# SAR Test Report

Report No.: STS2511068H01

Issued for

Fort Robotics Inc.

1608 Walnut Street Floor 12, Philadelphia, Pennsylvania 19103, United States

| | |
|---|---|
| Product Name: | Wireless E-Stop Pro |
| Brand Name: | FORT Robotics |
| Model Name: | WESP 1003 |
| Series Model(s): | N/A |
| FCC ID: | 2A8I8-1000415 |
| Test Standard: | ANSI/IEEE Std. C95.1<br>FCC 47 CFR Part 2 (2.1093)<br>IEEE Std. 1528-2013 |
| Max. Report SAR (1g) | Body: 0.375 W/kg |

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

# TEST REPORT CERTIFICATION

**Applicant's name** ..... : Fort Robotics Inc.

Address ..... : 1608 Walnut Street Floor 12, Philadelphia, Pennsylvania 19103, United States

**Manufacturer's Name** ..... : Fort Robotics Inc.

Address ..... : 1608 Walnut Street Floor 12, Philadelphia, Pennsylvania 19103, United States

**Product description**

Product name ..... : Wireless E-Stop Pro

Brand name ..... : FORT Robotics

Model name ..... : WESP 1003

Series Model..... : N/A

**Standards**..... : ANSI/IEEE Std. C95.1
FCC 47 CFR Part 2 (2.1093)
IEEE Std. 1528-2013

The device was tested by Shenzhen STS Test Services Co., Ltd. in accordance with the measurement methods and procedures specified in KDB 865664 The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Date of Test**..... :

Date (s) of performance of tests..... : 12 Nov. 2025

Date of Issue..... : 21 Nov. 2025

Test Result..... : **Pass**

Testing Engineer : Xin Liu

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SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

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## Revision History

| Rev. | Issue Date | Report No. | Effect Page | Contents |
|---|---|---|---|---|
| 00 | 21 Nov. 2025 | STS2511068H01 | ALL | Initial Issue |
| | | | | |


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# 1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

## 1.1 EUT Description

| | | | |
|---|---|---|---|
| Product Name | Wireless E-Stop Pro | | |
| Brand Name | FORT Robotics | | |
| Model Name | WESP 1003 | | |
| Series Model | N/A | | |
| Model Difference | N/A | | |
| Sample number | 251107017-1 | | |
| Battery | Rated Voltage:3.70V<br>Charge Limit Voltage:<br>Capacity: 4000mAh, 14.8Wh | | |
| Device Category | Portable | | |
| Product stage | Production unit | | |
| RF Exposure Environment | General Population / Uncontrolled | | |
| Hardware Version | B | | |
| Software Version | 0.0.6 | | |
| Frequency Range | BLE: 2402 MHz to 2480 MHz | | |
| Max. Reported SAR(1g): (Limit:1.6W/kg) Test distance: Body:0mm | Band | Mode | Body Worn(W/kg) |
| | DTS | BLE | 0.375 |
| FCC Equipment Class | Digital Transmission System (DTS) | | |
| Operating Mode: | BLE: GFSK | | |
| Antenna Specification: | BLE: Whip Antenna | | |
| Hotspot Mode | Not Support | | |
| DTM Mode | Not Support | | |
| Note:<br>1. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power | | | |

## 1.2 Test Environment

Ambient conditions in the SAR laboratory:

| Items | Required |
|---|---|
| Temperature (℃) | 18-25 |
| Humidity (%RH) | 30-70 |

## 1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01

## 2. Test Standards and Limits

| No. | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 2 | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2 | IEEE Std 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. |
| 3 | IEEE Std. 1528-2013 | Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques |
| 4 | FCC KDB 447498 D04 v01 | RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices |
| 5 | FCC KDB 865664 D01 v01r04 | SAR Measurement 100 MHz to 6 GHz |
| 6 | FCC KDB 865664 D02 v01r02 | RF Exposure Reporting |

(A). Limits for Occupational/Controlled Exposure (W/kg)

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|---|---|---|
| 0.4 | 8.0 | 20.0 |

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|---|---|---|
| 0.08 | 1.6 | 4.0 |

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

**Population/Uncontrolled Environments:**

Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**Occupational/Controlled Environments:**

Are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

**NOTE**

**GENERAL POPULATION/UNCONTROLLED EXPOSURE**

**PARTIAL BODY LIMIT**

**1.6 W/kg**

# 3. SAR Measurement System

## 3.1 Definition of Specific Absorption Rate (SAR)

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 ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.
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:

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

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

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

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

## 3.2 SAR System

The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (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.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

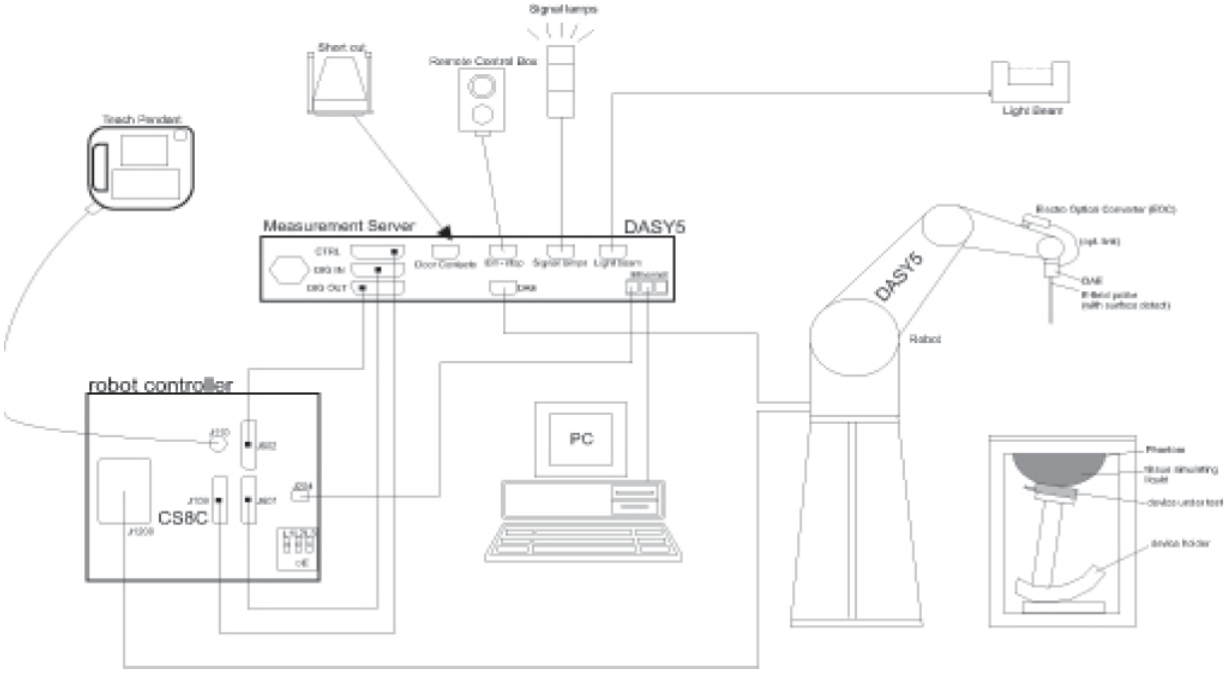
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



## 3.3 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

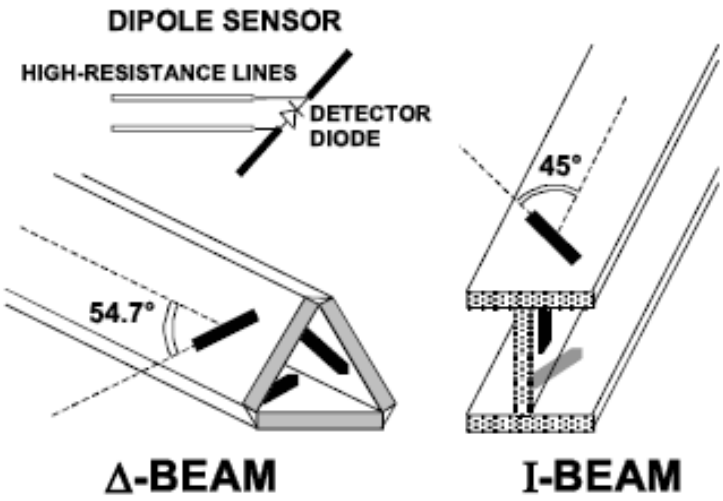
Probe Specification

| | |
|---|---|
| Construction | Symmetrical design with triangular core<br>Interleaved sensors<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| Calibration | ISO/IEC 17025 calibration service available. |
| Frequency | 10 MHz to 4 GHz;<br>Linearity: ± 0.2 dB (30 MHz to 4 GHz) |
| Directivity | ± 0.2 dB in HSL (rotation around probe axis)<br>± 0.3 dB in tissue material (rotation normal to probe axis) |
| Dynamic Range | 5 µW/g to > 100 mW/g;<br>Linearity: ± 0.2 dB |
| Dimensions | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 3.9 mm (Body: 12 mm)<br>Distance from probe tip to dipole centers: 2.0 mm |
| Application | General dosimetry up to 4 GHz<br>Dosimetry in strong gradient fields<br>Compliance tests of Mobile Phones |
| Compatibility | DASY3, DASY5, DASY52 SAR and higher, EASY4/MRI |

Isotropic E-Field Probe

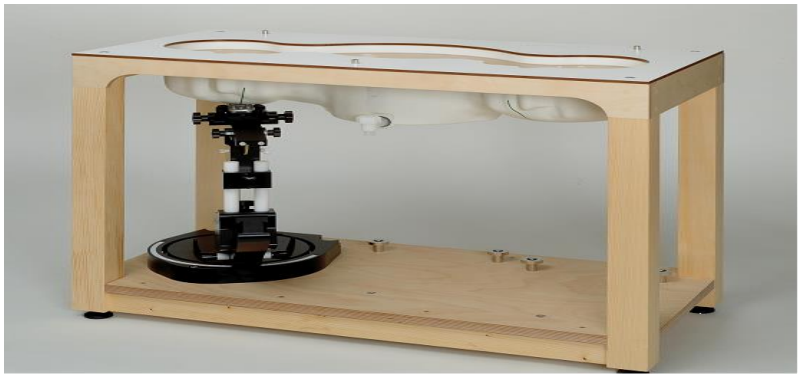
The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:




## 3.4 Phantoms

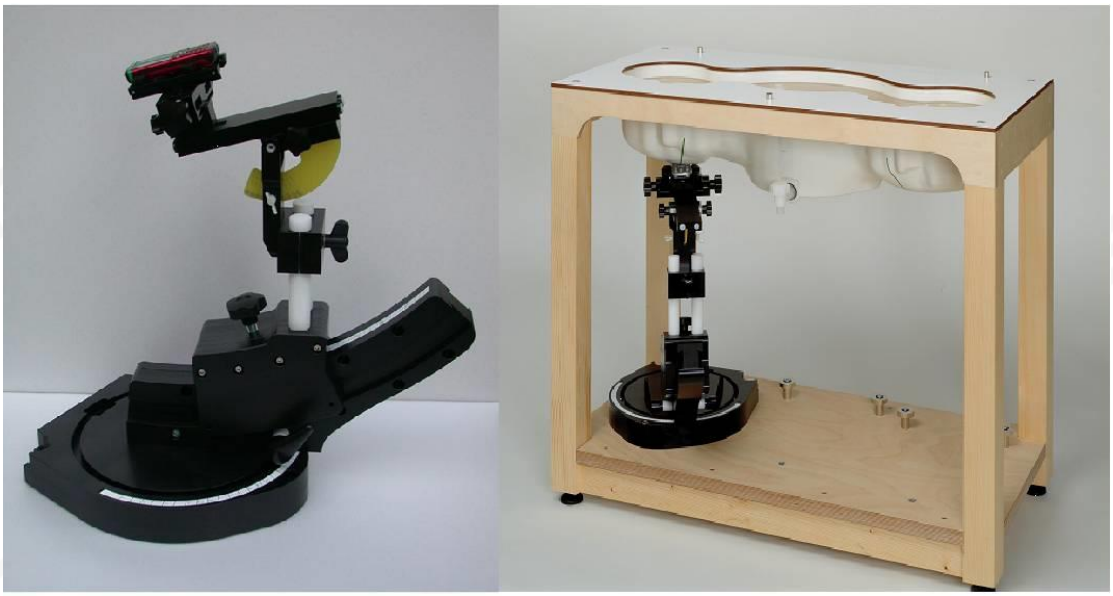
The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM Twin Phantom

## 3.5 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
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.



Device holder supplied by SPEAG

## 3.6 Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan
Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume

containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

Spatial Peak Detection
The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The DASY5 system allows evaluations that combine measured data and robot positions, such as: • maximum search • extrapolation • boundary correction • peak search for averaged SAR During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

## 3.7 Data Storage and Evaluation

**Data Storage**
The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

**Data Evaluation**
The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

| | | |
|---|---|---|
| Probe parameters: | - Sensitivity | Normi, ai0, ai1, ai2 |
| | - Conversion factor | ConvFi |
| | - Diode compression point | Dcpi |
| Device parameters: | - Frequency | f |
| | - Crest factor | cf |
| Media parameters: | - Conductivity | σ |
| | - Density | ρ |

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.
The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.
The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i ( i = x, y, z )
Ui = input signal of channel i ( i = x, y, z )
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

From the compensated input signals the priMayy field data for each channel can be evaluated:

$$\text{E} - \text{fieldprobes}: \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\text{H} - \text{fieldprobes}: \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The priMayy field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

# 4. Tissue Simulating Liquids

## 4.1 Simulating Liquids Parameter Check

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values

The uncertainty due to the liquid conductivity and permittivity arises from two different sources. The first source of error is the deviation of the liquid conductivity from its target value (max _ 5 %) and the second source of error arises from the measurement procedures used to assess conductivity. The uncertainty shall be assessed using a rectangular probability For 1 g averaging, the maximum weighting coefficient for SAR is 0,5.

**IEEE SCC-34/SC-2 RECOMMENDED TISSUE DIELECTRIC PARAMETERS**
The head and body tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been incorporated in the following table.

| Frequency | εr | σ 10g S/m |
|---|---|---|
| 300 | 45.3 | 0.87 |
| 450 | 43.5 | 0.87 |
| 750 | 41.9 | 0.89 |
| 835 | 41.5 | 0.90 |
| 900 | 41.5 | 0.97 |
| 1450 | 40.5 | 1.20 |
| 1800 to 2000 | 40.0 | 1.40 |
| 2100 | 39.8 | 1.49 |
| 2450 | 39.2 | 1.80 |
| 2600 | 39.0 | 1.96 |
| 3000 | 38.5 | 2.40 |
| 3500 | 37.9 | 2.91 |
| 4000 | 37.4 | 3.43 |
| 4500 | 36.8 | 3.94 |
| 5000 | 36.2 | 4.45 |
| 5200 | 36.0 | 4.66 |
| 5400 | 35.8 | 4.86 |
| 5600 | 35.5 | 5.07 |
| 5800 | 35.3 | 5.27 |

The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

| Head (Reference IEEE1528) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Water (%) | Sugar (%) | Cellulose (%) | Salt (%) | Preventol (%) | DGBE (%) | Conductivity σ (S/m) | Permittivity ε |
| 750 | 41.1 | 57.0 | 0.2 | 1.4 | 0.2 | 0 | 0.89 | 41.9 |
| 835 | 40.3 | 57.9 | 0.2 | 1.4 | 0.2 | 0 | 0.90 | 41.5 |
| 900 | 40.3 | 57.9 | 0.2 | 1.4 | 0.2 | 0 | 0.97 | 41.5 |
| 1800, 1900, 2000 | 55.2 | 0 | 0 | 0.3 | 0 | 44.5 | 1.4 | 40.0 |
| 2450 | 55.0 | 0 | 0 | 0.1 | 0 | 44.9 | 1.80 | 39.2 |
| 2600 | 54.9 | 0 | 0 | 0.1 | 0 | 45.0 | 1.96 | 39.0 |
| Frequency (MHz) | Water (%) | Hexyl Carbitol (%) | | | Triton X-100 (%) | | Conductivity σ (S/m) | Permittivity ε |
| 5200 | 62.52 | 17.24 | | | 17.24 | | 4.66 | 36.0 |
| 5800 | 62.52 | 17.24 | | | 17.24 | | 5.27 | 35.3 |
| Body (From instrument manufacturer) | | | | | | | | |
| Frequency (MHz) | Water (%) | Sugar (%) | Cellulose (%) | Salt (%) | Preventol (%) | DGBE (%) | Conductivity σ (S/m) | Permittivity ε |
| 750 | 51.7 | 47.2 | 0 | 0.9 | 0.1 | 0 | 0.96 | 55.5 |
| 835 | 50.8 | 48.2 | 0 | 0.9 | 0.1 | 0 | 0.97 | 55.2 |
| 900 | 50.8 | 48.2 | 0 | 0.9 | 0.1 | 0 | 1.05 | 55.0 |
| 1800, 1900, 2000 | 70.2 | 0 | 0 | 0.4 | 0 | 29.4 | 1.52 | 53.3 |
| 2450 | 68.6 | 0 | 0 | 0.1 | 0 | 31.3 | 1.95 | 52.7 |
| 2600 | 68.2 | 0 | 0 | 0.1 | 0 | 31.7 | 2.16 | 52.5 |
| Frequency(MHz) | Water | DGBE (%) | | | Salt (%) | | Conductivity σ (S/m) | Permittivity ε |
| 5200 | 78.60 | 21.40 | | | / | | 5.30 | 49.00 |
| 5800 | 78.50 | 21.40 | | | 0.1 | | 6.00 | 48.20 |

## LIQUID MEASUREMENT RESULTS

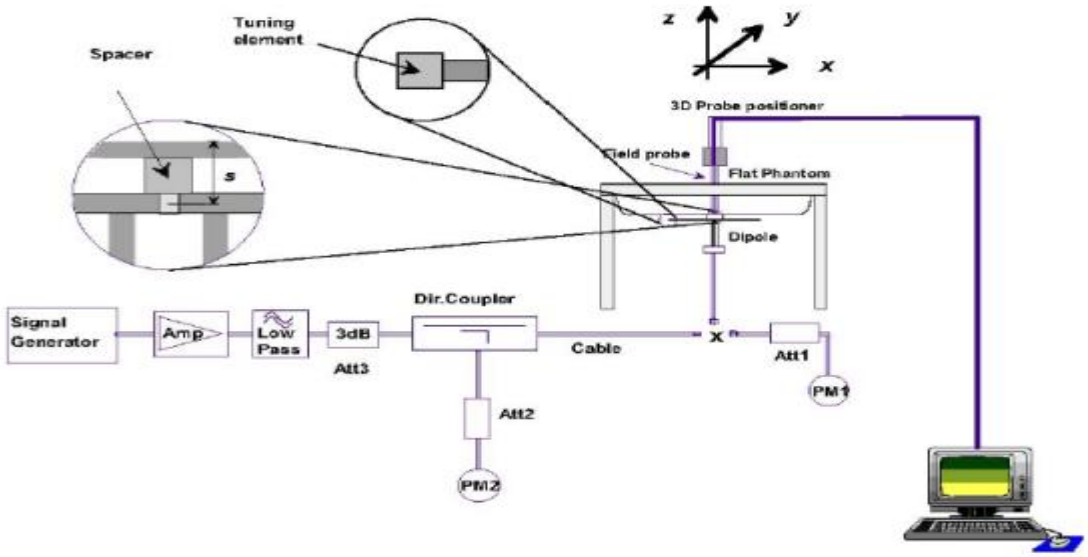
| Date | Ambient | | Simulating Liquid | | Parameters | Target | Measured | Deviation % | Limited % |
|---|---|---|---|---|---|---|---|---|---|
| | Temp. [°C] | Humidity % | Frequency (MHz) | Temp. [°C] | | | | | |
| 2025-11-12 | 23.6 | 54 | 2402 | 23.2 | Permittivity | 39.29 | 40.18 | 2.28 | ±5 |
| | | | | | Conductivity | 1.76 | 1.75 | -0.42 | ±5 |
| 2025-11-12 | 23.7 | 54 | 2440 | 23.4 | Permittivity | 39.22 | 39.90 | 1.74 | ±5 |
| | | | | | Conductivity | 1.79 | 1.80 | 0.50 | ±5 |
| 2025-11-12 | 23.8 | 54 | 2450 | 23.5 | Permittivity | 39.20 | 39.79 | 1.51 | ±5 |
| | | | | | Conductivity | 1.80 | 1.81 | 0.56 | ±5 |
| 2025-11-12 | 23.9 | 55 | 2480 | 23.6 | Permittivity | 39.15 | 39.82 | 1.72 | ±5 |
| | | | | | Conductivity | 1.83 | 1.83 | 0.18 | ±5 |

# 5. SAR System Validation

## 5.1 Validation System

The purpose of the system check is to verify that the system operates within its specifications at the decice test frequency.The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).
System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.




## 5.2 Validation Result

| Date | Frequency (MHz) | Power | $SAR_{1g}$ (W/Kg) | $SAR_{10g}$ (W/Kg) | Drift (%) | 1W Target | | Difference percentage | | Limited % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $SAR_{1g}$ (W/Kg) | $SAR_{10g}$ (W/Kg) | 1g | 10g | |
| 2025-11-12 | 2450 | 100 mW | 5.468 | 2.427 | 2.41 | 54.70 | 24.11 | -0.04% | 0.66% | 10 |
| | | Normalize to 1 Watt | 54.68 | 24.27 | | | | | | |

Note:
(1) We use a CW signal of 20dBm for system check, and then all SAR values are normalized to 1W forward power. The result must be within ±10% of target value.

# 6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps:
The following steps are used for each test position

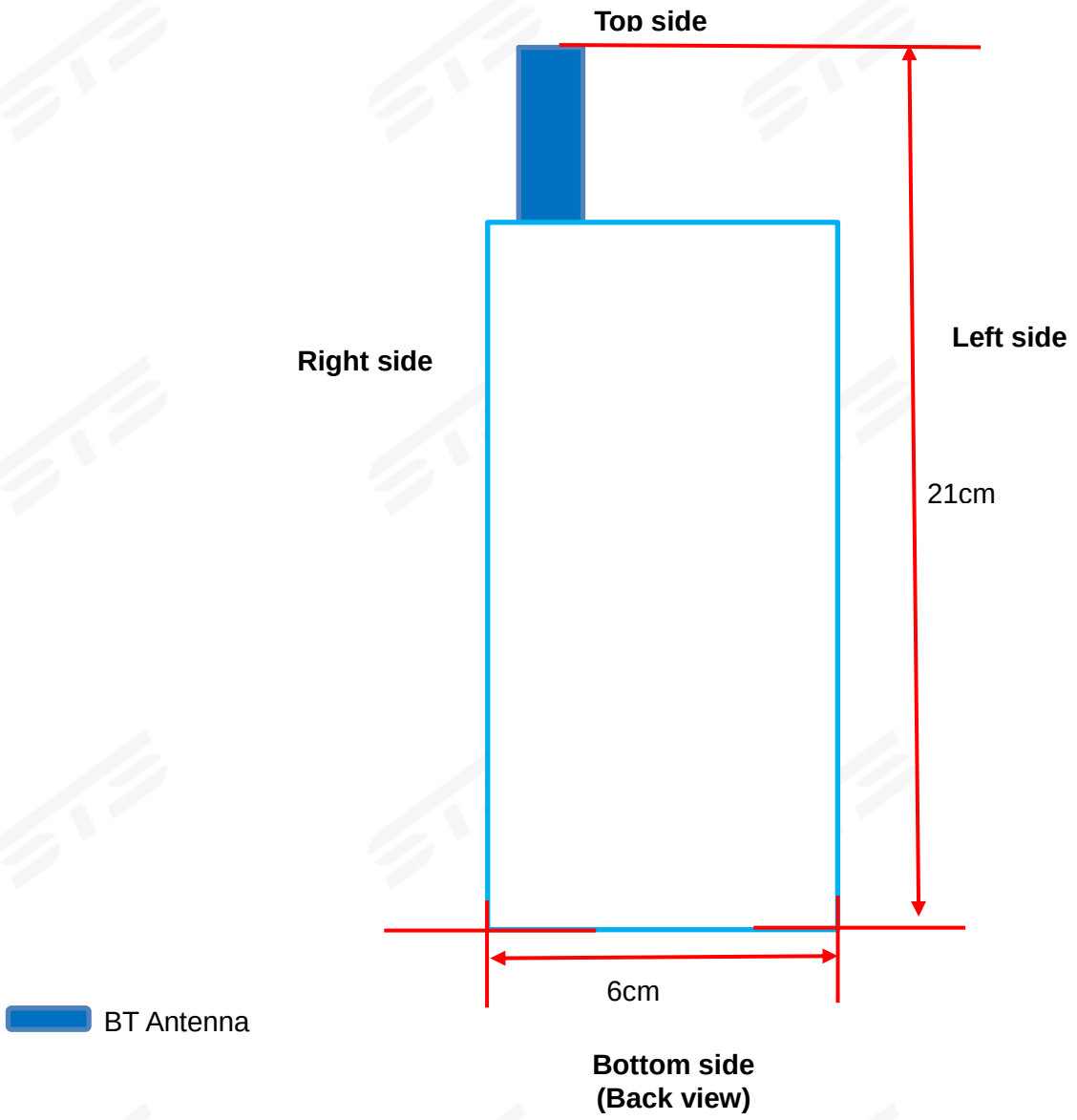
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

➢ Area Scan& Zoom Scan

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01 quoted below. When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

# 7. EUT Antenna Location Sketch

It is a Wireless E-Stop Pro, support BLE mode.




| Antenna Separation Distance(cm) | | | | | | |
|---|---|---|---|---|---|---|
| ANT | Back Side | Front Side | Left Side | Right Side | Top Side | Bottom Side |
| BLE | 0.7 | 1.5 | 4.5 | ⩽0.5 | ⩽0.5 | 16.3 |

Note 1: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.

## 7.1 SAR test exclusion consider table

The BLE SAR evaluation of Maximum power (dBm) summing tolerance.

| Exposure Position | Wireless Interface | BLE |
|---|---|---|
| | Calculated Frequency(GHz) | 2.44 |
| | Maximum Turn-up power (dBm) | 13.5 |
| | Maximum rated power(mW) | 22.39 |
| Back Side | Separation distance (cm) | 0.7 |
| | exclusion threshold(mW) | 5.22 |
| | Testing required? | YES |
| Front Side | Separation distance (cm) | 1.5 |
| | exclusion threshold(mW) | 22.23 |
| | Testing required? | YES |
| Left Side | Separation distance (cm) | 4.5 |
| | exclusion threshold(mW) | 179.49 |
| | Testing required? | NO |
| Right Side | Separation distance (cm) | 0.5 |
| | exclusion threshold(mW) | 2.75 |
| | Testing required? | YES |
| Top Side | Separation distance (cm) | 0.5 |
| | exclusion threshold(mW) | 2.75 |
| | Testing required? | YES |
| Bottom Side | Separation distance (cm) | 16.3 |
| | exclusion threshold(mW) | 2074.00 |
| | Testing required? | NO |

**Note：**

1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. Per KDB 447498 D04, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D04, if the maximum time-averaged power available does not exceed 1 mW. This stand-alone SAR exemption test.
4. Per KDB 447498 D04, the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

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

Where

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

and

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

$d$ = the separation distance (cm);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Tel: +86-755 3688 6288 Fax: +86-755 3688 6277 Http://www.stsapp.com E-mail:sts@stsapp.com

5. Per KDB 447498 D04, An alternative to the SAR-based exemption is using below table and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in below table to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

| RF Source frequency (MHz) | Threshold ERP(watts) |
|---|---|
| 0.3-1.34 | 1,920 $R^2$. |
| 1.34-30 | 3,450 $R^2/f^2$. |
| 30-300 | 3.83 $R^2$. |
| 300-1,500 | 0.0128 $R^2f$. |
| 1,500-100,000 | 19.2$R^2$. |

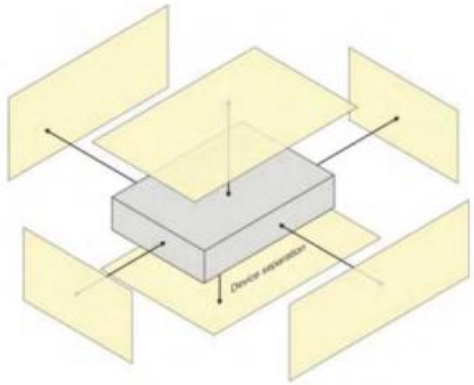
6. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8.for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.
7. Per KDB 616217 D04, SAR evaluation for the front surface of tablet display screens are generally not necessary.
8. Per KDB 248227, as maximum rated power for U-NII-2A＞U-NII-1, U-NII-2A was chosen for SAR evaluation. Based on the measurements obtained, SAR measurements on U-NII-1 are not required as highest reported SAR from U-NII-2A band is≤1.2W/Kg.

# 8. EUT Test Position

This EUT was tested in Rear Face, Right Side, Left Side, Top Side,

## 8.1 Body-worn Position Conditions:

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D04 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



# 9. Uncertainty

## 9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Measurement uncertainty for DUT averaged over 1 gram / 10 gram. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Uncertainty Component | Sec. | Tol (+- %) | Prob. Dist. | Div. | Ci (1g) | Ci (10g) | 1g Ui (+- %) | 10g Ui (+- %) | vi |
| **Measurement System** | | | | | | | | | |
| Probe calibration | E.2.1 | 5.72 | N | 1.00 | 1.00 | 1.00 | 5.72 | 5.72 | ∞ |
| Axial Isotropy | E.2.2 | 0.18 | R | 1.73 | 0.71 | 0.71 | 0.07 | 0.07 | ∞ |
| Hemispherical Isotropy | E.2.2 | 1.04 | R | 1.73 | 0.71 | 0.71 | 0.42 | 0.42 | ∞ |
| Boundary effect | E.2.3 | 0.80 | R | 1.73 | 1.00 | 1.00 | 0.46 | 0.46 | ∞ |
| Linearity | E.2.4 | 1.25 | R | 1.73 | 1.00 | 1.00 | 0.72 | 0.72 | ∞ |
| System detection limits | E.2.4 | 1.20 | R | 1.73 | 1.00 | 1.00 | 0.69 | 0.69 | ∞ |
| Modulation response | E2.5 | 3.42 | R | 1.73 | 1.00 | 1.00 | 1.97 | 1.97 | ∞ |
| Readout Electronics | E.2.6 | 0.26 | N | 1.00 | 1.00 | 1.00 | 0.26 | 0.26 | ∞ |
| Response Time | E.2.7 | 0.17 | R | 1.73 | 1.00 | 1.00 | 0.10 | 0.10 | ∞ |
| Integration Time | E.2.8 | 1.43 | R | 1.73 | 1.00 | 1.00 | 0.83 | 0.83 | ∞ |
| RF ambient conditions-Noise | E.6.1 | 3.51 | R | 1.73 | 1.00 | 1.00 | 2.03 | 2.03 | ∞ |
| RF ambient conditions-reflections | E.6.1 | 3.15 | R | 1.73 | 1.00 | 1.00 | 1.82 | 1.82 | ∞ |
| Probe positioner mechanical tolerance | E.6.2 | 1.20 | R | 1.73 | 1.00 | 1.00 | 0.69 | 0.69 | ∞ |
| Probe positioning with respect to phantom shell | E.6.3 | 1.40 | R | 1.73 | 1.00 | 1.00 | 0.81 | 0.81 | ∞ |
| Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation | E.5 | 2.10 | R | 1.73 | 1.00 | 1.00 | 1.21 | 1.21 | ∞ |
| **Test sample Related** | | | | | | | | | |
| Test sample positioning | E.4.2 | 3.10 | N | 1.00 | 1.00 | 1.00 | 3.10 | 3.10 | ∞ |
| Device holder uncertainty | E.4.1 | 3.80 | N | 1.00 | 1.00 | 1.00 | 3.80 | 3.80 | ∞ |
| Output power variation—SAR drift measurement | E.2.9 | 4.50 | R | 1.73 | 1.00 | 1.00 | 2.60 | 2.60 | ∞ |
| SAR scaling | E.6.5 | 1.80 | R | 1.73 | 1.00 | 1.00 | 1.04 | 1.04 | ∞ |
| **Phantom and tissue parameters** | | | | | | | | | |
| Phantom shell uncertainty—shape, thickness, and permittivity | E.3.1 | 3.70 | R | 1.73 | 1.00 | 1.00 | 2.14 | 2.14 | ∞ |
| Uncertainty in SAR correction for deviations in permittivity and conductivity | E.3.2 | 1.90 | N | 1.00 | 1.00 | 0.84 | 1.90 | 1.60 | ∞ |
| Liquid conductivity measurement | E.3.3 | 2.40 | R | 1.73 | 0.78 | 0.71 | 1.08 | 0.98 | M |
| Liquid permittivity measurement | E.3.3 | 4.10 | N | 1.00 | 0.78 | 0.71 | 3.20 | 2.91 | M |
| Liquid conductivity—temperature uncertainty | E.3.4 | 2.70 | R | 1.73 | 0.23 | 0.26 | 0.36 | 0.41 | ∞ |
| Liquid permittivity—temperature uncertainty | E.3.4 | 4.80 | N | 1.00 | 0.23 | 0.26 | 1.10 | 1.25 | ∞ |
| Combined Standard Uncertainty | | | RSS | | | | 10.08 | 9.59 | |
| Expanded Uncertainty (95% Confidence interval) | | | K=2 | | | | 19.58 | 19.18 | |

| System Validation uncertainty for DUT averaged over 1 gram / 10 gram. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Uncertainty Component | Sec. | Tol (+- %) | Prob. Dist. | Div. | Ci (1g) | Ci (10g) | 1g Ui (+-%) | 10g Ui (+-%) | vi |
| **Measurement System** | | | | | | | | | |
| Probe calibration | E.2.1 | 5.72 | N | 1.00 | 1.00 | 1.00 | 5.72 | 5.72 | ∞ |
| Axial Isotropy | E.2.2 | 0.18 | R | 1.73 | 1.00 | 1.00 | 0.10 | 0.10 | ∞ |
| Hemispherical Isotropy | E.2.2 | 1.04 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Boundary effect | E.2.3 | 0.80 | R | 1.73 | 1.00 | 1.00 | 0.46 | 0.46 | ∞ |
| Linearity | E.2.4 | 1.25 | R | 1.73 | 1.00 | 1.00 | 0.72 | 0.72 | ∞ |
| System detection limits | E.2.4 | 1.20 | R | 1.73 | 1.00 | 1.00 | 0.69 | 0.69 | ∞ |
| Modulation response | E2.5 | 3.42 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Readout Electronics | E.2.6 | 0.26 | N | 1.00 | 1.00 | 1.00 | 0.26 | 0.26 | ∞ |
| Response Time | E.2.7 | 0.17 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Integration Time | E.2.8 | 1.43 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-Noise | E.6.1 | 3.51 | R | 1.73 | 1.00 | 1.00 | 2.03 | 2.03 | ∞ |
| RF ambient conditions-reflections | E.6.1 | 3.15 | R | 1.73 | 1.00 | 1.00 | 1.82 | 1.82 | ∞ |
| Probe positioner mechanical tolerance | E.6.2 | 1.20 | R | 1.73 | 1.00 | 1.00 | 0.69 | 0.69 | ∞ |
| Probe positioning with respect to phantom shell | E.6.3 | 1.40 | R | 1.73 | 1.00 | 1.00 | 0.81 | 0.81 | ∞ |
| Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation | E.5 | 2.10 | R | 1.73 | 1.00 | 1.00 | 1.21 | 1.21 | ∞ |
| **System validation source** | | | | | | | | | |
| Deviation of experimental dipole from numerical dipole | E.6.4 | 4.80 | N | 1.00 | 1.00 | 1.00 | 4.80 | 4.80 | ∞ |
| Input power and SAR drift measurement | 8,6.6.4 | 5.10 | R | 1.73 | 1.00 | 1.00 | 2.94 | 2.94 | ∞ |
| Dipole axis to liquid distance | 8,E.6.6 | 2.40 | R | 1.73 | 1.00 | 1.00 | 1.39 | 1.39 | ∞ |
| **Phantom and set-up** | | | | | | | | | |
| Phantom shell uncertainty—shape, thickness, and permittivity | E.3.1 | 3.70 | R | 1.73 | 1.00 | 1.00 | 2.14 | 2.14 | ∞ |
| Uncertainty in SAR correction for deviations in permittivity and conductivity | E.3.2 | 1.90 | N | 1.00 | 1.00 | 0.84 | 1.90 | 1.60 | ∞ |
| Liquid conductivity ( temperature uncertainty ) | E.3.3 | 2.40 | R | 1.73 | 0.78 | 0.71 | 1.08 | 0.98 | ∞ |
| Liquid conductivity ( measured ) | E.3.3 | 4.10 | N | 1.00 | 0.78 | 0.71 | 3.20 | 2.91 | M |
| Liquid permittivity ( temperature uncertainty ) | E.3.4 | 2.70 | R | 1.73 | 0.23 | 0.26 | 0.36 | 0.41 | ∞ |
| Liquid permittivity ( measured ) | E.3.4 | 4.80 | N | 1.00 | 0.23 | 0.26 | 1.10 | 1.25 | M |
| Combined Standard Uncertainty | | | RSS | | | | 9.72 | 9.52 | |
| Expanded Uncertainty (95% Confidence interval) | | | K=2 | | | | 19.44 | 19.03 | |

| ◦ System Check uncertainty for DUT averaged over 1 gram / 10 gram. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Uncertainty Component | Sec. | Tol | Prob. Dist. | Div. | Ci (1g) | Ci (10g) | 1g Ui (+-%) | 10g Ui (+-%) | vi |
| | | (+- %) | | | | | | | |
| **Measurement System** | | | | | | | | | |
| Probe calibration drift | E.2.1.3 | 5.72 | N | 1.00 | 1.00 | 1.00 | 5.72 | 5.72 | ∞ |
| Axial Isotropy | E.2.2 | 0.18 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Hemispherical Isotropy | E.2.2 | 1.04 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Boundary effect | E.2.3 | 0.8 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Linearity | E.2.4 | 1.25 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| System detection limits | E.2.4 | 1.20 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Modulation response | E2.5 | 3.42 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Readout Electronics | E.2.6 | 0.26 | N | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Response Time | E.2.7 | 0.17 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Integration Time | E.2.8 | 1.43 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-Noise | E.6.1 | 3.51 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| RF ambient conditions-reflections | E.6.1 | 3.15 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| Probe positioner mechanical tolerance | E.6.2 | 1.2 | R | 1.73 | 1.00 | 1.00 | 0.69 | 0.69 | ∞ |
| Probe positioning with respect to phantom shell | E.6.3 | 1.4 | R | 1.73 | 1.00 | 1.00 | 0.81 | 0.81 | ∞ |
| Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation | E.5 | 3.9 | R | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | ∞ |
| **System check source (dipole)** | | | | | | | | | |
| Deviation of experimental dipoles | E.6.4 | 4.8 | N | 1.00 | 1.00 | 1.00 | 4.80 | 4.80 | ∞ |
| Input power and SAR drift measurement | 8,6.6.4 | 5.1 | R | 1.73 | 1.00 | 1.00 | 2.94 | 2.94 | ∞ |
| Dipole axis to liquid distance | 8,E.6.6 | 2.4 | R | 1.73 | 1.00 | 1.00 | 1.39 | 1.39 | ∞ |
| **Phantom and tissue parameters** | | | | | | | | | |
| Phantom shell uncertainty—shape, thickness, and permittivity | E.3.1 | 3.7 | R | 1.73 | 1.00 | 1.00 | 2.14 | 2.14 | ∞ |
| Uncertainty in SAR correction for deviations in permittivity and conductivity | E.3.2 | 1.9 | N | 1.00 | 1.00 | 0.84 | 1.90 | 1.60 | ∞ |
| Liquid conductivity measurement | E.3.3 | 2.4 | R | 1.73 | 0.78 | 0.71 | 1.08 | 0.98 | ∞ |
| Liquid permittivity measurement | E.3.3 | 4.1 | N | 1.00 | 0.78 | 0.71 | 3.20 | 2.91 | M |
| Liquid conductivity—temperature uncertainty | E.3.4 | 2.7 | R | 1.73 | 0.23 | 0.26 | 0.36 | 0.41 | ∞ |
| Liquid permittivity—temperature uncertainty | E.3.4 | 4.8 | N | 1.00 | 0.23 | 0.26 | 1.10 | 1.25 | M |
| Combined Standard Uncertainty | | | RSS | | | | 5.56 | 5.20 | |
| Expanded Uncertainty (95% Confidence interval) | | | K=2 | | | | 11.12 | 10.41 | |

# 10. Conducted Power Measurement

## 10.1 Test Result

**BLE**

| BLE | | | | |
|---|---|---|---|---|
| Mode | Channel Number | Frequency (MHz) | Peak Conducted Output Power (dBm) | Output Power (mW) |
| GFSK(1Mbps) | 0 | 2402 | 10.55 | 11.35 |
| | 19 | 2440 | 13.49 | 22.34 |
| | 39 | 2480 | 12.17 | 16.48 |

# 11. EUT and Test Setup Photo

## 11.1 EUT Photo

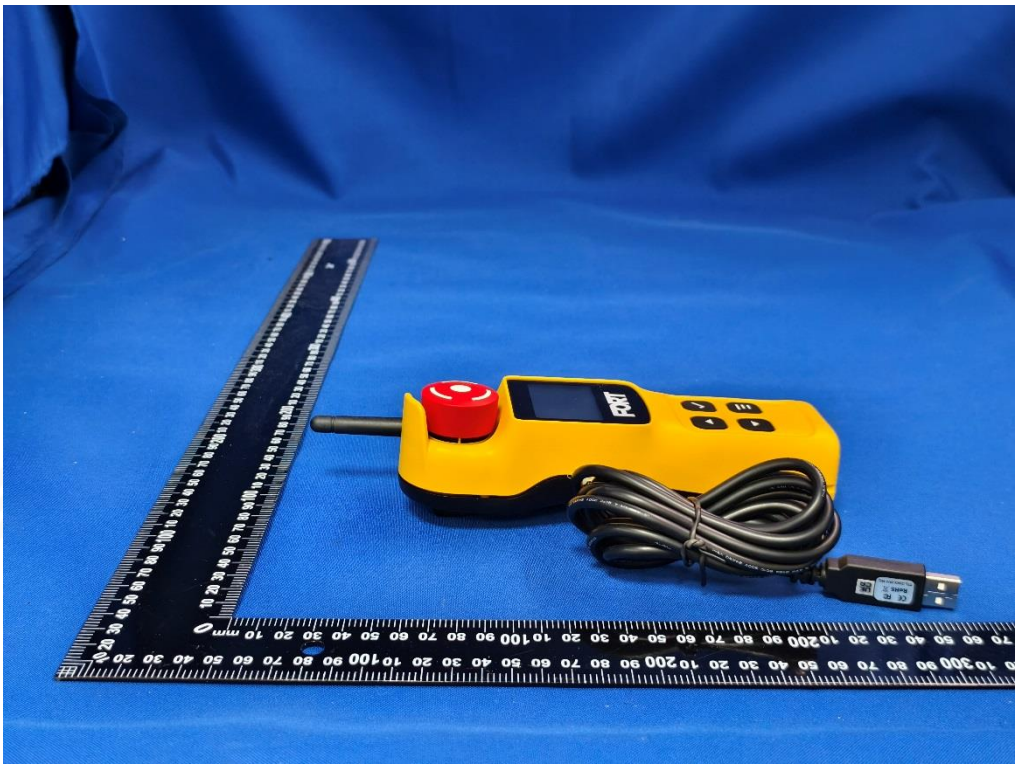
Front side

Back side

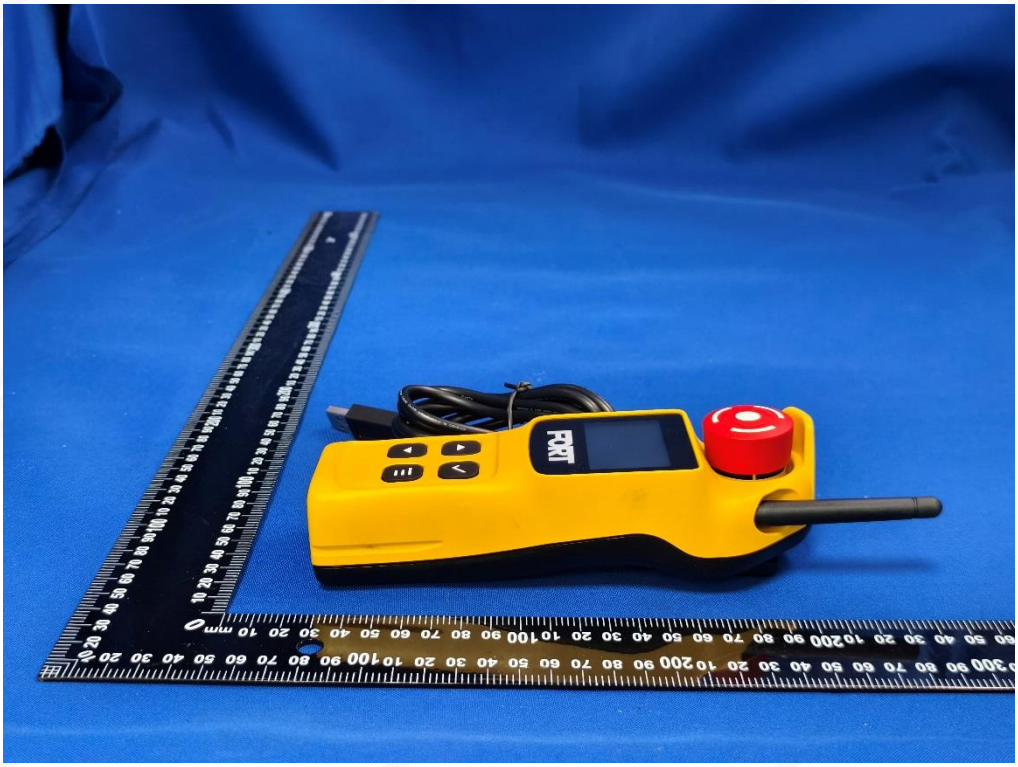
Top side

Bottom side

Left side

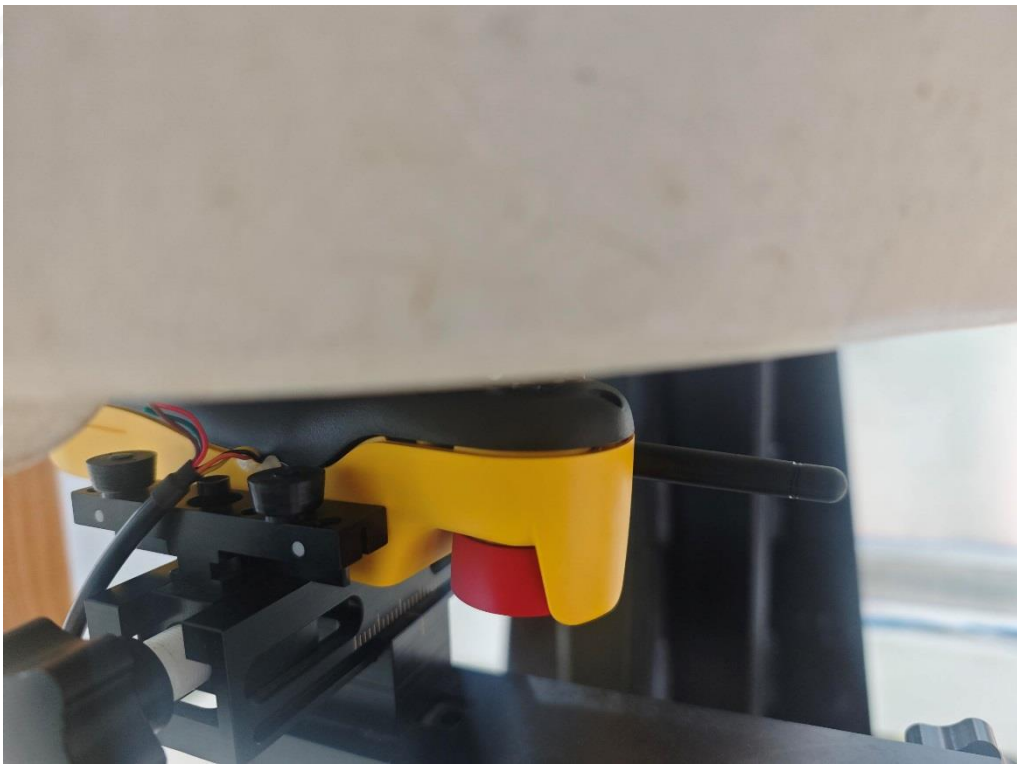


Right side

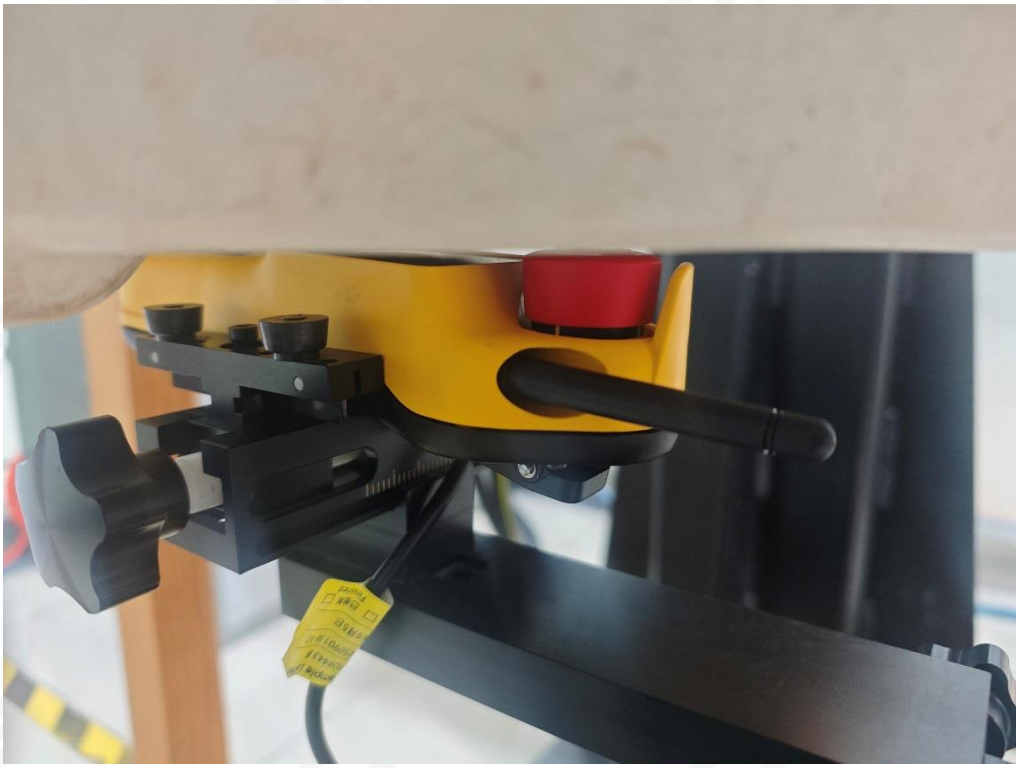


## 11.2 Setup Photo

Body Back side(separation distance is 0mm)



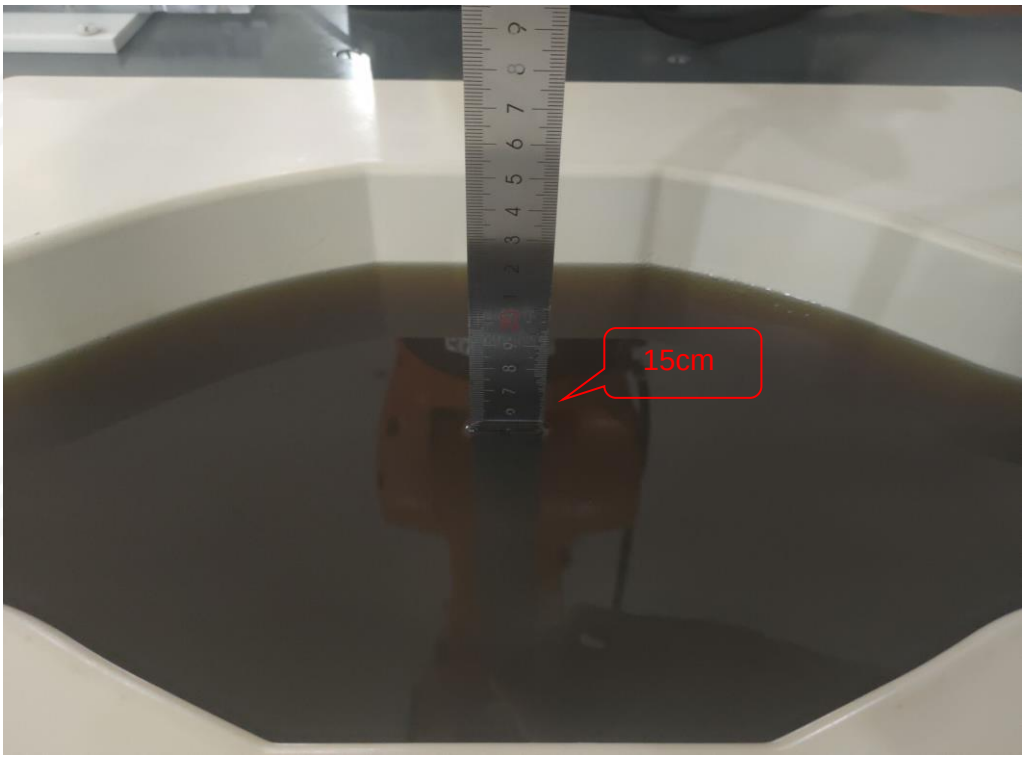
Body Front Side (separation distance is 0mm)



Body Right side(separation distance is 0mm)

Body Top Side (separation distance is 0mm)

Liquid depth (15 cm)



# 12. SAR Result Summary

## 12.1 Body-worn SAR

| Band | Mod. | Test Position | Freq. | Result 1g (W/Kg) | Power Drift(%) | Max. Turn-up Power(dBm) | Meas. Output Power(dBm) | Scaling Factor | Scaled SAR (W/Kg) | Meas.No. |
|---|---|---|---|---|---|---|---|---|---|---|
| BLE | GFSK | Front Side | 2440 | 0.145 | 2.74 | 13.50 | 13.49 | 1.002 | 0.145 | / |
| | | Back Side | 2440 | 0.198 | -3.36 | 13.50 | 13.49 | 1.002 | 0.198 | / |
| | | Right Side | 2402 | 0.289 | -0.25 | 11.00 | 10.55 | 1.109 | 0.321 | / |
| | | Right Side | 2440 | 0.374 | -2.93 | 13.50 | 13.49 | 1.002 | **0.375** | **1** |
| | | Right Side | 2480 | 0.314 | 2.72 | 12.50 | 12.17 | 1.079 | 0.339 | / |
| | | Top Side | 2440 | 0.344 | -0.30 | 13.50 | 13.49 | 1.002 | 0.345 | **/** |

Note:

1. The test separation of all above table is 0mm.
2. Per KDB 447498 D04, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
3. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

# 13. Equipment List

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last Calibration | Calibrated Until |
|---|---|---|---|---|---|
| 2450MHzDipole | MVG | SID2450 | SN 30/14 DIP2G450-335 | 2023.07.04 | 2026.07.03 |
| Data Acquisition Electronics DAEx | SPEAG | DAE3 | 428 | 2025.09.08 | 2026.09.07 |
| E-field Probe | SPEAG | EX3DV4 | 3806 | 2025-09-11 | 2025-09-10 |
| Dielectric Probe Kit | MVG | SCLMP | SN 32/14 OCPG67 | 2025.09.15 | 2026.09.14 |
| Antenna | MVG | ANTA3 | SN 07/13 ZNTA52 | N/A | N/A |
| Attenuator | Agilent | HXT-10-8-SMA | 240327017 | 2025-02-22 | 2026-02-21 |
| Directional coupler | Xi'an Xingbo | XBOH-OA08-20dB | 211123-4-3 | 2025-02-22 | 2026-02-21 |
| Network Analyzer | Agilent | E5071C | MY46520378 | 2025-09-26 | 2026-09-24 |
| Multi Meter | Keithley | Multi Meter 2000 | 4050073 | 2025-09-22 | 2026-09-21 |
| Signal Generator | Agilent | N5182A | MY50140530 | 2025-09-26 | 2026-09-25 |
| Wireless Communication Test Set | Agilent | 8960-E5515C | MY48360751 | 2025-02-22 | 2026-02-21 |
| Wireless Communication Test Set | R&S | CMW500 | 156324 | 2025-09-25 | 2026-09-24 |
| Power Amplifier | DESAY | WCS-DLNA50M8G50G1 | CSKJLNA231227A | 2025-09-29 | 2026-09-28 |
| Power Meter | R&S | NRP | 100510 | 2025-09-25 | 2026-09-24 |
| Power Sensor | R&S | NRP-Z11 | 101919 | 2025-09-25 | 2026-09-24 |
| Power Sensor | Keysight | U2021XA | MY56280002 | 2025-09-25 | 2026-09-24 |
| Temperature hygrometer | TOPRIE | TP502V4-P | 6700000124198 | 2025.10.09 | 2026.10.08 |
| Thermograph | Elitech | RC-4 | S/N EF7176501537 | 2025.10.17 | 2026.10.16 |

# Appendix A. System Validation Plots

Test Laboratory: STS Lab Time: 2025-11-12

**DUT: Dipole 2450 MHz**

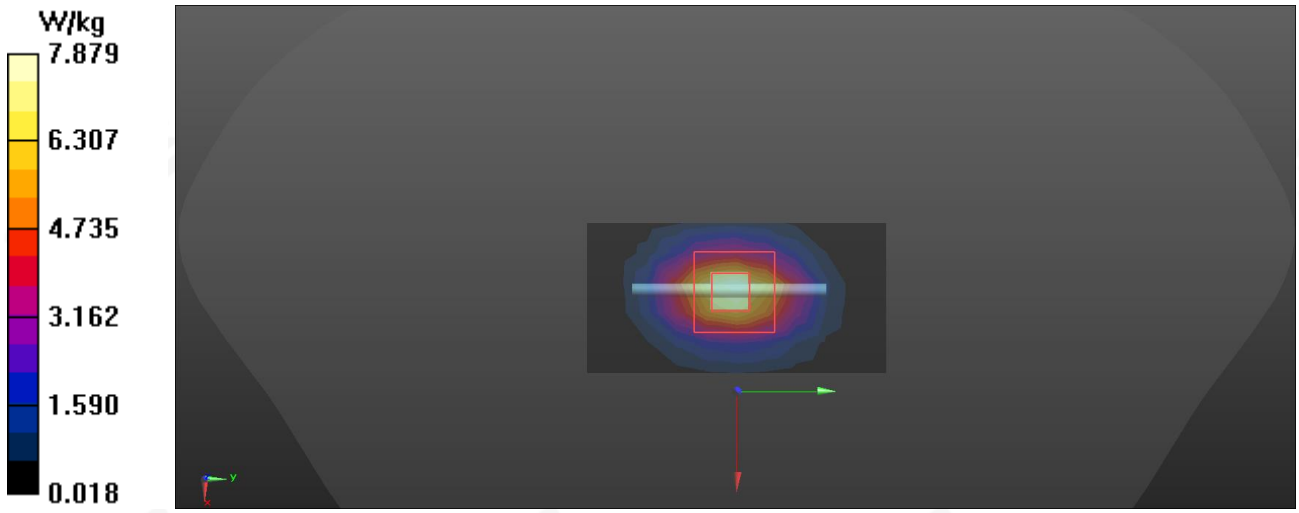
Communication System CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;
Frequency:2450 MHz Medium parameters used: f = 2450 MHz; σ = 1.81 S/m; $\varepsilon_r$ = 39.79; ρ = 1000 kg/m$^3$
Phantom section: Flat Section; Input Power=20dBm
Ambient Temperature:23.8℃;Liquid Temperature:23.5℃;

DASY Configuration:

- Probe: EX3DV4 - SN3806; ConvF(6.3, 6.71, 6.9) @ 2450 MHz; Calibrated: 2025-09-11
- Sensor-Surface: 1.8mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE3 SN428; Calibrated: 2025-09-08
- Phantom: Twin-SAM V5.0 (30deg probe tilt); Type: QD 000 P40 CD; Serial: 1266
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Area Scan (6x11x1):** Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 7.88 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 72.39 V/m; Power Drift = -0.65 dB
Peak SAR (extrapolated) = 10.0 W/kg
**SAR(1 g) = 5.47 W/kg; SAR(10 g) = 2.43 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 50.6%
Maximum value of SAR (measured) = 7.95 W/kg



# Appendix B. SAR Test Plots

Test Laboratory: STS Lab Time: 2025-11-12

**BLE_2440Mhz_ Right Side_0mm**

**Plot 1: DUT: Wireless E-Stop Pro Type: WESP 1003**

Communication System: BLE; Communication System Band: GFSK; Duty Cycle: 1:1;

Frequency:2440 MHz Medium parameters used: f = 2440 MHz; σ = 1.80 S/m; $\varepsilon_r$ = 39.90; ρ = 1000 kg/m$^3$

Phantom section: Flat Section

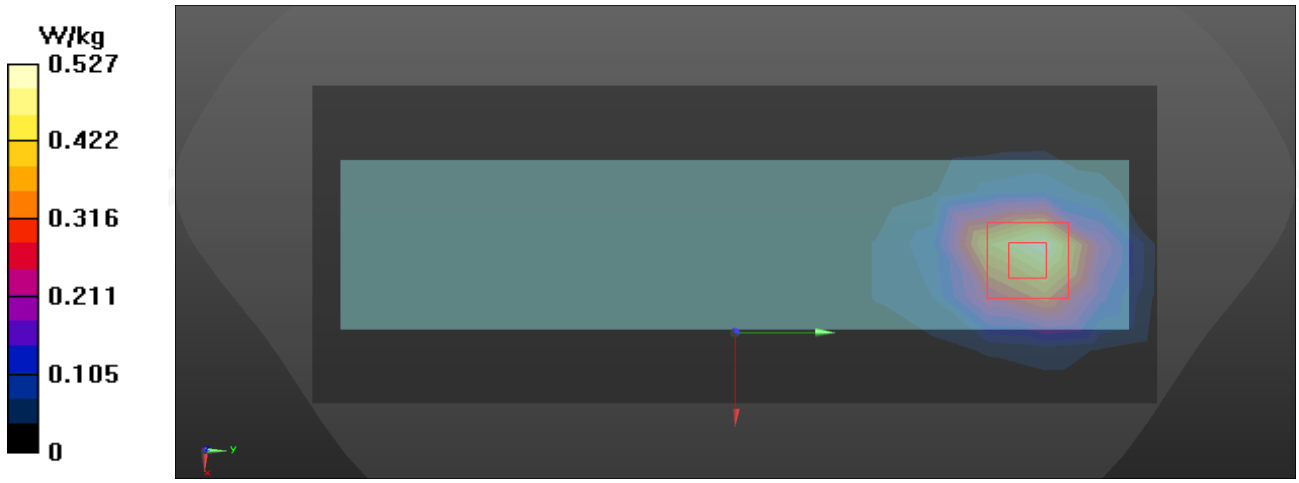
Ambient Temperature:23.7℃;Liquid Temperature:23.4℃;

DASY Configuration:

- Probe: EX3DV4 - SN3806; ConvF(6.3, 6.71, 6.9) @ 2450 MHz; Calibrated: 2025-09-11
- Sensor-Surface: 1.8mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE3 SN428; Calibrated: 2025-09-08
- Phantom: Twin-SAM V5.0 (30deg probe tilt); Type: QD 000 P40 CD; Serial: 1266
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Area Scan (7x16x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.527 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.572 V/m; Power Drift = 3.06 dB
Peak SAR (extrapolated) = 0.691 W/kg
**SAR(1 g) = 0.374 W/kg; SAR(10 g) = 0.186 W/kg**
Smallest distance from peaks to all points 3 dB below = 11.6 mm
Ratio of SAR at M2 to SAR at M1 = 54.5%
Maximum value of SAR (measured) = 0.552 W/kg



# Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※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