

TEST REPORT

Reference No...... : WTX24X11256034W012
FCC ID..... : 2BOTS-UA60
Applicant..... : Runione Tech Co., Ltd
Address..... : Building D, 3rd Floor, No.599 Gaojing Road, Qingpu District, Shanghai,
China
Manufacturer..... : The same as Applicant
Address..... : The same as Applicant
Product Name..... : Rugged handheld
Model No...... : UA60
FCC Part 2.1093
Standards..... : IEEE Std C95.1: 2019
IEEE Std C95.3: 2002 + Rev. 2008
IEC/IEEE 62209-1528:2020
Date of Receipt sample..... : 2024-11-06
Date of Test..... : 2024-11-06 to 2024-12-15; 2025-04-07 to 2025-04-09
Date of Issue..... : 2025-04-09
Test Report Form No...... : WTX_IEEE_1528W
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

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Report version

Version No.	Date of issue	Description
Rev.00	2025-04-09	Original
/	/	/

1. General Information

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT:	
Product Name:	Rugged handheld
Brand Name:	/
Model No.:	UA60
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery Capacity	8000mAh
Adapter Model	/
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT:	
4G	
Support Networks:	TDD-LTE
Support Band:	TDD-LTE Band 48
Uplink Frequency:	TDD-LTE Band 48: Tx: 3550-3700MHz
Downlink Frequency:	TDD-LTE Band 48: Rx: 3550-3700MHz
RF Output Power:	Normal: TDD-LTE Band 48: 22.88dBm
Type of Modulation:	QPSK, 16QAM, 64QAM, 256QAM
Antenna Type:	FPC Antenna
Antenna Gain:	TDD-LTE Band 48: 1.57dBi
<i>Note: The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Test Standards

The following report is accordance with FCC 47 CFR Part 2.1093, IEEE Std C95.1: 2019, IEEE Std C95.3: 2002 + Rev. 2008, IEC/IEEE 62209-1528 Ed. 1.0 (2020-10), KDB 447498 D01 v06, KDB 648474 D04 v01r03, KDB 248227 D01 v02r02, KDB 941225 D01 v03r01, KDB 941225 D05 v02r05 , and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02.

The objective is to determine compliance with FCC Part 2.1093 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02. The public notice KDB 447498 D01 v06 for Mobile and Portable Devices RF Exposure Procedure also.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010. Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464 A and the CAB identifier is CN0057.

2. Summary of Test Results

The maximum results of Specific Absorption Rate (SAR) have found during testing are as follows:

Frequency Band	Head SAR	Body SAR (0mm Gap)	SAR _{1g} Limit (W/kg)
	Maximum SAR _{1g} (W/kg)	Maximum SAR _{1g} (W/kg)	
LTE Band 48	0.033	0.711	1.6
Simultaneous Transmission	0.563	1.098	1.6

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2.1093 and IEEE Std C95.1: 2019, and had been tested in accordance with the measurement methods and procedure specified in IEC/IEEE 62209-1528:2020 and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02.

3. Specific Absorption Rate (SAR)

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

3.2 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 heat 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 the tissue and E is the RMS electrical field strength.

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

4. SAR Measurement System

4.1 The Measurement System

Comosar is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Comosar system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



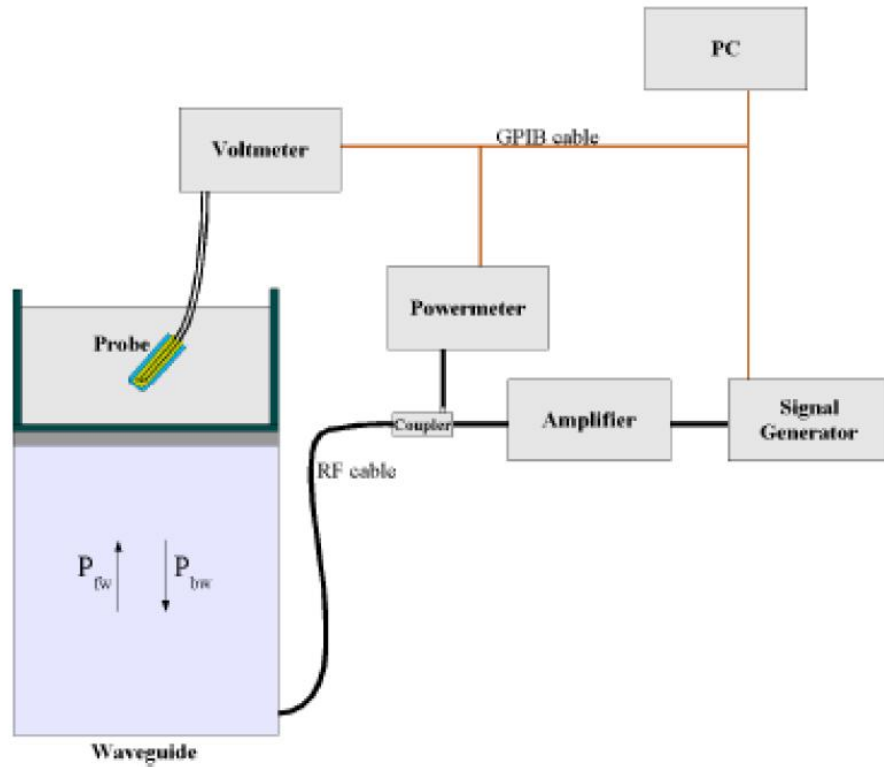
The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 10g mass.

4.2 Probe

For the measurements the Specific Dosimetric E-Field Probe SSE2 3823-EPGO-435, and refer to the calibration report for probe parameters.

For the measurements the Specific Dosimetric E-Field Probe SSE2 0725-EPGO-446, and refer to the calibration report for probe parameters.

Probe calibration is realized, in compliance with IEC/IEEE 62209-1528:2020 STD, with CALISAR, Antenna proprietary calibration system. The calibration is performed with the IEC/IEEE 62209-1528:2020 annexes technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-2z/\delta}$$

Where :

P_{fw} = Forward Power

P_{bw} = Backward Power

a and b =Waveguide dimensions

δ = Skin depth

Keithley configuration:

Rate = Medium; Filter = ON; RDGS = 10; Filter type = Moving Average; Range auto after each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it. The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

$$CF(N) = SAR(N)/V_{lin}(N) \quad (N=1,2,3)$$

The linearised output voltage $V_{lin}(N)$ is obtained from the displayed output voltage $V(N)$ using

$$V_{lin}(N) = V(N) * (1 + V(N)/DCP(N)) \quad (N=1,2,3)$$

where DCP is the diode compression point in mV.

4.3 Probe Calibration Process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe 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/cm²) using an with CALISAR, Antenna proprietary calibration system.

Free Space Assessment Procedure

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 in 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 rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1mW/cm².

Temperature Assessment Procedure

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head 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 is proportional to $\Delta T/\Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

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

Where:

σ = simulated tissue conductivity,

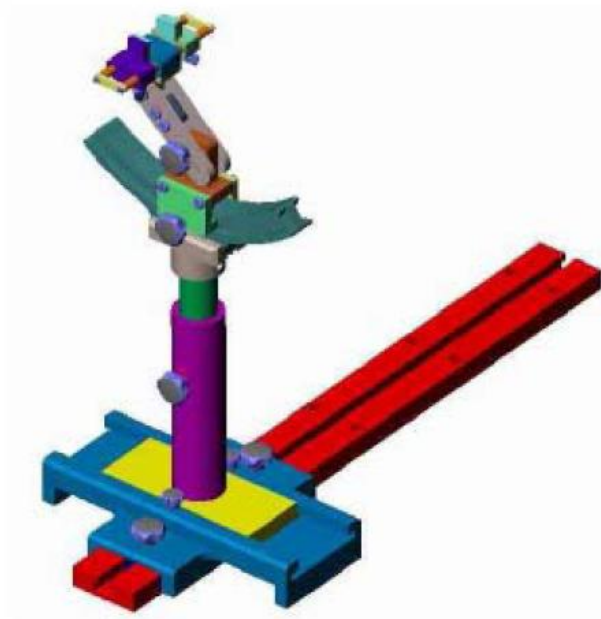
ρ = Tissue density (1.25 g/cm³ for brain tissue)

4.4 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

4.5 Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1°.



System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

4.6 Test Equipment List

Fixed asset Number	Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
WTXE1105A1002-1	E-Field Probe	MVG	SSE2	3823-EPGO-435	2024-07-11	2025-07-10
WTXE1053A1006-004	3500MHz Dipole	MVG	SID3500	SN 28/21 DIP 3G500-592	2024-07-11	2027-07-10
WTXE1053A1006-005	3700MHz Dipole	MVG	SID3700	SN 28/21 DIP 3G700-593	2024-07-11	2027-07-10
WTXE1053A1001-010	Dielectric Probe	SATIMO	SCLMP	SN 47/12 OCPG49	2024-02-24	2025-02-23
WTXE1075A1003	Power meter	Keithley	3500	1232959	2024-02-24	2025-02-23
WTXE1075A1002	Power meter	Keithley	3500	1162591	2024-02-24	2025-02-23
WTXE1104A1003	EXG Analog Signal Generator	KEYSIGHT	N5173B	MY61252892	2024-02-24	2025-02-23
WTXE1022A1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2024-02-27	2025-02-26
WTXE1041A1002	Communications Tester	Rohde & Schwarz	CMW500	148650	2024-03-19	2025-03-18
WTXE1036A1001	Network Analyzer	Rohde & Schwarz	ZVB 8	101353	2024-10-15	2025-10-14

5. Tissue Simulating Liquids

5.1 Composition of Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with SMTIMO, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. Please see the following photos for the liquid height.



Liquid Height for Body SAR

The Composition of Tissue Simulating Liquid

Frequency (MHz)	Water (%)	Salt (%)	1,2-Propane diol (%)	HEC (%)	Preventol (%)	DGBE (%)
Head/Body						
835	40.3	1.4	57.9	0.2	0.2	0
900	40.3	1.4	57.9	0.2	0.2	0
1800-2000	55.2	0.3	0	0	0	44.5
2450	55.0	0.1	0	0	0	44.9
2600	54.9	0.1	0	0	0	45.0
3500	71.6	1.3	10.9	0.7	0.7	14.8
3700	71.7	1.3	10.8	0.6	0.8	14.8

Frequency (MHz)	Water (%)	Hexyl Carbitol (%)	Triton X-100 (%)
Head/Body			
5000-6000	65.52	17.24	17.24

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

According to FCC KDBs, IEC/IEEE 62209-1528:2020 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

Target Frequency (MHz)	Head		Body	
	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity (σ)	Permittivity (ϵ_r)
150	0.76	52.3	0.80	61.9
300	0.87	45.3	0.92	58.2
450	0.87	43.5	0.94	56.7
750	0.89	41.9	0.96	55.5
835	0.90	41.5	0.97	55.2
900	0.97	41.5	1.05	55.0
915	0.98	41.5	1.06	55.0
1450	1.20	40.5	1.30	54.0
1610	1.29	40.3	1.40	53.8
1800-2000	1.40	40.0	1.52	53.3
2100	1.49	39.8	1.62	53.2
2300	1.67	39.5	1.81	52.9
2450	1.80	39.2	1.95	52.7
2600	1.96	39.0	2.16	52.5
3000	2.40	38.5	2.73	52.0
3300	2.71	38.2	3.08	51.6
3500	2.91	37.9	3.31	51.3
3700	3.12	37.7	3.55	51.0
3900	3.32	37.5	3.78	50.8
4200	3.63	37.1	4.13	50.4
4600	4.04	36.7	4.60	49.8
4900	4.35	36.3	4.95	49.4
5200	4.66	36.0	5.30	49.0
5400	4.86	35.8	5.53	48.7
5600	5.07	35.5	5.77	48.5
5800	5.27	35.3	6.00	48.2

5.3 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using COMOSAR Dielectric Probe Kit and an Agilent Network Analyzer.

Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Head Tissue Simulating Liquid									
Freq. MHz	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
3500	22.5	2.88	2.91	-1.03	37.68	37.9	-0.58	±5	2024-12-10
3700	22.5	3.09	3.12	-0.96	38.81	37.7	2.94	±5	2024-12-10
3555	22.5	2.88	2.91	-1.03	37.67	37.9	-0.61	±5	2024-12-10
3560	22.5	2.88	2.91	-1.03	37.67	37.9	-0.61	±5	2024-12-10
3625	22.5	3.09	3.12	-0.96	38.80	37.7	2.92	±5	2024-12-10
3690	22.5	3.09	3.12	-0.96	38.81	37.7	2.94	±5	2024-12-10
3695	22.5	3.09	3.12	-0.96	38.81	37.7	2.94	±5	2024-12-10

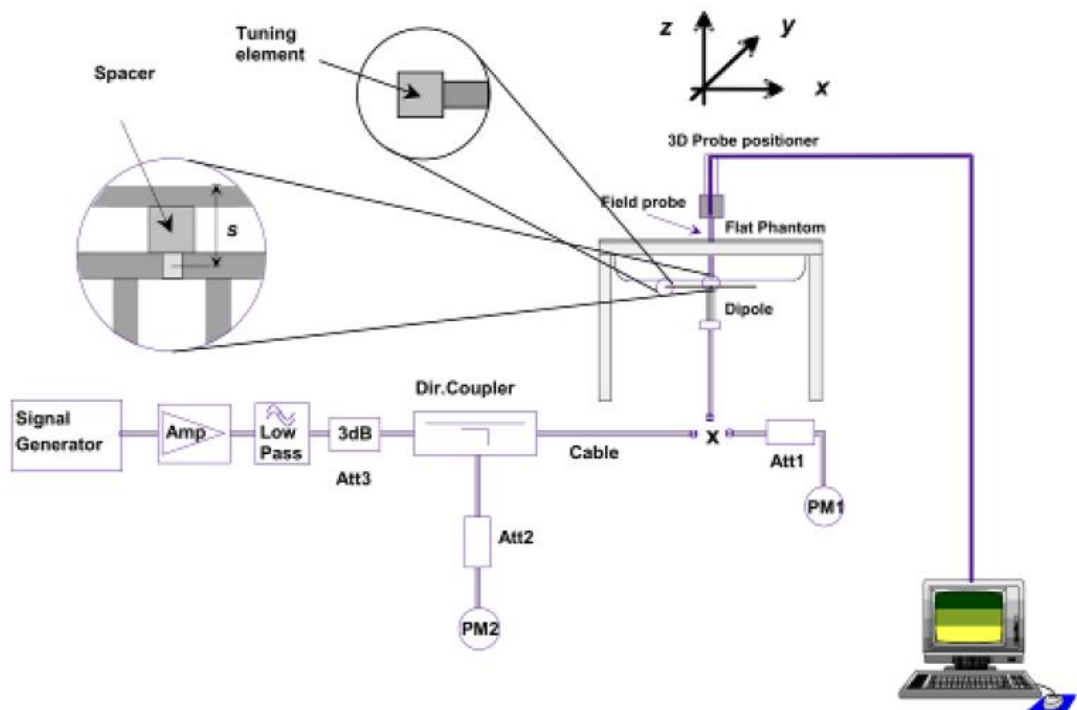
6. SAR Measurement Evaluation

6.1 Purpose of System Performance Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

6.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835MHz, 1800MHz, 1900MHz, 2450MHz, 2600MHz and 5GHz. 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.



System Verification Setup Block Diagram



Setup Photo of Dipole Antenna

The output power on dipole port must be calibrated to 24 dBm(250 mW) before dipole is connected.

6.3 Validation Results

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %. Table 6.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion.

Frequency	Power	Targeted SAR _{1g}	Measured SAR _{1g}	Normalized SAR _{1g}	Tolerance	Date
MHz	(mw)	(W/kg)	(W/kg)	(W/kg)	(%)	
Head						
3500	250	68.86	16.854	67.416	-2.10	2024-12-10
3700	250	67.40	15.827	63.308	-6.07	2024-12-10

Remark: Referring to IEC/IEEE 62209-1528:2020, the system check shall be performed at a test frequency that is within ±10% or ±100 MHz of the compliance test mid-band frequency, so the 1750 MHz system verification is made of 1800MHz Dipole.

Targeted and Measurement SAR

Please refer to Annex A for the plots of system performance check.

7. EUT Testing Position

7.1 Define Two Imaginary Lines on The Handset

- (a) The vertical centerline passes through two points on the Front Face of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- (b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

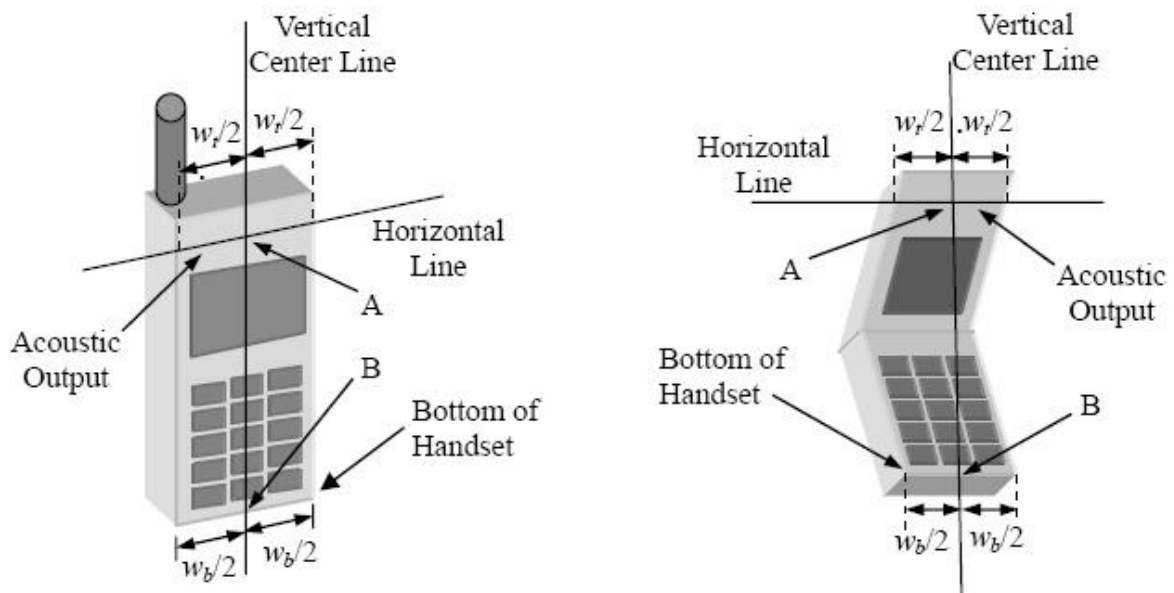


Illustration for Handset Vertical and Horizontal Reference Lines

7.2 Cheek Position

- (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the Front Face is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 7.2).

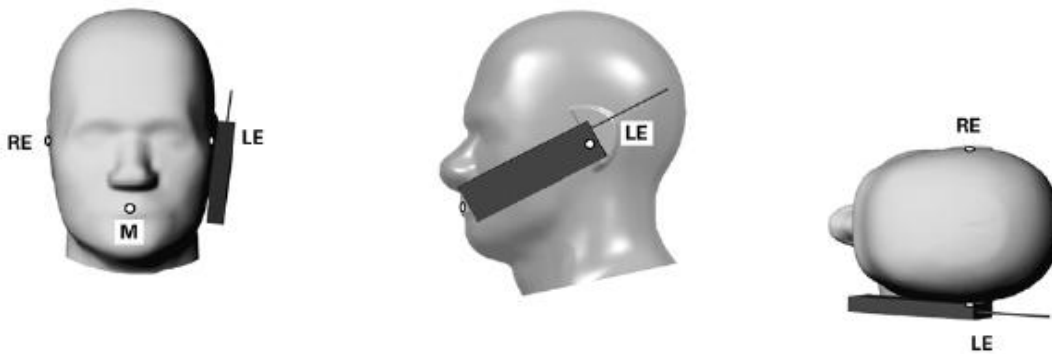


Illustration for Cheek Position

7.3 Tilted Position

- (a) To position the device in the “cheek” position described above.
- (b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 7.3).

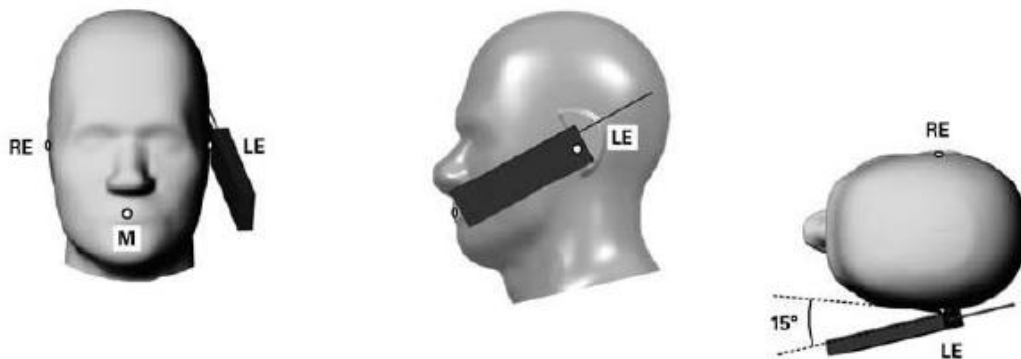


Illustration for Tilted Position

7.4 Body Position

- (a) To position the device parallel to the phantom surface with each side.
- (b) To adjust the device parallel to the flat phantom.
- (c) To adjust the distance between the device surface and the flat phantom to 0mm.

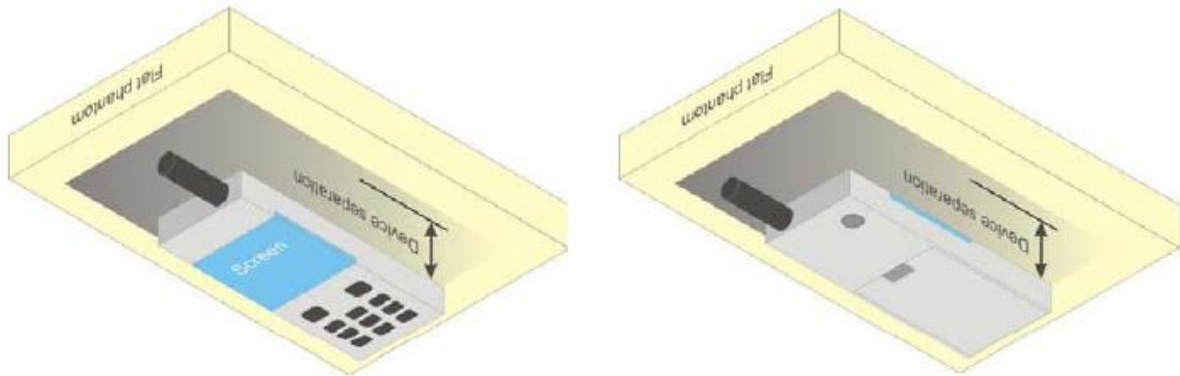
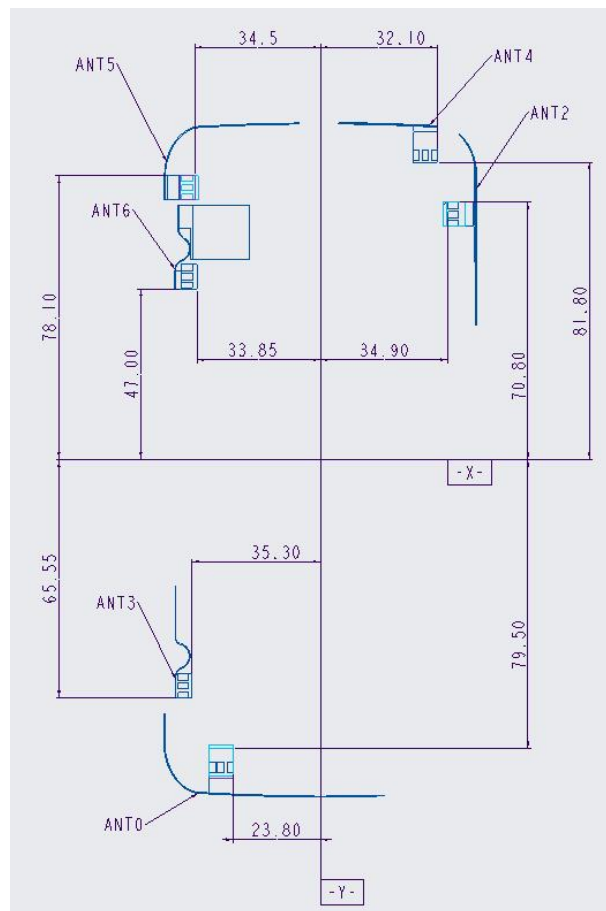


Illustration for Body Position

7.5 EUT Antenna Position



Block Diagram for EUT Antenna Position

Block Diagram for EUT Antenna Position**EUT Sizes: Long 192mm; width:92mm**

Distance of EUT antenna-to-edge/surface(mm),						
Antennas	Back Face	Front Face	Left Edge	Right Edge	Top Edge	Bottom Edge
ANT0	<25	<25	<25	>25	>25	<25
ANT2	<25	<25	>25	<25	<25	>25
ANT3	<25	<25	<25	>25	>25	>25
ANT4	<25	<25	>25	<25	<25	>25
ANT5	<25	<25	<25	>25	<25	>25
ANT6	<25	<25	<25	>25	>25	>25

7.6 EUT Testing Position

Head/Body mode SAR assessments are required for this device. This EUT was tested in different positions for different SAR test modes, more information as below:

Head SAR tests				
Antennas	Right Cheek	Left Cheek	Right Tilted	Left Tilted
WWAN	Yes	Yes	Yes	Yes
WLAN	Yes	Yes	Yes	Yes

Body SAR tests, Test distance: 0mm						
Antennas	Front	Back	Left Side	Right Side	Top Side	Bottom Side
ANT4	Yes	Yes	No	Yes	Yes	No

Remark:

1. Referring to KDB 447498 D01 v06, the test separation distances is $\leq 5\text{mm}$. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
2. Referring to KDB 648474 D04 Handset SAR v01r03, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR $> 1.2\text{ W/kg}$.
3. ANT4: TDD-LTE Band 48

Please refer to Annex for SAR for the EUT test setup photos.

8. SAR Measurement Procedures

8.1 Measurement Procedures

The measurement procedures are as follows:

- (a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
- (b) Keep EUT to radiate maximum output power or 100% factor (if applicable)
- (c) Measure output power through RF cable and power meter.
- (d) Place the EUT in the positions as Annex D demonstrates.
- (e) Set scan area, grid size and other setting on the SATIMO software.
- (f) Measure SAR results for the highest power channel on each testing position.
- (g) Find out the largest SAR result on these testing positions of each band
- (h) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

8.2 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The SATIMO software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

8.3 Area & Zoom Scan Procedures

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 measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

8.4 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.5 SAR Averaged Methods

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10g and 1 g requires a very fine resolution in the three dimensional scanned data array.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In SATIMO measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

9. SAR Test Result

9.1 Conducted RF Output Power

TDD-LTE Band 48:

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			QPSK	16QAM	64QAM	256QAM
5MHz	1 RB high	3697.5	22.85	22.17	21.28	18.14
		3625.0	22.33	21.55	20.91	17.77
		3552.5	22.87	21.92	20.93	18.03
	1 RB low	3697.5	22.85	22.16	21.17	18.11
		3625.0	22.30	21.48	20.83	17.75
		3552.5	22.86	21.94	21.01	17.98
	50% RB mid	3697.5	21.93	20.93	20.12	18.07
		3625.0	21.39	20.50	19.66	17.63
		3552.5	21.84	20.95	20.05	17.94
	100% RB	3697.5	21.92	20.95	20.07	18.03
		3625.0	21.41	20.41	19.65	17.60
		3552.5	21.89	20.91	19.96	17.91
10MHz	1 RB high	3695.0	22.88	22.05	21.03	18.09
		3625.0	22.33	21.50	20.86	17.78
		3555.0	22.79	21.92	20.94	17.83
	1 RB low	3695.0	22.80	21.96	21.41	17.98
		3625.0	22.29	21.50	20.63	17.72
		3555.0	22.85	22.08	21.23	18.00
	50% RB mid	3695.0	21.90	20.85	20.07	17.96
		3625.0	21.42	20.46	19.65	17.57
		3555.0	21.85	20.91	20.02	17.96
	100% RB	3695.0	21.81	20.82	20.01	17.91
		3625.0	21.40	20.40	19.64	17.59
		3555.0	21.85	20.93	19.99	17.89
15MHz	1 RB high	3692.5	22.60	21.72	21.00	17.99
		3625.0	22.13	21.32	20.55	17.67
		3557.5	22.46	21.58	20.78	17.90
	1 RB low	3692.5	22.48	21.56	20.66	17.84
		3625.0	22.12	21.18	20.62	17.56
		3557.5	22.65	21.67	20.68	17.74
	50% RB mid	3692.5	21.68	20.61	19.85	17.75
		3625.0	21.20	20.22	19.45	17.44
		3557.5	21.56	20.61	19.70	17.64

20MHz	100% RB	3692.5	21.60	20.59	19.78	17.74
		3625.0	21.21	20.20	19.45	17.40
		3557.5	21.59	20.61	19.66	17.67
	1 RB high	3690.0	22.61	21.74	20.97	18.01
		3625.0	22.16	21.39	20.69	17.63
		3560.0	22.46	21.66	20.69	17.68
	1 RB low	3690.0	22.53	21.75	21.02	17.85
		3625.0	22.17	21.45	20.37	17.57
		3560.0	22.67	21.86	21.06	17.81
	50% RB mid	3690.0	21.70	20.63	19.86	17.75
		3625.0	21.22	20.24	19.48	17.45
		3560.0	21.57	20.61	19.64	17.64
	100% RB	3690.0	21.58	20.58	19.73	17.75
		3625.0	21.21	20.22	19.47	17.41
		3560.0	21.57	20.58	19.65	17.61

Remark:

The TDD-LTE Band 48 Output power is provided by the test report 25T04Z100068-001.

Remark:

1. Per KDB941225 D05 v02r05, Start with the largest channel bandwidth then measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle, and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
2. Per KDB941225 D05 v02r05, the procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
3. Per KDB941225 D05 v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations, and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB941225 D05 v02r05, For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in 5.2.1, 5.2.2, and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

9.2 Test Results for Standalone SAR Test

Head SAR

LTE Band 48– Head SAR Test								
Plot No.	Mode	Test Position	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
	QPSK 10MHz 1RB	Right Cheek	3695.0	22.88	23.0	1.028	0.027	0.028
	QPSK 10MHz 1RB	Right Tilted	3695.0	22.88	23.0	1.028	0.026	0.027
	QPSK 10MHz 1RB	Left Cheek	3695.0	22.88	23.0	1.028	0.030	0.031
	QPSK 10MHz 1RB	Left Tilted	3695.0	22.88	23.0	1.028	0.027	0.028
	QPSK 10MHz 1RB	Left Cheek	3625.0	22.33	23.0	1.167	0.025	0.029
	QPSK 10MHz 1RB	Left Cheek	3555.0	22.79	23.0	1.050	0.026	0.027
	QPSK 10MHz 50%RB	Right Cheek	3695.0	22.88	23.0	1.028	0.026	0.027
	QPSK 10MHz 50%RB	Right Tilted	3695.0	22.88	23.0	1.028	0.024	0.025
	QPSK 10MHz 50%RB	Left Cheek	3695.0	22.88	23.0	1.028	0.029	0.030
	QPSK 10MHz 50%RB	Left Tilted	3695.0	22.88	23.0	1.028	0.028	0.029
	QPSK 10MHz 50%RB	Left Cheek	3625.0	22.33	23.0	1.167	0.024	0.028
	QPSK 10MHz 50%RB	Left Cheek	3555.0	22.79	23.0	1.050	0.025	0.026
	QPSK 20MHz 1RB	Right Cheek	3560.0	22.67	23.0	1.079	0.028	0.030
	QPSK 20MHz 1RB	Right Tilted	3560.0	22.67	23.0	1.079	0.025	0.027
	QPSK 20MHz 1RB	Left Cheek	3560.0	22.67	23.0	1.079	0.030	0.032
	QPSK 20MHz 1RB	Left Tilted	3560.0	22.67	23.0	1.079	0.028	0.030
	QPSK 20MHz 1RB	Left Cheek	3690.0	22.53	23.0	1.114	0.029	0.032
1.	QPSK 20MHz 1RB	Left Cheek	3625.0	22.17	23.0	1.211	0.027	0.033
	QPSK 20MHz 50%RB	Right Cheek	3560.0	22.67	23	1.079	0.027	0.029
	QPSK 20MHz 50%RB	Right Tilted	3560.0	22.67	23	1.079	0.024	0.026
	QPSK 20MHz 50%RB	Left Cheek	3560.0	22.67	23	1.079	0.029	0.031
	QPSK 20MHz 50%RB	Left Tilted	3560.0	22.67	23	1.079	0.027	0.029
	QPSK 20MHz 50%RB	Left Cheek	3690.0	22.53	23	1.114	0.026	0.029
	QPSK 20MHz 50%RB	Left Cheek	3625.0	22.17	23	1.211	0.025	0.030

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

Body SAR

LTE Band 48 –Body SAR Test (Gap: 0mm)								
Plot No.	Mode	Test Position	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
	QPSK 10MHz 1RB	Back Face	3695.0	22.88	23.0	1.028	0.112	0.115
	QPSK 10MHz 1RB	Front Face	3695.0	22.88	23.0	1.028	0.132	0.136
	QPSK 10MHz 1RB	Right Side	3695.0	22.88	23.0	1.028	0.658	0.676
	QPSK 10MHz 1RB	Top Side	3695.0	22.88	23.0	1.028	0.086	0.088
	QPSK 10MHz 1RB	Right Side	3625.0	22.33	23.0	1.167	0.384	0.448
2.	QPSK 10MHz 1RB	Right Side	3555.0	22.79	23.0	1.050	0.677	0.711
	QPSK 10MHz 50%RB	Back Face	3695.0	22.88	23.0	1.028	0.099	0.102
	QPSK 10MHz 50%RB	Front Face	3695.0	22.88	23.0	1.028	0.118	0.121
	QPSK 10MHz 50%RB	Right Side	3695.0	22.88	23.0	1.028	0.621	0.638
	QPSK 10MHz 50%RB	Top Side	3695.0	22.88	23.0	1.028	0.079	0.081
	QPSK 10MHz 50%RB	Right Side	3625.0	22.33	23.0	1.167	0.385	0.449
	QPSK 10MHz 50%RB	Right Side	3555.0	22.79	23.0	1.050	0.658	0.691
	QPSK 20MHz 1RB	Back Face	3695.0	22.88	23.0	1.028	0.120	0.126
	QPSK 20MHz 1RB	Front Face	3695.0	22.88	23.0	1.028	0.151	0.155
	QPSK 20MHz 1RB	Right Side	3695.0	22.88	23.0	1.028	0.688	0.707
	QPSK 20MHz 1RB	Top Side	3695.0	22.88	23.0	1.028	0.095	0.098
	QPSK 20MHz 1RB	Right Side	3625.0	22.33	23.0	1.167	0.414	0.483
	QPSK 20MHz 1RB	Right Side	3555.0	22.79	23.0	1.050	0.671	0.705
	QPSK 20MHz 50%RB	Back Face	3695.0	22.88	23.0	1.028	0.109	0.112
	QPSK 20MHz 50%RB	Front Face	3695.0	22.88	23.0	1.028	0.138	0.142
	QPSK 20MHz 50%RB	Right Side	3695.0	22.88	23.0	1.028	0.656	0.674
	QPSK 20MHz 50%RB	Top Side	3695.0	22.88	23.0	1.028	0.089	0.091
	QPSK 20MHz 50%RB	Right Side	3625.0	22.33	23.0	1.167	0.405	0.473
	QPSK 20MHz 50%RB	Right Side	3555.0	22.79	23.0	1.050	0.675	0.708

Remark: 1. Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

2. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 3) through 5) do not apply.

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

4. 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 ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

5. 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 .

9.3 Simultaneous Multi-band Transmission SAR Analysis

List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Head SAR	Body SAR
1	LTE Band 48 (Data) + WLAN ANT1(2.4G /5G)(Data) + WLAN ANT2(2.4G/5G)(Data) + NFC(Data)	Yes	Yes

Remark:

1. WLAN ANT1(2.4G /5G)(Data) WLAN ANT2(2.4G/5G)(Data) and NFC(Data) are provided by the test report WTX24X11256034W011.

2. According to the KDB 447498 D01 v06, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [$\sqrt{f(\text{GHz})}/x$]
W/kg for test separation distances ≤ 50 mm;

where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

3. The maximum SAR summation is calculated based on the same configuration and test position.

Head SAR

WWAN and WLAN

Position	WWAN		WLAN (2.4GHz/5GHz) -ANT1	WLAN (2.4GHz/5GHz) -ANT2	NFC	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)			Scaled SAR (W/kg)	
Right Cheek	TDD-LTE Band 48	0.030	0.359	0.174	0.0001	0.563
Right Tilted	TDD-LTE Band 48	0.027	0.346	0.167	0.0001	0.540
Left Cheek	TDD-LTE Band 48	0.033	0.327	0.140	0.0001	0.500
Left Tilted	TDD-LTE Band 48	0.030	0.319	0.135	0.0001	0.484

WWAN and Bluetooth

Position	WWAN		WLAN (2.4GHz/5GHz) -ANT2	Bluetooth	NFC	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)			Scaled SAR (W/kg)	
Right Cheek	TDD-LTE Band 48	0.030	0.174	0.073	0.0001	0.277
Right Tilted	TDD-LTE	0.027	0.167	0.067	0.0001	0.261

	Band 48					
Left Cheek	TDD-LTE Band 48	0.033	0.140	0.061	0.0001	0.234
Left Tilted	TDD-LTE Band 48	0.030	0.135	0.055	0.0001	0.220

Body SAR**WWAN and WLAN**

Position	WWAN		WLAN (2.4GHz/5GHz) -ANT1	WLAN (2.4GHz/5GHz) -ANT2	NFC	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)			Scaled SAR (W/kg)	
Back	TDD-LTE Band 48	0.126	0.187	0.294	0.0001	0.607
Front	TDD-LTE Band 48	0.155	0.329	0.324	0.0001	0.808
Right side	TDD-LTE Band 48	0.711	--	--	0.0001	0.711
Left side	TDD-LTE Band 48	--	0.575	0.523	0.0001	1.098
Top side	TDD-LTE Band 48	0.098	0.281	--	0.0001	0.379
Bottom side	TDD-LTE Band 48	--	--	--	0.0001	0.0001

WWAN and Bluetooth

Position	WWAN		WLAN (2.4GHz/5GHz) -ANT2	Bluetooth	NFC	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)			Scaled SAR (W/kg)	
Back	TDD-LTE Band 48	0.126	0.294	0.070	0.0001	0.490
Front	TDD-LTE Band 48	0.155	0.324	0.105	0.0001	0.584
Right side	TDD-LTE Band 48	0.711	--	--	0.0001	0.711
Left side	TDD-LTE Band 48	--	0.523	0.080	0.0001	0.603
Top side	TDD-LTE Band 48	0.098		0.063	0.0001	0.161
Bottom side	TDD-LTE Band 48	--	--	--	0.0001	0.0001

10. Measurement Uncertainty

10.1 Uncertainty for SAR Test

Input quantity X_i (source of uncertainty)	Ref.	Prob. Dist PDF_i	Unc. $a(x_i)$	Div. q_i	$u(x_i) =$ $a(x_i)/q_i$	c_i (1 g; 10 g)	$u(y) = c_i \cdot u(x_i)$	v_i or v_{eff}
Measurement System errors								
Probe calibration	8.4.1.1	N	7.00	2	3.5	1	3.5	∞
Probe calibration drift	8.4.1.2	R	0	$\sqrt{3}$	0	1	0	∞
Probe linearity and detection limit	8.4.1.3	R	5.00	$\sqrt{3}$	2.89	1	2.89	∞
Broadband signal	8.4.1.4	R	0	$\sqrt{3}$	0	1	0	∞
Probe isotropy	8.4.1.5	R	2.50	$\sqrt{3}$	1.44	1	1.44	∞
Other probe and data acquisition errors	8.4.1.6	N	0.02	1	0.02	1	0.02	∞
RF ambient and noise	8.4.1.7	N	0	1	0	1	0	∞
Probe positioning errors	8.4.1.8	N	1.40	1	1.40	$2/TM$	0.70	
Data processing errors	8.4.1.9	N	0.05	1	0.05	1	0.05	∞
Phantom and device (DUT or validation antenna) errors								
Measurement of phantom conductivity(σ)	8.4.2.1	N	4.00	1	4.00	$c_{\epsilon_s}, c_{\sigma}$	4.00	∞
Temperature effects (medium)	8.4.2.2	R	2.50	$\sqrt{3}$	1.44	$c_{\epsilon_s}, c_{\sigma}$	1.44	∞
Shell permittivity	8.4.2.3	R	5.00	$\sqrt{3}$	2.88	See 8.4.2.3	2.88	∞
Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	N	0.03	1	0.03	2	0.02	∞
Repeatability of positioning the DUT or source against the phantom	8.4.2.5	N	0.05	1	0.05	1	0.05	5
Device holder effects	8.4.2.6	N	5.00	1	5.00	1	5.00	
Effect of operating mode on probe sensitivity	8.4.2.7	R	0	$\sqrt{3}$	0	1	0	∞
Time-average SAR	8.4.2.8	R	0	$\sqrt{3}$	0	1	0	∞
Variation in SAR due to drift in output of DUT	8.4.2.9	N	5.00	1	5.00	1	5.00	
Validation antenna uncertainty (validation measurement only)	8.4.2.10	N	0	1	0	1	0	
Uncertainty in accepted power	8.4.2.11	N	0	1	0	1	0	

(validation measurement only)								
Corrections to the SAR result								
Phantom deviation from target (ϵ', σ)	8.4.3.1	N	0.05	1	0.05	1	0.05	
SAR scaling	8.4.3.2	R	2.00	$\sqrt{3}$	1.15	1	1.15	
Combined Standard Uncertainty		RSS			10.11		10.11	$v_{\text{eff}}^{\text{C}}$
Expanded uncertainty, U		K=2			20.23		20.23	

Annex A. Plots of System Performance Check

MEASUREMENT 1

Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 2024-12-10
Measurement duration: 7 minutes 21 seconds
E-field Probe: SSE2 - 3823-EPGO-435; ConvF: 1.28; Calibrated: 2024-07-11

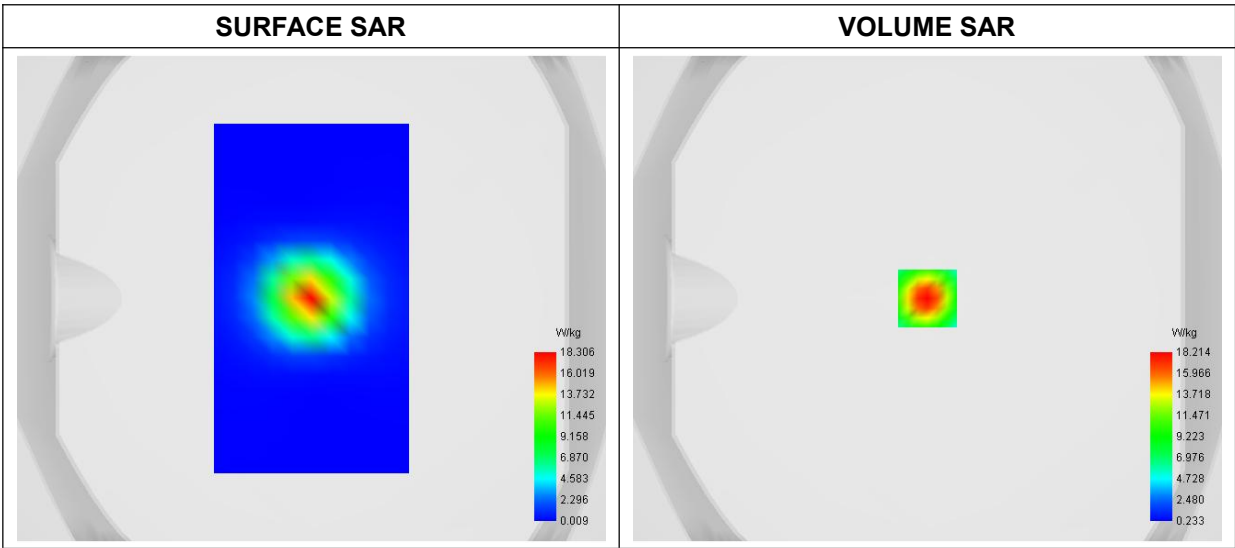
A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Zoom Scan	dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW3500
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Result

Frequency (MHz)	3500.000000
Relative Permittivity (real part)	37.682137
Conductivity (S/m)	2.881287
Power Variation (%)	1.365100
Ambient Temperature	22.5
Liquid Temperature	22.5

C. SAR Surface and Volume

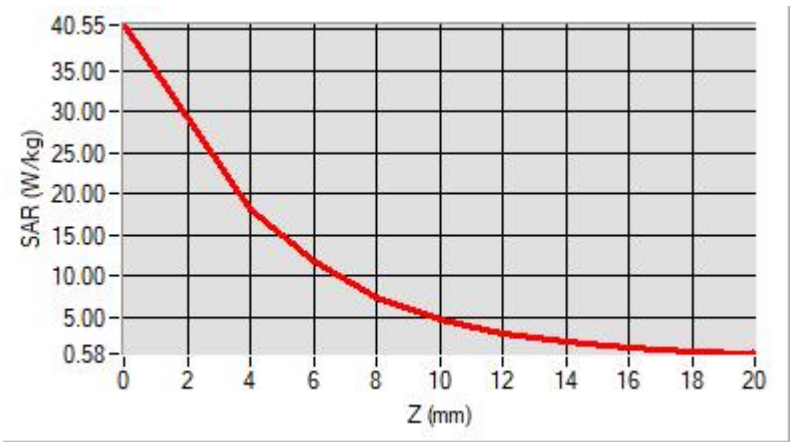


Maximum location: X=0.00, Y=0.00
D. SAR 1g & 10g

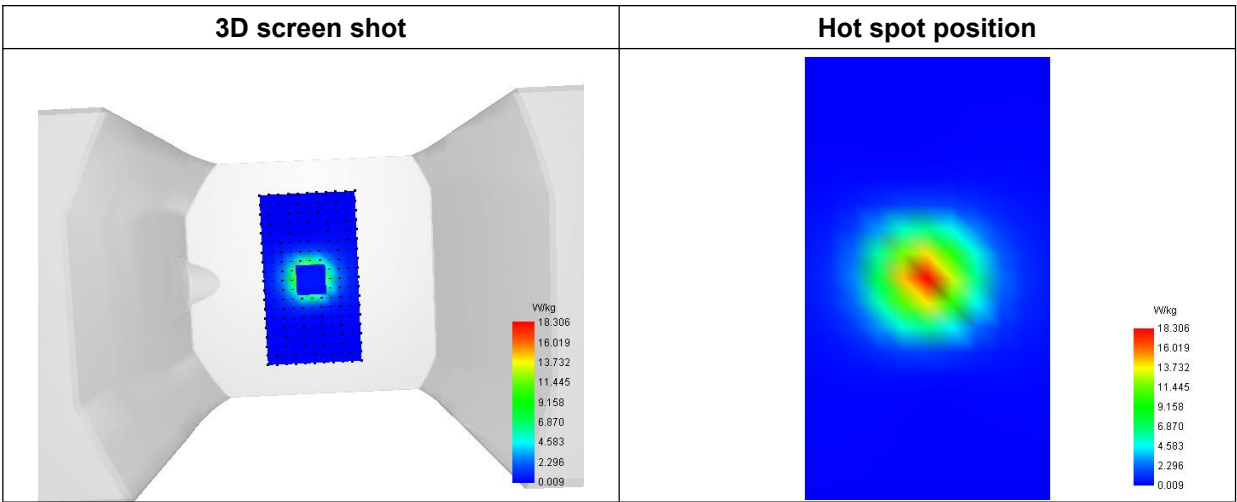
SAR 10g (W/Kg)	6.791900
SAR 1g (W/Kg)	16.854076

E. Z Axis Scan

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00
SAR (W/Kg)	40.552	18.213	11.791	7.4928	4.7792	3.0841	2.0253	1.3521	0.9043
	1	7	4						



F. 3D Image



MEASUREMENT 2

Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 2024-12-10
Measurement duration: 7 minutes 21 seconds
E-field Probe: SSE2 - 3823-EPGO-435; ConvF: 1.25; Calibrated: 2024-07-11

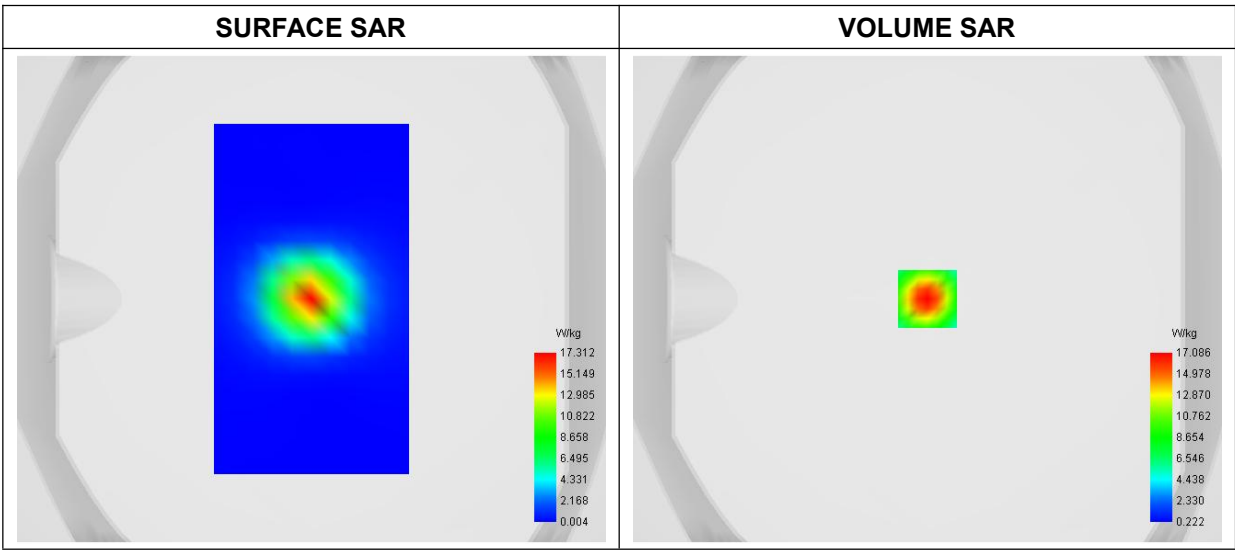
A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Zoom Scan	dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW3700
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	3700.000000
Relative Permittivity (real part)	38.811724
Conductivity (S/m)	3.093695
Power Variation (%)	1.025400
Ambient Temperature	22.5
Liquid Temperature	22.5

C. SAR Surface and Volume

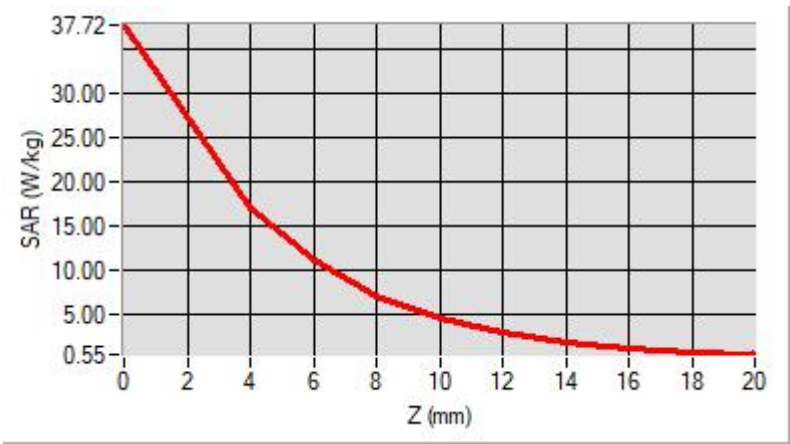


Maximum location: X=0.00, Y=0.00
D. SAR 1g & 10g

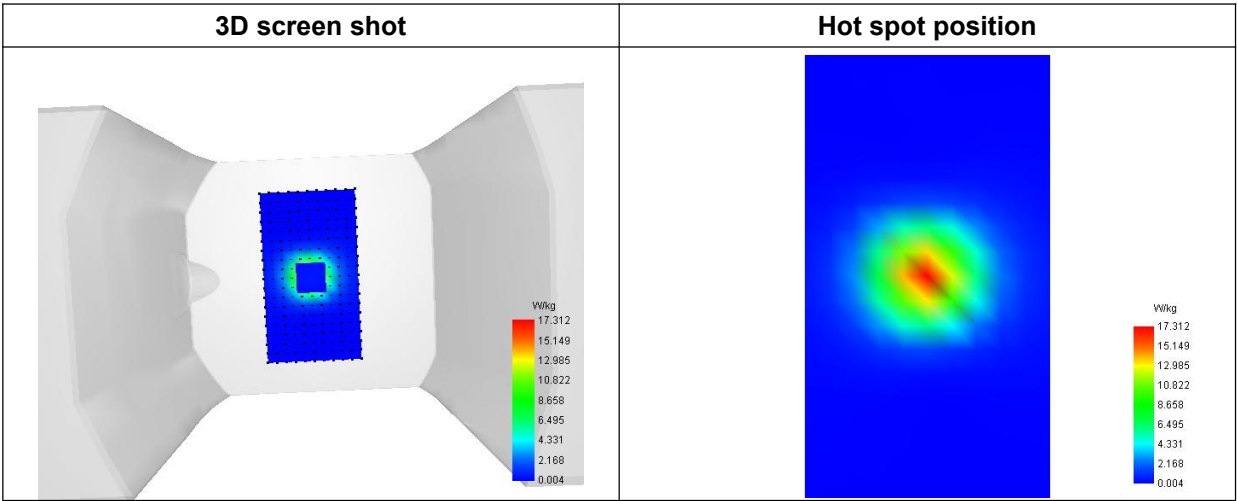
SAR 10g (W/Kg)	6.422343
SAR 1g (W/Kg)	15.826571

E. Z Axis Scan

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00
SAR (W/Kg)	37.715	17.085	11.122	7.1110	4.5615	2.9568	1.9461	1.2980	0.8639
	2	5	8						



F. 3D Image



Annex B. Plots of SAR Measurement

MEASUREMENT 14

Type: Measurement (Complete)
Date of measurement: 2024-12-10
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE2 - 3823-EPGO-435; ConvF: 1.25; Calibrated: 2024-07-11

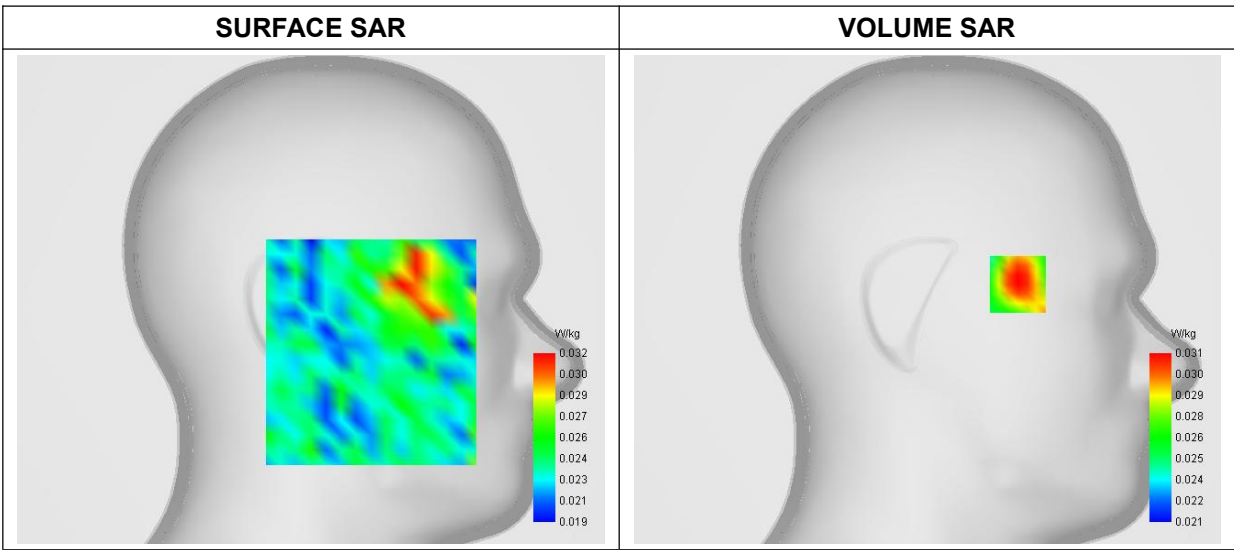
A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Zoom Scan	dx=5mm dy=5mm dz=4mm
Phantom	Left head
Device Position	Cheek
Band	LTE Band 48
Channels	QPSK, 20MHz, 1RB, Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	3625.000000
Relative Permittivity (real part)	38.800654
Conductivity (S/m)	3.091301
Power Variation (%)	1.516100
Ambient Temperature	22.5
Liquid Temperature	22.5

C. SAR Surface and Volume

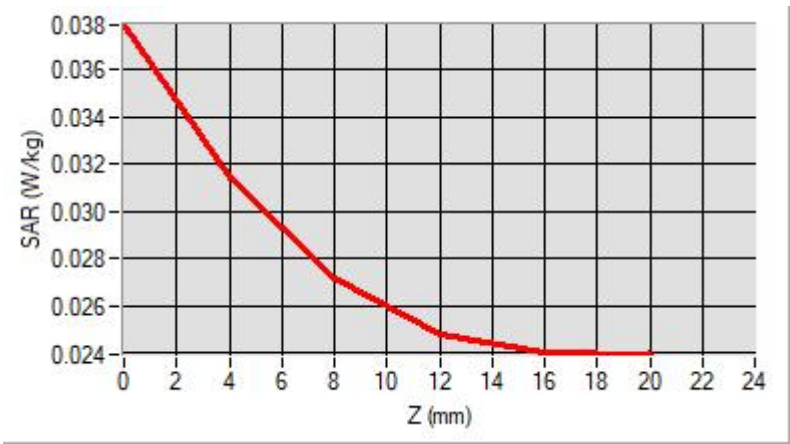


Maximum location: X=-48.00, Y=8.00
D. SAR 1g & 10g

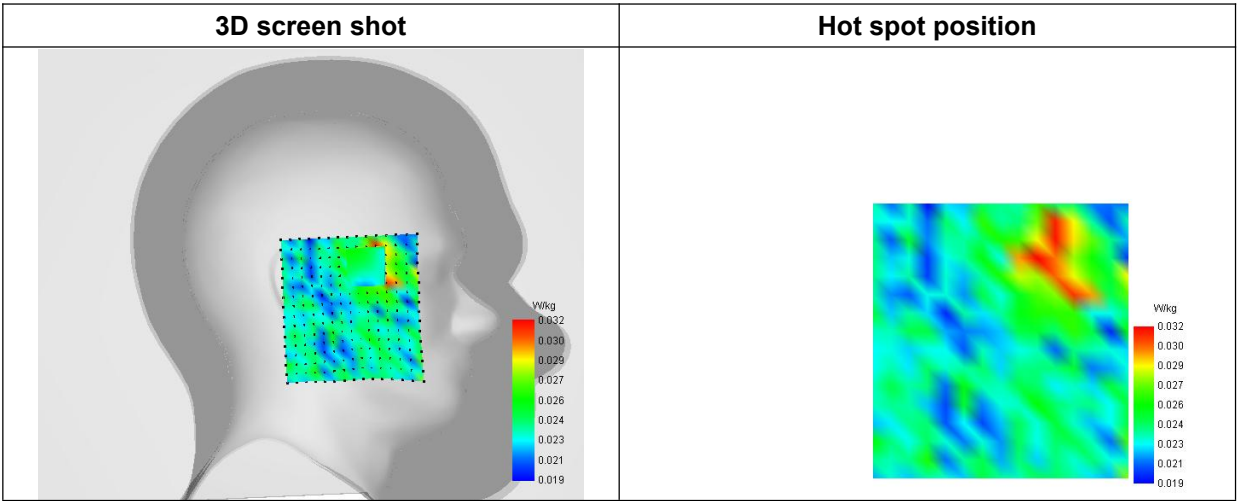
SAR 10g (W/Kg)	0.024781
SAR 1g (W/Kg)	0.027272

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	0.0379	0.0315	0.0271	0.0248	0.0240



F. 3D Image



MEASUREMENT 53

Type: Measurement (Complete)
Date of measurement: 2024-12-10
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE2 - 3823-EPGO-435; ConvF: 1.25; Calibrated: 2024-07-11

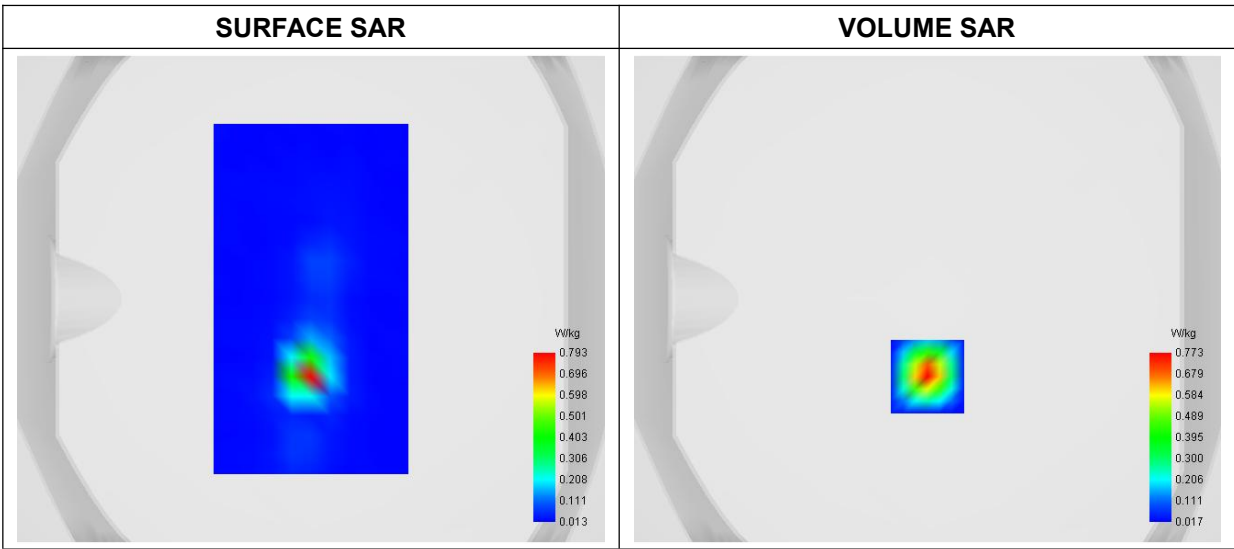
A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Zoom Scan	dx=5mm dy=5mm dz=4mm
Phantom	Flat Plane
Device Position	Right
Band	LTE Band 48
Channels	QPSK, 20MHz, 1RB, low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	3555.000000
Relative Permittivity (real part)	38.811451
Conductivity (S/m)	3.094311
Power Variation (%)	-1.158600
Ambient Temperature	22.5
Liquid Temperature	22.5

C. SAR Surface and Volume

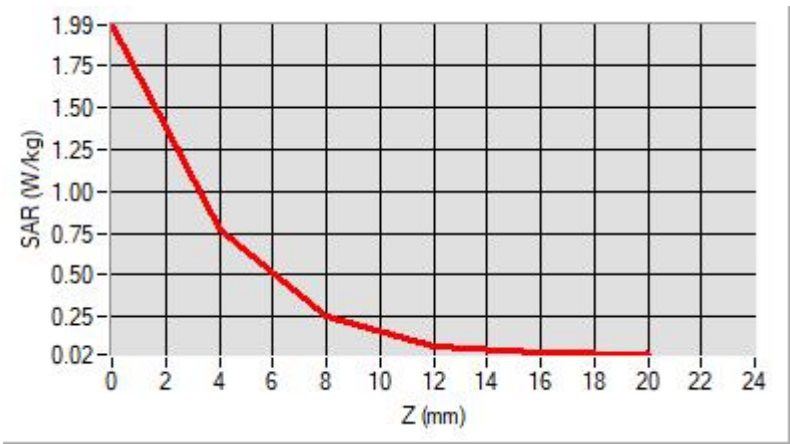


Maximum location: X=0.00, Y=-32.00
D. SAR 1g & 10g

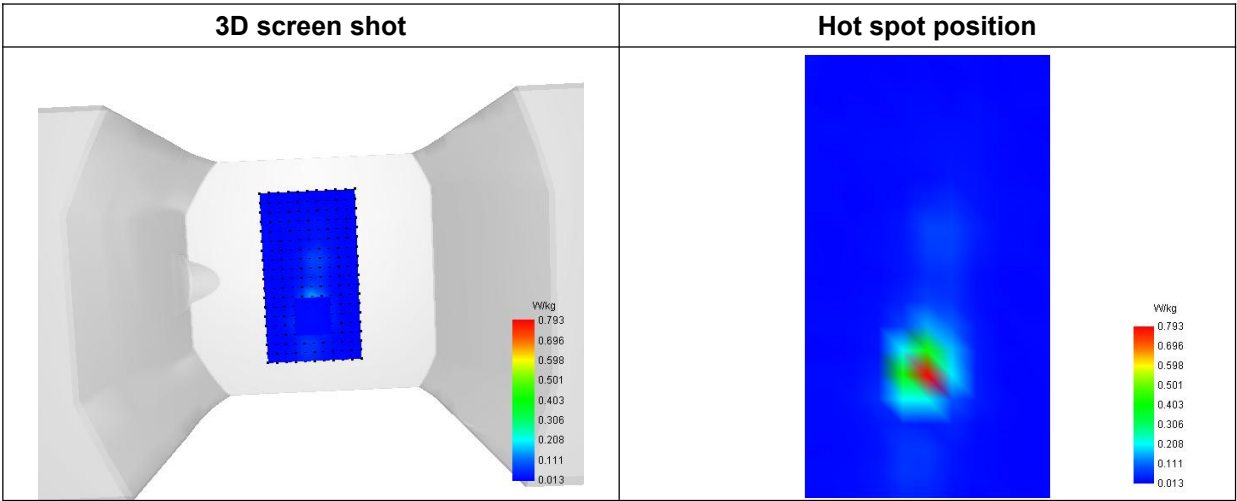
SAR 10g (W/Kg)	0.223344
SAR 1g (W/Kg)	0.677495

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	1.9931	0.7631	0.2372	0.0727	0.0314



F. 3D Image



Annex C. EUT Photos

EUT View 1



EUT View 2



EUT View 3



Antenna View



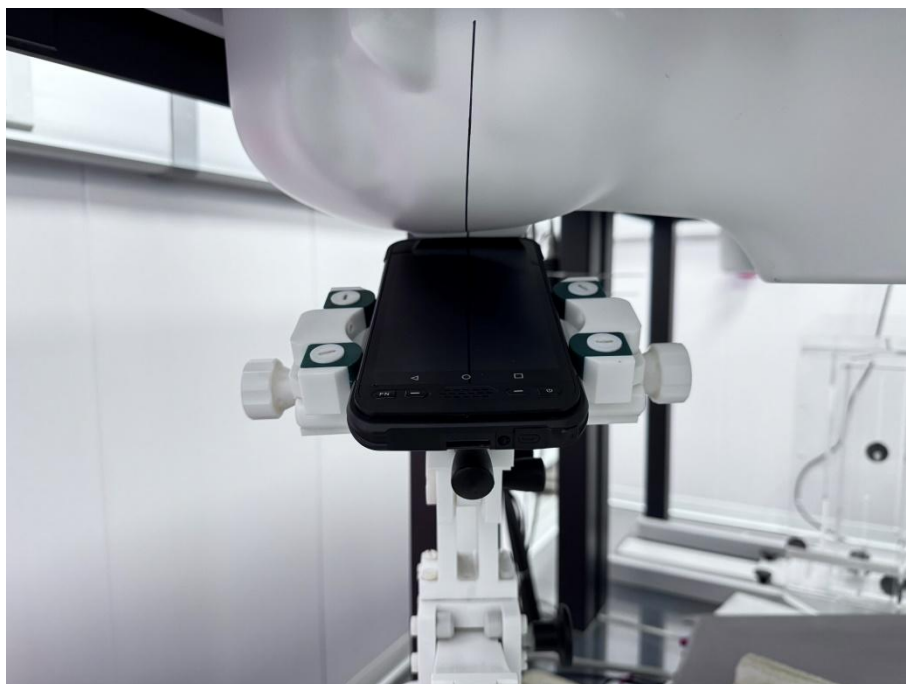
Annex D. Test Setup Photos

Head Exposure Conditions

Right Cheek



Right Tilt



Left Cheek



Left Tilt



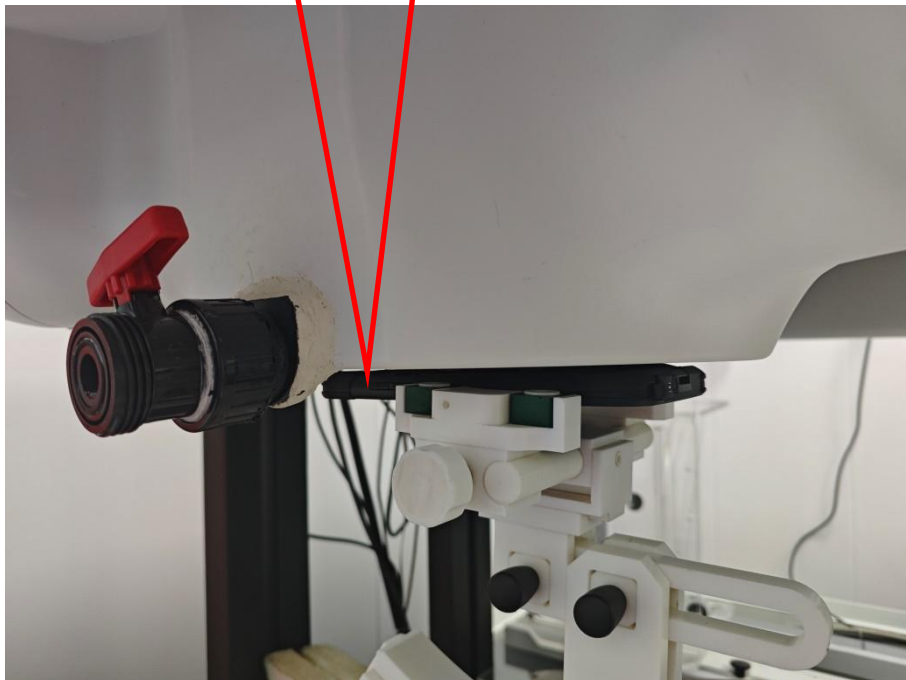
Body mode Exposure Conditions
Test distance: 0mm

Body Front



Removed the protruding part and
the part does not contain metal

Body Back





Body Right



Body Top



Annex E. Calibration Certificate

Please refer to the exhibit for the calibration certificate

******* END OF REPORT *******