# TEST REPORT

**REPORT NUMBER: 25B02W000005-003**

**ON**

| | |
|---|---|
| **Type of Equipment:** | **Barcode Reader** |
| **Type of Designation:** | **DLMKWF** |
| **Brand Name:** | **DATALOGIC** |
| **Manufacturer:** | **Datalogic S.r.l.** |
| **FCC ID:** | **U4G-DLMKWF** |
| **IC:** | **3862E-DLMKWF** |

**ACCORDING TO**

**RSS 102: Issue 6/2023**
**RSS-102.SAR.MEAS Issue 1 Amendment 1 December 15, 2023**
**IEC/IEEE 62209-1528:2020**
**IEEE C95.1-2019**
**IEEE Std 1528-2013**

**Chongqing Academy of Information and Communications Technology**

***Month date, year***
*Apr.18th, 2025*
***Signature***

*Zhou Jin*
***Director***

**Note:**
The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

**Revision Version**

| Report Number | Revision | Date |
|---|---|---|
| 25B02W000005-003 | 00 | |

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# 1.Test Laboratory

## 1.1 Testing Location

| | |
|---|---|
| Company Name: | Chongqing Academy of Information and Communications Technology |
| Address: | No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China |
| Postal Code: | 401336 |
| Telephone: | 0086-23-88069965/021-68866880 |
| Fax: | 0086-23-88608777 |
| FCC Registration No.: | 558044 |
| FCC Designation No.: | CN1239 |
| IC Designation No.: | 11590A |
| CAB identifier: | CN0044 |

## 1.2 Testing Environment

| | |
|---|---|
| Normal Temperature: | 18℃-25℃ |
| Relative Humidity: | 30%-70% |
| Ambient noise & Reflection: | < 0.012 W/kg |

## 1.3 Project Data

| | |
|---|---|
| Testing Start Date: | 2025-3-25 |
| Testing End Date: | 2025-4-12 |

## 1.4 Signature

| | |
|---|---|
| 刘秋萍 | **2025-04-18** |
| **Liu Qiuping**<br>**(Prepared this test report)** | **Date** |
| 王成宇 | **2025-04-18** |
| **Wang Chengyu**<br>**(Reviewed this test report)** | **Date** |
| 周进 | **2025-04-18** |
| **Zhou Jin**<br>**Director of the laboratory**<br>**(Approved this test report)** | **Date** |

## 2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **DLMKWF** are as follow:

**Table 2.1: Highest Reported SAR**

| Technology Band | **Highest Reported SAR (1g, W/kg)** | | **Highest Reported SAR (10g, W/kg)** |
|---|---|---|---|
| | Head(0mm) | Body(5mm) | Limb(0mm) |
| Wi-Fi 2.4G | **1.17** | 1.04 | **1.12** |
| Wi-Fi 5G | 0.35 | **1.16** | 1.00 |
| BT | 0.06 | 0.07 | 0.12 |

**Remark:** The SAR values found for the barcode reader are below the maximum recommended levels of 1.6 W/kg as averaged over any 1g tissue according to the IEEE C95.1-2019.

For body operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 5 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

The measurement together with the test system set-up is described in Chapter 7 of this test report.

A detailed description of the equipment under test can be found in Chapter 4 of this test report.

The maximum SAR value is obtained at the case of **Table 2.1**, and the values are**:**

**Head: 1.17 W/kg (1g), Body: 1.16 W/kg (1g), Limb: 1.12 W/kg (10g).**

# 3.Client Information

## 3.1 Applicant Information

| | |
|---|---|
| Company Name: | Datalogic S.r.l. |
| Address /Post: | Via San Vitalino no.13, Calderara di Reno -40012(BO)-ltaly |
| Telephone: | +39 051 3147 393 |
| Fax: | -- |
| Email: | Ruggero.Cacioppo@datalogic.com |
| Contact Person: | Ruggero Cacioppo |

## 3.2 Manufacturer Information

| | |
|---|---|
| Company Name: | Datalogic S.r.l. |
| Address /Post: | Via San Vitalino no.13, Calderara di Reno -40012(BO)-ltaly |
| Telephone: | +39 051 3147 393 |
| Fax: | -- |
| Email: | Ruggero.Cacioppo@datalogic.com |
| Contact Person: | Ruggero Cacioppo |

# 4. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 4.1 About EUT

| | |
|---|---|
| **Description:** | Barcode Reader |
| **Model name:** | DLMKWF |
| **Operating mode(s):** | Wi-Fi 2.4G,Wi-Fi 5G U-NII-1/2A/2C/3,BT/BLE,NFC |
| **Tested Tx Frequency:** | 2412 MHz-2462 MHz (Wi-Fi 2.4G) |
| | 5180 MHz-5240 MHz (Wi-Fi 5G U-NII-1) |
| | 5260 MHz-5320 MHz (Wi-Fi 5G U-NII-2A) |
| | 5500 MHz-5700 MHz (Wi-Fi 5G U-NII-2C) |
| | 5745 MHz-5825 MHz (Wi-Fi 5G U-NII-3) |
| | 2402 MHz-2480 MHz (BT/BLE) |
| | 13.56 MHz (NFC) |
| **HVIN:** | DLMKWF |
| **Device type:** | Portable device |
| **Antenna type:** | PIFA(internal) antenna |
| **Hotspot mode:** | Not support |

## 4.2 Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version | Date of receipt |
|---|---|---|---|---|
| 25B02W000005 #S9 | S25CC0875 | V00 | V0.00.01.20250315_dev | 2025-03-21 |
| 25B02W000005 #S10 | S25CC0886 | V00 | V0.00.01.20250315_dev | 2025-03-21 |

*EUT ID: is used to identify the test sample in the lab internally.

## 4.3 Internal Identification of AE used during the test

| AE ID* | Description | Model | SN | Manufacturer |
|---|---|---|---|---|
| BA09 | Battery | Model: MK2-BY-202 3.85V 4850mAh | VA250300593 | -- |
| BA10 | Battery | Model: MK2-BY-202 3.85V 4850mAh | VA250300761 | -- |

*AE ID: is used to identify the test sample in the lab internally.

# 5.Reference Documents

## 5.1 Applicable Limit Regulations

**RSS 102: Issue 6/2023** Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
**IEEE C95.1: 2019** IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

## 5.2 Applicable Measurement Standards

**RSS-102.SAR.MEAS Issue 1 Amendment 1 December 15, 2023:** Measurement Procedure for Assessing Specific Absorption Rate (SAR) Compliance in Accordance with RSS-102

**IEC/IEEE 62209-1528:2020** 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)

**IEEE Std 1528-2013** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

**KDB447498 D01: General RF Exposure Guidance v06:** Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

**KDB248227 D01 802.11 Wi-Fi SAR v02r02:** SAR Guidance For 802.11(Wi-Fi) Transmitters

**KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04:** SAR Measurement Requirements for 100 MHz to 6 GHz.

**KDB865664 D02 RF Exposure Reporting v01r02:** RF Exposure Compliance Reporting and Documentation Considerations.

# 6.Specific Absorption Rate (SAR)

## 6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled,based on a person's awareness and abilityto exercise control over his or her exposure.In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

## 6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy ($dW$) absorbed by (dissipated in) an incremental mass ($dm$) contained in a volume element ($dv$) of a given density ($\rho$). The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, $\delta T$ is the temperature rise and $\delta t$ is the exposure duration, or related to the electrical field in the tissue by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

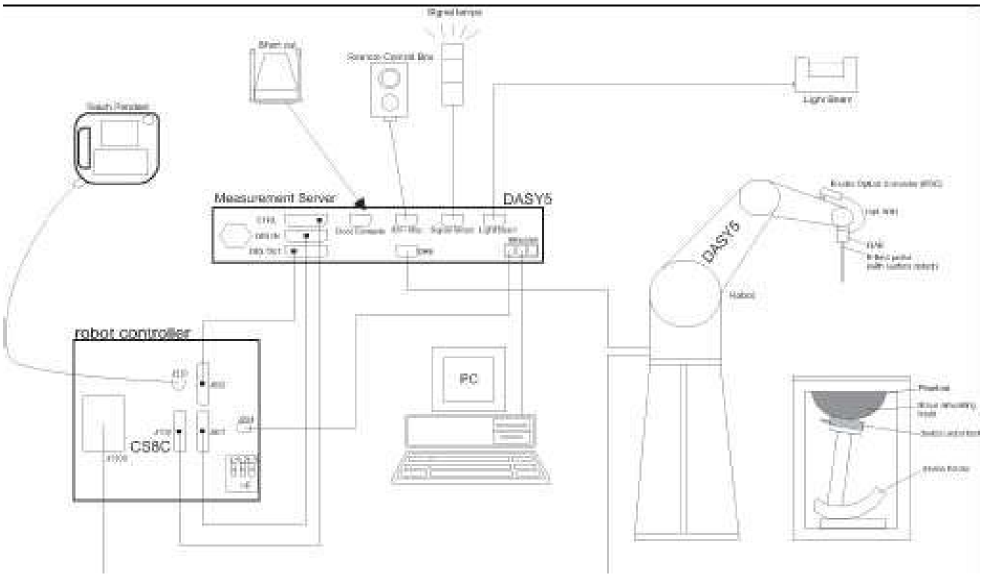
Where: $\sigma$ is the conductivity of the tissue, $\rho$ is the mass density of tissue and $E$ is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

# 7.SAR MEASUREMENT SETUP

## 7.1 Measurement Set-up

The DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:




**Picture 7.1-1 SAR Lab Test Measurement Set-up**

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and theDASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 7.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection durning a software approach and looks for the maximum using $2^{nd}$ord curve fitting. The approach is stopped at reaching the maximum.

**Probe Specifications:**

**Model:** EX3DV4

**Frequency:** 650MHz — 6GHz

**Calibration:** In head and body simulating tissue at Frequencies from 650 up to 4900MHz

**Linearity:** ± 0.2dB

**Dynamic Range:** 10mW/kg-100W/kg

**Probe Length:** 330 mm

**Probe Tip Length:** 20mm

**Body Diameter:** 12 mm

**Tip Diameter:** 2.5mm

**Tip-Center :** 1 mm

**Application:** SAR Dosimetry Test Compliance tests of trackers Dosimetry in strong gradient fields

**Picture 7-2 Near-field Probe**

**Picture 7-3 E-field Probe**

### 7.3 E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm$^2$) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/ cm$^2$..

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

$\Delta t$ = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

$\Delta T$ = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

$\sigma$ = Simulated tissue conductivity,

$\rho$ = Tissue density (kg/m$^3$).

## 7.4 Other Test Equipment

### 7.4.1 Data Acquisition Electronics(DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

**Picture7.4.1-1: DAE**

### 7.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

**Picture7.4.2-1: DASY 5**

### 7.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.


**Picture 7.4.3-1: Server for DASY 5**

### 7.4.4 Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

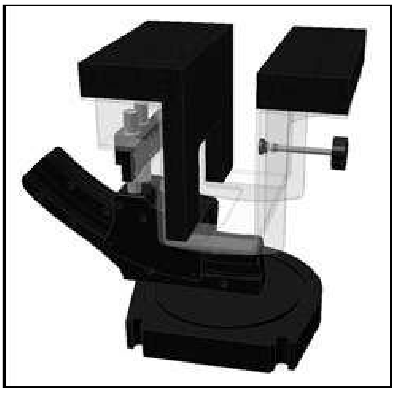
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The DASY device holder is constructed of low-loss POM material having the following dielectric parameters:

relative permittivity=3 and loss tangent=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with theTwin-SAM and ELI phantoms.

Picture7.4.4-1: Device Holder



Picture 7.4.4-2: Laptop Extension Kit

**7.4.5 Phantom**

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to
Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

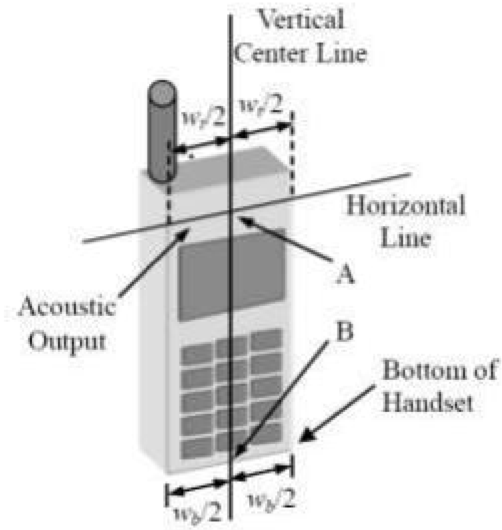
Shell Thickness: 2 ± 0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

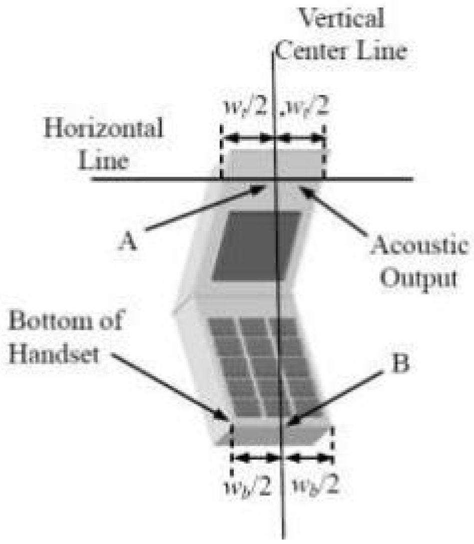
Picture 7.4.5-1: SAM Twin Phantom

# 8.Position of the wireless device in relation to the phantom

## 8.1 General considerations

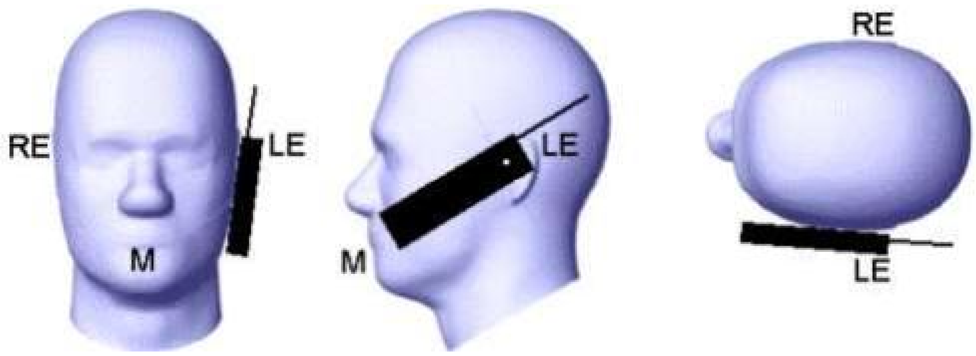
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.



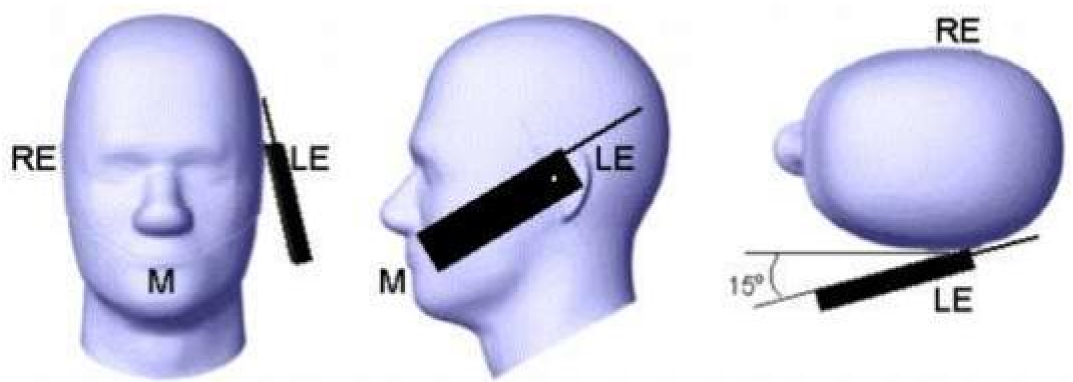




| | |
|---|---|
| $w_t$ | Width of the handset at the level of the acoustic |
| $w_b$ | Width of the bottom of the handset |
| A | Midpoint of the width $w_t$ of the handset at the level of the acoustic output |
| B | Midpoint of the width $W_b$ of the bottom of the handset |

**Picture 12-a Typical “fixed” case handset Picture 12-b Typical “clam-shell” case handset**



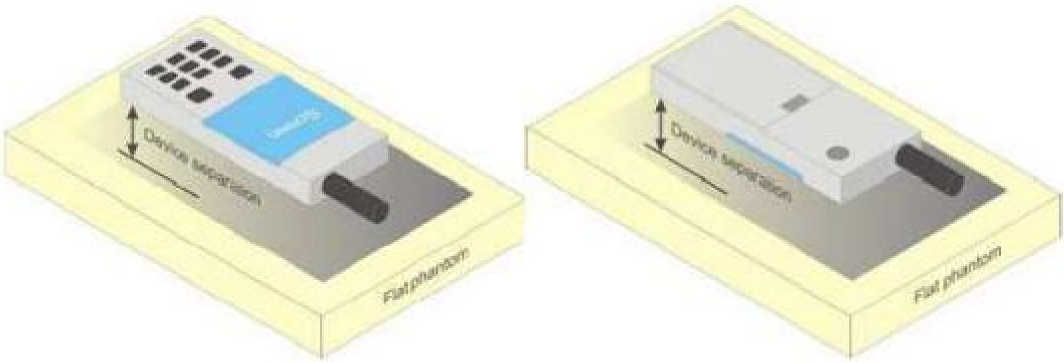

**Picture 8.1-1 Cheek position of the wireless device on the left side of SAM**




**Picture 8.1-2 Tilt position of the wireless device on the left side of SAM**

## 8.2 Body-worn device

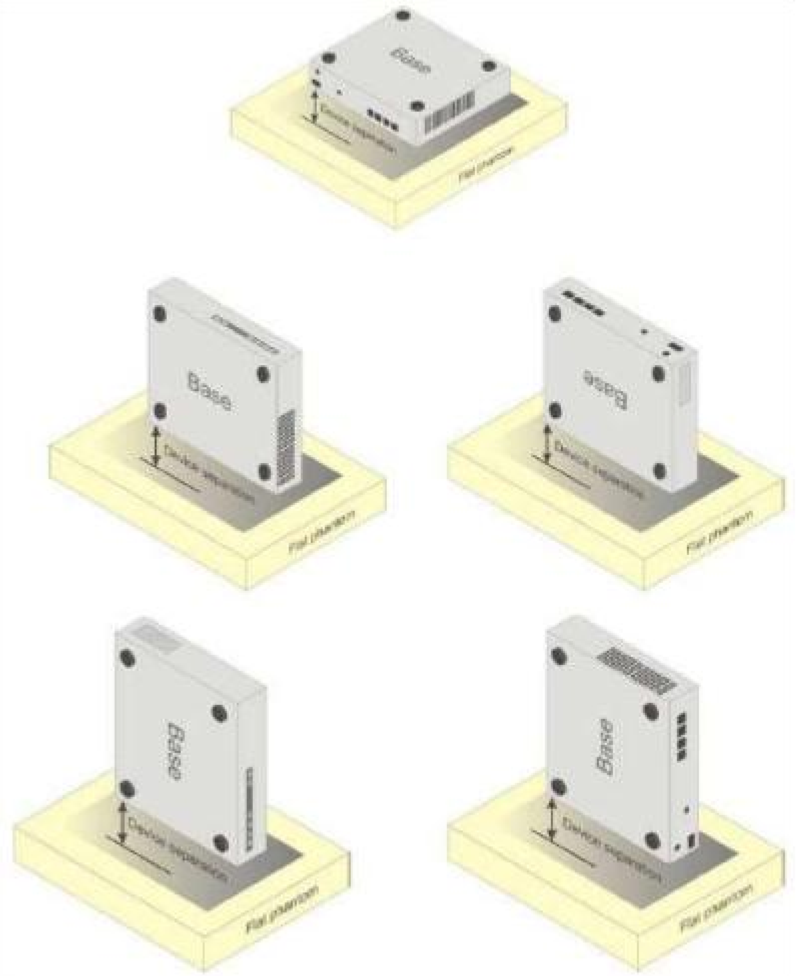
A typical example of a body-worn device is a tracker, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.




**Picture 8.2-1 Test positions for body-worn devices**

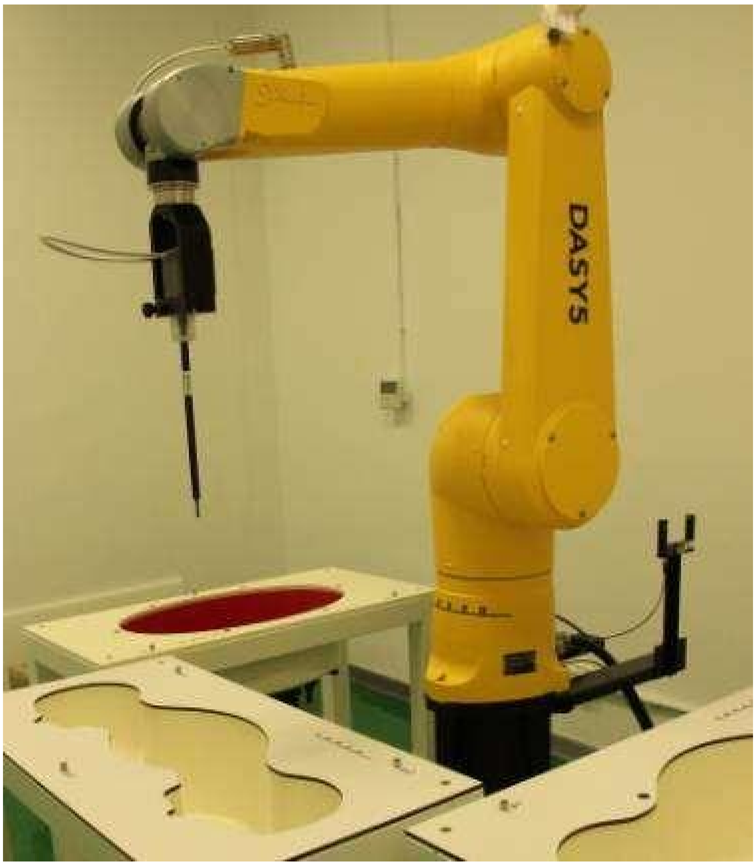
### 8.3 Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture16 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.




**Picture8.3-1 Test positions for desktop devices**

## 8.4 DUT Setup Photo




Picture 8.4-1: Specific Absorption Rate Test Layout

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Tel: 0086-23-88069965 FAX:0086-23-88608777

# 9.Tissue Simulating Liquids

## 9.1 Equivalent Tissues

The liquid used for the frequency range of 750-6000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 9.1-1 and 9.1-2 shows the detail solution. The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

**Table 9.1-1 Composition of the Head Tissue Equivalent Matter**

| **Frequency (MHz)** | **835** | **900** | **1800** | **1950** | **2300** | **2450** | **2600** | **5800** |
|---|---|---|---|---|---|---|---|---|
| **Ingredients (% by weight)** | | | | | | | | |
| Water | 41.45 | 40.92 | 55.242 | 54.89 | 56.34 | 58.79 | 58.79 | 65.53 |
| Sugar | 56.0 | 56.5 | / | / | / | / | / | / |
| Salt | 1.45 | 1.48 | 0.306 | 0.18 | 0.14 | 0.06 | 0.06 | / |
| Preventol | 0.1 | 0.1 | / | / | / | / | / | / |
| Cellulose | 1.0 | 1.0 | / | / | / | / | / | / |
| GlycolMonobutyl | / | / | 44.452 | 44.93 | 43.52 | 41.15 | 41.15 | / |
| Diethylenglycol momohexylether | / | / | / | / | / | / | / | 17.24 |
| Triton X-100 | / | / | / | / | / | / | / | 17.23 |
| Dielectric Parameters Target Value | ε=41.5 σ=0.90 | ε=41.5 σ=0.97 | ε=40.0 σ=1.40 | ε=40.0 σ=1.40 | ε=39.5 σ=1.67 | ε=39.2 σ=1.80 | ε=39.0 σ=1.96 | ε=35.3 σ=5.27 |

**Table 9.1-2 Targets for tissue simulating liquid**

| Frequency (MHz) | Liquid Type | Conductivity (σ) | ± 5% Range | Permittivity (ε) | ± 5% Range |
|---|---|---|---|---|---|
| 750 | Head | 0.89 | 0.846~0.934 | 41.9 | 39.805~43.995 |
| 835 | Head | 0.90 | 0.855~0.945 | 41.5 | 39.425~43.575 |
| 900 | Head | 0.97 | 0.922~1.018 | 41.5 | 39.425~43.575 |
| 1450 | Head | 1.20 | 1.140~1.260 | 40.5 | 38.475~42.525 |
| 1800 | Head | 1.40 | 1.330~1.470 | 40.0 | 38.000~42.000 |
| 1900 | Head | 1.40 | 1.330~1.470 | 40.0 | 38.000~42.000 |
| 1950 | Head | 1.40 | 1.330~1.470 | 40.0 | 38.000~42.000 |
| 2000 | Head | 1.40 | 1.330~1.470 | 40.0 | 38.000~42.000 |
| 2100 | Head | 1.49 | 1.416~1.564 | 39.8 | 37.810~41.790 |
| 2450 | Head | 1.80 | 1.710~1.890 | 39.2 | 37.240~41.160 |
| 2600 | Head | 1.96 | 1.862~2.058 | 39.0 | 37.050~40.950 |
| 3000 | Head | 2.40 | 2.280~2.520 | 38.5 | 36.575~40.425 |
| 3500 | Head | 2.91 | 2.765~3.055 | 37.9 | 36.005~39.795 |
| 4000 | Head | 3.43 | 3.259~3.601 | 37.4 | 35.530~39.270 |
| 4500 | Head | 3.94 | 3.743~4.137 | 36.8 | 34.960~38.640 |
| 5000 | Head | 4.45 | 4.228~4.672 | 36.2 | 34.390~38.010 |
| 5200 | Head | 4.66 | 4.427~4.893 | 36.0 | 34.200~37.800 |
| 5400 | Head | 4.86 | 4.617~5.103 | 35.8 | 34.010~37.590 |
| 5600 | Head | 5.07 | 4.817~5.323 | 35.5 | 33.725~37.275 |
| 5800 | Head | 5.27 | 5.007~5.533 | 35.3 | 33.535~37.065 |
| 6000 | Head | 5.48 | 5.206~5.754 | 35.1 | 33.345~36.855 |

## 9.2 Dielectric Performance

**Table 9.2-1: Dielectric Performance of Head Tissue Simulating Liquid**

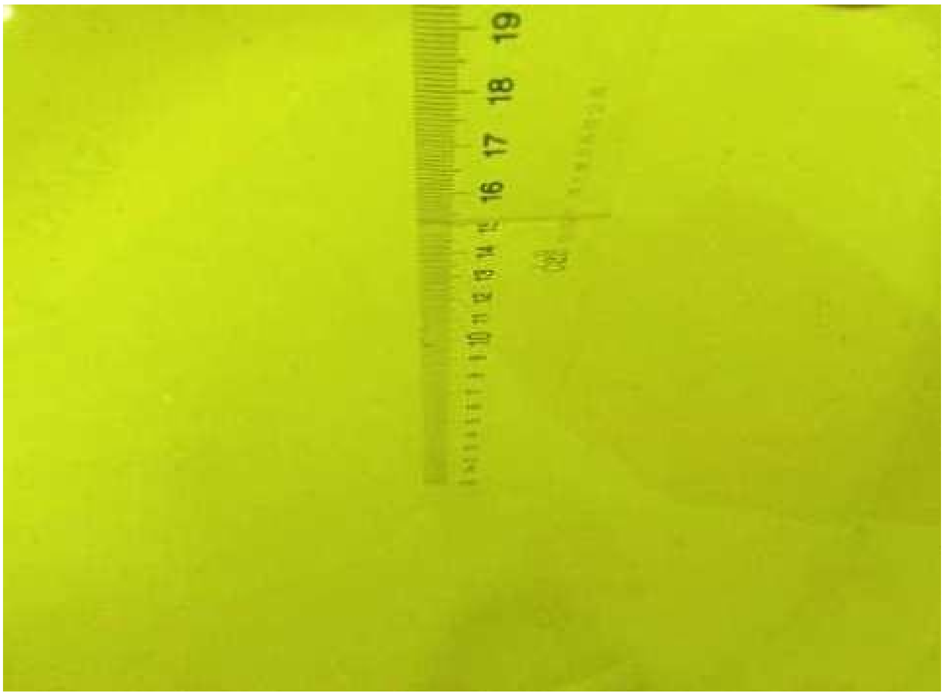
| Frequency (MHz) | Head(Standard) | | Temperature | Date | Test Result | | Deviation | |
|---|---|---|---|---|---|---|---|---|
| | Permittivity ε | Conductivity σ | | | Permittivity ε | Conductivity σ | Permittivity ε | Conductivity σ |
| 2450 | 39.20 | 1.80 | 20.7°C | 2025-03-25 | 40.158 | 1.851 | 2.44% | 2.83% |
| 2450 | 39.20 | 1.80 | 20.6°C | 2025-04-12 | 38.626 | 1.831 | -1.46% | 1.72% |
| 5250 | 36.05 | 4.71 | 20.5°C | 2025-03-26 | 36.299 | 4.797 | 0.69% | 1.85% |
| 5250 | 36.05 | 4.71 | 20.7°C | 2025-03-27 | 36.299 | 4.797 | 0.69% | 1.85% |
| 5250 | 36.05 | 4.71 | 20.6°C | 2025-04-10 | 35.664 | 4.775 | -1.07% | 1.38% |
| 5750 | 35.45 | 5.22 | 20.5°C | 2025-03-28 | 35.343 | 5.397 | -0.30% | 3.39% |
| 5750 | 35.45 | 5.22 | 20.5°C | 2025-04-02 | 35.343 | 5.397 | -0.30% | 3.39% |
| 5750 | 35.45 | 5.22 | 20.4°C | 2025-04-11 | 34.682 | 5.36 | -2.17% | 2.68% |

**Table 9.2-2: Dielectric Performance of Head Tissue Simulating Liquid**

| Frequency (MHz) | Head(Standard) | | Temperature | Date | Test Result | | Deviation | |
|---|---|---|---|---|---|---|---|---|
| | Permittivity ε | Conductivity σ | | | Permittivity ε | Conductivity σ | Permittivity ε | Conductivity σ |
| 2412 | 39.276 | 1.767 | 20.7°C | 2025-03-25 | 40.244 | 1.822 | 2.46% | 3.11% |
| 2437 | 39.226 | 1.789 | 20.7°C | 2025-03-25 | 40.187 | 1.841 | 2.45% | 2.91% |
| 2462 | 39.184 | 1.813 | 20.7°C | 2025-03-25 | 40.134 | 1.859 | 2.42% | 2.54% |
| 2412 | 39.276 | 1.767 | 20.6°C | 2025-04-12 | 38.690 | 1.801 | -1.49% | 1.92% |
| 2437 | 39.226 | 1.789 | 20.6°C | 2025-04-12 | 38.649 | 1.821 | -1.47% | 1.79% |
| 2462 | 39.184 | 1.813 | 20.6°C | 2025-04-12 | 38.609 | 1.839 | -1.47% | 1.43% |
| 2402 | 39.296 | 1.758 | 20.7°C | 2025-03-25 | 40.265 | 1.814 | 2.47% | 3.19% |
| 2441 | 39.218 | 1.792 | 20.7°C | 2025-03-25 | 40.178 | 1.844 | 2.45% | 2.90% |
| 2480 | 39.160 | 1.832 | 20.7°C | 2025-03-25 | 40.098 | 1.872 | 2.40% | 2.18% |
| 2402 | 39.296 | 1.758 | 20.6°C | 2025-04-12 | 38.703 | 1.793 | -1.51% | 1.99% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2441 | 39.218 | 1.792 | 20.6℃ | 2025-04-12 | 38.642 | 1.824 | -1.47% | 1.79% |
| 2480 | 39.160 | 1.832 | 20.6℃ | 2025-04-12 | 38.586 | 1.854 | -1.47% | 1.20% |
| 5180 | 36.020 | 4.639 | 20.5℃ | 2025-03-26 | 36.459 | 4.781 | 1.22% | 3.06% |
| 5200 | 36.000 | 4.660 | 20.5℃ | 2025-03-26 | 36.417 | 4.741 | 1.16% | 1.74% |
| 5240 | 35.960 | 4.700 | 20.5℃ | 2025-03-26 | 36.319 | 4.786 | 1.00% | 1.83% |
| 5180 | 36.020 | 4.639 | 20.6℃ | 2025-04-10 | 35.807 | 4.694 | -0.59% | 1.19% |
| 5200 | 36.000 | 4.660 | 20.6℃ | 2025-04-10 | 35.764 | 4.714 | -0.66% | 1.16% |
| 5240 | 35.960 | 4.700 | 20.6℃ | 2025-04-10 | 35.686 | 4.763 | -0.76% | 1.34% |
| 5260 | 35.940 | 4.720 | 20.7℃ | 2025-03-27 | 36.281 | 4.809 | 0.95% | 1.89% |
| 5280 | 35.920 | 4.740 | 20.7℃ | 2025-03-27 | 36.246 | 4.834 | 0.91% | 1.98% |
| 5320 | 35.880 | 4.780 | 20.7℃ | 2025-03-27 | 36.169 | 4.886 | 0.81% | 2.22% |
| 5260 | 35.940 | 4.720 | 20.6℃ | 2025-04-10 | 35.642 | 4.787 | -0.83% | 1.42% |
| 5280 | 35.920 | 4.740 | 20.6℃ | 2025-04-10 | 35.599 | 4.811 | -0.89% | 1.50% |
| 5320 | 35.880 | 4.780 | 20.6℃ | 2025-04-10 | 35.526 | 4.857 | -0.99% | 1.61% |
| 5500 | 35.650 | 4.965 | 20.5℃ | 2025-04-02 | 35.827 | 5.093 | 0.50% | 2.58% |
| 5580 | 35.530 | 5.049 | 20.5℃ | 2025-04-02 | 35.671 | 5.188 | 0.40% | 2.75% |
| 5700 | 35.400 | 5.170 | 20.5℃ | 2025-04-02 | 35.435 | 5.334 | 0.10% | 3.17% |
| 5500 | 35.650 | 4.965 | 20.4℃ | 2025-04-11 | 35.180 | 5.061 | -1.32% | 1.93% |
| 5580 | 35.530 | 5.049 | 20.4℃ | 2025-04-11 | 35.025 | 5.156 | -1.42% | 2.12% |
| 5700 | 35.400 | 5.170 | 20.4℃ | 2025-04-11 | 34.792 | 5.304 | -1.72% | 2.59% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5745 | 35.355 | 5.215 | 20.5℃ | 2025-03-28 | 35.355 | 5.391 | 0.00% | 3.37% |
| 5785 | 35.315 | 5.255 | 20.5℃ | 2025-03-28 | 35.259 | 5.434 | -0.16% | 3.41% |
| 5825 | 35.275 | 5.296 | 20.5℃ | 2025-03-28 | 35.185 | 5.482 | -0.26% | 3.51% |
| 5745 | 35.355 | 5.215 | 20.4℃ | 2025-4-11 | 34.692 | 5.355 | -1.88% | 2.68% |
| 5785 | 35.315 | 5.255 | 20.4℃ | 2025-4-11 | 34.621 | 5.401 | -1.97% | 2.78% |
| 5825 | 35.275 | 5.296 | 20.4℃ | 2025-4-11 | 34.554 | 5.449 | -2.04% | 2.89% |



**Picture 9.2-1: Liquid depth in the Flat Phantom**

# 10.System Validation

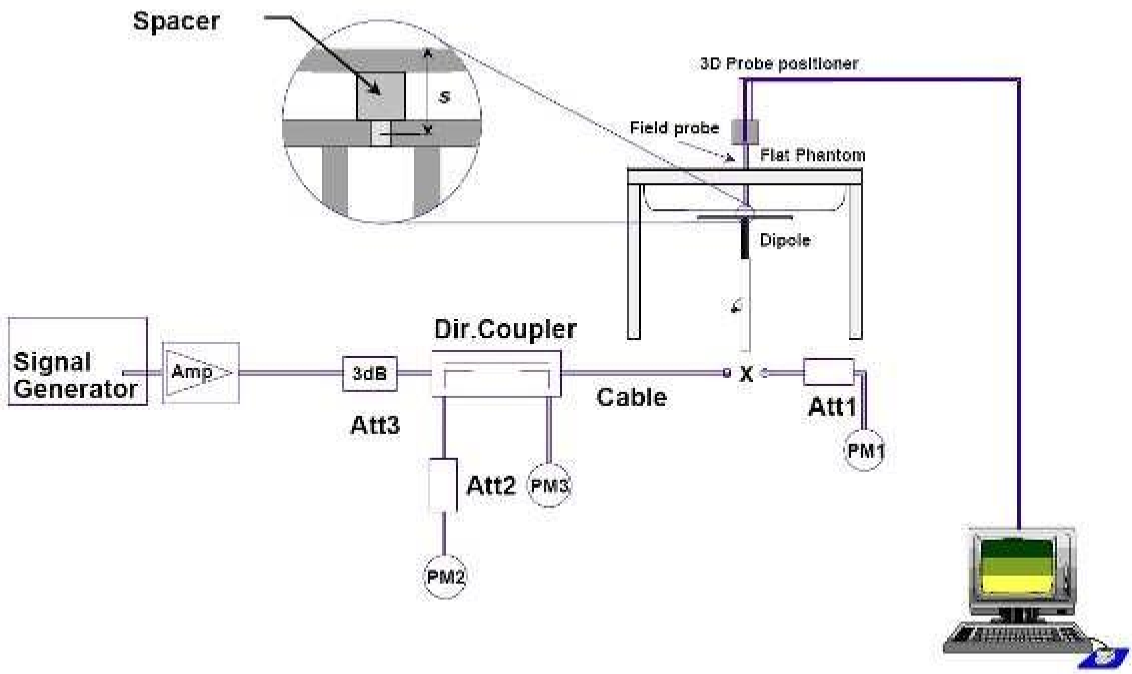
## 10.1 System Validation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performace check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

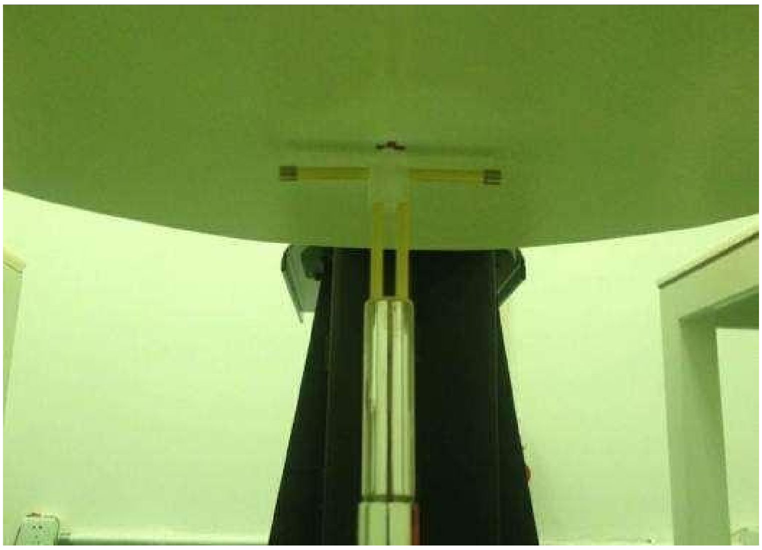
## 10.2 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

**Picture 10.2-1 System Setup for System Evaluation**




The output power on dipole port must be calibrated to 24 dBm (250mW) before dipole is connected. The results are normalized to 1 W input power.



Picture 10.2-1: Photo of Dipole Setup

Table 10.2-1: System Validation of Head

| Frequency (MHz) | Average Target Value (W/kg) | | Temperature | Date | Test Result (W/kg) | | Deviation (W/kg) | |
|---|---|---|---|---|---|---|---|---|
| | 10g | 1g | | | 10g | 1g | 10g | 1g |
| 2450 | 24.80 | 54.00 | 21.6℃ | 2025-03-25 | 24.60 | 53.20 | -0.81% | -1.48% |
| 2450 | 24.80 | 54.00 | 21.7℃ | 2025-04-12 | 24.84 | 53.60 | 0.16% | -0.74% |
| 5250 | 22.3 | 78.6 | 21.4℃ | 2025-03-26 | 22.80 | 79.20 | 2.24% | 0.76% |
| 5250 | 22.3 | 78.6 | 21.5℃ | 2025-03-27 | 22.50 | 79.30 | 0.90% | 0.89% |
| 5250 | 22.3 | 78.6 | 21.7℃ | 2025-04-10 | 23.00 | 80.70 | 3.14% | 2.67% |
| 5750 | 21.5 | 77.5 | 21.3℃ | 2025-03-28 | 22.20 | 78.30 | 3.26% | 1.03% |
| 5750 | 21.5 | 77.5 | 21.4℃ | 2025-04-02 | 21.60 | 76.60 | 0.47% | -1.16% |
| 5750 | 21.5 | 77.5 | 21.5℃ | 2025-04-11 | 21.50 | 76.10 | 0.00% | -1.81% |

NOTE 1: The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.
NOTE 2: The system verifies that the measured input power level is equivalent to 250mW for 0.6GHz to 3GHz and above 3GHz is equivalent to 100mW, and the measured results are compared with the target value by converting to 1W.

# 11. Measurement Procedures

## 11.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in Picture 19

**Step 1**: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band ($f_c$) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in Chapter 8),

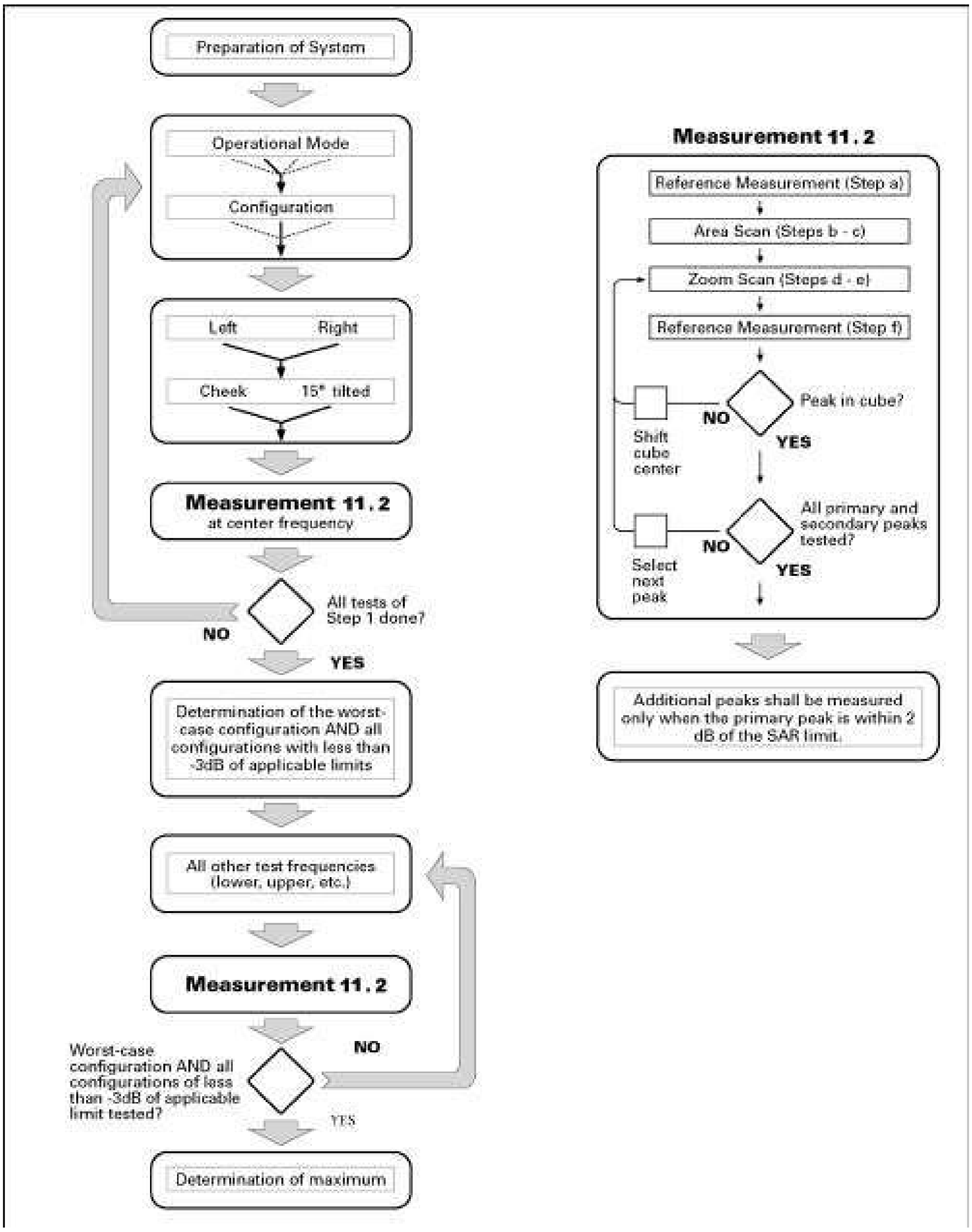
b) all configurations for each device position in a), e.g., antenna extended and retracted, and

c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., $N_c$ > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

**Step 2**: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 11.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

**Step 3**: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.




**Picture 11.1-1: Block diagram of the tests to be performed**

## 11.2 Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 19) described in 11.1:

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and In(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional uncertainty evaluation is needed.

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step

e) The horizontal grid step shall be (24 / f[GHz] ) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be ( 8-f[GHz] ) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and In(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5°. If this cannot be achieved an additional uncertainty evaluation is needed.

f) Use post processing( e.g. interpolation and extrapolation ) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

## 11.3 SAR Measurement for Bluetooth & Wi-Fi

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

## 11.4 Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Section 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

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# 12.Area Scan Based 1-g SAR

## 12.1 Requirement of KDB

According to the KDB447498D01v06,when the implementation is based the specific polynomial it algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007)and the estimated 1-g SARis≤1.2W/kg, a zoom scan measurement is not required provided it is also not needed For any other purpose ;for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between is tinctive peak sand scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements ,peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. The SAR system verification must also demonstrate that the area scan estimated 1-gSAR is within 3%of the zoom scan 1-g SAR (See Annex A).When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

## 12.2 Fast SAR Algorithms

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empiri call determined by analyzing a large number of phones. The MOTOROLAFASTSAR was developed and validated by the MOTOROLA Research Group in Ft .Lauderdale.

In the initial study, an approximation algorithm based on Linearf it was developed. The accuracy of the algorithm has been demonstrated across abroad frequency range(136-2450 MHz)andforboth1-gand 10-g averaged SAR using a sample of 264 SARmeasurementsfrom55 wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithmare1.2%and 5.8%for1-g and 10-g averaged SAR, respectively. The paper describing the algorith min detail is expected to be published inAugust2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomia lf it where by the frequency validity was extended to cover the range 30-6000MHz.Detailsof this study can be found in the BEMS2007 Proceedings.Both algorithms are implemented in DASY software.

# 13.Conducted Output Power

## 13.1 Conducted Output Power

**Table 13.1-1 The conducted power for Wi-Fi 2.4G**

| Wi-Fi 2.4G | | | Maximum Conducted Power (dBm) | |
|---|---|---|---|---|
| Mode | BW | Channel/Frequency(MHz) | Tune up(dBm) | Output Power(dBm) |
| 802.11b | 20M | 1/2412 | 20.00 | 19.13 |
| | | 6/2437 | 21.00 | 20.02 |
| | | 11/2462 | 20.00 | 18.79 |
| 802.11g | 20M | 1/2412 | 19.50 | 18.34 |
| | | 6/2437 | 19.50 | 19.15 |
| | | 11/2462 | 19.50 | 18.22 |
| 802.11n | 20M | 1/2412 | 19.50 | 18.17 |
| | | 6/2437 | 19.50 | 18.95 |
| | | 11/2462 | 19.50 | 18.05 |

**Table 13.1-2 The conducted power for Wi-Fi 5G**

| Wi-Fi 5G | | | | Maximum Conducted Power (dBm) | |
|---|---|---|---|---|---|
| | Mode | BW | Channel/Frequency(MHz) | Tune up | Output Power |
| U-NII-1 | 802.11a | 20M | 36/5180 | 17.50 | 16.40 |
| | | | 40/5200 | 17.50 | 16.48 |
| | | | 48/5240 | 16.50 | 15.42 |
| | 802.11n | 20M | 36/5180 | 16.50 | 15.81 |
| | | | 40/5200 | 16.50 | 15.90 |
| | | | 48/5240 | 16.50 | 15.26 |
| | | 40M | 38/5190 | 16.50 | 15.22 |
| | | | 46/5230 | 15.50 | 14.36 |
| | 802.11ac | 20M | 36/5180 | 17.00 | 15.97 |
| | | | 40/5200 | 17.00 | 15.87 |
| | | | 48/5240 | 16.00 | 15.28 |
| | | 40M | 38/5190 | 15.50 | 14.75 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 46/5230 | 15.50 | 14.14 |
| | | 80M | 42/5210 | 16.50 | 15.49 |
| U-NII-2A | 802.11a | 20M | 52/5260 | 16.00 | 14.96 |
| | | | 56/5280 | 16.00 | 15.16 |
| | | | 64/5320 | 16.00 | 15.73 |
| | 802.11n | 20M | 52/5260 | 16.00 | 14.82 |
| | | | 56/5280 | 16.00 | 15.06 |
| | | | 64/5320 | 16.00 | 15.66 |
| | | 40M | 54/5270 | 15.50 | 14.49 |
| | | | 62/5310 | 15.50 | 15.17 |
| | 802.11ac | 20M | 52/5260 | 16.50 | 15.34 |
| | | | 56/5280 | 16.50 | 15.61 |
| | | | 64/5320 | 16.50 | 16.20 |
| | | 40M | 54/5270 | 15.50 | 14.39 |
| | | | 62/5310 | 15.50 | 15.08 |
| | | 80M | 58/5290 | 15.50 | 14.84 |
| U-NII-2C | 802.11a | 20M | 100/5500 | 16.50 | 15.94 |
| | | | 116/5580 | 16.50 | 16.18 |
| | | | 140/5700 | 16.50 | 15.77 |
| | 802.11n | 20M | 100/5500 | 16.50 | 15.49 |
| | | | 116/5580 | 16.50 | 16.03 |
| | | | 140/5700 | 16.50 | 15.71 |
| | | 40M | 102/5510 | 15.50 | 14.69 |
| | | | 110/5550 | 15.50 | 14.44 |
| | | | 134/5670 | 15.50 | 15.00 |
| | 802.11ac | 20M | 100/5500 | 16.50 | 15.35 |
| | | | 116/5580 | 16.50 | 15.89 |
| | | | 140/5700 | 16.50 | 15.65 |
| | | 40M | 102/5510 | 16.00 | 14.90 |
| | | | 110/5550 | 16.00 | 14.38 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 134/5670 | 16.00 | 14.96 |
| | | 80M | 106/5530 | 12.00 | 10.95 |
| | | | 122/5610 | 16.50 | 15.58 |
| U-NII-3 | 802.11a | 20M | 149/5745 | 16.50 | 16.27 |
| | | | 157/5785 | 16.50 | 15.82 |
| | | | 165/5825 | 16.50 | 16.21 |
| | 802.11n | 20M | 149/5745 | 16.50 | 15.83 |
| | | | 157/5785 | 16.50 | 15.55 |
| | | | 165/5825 | 16.50 | 16.00 |
| | | 40M | 151/5755 | 16.00 | 15.39 |
| | | | 159/5795 | 16.00 | 14.21 |
| | 802.11ac | 20M | 149/5745 | 16.50 | 15.78 |
| | | | 157/5785 | 16.50 | 15.52 |
| | | | 165/5825 | 16.50 | 15.95 |
| | | 40M | 151/5755 | 15.50 | 14.55 |
| | | | 159/5795 | 15.50 | 13.52 |
| | | 80M | 155/5775 | 15.50 | 13.80 |

**Table 13.1-3 The conducted power for BT**

| Bluetooth | Maximum Output Power (dBm) | | | | | |
|---|---|---|---|---|---|---|
| Channel/Frequency(MHz) | 0/2402 | | 39/2441 | | 78/2480 | |
| Mode | Tune up | Output Power | Tune up | Output Power | Tune up | Output Power |
| DH5 | 9.50 | 8.58 | 9.50 | 8.96 | 9.50 | 7.64 |
| 2DH5 | 9.00 | 7.86 | 9.00 | 8.42 | 9.00 | 7.61 |
| 3DH5 | 9.00 | 7.84 | 9.00 | 8.38 | 9.00 | 7.60 |

| Mode | Channel/Frequency(MHz) | Tune up | Output Power |
|---|---|---|---|
| BLE 1M | 0/2402 | -3.00 | -3.88 |
| | 19/2440 | -1.50 | -2.57 |
| | 39/2480 | -3.00 | -4.29 |
| BLE 2M | 0/2402 | -3.00 | -3.78 |
| | 19/2440 | -1.50 | -2.37 |
| | 39/2480 | -3.00 | -4.04 |
| BLE 125k | 0/2402 | -3.00 | -3.84 |
| | 19/2440 | -1.50 | -2.52 |
| | 39/2480 | -3.00 | -4.15 |
| BLE 500k | 0/2402 | -3.00 | -3.67 |
| | 19/2440 | -1.50 | -2.37 |
| | 39/2480 | -3.00 | -4.07 |

**Table 13.1-4 The conducted power for NFC**

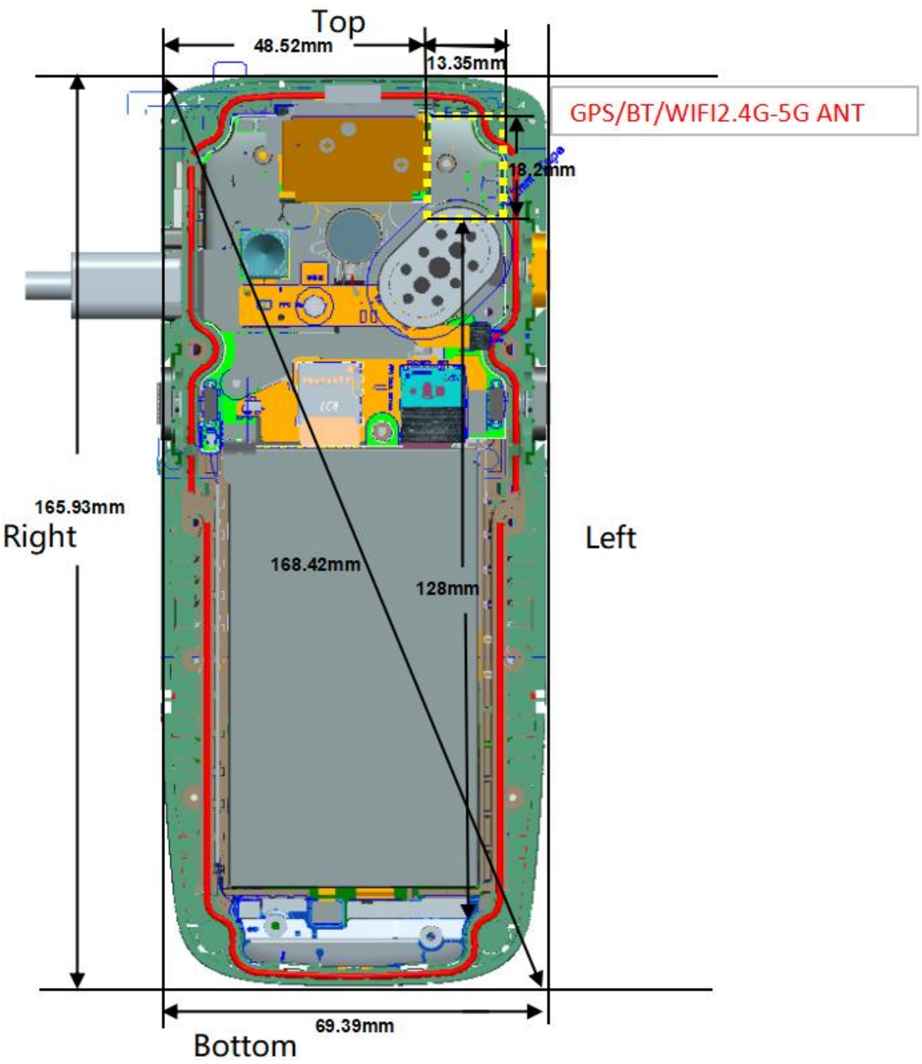
| Frequency(MHz) | dBμV/m @3m | EIRP(dBm) | Tune up(dBm) |
|---|---|---|---|
| 13.56 | 61.705 | -33.523 | -32.00 |
| Note: EIRP(dBm)=Radiated field strength(dBμV/m)+20Log(3)-104.77. | | | |

# 14.Simultaneous TX SAR Considerations

## 14.1 Introduction

The following procedures adopted from "FCC SAR Considerations for Cell Phones with Multiple Transmitters" are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter. For this device, Bluetooth cannot transmit simultaneously with other transmitters.

## 14.2 Transmit Antenna Position




Picture14.2-1 Antenna Position(back view)

## 14.3 Low Power Transmitters SAR Consideration

For ISED, according to RSS 102 issue6 section 6.3 Table 11 Power limits for exemption from routine SAR evaluation based on the separation distance:

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

SAR test exclusion for NFC separation≤5mm is 45mW, the maximum tune up power of NFC is -32.00 dBm(0.001mW), NFC can be exempted.

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation for low power transmitters is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\frac{(max.power\ of\ channel, including\ tune-up\ tolerance, mW)}{(min.test\ separation\ distance, mm)} \times \sqrt{Frequency(GHz)} \leq 3.0$$

Where:

- Frequency (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

SAR test exclusion for NFC separation＜50mm=[474*(1+log(100/f(MHz)))]/2=443 mW, the maximum tune up power of NFC is -32.00 dBm(0.001mW), NFC can be exempted.

## 14.4 Simultaneous Transmission for EUT

The device does not support simultaneous transmission.

# 15.SAR Test Result

## 15.1 SAR Result

Table 15.1-1: SAR Values for Wi-Fi 2.4G

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| Head SAR | | | | | | | | | | | | | | | |
| Left Touch | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.04 | 0.679 | 1.01 | 1.25 | 0.857 | / | 25B02W000005#S10 |
| Left Tilt 15° | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.03 | 0.715 | 1.01 | 1.25 | 0.902 | / | 25B02W000005#S10 |
| Right Touch | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.06 | 0.927 | 1.01 | 1.25 | **1.170** | **A1** | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.10 | 0.553 | 1.01 | 1.25 | 0.698 | / | 25B02W000005#S10 |
| Right Touch | Standard | 802.11b | 20 | 99.29% | 1 | 2412 | 19.13 | 20.00 | -0.07 | 0.659 | 1.01 | 1.22 | 0.811 | / | 25B02W000005#S10 |
| Right Touch | Standard | 802.11b | 20 | 100% | 11 | 2462 | 18.79 | 20.00 | 0.00 | 0.440 | 1.00 | 1.32 | 0.581 | / | 25B02W000005#S10 |
| Repeat | | | | | | | | | | | | | | | |
| Right Touch | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.03 | 0.923 | 1.01 | 1.25 | 1.165 | / | 25B02W000005#S10 |
| Body SAR (5mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.02 | 0.318 | 1.01 | 1.25 | 0.401 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.15 | 0.282 | 1.01 | 1.25 | 0.356 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.03 | 0.825 | 1.01 | 1.25 | **1.041** | **A2** | 25B02W000005#S9 |
| Left Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.06 | 0.783 | 1.01 | 1.25 | 0.988 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.02 | 0.128 | 1.01 | 1.25 | 0.162 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.12 | 0.445 | 1.01 | 1.25 | 0.562 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11b | 20 | 99.29% | 1 | 2412 | 19.13 | 20.00 | 0.07 | 0.638 | 1.01 | 1.22 | 0.785 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11b | 20 | 100% | 11 | 2462 | 18.79 | 20.00 | 0.08 | 0.562 | 1.00 | 1.32 | 0.743 | / | 25B02W000005#S9 |
| Repeat | | | | | | | | | | | | | | | |
| Back Tilt Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.02 | 0.821 | 1.01 | 1.25 | 1.036 | / | 25B02W000005#S9 |
| **Test Position** | **Cover Type** | **Mode** | **BW(MHz)** | **Duty Cycle** | **Channel** | **Frequency (MHz)** | **Measured power (dBm)** | **Tune-up (dBm)** | **Power Drift (dB)** | **Limit of 10gSAR 4.0 W/kg (mW/g)** | | | | **Figure No.** | **EUT** |
| | | | | | | | | | | **Measured SAR10g** | **Duty Cycle Scaling Factor** | **Scaling Factor** | **Report SAR10g** | | |
| Limb SAR (0mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.05 | 0.514 | 1.01 | 1.25 | 0.649 | / | 25B02W000005#S10 |
| Back Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.03 | 0.314 | 1.01 | 1.25 | 0.396 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.06 | 0.884 | 1.01 | 1.25 | **1.116** | **A3** | 25B02W000005#S10 |
| Left Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.02 | 0.835 | 1.01 | 1.25 | 1.054 | / | 25B02W000005#S10 |
| Right Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | 0.04 | 0.147 | 1.01 | 1.25 | 0.186 | / | 25B02W000005#S10 |
| Top Side | Standard | 802.11b | 20 | 99.29% | 6 | 2437 | 20.02 | 21.00 | -0.14 | 0.564 | 1.01 | 1.25 | 0.712 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11b | 20 | 99.29% | 1 | 2412 | 19.13 | 20.00 | -0.02 | 0.619 | 1.01 | 1.22 | 0.762 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11b | 20 | 100% | 11 | 2462 | 18.79 | 20.00 | 0.04 | 0.664 | 1.00 | 1.32 | 0.877 | / | 25B02W000005#S10 |

## Table 15.1-2: SAR Values for Wi-Fi 5G U-NII-1

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| Head SAR | | | | | | | | | | | | | | | |
| Left Touch | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.10 | 0.147 | 1.03 | 1.26 | 0.191 | / | 25B02W000005#S10 |
| Left Tilt 15° | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.05 | 0.178 | 1.03 | 1.26 | 0.232 | / | 25B02W000005#S10 |
| Right Touch | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.12 | 0.152 | 1.03 | 1.26 | 0.198 | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | -0.12 | 0.195 | 1.03 | 1.26 | 0.254 | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 97.20% | 36 | 5180 | 16.40 | 17.50 | 0.02 | 0.166 | 1.03 | 1.29 | 0.220 | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 97.22% | 48 | 5240 | 15.42 | 16.50 | 0.03 | 0.202 | 1.03 | 1.28 | **0.266** | A.4 | 25B02W000005#S10 |
| Body SAR (5mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.02 | 0.060 | 1.03 | 1.26 | 0.078 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.10 | 0.424 | 1.03 | 1.26 | 0.552 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.07 | 0.760 | 1.03 | 1.26 | 0.989 | / | 25B02W000005#S9 |
| Left Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.14 | 0.688 | 1.03 | 1.26 | 0.895 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.10 | 0.020 | 1.03 | 1.26 | 0.025 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | -0.03 | 0.338 | 1.03 | 1.26 | 0.440 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.20% | 36 | 5180 | 16.40 | 17.50 | 0.08 | 0.867 | 1.03 | 1.29 | **1.149** | A.5 | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 48 | 5240 | 15.42 | 16.50 | 0.04 | 0.827 | 1.03 | 1.28 | 1.091 | / | 25B02W000005#S9 |
| Repeat | | | | | | | | | | | | | | | |
| Back Tilt Side | Standard | 802.11a | 20 | 97.20% | 36 | 5180 | 16.40 | 17.50 | 0.09 | 0.866 | 1.03 | 1.29 | 1.148 | / | 25B02W000005#S9 |

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 10gSAR 4.0 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR10g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR10g | | |
| Limb SAR (0mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | -0.09 | 0.267 | 1.03 | 1.26 | 0.347 | / | 25B02W000005#S10 |
| Back Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.10 | 0.215 | 1.03 | 1.26 | 0.280 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.10 | 0.577 | 1.03 | 1.26 | 0.751 | / | 25B02W000005#S10 |
| Left Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.08 | 0.449 | 1.03 | 1.26 | 0.584 | / | 25B02W000005#S10 |
| Right Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | -0.10 | 0.013 | 1.03 | 1.26 | 0.017 | / | 25B02W000005#S10 |
| Top Side | Standard | 802.11a | 20 | 97.22% | 40 | 5200 | 16.48 | 17.50 | 0.03 | 0.260 | 1.03 | 1.26 | 0.338 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.20% | 36 | 5180 | 16.40 | 17.50 | 0.01 | 0.623 | 1.03 | 1.29 | 0.826 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 48 | 5240 | 15.42 | 16.50 | -0.02 | 0.683 | 1.03 | 1.28 | **0.901** | A.6 | 25B02W000005#S10 |

## Table 15.1-3: SAR Values for Wi-Fi 5G U-NII-2A

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| Head SAR | | | | | | | | | | | | | | | |
| Left Touch | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.16 | 0.151 | 1.04 | 1.07 | 0.168 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.10 | 0.198 | 1.04 | 1.07 | **0.220** | A7 | 25B02W000005#S9 |
| Right Touch | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.03 | 0.151 | 1.04 | 1.07 | 0.168 | / | 25B02W000005#S9 |
| Right Tilt 15° | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.02 | 0.168 | 1.04 | 1.07 | 0.187 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11ac | 20 | 97.04% | 52 | 5260 | 15.34 | 16.50 | 0.02 | 0.148 | 1.03 | 1.31 | 0.199 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11ac | 20 | 97.04% | 56 | 5280 | 15.61 | 16.50 | 0.10 | 0.160 | 1.03 | 1.23 | 0.202 | / | 25B02W000005#S9 |
| Body SAR (5mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.00 | 0.058 | 1.04 | 1.07 | 0.065 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.08 | 0.647 | 1.04 | 1.07 | 0.720 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.09 | 0.941 | 1.04 | 1.07 | 1.047 | A8 | 25B02W000005#S9 |
| Left Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.08 | 0.603 | 1.04 | 1.07 | 0.671 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.00 | 0.023 | 1.04 | 1.07 | 0.026 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.04 | 0.352 | 1.04 | 1.07 | 0.392 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 97.04% | 52 | 5260 | 15.34 | 16.50 | 0.11 | 0.855 | 1.03 | 1.31 | 1.151 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 97.04% | 56 | 5280 | 15.61 | 16.50 | 0.03 | 0.914 | 1.03 | 1.23 | **1.156** | / | 25B02W000005#S9 |
| Repeat | | | | | | | | | | | | | | | |
| Back Tilt Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.10 | 0.931 | 1.04 | 1.07 | 1.036 | / | 25B02W000005#S9 |
| **Test Position** | **Cover Type** | **Mode** | **BW(MHz)** | **Duty Cycle** | **Channel** | **Frequency (MHz)** | **Measured power (dBm)** | **Tune-up (dBm)** | **Power Drift (dB)** | **Limit of 10gSAR 4.0 W/kg (mW/g)** | | | | **Figure No.** | **EUT** |
| | | | | | | | | | | **Measured SAR10g** | **Duty Cycle Scaling Factor** | **Scaling Factor** | **Report SAR10g** | | |
| Limb SAR (0mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.07 | 0.074 | 1.04 | 1.07 | 0.082 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.02 | 0.230 | 1.04 | 1.07 | 0.256 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.14 | 0.827 | 1.04 | 1.07 | 0.920 | A9 | 25B02W000005#S9 |
| Left Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.02 | 0.425 | 1.04 | 1.07 | 0.473 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | 0.03 | 0.008 | 1.04 | 1.07 | 0.009 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11ac | 20 | 96.32% | 64 | 5320 | 16.20 | 16.50 | -0.07 | 0.277 | 1.04 | 1.07 | 0.308 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 97.04% | 52 | 5260 | 15.34 | 16.50 | -0.14 | 0.681 | 1.03 | 1.31 | 0.917 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11ac | 20 | 97.04% | 56 | 5280 | 15.61 | 16.50 | 0.06 | 0.789 | 1.03 | 1.23 | **0.998** | / | 25B02W000005#S9 |

**Table 15.1-4: SAR Values for Wi-Fi 5G U-NII-2C**

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| Head SAR | | | | | | | | | | | | | | | |
| Left Touch | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.173 | 1.03 | 1.08 | 0.192 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.288 | 1.03 | 1.08 | 0.319 | / | 25B02W000005#S9 |
| Right Touch | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.098 | 1.03 | 1.08 | 0.109 | / | 25B02W000005#S9 |
| Right Tilt 15° | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.156 | 1.03 | 1.08 | 0.173 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11a | 20 | 96.53% | 100 | 5500 | 15.94 | 16.50 | 0.10 | 0.299 | 1.04 | 1.14 | **0.352** | A.10 | 25B02W000005#S9 |
| Left Tilt 15° | Standard | 802.11a | 20 | 97.22% | 140 | 5700 | 15.77 | 16.50 | 0.00 | 0.213 | 1.03 | 1.18 | 0.259 | / | 25B02W000005#S9 |
| Body SAR (5mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.073 | 1.03 | 1.08 | 0.081 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.02 | 0.691 | 1.03 | 1.08 | 0.765 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.08 | 0.968 | 1.03 | 1.08 | 1.072 | A.11 | 25B02W000005#S9 |
| Left Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.06 | 0.428 | 1.03 | 1.08 | 0.474 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.03 | 0.049 | 1.03 | 1.08 | 0.054 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | -0.08 | 0.292 | 1.03 | 1.08 | 0.323 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 100 | 5500 | 15.94 | 16.50 | 0.10 | 0.955 | 1.04 | 1.14 | **1.125** | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 140 | 5700 | 15.77 | 16.50 | 0.09 | 0.871 | 1.03 | 1.18 | 1.060 | / | 25B02W000005#S9 |
| Repeat | | | | | | | | | | | | | | | |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.02 | 0.919 | 1.03 | 1.08 | 1.018 | / | 25B02W000005#S9 |
| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 10gSAR 4.0 W/kg (mW/g) | | | | Figure No. | EUT |
| | | | | | | | | | | Measured SAR10g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR10g | | |
| Limb SAR (0mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.00 | 0.056 | 1.03 | 1.08 | 0.062 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.11 | 0.453 | 1.03 | 1.08 | 0.502 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.06 | 0.662 | 1.03 | 1.08 | 0.733 | / | 25B02W000005#S9 |
| Left Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.16 | 0.287 | 1.03 | 1.08 | 0.318 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.13 | 0.022 | 1.03 | 1.08 | 0.024 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11a | 20 | 97.22% | 116 | 5580 | 16.18 | 16.50 | 0.02 | 0.224 | 1.03 | 1.08 | 0.248 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 100 | 5500 | 15.94 | 16.50 | 0.09 | 0.733 | 1.04 | 1.14 | **0.864** | A.12 | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.22% | 140 | 5700 | 15.77 | 16.50 | 0.05 | 0.496 | 1.03 | 1.18 | 0.604 | / | 25B02W000005#S9 |

## Table 15.1-5: SAR Values for Wi-Fi 5G U-NII-3

| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| Head SAR | | | | | | | | | | | | | | | |
| Left Touch | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.03 | 0.156 | 1.04 | 1.17 | 0.189 | / | 25B02W000005#S10 |
| Left Tilt 15° | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | -0.03 | 0.181 | 1.04 | 1.17 | 0.219 | / | 25B02W000005#S10 |
| Right Touch | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.04 | 0.147 | 1.04 | 1.17 | 0.178 | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.02 | 0.202 | 1.04 | 1.17 | **0.245** | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 96.53% | 149 | 5745 | 16.27 | 16.50 | 0.04 | 0.176 | 1.04 | 1.05 | 0.192 | / | 25B02W000005#S10 |
| Right Tilt 15° | Standard | 802.11a | 20 | 97.20% | 165 | 5825 | 16.21 | 16.50 | -0.05 | 0.218 | 1.03 | 1.07 | 0.240 | A13 | 25B02W000005#S10 |
| Body SAR (5mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.00 | 0.076 | 1.04 | 1.17 | 0.092 | / | 25B02W000005#S9 |
| Back Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.02 | 0.613 | 1.04 | 1.17 | 0.743 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.05 | 0.907 | 1.04 | 1.17 | 1.099 | / | 25B02W000005#S9 |
| Left Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.10 | 0.293 | 1.04 | 1.17 | 0.355 | / | 25B02W000005#S9 |
| Right Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.10 | 0.025 | 1.04 | 1.17 | 0.030 | / | 25B02W000005#S9 |
| Top Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.07 | 0.286 | 1.04 | 1.17 | 0.347 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 149 | 5745 | 16.27 | 16.50 | 0.02 | 1.030 | 1.04 | 1.05 | **1.125** | A14 | 25B02W000005#S9 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.20% | 165 | 5825 | 16.21 | 16.50 | 0.02 | 0.951 | 1.03 | 1.07 | 1.046 | / | 25B02W000005#S9 |
| Repeat | | | | | | | | | | | | | | | |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 149 | 5745 | 16.27 | 16.50 | 0.16 | 1.000 | 1.04 | 1.05 | 1.092 | / | 25B02W000005#S9 |
| Test Position | Cover Type | Mode | BW(MHz) | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 10gSAR 4.0 W/kg (mW/g) | | | | Figure No. | EUT |
| | | | | | | | | | | Measured SAR10g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR10g | | |
| Limb SAR (0mm) | | | | | | | | | | | | | | | |
| Front Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.00 | 0.053 | 1.04 | 1.17 | 0.064 | / | 25B02W000005#S10 |
| Back Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.02 | 0.352 | 1.04 | 1.17 | 0.426 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.10 | 0.505 | 1.04 | 1.17 | 0.612 | / | 25B02W000005#S10 |
| Left Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.06 | 0.174 | 1.04 | 1.17 | 0.211 | / | 25B02W000005#S10 |
| Right Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | 0.03 | 0.025 | 1.04 | 1.17 | 0.030 | / | 25B02W000005#S10 |
| Top Side | Standard | 802.11a | 20 | 96.53% | 157 | 5785 | 15.82 | 16.50 | -0.12 | 0.264 | 1.04 | 1.17 | 0.320 | / | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 96.53% | 149 | 5745 | 16.27 | 16.50 | 0.10 | 0.563 | 1.04 | 1.05 | **0.615** | A15 | 25B02W000005#S10 |
| Back Tilt Side | Standard | 802.11a | 20 | 97.20% | 165 | 5825 | 16.21 | 16.50 | 0.06 | 0.526 | 1.03 | 1.07 | 0.579 | / | 25B02W000005#S10 |

**Table 15.1-6: SAR Values for BT**

| Test Position | Cover Type | Mode | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 1gSAR 1.6 W/kg (mW/g) | | | | Figure No. | EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Measured SAR1g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR1g | | |
| **Head SAR** | | | | | | | | | | | | | | |
| Left Touch | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.03 | 0.025 | 1.30 | 1.13 | 0.038 | / | 25B02W000005#S9 |
| Left Tilt 15° | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.04 | 0.032 | 1.30 | 1.13 | 0.048 | / | 25B02W000005#S9 |
| Right Touch | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.06 | 0.043 | 1.30 | 1.13 | **0.064** | A.16 | 25B02W000005#S9 |
| Right Tilt 15° | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | -0.03 | 0.025 | 1.30 | 1.13 | 0.036 | / | 25B02W000005#S9 |
| Right Touch | Standard | DH5 | 76.66% | 0 | 2402 | 8.58 | 9.50 | 0.07 | 0.030 | 1.30 | 1.24 | 0.048 | / | 25B02W000005#S9 |
| Right Touch | Standard | DH5 | 76.66% | 78 | 2480 | 7.64 | 9.50 | -0.01 | 0.027 | 1.30 | 1.53 | 0.053 | / | 25B02W000005#S9 |
| **Body SAR (5mm)** | | | | | | | | | | | | | | |
| Front Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.05 | 0.018 | 1.30 | 1.13 | 0.027 | / | 25B02W000005#S9 |
| Back Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.10 | 0.014 | 1.30 | 1.13 | 0.021 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.10 | 0.042 | 1.30 | 1.13 | 0.062 | / | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.08 | 0.048 | 1.30 | 1.13 | **0.071** | A.17 | 25B02W000005#S9 |
| Right Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.10 | 0.002 | 1.30 | 1.13 | 0.003 | / | 25B02W000005#S9 |
| Top Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.02 | 0.020 | 1.30 | 1.13 | 0.029 | / | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 0 | 2402 | 8.58 | 9.50 | 0.04 | 0.028 | 1.30 | 1.24 | 0.045 | / | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 78 | 2480 | 7.64 | 9.50 | 0.05 | 0.023 | 1.30 | 1.53 | 0.047 | / | 25B02W000005#S9 |
| Test Position | Cover Type | Mode | Duty Cycle | Channel | Frequency (MHz) | Measured power (dBm) | Tune-up (dBm) | Power Drift (dB) | Limit of 10gSAR 4.0 W/kg (mW/g) | | | | Figure No. | EUT |
| | | | | | | | | | Measured SAR10g | Duty Cycle Scaling Factor | Scaling Factor | Report SAR10g | | |
| **Limb SAR (0mm)** | | | | | | | | | | | | | | |
| Front Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | -0.09 | 0.026 | 1.30 | 1.13 | 0.038 | / | 25B02W000005#S9 |
| Back Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | -0.10 | 0.017 | 1.30 | 1.13 | 0.026 | / | 25B02W000005#S9 |
| Back Tilt Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.10 | 0.039 | 1.30 | 1.13 | 0.057 | / | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.07 | 0.045 | 1.30 | 1.13 | 0.066 | / | 25B02W000005#S9 |
| Right Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | 0.04 | 0.007 | 1.30 | 1.13 | 0.011 | / | 25B02W000005#S9 |
| Top Side | Standard | DH5 | 76.66% | 39 | 2441 | 8.96 | 9.50 | -0.01 | 0.033 | 1.30 | 1.13 | 0.049 | / | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 0 | 2402 | 8.58 | 9.50 | 0.03 | 0.075 | 1.30 | 1.24 | **0.121** | A.18 | 25B02W000005#S9 |
| Left Side | Standard | DH5 | 76.66% | 78 | 2480 | 7.64 | 9.50 | 0.02 | 0.059 | 1.30 | 1.53 | 0.118 | / | 25B02W000005#S9 |

## 15.2. SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

2) When the original highest measured SAR is ≥0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥1.45W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

**Table15.2-1 SAR Measurement Variability (1g)**

| Band | Frequency | | Mode | Test Position | Distance (mm) | Original Measured SAR (W/kg) | First Repeated measured SAR (W/kg) | The Ratio |
|---|---|---|---|---|---|---|---|---|
| | Ch. | MHz | | | | | | |
| Wi-Fi2.4G | 6 | 2437 | 802.11b | Right Touch | 0 | 0.927 | 0.923 | 1.004 |
| Wi-Fi5G | 36 | 5180 | 802.11a | Back Tilt Side | 5 | 0.867 | 0.866 | 1.001 |
| Wi-Fi5G | 64 | 5320 | 802.11ac | Back Tilt Side | 5 | 0.941 | 0.931 | 1.011 |
| Wi-Fi5G | 116 | 5580 | 802.11a | Back Tilt Side | 5 | 0.968 | 0.919 | 1.053 |
| Wi-Fi5G | 149 | 5745 | 802.11a | Back Tilt Side | 5 | 1.030 | 1.000 | 1.030 |

# 16. Measurement Uncertainty

**Measurement Uncertainty for Normal SAR Tests (below 3GHz)**

| Error Description | Uncert. Value | Prob. Dist. | Div. | (Ci) 1g | (Ci) 10g | Std. Unc.[%] (1g) | Std. Unc.[%] (10g) | (Ui) veff |
|---|---|---|---|---|---|---|---|---|
| Measurement System | | | | | | | | |
| Probe Calibration | 6.0 | N | 1 | 1 | 1 | 6.00 | 6.00 | ∞ |
| Axial Isotropy | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | R | $\sqrt{3}$ | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary effects | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Linearity | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | N | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Response Time | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.50 | 0.50 | ∞ |
| Integration Time | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF ambient conditions-noise | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-reection | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| Probe Positioned mech.retrictions | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.23 | 0.23 | ∞ |
| Probe Positioning with respect to phantom shell | 2.9 | R | $\sqrt{3}$ | 1 | 1 | 1.67 | 1.67 | ∞ |
| Post-processing | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.31 | 2.31 | ∞ |
| Test Sample Related | | | | | | | | |
| Device Holder | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 4 |
| Test dample Positioning | 0.5 | N | 1 | 1 | 1 | 0.50 | 0.50 | 63 |
| Power Drift | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.89 | 2.89 | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | 6.1 | R | $\sqrt{3}$ | 1 | 1 | 3.5 | 3.5 | ∞ |
| Liquid Conductivity (target) | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.85 | 1.24 | ∞ |
| Liquid Conductivity (meas.) | 2.0 | N | 1 | 0.64 | 0.43 | 1.28 | 0.86 | ∞ |
| Liquid Permittivity (target) | 5.00 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.73 | 1.41 | ∞ |
| Liquid Permittivity (meas.) | 1.2 | N | 1 | 0.6 | 0.49 | 0.72 | 0.59 | ∞ |
| Combined Std. Uncertainty | $U_c = \sqrt{\sum_{i=1}^{n} Ci^2 Ui^2}$ | RSS | | | | 9.95 | 9.83 | |
| Expanded STD Uncertainty(confidence interval of 95%) | $U_e = 2U_c$ | | | | | 19.90 | 19.66 | |

## Measurement Uncertainty for Fast SAR Tests (below 3GHz)

| Error Description | Uncert. Value | Prob. Dist. | Div. | (Ci) 1g | (Ci) 10g | Std. Unc.[%] (1g) | Std. Unc.[%] (10g) | (Ui) veff |
|---|---|---|---|---|---|---|---|---|
| Measurement System | | | | | | | | |
| Probe Calibration | 6.0 | N | 1 | 1 | 1 | 6.00 | 6.00 | ∞ |
| Axial Isotropy | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | R | $\sqrt{3}$ | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary effects | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Linearity | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | N | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Response Time | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.50 | 0.50 | ∞ |
| Integration Time | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF ambient conditions-noise | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-reflection | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| Probe Positioned mech.retrictions | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.23 | 0.23 | ∞ |
| Probe Positioning with respect to phantom shell | 2.9 | R | $\sqrt{3}$ | 1 | 1 | 1.67 | 1.67 | ∞ |
| Post-processing | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.31 | 2.31 | ∞ |
| Fast SAR-Z-Approximation | 7.0 | R | $\sqrt{3}$ | 1 | 1 | 4.0 | 4.0 | ∞ |
| Test Sample Related | | | | | | | | |
| Device Holder | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 4 |
| Test sample Positioning | 0.5 | N | 1 | 1 | 1 | 0.50 | 0.50 | 63 |
| Power Drift | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.89 | 2.89 | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | 6.1 | R | $\sqrt{3}$ | 1 | 1 | 3.5 | 3.5 | ∞ |
| Liquid Conductivity (target) | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.85 | 1.24 | ∞ |
| Liquid Conductivity (meas.) | 2.0 | N | 1 | 0.64 | 0.43 | 1.28 | 0.86 | ∞ |
| Liquid Permittivity (target) | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.73 | 1.41 | ∞ |
| Liquid Permittivity (meas.) | 1.2 | N | 1 | 0.6 | 0.49 | 0.72 | 0.59 | ∞ |
| Combined Std. Uncertainty | $U_c' = \sqrt{\sum_{i=1}^{n} Ci^2 Ui^2}$ | RSS | | | | 9.95 | 9.83 | |
| Expanded STD Uncertainty (confidence interval of 95%) | $U_e = 2U_c$ | | | | | 19.90 | 19.66 | |

## Measurement Uncertainty for Normal SAR Tests (3GHz-6GHz)

| Error Description | Uncert. Value | Prob. Dist. | Div. | (Ci) 1g | (Ci) 10g | Std. Unc.[%] (1g) | Std. Unc.[%] (10g) | (Ui) veff |
|---|---|---|---|---|---|---|---|---|
| Measurement System | | | | | | | | |
| Probe Calibration | 6.55 | N | 1 | 1 | 1 | 6.55 | 6.55 | ∞ |
| Axial Isotropy | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | R | $\sqrt{3}$ | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary effects | 2.0 | R | $\sqrt{3}$ | 1 | 1 | 1.15 | 1.15 | ∞ |
| Linearity | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | N | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Response Time | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.50 | 0.50 | ∞ |
| Integration Time | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF ambient conditions-noise | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-reflection | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| Probe Positioned mech.retrictions | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.23 | 0.23 | ∞ |
| Probe Positioning with respect to phantom shell | 6.7 | R | $\sqrt{3}$ | 1 | 1 | 3.87 | 3.87 | ∞ |
| Post-processing | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.31 | 2.31 | ∞ |
| Test Sample Related | | | | | | | | |
| Device Holder | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 4 |
| Test dample Positioning | 0.5 | N | 1 | 1 | 1 | 0.50 | 0.50 | 63 |
| Power Drift | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.89 | 2.89 | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | 6.6 | R | $\sqrt{3}$ | 1 | 1 | 3.8 | 3.8 | ∞ |
| Liquid Conductivity (target) | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.85 | 1.24 | ∞ |
| Liquid Conductivity (meas.) | 2.0 | N | 1 | 0.64 | 0.43 | 1.28 | 0.86 | ∞ |
| Liquid Permittivity (target) | 5.00 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.73 | 1.41 | ∞ |
| Liquid Permittivity (meas.) | 1.2 | N | 1 | 0.6 | 0.49 | 0.72 | 0.59 | ∞ |
| Combined Std. Uncertainty | $U_c' = \sqrt{\sum_{i=1}^{n} Ci^2 Ui^2}$ | RSS | | | | 11.01 | 10.91 | |
| Expanded STD Uncertainty (confidence interval of 95%) | $U_e = 2U_c$ | | | | | 22.03 | 21.81 | |

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## Measurement Uncertainty for Fast SAR Tests (3GHz-6GHz)

| Error Description | Uncert. Value | Prob. Dist. | Div. | (Ci) 1g | (Ci) 10g | Std. Unc.[%] (1g) | Std. Unc.[%] (10g) | (Ui) veff |
|---|---|---|---|---|---|---|---|---|
| Measurement System | | | | | | | | |
| Probe Calibration | 6.55 | N | 1 | 1 | 1 | 6.55 | 6.55 | ∞ |
| Axial Isotropy | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | R | $\sqrt{3}$ | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary effects | 2.0 | R | $\sqrt{3}$ | 1 | 1 | 1.15 | 1.15 | ∞ |
| Linearity | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | N | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Response Time | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.50 | 0.50 | ∞ |
| Integration Time | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF ambient conditions-noise | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-re ection | 0 | R | $\sqrt{3}$ | 1 | 1 | 0.00 | 0.00 | ∞ |
| Probe Positioned mech.retrictions | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.23 | 0.23 | ∞ |
| Probe Positioning with respect to phantom shell | 6.7 | R | $\sqrt{3}$ | 1 | 1 | 3.87 | 3.87 | ∞ |
| Post-processing | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.31 | 2.31 | ∞ |
| Fast SAR-Z-Approximation | 14.0 | R | $\sqrt{3}$ | 1 | 1 | 8.10 | 8.10 | ∞ |
| Test Sample Related | | | | | | | | |
| Device Holder | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 4 |
| Test dample Positioning | 0.5 | N | 1 | 1 | 1 | 0.50 | 0.50 | 63 |
| Power Drift | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.89 | 2.89 | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | 6.6 | R | $\sqrt{3}$ | 1 | 1 | 3.8 | 3.8 | ∞ |
| Liquid Conductivity (target) | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.85 | 1.24 | ∞ |
| Liquid Conductivity (meas.) | 2.0 | N | 1 | 0.64 | 0.43 | 1.28 | 0.86 | ∞ |
| Liquid Permittivity (target) | 5.00 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.73 | 1.41 | ∞ |
| Liquid Permittivity (meas.) | 1.2 | N | 1 | 0.6 | 0.49 | 0.72 | 0.59 | ∞ |
| Combined Std. Uncertainty | $U_c = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$ | RSS | | | | 13.67 | 13.58 | |
| Expanded STD Uncertainty(confidence interval of 95%) | $U_e = 2U_c$ | | | | | 27.34 | 27.17 | |

# 17. MAIN TEST INSTRUMENTS

## 17.1 Main Instruments

**Table 17-1: List of Main Instruments**

| No. | Name | Type | Serial Number | Software version | Hardware version | Calibration validity period |
|---|---|---|---|---|---|---|
| 1 | Radio Communication Analyzer | CMW500 | 109616 | -- | -- | 2025-05-26 |
| 2 | Network Analyzer | E5071C | MY46212462 | A.10.0x | 8.0 | 2025-05-22 |
| 3 | Power Meter | N1914A | MY50001660 | -- | -- | 2025-05-26 |
| 4 | Power Sensor | E8481H | MY51020011 | -- | -- | 2025-05-26 |
| 5 | Dipole Validation Kit | D5GHzV2 | 1121 | -- | -- | 2026-12-11 |
| 6 | Signal Generator | N5181A | MY50143363 | -- | -- | 2025-05-26 |
| 7 | Dipole Validation Kit | D2450V2 | 886 | -- | -- | 2026-12-11 |
| 8 | E-field Probe | EX3DV4 | 3844 | -- | -- | 2025-09-04 |
| 9 | DAE | DAE4 | 1329 | -- | -- | 2025-09-04 |

## 17.2 Test software

| No. | Name | Manufacture | SN | version |
|---|---|---|---|---|
| 1 | SAR Testing System Software | speag | -- | 5210.4.1527 |

***END OF REPORT BODY***

# ANNEX A. GRAPH RESULTS

## Wi-Fi 2.4G 802.11b Right Touch Mode Middle

Date/Time: 2025/3/25

Electronics: DAE4 Sn1329

Medium parameters used: f = 2437 MHz; $\sigma$ = 1.841 S/m; $\varepsilon_r$ = 40.187; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:21.6°C  Liquid Temperature:20.6°C

Communication System: WLan 2450MHz; Frequency: 2437 MHz; Duty Cycle: 1:1

Probe: EX3DV4 – SN3844ConvF(7.75, 7.75, 7.75) @ 2437 MHz

**Wi-Fi 2.4G 802.11b Right Touch Mode Middle/Area Scan (11x6x1):**

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

Maximum value of SAR (measured) = 1.37 W/kg

**Wi-Fi 2.4G 802.11b Right Touch Mode Middle/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 19.90 V/m; Power Drift = -0.06 dB

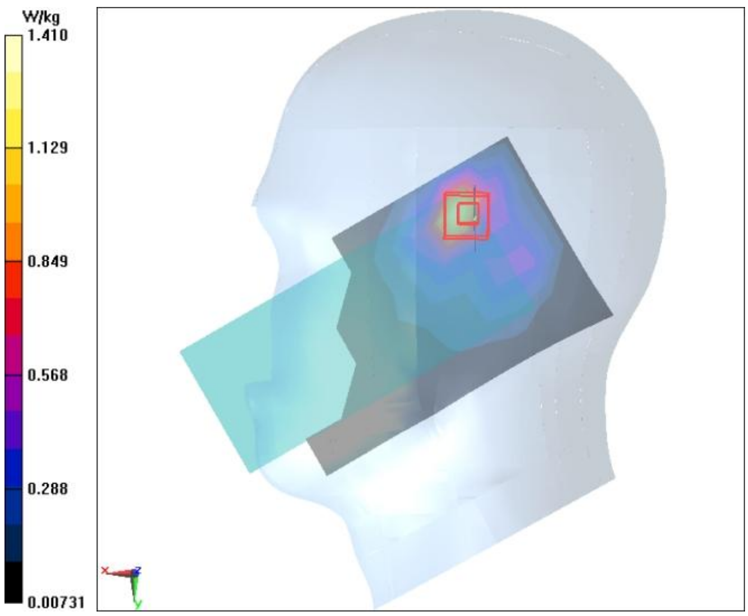
Peak SAR (extrapolated) = 1.88 W/kg

**SAR(1 g) = 0.927 W/kg; SAR(10 g) = 0.434 W/kg**

Smallest distance from peaks to all points 3 dB below = 11.5 mm

Ratio of SAR at M2 to SAR at M1 = 50.8%

Maximum value of SAR (measured) = 1.41 W/kg




A.1

## Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 5mm

Date/Time: 2025/4/12

Electronics: DAE4 Sn1329

Medium parameters used: f = 2437 MHz; σ = 1.821 S/m; $\varepsilon_r$ = 38.649; ρ = 1000 kg/$m^3$

Ambient Temperature:21.5°C    Liquid Temperature:20.6°C

Communication System: WLan 2450MHz;  Frequency: 2437 MHz; Duty Cycle: 1:1

Probe: EX3DV4 – SN3844ConvF(7.75, 7.75, 7.75) @ 2437 MHz

**Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 5mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.03 W/kg

**Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 5mm/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 5.398 V/m; Power Drift = 0.03 dB

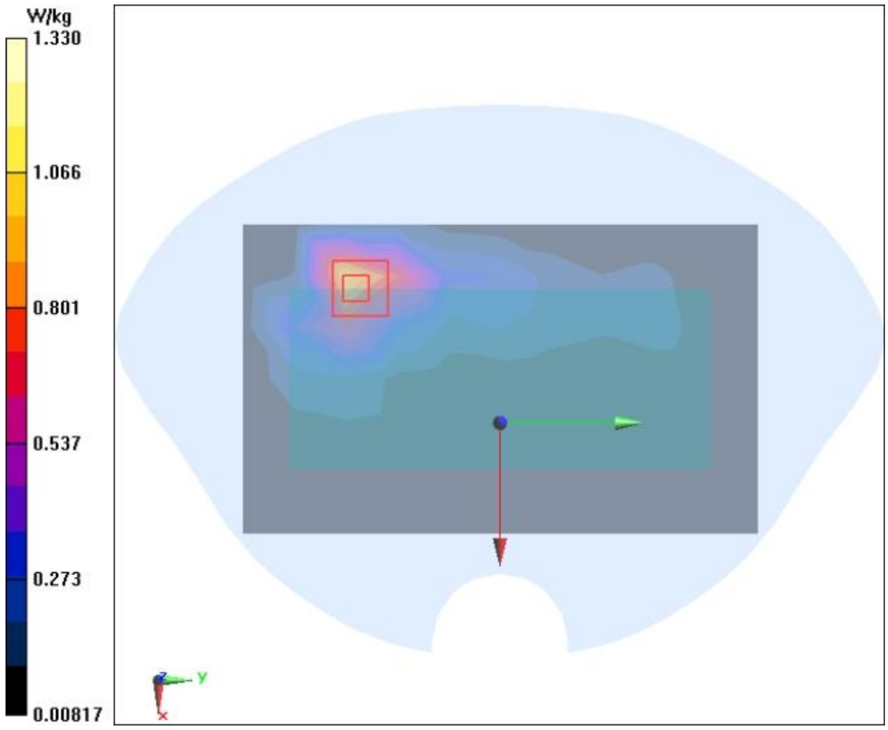
Peak SAR (extrapolated) = 1.65 W/kg

**SAR(1 g) = 0.825 W/kg; SAR(10 g) = 0.408 W/kg**

Smallest distance from peaks to all points 3 dB below = 11.3 mm

Ratio of SAR at M2 to SAR at M1 = 51.7%

Maximum value of SAR (measured) = 1.33 W/kg




A.2

## Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 0mm

Date/Time: 2025/4/12

Electronics: DAE4 Sn1329

Medium parameters used: f = 2437 MHz; σ = 1.821 S/m; $\varepsilon_r$ = 38.649; ρ = 1000 kg/m$^3$

Ambient Temperature:21.5°C    Liquid Temperature:20.6°C

Communication System: WLan 2450MHz;  Frequency: 2437 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2437 MHz

**Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 0mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 2.15 W/kg

**Wi-Fi 2.4G 802.11b Back Tilt Side Mode Middle 0mm/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 5.304 V/m; Power Drift = 0.06 dB

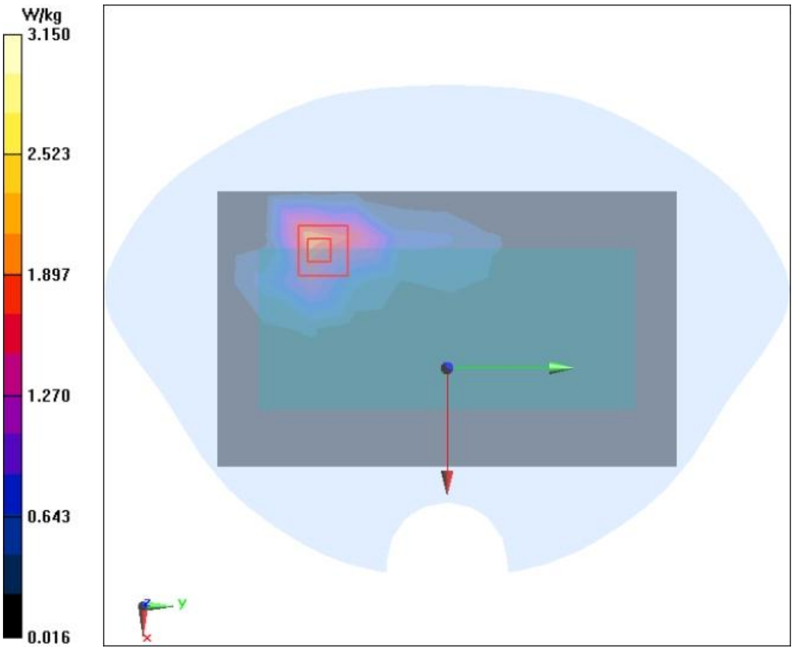
Peak SAR (extrapolated) = 4.25 W/kg

**SAR(1 g) = 1.93 W/kg; SAR(10 g) = 0.884 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.1 mm

Ratio of SAR at M2 to SAR at M1 = 49.2%

Maximum value of SAR (measured) = 3.15 W/kg




A.3

## WiFi 5G 802.11a Right Tilt Mode High

Date/Time: 2025/3/26

Electronics: DAE4 Sn1329

Medium parameters used: f = 5240 MHz; σ = 4.786 S/m; $\varepsilon_r$ = 36.319; ρ = 1000 kg/m$^3$

Ambient Temperature:21.4°C    Liquid Temperature:20.5°C

Communication System: 5G-U-NII-1;  Frequency: 5240 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5240 MHz

**WiFi 5G 802.11a Right Tilt Mode High/Area Scan (11x6x1):**

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

Maximum value of SAR (measured) = 0.407 W/kg

**WiFi 5G 802.11a Right Tilt Mode High/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.863 V/m; Power Drift = 0.03 dB

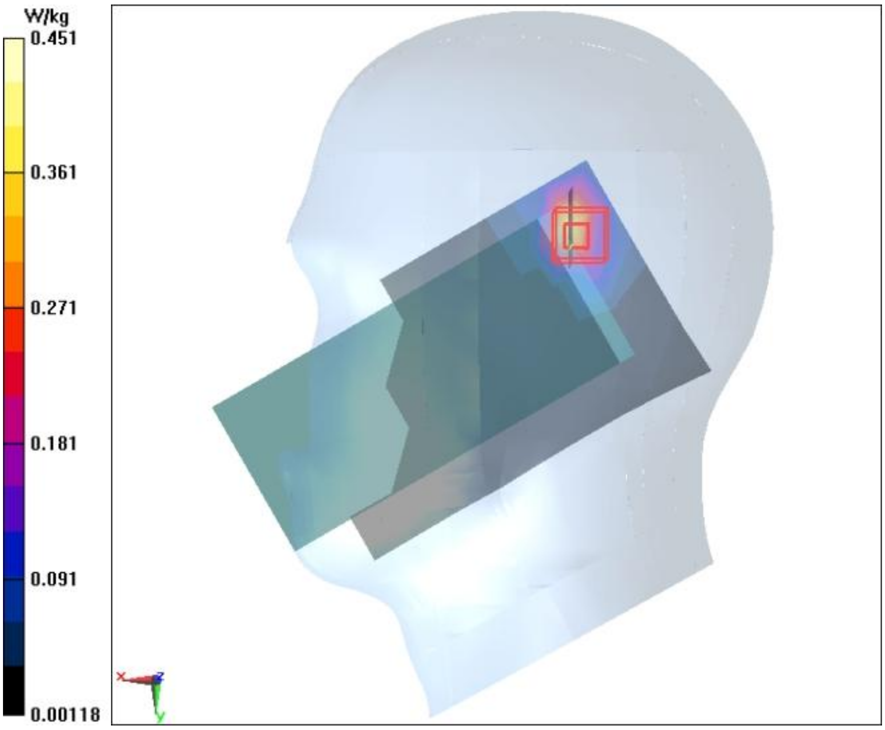
Peak SAR (extrapolated) = 0.773 W/kg

**SAR(1 g) = 0.202 W/kg; SAR(10 g) = 0.072 W/kg**

Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 35.4%

Maximum of SAR (measured) = 0.451 W/kg




A.4

## WiFi 5G 802.11a Back Tilt Side Mode Low 5mm

Date/Time: 2025/4/10

Electronics: DAE4 Sn1329

Medium parameters used: f = 5180 MHz; σ = 4.694 S/m; $\varepsilon_r$ = 35.807; ρ = 1000 kg/m$^3$

Ambient Temperature:21.5°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-1;  Frequency: 5180 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5180 MHz

**WiFi 5G 802.11a Back Tilt Side Mode Low 5mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.13 W/kg

**WiFi 5G 802.11a Back Tilt Side Mode Low 5mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.5720 V/m; Power Drift = 0.08 dB

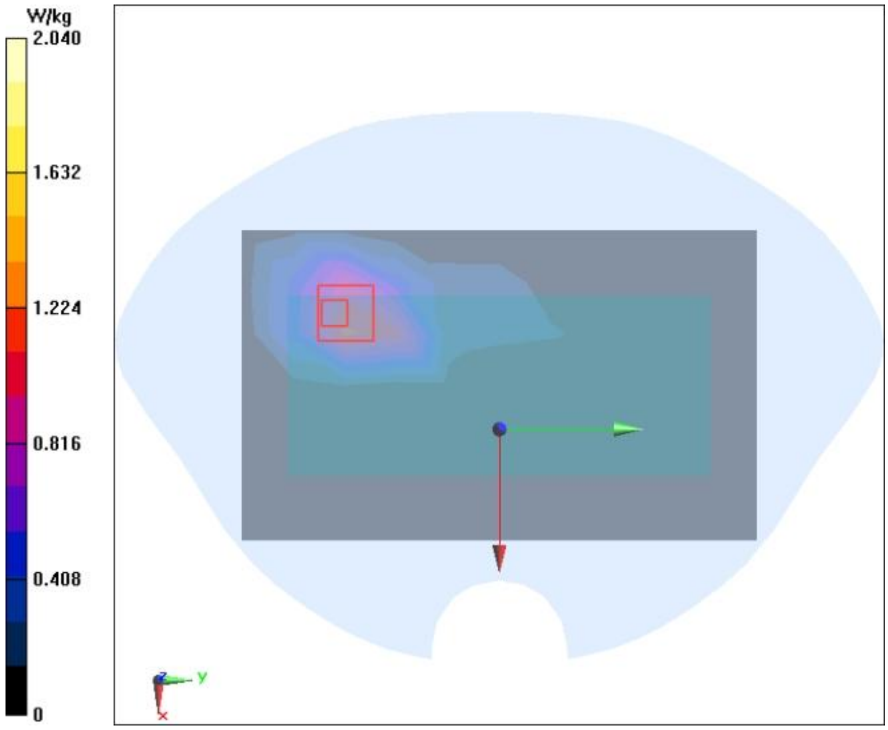
Peak SAR (extrapolated) = 3.14 W/kg

**SAR(1 g) = 0.867 W/kg; SAR(10 g) = 0.303 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.3 mm

Ratio of SAR at M2 to SAR at M1 = 42.5%

Maximum of SAR (measured) = 2.04 W/kg




A.5

## WiFi 5G 802.11a Back Tilt Side Mode High 0mm

Date/Time: 2025/4/10

Electronics: DAE4 Sn1329

Medium parameters used: f = 5240 MHz; σ = 4.763 S/m; $\varepsilon_r$ = 35.686; ρ = 1000 kg/m$^3$

Ambient Temperature:21.5°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-1;  Frequency: 5240 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5240 MHz

**WiFi 5G 802.11a Back Tilt Side Mode High 0mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 2.16 W/kg

**WiFi 5G 802.11a Back Tilt Side Mode High 0mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.545 V/m; Power Drift = -0.02 dB

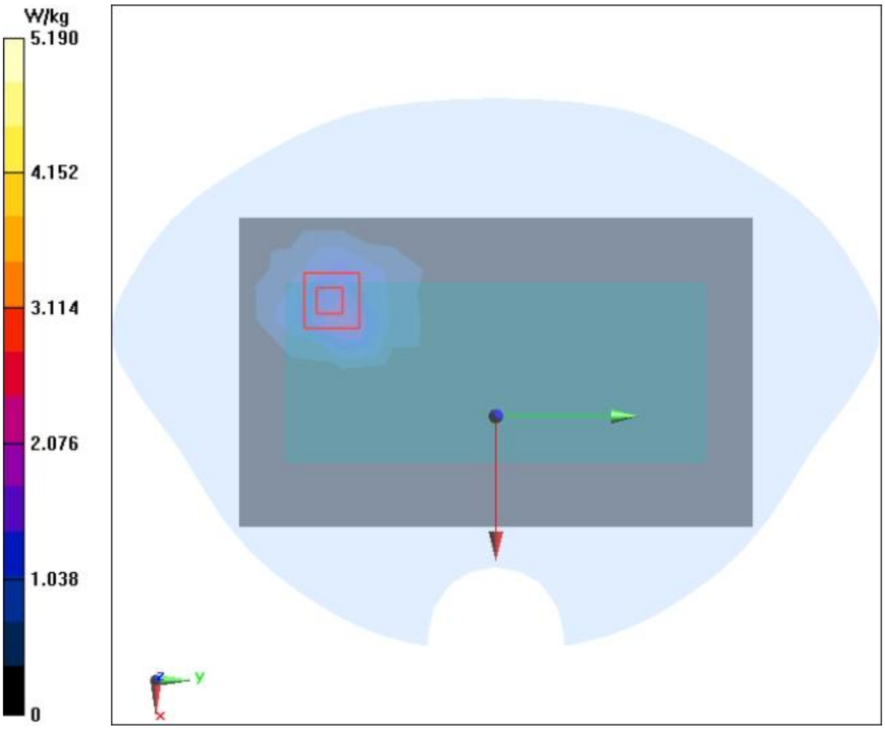
Peak SAR (extrapolated) = 8.90 W/kg

**SAR(1 g) = 2.18 W/kg; SAR(10 g) = 0.683 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.6 mm

Ratio of SAR at M2 to SAR at M1 = 42.7%

Maximum of SAR (measured) = 5.19 W/kg




A.6

## WiFi 5G 802.11ac20 Left Tilt Mode High

Date/Time: 2025/3/27

Electronics: DAE4 Sn1329

Medium parameters used: f = 5320 MHz; σ = 4.886 S/m; $\varepsilon_r$ = 36.169; ρ = 1000 kg/m$^3$

Ambient Temperature:21.7°C    Liquid Temperature:20.7°C

Communication System: 5GHz U-NII-2A;  Frequency: 5320 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5320 MHz

**WiFi 5G 802.11ac20 Left Tilt Mode High/Area Scan (12x7x1):**

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

Maximum value of SAR (measured) = 0.438 W/kg

**WiFi 5G 802.11ac20 Left Tilt Mode High/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0 V/m; Power Drift = 0.10 dB

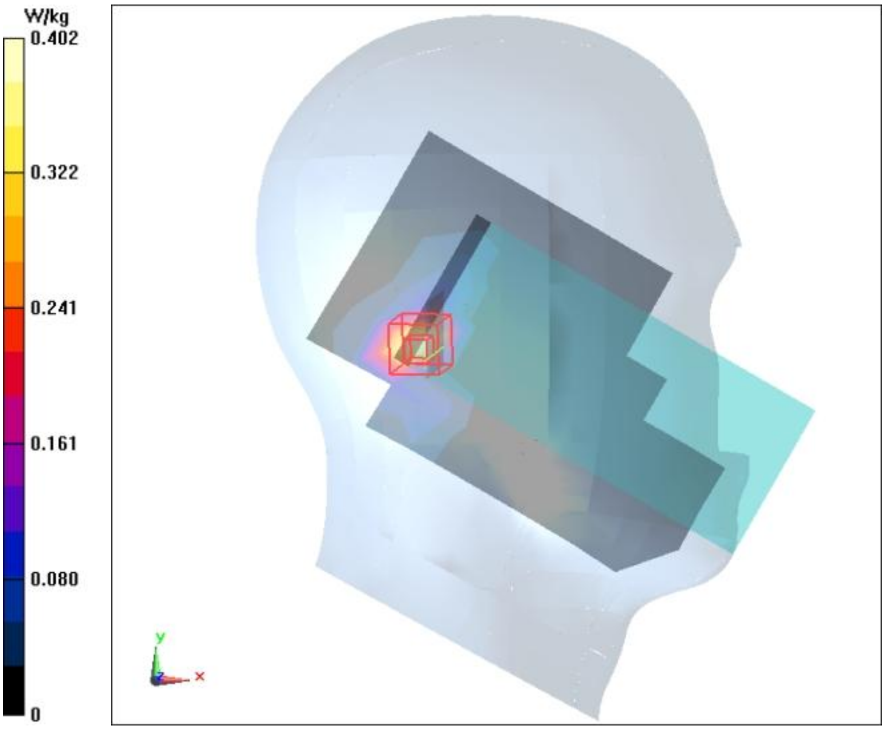
Peak SAR (extrapolated) = 0.755 W/kg

**SAR(1 g) = 0.198 W/kg; SAR(10 g) = 0.066 W/kg**

Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 40.7%

Maximum of SAR (measured) = 0.402 W/kg




A.7

**WiFi 5G 802.11ac20 Back Tilt Side Mode High 5mm**

Date/Time: 2025/4/10

Electronics: DAE4 Sn1329

Medium parameters used: f = 5320 MHz; σ = 4.857 S/m; $\varepsilon_r$ = 35.526; ρ = 1000 kg/m$^3$

Ambient Temperature:21.5°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-2A;  Frequency: 5320 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5320 MHz

**WiFi 5G 802.11ac20 Back Tilt Side Mode High 5mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.15 W/kg

**WiFi 5G 802.11ac20 Back Tilt Side Mode High 5mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.024 V/m; Power Drift = 0.09 dB

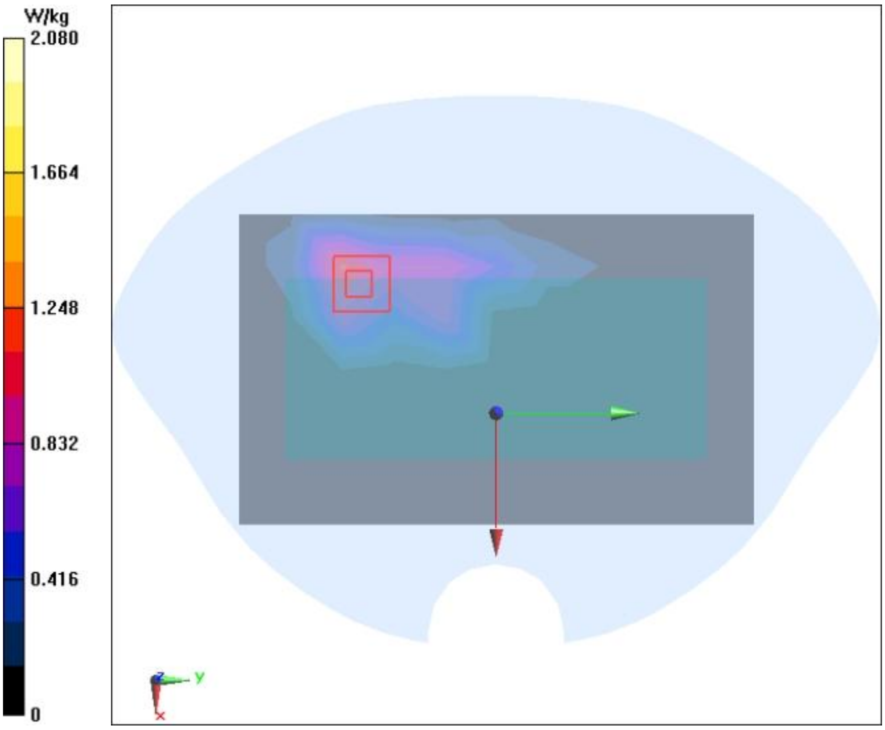
Peak SAR (extrapolated) = 3.42 W/kg

**SAR(1 g) = 0.941 W/kg; SAR(10 g) = 0.338 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.7 mm

Ratio of SAR at M2 to SAR at M1 = 42%

Maximum of SAR (measured) = 2.08 W/kg




A.8

## WiFi 5G 802.11ac20 Back Tilt Side Mode High 0mm

Date/Time: 2025/4/10

Electronics: DAE4 Sn1329

Medium parameters used: f = 5320 MHz; $\sigma$ = 4.857 S/m; $\varepsilon_r$ = 35.526; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:21.5°C Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-2A; Frequency: 5320 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5320 MHz

**WiFi 5G 802.11ac20 Back Tilt Side Mode High 0mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 2.36 W/kg

**WiFi 5G 802.11ac20 Back Tilt Side Mode High 0mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.046 V/m; Power Drift = 0.14 dB

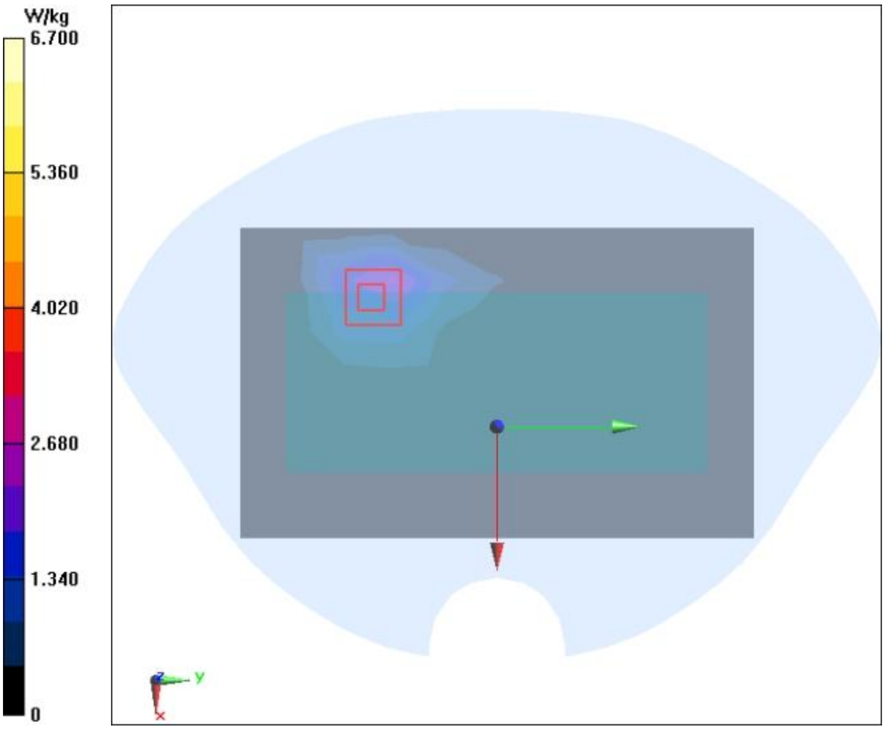
Peak SAR (extrapolated) = 10.8 W/kg

**SAR(1 g) = 2.58 W/kg; SAR(10 g) = 0.827 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.4 mm

Ratio of SAR at M2 to SAR at M1 = 40.8%

Maximum of SAR (measured) = 6.70 W/kg




A.9

**WiFi 5G 802.11a Left Tilt Mode Low**

Date/Time: 2025/4/2

Electronics: DAE4 Sn1329

Medium parameters used: f = 5500 MHz; σ = 5.093 S/m; $\varepsilon_r$ = 35.827; ρ = 1000 kg/m$^3$

Ambient Temperature:21.5°C  Liquid Temperature:20.5°C

Communication System: 5GHz U-NII-2C; Frequency: 5500 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.11, 5.11, 5.11) @ 5500 MHz

**WiFi 5G 802.11a Left Tilt Mode Low/Area Scan (12x7x1):**

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

Maximum value of SAR (measured) = 0.491 W/kg

**WiFi 5G 802.11a Left Tilt Mode Low/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0 V/m; Power Drift = 0.10 dB

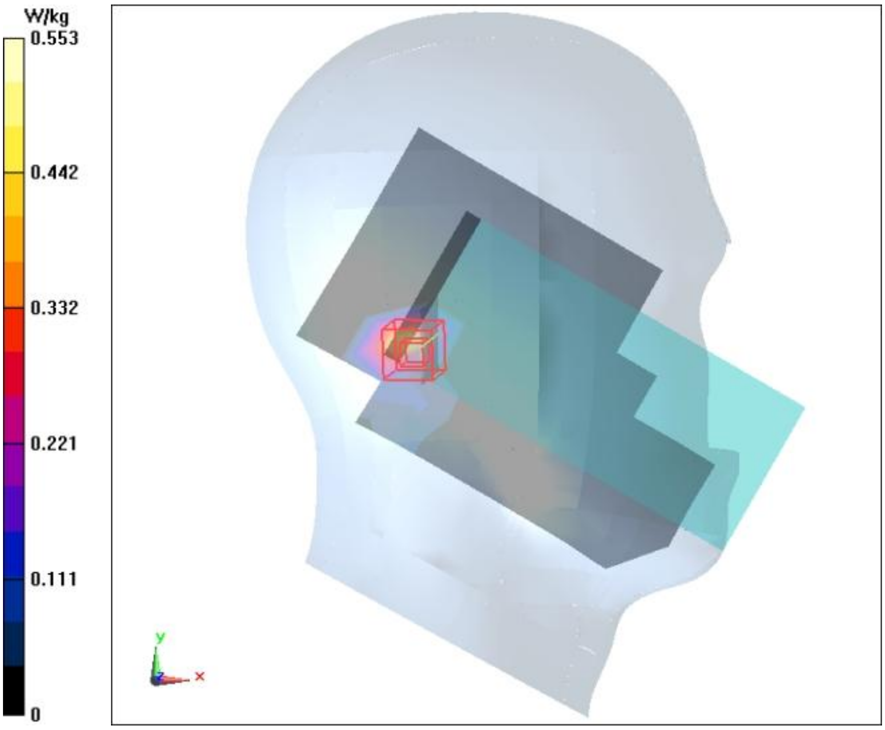
Peak SAR (extrapolated) = 2.02 W/kg

**SAR(1 g) = 0.299 W/kg; SAR(10 g) = 0.086 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.1 mm

Ratio of SAR at M2 to SAR at M1 = 39.1%

Maximum of SAR (measured) = 0.553 W/kg




A.10

## WiFi 5G 802.11a Back Tilt Mode Middle 5mm

Date/Time: 2025/4/11

Electronics: DAE4 Sn1329

Medium parameters used: f = 5580 MHz; $\sigma$ = 5.156 S/m; $\varepsilon_r$ = 35.025; $\rho$ = 1000 kg/$m^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-2C;  Frequency: 5580 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.11, 5.11, 5.11) @ 5580 MHz

**WiFi 5G 802.11a Back Tilt Mode Middle 5mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.08 W/kg

**WiFi 5G 802.11a Back Tilt Mode Middle 5mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 4.917 V/m; Power Drift = 0.08 dB

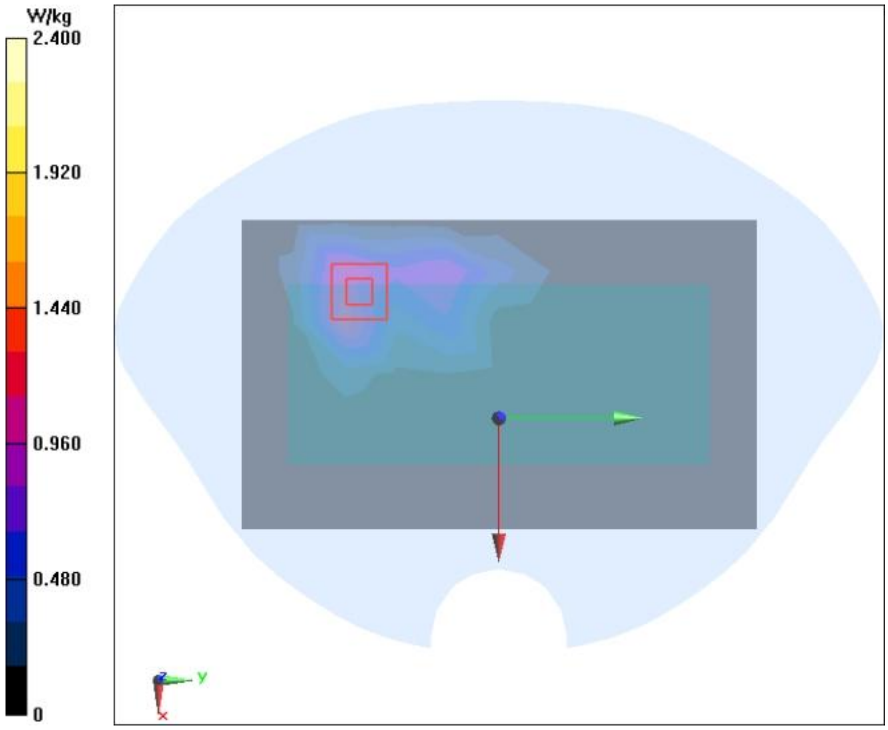
Peak SAR (extrapolated) = 3.99 W/kg

**SAR(1 g) = 0.968 W/kg; SAR(10 g) = 0.332 W/kg**

Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 39.6%

Maximum of SAR (measured) = 2.40 W/kg



## WiFi 5G 802.11a Back Tilt Mode Low 0mm

Date/Time: 2025/4/11

Electronics: DAE4 Sn1329

Medium parameters used: f = 5500 MHz; $\sigma$ = 5.061 S/m; $\varepsilon_r$ = 35.18; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-2C;  Frequency: 5500 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.11, 5.11, 5.11) @ 5500 MHz

**WiFi 5G 802.11a Back Tilt Mode Low 0mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 2.19 W/kg

**WiFi 5G 802.11a Back Tilt Mode Low 0mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.150 V/m; Power Drift = 0.09 dB

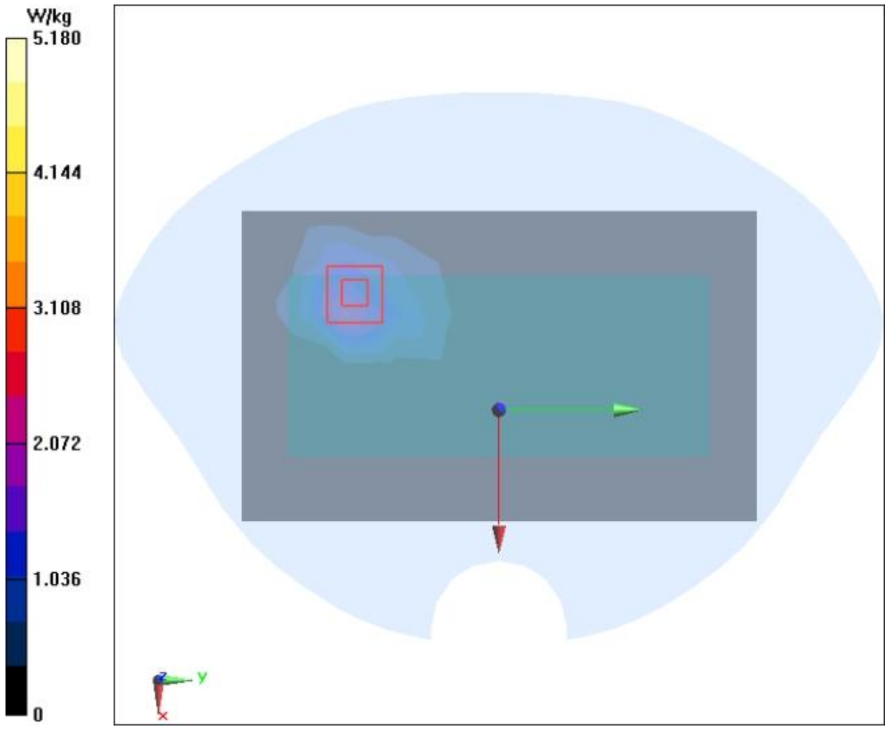
Peak SAR (extrapolated) = 9.30 W/kg

**SAR(1 g) = 2.25 W/kg; SAR(10 g) = 0.733 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.4 mm

Ratio of SAR at M2 to SAR at M1 = 39.8%

Maximum of SAR (measured) = 5.18 W/kg




A.12

## WiFi 5G 802.11a Right Tilt Mode High

Date/Time: 2025/3/28

Electronics: DAE4 Sn1329

Medium parameters used: f = 5825 MHz; σ = 5.482 S/m; $\varepsilon_r$ = 35.185; ρ = 1000 kg/$m^3$

Ambient Temperature:21.5°C  Liquid Temperature:20.4°C

Communication System: 5G-U-NII-3; Frequency: 5825 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5825 MHz

**WiFi 5G 802.11a Right Tilt Mode High/Area Scan (11x6x1):**

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

Maximum value of SAR (measured) = 0.346 W/kg

**WiFi 5G 802.11a Right Tilt Mode High/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.211 V/m; Power Drift = -0.05 dB

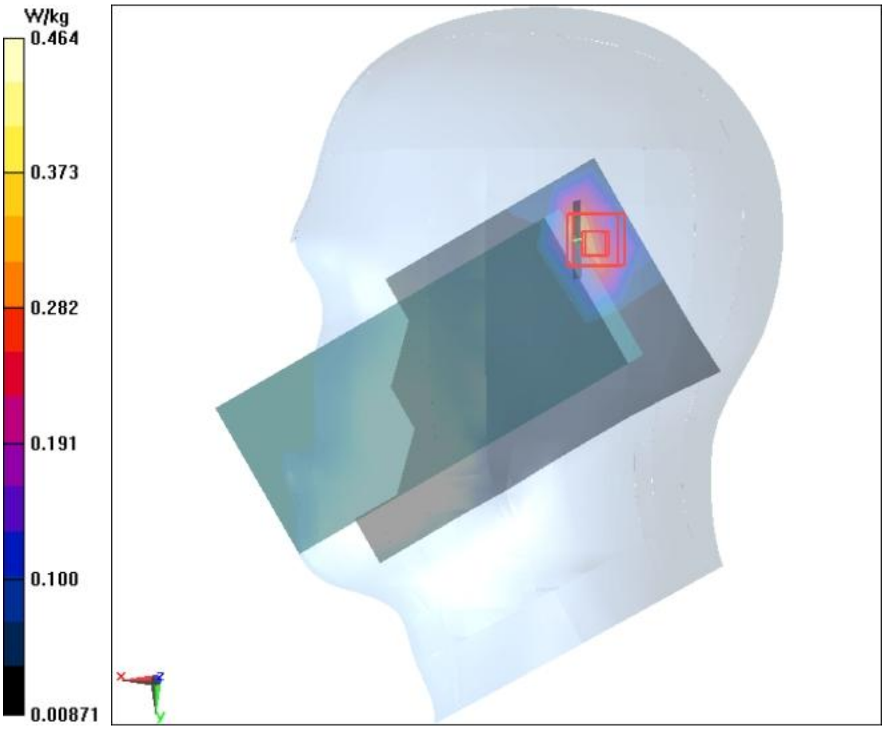
Peak SAR (extrapolated) = 1.19 W/kg

**SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.072 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.8 mm

Ratio of SAR at M2 to SAR at M1 = 42.8%

Maximum of SAR (measured) = 0.464 W/kg




A.13

**WiFi 5G 802.11a Back Tilt Side Mode Low 5mm**

Date/Time: 2025/4/11

Electronics: DAE4 Sn1329

Medium parameters used: f = 5745 MHz; σ = 5.355 S/m; $\varepsilon_r$ = 34.692; ρ = 1000 kg/m$^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-3;  Frequency: 5745 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5745 MHz

**WiFi 5G 802.11a Back Tilt Side Mode Low 5mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.80 W/kg

**WiFi 5G 802.11a Back Tilt Side Mode Low 5mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.202 V/m; Power Drift = 0.02 dB

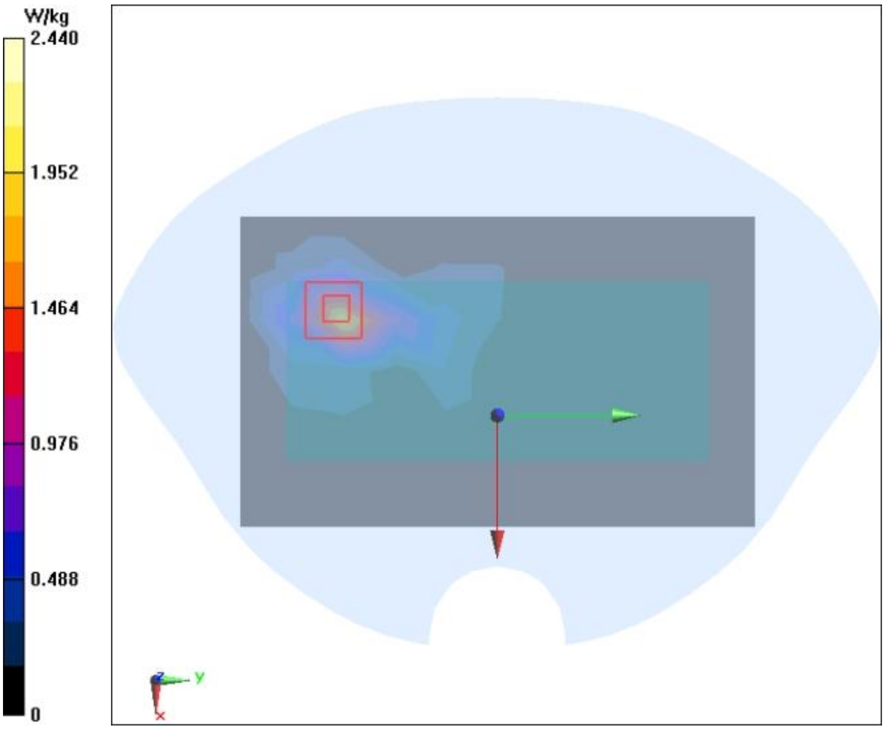
Peak SAR (extrapolated) = 4.53 W/kg

**SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.343 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 38.2%

Maximum of SAR (measured) = 2.44 W/kg




A.14

## WiFi 5G 802.11a Back Tilt Side Mode Low 0mm

Date/Time: 2025/4/11

Electronics: DAE4 Sn1329

Medium parameters used: f = 5745 MHz; $\sigma$ = 5.355 S/m; $\varepsilon_r$ = 34.692; $\rho$ = 1000 kg/m$^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.4°C

Communication System: 5GHz U-NII-3;  Frequency: 5745 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5745 MHz

**WiFi 5G 802.11a Back Tilt Side Mode Low 0mm/Area Scan (7x11x1):**

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

Maximum value of SAR (measured) = 1.83 W/kg

**WiFi 5G 802.11a Back Tilt Side Mode Low 0mm/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.4480 V/m; Power Drift = 0.10 dB

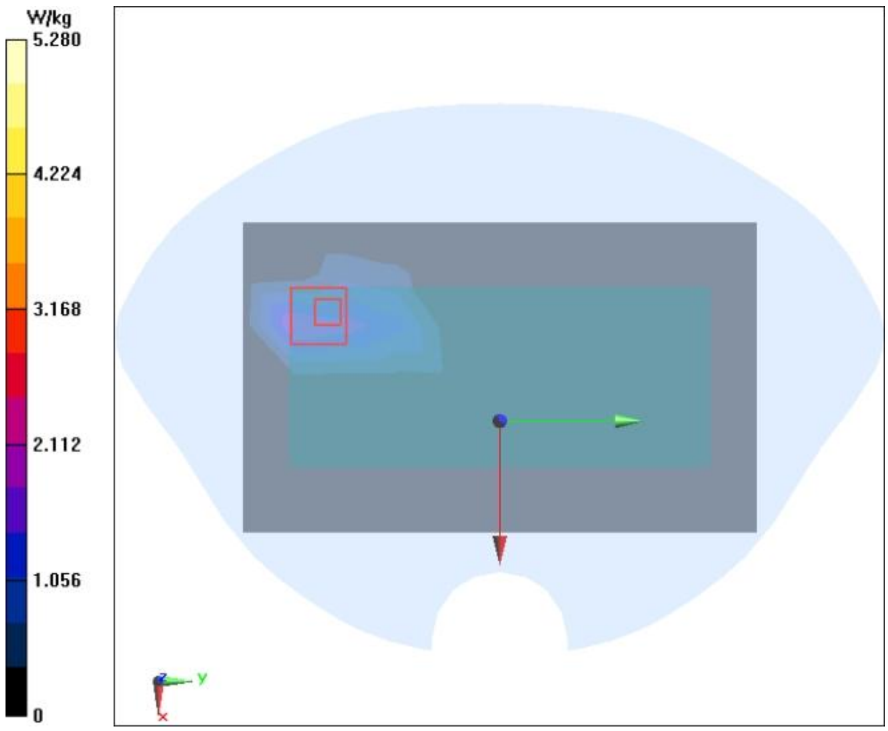
Peak SAR (extrapolated) = 10.2 W/kg

**SAR(1 g) = 1.98 W/kg; SAR(10 g) = 0.563 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.8 mm

Ratio of SAR at M2 to SAR at M1 = 36.4%

Maximum of SAR (measured) = 5.28 W/kg




A.15

## BT DH5 Right Touch Mode Middle

Date/Time: 2025/3/25

Electronics: DAE4 Sn1329

Medium parameters used: f = 2441 MHz; σ = 1.844 S/m; $\varepsilon_r$ = 40.178; ρ = 1000 kg/m$^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.6°C

Communication System: Bluetooth 2450MHz;  Frequency: 2441 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2441 MHz

**BT DH5 Right Touch Mode Middle/Area Scan (11x6x1):**

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

Maximum value of SAR (measured) = 0.0699 W/kg

**BT DH5 Right Touch Mode Middle/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 3.481 V/m; Power Drift = 0.06 dB

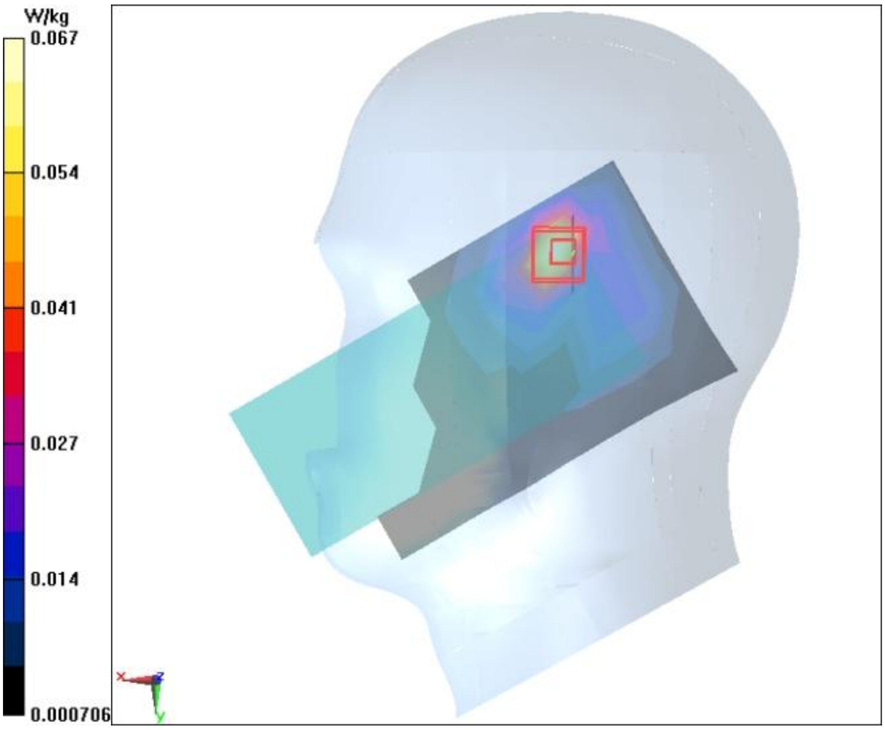
Peak SAR (extrapolated) = 0.091 W/kg

**SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.021 W/kg**

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 49.1%

Maximum value of SAR (measured) = 0.067 W/kg




A.16

**BT DH5 Left Side Mode Middle 5mm**

Date/Time: 2025/4/12

Electronics: DAE4 Sn1329

Medium parameters used: f = 2441 MHz; $\sigma$ = 1.824 S/m; $\varepsilon_r$ = 38.642; $\rho$ = 1000 $kg/m^3$

Ambient Temperature:21.5°C  Liquid Temperature:20.6°C

Communication System: BT 2450MHz; Frequency: 2441 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2441 MHz

**BT DH5 Left Side Mode Middle 5mm/Area Scan (5x11x1):**

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

Maximum value of SAR (measured) = 0.0762 W/kg

**BT DH5 Left Side Mode Middle 5mm/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 3.286 V/m; Power Drift = 0.08 dB

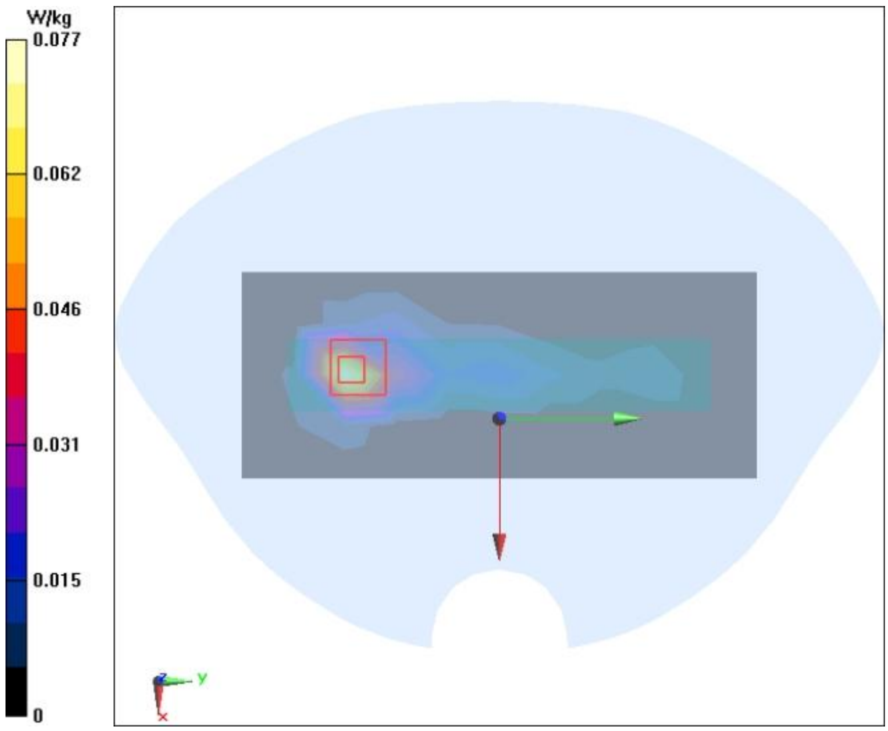
Peak SAR (extrapolated) = 0.102 W/kg

**SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.021 W/kg**

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 46.5%

Maximum value of SAR (measured) = 0.077 W/kg




A.17

**BT DH5 Left Side Mode Low 0mm**

Date/Time: 2025/3/25

Electronics: DAE4 Sn1329

Medium parameters used: f = 2402 MHz; σ = 1.814 S/m; $\varepsilon_r$ = 40.265; ρ = 1000 kg/m$^3$

Ambient Temperature:21.6°C    Liquid Temperature:20.6°C

Communication System: Bluetooth 2450MHz;  Frequency: 2402 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2402 MHz

**BT DH5 Left Side Mode Low 0mm/Area Scan (5x11x1):**

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

Maximum value of SAR (measured) = 0.113 W/kg

**BT DH5 Left Side Mode Low 0mm/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 2.873 V/m; Power Drift = 0.03 dB

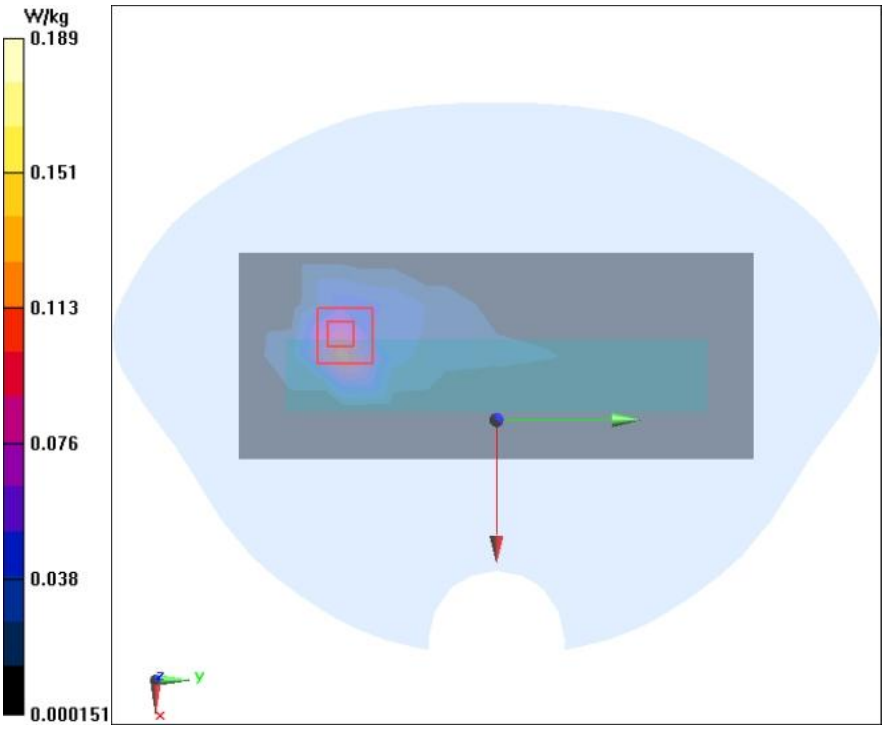
Peak SAR (extrapolated) = 0.267 W/kg

**SAR(1 g) = 0.112 W/kg; SAR(10 g) = 0.075 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.8 mm

Ratio of SAR at M2 to SAR at M1 = 45.4%

Maximum of SAR (measured) = 0.189 W/kg




A.18

# ANNEX B. SYSTEM CHECK RESULTS

## System Check 2450MHz

Date/Time: 2025/3/25

Electronics: DAE4 Sn1329

Medium parameters used: f = 2450 MHz; σ = 1.851 S/m; εr = 40.158; ρ = 1000 kg/m3

Ambient Temperature:21.6°C    Liquid Temperature:20.5°C

Communication System: CW 2450MHz;  Frequency: 2450 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2450 MHz

**System Check 2450MHz/Area Scan (8x8x1):**

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

Maximum value of SAR (measured) = 16.5 W/kg

**System Check 2450MHz/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 110.2 V/m; Power Drift = 0.11 dB

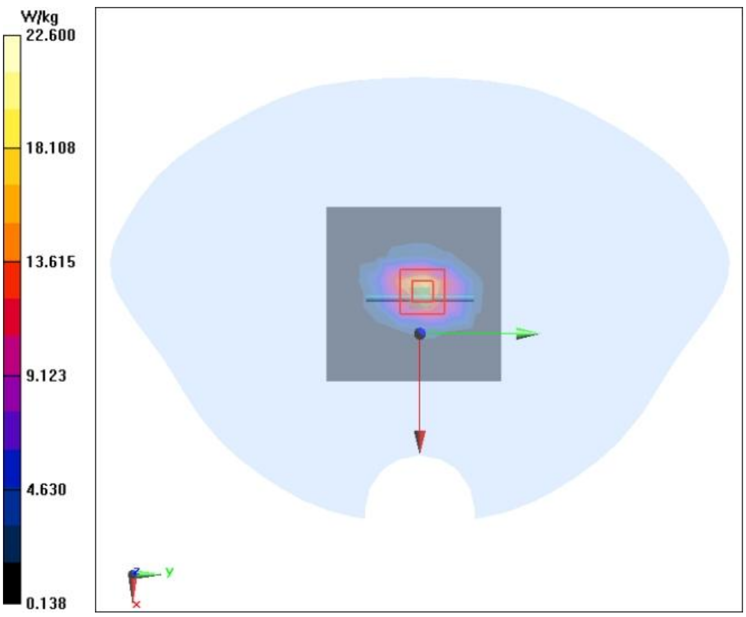
Peak SAR (extrapolated) = 27.9 W/kg

**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.15 W/kg**

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 47.9%

Maximum value of SAR (measured) = 22.6 W/kg




B.1

## System Check 2450MHz

Date/Time: 2025/4/12

Electronics: DAE4 Sn1329

Medium parameters used: f = 2450 MHz; σ = 1.831 S/m; εr = 38.626; ρ = 1000 kg/m3

Ambient Temperature:21.7°C  Liquid Temperature:20.6°C

Communication System: CW 2450MHz; Frequency: 2450 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN3844ConvF(7.75, 7.75, 7.75) @ 2450 MHz

**System Check 2450MHz/Area Scan (8x8x1):**

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

Maximum value of SAR (measured) = 18.0 W/kg

**System Check 2450MHz/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 109.4 V/m; Power Drift = 0.14 dB

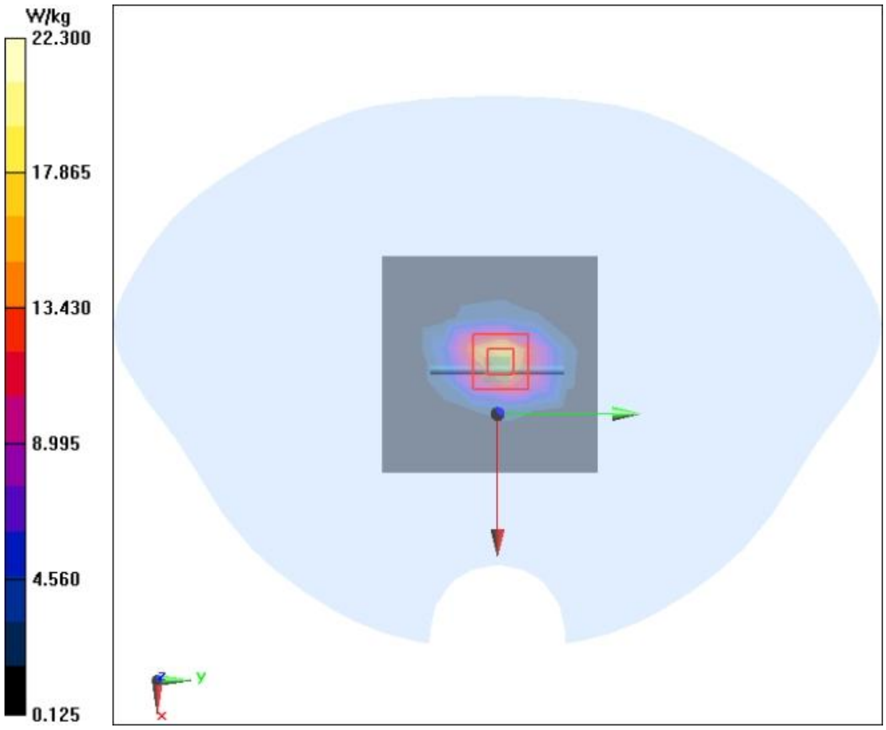
Peak SAR (extrapolated) = 27.8 W/kg

**SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.21 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 48.3%

Maximum value of SAR (measured) = 22.3 W/kg




B.2

## System Check 5250MHz

Date/Time: 2025/3/26

Electronics: DAE4 Sn1329

Medium parameters used: f = 5250 MHz; σ = 4.797 S/m; εr = 36.299; ρ = 1000 kg/m3

Ambient Temperature:21.4°C    Liquid Temperature:20.5°C

Communication System: CW 5000MHz;  Frequency: 5250 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5250 MHz

**System Check 5250MHz/Area Scan (61x81x1):**

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

Maximum value of SAR  (Measurement) = 19.9 W/kg

**System Check 5250MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 66.33 V/m; Power Drift = 0.08 dB

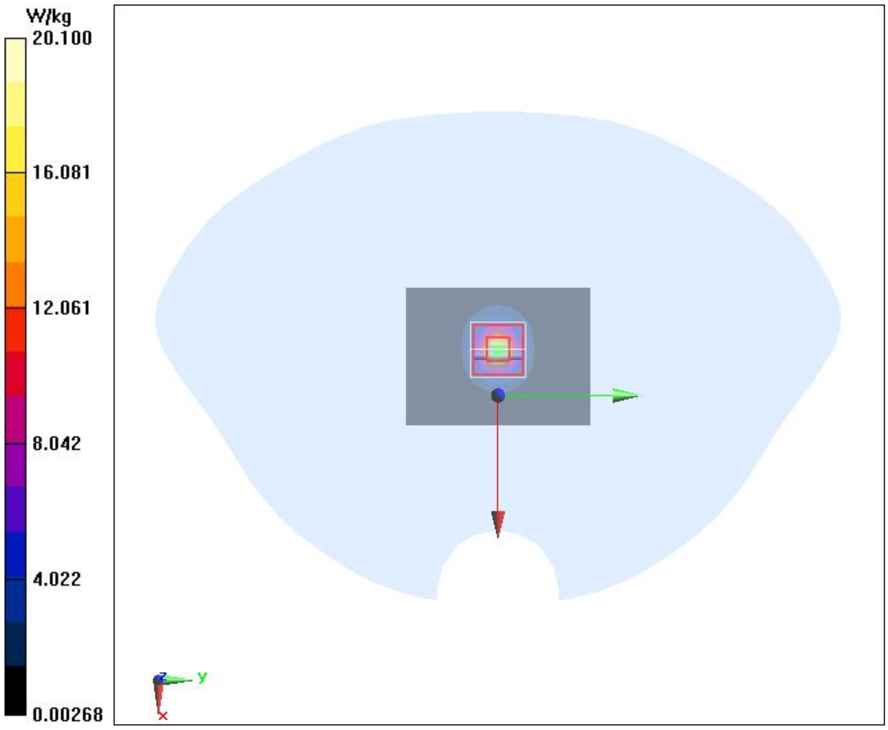
Peak SAR (extrapolated) = 32.5 W/kg

**SAR(1 g) = 7.92 W/kg; SAR(10 g) = 2.28 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 64%

Maximum value of SAR  (measured) = 20.1 W/kg




B.3

## System Check 5250MHz

Date/Time: 2025/3/27

Electronics: DAE4 Sn1329

Medium parameters used: f = 5250 MHz; σ = 4.797 S/m; εr = 36.299; ρ = 1000 kg/m3

Ambient Temperature:21.7°C  Liquid Temperature:20.7°C

Communication System: CW 5000MHz; Frequency: 5250 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5250 MHz

**System Check 5250MHz/Area Scan (61x81x1):**

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

Maximum value of SAR (Measurement) = 20.2 W/kg

**System Check 5250MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 65.44 V/m; Power Drift = 0.12 dB

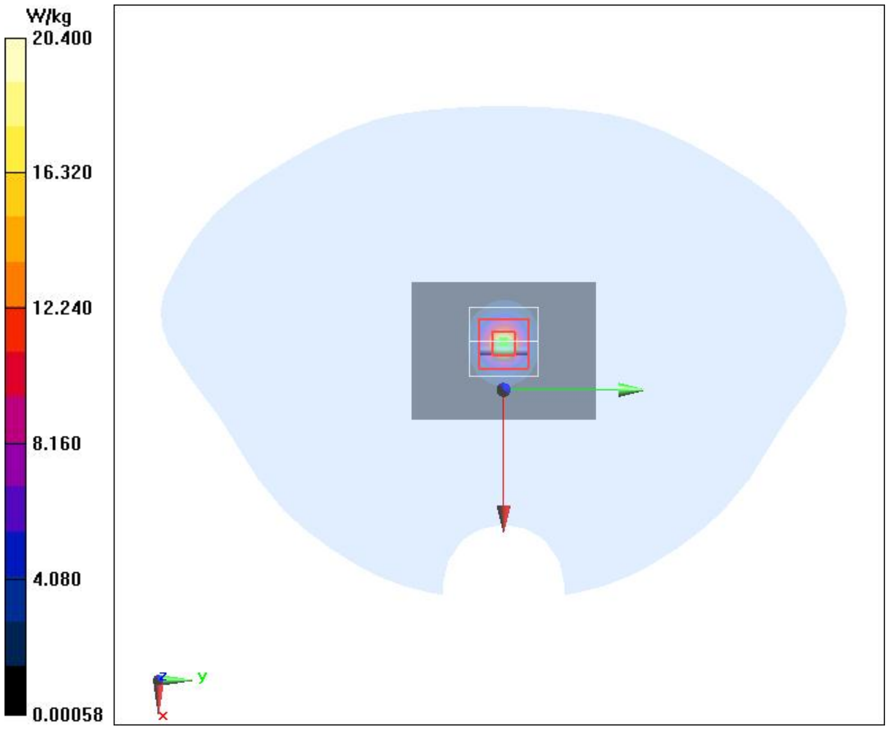
Peak SAR (extrapolated) = 34.2 W/kg

**SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.25 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.1 mm

Ratio of SAR at M2 to SAR at M1 = 40.9%

Maximum of SAR (measured) = 20.4 W/kg




B.4

## System Check 5250MHz

Date/Time: 2025/4/10

Electronics: DAE4 Sn1329

Medium parameters used: f = 5250 MHz; σ = 4.775 S/m; εr = 35.664; ρ = 1000 kg/m3

Ambient Temperature:21.5°C Liquid Temperature:20.6°C

Communication System: CW 5000MHz; Frequency: 5250 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.7, 5.7, 5.7) @ 5250 MHz

**System Check 5250MHz/Area Scan (91x91x1):**

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

Maximum value of SAR (Measurement) = 19.0 W/kg

**System Check 5250MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 69.52 V/m; Power Drift = -0.04 dB

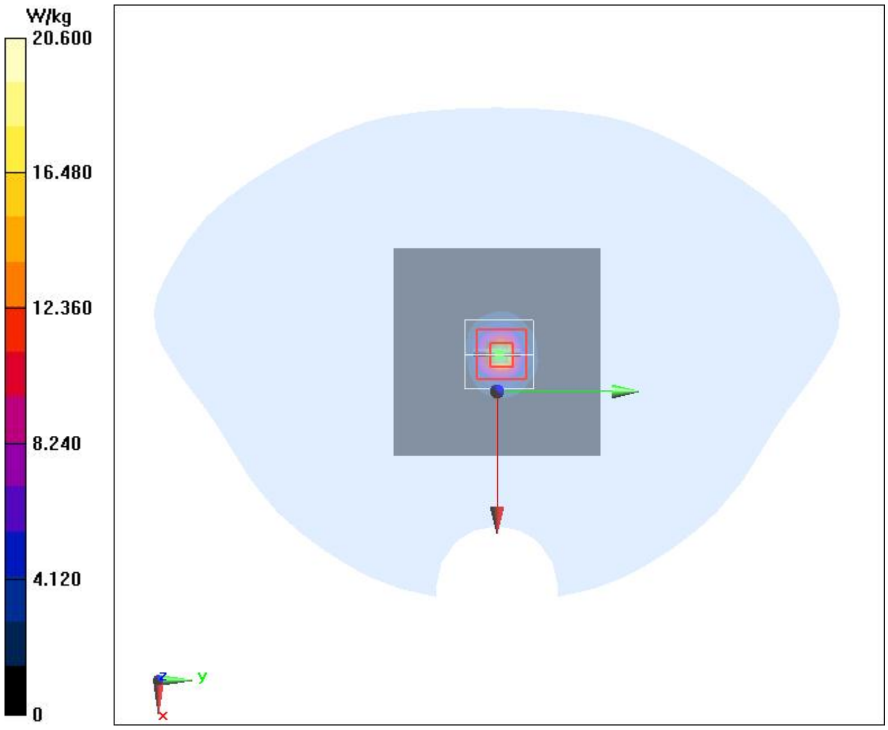
Peak SAR (extrapolated) = 33.7 W/kg

**SAR(1 g) = 8.07 W/kg; SAR(10 g) = 2.3 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.1 mm

Ratio of SAR at M2 to SAR at M1 = 41.7%

Maximum of SAR (measured) = 20.6 W/kg




B.5

## System Check 5750MHz

Date/Time: 2025/3/28

Electronics: DAE4 Sn1329

Medium parameters used: f = 5750 MHz; σ = 5.397 S/m; εr = 35.343; ρ = 1000 kg/m3

Ambient Temperature:21.3°C    Liquid Temperature:20.5°C

Communication System: CW 5GHz;  Frequency: 5750 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5750 MHz

**System Check 5750MHz/Area Scan (61x81x1):**

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

Maximum value of SAR  (Measurement) = 20.9 W/kg

**System Check 5750MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 66.27 V/m; Power Drift = 0.11 dB

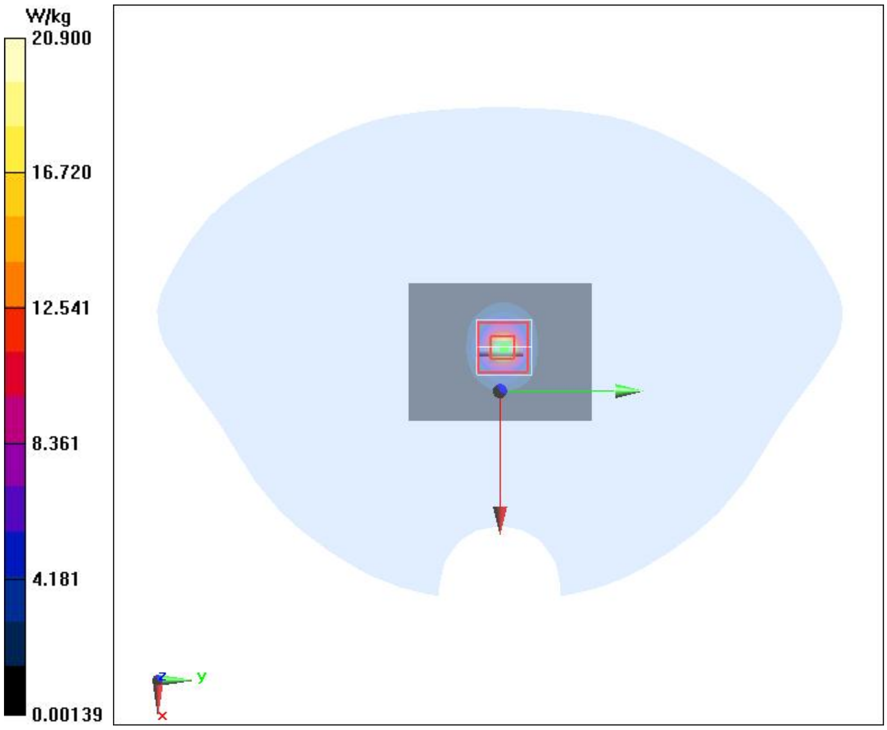
Peak SAR (extrapolated) = 35.7 W/kg

**SAR(1 g) = 7.83 W/kg; SAR(10 g) = 2.22 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.6 mm

Ratio of SAR at M2 to SAR at M1 = 60.7%

Maximum of SAR  (measured) = 20.9 W/kg




B.6

## System Check 5750MHz

Date/Time: 2025/4/2

Electronics: DAE4 Sn1329

Medium parameters used: f = 5750 MHz; σ = 5.397 S/m; εr = 35.343; ρ = 1000 kg/m3

Ambient Temperature:21.4°C  Liquid Temperature:20.5°C

Communication System: CW 5G; Frequency: 5750 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5750 MHz

**System Check 5750MHz/Area Scan (91x91x1):**

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

Maximum value of SAR (Measurement) = 19.4 W/kg

**System Check5750MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.20 V/m; Power Drift = 0.09 dB

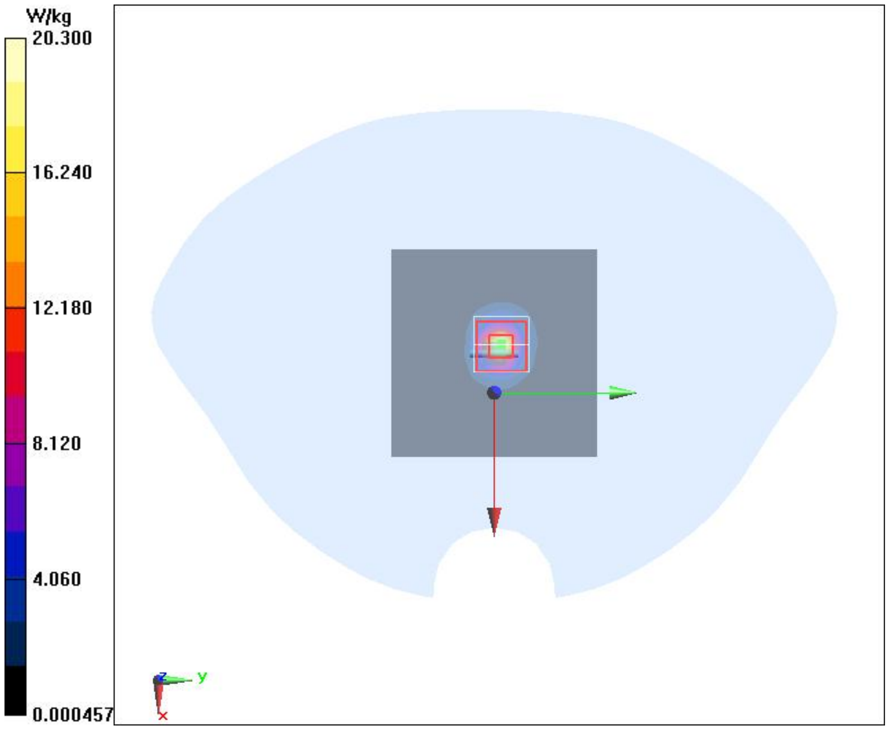
Peak SAR (extrapolated) = 34.5 W/kg

**SAR(1 g) = 7.66 W/kg; SAR(10 g) = 2.16 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 61.7%

Maximum of SAR (measured) = 20.3 W/kg




B.7

## System Check 5750MHz

Date/Time: 2025/4/11

Electronics: DAE4 Sn1329

Medium parameters used: f = 5750 MHz; σ = 5.36 S/m; εr = 34.682; ρ = 1000 kg/m3

Ambient Temperature:21.5°C  Liquid Temperature:20.4°C

Communication System: CW 5G; Frequency: 5750 MHz; Duty Cycle: 1:1

Probe: EX3DV4 - SN7633ConvF(5.25, 5.25, 5.25) @ 5750 MHz

**System Check 5750MHz/Area Scan (91x91x1):**

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

Maximum value of SAR (Measurement) = 19.3 W/kg

**System Check 5750MHz/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.20 V/m; Power Drift = 0.09 dB

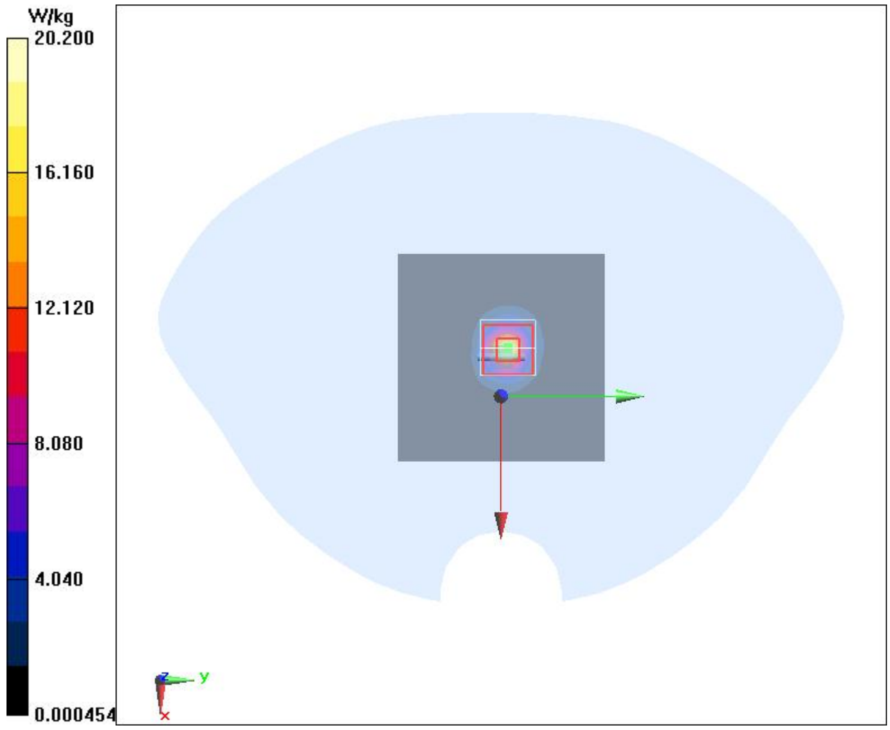
Peak SAR (extrapolated) = 34.3 W/kg

**SAR(1 g) = 7.61 W/kg; SAR(10 g) = 2.15 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 61.7%

Maximum of SAR (measured) = 20.2 W/kg




B.7

# ANNEX C. CALIBRATION REPORT

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: emf@caict.ac.cn http://www.caict.ac.cn

中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client : CATR(Chongqing) Certificate No: 24J02Z000528

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SN: 1329 |
| Calibration Procedure(s) | FF-Z11-002-01<br>Calibration Procedure for the Data Acquisition Electronics (DAEx) |
| Calibration date: | September 05, 2024 |

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Process Calibrator 753 | 1971018 | 11-Jun-24 (CTTL, No.24J02X005147) | Jun-25 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Lin Jun | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: September 08, 2024

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: emf@caict.ac.cn http://www.caict.ac.cn

**Glossary:**

| | |
|---|---|
| DAE | data acquisition electronics |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

**Methods Applied and Interpretation of Parameters:**

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.