Configuration | | | | | | | | | | | | | | | | | |
|--|---------|----------------------|-----------------------------|-------------|----|------|----|---------------------------------|-----------|--------------|---------------------|----------------|------------------|------------------|-----------------------|-----------------|---------------------|
| Date | Plot ID | Test Frequency (MHz) | DUT Configuration | | | | | Accessories | Spacing | | Measured SAR (W/kg) | SAR Drift (dB) | Delta Power (dB) | Crest Factor (n) | Fluid Sensitivity (n) | Duty Factor (%) | reported SAR (W/kg) |
| | | | Pos | Mode | BW | Mod | BR | | DUT (mm) | Antenna (mm) | | | | | | | |
| Area Scan | | | | | | | | | | | | | | | | | |
| 9/6/2024 | B1 | 5745 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.625 | 0.990 | -0.300 | 1.031 | 1.000 | 100.000 | 0.690 |
| 9/7/2024 | B4 | 5805 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.699 | 0.160 | -0.350 | 1.031 | 1.000 | 100.000 | 0.781 |
| 9/7/2024 | B4 | 5805 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.685 | 0.640 | -0.350 | 1.031 | 1.000 | 100.000 | 0.765 |
| 9/7/2024 | B5 | 5765 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.737 | 0.210 | -0.600 | 1.031 | 1.000 | 100.000 | 0.872 |
| 9/10/2024 | B11 | 5180 | Back | 802.11a | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.685 | 0.060 | -0.200 | 1.031 | 1.000 | 100.000 | 0.739 |
| 9/10/2024 | B12 | 5200 | Back | 802.11a | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.390 | 2.880 | -0.210 | 1.031 | 1.000 | 100.000 | 0.422 |
| 9/10/2024 | B13 | 5240 | Back | 802.11a | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.387 | 2.770 | -0.510 | 1.031 | 1.000 | 100.000 | 0.449 |
| Zoom Scan | | | | | | | | | | | | | | | | | |
| 9/7/2024 | B5Z | 5765 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.725 | -0.020 | -0.600 | 1.031 | 1.000 | 100.000 | 0.862 |
| 9/10/2024 | B11Z | 5180 | Back | 802.11a | 20 | OFDM | 6 | ---- | 5 | 17.7 | 0.620 | 0.260 | -0.200 | 1.031 | 1.000 | 100.000 | 0.669 |
| Applicable SAR Limit | | | | | | | | | Use Group | | | | | | Limit | | |
| FCC CFR 2.1093 | | | Health Canada Safety Code 6 | | | | | General Population/User Unaware | | | | | | 1.6 W/kg | | | |

Table 10.3: Measured Results – Extremity 10g – 2.4GHz

| Measured 10g SAR Results - EXTREMITY Configuration | | | | | | | | | | | | | | | | | |
|--|---------|----------------------|-----------------------------|------------|----|------|----|-------------|---------------------------------|--------------|---------------------|----------------|------------------|------------------|-----------------------|-----------------|---------------------|
| Date | Plot ID | Test Frequency (MHz) | DUT Configuration | | | | | Accessories | Spacing | | Measured SAR (W/kg) | SAR Drift (dB) | Delta Power (dB) | Crest Factor (n) | Fluid Sensitivity (n) | Duty Factor (%) | reported SAR (W/kg) |
| | | | Pos | Mode | BW | Mod | BR | | DUT (mm) | Antenna (mm) | | | | | | | |
| Area Scan | | | | | | | | | | | | | | | | | |
| 9/11/2024 | E20 | 2412 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 12.7 | 0.342 | 0.010 | -0.290 | 1.001 | 1.000 | 100.000 | 0.366 |
| 9/12/2024 | E21 | 2412 | Front | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 12.81 | 0.054 | 0.370 | -0.290 | 1.001 | 1.000 | 100.000 | 0.058 |
| 9/12/2024 | E22 | 2412 | Top Edge | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 10.9 | 0.312 | 0.260 | -0.290 | 1.001 | 1.000 | 100.000 | 0.334 |
| 9/12/2024 | E23 | 2437 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 12.7 | 0.343 | -0.010 | -0.610 | 1.001 | 1.000 | 100.000 | 0.396 |
| 9/12/2024 | E24 | 2462 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 12.7 | 0.390 | 0.090 | -0.330 | 1.001 | 1.000 | 100.000 | 0.421 |
| 9/12/2024 | E25 | 2441 | Back | BT BR | | GFSK | | ---- | 0 | 10.9 | 0.028 | -0.040 | -0.200 | 1.300 | 1.000 | 100.000 | 0.038 |
| Zoom Scan | | | | | | | | | | | | | | | | | |
| 9/12/2024 | E24Z | 2462 | Back | 802.11b-NA | 20 | DSSS | 11 | ---- | 0 | 12.7 | 0.356 | 0.050 | -0.330 | 1.001 | 1.000 | 100.000 | 0.384 |
| 9/12/2024 | E25Z | 2441 | Back | BT BR | | GFSK | | ---- | 0 | 10.9 | 0.022 | 0.020 | -0.200 | 1.300 | 1.000 | 100.000 | 0.030 |
| Applicable SAR Limit | | | | | | | | | Use Group | | | | Limit | | | | |
| FCC CFR 2.1093 | | | Health Canada Safety Code 6 | | | | | | General Population/User Unaware | | | | 4 W/kg | | | | |

Table 10.4: Measured Results – Extremity 10g – U-NII

| Measured 10g SAR Results - EXTREMITY Configuration | | | | | | | | | | | | | | | | | |
|--|---------|----------------------|-----------------------------|-------------|----|------|----|-------------|---------------------------------|--------------|---------------------|----------------|------------------|------------------|-----------------------|-----------------|---------------------|
| Date | Plot ID | Test Frequency (MHz) | DUT Configuration | | | | | Accessories | Spacing | | Measured SAR (W/kg) | SAR Drift (dB) | Delta Power (dB) | Crest Factor (n) | Fluid Sensitivity (n) | Duty Factor (%) | reported SAR (W/kg) |
| | | | Pos | Mode | BW | Mod | BR | | DUT (mm) | Antenna (mm) | | | | | | | |
| Area Scan | | | | | | | | | | | | | | | | | |
| 9/6/2024 | E1 | 5745 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 12.7 | 0.395 | -0.070 | -0.300 | 1.031 | 1.000 | 100.000 | 0.443 |
| 9/7/2024 | E2R | 5745 | Top Edge | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 10.9 | 0.304 | 1.130 | -0.300 | 1.031 | 1.000 | 100.000 | 0.336 |
| 9/7/2024 | E3R | 5745 | Front | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 12.81 | 0.035 | -0.350 | -0.300 | 1.031 | 1.000 | 100.000 | 0.041 |
| 9/7/2024 | E6 | 5805 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 12.7 | 0.426 | 0.050 | -0.350 | 1.031 | 1.000 | 100.000 | 0.476 |
| 9/7/2024 | E7 | 5765 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 12.7 | 0.448 | -0.010 | -0.600 | 1.031 | 1.000 | 100.000 | 0.532 |
| 9/10/2024 | E11 | 5180 | Top Edge | 802.11a | 20 | OFDM | 6 | ---- | 0 | 10.9 | 0.149 | 1.170 | -0.200 | 1.031 | 1.000 | 100.000 | 0.161 |
| 9/10/2024 | E12 | 5200 | Top Edge | 802.11a | 20 | OFDM | 6 | ---- | 0 | 10.9 | 0.194 | 2.010 | -0.210 | 1.031 | 1.000 | 100.000 | 0.210 |
| 9/10/2024 | E13 | 5240 | Top Edge | 802.11a | 20 | OFDM | 6 | ---- | 0 | 10.9 | 0.198 | 2.520 | -0.510 | 1.031 | 1.000 | 100.000 | 0.230 |
| Zoom Scan | | | | | | | | | | | | | | | | | |
| 9/7/2024 | E7Z | 5765 | Back | 802.11a -NA | 20 | OFDM | 6 | ---- | 0 | 12.7 | 0.403 | 0.020 | -0.600 | 1.031 | 1.000 | 100.000 | 0.477 |
| 9/10/2024 | E13Z | 5240 | Top Edge | 802.11a | 20 | OFDM | 6 | ---- | 0 | 10.9 | 0.170 | 1.130 | -0.510 | 1.031 | 1.000 | 100.000 | 0.197 |
| Applicable SAR Limit | | | | | | | | | Use Group | | | | Limit | | | | |
| FCC CFR 2.1093 | | | Health Canada Safety Code 6 | | | | | | General Population/User Unaware | | | | 4 W/kg | | | | |

11.0 SCALING OF MAXIMUM MEASURE SAR

Table 11.1 SAR Scaling 1g – Body 2.4GHz WiFi, BT and UNII

| Scaling of Maximum Measured SAR (1g) | | | | | | |
|---|-----------------|-----------|------------|------------|------------|--------|
| Measured Parameters | Configuration | | | | | |
| | Body | Body | Body | Body | | |
| Plot ID | B5Z | B11Z | B20Z | B23Z | | |
| Maximum Measured SAR _M | 0.725 | 0.620 | 0.361 | 0.026 | | (W/kg) |
| Frequency | 5765 | 5180 | 2412 | 2441 | | (MHz) |
| Drift Power Drift | -0.020 | 0.260 (7) | 0.130 (13) | 0.220 (22) | | (dB) |
| Conducted Power | 17.900 | 13.800 | 17.210 | 8.300 | | (dBm) |
| DC Transmitter Duty Cycle | | | | | | (%) |
| DF Use Duty Factor | 100.0 (2) | 100.0 (8) | 100.0 (14) | 100.0 (23) | | (%) |
| Fluid Deviation from Target | | | | | | |
| Δe Permittivity | -7.13% | -4.92% | -5.56% | -5.87% | | |
| Δσ Conductivity | 8.21% | 4.10% | 3.97% | 4.52% | | |
| Fluid Sensitivity Calculation (1g) IEC/IEEE 62209-1528 7.8.2 | | | | | | |
| Delta SAR = Ce * Δe + Cσ * Δσ (8) | | | | | | |
| Ce = (-0.0007854*f ³) + (0.009402*f ²) - (0.02742*f) - 0.2026 (9) | | | | | | |
| Cσ = (0.009804*f ³) - (0.08661*f ²) + (0.02981*f) + 0.7829 (10) | | | | | | |
| f | Frequency (GHz) | 5.765 | 5.18 | 2.412 | 2.441 | |
| | Ce | -0.199 | -0.202 | -0.225 | -0.225 | |
| | Cσ | -0.045 | -0.024 | 0.489 | 0.482 | |
| | Ce * Δe | 0.014 | 0.010 | 0.013 | 0.013 | |
| | Cσ * Δσ | -0.004 | -0.001 | 0.019 | 0.022 | |
| | ΔSAR | 0.010 (1) | 0.009 (6) | 0.032 (12) | 0.035 (21) | (%) |
| Manufacturer's Tuneup Tolerance | | | | | | |
| Measured Conducted Power | 17.900 | 13.800 | 17.210 | 8.300 | | (dBm) |
| Rated Conducted Power | 18.500 | 14.000 | 17.500 | 8.500 | | (dBm) |
| ΔP | -0.600 | -0.200 | -0.290 | -0.200 | | (dB) |
| Transmitter Duty Cycle [Crest Factor] | | | | | | |
| Transmitter Duty Cycle (DC) | 97.0 | 97.0 | 99.9 | 76.9 | | (%) |
| CF (1/DC) | 1.03 | 1.03 | 1.00 | 1.30 | | |
| SAR Adjustment for Fluid Sensitivity | | | | | | |
| SAR ₁ = SAR _M X [ΔSAR] | 0.725 (1) | 0.620 (6) | 0.361 (12) | 0.026 (21) | | (W/kg) |
| SAR Adjustment for Tuneup Tolerance | | | | | | |
| SAR ₂ = SAR ₁ + [ΔP] | 0.832 | 0.649 | 0.386 | 0.027 | | (W/kg) |
| SAR Adjustment for Drift | | | | | | |
| SAR ₃ = SAR ₂ + [Drift] | 0.836 | 0.649 (7) | 0.386 (13) | 0.027 (22) | | (W/kg) |
| SAR Adjustment for Transmitter Duty Cycle [Crest Factor] | | | | | | |
| SAR ₄ = SAR ₃ x [CF] | 0.862 | 0.669 | 0.386 | 0.035 | | (W/kg) |
| SAR Adjustment for Use Duty Factor | | | | | | |
| SAR ₅ = SAR ₄ x [DF] | 0.862 (2) | 0.669 (8) | 0.386 (14) | 0.035 (23) | | (W/kg) |
| reported 1g SAR | | | | | | |
| reported SAR | 0.86 | 0.67 | 0.39 | 0.04 | | (W/kg) |

Table 11.2 SAR Scaling 10g – 2.4GHz WiFi, BT and UNII

| Scaling of Maximum Measured SAR (10g) | | | | | | |
|--|-----------------|------------|------------|------------|------------|--------|
| Measured Parameters | Configuration | | | | | |
| | Extremity | Extremity | Extremity | Extremity | | |
| Plot ID | E7Z | E13Z | E24Z | E25Z | | |
| Maximum Measured SAR _M | 0.403 | 0.170 | 0.356 | 0.022 | | (W/kg) |
| Frequency | 5765 | 5240 | 2462 | 2441 | | (MHz) |
| Drift Power Drift | 0.020 (4) | 1.130 (10) | 0.050 (16) | 0.020 (19) | | (dB) |
| Conducted Power | 17.900 | 13.490 | 17.170 | 8.300 | | (dBm) |
| DC Transmitter Duty Cycle | | | | | | (%) |
| DF Use Duty Factor | 100.0 (5) | 100.0 (11) | 100.0 (17) | 100.0 (20) | | (%) |
| Fluid Deviation from Target | | | | | | |
| Δe Permittivity | -7.13% | -2.64% | -6.08% | -5.87% | | |
| Δσ Conductivity | 8.21% | 2.13% | 4.42% | 4.52% | | |
| Fluid Sensitivity Calculation (1g) IEC/IEEE 62209-1528 7.8.2 | | | | | | |
| Delta SAR = Ce * Δe + Cσ * Δσ (8) | | | | | | |
| Ce = (0.003456*f ³) - (0.03531*f ²) + (0.07675*f) - 0.186 (11) | | | | | | |
| Cσ = (0.004479*f ³) - (0.01586*f ²) - (0.1972*f) + 0.7717 (12) | | | | | | |
| f | Frequency (GHz) | 5.765 | 5.24 | 2.462 | 2.441 | |
| | Ce | -0.255 | -0.256 | -0.159 | -0.159 | |
| | Cσ | -0.034 | -0.053 | 0.257 | 0.261 | |
| | Ce * Δe | 0.018 | 0.007 | 0.010 | 0.009 | |
| | Cσ * Δσ | -0.003 | -0.001 | 0.011 | 0.012 | |
| | ΔSAR | 0.015 (3) | 0.006 (9) | 0.021 (15) | 0.021 (18) | (%) |
| Manufacturer's Tuneup Tolerance | | | | | | |
| Measured Conducted Power | 17.900 | 13.490 | 17.170 | 8.300 | | (dBm) |
| Rated Conducted Power | 18.500 | 14.000 | 17.500 | 8.500 | | (dBm) |
| ΔP | -0.600 | -0.510 | -0.330 | -0.200 | | (dB) |
| Transmitter Duty Cycle [Crest Factor] | | | | | | |
| Transmitter Duty Cycle (DC) | 97.0 | 97.0 | 99.9 | 76.9 | | (%) |
| CF (1/DC) | 1.03 | 1.03 | 1.00 | 1.30 | | |
| SAR Adjustment for Fluid Sensitivity | | | | | | |
| SAR ₁ = SAR _M X [ΔSAR] | 0.403 (3) | 0.170 (9) | 0.356 (15) | 0.022 (18) | | (W/kg) |
| SAR Adjustment for Tuneup Tolerance | | | | | | |
| SAR ₂ = SAR ₁ + [ΔP] | 0.463 | 0.191 | 0.384 | 0.023 | | (W/kg) |
| SAR Adjustment for Drift | | | | | | |
| SAR ₃ = SAR ₂ + [Drift] | 0.463 (4) | 0.191 (10) | 0.384 (16) | 0.023 (19) | | (W/kg) |
| SAR Adjustment for Transmitter Duty Cycle [Crest Factor] | | | | | | |
| SAR ₄ = SAR ₃ x [CF] | 0.477 | 0.197 | 0.384 | 0.030 | | (W/kg) |
| SAR Adjustment for Use Duty Factor | | | | | | |
| SAR ₅ = SAR ₄ x [DF] | 0.477 (5) | 0.197 (11) | 0.384 (17) | 0.030 (20) | | (W/kg) |
| reported 1g SAR | | | | | | |
| reported SAR | 0.48 | 0.20 | 0.38 | 0.03 | | (W/kg) |

NOTES to Table

Scaling of the Maximum Measured SAR is based on the highest Face, Body, Extremity and/or Head SAR measured of ALL test channels, configurations and accessories used during THIS evaluation. The Measured Fluid Deviation parameters, Drift, Conducted Power, Duty Cycle [Crest] and Use Duty Factor apply only to those test frequencies and configurations producing the highest SAR. The *reported* SAR is the accumulation of all SAR Adjustments from the applicable steps above. The Plot ID is for identification of the SAR Measurement Plot(s) in the Annexes of this report.

NOTE: The above adjustments have been applied to ALL Measured SAR values. In some cases, the highest Measure SAR may not have produced the highest *reported* SAR after all adjustments have been made.

NOTE: Some of the above adjustments may not be applicable to each configuration. They are identified by grayed fields.

SAR₁

Per IEC/IEEE 62209-1528, FCC KDB 865664, ISED RSS-102 and ISED Notice 2012-DRS0529, SAR adjustment is applied when the calculated Δ SAR, resulting from the equations indicated, is negative (-).

Δ SAR is given as a percentage (%). The SAR is MULTIPLIED by this scaling factor only when the scaling factor is negative (-).

SAR₂

Per IEC/IEEE 62209-1528, FCC KDB 865664 and ISED RSS-102, adjustment is required only when the difference (Δ P) between the Measured Conducted Power and the Manufacturer's Rated Conducted Power is (-) Negative.

Δ P is given in dB. The absolute value of Δ P is ADDED (logarithmically) to the SAR when Δ P is negative (-).

SAR₃

Per IEC/IEEE 62209-1528, FCC KDB 865664 and ISED RSS-102, adjustment is required only when Measured Drift is negative (-). The absolute value of Measured Drift is ADDED (logarithmically) to the SAR.

Drift is given in dB. The absolute value of Drift is ADDED (logarithmically) to the SAR when Drift is negative (-).

SAR₄

Per IEC/IEEE 62209-1528, FCC KDB 865664 and ISED RSS-102, when the transmit Duty Cycle (DC) is less than 100%, the *reported* SAR must be scaled to 100% by the Crest Factor (CF). $CF = 1/DC$ where DC is in decimal.

CF is given as a decimal. The SAR is MULTIPLIED by this scaling factor only when the scaling factor is greater than 1.

SAR₅

Use Duty Factor applies to Push-To-Talk (PTT) transceivers or other devices whereby the user has some control of the transmitter on-off period. Per IEC/IEEE 62209-1528, FCC KDB 447498, FCC KDB 643646 and ISED RSS-102, a Duty Factor (DF) of 50% may be applied. In cases where Voice Activated transmit is employed, a DF of 75% may be applied.

DF is given as a percentage (%). The SAR is MULTIPLIED by this scaling factor only when the scaling factor is less than 100%.

reported SAR

The *reported* SAR is the Maximum SAR after all applicable adjustments have been made and is indicated on the cover page of this report.

- Note (1): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (2): Power Drift is Positive, Drift Adjustment not Required.
- Note (3): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (4): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (5): Power Drift is Positive, Drift Adjustment not Required.
- Note (6): Crest Factor = 1 (100% Duty Cycle), Crest Factor Adjustment not Required.
- Note (7): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (8): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (9): Power Drift is Positive, Drift Adjustment not Required.
- Note (10): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (11): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (12): Power Drift is Positive, Drift Adjustment not Required.
- Note (13): Crest Factor = 1 (100% Duty Cycle), Crest Factor Adjustment not Required.
- Note (14): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (15): Power Drift is Positive, Drift Adjustment not Required.
- Note (16): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (17): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (18): Power Drift is Positive, Drift Adjustment not Required.
- Note (19): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (20): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (21): Power Drift is Positive, Drift Adjustment not Required.
- Note (22): Use Duty Factor is 100%. No Duty Factor Correction applied.
- Note (23): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529
- Note (24): Power Drift is Positive, Drift Adjustment not Required.
- Note (25): Use Duty Factor is 100%. No Duty Factor Correction applied.

Table 11.3 Simultaneous Transmission SAR Analysis

Only the Bluetooth and U-NII transmitters are capable of simultaneous transmission. The following is the analysis of the simultaneous transmission configurations.

From Table 11.1 above, the reported Standalone SAR are as follows:
BODY SAR (1g)

Bluetooth (SAR_{BT}): 0.04W/kg
WiFi (SAR_{WiFi}): 0.86W/kg (U-NII)

Simultaneous SAR (SAR_{TOT}) = $SAR_{BT} + SAR_{WiFi} = 0.04 + 0.86 = \underline{\underline{0.9 W/kg}}$

EXTREMITY SAR (10g)

Bluetooth (SAR_{BT}): 0.03W/kg
WiFi (SAR_{WiFi}): 0.48W/kg (U-NII)

Simultaneous SAR (SAR_{TOT}) = $SAR_{BT} + SAR_{WiFi} = 0.03 + 0.48 = \underline{\underline{0.51W/kg}}$

The BT SAR measurements were not required as per antenna distances and power levels and noted in tables 8.3 and 8.4. SAR measurements were taken to facilitate a simultaneous SAR value for reporting purposes. BT SAR was very low and to facilitate a most accurate and conservative assessment the worse case position of back position, was used in both Body and Extremity simultaneous SAR analysis.

12.0 SAR EXPOSURE LIMITS

Table 12.1 Exposure Limits

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

13.0 DETAILS OF SAR EVALUATION

13.1 Day Log

| DAY LOG | | | | | Fluid Dielectric | SPC | Test | Task |
|-------------|-------------------|-----------------|-----------------------|---------------------------|------------------|-----|------|--------------------------------|
| Date | Ambient Temp (°C) | Fluid Temp (°C) | Relative Humidity (%) | Barometric Pressure (kPa) | | | | |
| 5 Sep 2024 | 26.0 | 24.0 | 39% | 101.9 | X | X | X | 5750H Fluids, SPC, SAR Testing |
| 6 Sep 2024 | 24.6 | 24.0 | 39% | 102.0 | | | X | 5750H SAR Testing |
| 7 Sep 2024 | 24.4 | 24.2 | 38% | 101.7 | | | X | 5750H SAR Testing |
| 10 Sep 2024 | 21.0 | 23.8 | 39% | 100.7 | X | X | X | 5250H Fluids, SPC, SAR Testing |
| 11 Sep 2024 | 25.0 | 24.2 | 34% | 100.6 | X | X | X | 2450H Fluids, SPC, SAR Testing |
| 12 Sep 2024 | 24.3 | 23.8 | 36% | 101.0 | | | X | 2450H SAR Testing |

13.2 DUT Setup and Configuration

| DUT Setup and Configuration | |
|-----------------------------|---|
| 1 | The DUT was evaluated for Extremity at a 0mm distance, for Body at a 5mm distance, from a flat phantom filled with head tissue-equivalent medium. The DUT was evaluated for SAR in accordance with the procedures as described in FCC KDB 447498, 248227, 865664 and IEC/IEEE. Initial testing was undertaken in the highest power UNII band for extremity configuration on all sides as indicated in sec 8, antenna separation distances. Back side was determined as the default test position for highest SAR. |
| 2 | <p>2.4GHz 802.11g/n OFDM SAR Test Exclusion</p> <p>As Per KDB 248227 D01v02r02 - 5.2.2,</p> <p>b) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2W/kg$</p> <p>When applying this formula to 10-g, the threshold should be multiplied by 2.5, i.e. when 10-g extremity SAR is considered the threshold adjusted SAR is $\leq 3.0W/kg$</p> <p>Maximum 802.11g/n OFDM specified power(POFDM)= 17.5dBm (56.23mW)</p> <p>Maximum 802.11b DSSS specified power (PDSSS)=17.5 dBm (56.23mW)</p> <p>Ratio OFDM/DSSS power = 100%</p> <p>Highest reported SAR (SARMAX)_{EXTREMITY}=0.0.38W/kg and Highest reported SAR (SARMAX)_{BODY}=0.39W/kg</p> <p>POFDM/PDSSS X SARMAX_{EXTREMITY} = 0.38 W/kg $\leq 3.0 W/kg$ (Extremity) SAR test exclusion applies.</p> <p>POFDM/PDSSS X SARMAX_{BODY} = 0.39 W/kg $\leq 1.5 W/kg$ (Body) SAR test exclusion applies.</p> <p>UNII rated power is the same or lower in higher order modulations as a result the UNII 802.11A OFDM SAR value would not be higher, in higher order modulations and further testing is not required in UNII.</p> |
| 3 | The Device was capable of transmitting at various modulations, data rates and duty cycles. The Conducted Power was measured at the lowest modulation and largest bandwidth and with the Duty cycle noted. The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer, and adjusted crest factor for 100% duty cycle. |
| 4 | Bluetooth was evaluated for SAR in BT BR (GFSK) mode with a transmit duty cycle of noted and with a crest factor adjustment to 100% duty cycle if required, in the worst-case configuration from the WiFi test evaluation. The Duty cycle could not be altered in test mode or by the user. The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer. |
| 5 | Each SAR evaluation was performed with the device battery fully charged. |

13.3 DUT Positioning

| DUT Positioning | |
|--------------------------------|---|
| Positioning | The DUT Positioner was securely fastened to the Phantom Platform. Registration marks were placed on the DUT and the Positioner to ensure consistent positioning of the DUT for each test evaluation. |
| FACE Configuration | Head SAR - (held- to-face). Devices that are designed to be near extremity and may operate with in a mode for voice communication, with the device positioned next to the mouth. When next-to-mouth SAR evaluation is required, the device is positioned at 10mm from a flat phantom filled with head tissue-equivalent medium. |
| BODY Configuration | Devices that are designed to be worn on the Body or on person are positioned on the device holder with a body worn accessory in place against the surface of the phantom, or with-out an accessory at 5mm from the bottom of the phantom in the Body configuration. |
| HEAD Configuration | This device is not intended to be held to the ear and was not tested in the HEAD configuration. |
| Extremity Configuration | Devices that are designed to be near extremity, or hand-held are positioned with the back side directly against the phantom surface. |

13.4 General Procedures and Report

| General Procedures and Reporting | |
|----------------------------------|---|
| General Procedures | <p>The fluid dielectric parameters of the Active Tissue Simulating Liquid (TSL) were measured as described in this Section, recorded and entered into the DASY Measurement Server. Active meaning the TSL used during the SAR evaluation of the DUT. The temperature of the Active TSL was measured and recorded prior to performing a System Performance Check (SPC). An SPC was performed with the Active TSL prior to the start of the test series. The temperature of the Active TSL was measured throughout the day and the Active TSL temperature was maintained to $\pm 0.5^{\circ}\text{C}$. The Active TSL temperature was maintained to within $\pm 2.0^{\circ}\text{C}$ throughout the test series. The liquid parameters shall be measured within 24 hours before the start of a test series and if it takes longer than 48 hours, the liquid parameters shall also be measured at the end of the test series.</p> <p>An Area Scan exceeding the length and width of the DUT projection was performed and the locations of all maximas within 2dB of the Peak SAR recorded. A Zoom Scan centered over the Peak SAR location(s) was performed and the 1g and 10g SAR values recorded. The resolutions of the Area Scan and Zoom Scan are described in the Scan Resolution table(s) in this Section. A Power Reference Measurement was taken at the phantom reference point immediately prior to the Area Scan. A Power Drift measurement was taken at the phantom reference point immediately following the Zoom Scan to determine the power drift. A Z-Scan from the <u>Maximum Distance to Phantom Surface</u> to the fluid surface was performed following the power drift measurement.</p> |
| Reporting | <p>The 1g SAR, 10g SAR and power drift measurements are recorded in the SAR Measurement Summary tables in the SAR Measurement Summary Section of this report. The SAR values shown in the SAR column are the SAR values reported by the SAR Measurement Server with the DUT operating at maximum transmit duty cycle. These tables also include other information such as transmit channel and frequency, modulation, accessories tested and DUT-phantom separation distance.</p> <p>In the Scaling of Maximum Measured SAR Section of this report, the highest measured SAR in the BODY configuration, within the entire scope of this assessment, are, when applicable, scaled for Fluid Sensitivity, Manufacturer's Tune-Up Tolerance, Simultaneous Transmission and Drift. With the exception of Duty Cycle correction/compensation, SAR values are <u>ONLY</u> scaled up, not down. The final results of this scaling is the <u>reported SAR</u> which appears on the Cover Page of this report.</p> |

13.5 Fluid Dielectric and Systems Performance Check

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

13.6 Scan Resolution 100MHz to 2GHz

| Scan Resolution 100MHz to 2GHz | |
|--|------------------------|
| Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center) | $4 \pm 1 \text{ mm}$ |
| Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom) | $5^\circ \pm 1^\circ$ |
| Area Scan Spatial Resolution $\Delta X, \Delta Y$ | 15 mm |
| Zoom Scan Spatial Resolution $\Delta X, \Delta Y$ | 7.5 mm |
| Zoom Scan Spatial Resolution ΔZ (Uniform Grid) | 5 mm |
| Zoom Scan Volume X, Y, Z | 30 mm |
| Fluid Depth | $150 \pm 5 \text{ mm}$ |
| An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima. | |
| A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR | |

13.7 Scan Resolution 2GHz to 3GHz

| Scan Resolution 2GHz to 3GHz | |
|--|------------|
| Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center) | 4 ± 1 mm |
| Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom) | 5° ± 1° |
| Area Scan Spatial Resolution ΔX, ΔY | 12 mm |
| Zoom Scan Spatial Resolution ΔX, ΔY | 5 mm |
| Zoom Scan Spatial Resolution ΔZ (Uniform Grid) | 5 mm |
| Zoom Scan Volume X, Y, Z | 30 mm |
| Fluid Depth | 150 ± 5 mm |
| An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima. | |
| A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR | |

13.8 Scan Resolution 5GHz to 6GHz

| Scan Resolution 5GHz to 6GHz | |
|--|------------|
| Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center) | 4 ± 1 mm |
| Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom) | 5° ± 1° |
| Area Scan Spatial Resolution ΔX, ΔY | 10 mm |
| Zoom Scan Spatial Resolution ΔX, ΔY | 4 mm |
| Zoom Scan Spatial Resolution ΔZ (Uniform Grid) | 2 mm |
| Zoom Scan Volume X, Y, Z | 22 mm |
| Fluid Depth | 100 ± 5 mm |
| An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima. | |
| A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR | |

14.0 MEASUREMENT UNCERTAINTY

Table 14.1 Measurement Variability

Per FCC KDB Publication 865664, SAR measurement variability is not required to be assessed for each frequency band where all measured SAR values are <0.8 W/kg for 1g and < 2.0 W/kg for 10g.

Table 14.2 Measurement Uncertainty

Per FCC KDB 865664 when the highest measured SAR is <1.5 W/kg for 1 g and < 3.75 W/kg for 10g all frequency bands, the extensive SAR measurement uncertainty analysis tables described in IEEE std 1528-2013 are not required.

15.0 FLUID DIELECTRIC PARAMETERS

Table 15.1 Fluid Dielectric Parameters 2450MHz HEAD TSL

| 32 FLUID DIELECTRIC PARAMETERS | | | | | | | | Fluid Sensitivity Calculation IEC/IEEE 62209-1528 7.8.2 | | | |
|--------------------------------|-------------|-----------------|----------|-------------------|---------------------------|---------------------------|-------|--|-------------|------------------------------|-------|
| Date: | 11-Sep-2024 | Fluid Temp: | 24.2 | Frequency: | 2450MHz | Tissue: | Head | ΔSAR 1g | ΔSAR 10g | SAR Correction Factor (1) | |
| Freq (MHz) | Test ε | Test σ (S/m) | Target ε | Target σ (S/m) | Deviation Permittivity | Deviation Conductivity | 1g | | | 10g | |
| 2410.0000 | | 37.0800 | 1.8300 | 39.2700 | 1.76 | -5.58% | 3.98% | 0.032 | 0.019 | 1.000 | 1.000 |
| 2412.0000 | * | 37.0820 | 1.8320 | 39.2660 | 1.76 | -5.56% | 3.97% | 0.032 | 0.019 | 1.000 | 1.000 |
| 2420.0000 | | 37.0900 | 1.8400 | 39.2500 | 1.77 | -5.50% | 3.95% | 0.032 | 0.019 | 1.000 | 1.000 |
| 2430.0000 | | 36.9900 | 1.8400 | 39.2400 | 1.78 | -5.73% | 3.37% | 0.029 | 0.018 | 1.000 | 1.000 |
| 2437.0000 | * | 36.9480 | 1.8610 | 39.2260 | 1.79 | -5.81% | 4.14% | 0.033 | 0.020 | 1.000 | 1.000 |
| 2440.0000 | | 36.9300 | 1.8700 | 39.2200 | 1.79 | -5.84% | 4.47% | 0.035 | 0.021 | 1.000 | 1.000 |
| 2441.0000 | * | 36.9140 | 1.8720 | 39.2180 | 1.79 | -5.87% | 4.52% | 0.035 | 0.021 | 1.000 | 1.000 |
| 2450.0000 | | 36.7700 | 1.8900 | 39.2000 | 1.80 | -6.20% | 5.00% | 0.038 | 0.023 | 1.000 | 1.000 |
| 2460.0000 | | 36.7700 | 1.8900 | 39.1900 | 1.81 | -6.18% | 4.42% | 0.035 | 0.021 | 1.000 | 1.000 |
| 2462.0000 | * | 36.8040 | 1.8920 | 39.1860 | 1.81 | -6.08% | 4.42% | 0.035 | 0.021 | 1.000 | 1.000 |
| 2470.0000 | | 36.9400 | 1.9000 | 39.1700 | 1.82 | -5.69% | 4.40% | 0.034 | 0.020 | 1.000 | 1.000 |

*Channel Frequency Tested

Table 15.2 Fluid Dielectric Parameters 5250MHz HEAD TSL

| 28 FLUID DIELECTRIC PARAMETERS | | | | | | | | Fluid Sensitivity Calculation IEC/IEEE 62209-1528 7.8.2 | | | |
|--------------------------------|-------------|-----------------|----------|-------------------|---------------------------|---------------------------|-------|--|-------------|------------------------------|-------|
| Date: | 10-Sep-2024 | Fluid Temp: | 23.8 | Frequency: | 5250MHz | Tissue: | Head | ΔSAR 1g | ΔSAR 10g | SAR Correction Factor (1) | |
| Freq (MHz) | Test ε | Test σ (S/m) | Target ε | Target σ (S/m) | Deviation Permittivity | Deviation Conductivity | 1g | | | 10g | |
| 5170.0000 | | 34.9000 | 4.8800 | 36.0200 | 4.62 | -3.11% | 5.63% | 0.005 | 0.005 | 1.000 | 1.000 |
| 5180.0000 | * | 34.2400 | 4.8200 | 36.0100 | 4.63 | -4.92% | 4.10% | 0.009 | 0.010 | 1.000 | 1.000 |
| 5190.0000 | | 33.7300 | 4.8500 | 36.0000 | 4.64 | -6.31% | 4.53% | 0.012 | 0.014 | 1.000 | 1.000 |
| 5200.0000 | * | 33.5800 | 4.9400 | 35.9900 | 4.65 | -6.70% | 6.24% | 0.012 | 0.014 | 1.000 | 1.000 |
| 5210.0000 | | 33.7600 | 4.9900 | 35.9700 | 4.67 | -6.14% | 6.85% | 0.011 | 0.012 | 1.000 | 1.000 |
| 5230.0000 | | 34.7500 | 4.9800 | 35.9500 | 4.69 | -3.34% | 6.18% | 0.005 | 0.005 | 1.000 | 1.000 |
| 5240.0000 | * | 34.9900 | 4.8000 | 35.9400 | 4.70 | -2.64% | 2.13% | 0.005 | 0.006 | 1.000 | 1.000 |
| 5250.0000 | | 34.2600 | 5.1200 | 35.9300 | 4.71 | -4.65% | 8.70% | 0.007 | 0.007 | 1.000 | 1.000 |

Table 15.3 Fluid Dielectric Parameters 5750MHz HEAD TSL

| 34 FLUID DIELECTRIC PARAMETERS | | | | | | | | Fluid Sensitivity Calculation IEC/IEEE 62209-1528 7.8.2 | | | |
|---------------------------------------|------------|-----------------|----------|-------------------|---------------------------|---------------------------|-------|--|-------------|------------------------------|-------|
| Date: | 5-Sep-2024 | Fluid Temp: | 24 | Frequency: | 5750MHz | Tissue: | Head | ΔSAR 1g | ΔSAR 10g | SAR Correction Factor (1) | |
| Freq (MHz) | Test ε | Test σ (S/m) | Target ε | Target σ (S/m) | Deviation Permittivity | Deviation Conductivity | 1g | | | 10g | |
| 5740.0000 | | 32.8500 | 5.6200 | 35.3700 | 5.21 | -7.12% | 7.87% | 0.011 | 0.015 | 1.000 | 1.000 |
| 5745.0000 | * | 32.8050 | 5.6500 | 35.3650 | 5.22 | -7.24% | 8.34% | 0.011 | 0.016 | 1.000 | 1.000 |
| 5750.0000 | | 32.7600 | 5.6800 | 35.3600 | 5.22 | -7.35% | 8.81% | 0.011 | 0.016 | 1.000 | 1.000 |
| 5760.0000 | | 32.7600 | 5.6900 | 35.3500 | 5.23 | -7.33% | 8.80% | 0.011 | 0.016 | 1.000 | 1.000 |
| 5765.0000 | * | 32.8200 | 5.6650 | 35.3400 | 5.24 | -7.13% | 8.21% | 0.010 | 0.015 | 1.000 | 1.000 |
| 5770.0000 | | 32.8800 | 5.6400 | 35.3300 | 5.24 | -6.93% | 7.63% | 0.010 | 0.015 | 1.000 | 1.000 |
| 5800.0000 | | 32.5500 | 5.6600 | 35.3000 | 5.27 | -7.79% | 7.40% | 0.012 | 0.017 | 1.000 | 1.000 |
| 5805.0000 | * | 32.6350 | 5.6550 | 35.2950 | 5.28 | -7.54% | 7.20% | 0.012 | 0.017 | 1.000 | 1.000 |
| 5810.0000 | | 32.7200 | 5.6500 | 35.2900 | 5.28 | -7.28% | 7.01% | 0.011 | 0.016 | 1.000 | 1.000 |

*Channel Frequency Tested

16.0 SYSTEM VERIFICATION TEST RESULTS

Table 16.1 - 5750MHz

| System Verification Test Results | | | | | |
|--|---------------|-----------------|----------------------|--------------------|---------------------|
| Date | | Frequency (MHz) | Validation Source | | |
| | | | P/N | S/N | |
| 5 Sep 2024 | | 5750 | D5GHzV2 | | 1031 |
| Fluid Type | Fluid Temp °C | Ambient Temp °C | Ambient Humidity (%) | Forward Power (mW) | Source Spacing (mm) |
| Head | 24.0 | 26 | 39% | 50 | 10 |
| Fluid Parameters | | | | | |
| Permittivity | | | Conductivity | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 32.76 | 35.36 | -7.35% | 5.68 | 5.22 | 8.81% |
| Measured SAR | | | | | |
| 1 gram | | | 10 gram | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 3.75 | 3.92 | -4.34% | 1.08 | 1.12 | -3.14% |
| Measured SAR Normalized to 1.0W | | | | | |
| 1 gram | | | 10 gram | | |
| Normalized | Target | Deviation | Normalized | Target | Deviation |
| 75.00 | 78.40 | -4.34% | 21.60 | 22.30 | -3.14% |
| <p>Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEC/IEEE 62209-1528 and FCC KDB 865664,</p> <p>The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.</p> <p>The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> | | | | | |

Table 16.2 - 5250MHz

| System Verification Test Results | | | | | |
|--|---------------|-----------------|----------------------|--------------------|---------------------|
| Date | | Frequency (MHz) | Validation Source | | |
| | | | P/N | | S/N |
| 10 Sep 2024 | | 5250 | D5GHzV2 | | 1031 |
| Fluid Type | Fluid Temp °C | Ambient Temp °C | Ambient Humidity (%) | Forward Power (mW) | Source Spacing (mm) |
| Head | 23.8 | 21 | 39% | 50 | 10 |
| Fluid Parameters | | | | | |
| Permittivity | | | Conductivity | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 34.26 | 35.93 | -4.65% | 5.12 | 4.71 | 8.70% |
| Measured SAR | | | | | |
| 1 gram | | | 10 gram | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 3.98 | 4.01 | -0.75% | 1.14 | 1.15 | -0.44% |
| Measured SAR Normalized to 1.0W | | | | | |
| 1 gram | | | 10 gram | | |
| Normalized | Target | Deviation | Normalized | Target | Deviation |
| 79.60 | 80.20 | -0.75% | 22.80 | 22.90 | -0.44% |
| <p>Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEC/IEEE 62209-1528 and FCC KDB 865664,</p> <p>The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.</p> <p>The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> | | | | | |

Table 16.3 - 2450MHz

| System Verification Test Results | | | | | |
|--|---------------|-----------------|----------------------|--------------------|---------------------|
| Date | | Frequency (MHz) | Validation Source | | |
| 11 Sep 2024 | | 2450 | P/N | | S/N |
| | | | D2450V2 | | 825 |
| Fluid Type | Fluid Temp °C | Ambient Temp °C | Ambient Humidity (%) | Forward Power (mW) | Source Spacing (mm) |
| Head | 24.2 | 25 | 34% | 250 | 10 |
| Fluid Parameters | | | | | |
| Permittivity | | | Conductivity | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 36.77 | 39.20 | -6.20% | 1.89 | 1.80 | 5.00% |
| Measured SAR | | | | | |
| 1 gram | | | 10 gram | | |
| Measured | Target | Deviation | Measured | Target | Deviation |
| 13.60 | 13.13 | 3.62% | 6.29 | 6.23 | 1.04% |
| Measured SAR Normalized to 1.0W | | | | | |
| 1 gram | | | 10 gram | | |
| Normalized | Target | Deviation | Normalized | Target | Deviation |
| 54.40 | 52.50 | 3.62% | 25.16 | 24.90 | 1.04% |
| <p>Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEC/IEEE 62209-1528 and FCC KDB 865664,</p> <p>The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.</p> <p>The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.</p> <p>The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.</p> | | | | | |

17.0 SYSTEM VALIDATION SUMMARY

Table 17.1 System Validation Summary

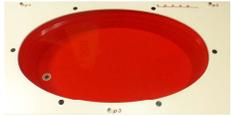
| SAR Validation Summary Chart | | | | | | | |
|------------------------------|-------------|------------|-------------------|-----------------|--------------------|----------|---------------|
| Validation Date | Probe Model | Probe S/N | Validation Source | Frequency (MHz) | Validation Results | | |
| | | | | | Linearity | Isotropy | Extrapolation |
| ✓ | | = Complete | | | ✓ = Not Required | | |
| 30-May-24 | EX3DV4 | 7826 | D2450V2 | 2450 | Pass | Pass | Pass |
| 23-Jul-24 | EX3DV4 | 7826 | D5GHzV2 | 5250 | Pass | Pass | Pass |
| 25-Jul-24 | EX3DV4 | 7826 | D5GHzV2 | 5750 | Pass | Pass | Pass |

18.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 18.0 Measurement System Specifications

| Measurement System Specification | |
|---|--|
| Specifications | |
| Positioner | Stäubli Unimation Corp. Robot Model: TX90XL |
| Repeatability | +/- 0.035 mm |
| No. of axis | 6.0 |
| Data Acquisition Electronic (DAE) System | |
| Cell Controller | |
| Processor | Intel(R) Core(TM) i7-7700 |
| Clock Speed | 3.60 GHz |
| Operating System | Windows 10 Professional |
| Data Converter | |
| Features | Signal Amplifier, multiplexer, A/D converter, and control logic |
| Software | Measurement Software: DASY6, V 6.4.0.12171 / DASY52 V10.2(1504) Postprocessing Software: SEMCAD X, V14.6.12(7470) |
| Connecting Lines | Optical downlink for data and status info., Optical uplink for commands and clock |
| DASY Measurement Server | |
| Function | Real-time data evaluation for field measurements and surface detection |
| Hardware | Intel ULV Celeron CPU 400 MHz; 128 MB chip disk; 128 MB RAM |
| Connections | COM1, COM2, DAE, Robot, Ethernet, Service Interface |
| E-Field Probe | |
| Model | EX3DV4 |
| Serial No. | 7826 |
| Construction | Triangular core fiber optic detection system |
| Frequency | 10 MHz to 6 GHz |
| Linearity | ±0.2 dB (30 MHz to 3 GHz) |
| Phantom | |
| Type | ELI Elliptical Planar Phantom |
| Shell Material | Fiberglass |
| Thickness | 2mm +/- .2mm |
| Volume | > 30 Liter |
| Phantom | |
| Type | Twin SAM Phantom |
| Shell Material | Fiberglass |
| Thickness | 2mm +/- .2mm |
| Volume | < 25 Liter |
| Phantom | |
| Type | Modular Flat Phantom |
| Shell Material | Fiberglass |
| Thickness | 2mm +/- .2mm |
| Volume | < 9 Liter |

Table 18.1

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

19.0 TEST EQUIPMENT LIST

Table 19.1 Equipment List and Calibration

| Test Equipment List | | | | |
|---|-----------|-------------|-----------------|-----------------|
| DESCRIPTION | ASSET NO. | SERIAL NO. | DATE CALIBRATED | CALIBRATION DUE |
| Schmid & Partner DASY 6 System | - | - | - | - |
| -DASY Measurement Server | 00158 | 1078 | CNR | CNR |
| -Robot | 00046 | 599396-01 | CNR | CNR |
| -DAE4 | 00019 | 353 | 13-May-24 | 13-May-25 |
| -EX3DV4 E-Field Probe | 00357 | 7826 | 15-May-24 | 15-May-25 |
| -D2450V2 Validation Dipole | 00219 | 825 | 15-May-24 | 15-May-27 |
| -D5GHzV2 Validation Dipole | 00126 | 1031 | 16-May-24 | 16-May-27 |
| ELI Phantom | 00247 | 1234 | CNR | CNR |
| SAM Phantom | 00154 | 1033 | CNR | CNR |
| MFP Phantom | 00355 | 1177/2 | CNR | CNR |
| HP 85070C Dielectric Probe Kit | 00033 | none | CNR | CNR |
| Gigatronics 8652A Power Meter | 00007 | 1835801 | 10-May-22 | 10-May-25 |
| Gigatronics 80701A Power Sensor | 00186 | 1837002 | COU | COU |
| Gigatronics 80334A Power Sensor | 00237 | 1837001 | 10-May-22 | 10-May-25 |
| HP 8753ET Network Analyzer | 00134 | US39170292 | 6-Jan-24 | 6-Jan-27 |
| Rohde & Schwarz SMR20 Signal Generator | 00006 | 100104 | COU | COU |
| Amplifier Research 10W1000C Power Amplifier | 00041 | 27887 | CNR | CNR |
| Amplifier Research 5S1G4 Power Amplifier | 00106 | 26235 | CNR | CNR |
| Narda Directional Coupler 3020A | 00064 | - | CNR | CNR |
| Bipolar Power Supply 6299A | 00086 | 1144A02155 | CNR | CNR |
| DC-18G 10W 30db Attenuator | 00102 | - | COU | COU |
| R&S FSP40 Spectrum Analyzer | 00241 | 100500 | 10-Sep-24 | 10-Sep-27 |
| HP 8566B Spectrum Analyzer | 00051 | 2747A055100 | 6-Jul-24 | 6-Jul-27 |
| RF Cable-SMA | 00311 | - | CNR | CNR |
| HP Calibration Kit | 00145 | - | CNR | CNR |

CNR = Calibration Not Required
 SB=Stand By
 COU = Calibrate on Use

20.0 FLUID COMPOSITION

Table 20.1 Fluid Composition 2450MHz HEAD TSL

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

- (1) Non-Iodinized
- (2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g
- (3) Dow Chemical Dowicil 75 Antimicrobial Perservative

Table 20.2 Fluid Composition 5250, 5750MHz HEAD TSL
The 5GHz Head TSL is a SPEAG proprietary broad band fluid:

Type: **HBBL3500-5500V2**
Batch number: **131210-2**
P/N: **SL AAH 502 AC**

END OF REPORT

APPENDIX A – SYSTEM VERIFICATION PLOTS

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1031

Procedure Name: SPC 5750H Input=50mw, Target=[3.53][3.92][4.31], Target=78.6W/kg@1000 mw

Communication System: UID 0, CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5750$ MHz; $\sigma = 5.68$ S/m; $\epsilon_r = 32.76$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/5/2024 7:29:28 PM
 DASYS Configuration:

- Probe: EX3DV4 - SN7826; ConvF(4.91, 4.76, 4.89) @ 5750 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1031x
- Measurement SW: DASYS2, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 5750H Input=50mw, Target=[3.53][3.92][4.31], Target=78.6W/kg@1000 mw 2 2/Area Scan (4x7x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 6.41 W/kg

SPC/SPC 5750H Input=50mw, Target=[3.53][3.92][4.31], Target=78.6W/kg@1000 mw 2 2/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 27.33 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 3.75 W/kg; SAR(10 g) = 1.08 W/kg

Smallest distance from peaks to all points 3 dB below = 7.5 mm

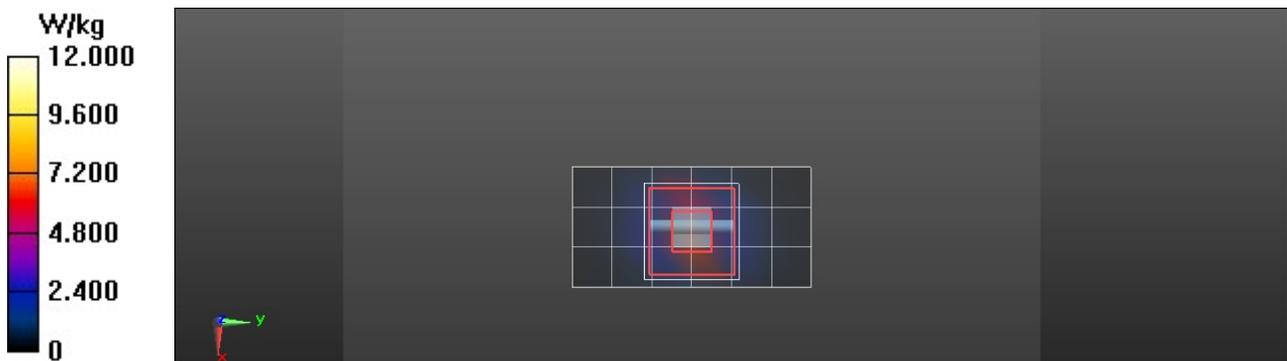
Ratio of SAR at M2 to SAR at M1 = 52.1%

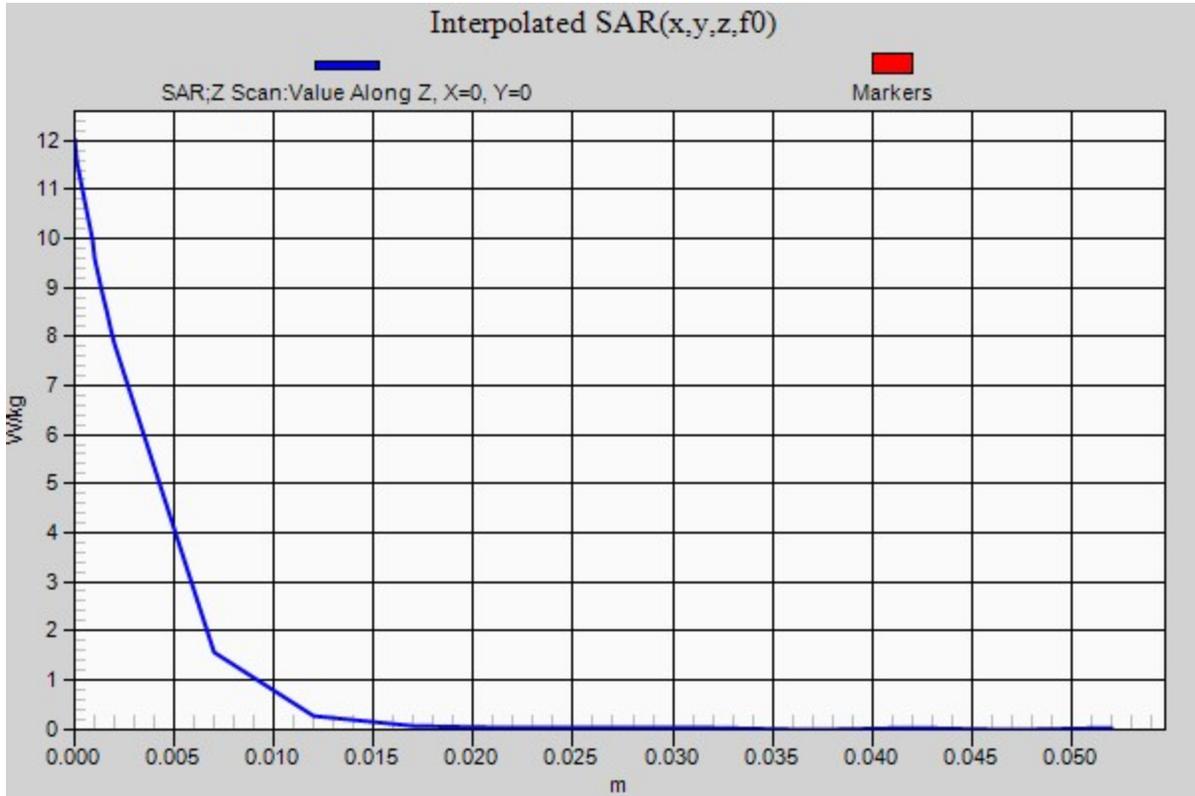
Maximum value of SAR (measured) = 7.91 W/kg

SPC/SPC 5750H Input=50mw, Target=[3.53][3.92][4.31], Target=78.6W/kg@1000 mw 2 2/Z Scan (1x1x22): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Penetration depth = 2.901 (3.084, 2.874) [mm]

Maximum value of SAR (interpolated) = 12.0 W/kg





DUT: D5GHzV2 - SN1031; Type: D5GHzV2; Serial: SN1031
Procedure Name: SPC 5250H Input=50 mw, Target= [3.71[4.12][4.53] Target=82.4W/kg@1000mw

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5250$ MHz; $\sigma = 5.12$ S/m; $\epsilon_r = 34.26$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/10/2024 6:10:25 PM
 DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(5.53, 5.11, 5.33) @ 5250 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 5250H Input=50 mw, Target= [3.71[4.12][4.53] Target=82.4W/kg@1000mw 2 2/Area Scan (7x4x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 3.54 W/kg

SPC/SPC 5250H Input=50 mw, Target= [3.71[4.12][4.53] Target=82.4W/kg@1000mw 2 2/Zoom Scan (9x9x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 29.94 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 3.98 W/kg; SAR(10 g) = 1.14 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

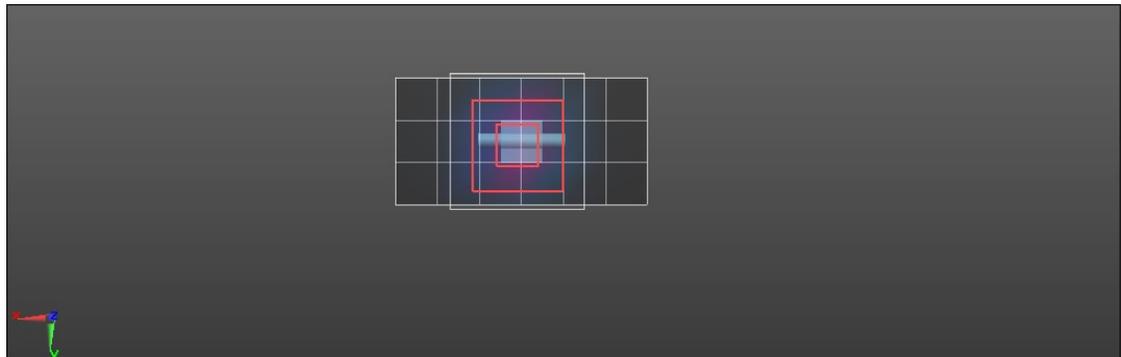
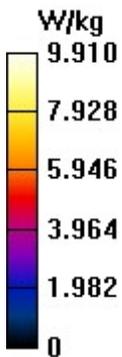
Ratio of SAR at M2 to SAR at M1 = 53.8%

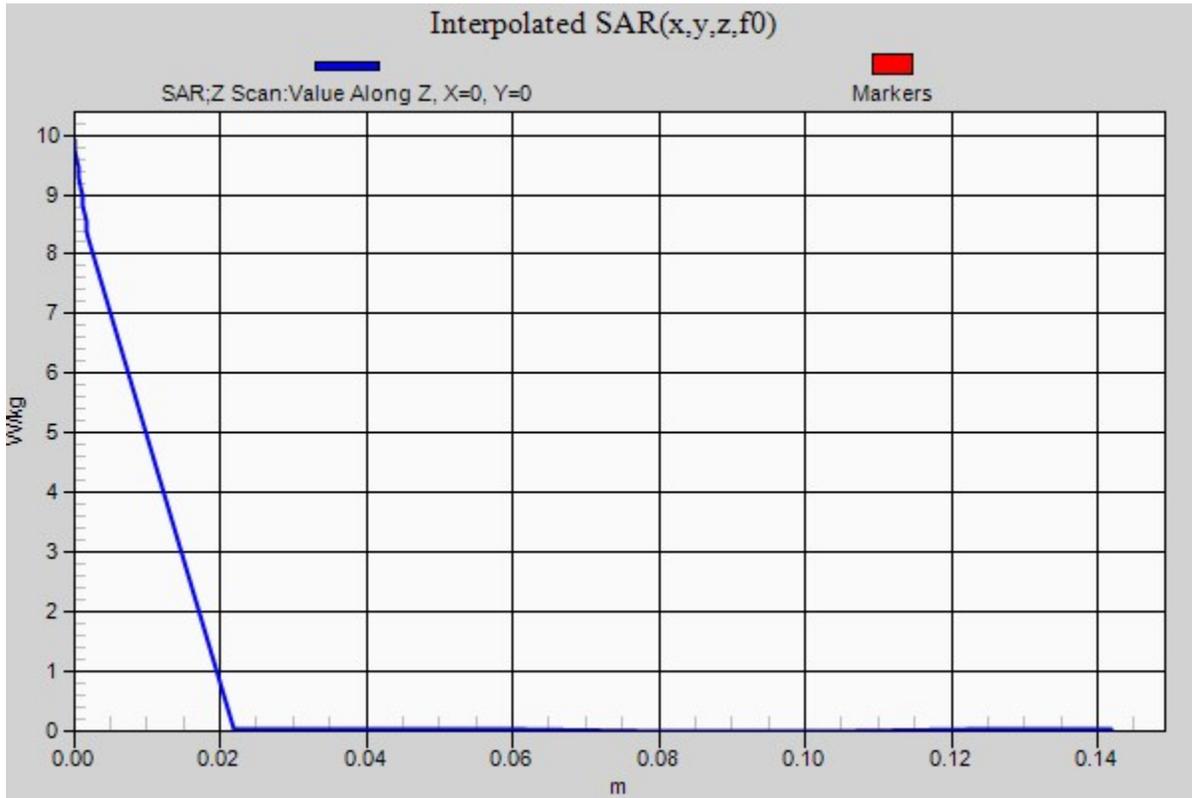
Maximum value of SAR (measured) = 8.39 W/kg

SPC/SPC 5250H Input=50 mw, Target= [3.71[4.12][4.53] Target=82.4W/kg@1000mw 2 2/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Penetration depth = n/a (n/a, 3.145) [mm]

Maximum value of SAR (interpolated) = 9.91 W/kg





DUT: D2450V2 - SN825; Type: D2450V2; Serial: SN825

Procedure Name: SPC 2450H_Input=250mw, 1gTarget=[12.15]13.5][14.85]W/kg 10g Target=[5.68][6.32][6.95]

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.89$ S/m; $\epsilon_r = 36.77$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/11/2024 4:04:18 PM

DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(7.5, 7.2, 7.38) @ 2450 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 2450H_Input=250mw, 1gTarget=[12.15]13.5][14.85]W/kg 10g Target=[5.68][6.32][6.95] 2 2 2/Area Scan (9x4x1):
Measurement grid: dx=12mm, dy=12mm

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

SPC/SPC 2450H_Input=250mw, 1gTarget=[12.15]13.5][14.85]W/kg 10g Target=[5.68][6.32][6.95] 2 2 2/Zoom Scan
(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.11 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.29 W/kg

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

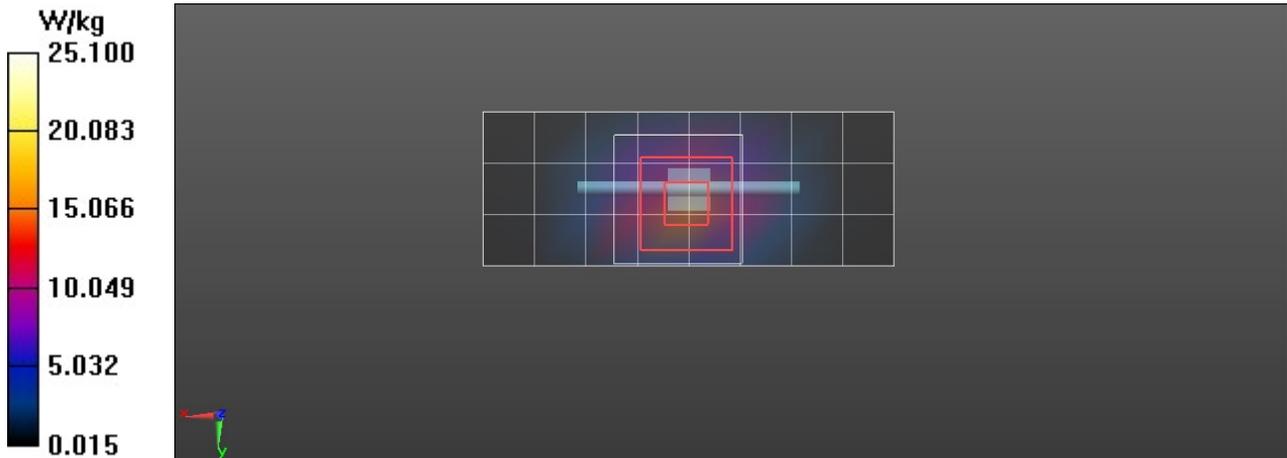
Ratio of SAR at M2 to SAR at M1 = 47.7%

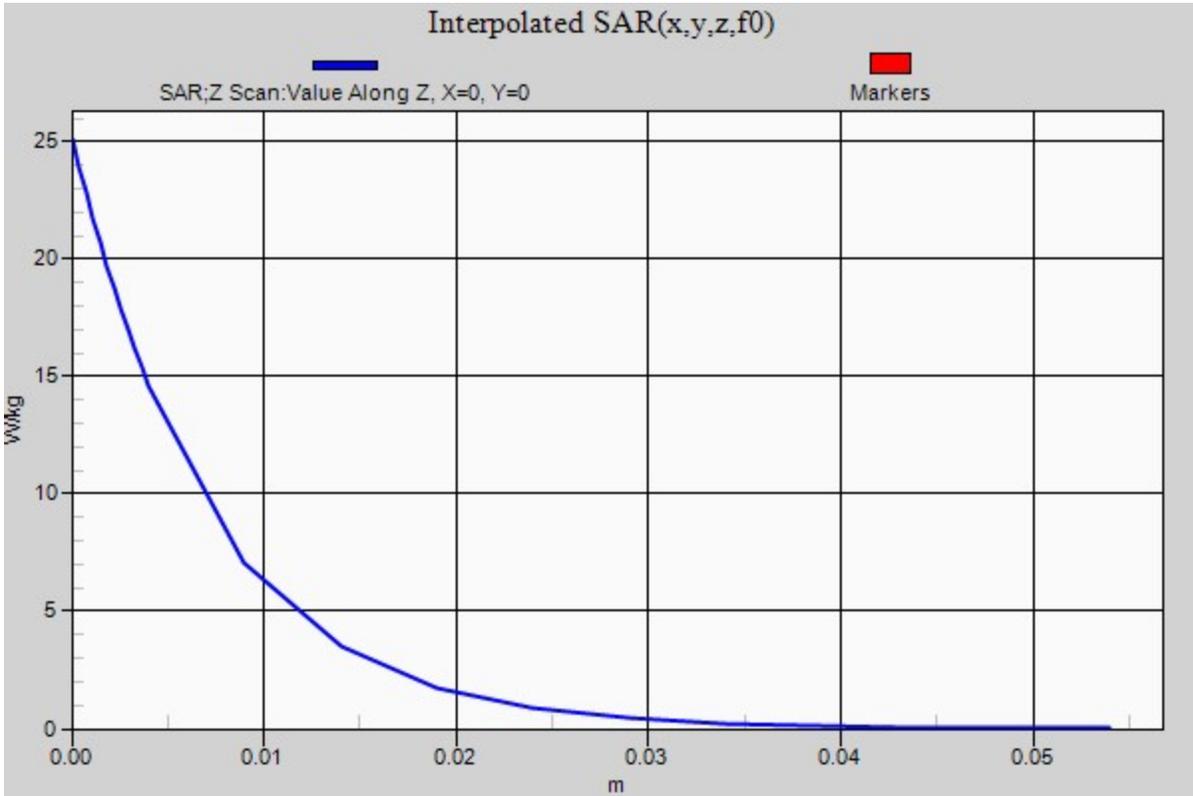
Maximum value of SAR (measured) = 15.4 W/kg

SPC/SPC 2450H_Input=250mw, 1gTarget=[12.15]13.5][14.85]W/kg 10g Target=[5.68][6.32][6.95] 2 2 2/Z Scan (1x1x22):
Measurement grid: dx=20mm, dy=20mm, dz=5mm

Penetration depth = 7.057 (6.904, 7.090) [mm]

Maximum value of SAR (interpolated) = 25.1 W/kg





APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR

B5/B5Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385
Procedure Name: B5 - A04939, NA Back Side 5mm, 5765MHz OFDM6 20MHz,WIFI

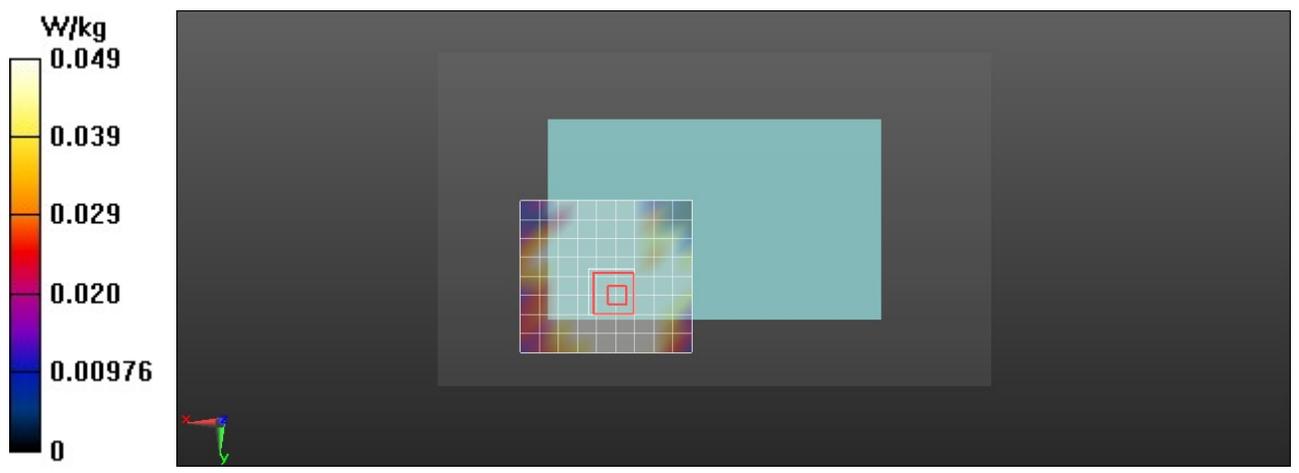
Communication System: UID 0, CW (0); Frequency: 5765 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 5765 \text{ MHz}$; $\sigma = 5.665 \text{ S/m}$; $\epsilon_r = 32.82$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section
 Date/Time: 9/7/2024 3:35:45 PM
 DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(4.91, 4.76, 4.89) @ 5765 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

5750H/B5 - A04939, NA Back Side 5mm, 5765MHz OFDM6 20MHz,WIFI/Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.708 W/kg

5750H/B5 - A04939, NA Back Side 5mm, 5765MHz OFDM6 20MHz,WIFI/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 9.679 V/m; Power Drift = -0.02 dB
 Peak SAR (extrapolated) = 2.87 W/kg
SAR(1 g) = 0.725 W/kg; SAR(10 g) = 0.256 W/kg
 Smallest distance from peaks to all points 3 dB below = 9.4 mm
 Ratio of SAR at M2 to SAR at M1 = 49.8%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 1.64 W/kg

5750H/B5 - A04939, NA Back Side 5mm, 5765MHz OFDM6 20MHz,WIFI/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm
 Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 0) [mm]
 Maximum value of SAR (interpolated) = 0.0488 W/kg



E7/E7Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385
Procedure Name: E7 -A04939, NA Back Side, 5765MHz OFDM6 20MHz,WIFI

Communication System: UID 0, CW (0); Frequency: 5765 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 5765$ MHz; $\sigma = 5.665$ S/m; $\epsilon_r = 32.82$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/7/2024 3:18:25 PM
 DASYS Configuration:

- Probe: EX3DV4 - SN7826; ConvF(4.91, 4.76, 4.89) @ 5765 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASYS2, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

5750H/E7 -A04939, NA Back Side, 5765MHz OFDM6 20MHz,WIFI/Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm

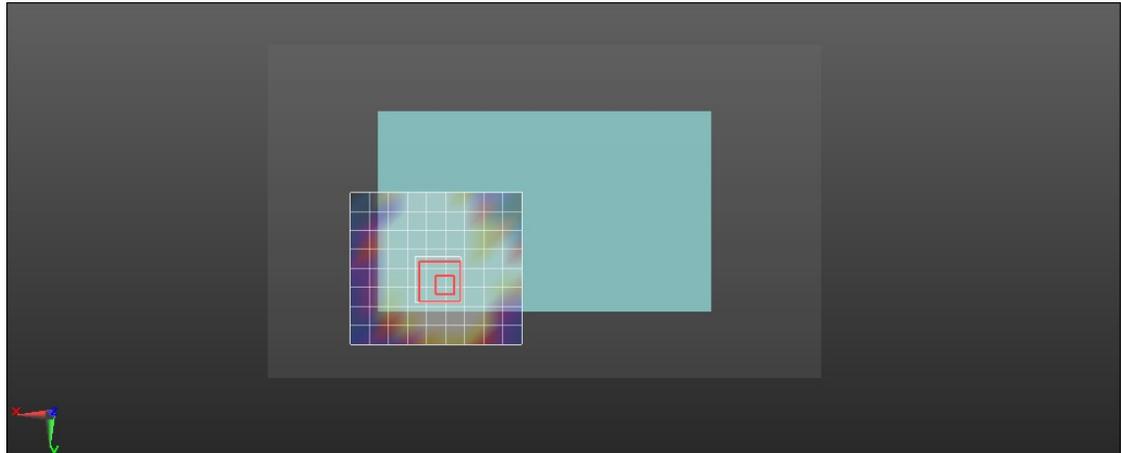
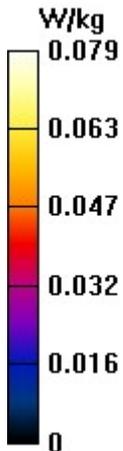
Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 1.31 W/kg

5750H/E7 -A04939, NA Back Side, 5765MHz OFDM6 20MHz,WIFI/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 13.03 V/m; Power Drift = 0.02 dB
 Peak SAR (extrapolated) = 5.13 W/kg
SAR(1 g) = 1.24 W/kg; SAR(10 g) = 0.403 W/kg
 Smallest distance from peaks to all points 3 dB below = 9.4 mm
 Ratio of SAR at M2 to SAR at M1 = 51%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 2.92 W/kg

5750H/E7 -A04939, NA Back Side, 5765MHz OFDM6 20MHz,WIFI/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 0) [mm]
 Maximum value of SAR (interpolated) = 0.0788 W/kg



B20/B20Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385

Procedure Name: B20-A04939, NA Back Side-5mm, 2412MHz 802.11b DSSS11 20MHz

Communication System: UID 0, CW (0); Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.832$ S/m; $\epsilon_r = 37.082$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/11/2024 5:46:59 PM
 DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(7.5, 7.2, 7.38) @ 2412 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

2450H/B20-A04939, NA Back Side-5mm, 2412MHz 802.11b DSSS11 20MHz,/Area Scan (10x8x1): Measurement grid: dx=12mm, dy=12mm

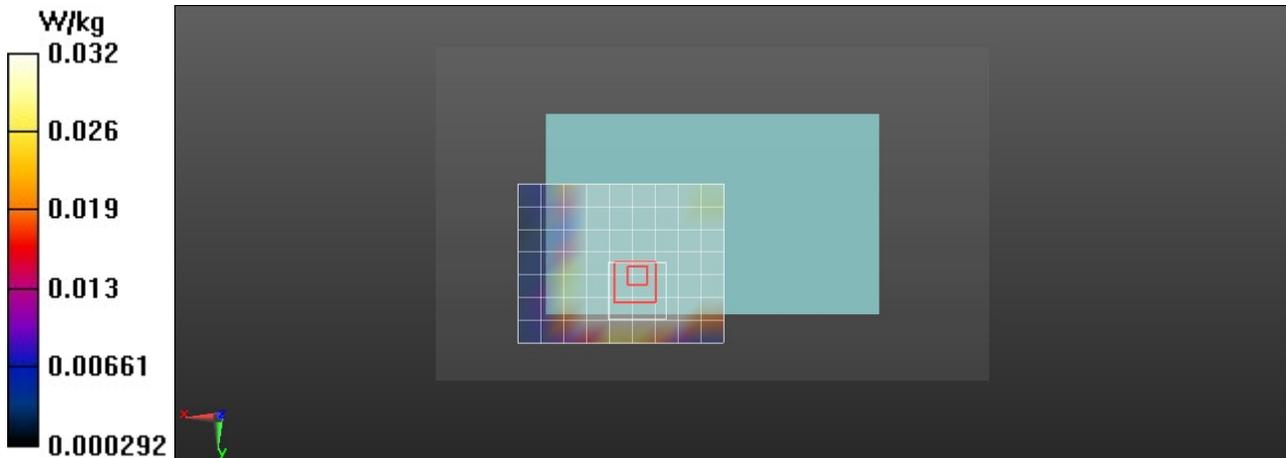
Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.463 W/kg

2450H/B20-A04939, NA Back Side-5mm, 2412MHz 802.11b DSSS11 20MHz,/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.785 V/m; Power Drift = 0.13 dB
 Peak SAR (extrapolated) = 0.737 W/kg
SAR(1 g) = 0.361 W/kg; SAR(10 g) = 0.173 W/kg
 Smallest distance from peaks to all points 3 dB below = 11.2 mm
 Ratio of SAR at M2 to SAR at M1 = 47.4%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.588 W/kg

2450H/B20-A04939, NA Back Side-5mm, 2412MHz 802.11b DSSS11 20MHz,/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 8.145) [mm]
 Maximum value of SAR (interpolated) = 0.0319 W/kg



E24/E24Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385
Procedure Name: E24-A04939, NA Back Side, 2462MHz 80211b DSSS11

Communication System: UID 0, CW (0); Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.892$ S/m; $\epsilon_r = 36.804$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/12/2024 2:48:30 PM
 DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(7.5, 7.2, 7.38) @ 2462 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

2450H/E24-A04939, NA Back Side, 2462MHz 80211b DSSS11/Area Scan (10x8x1): Measurement grid: dx=12mm, dy=12mm

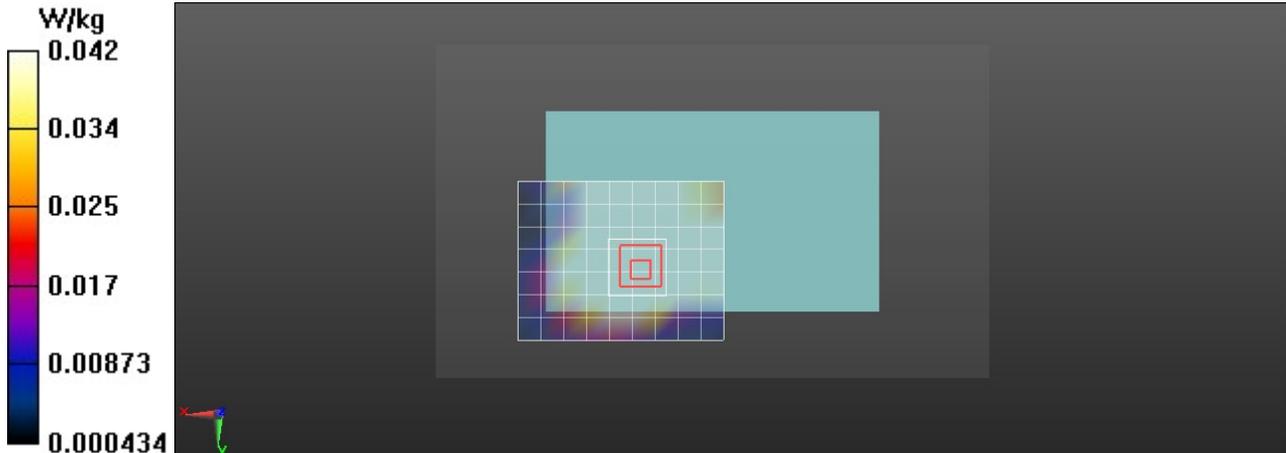
Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.863 W/kg

2450H/E24-A04939, NA Back Side, 2462MHz 80211b DSSS11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.79 V/m; Power Drift = 0.05 dB
 Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 0.760 W/kg; SAR(10 g) = 0.356 W/kg
 Smallest distance from peaks to all points 3 dB below = 8.9 mm
 Ratio of SAR at M2 to SAR at M1 = 44.6%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 1.28 W/kg

2450H/E24-A04939, NA Back Side, 2462MHz 80211b DSSS11/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 9.829) [mm]
 Maximum value of SAR (interpolated) = 0.0419 W/kg



B23/B23Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385
Procedure Name: B23-A04939, NA Back Side-5mm, 2441MHz BT BR GFSK

Communication System: UID 0, CW (0); Frequency: 2441 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.872$ S/m; $\epsilon_r = 36.914$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/12/2024 3:23:01 PM
 DASYS Configuration:

- Probe: EX3DV4 - SN7826; ConvF(7.5, 7.2, 7.38) @ 2441 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASYS2, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

2450H/B23-A04939, NA Back Side-5mm, 2441MHz BT BR GFSK/Area Scan (10x8x1): Measurement grid: dx=12mm, dy=12mm

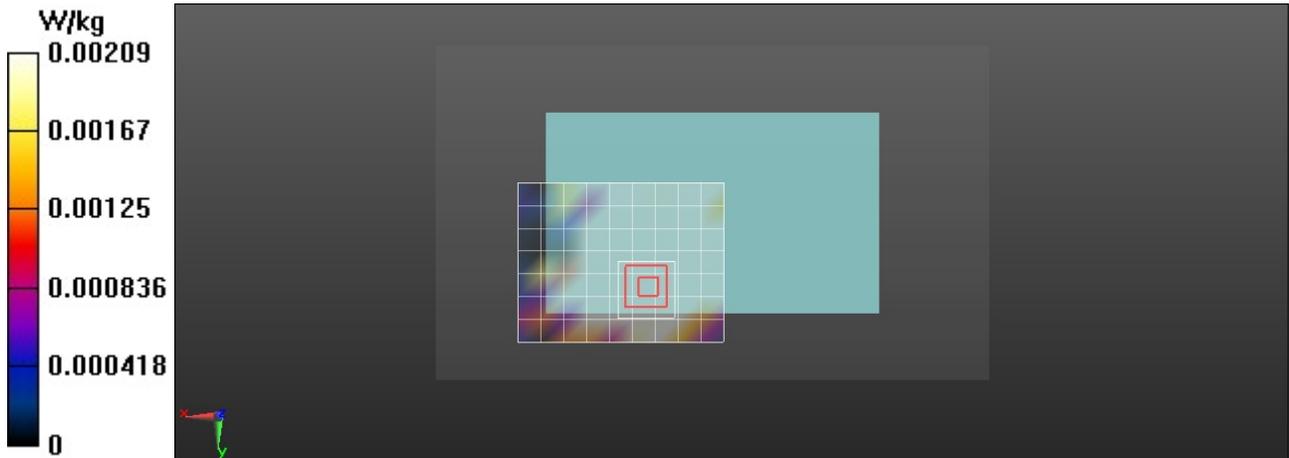
Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.0294 W/kg

2450H/B23-A04939, NA Back Side-5mm, 2441MHz BT BR GFSK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.948 V/m; Power Drift = 0.22 dB
 Peak SAR (extrapolated) = 0.0600 W/kg
SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.011 W/kg
 Ratio of SAR at M2 to SAR at M1 = 42.9%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.0462 W/kg

2450H/B23-A04939, NA Back Side-5mm, 2441MHz BT BR GFSK/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 0) [mm]
 Maximum value of SAR (interpolated) = 0.00209 W/kg



E25/E25Z

DUT: A04939 - Top/Back; Type: Transmitter; Serial: 3474385385
Procedure Name: E25-A04939, NA Back Side, 2441MHz BT BR GFSK

Communication System: UID 0, CW (0); Frequency: 2441 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.872$ S/m; $\epsilon_r = 36.914$; $\rho = 1000$ kg/m³
 Phantom section: Left Section
 Date/Time: 9/12/2024 3:07:56 PM
 DASY5 Configuration:

- Probe: EX3DV4 - SN7826; ConvF(7.5, 7.2, 7.38) @ 2441 MHz; Calibrated: 5/15/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 5/13/2024
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1177/2
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

2450H/E25-A04939, NA Back Side, 2441MHz BT BR GFSK/Area Scan (10x8x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.0564 W/kg

2450H/E25-A04939, NA Back Side, 2441MHz BT BR GFSK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.421 V/m; Power Drift = 0.02 dB
 Peak SAR (extrapolated) = 0.120 W/kg
SAR(1 g) = 0.050 W/kg; SAR(10 g) = 0.022 W/kg
 Ratio of SAR at M2 to SAR at M1 = 43.1%
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.0886 W/kg

2450H/E25-A04939, NA Back Side, 2441MHz BT BR GFSK/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Info: Interpolated medium parameters used for SAR evaluation.
 Penetration depth = n/a (n/a, 0) [mm]
 Maximum value of SAR (interpolated) = 0.00142 W/kg

