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
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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°C-25°C
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 **Liu Qiuping** **(Prepared this test report)**	**2025-04-18** **Date**
王成宇 **Wang Chengyu** **(Reviewed this test report)**	**2025-04-18** **Date**
周进 **Zhou Jin** **Director of the laboratory** **(Approved this test report)**	**2025-04-18** **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)-Italy
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)-Italy
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 (ρ) . 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, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

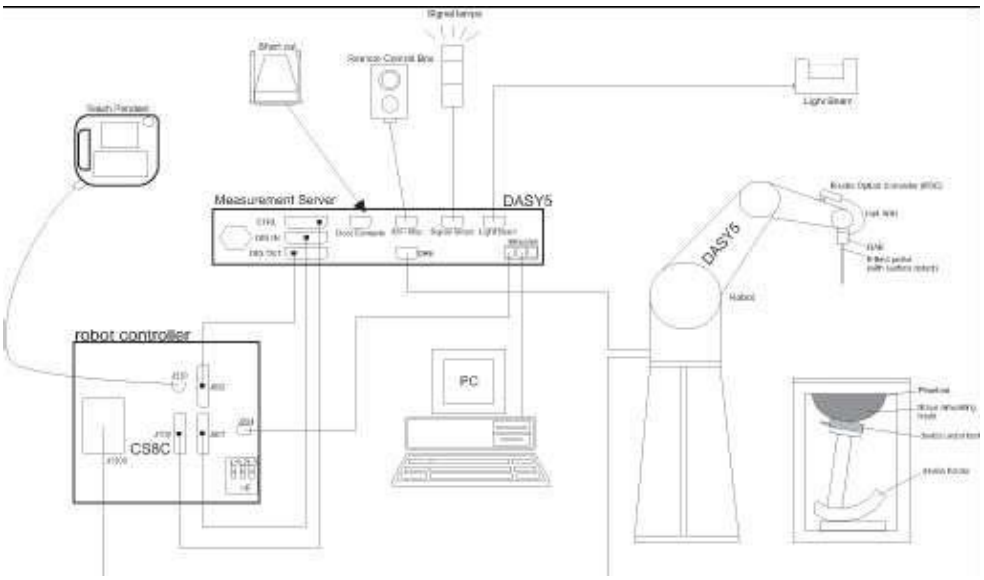
Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

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 2ndord 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: **± 0.2 dB**

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:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = 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

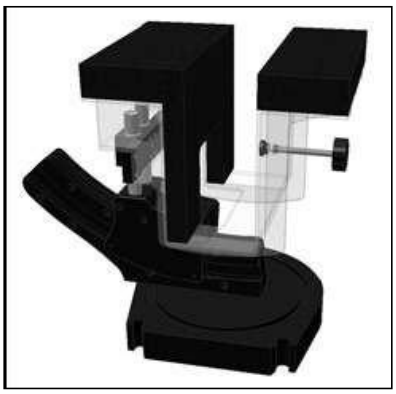
The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate 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)

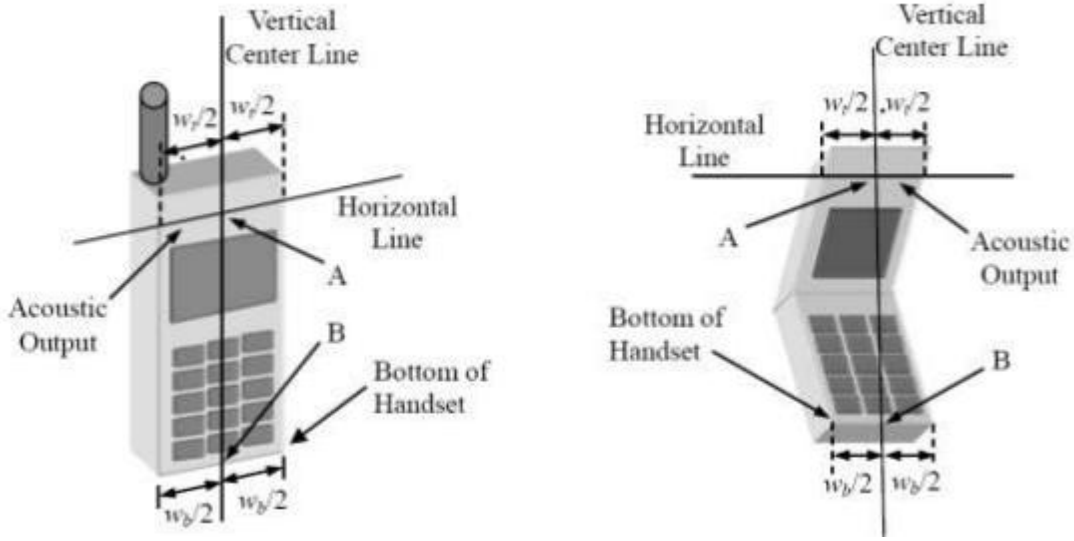
Available: Special

Picture 7.4.5-1: SAM Twin Phantom

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

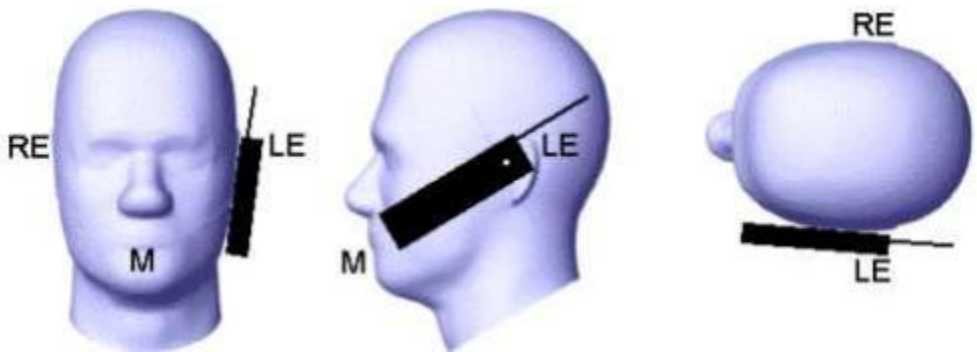
8.1 General considerations

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

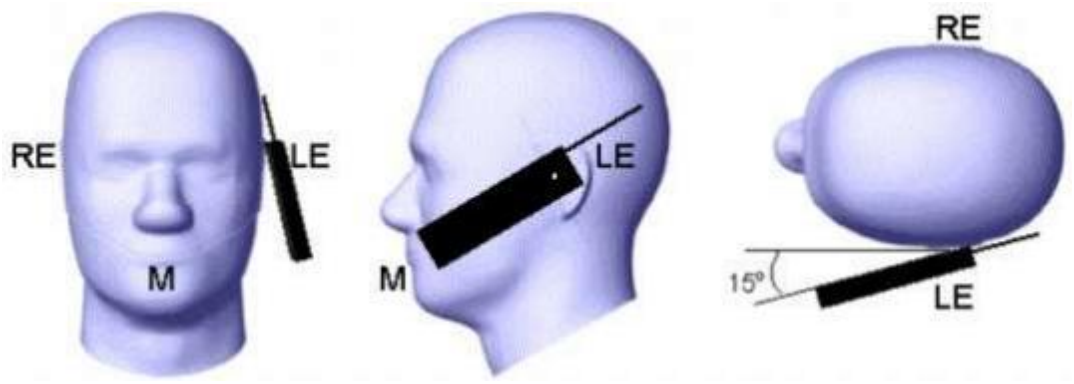


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width W_b of the bottom of the handset

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



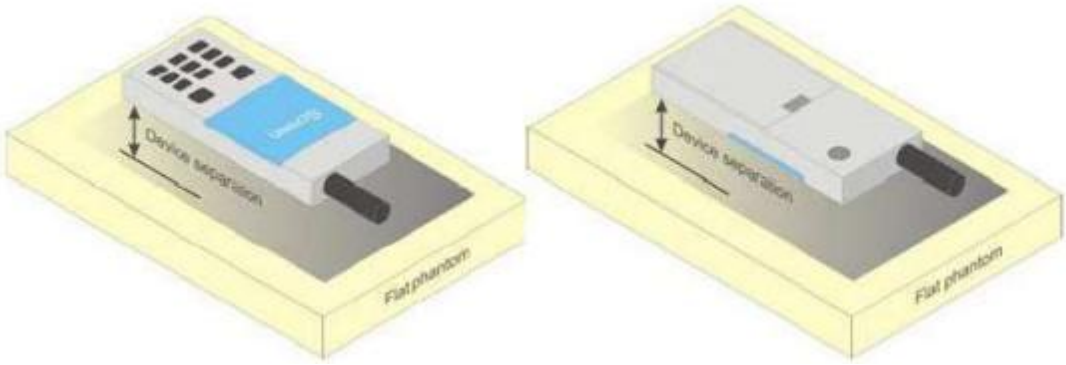
Picture 8.1-1 Cheek position of the wireless device on the left side of SAM



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

8.2 Body-worn device

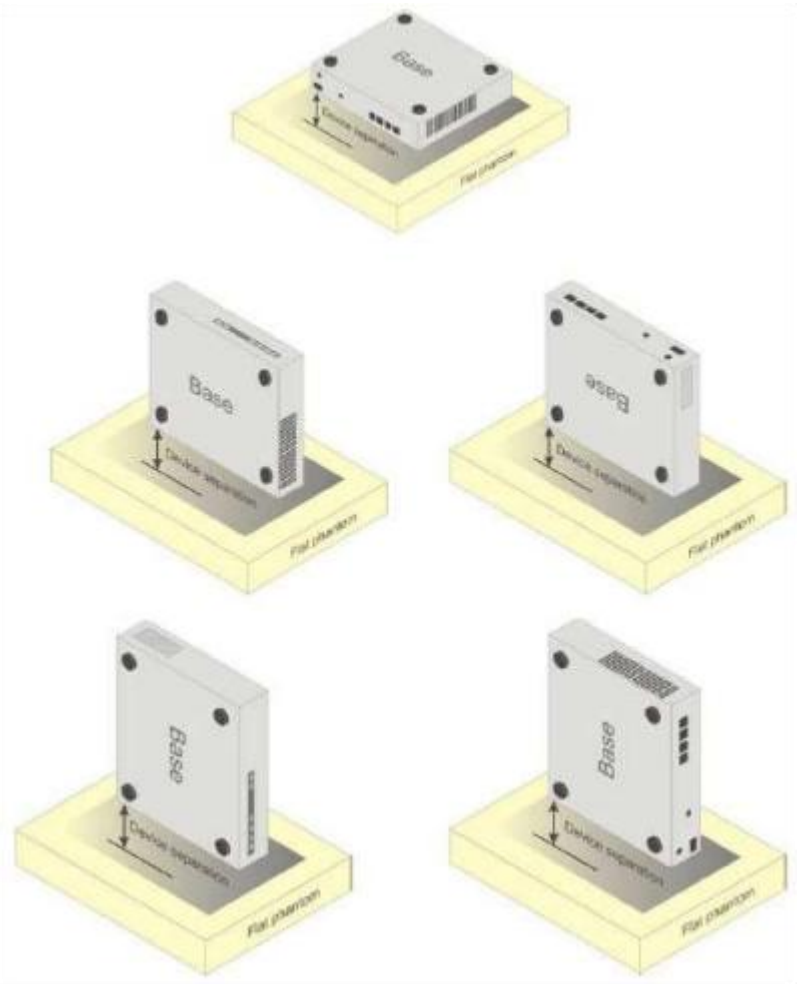
A typical example of a body-worn device is a tracker, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.



Picture 8.2-1 Test positions for body-worn devices

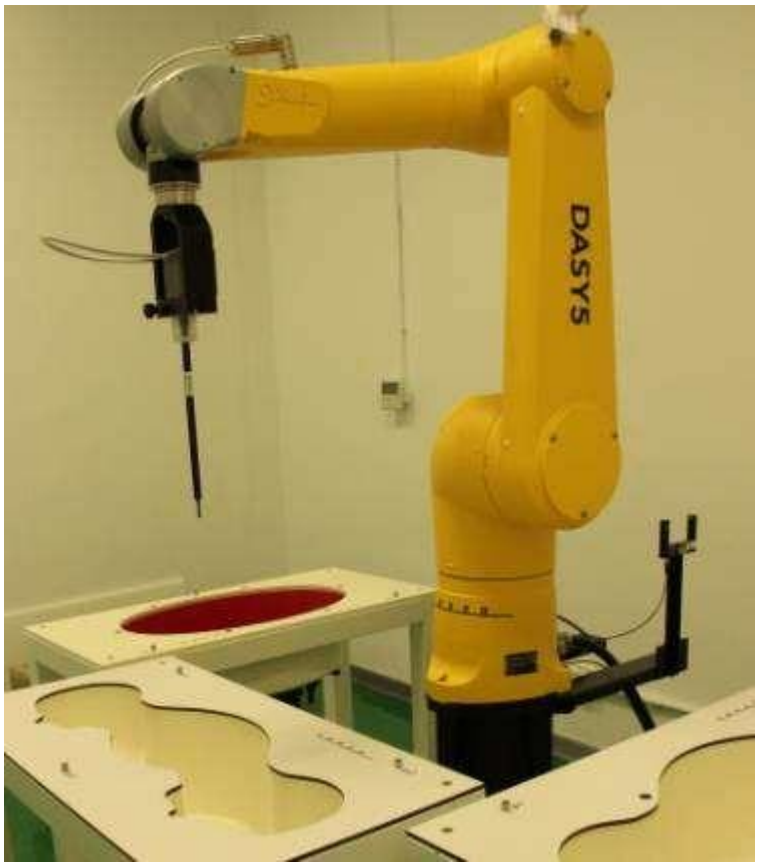
8.3 Desktop device

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

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

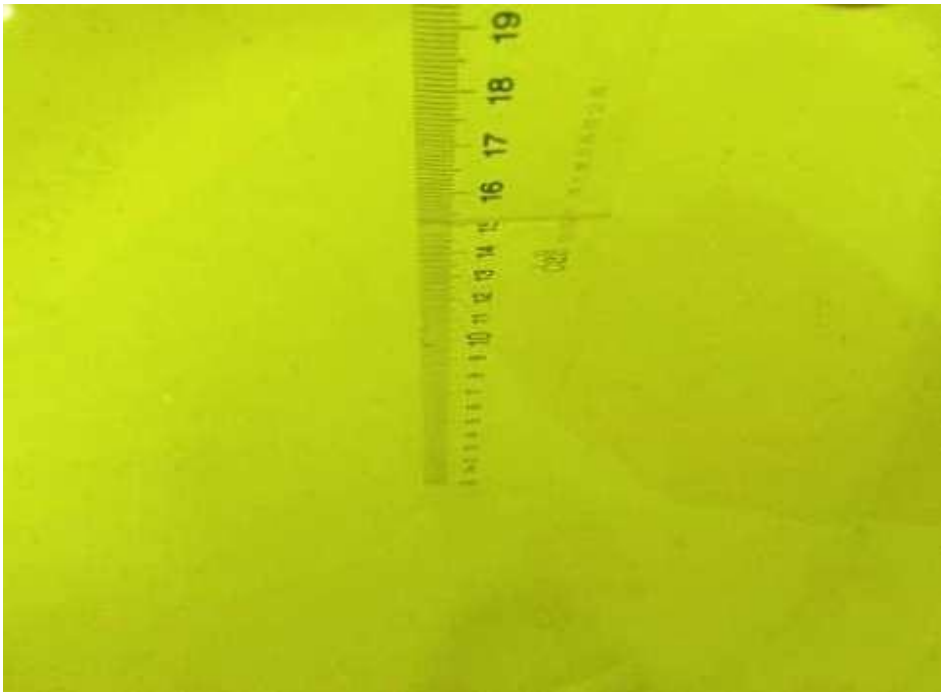
Frequency (MHz)	Head(Standard)		Temperature	Date	Test Result		Deviation	
	Permittivity ε	Conductivity σ			Permittivity ε	Conductivity σ	Permittivity ε	Conductivity σ
2450	39.20	1.80	20.7℃	2025-03-25	40.158	1.851	2.44%	2.83%
2450	39.20	1.80	20.6℃	2025-04-12	38.626	1.831	-1.46%	1.72%
5250	36.05	4.71	20.5℃	2025-03-26	36.299	4.797	0.69%	1.85%
5250	36.05	4.71	20.7℃	2025-03-27	36.299	4.797	0.69%	1.85%
5250	36.05	4.71	20.6℃	2025-04-10	35.664	4.775	-1.07%	1.38%
5750	35.45	5.22	20.5℃	2025-03-28	35.343	5.397	-0.30%	3.39%
5750	35.45	5.22	20.5℃	2025-04-02	35.343	5.397	-0.30%	3.39%
5750	35.45	5.22	20.4℃	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℃	2025-03-25	40.244	1.822	2.46%	3.11%
2437	39.226	1.789	20.7℃	2025-03-25	40.187	1.841	2.45%	2.91%
2462	39.184	1.813	20.7℃	2025-03-25	40.134	1.859	2.42%	2.54%
2412	39.276	1.767	20.6℃	2025-04-12	38.690	1.801	-1.49%	1.92%
2437	39.226	1.789	20.6℃	2025-04-12	38.649	1.821	-1.47%	1.79%
2462	39.184	1.813	20.6℃	2025-04-12	38.609	1.839	-1.47%	1.43%
2402	39.296	1.758	20.7℃	2025-03-25	40.265	1.814	2.47%	3.19%
2441	39.218	1.792	20.7℃	2025-03-25	40.178	1.844	2.45%	2.90%
2480	39.160	1.832	20.7℃	2025-03-25	40.098	1.872	2.40%	2.18%
2402	39.296	1.758	20.6℃	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

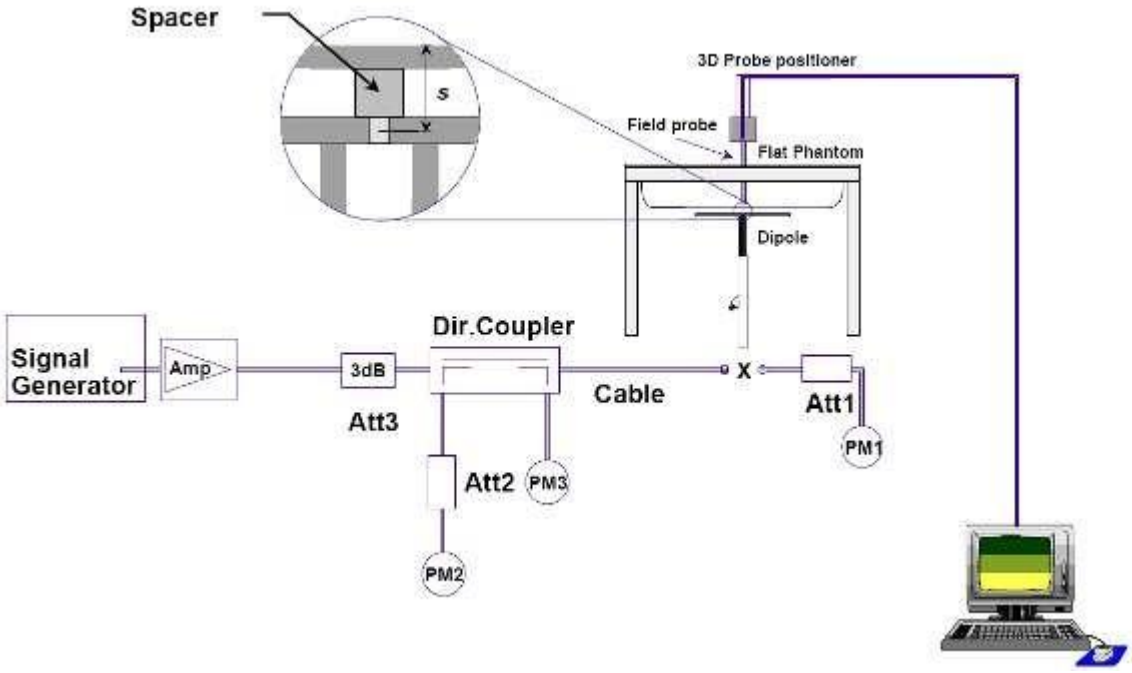
10.1 System Validation

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.

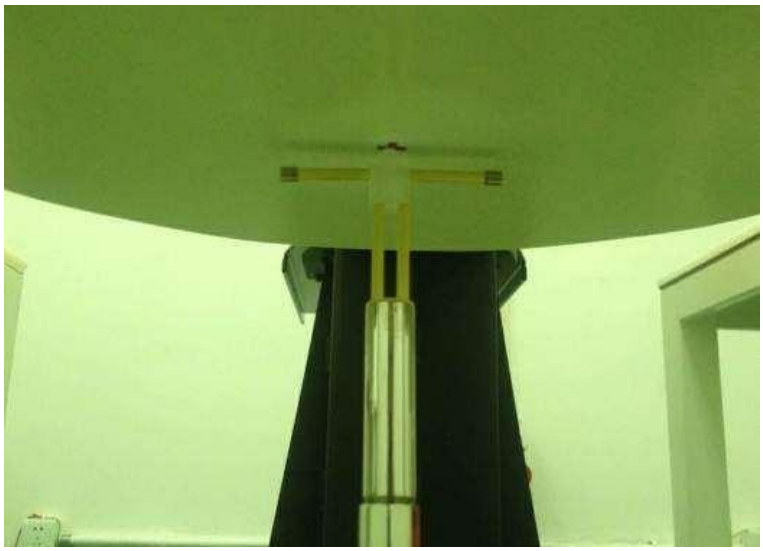
10.2 System Setup

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),

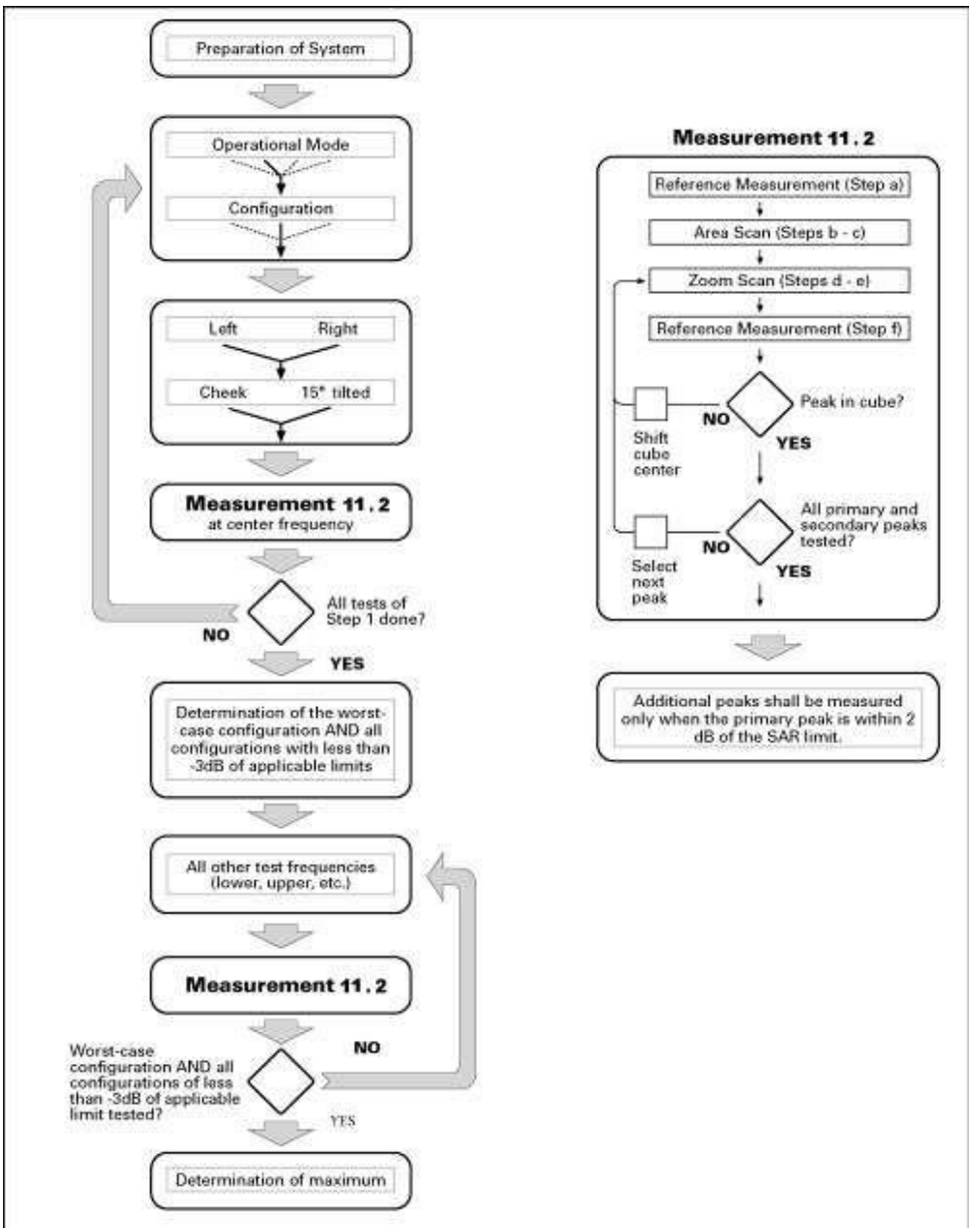
b) all configurations for each device position in a), e.g., antenna extended and retracted, and

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%.

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

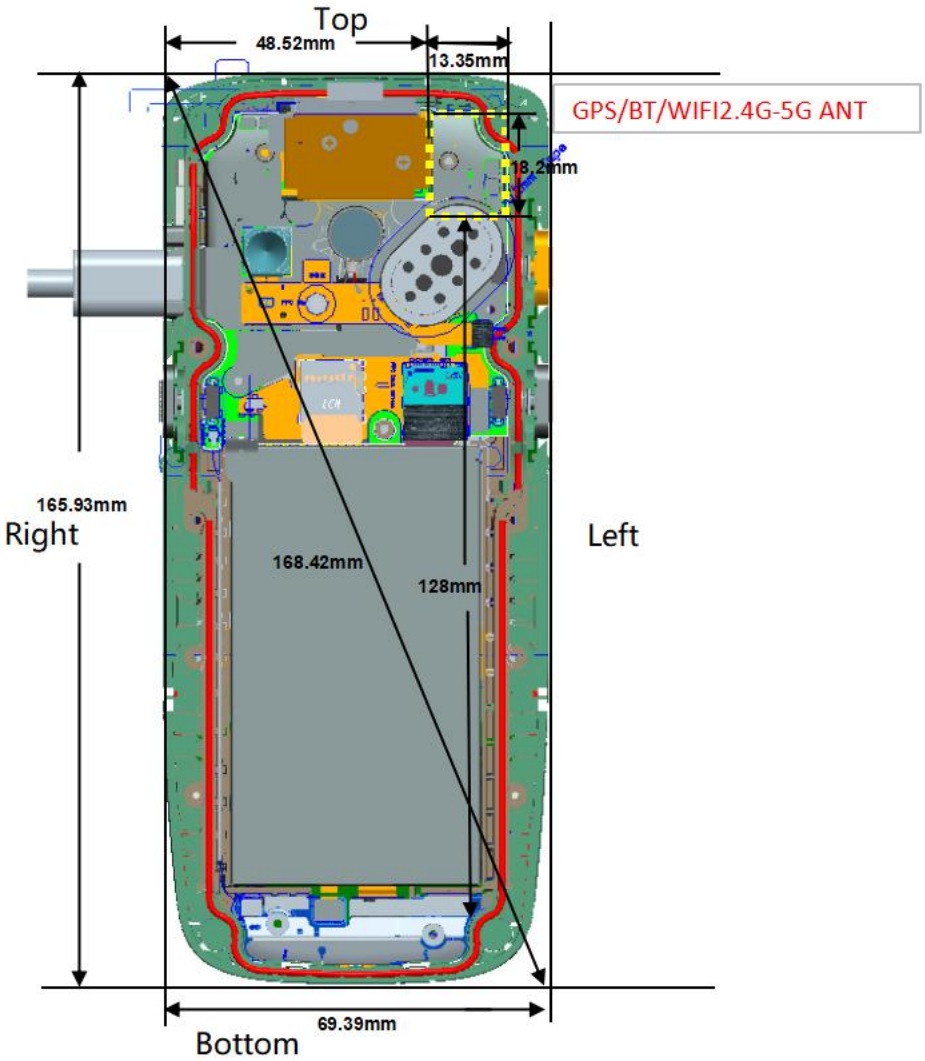
Frequency(MHz)	dBμV/m @3m	EIRP(dBm)	Tune up(dBm)
13.56	61.705	-33.523	-32.00
Note: EIRP(dBm)=Radiated field strength(dBμV/m)+20Log(3)-104.77.			

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**	A.1	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**	A.2	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**	A.3	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**	A.7	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	A.8	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	A.9	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	**A.13**	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**	**A.14**	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**	**A.15**	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-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	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	$U_c' = \sqrt{\sum_{i=1}^{m} Ci^2 Ui^2}$	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-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	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 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)	5.0	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	$U_c' = \sqrt{\sum_{i=1}^{m} Ci^2 Ui^2}$	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-re ection	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Probe Positioned mech.restrictions	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	

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.restrictions	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	$U_c = \sqrt{\sum_{i=1}^{n} Ci^2 Ui^2}$	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; σ = 1.841 S/m; ε_r = 40.187; ρ = 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

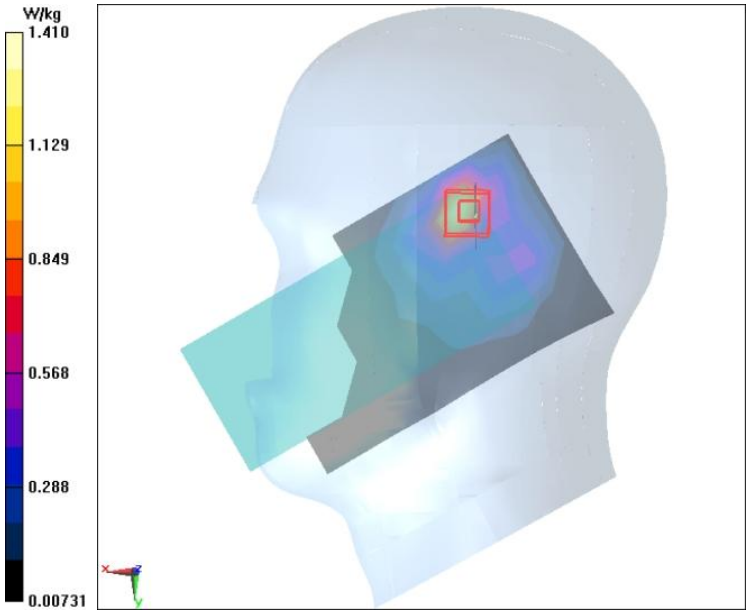
Peak SAR (extrapolated) = 1.88 W/kg

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; ε_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

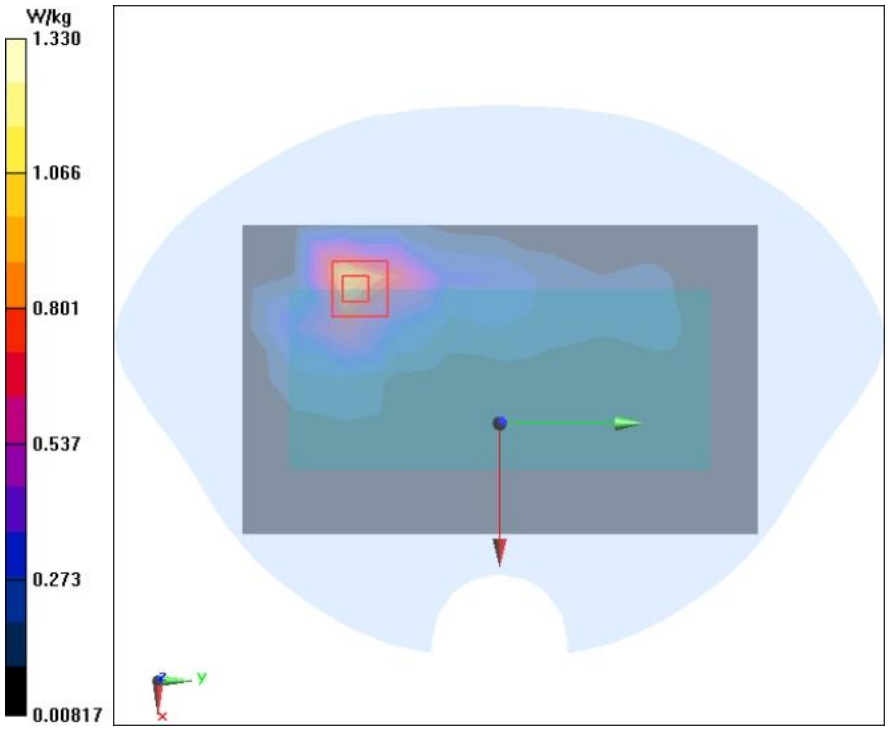
Peak SAR (extrapolated) = 1.65 W/kg

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; ε_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

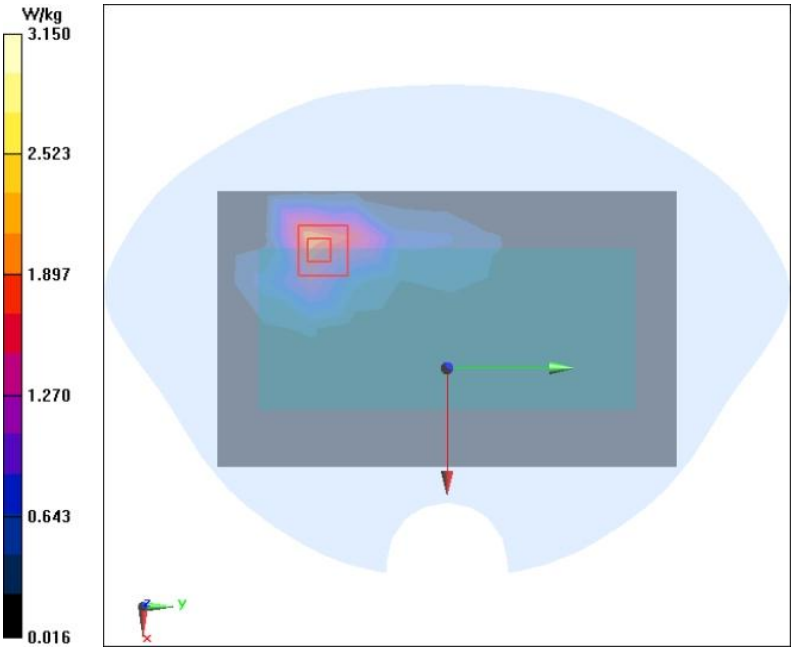
Peak SAR (extrapolated) = 4.25 W/kg

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; ε_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

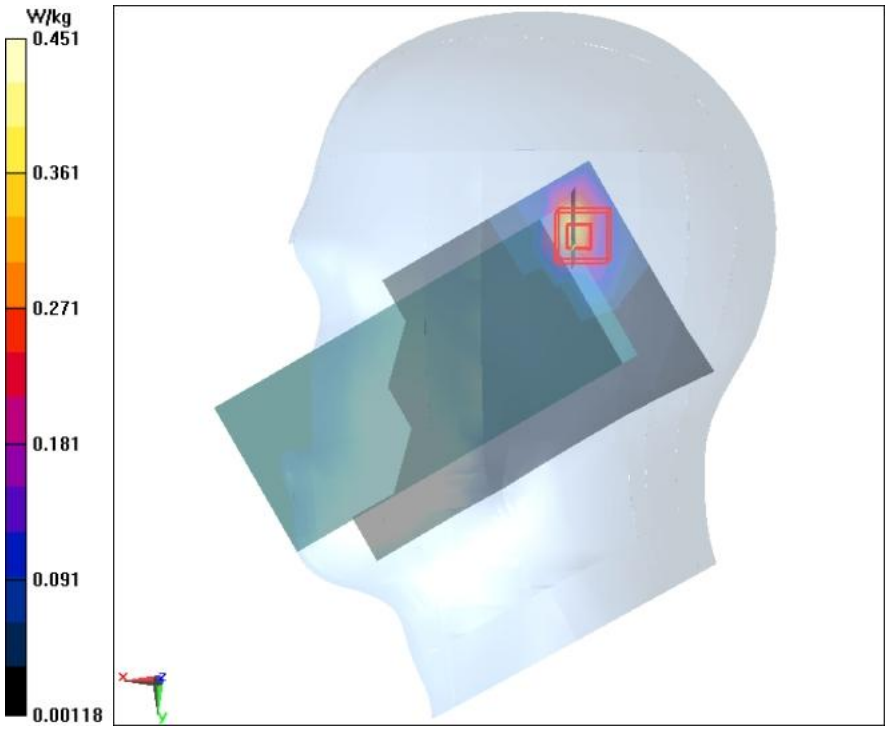
Peak SAR (extrapolated) = 0.773 W/kg

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; ε_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

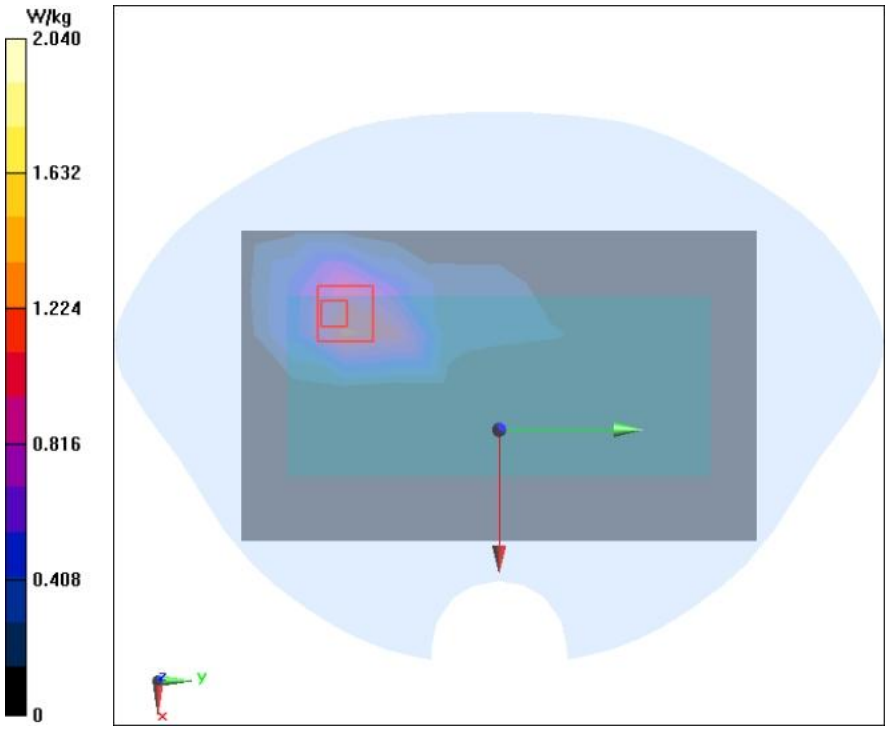
Peak SAR (extrapolated) = 3.14 W/kg

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; ε_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

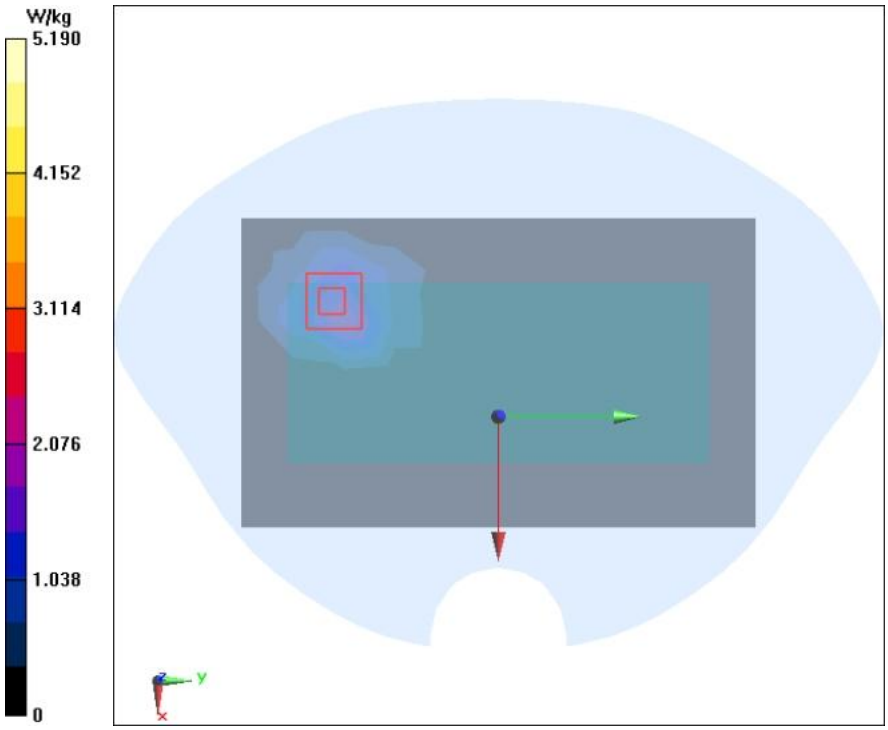
Peak SAR (extrapolated) = 8.90 W/kg

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; ε_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

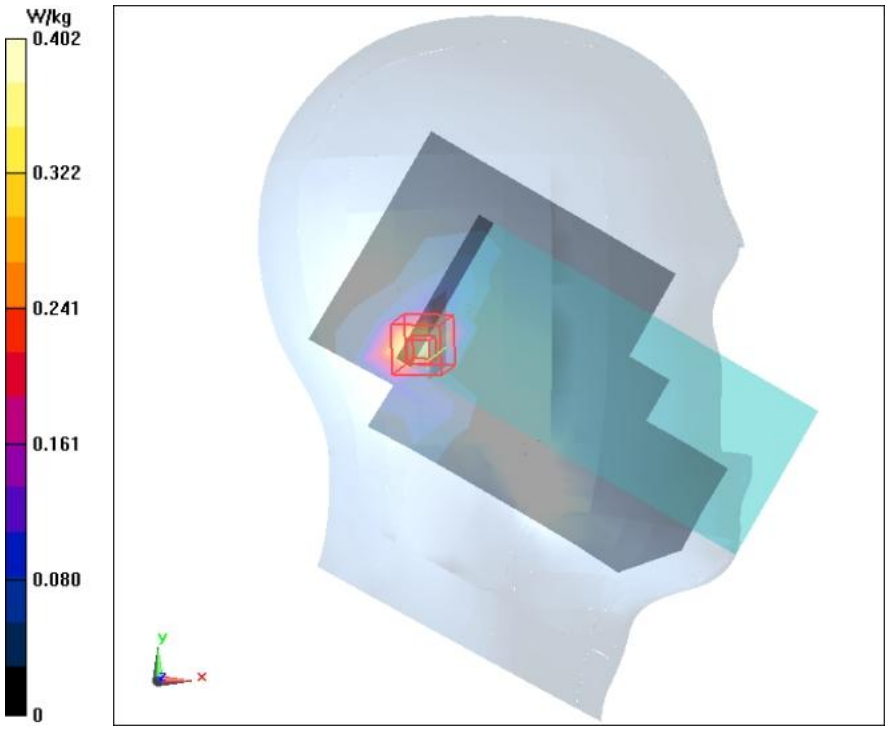
Peak SAR (extrapolated) = 0.755 W/kg

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; ε_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

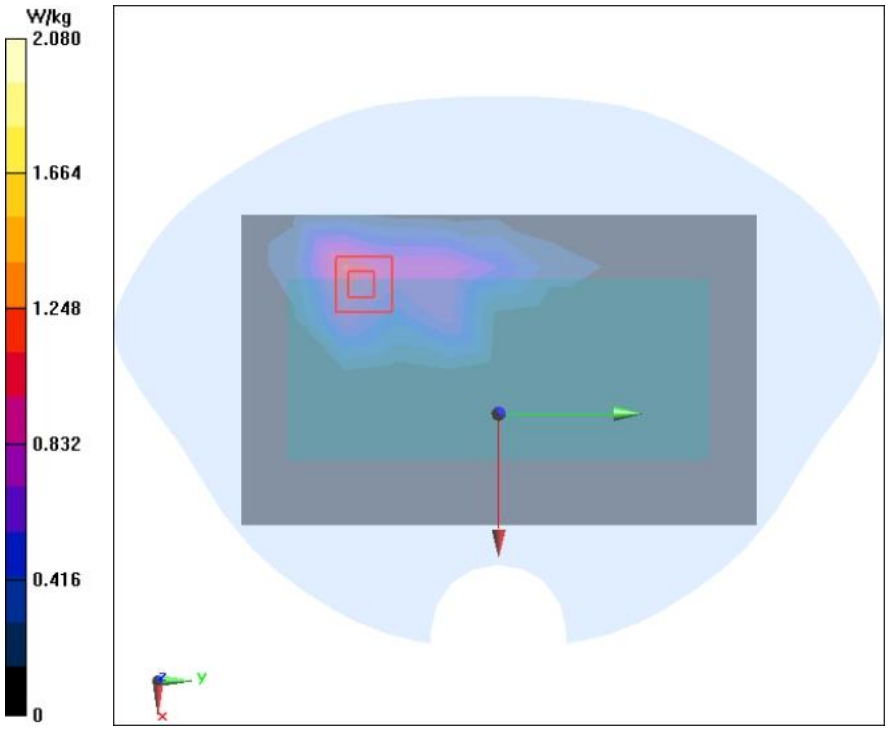
Peak SAR (extrapolated) = 3.42 W/kg

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; σ = 4.857 S/m; ε_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 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

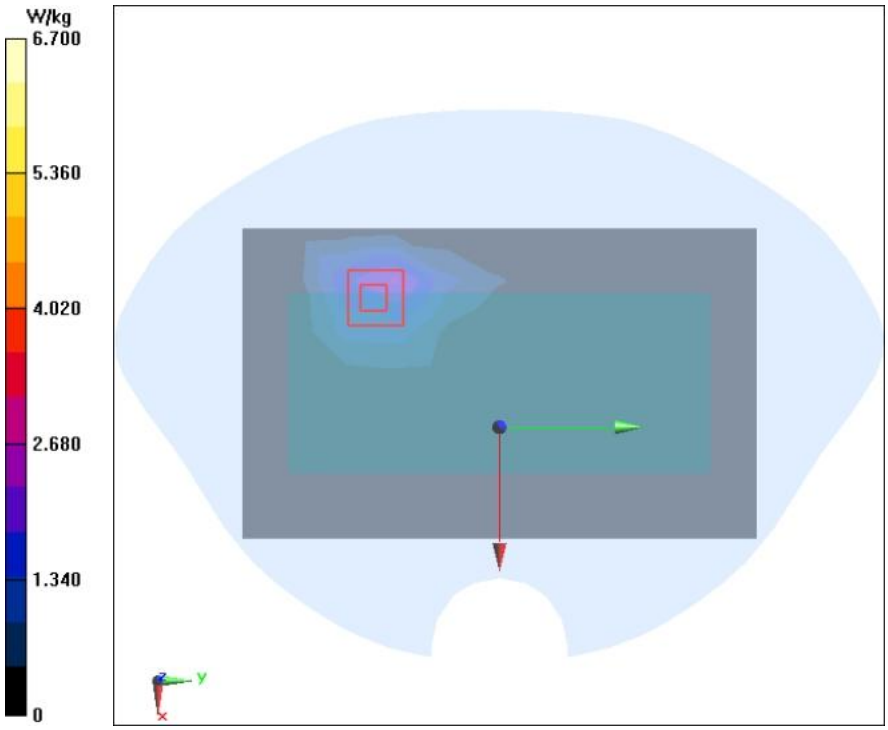
Peak SAR (extrapolated) = 10.8 W/kg

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; ε_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

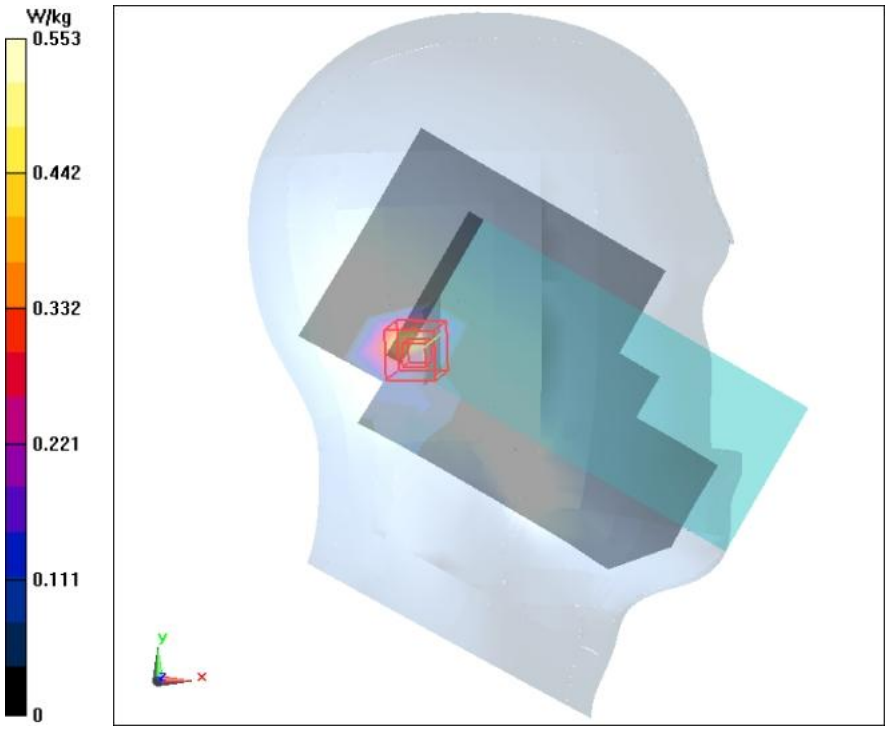
Peak SAR (extrapolated) = 2.02 W/kg

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; σ = 5.156 S/m; ε_r = 35.025; ρ = 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

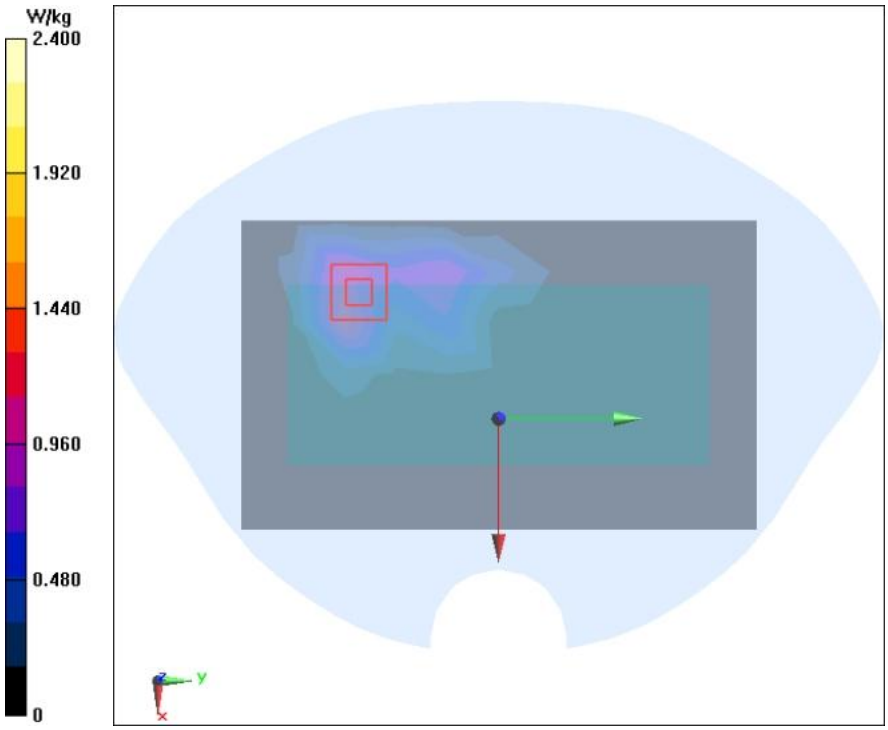
Peak SAR (extrapolated) = 3.99 W/kg

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; σ = 5.061 S/m; ε_r = 35.18; ρ = 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

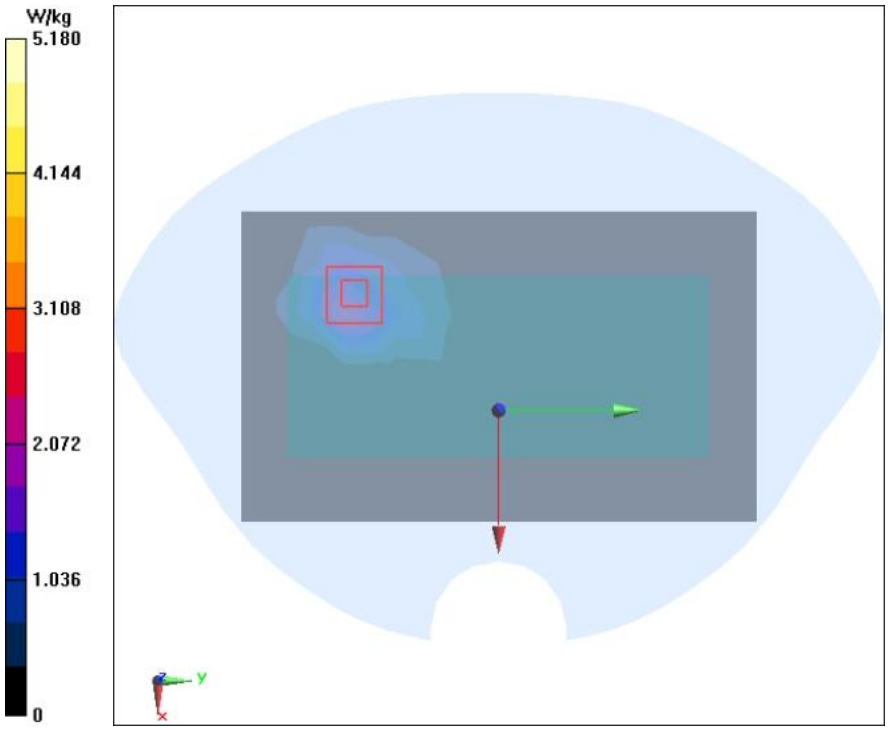
Peak SAR (extrapolated) = 9.30 W/kg

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; ε_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

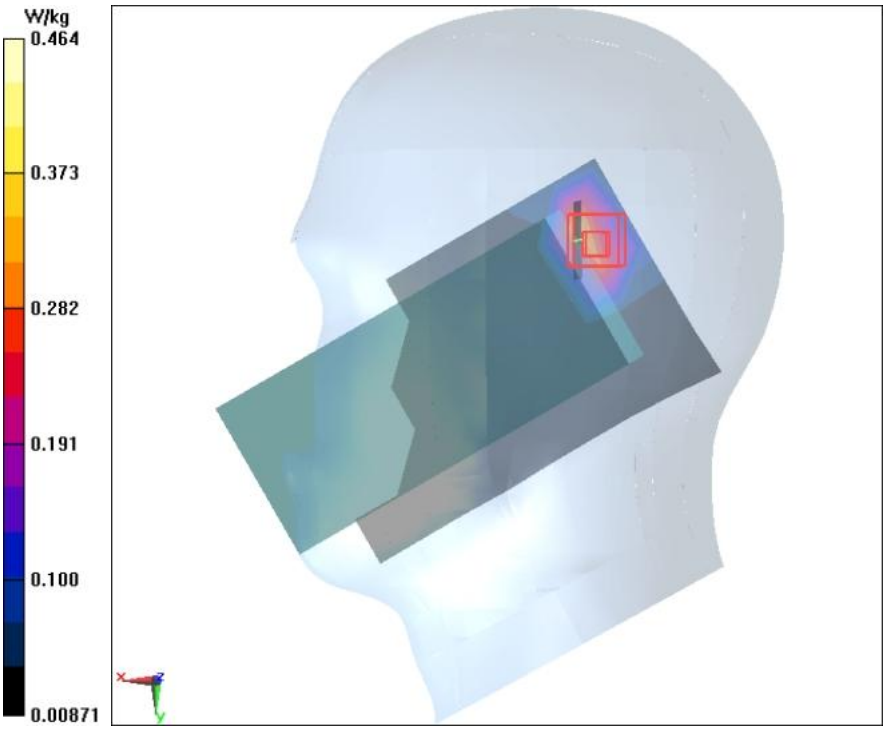
Peak SAR (extrapolated) = 1.19 W/kg

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; ε_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

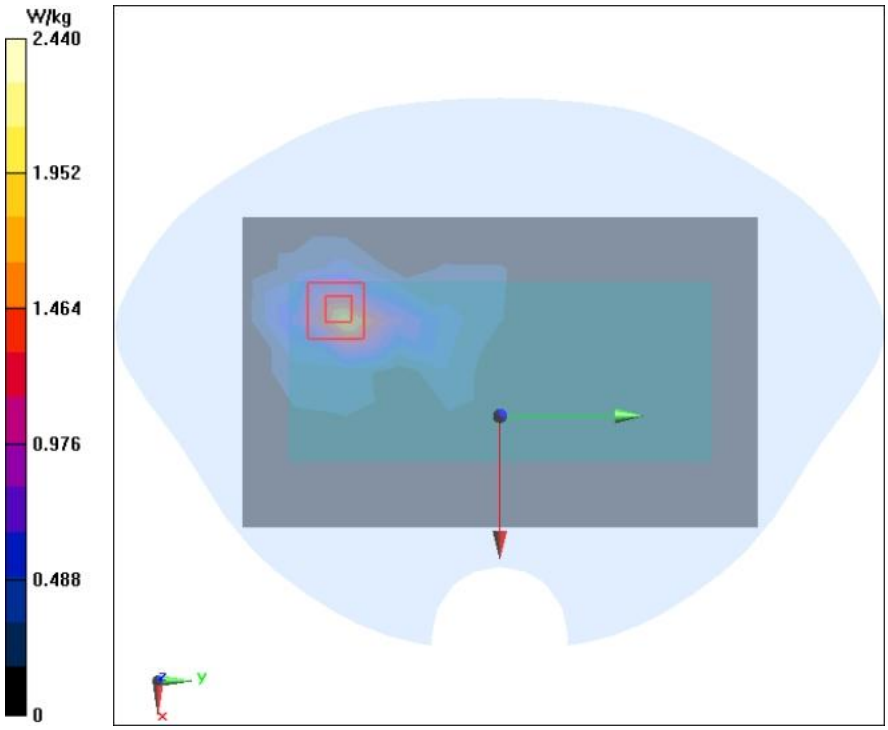
Peak SAR (extrapolated) = 4.53 W/kg

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; σ = 5.355 S/m; ε_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 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

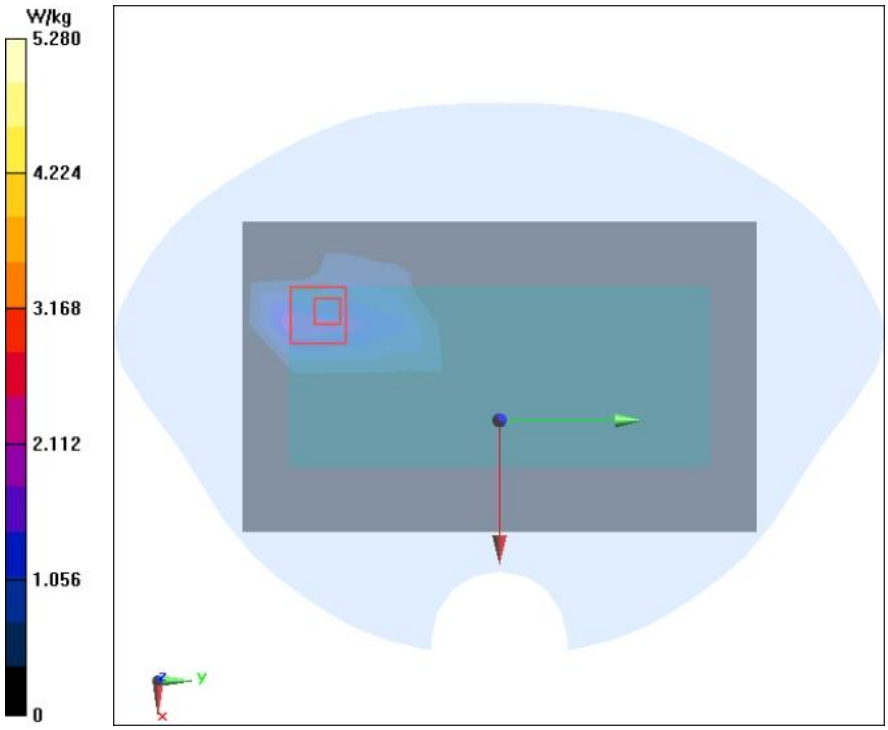
Peak SAR (extrapolated) = 10.2 W/kg

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; ε_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

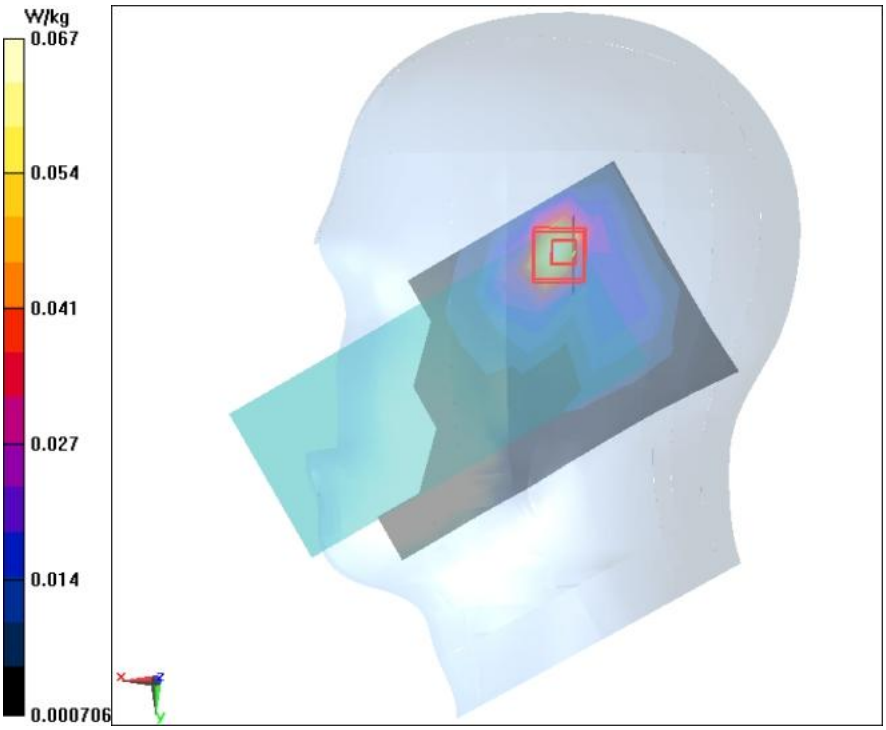
Peak SAR (extrapolated) = 0.091 W/kg

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; σ = 1.824 S/m; ε_r = 38.642; ρ = 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

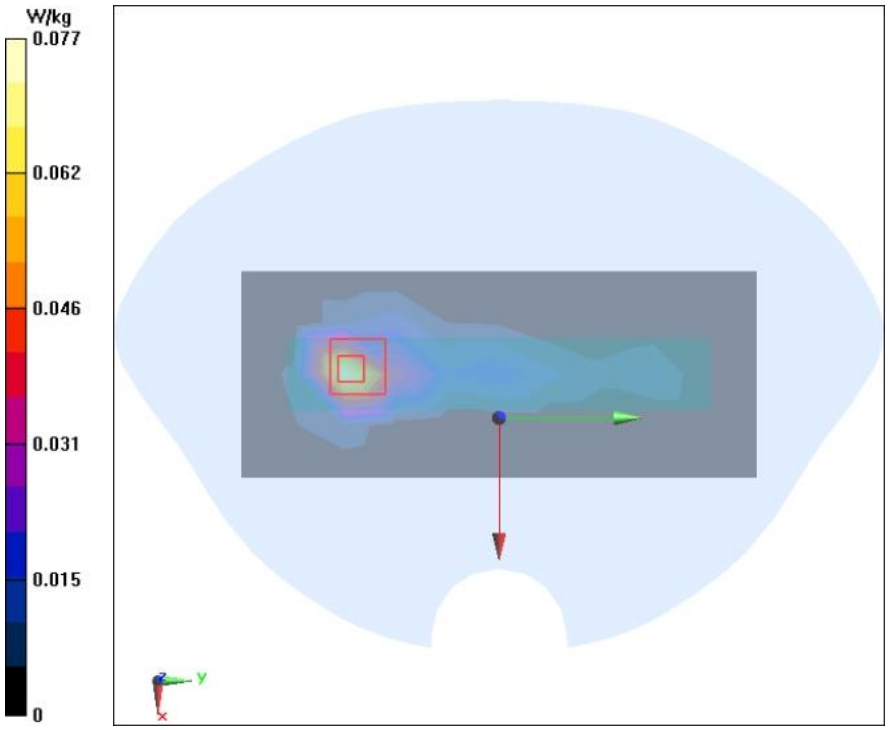
Peak SAR (extrapolated) = 0.102 W/kg

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; ε_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

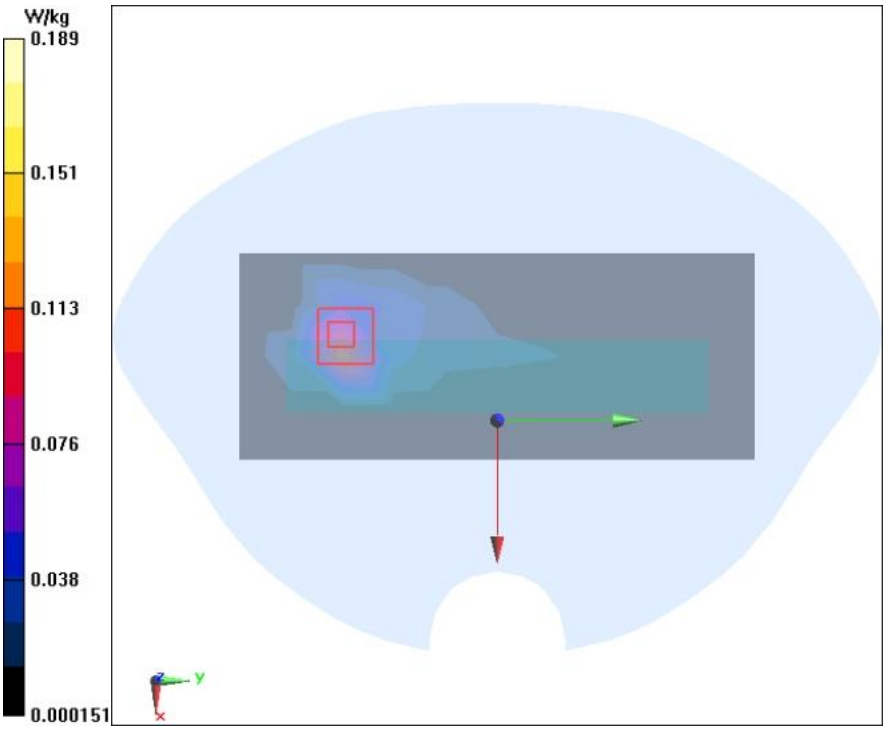
Peak SAR (extrapolated) = 0.267 W/kg

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

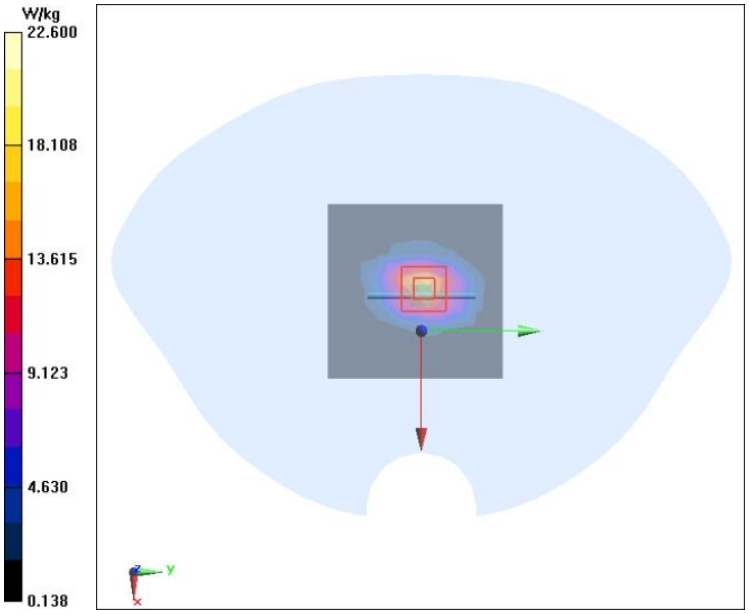
Peak SAR (extrapolated) = 27.9 W/kg

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

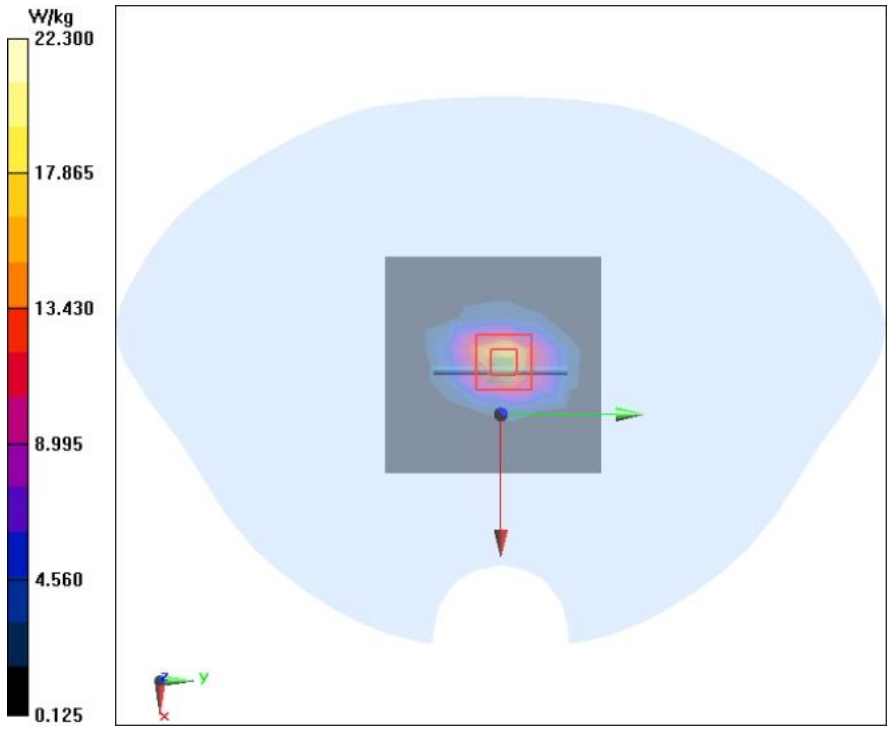
Peak SAR (extrapolated) = 27.8 W/kg

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

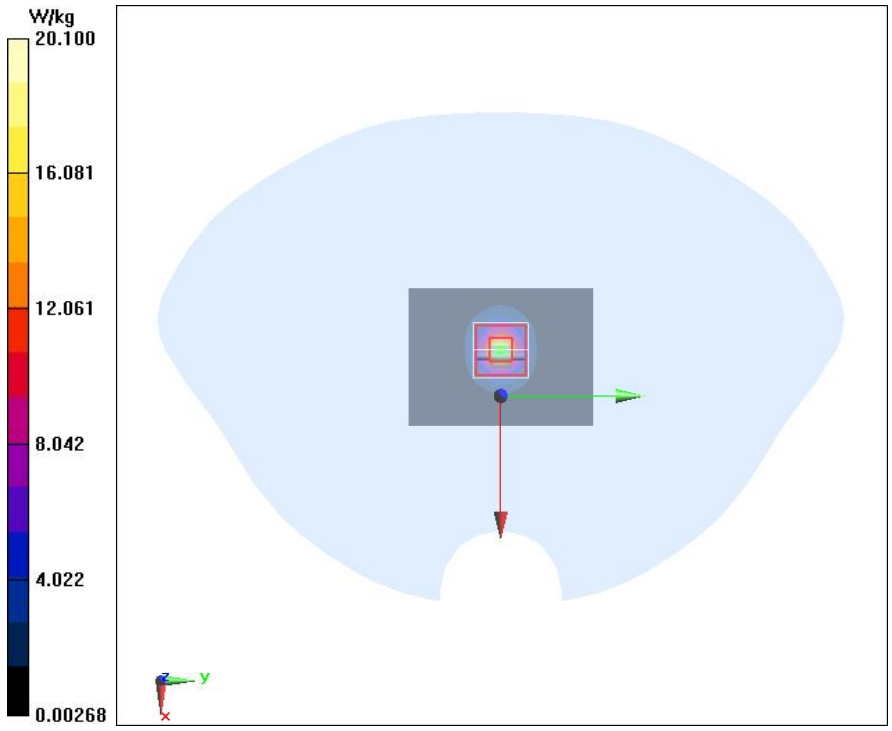
Peak SAR (extrapolated) = 32.5 W/kg

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

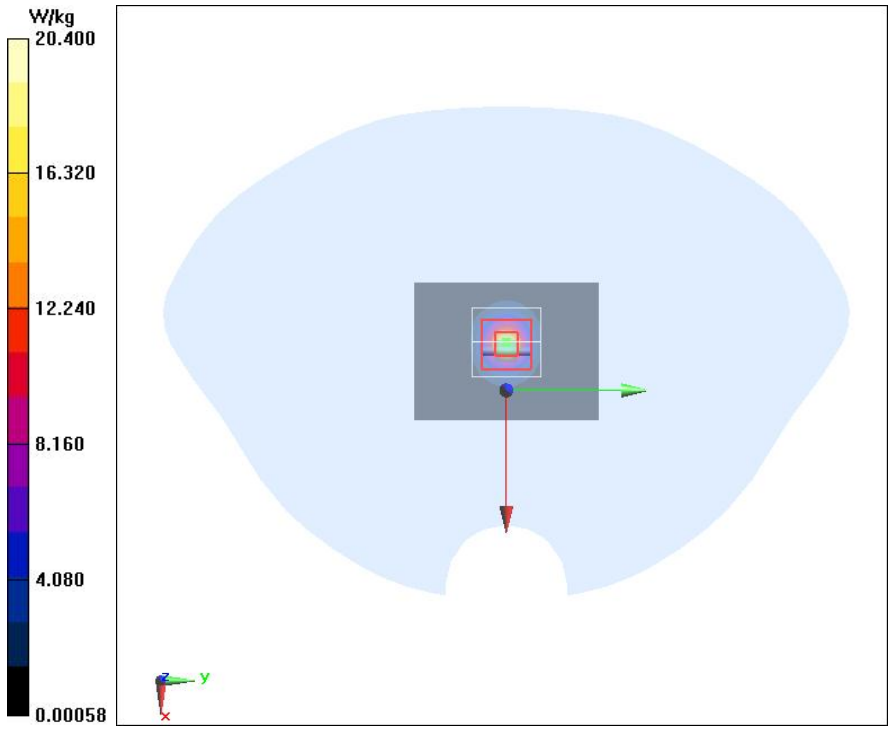
Peak SAR (extrapolated) = 34.2 W/kg

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

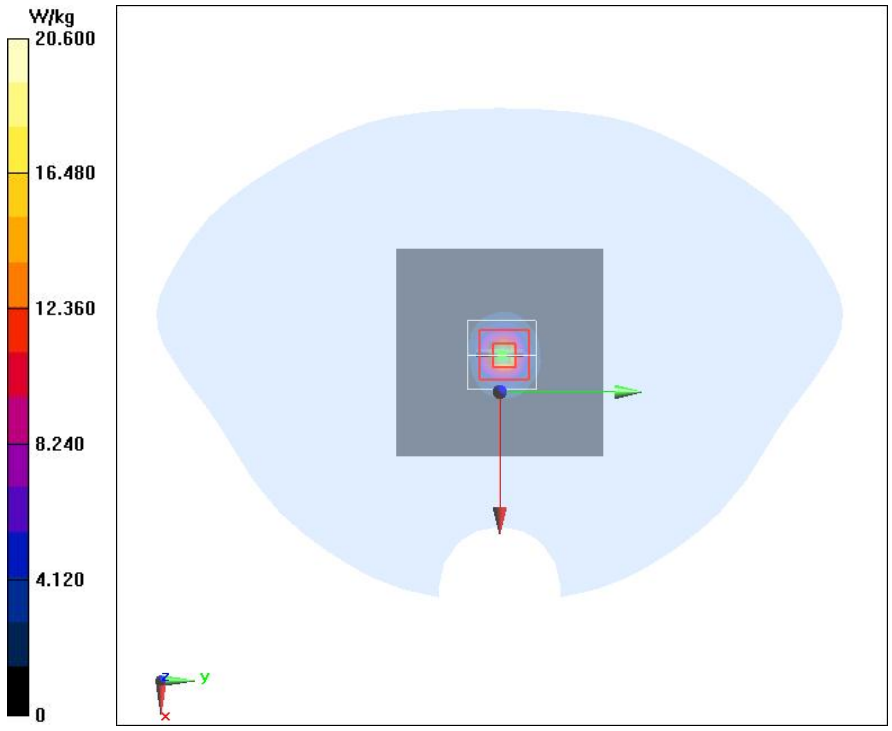
Peak SAR (extrapolated) = 33.7 W/kg

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

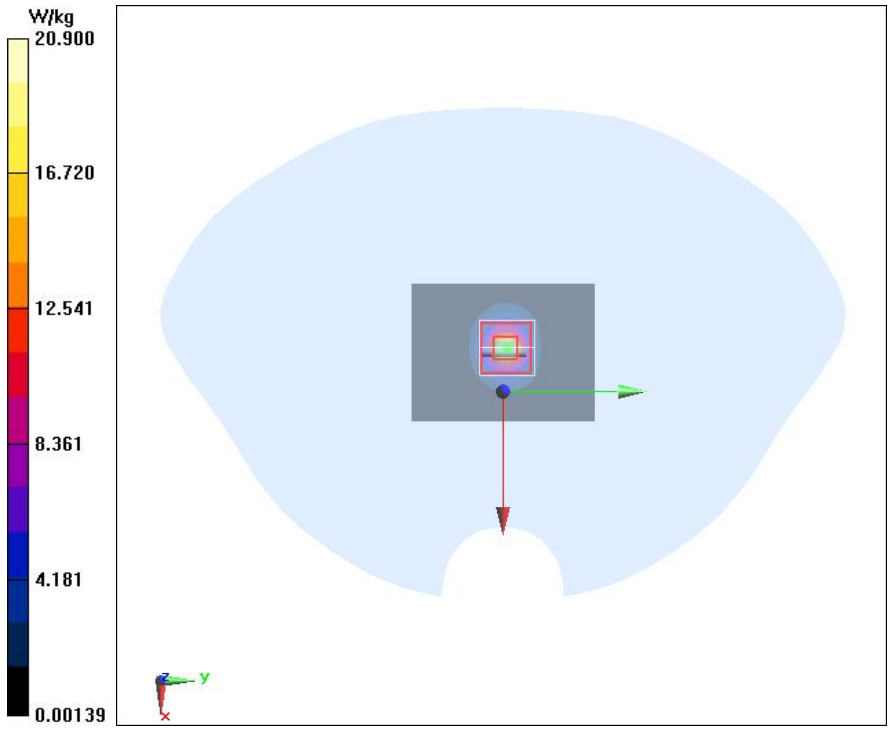
Peak SAR (extrapolated) = 35.7 W/kg

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

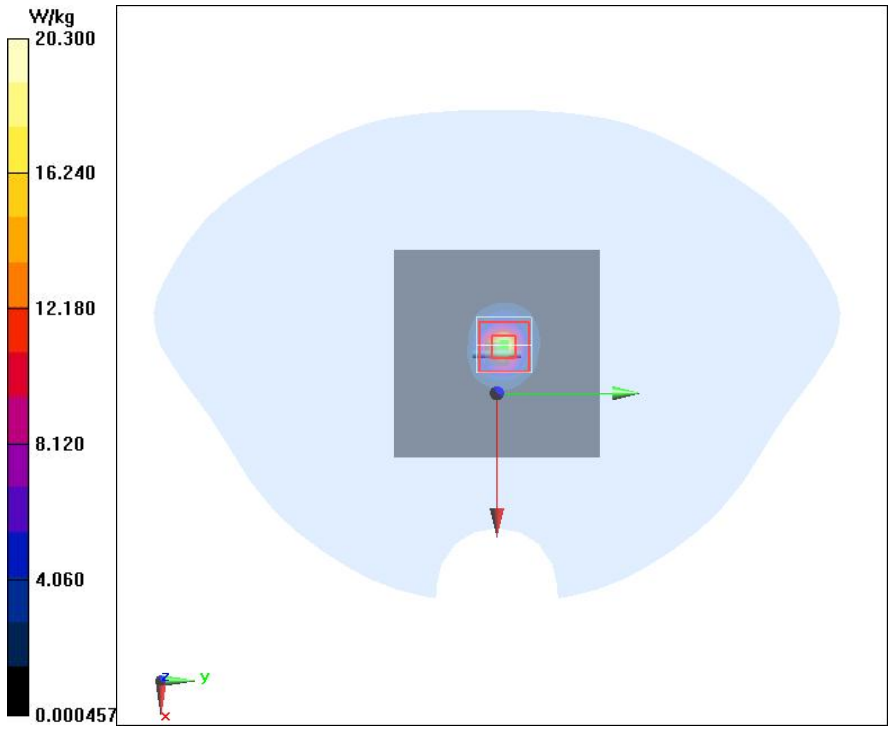
Peak SAR (extrapolated) = 34.5 W/kg

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

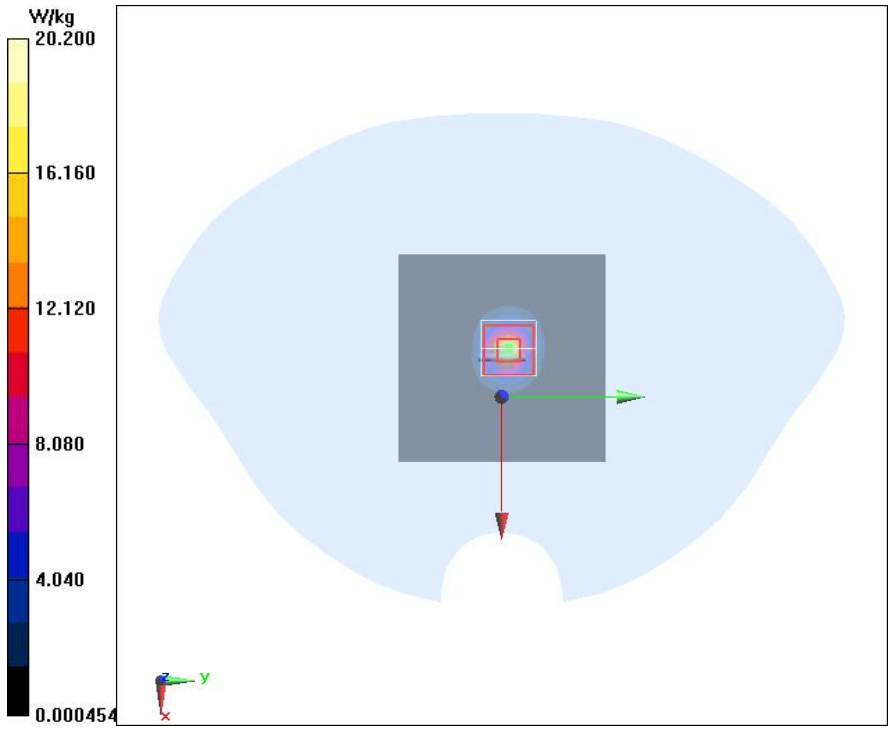
Peak SAR (extrapolated) = 34.3 W/kg

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 speag 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 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

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

Certificate No: 24J02Z000528 Page 1 of 3

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

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.