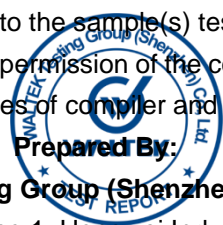


TEST REPORT

Reference No...... : WTX21X09102197W
FCC ID : 2ARO3-W665
Applicant : Worldwide Telecom Limited.
Address..... : 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.
Product Name : Smartphone
Test Model : W665
FCC Part 2.1093
Standards : ANSI / IEEE C95.1 : 2005+A1:2010
ANSI / IEEE C95.3 : 2002(R2008)
IEEE 62209-1528: 2020
Date of Receipt sample : Nov. 07, 2021
Date of Test..... : Nov. 07, 2021 to Nov. 19, 2021
Date of Issue : Nov. 22, 2021
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 compiler and approver.



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1. General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Worldwide Telecom Limited.
 Address of applicant: 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.

Manufacturer: Worldwide Telecom Limited.
 Address of manufacturer: 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.

General Description of EUT:	
Product Name:	Smartphone
Trade Name:	WOLKI
Model No.:	W665
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery:	3500mAh
Adapter Model:	WCH05 Input:AC100-240V, 50/60Hz, 0.15A Output:DC5.0V, 1000mA
Software Version:	/
Hardware Version:	/
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS 850: 824~849MHz GSM/GPRS 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS 850: 869~894MHz GSM/GPRS 1900: 1930~1990MHz
RF Output Power:	GSM850: 32.25dBm, GSM1900: 29.70dBm
Type of Modulation:	GMSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: -0.5dBi; GSM1900: 0.5dBi
GPRS Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 22.94dBm, WCDMA Band 5: 23.34dBm
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 0.5dBi, WCDMA Band 5: -0.5dBi
WIFI(2.4G)	
Support Standards:	802.11b, 802.11g, 802.11n-HT20/40
Frequency Range:	2412-2462MHz for 11b/g/n(HT20); 2422-2452MHz for 802.11n-HT40
RF Output Power:	15.41dBm (Conducted)
Type of Modulation:	DBPSK, BPSK, DQPSK, QPSK, 16QAM, 64QAM
Quantity of Channels:	11 for 802.11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0.7dBi
Bluetooth	
Bluetooth Version:	V4.0
Frequency Range:	2402-2480MHz
RF Output Power:	3.73dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK

Quantity of Channels:	79
Channel Separation:	1MHz
Antenna Type:	Integral Antenna
Antenna Gain:	0.7dBi

1.2 Test Standards

ANSI/IEEE C95.1-2005, ANSI / IEEE C95.3 :2002, IEEE 62209-1528: 2020, 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.: 11464A.

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-worn (10mm Gap)	Hotspot (10mm Gap)	SAR _{1g} Limit (W/kg)
	Maximum SAR _{1g} (W/kg)	Maximum SAR _{1g} (W/kg)	Maximum SAR _{1g} (W/kg)	
GSM	0.595	0.567	0.491	1.6
WCDMA	0.291	0.423	0.423	1.6
WLAN 2.4G	0.209	0.169	0.169	1.6
Simultaneous Transmission	0.773	0.736	0.660	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 ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedure specified in 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:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

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

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

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

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

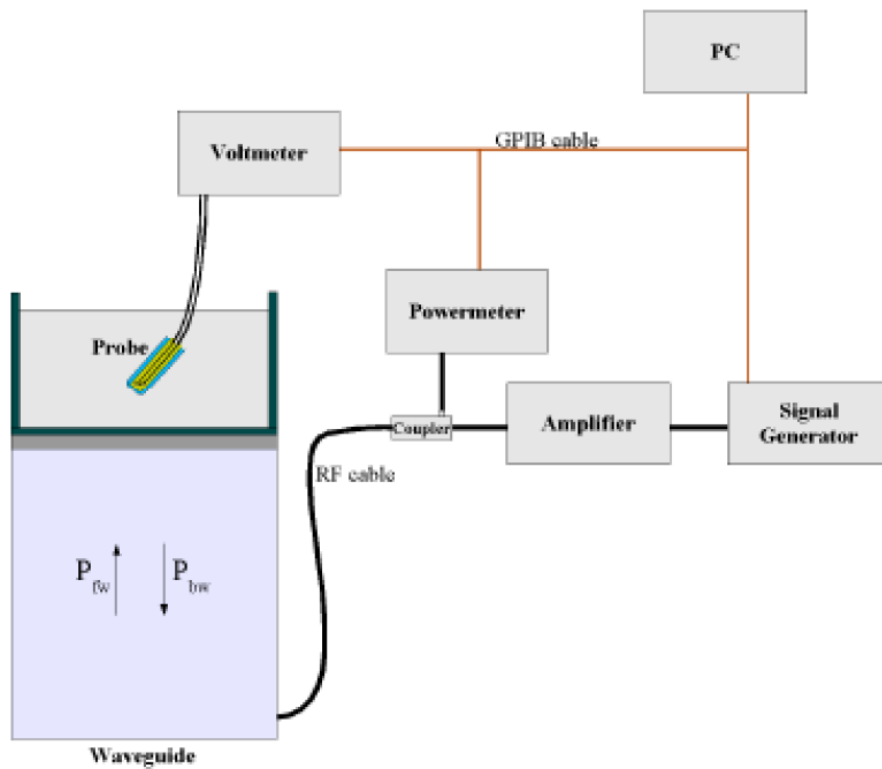
For the measurements the Specific Dosimetric E-Field Probe SSE2 SN 45/15 EPGO280 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Probe Length: 330 mm
- Length of Individual Dipoles: 4.5 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter : 5 mm

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- Distance between dipoles / probe extremity: 2.7mm
 - Probe linearity: <0.25 dB
 - Axial Isotropy: <0.25 dB
 - Spherical Isotropy: <0.50 dB
 - Calibration range: 700 to 3000MHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

Probe calibration is realized, in compliance with EN 62209-1 and IEEE 1528 STD, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 62209-1 annexe 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.

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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.

Where:

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

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.

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

Where:

σ = simulated tissue conductivity,

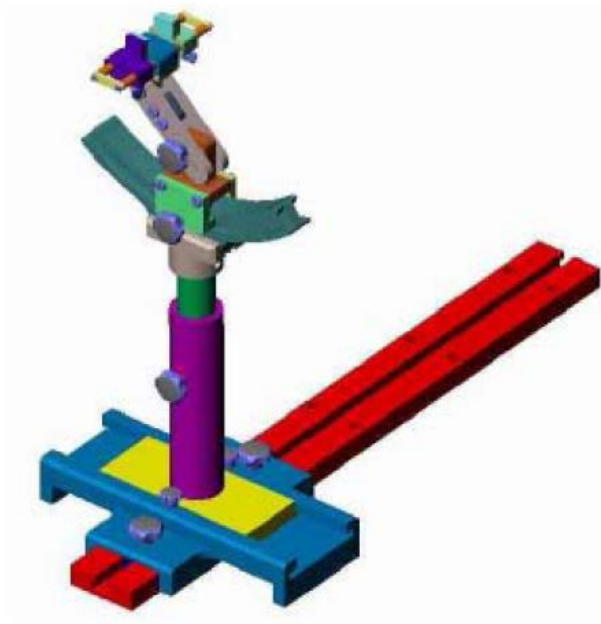
ρ = Tissue density (1.25 g/cm³ for brain tissue)

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

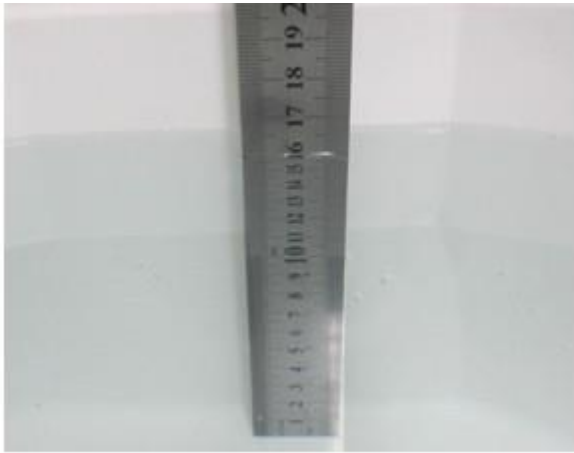
4.6 Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
E-Field Probe	MVG	SSE5	SN 09/13 EP168	2020-05-22	2022-05-21
E-Field Probe	MVG	SSE2	SN 18/21 EPGO356	2021-07-16	2024-07-15
835MHz Dipole	MVG	SID835	SN 47/12 DIP 0G835-204	2020-03-11	2022-03-10
1800MHz Dipole	MVG	SID1800	SN 47/12 DIP 1G800-206	2020-03-11	2022-03-10
1900MHz Dipole	MVG	SID1900	SN 47/12 DIP 1G900-207	2020-03-11	2022-03-10
2450MHz Dipole	MVG	SID2450	SN 13/15 DIP 2G450-364	2020-03-11	2022-03-10
2600MHz Dipole	MVG	SID2600	SN 28/21 DIP 2G600-590	2021-07-16	2024-07-15
3300MHz Dipole	MVG	SID3300	SN 28/21 DIP 3G300-591	2021-07-19	2024-07-18
3500MHz Dipole	MVG	SID3500	SN 28/21 DIP 3G500-592	2021-07-19	2024-07-18
3700MHz Dipole	MVG	SID3700	SN 28/21 DIP 3G700-593	2021-07-19	2024-07-18
3900MHz Dipole	MVG	SID3900	SN 28/21 DIP 3G900-594	2021-07-19	2024-07-18
4200MHz Dipole	MVG	SID4200	SN 28/21 DIP 4G200-595	2021-07-19	2024-07-18
4600MHz Dipole	MVG	SID4600	SN 28/21 DIP 4G600-596	2021-07-19	2024-07-18
4900MHz Dipole	MVG	SID4900	SN 28/21 DIP 4G900-597	2021-07-19	2024-07-18
5 GHz Dipole	MVG	SID5000	SN 28/21 DIP 5G000-543	2021-07-21	2024-07-20
Dielectric Probe	SATIMO	SCLMP	SN 47/12 OCPG49	2020-03-11	2022-03-10
SAM Phantom	SATIMO	SAM	SN/ 47/12 SAM95	N/A	N/A
Multi Meter	Keithley	Keithley 2000	4006367	2021-03-27	2022-03-26
Power meter	Keithley	3500	JC-2017-09-001	2021-03-27	2022-03-26
Power meter	Keithley	3500	JC-2017-09-001	2021-03-27	2022-03-26
Power Sensor	Agilent	11636B	JC-2017-10-002	2021-03-27	2022-03-26
Signal Generator	Rohde & Schwarz	SMR20	100047	2021-03-27	2022-03-26
Universal Tester	Rohde & Schwarz	CMU200	112315	2021-03-27	2022-03-26
Communications Tester	Rohde & Schwarz	CMW500	148650	2021-03-27	2022-03-26
Network Analyzer	HP	8753C	SEMT-1064	2021-03-27	2022-03-26
Directional Couplers	Agilent	778D	20160	2021-03-27	2022-03-26

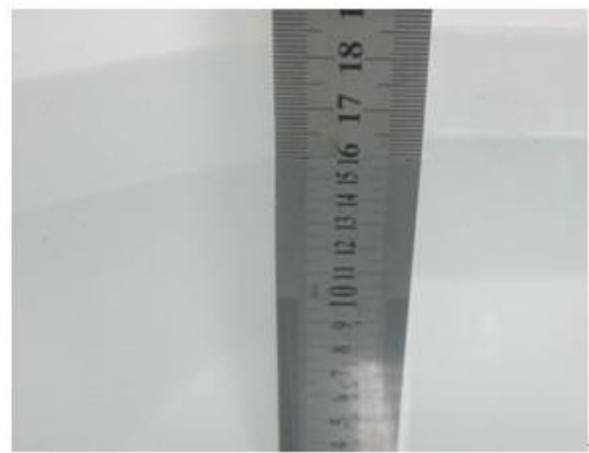
5. Tissue Simulating Liquids

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 Head SAR



Liquid Height for Body SAR

The Composition of Tissue Simulating Liquid

Frequency (MHz)	Water (%)	Salt (%)	Sugar (%)	HEC (%)	Preventol (%)	DGBE (%)
Head						
750	41.1	1.4	57.0	0.2	0.3	0
835	40.3	1.4	57.9	0.2	0.2	0
1700-1900	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

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Target Frequency (MHz)	Head/Body	
	Conductivity (σ)	Permittivity (ϵ_r)
150	0.76	52.3
300	0.87	45.3
450	0.87	43.5
750	0.89	41.9
835	0.90	41.5
900	0.97	41.5
915	0.98	41.5
1450	1.20	40.5
1610	1.29	40.3
1750	1.37	40.1
1800-2000	1.40	40.0
2450	1.80	39.2
3000	2.40	38.5
5200	4.66	36.0
5800	5.27	35.3

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/Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
835	22.8	0.88	0.90	-2.22	42.38	41.50	2.12	±5	2021-11-19
1900	22.5	1.41	1.40	0.71	40.76	40.0	1.90	±5	2021-11-19
2450	22.3	1.78	1.80	-1.11	39.85	39.20	1.66	±5	2021-11-18

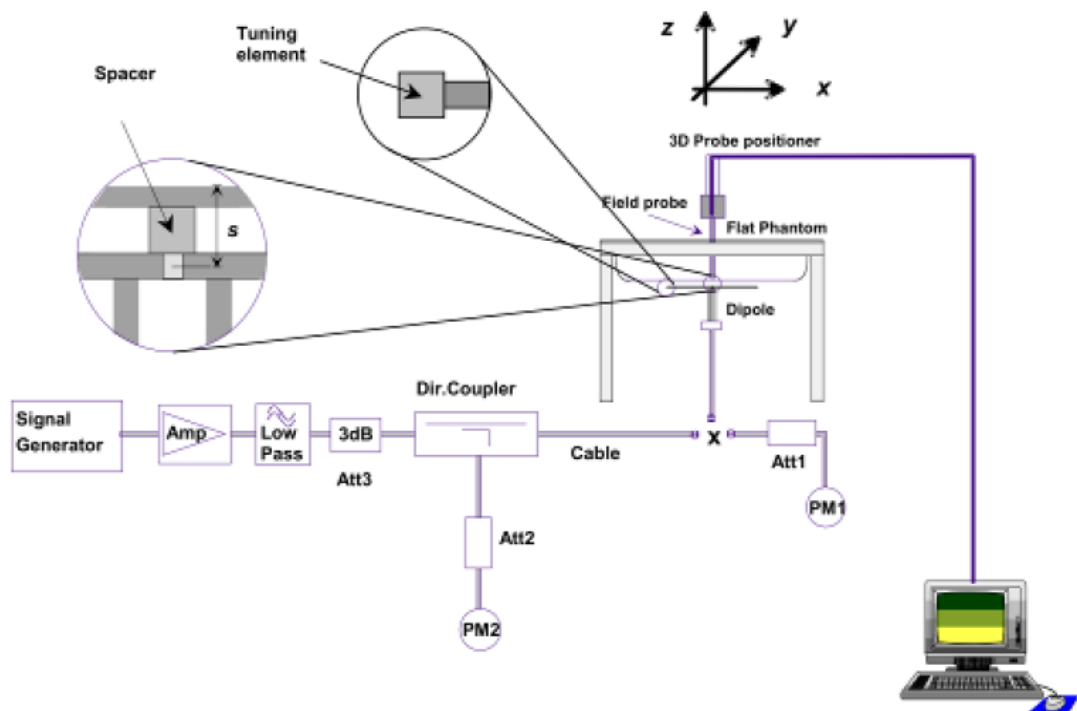
6. SAR Measurement Evaluation

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.
The output power on 5 GHz Waveguide must be calibrated to 20 dBm (100mW) before 5 GHz Waveguide 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)	(%)	
835	250	9.65	2.47	9.88	2.38	2021-11-19
1900	250	38.49	9.97	39.88	3.61	2021-11-19
2450	250	53.76	13.56	54.24	0.89	2021-11-18

Remark: Referring to IEEE 62209-1528: 2020, Section 8.2, The system check shall be performed at a test frequency that is within $\pm 10\%$ 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 side 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.

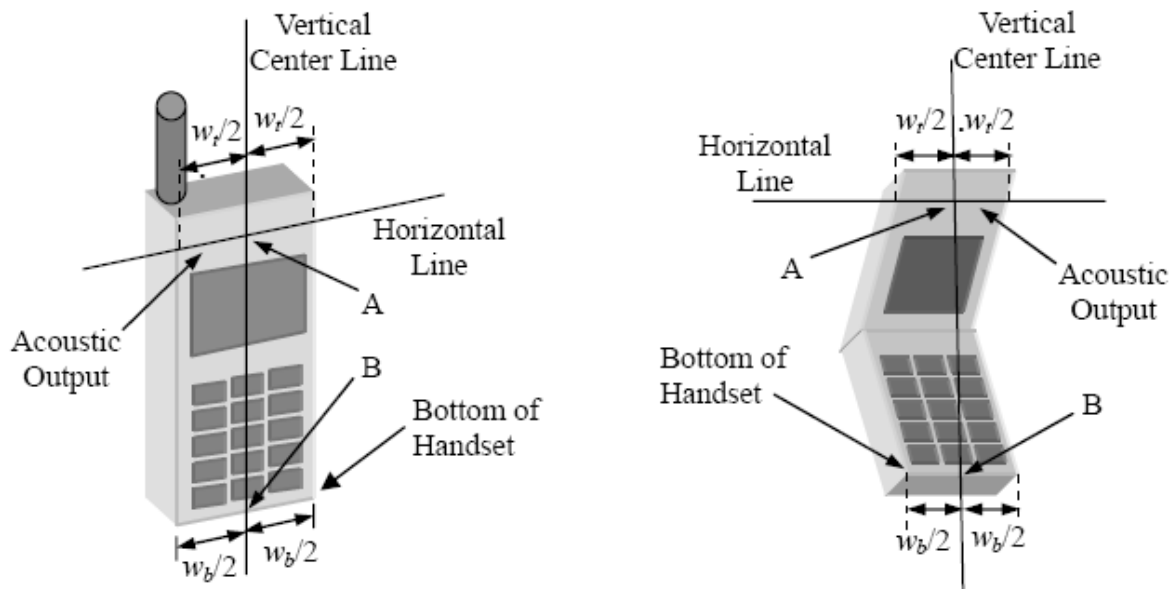


Illustration for Handset Vertical and Horizontal Reference Lines

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 side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 7.2).

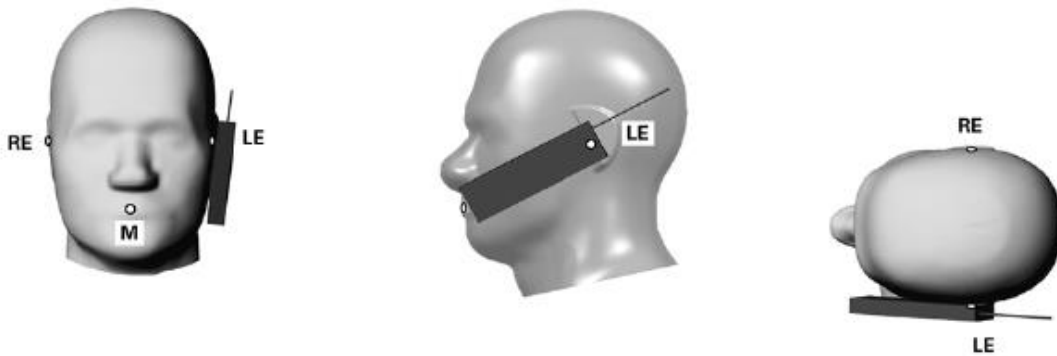


Illustration for Cheek Position

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).

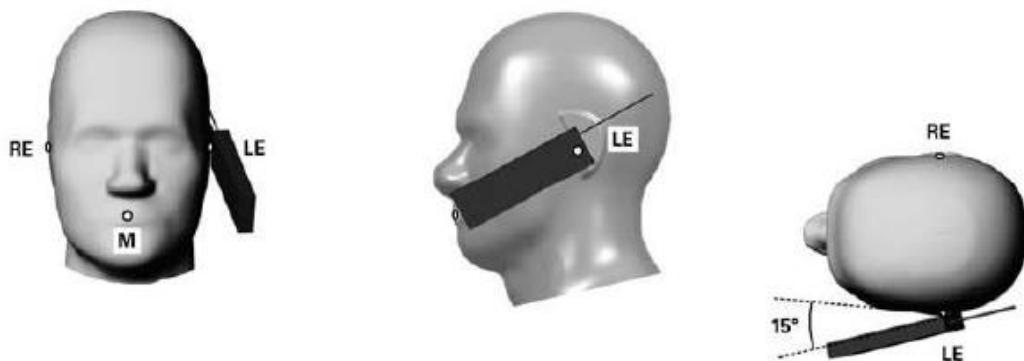


Illustration for Tilted Position

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 10mm.

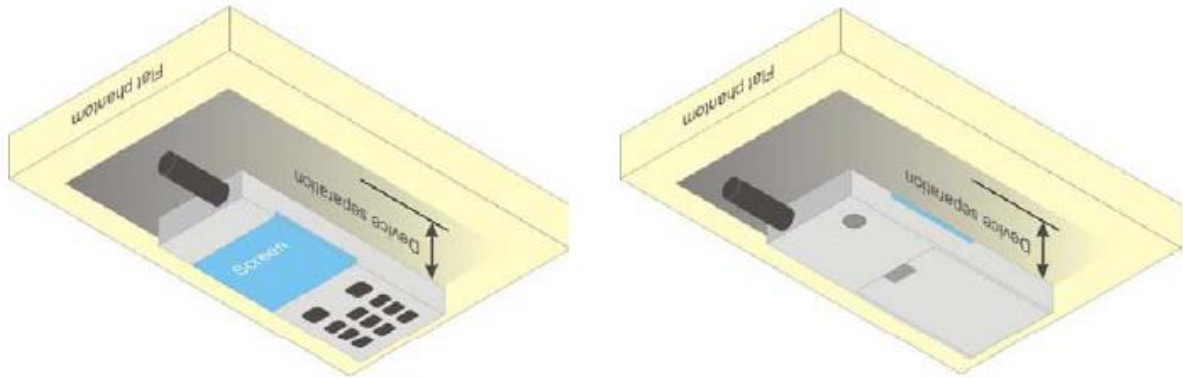
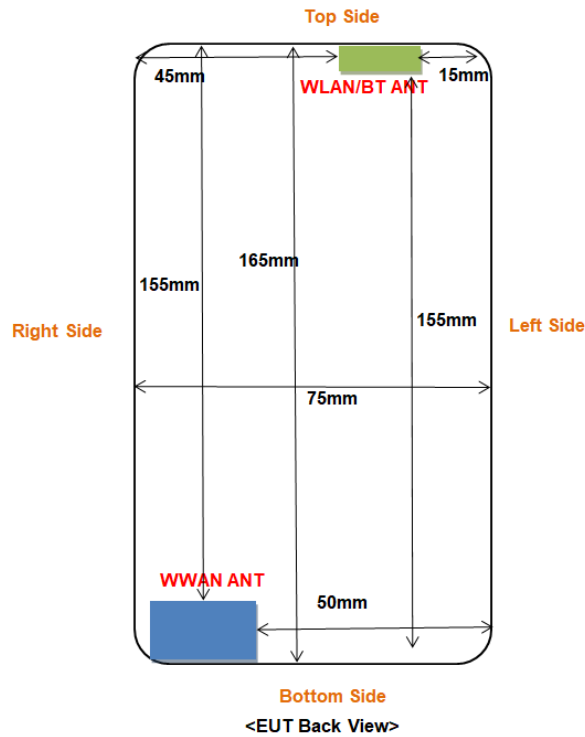


Illustration for Body Position

7.5 EUT Antenna Position



Block Diagram for EUT Antenna Position

Distance of EUT antenna-to-edge/surface(mm), Test distance:10mm						
Antennas	Front	Back	Right Side	Left Side	Top Side	Bottom Side
WWAN	<25	<25	<25	50	155	<25
WLAN	<25	<25	45	<25	<25	155

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: 10mm						
Antennas	Front	Back	Right Side	Left Side	Top Side	Bottom Side
WWAN	Yes	Yes	Yes	No	No	Yes
WLAN	Yes	Yes	No	Yes	Yes	No

Remark:

- Referring to KDB 941225 D06, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, the test separation distances is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
- 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 $> 1.2\text{ W/kg}$

Please refer to Annex D 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

GSM - Burst Average Power (dBm)								
Band	GSM850			Tune-up power (dBm)	PCS1900			Tune-up power (dBm)
Channel	128	190	251		512	661	810	
Frequency (MHz)	824.2	836.6	848.8		1850.2	1880	1909.8	
GSM	32.13	32.15	32.09	32.5	29.68	29.27	28.96	30.0
GPRS (1 slot)	32.23	32.25	32.25	32.5	29.70	29.3	28.98	30.0
GPRS (2 slots)	31.14	31.05	31.03	31.5	28.12	27.62	27.02	28.5
GPRS (3 slots)	28.76	28.69	28.53	29.0	26.51	25.88	25.07	27.0
GPRS (4 slots)	27.74	27.54	27.40	28.0	25.68	24.96	24.04	26.0

GSM - Source-Based Time-Average Power (dBm)								
Band	GSM850			Tune-up power (dBm)	PCS1900			Tune-up power (dBm)
Channel	128	190	251		512	661	810	
Frequency (MHz)	824.2	836.6	848.8		1850.2	1880	1909.8	
GSM	23.13	23.15	23.09	23.5	20.68	20.27	19.96	21.0
GPRS (1 slot)	23.23	23.25	23.25	23.5	20.70	20.30	19.98	21.0
GPRS (2 slots)	25.14	25.05	25.03	25.5	22.12	21.62	21.02	22.5
GPRS (3 slots)	24.51	24.44	24.28	25.0	22.26	21.63	20.82	22.5
GPRS (4 slots)	24.74	24.54	24.40	25.0	22.68	21.96	21.04	23.0

Note: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below:

Source based time-average power = Burst averaged power - Duty cycle factor in dB

Duty cycle factor = 9 dB for 1 Tx slot, 6 dB for 2 Tx slots, 4.25 dB for 3 Tx slots, 3 dB for 4 Tx slots

Remark:

1. For Head SAR testing, GSM should be evaluated, therefore the EUT was set in GSM for GSM850 and GSM1900 due to its highest source-based time-average power.
2. For Body SAR testing, GPRS should be evaluated, therefore the EUT was set in GPRS (2TX slots) for GSM850 and GPRS (4TX slots) for GSM1900 due to its highest source-based time-average power.
3. Per KDB 447498 D01 v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
4. The DUT do not support DTM function.
5. The DUT do not support Hotspot function.

WCDMA - Average Power (dBm)								
Band	WCDMA Band II				WCDMA Band V			
Channel	9262	9400	9538	Tune-up power (dBm)	4132	4183	4233	Tune-up power (dBm)
Frequency (MHz)	1852.4	1880.0	1907.6		826.4	836.4	846.6	
RMC 12.2k	22.91	22.94	22.86	23.0	23.34	22.98	22.58	23.5
HSDPA Subtest-1	21.88	22.08	22.06	22.5	22.10	21.87	21.50	22.5
HSDPA Subtest-2	21.83	22.06	22.05	22.5	22.08	21.85	21.47	22.5
HSDPA Subtest-3	21.84	22.04	22.03	22.5	22.07	21.83	21.46	22.5
HSDPA Subtest-4	21.85	22.07	22.04	22.5	22.09	21.84	21.47	22.5
HSUPA Subtest-1	21.87	22.08	21.91	22.5	22.09	21.89	21.51	22.5
HSUPA Subtest-2	21.83	22.05	21.86	22.5	22.06	21.86	21.5	22.5
HSUPA Subtest-3	21.84	22.06	21.87	22.5	22.04	21.87	21.49	22.5
HSUPA Subtest-4	21.83	22.07	21.86	22.5	22.08	21.86	21.47	22.5
HSUPA Subtest-5	21.84	22.07	21.87	22.5	22.07	21.86	21.48	22.5

Remark:

- per KDB 941225 D01 v03, The 12.2kbps RMC mode was selected for SAR testing(the primary mode).
- When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

WLAN(2.4G) - Maximum Average Power					
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up power (dBm)
802.11b	1Mbps	CH 01	2412	15.08	15.5
		CH 06	2437	15.41	15.5
		CH 11	2462	14.91	15.0
802.11g	54Mbps	CH 01	2412	13.56	14.0
		CH 06	2437	13.50	14.0
		CH 11	2462	13.26	13.5
802.11n (20MHz)	MCS7	CH 01	2412	12.17	12.5
		CH 06	2437	12.28	12.5
		CH 11	2462	12.15	12.5
802.11n (40MHz)	MCS7	CH 03	2422	11.38	11.5
		CH 06	2437	11.23	11.5
		CH 09	2452	11.48	11.5

Remark:

1. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.
2. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements, when the reported SAR of the highest measured maximum output power channel (see 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
3. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is ≤ 1.2 W/kg.
4. Per KDB 248227 D01 v02r02, When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined by applying the following steps sequentially.
 - 1) The largest channel bandwidth configuration is selected among the multiple configurations in a frequency band with the same specified maximum output power.
 - 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
 - 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
 - 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

Bluetooth - Maximum Average Power			
Test Mode	Data Rate	Average Power(dBm)	Tune-up power (dBm)
GFSK	1Mbps	3.69	4.0
Pi/4 QDPSK	2Mbps	3.58	4.0
8DPSK	3Mbps	3.73	4.0

Bluetooth - Maximum Average Power					
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up power (dBm)
BLE	1Mbps	CH 00	2402	3.46	3.5
		CH 19	2440	3.12	3.5
		CH 39	2480	2.91	3.0

Remark:

Bluetooth maximum output power is 3.73dBm and Maximum Tune-Up output power is 2.36dBm,. Per KDB 447498 D01 V06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,16 where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

Bluetooth:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	Result	Limit
4.0	2.51	5	2.48	0.79	3

The exclusion thresholds is $0.79 < 3$, therefore, the RF exposure evaluation is not required.

9.2 Test Results for Standalone SAR Test

Head SAR

GSM850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
	GSM	Right Cheek	190	836.6	32.15	32.5	1.084	0.489	0.530
	GSM	Right Tilted	190	836.6	32.15	32.5	1.084	0.223	0.242
1	GSM	Left Cheek	190	836.6	32.15	32.5	1.084	0.549	0.595
	GSM	Left Tilted	190	836.6	32.15	32.5	1.084	0.313	0.339

GSM1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
2	GSM	Right Cheek	512	1850.2	29.68	30.0	1.076	0.172	0.185
	GSM	Right Tilted	512	1850.2	29.68	30.0	1.076	0.101	0.109
	GSM	Left Cheek	512	1850.2	29.68	30.0	1.076	0.040	0.043
	GSM	Left Tilted	512	1850.2	29.68	30.0	1.076	0.022	0.024

GSM850 – Head SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
3	GPRS_2TX	Right Cheek	128	824.2	31.14	31.5	1.086	0.474	0.515
	GPRS_2TX	Right Tilted	128	824.2	31.14	31.5	1.086	0.238	0.259
	GPRS_2TX	Left Cheek	128	824.2	31.14	31.5	1.086	0.400	0.435
	GPRS_2TX	Left Tilted	128	824.2	31.14	31.5	1.086	0.226	0.246

GSM1900 – Head SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
4	GPRS_4TX	Right Cheek	512	1850.2	25.68	26.0	1.076	0.086	0.093
	GPRS_4TX	Right Tilted	512	1850.2	25.68	26.0	1.076	0.042	0.045
	GPRS_4TX	Left Cheek	512	1850.2	25.68	26.0	1.076	0.028	0.030
	GPRS_4TX	Left Tilted	512	1850.2	25.68	26.0	1.076	0.012	0.013

WCDMA Band 2 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
5	RMC	Right Cheek	9400	1880.0	22.94	23.0	1.014	0.196	0.199
	RMC	Right Tilted	9400	1880.0	22.94	23.0	1.014	0.102	0.103
	RMC	Left Cheek	9400	1880.0	22.94	23.0	1.014	0.116	0.118
	RMC	Left Tilted	9400	1880.0	22.94	23.0	1.014	0.095	0.096

WCDMA Band 5 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
6	RMC	Right Cheek	4132	826.4	23.34	23.5	1.038	0.280	0.291
	RMC	Right Tilted	4132	826.4	23.34	23.5	1.038	0.115	0.119
	RMC	Left Cheek	4132	826.4	23.34	23.5	1.038	0.261	0.271
	RMC	Left Tilted	4132	826.4	23.34	23.5	1.038	0.109	0.113

WLAN 2.4GHz – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
7	802.11b	Right Cheek	06	2437	15.41	15.5	1.021	0.205	0.209
	802.11b	Right Tilted	06	2437	15.41	15.5	1.021	0.103	0.105
	802.11b	Left Cheek	06	2437	15.41	15.5	1.021	0.174	0.178
	802.11b	Left Tilted	06	2437	15.41	15.5	1.021	0.112	0.114

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-worn SAR

GSM850 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
8	GSM	Back	190	836.6	32.15	32.5	1.084	0.523	0.567
	GSM	Front	190	836.6	32.15	32.5	1.084	0.479	0.519

GSM1900 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
9	GSM	Back	512	1850.2	29.68	30.0	1.076	0.401	0.432
	GSM	Front	512	1850.2	29.68	30.0	1.076	0.134	0.144

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
10	RMC 12.2k	Back Side	9400	1880.0	22.94	23.0	1.014	0.417	0.423
	RMC 12.2k	Front Face	9400	1880.0	22.94	23.0	1.014	0.227	0.230

WCDMA Band 5 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
11	RMC 12.2k	Back Side	4132	826.4	23.34	23.5	1.038	0.330	0.342
	RMC 12.2k	Front Side	4132	826.4	23.34	23.5	1.038	0.281	0.292

WLAN 2.4GHz –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
12	802.11b	Back Side	06	2437	15.41	15.5	1.021	0.166	0.169
	802.11b	Front Side	06	2437	15.41	15.5	1.021	0.078	0.080

Hotspot SAR

GSM850 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
13	GPRS_2TX	Back Side	128	824.2	31.14	31.5	1.086	0.452	0.491
	GPRS_2TX	Front Side	128	824.2	31.14	31.5	1.086	0.406	0.441
	GPRS_2TX	Right side	128	824.2	31.14	31.5	1.086	0.428	0.465
	GPRS_2TX	Bottom side	128	824.2	31.14	31.5	1.086	0.372	0.404

GSM1900 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
14	GPRS_4TX	Back Side	512	1850.2	25.68	26.0	1.076	0.226	0.243
	GPRS_4TX	Front Side	512	1850.2	25.68	26.0	1.076	0.098	0.105
	GPRS_4TX	Right side	512	1850.2	25.68	26.0	1.076	0.062	0.067
	GPRS_4TX	Bottom side	512	1850.2	25.68	26.0	1.076	0.163	0.175

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
15	RMC 12.2k	Back Side	9400	1880.0	22.94	23.0	1.014	0.417	0.423
	RMC 12.2k	Front Side	9400	1880.0	22.94	23.0	1.014	0.227	0.230
	RMC 12.2k	Right side	9400	1880.0	22.94	23.0	1.014	0.237	0.240
	RMC 12.2k	Bottom side	9400	1880.0	22.94	23.0	1.014	0.220	0.223

WCDMA Band 5 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
16	RMC 12.2k	Back Side	4132	826.4	23.34	23.5	1.038	0.330	0.342
	RMC 12.2k	Front Side	4132	826.4	23.34	23.5	1.038	0.281	0.292
	RMC 12.2k	Right side	4132	826.4	23.34	23.5	1.038	0.198	0.205
	RMC 12.2k	Bottom side	4132	826.4	23.34	23.5	1.038	0.238	0.247

WLAN 2.4GHz –Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
17	802.11b	Back Side	06	2437	15.41	15.5	1.021	0.166	0.169
	802.11b	Front Side	06	2437	15.41	15.5	1.021	0.078	0.080
	802.11b	Left side	06	2437	15.41	15.5	1.021	0.043	0.044
	802.11b	Top side	06	2437	15.41	15.5	1.021	0.088	0.090

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.

9.3 Simultaneous Multi-band Transmission SAR Analysis

List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Head SAR	Body SAR
1	GSM(Voice/Data) + WLAN(2.4G)(Data)	Yes	Yes
2	WCDMA (Voice/Data)+ (2.4G)(Data)	Yes	Yes
3	GSM(Voice/Data) + Bluetooth(Data)	Yes	Yes
4	WCDMA (Voice/Data) + Bluetooth(Data)	Yes	Yes

Remark:

1. GSM ,WCDMA and LTE share the same antenna, and cannot transmit simultaneously.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. 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.

For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 v06 as below:

Bluetooth:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	X	SAR(1g) 5mm	SAR(1g) 10mm
4.0	2.51	5/10	2.48	7.5	0.105	0.053

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

Head SAR**WWAN and WLAN**

Position	WWAN		WLAN(2.4G)	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Right Cheek	GSM	0.530	0.209	0.739
Right Tilted	GSM	0.259	0.105	0.364
Left Cheek	GSM	0.595	0.178	0.773
Left Tilted	GSM	0.339	0.114	0.453
Right Cheek	WCDMA	0.291	0.209	0.500
Right Tilted	WCDMA	0.119	0.105	0.224
Left Cheek	WCDMA	0.271	0.178	0.449
Left Tilted	WCDMA	0.113	0.114	0.227

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Right Cheek	GSM	0.530	0.105	0.635
Right Tilted	GSM	0.259	0.105	0.364
Left Cheek	GSM	0.595	0.105	0.700
Left Tilted	GSM	0.339	0.105	0.444
Right Cheek	WCDMA	0.291	0.105	0.396
Right Tilted	WCDMA	0.119	0.105	0.224
Left Cheek	WCDMA	0.271	0.105	0.376
Left Tilted	WCDMA	0.113	0.105	0.218

Body-worn SAR**WWAN and WLAN**

Position	WWAN		WLAN(2.4G)	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM	0.567	0.169	0.736
Front	GSM	0.519	0.080	0.599
Back	WCDMA	0.423	0.169	0.592
Front	WCDMA	0.292	0.080	0.372

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM	0.567	0.053	0.620
Front	GSM	0.519	0.053	0.572
Back	WCDMA	0.423	0.053	0.476
Front	WCDMA	0.292	0.053	0.345

Hotspot SAR**WWAN and WLAN**

Position	WWAN		WLAN(2.4G)	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM	0.491	0.169	0.660
Front	GSM	0.441	0.080	0.521
Right side	GSM	0.465	--	0.465
Left side	GSM	--	0.044	0.044
Top side	GSM	--	0.090	0.090
Bottom side	GSM	0.404	--	0.404
Back	WCDMA	0.423	0.169	0.592
Front	WCDMA	0.292	0.080	0.372
Right side	WCDMA	0.240	--	0.240
Left side	WCDMA	--	0.044	0.044
Top side	WCDMA	--	0.090	0.090
Bottom side	WCDMA	0.247	--	0.247

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM	0.491	0.053	0.544
Front	GSM	0.441	0.053	0.494
Right side	GSM	0.465	--	0.465
Left side	GSM	--	0.053	0.053
Top side	GSM	--	0.053	0.053
Bottom side	GSM	0.404	--	0.404
Back	WCDMA	0.423	0.053	0.476
Front	WCDMA	0.292	0.053	0.345
Right side	WCDMA	0.240	--	0.240
Left side	WCDMA	--	0.053	0.053
Top side	WCDMA	--	0.053	0.053
Bottom side	WCDMA	0.247	--	0.247

10. Measurement Uncertainty

10.1 Uncertainty for EUT SAR Test

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1_{Cp})^{1/2}$	$(1_{Cp})^{1/2}$	1.02	1.02	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$(Cp)^{1/2}$	$(Cp)^{1/2}$	1.63	1.63	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
RF ambient Conditions – Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Test Sample Related									
Test sample positioning	E.4.2	0.03	N	1	1	1	0.03	0.03	N-1
Device Holder Uncertainty	E.4.1	5.00	N	1	1	1	5.00	5.00	
Output power Variation - SAR drift measurement	E.2.9	12.02	R	$\sqrt{3}$	1	1	6.94	6.94	∞
SAR scaling	E6.5	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	1.9	R	$\sqrt{3}$	1	0.84	1.10	0.90	∞

Liquid conductivity - deviation from target value	E.3.2	5.00	R	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	∞
Liquid permittivity - deviation from target value	E.3.2	0.37	R	$\sqrt{3}$	0.6	0.49	0.13	0.10	∞
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	∞
Combined Standard Uncertainty			RSS				12.98	12.53	
Expanded Uncertainty (95% Confidence interval)			K=2				25.32	24.43	

10.2 Uncertainty for System Performance Check

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1_{-Cp})^{1/2}$	$(1_{-Cp})^{1/2}$	1.02	1.02	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$(Cp)^{1/2}$	$(Cp)^{1/2}$	1.63	1.63	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	E.2.5	0	R	$\sqrt{3}$	0	0	0.0	0.0	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
RF ambient Conditions – Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	N-1

Input power and SAR drift measurement	8,6.6.2	12.02	R	$\sqrt{3}$	1	1	6.94	6.94	∞
Deviation of experimental dipole from numerical dipole	E.6.4	5.5	R	$\sqrt{3}$	1	1	3.20	3.20	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	2.0	R	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid conductivity - deviation from target value	E.3.2	5.00	R	$\sqrt{3}$	0.64	0.43	1.85	1.24	
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	
Liquid permittivity - deviation from target value	E.3.2	0.37	R	$\sqrt{3}$	0.6	0.49	0.13	0.10	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				12.00	11.50	
Expanded Uncertainty (95% Confidence interval)			K=2				23.39	22.43	

Annex A. Plots of System Performance Check

MEASUREMENT 1

Type: Validation measurement (Fast, 75.00 %)

Measurement duration: 12 minutes 21 seconds

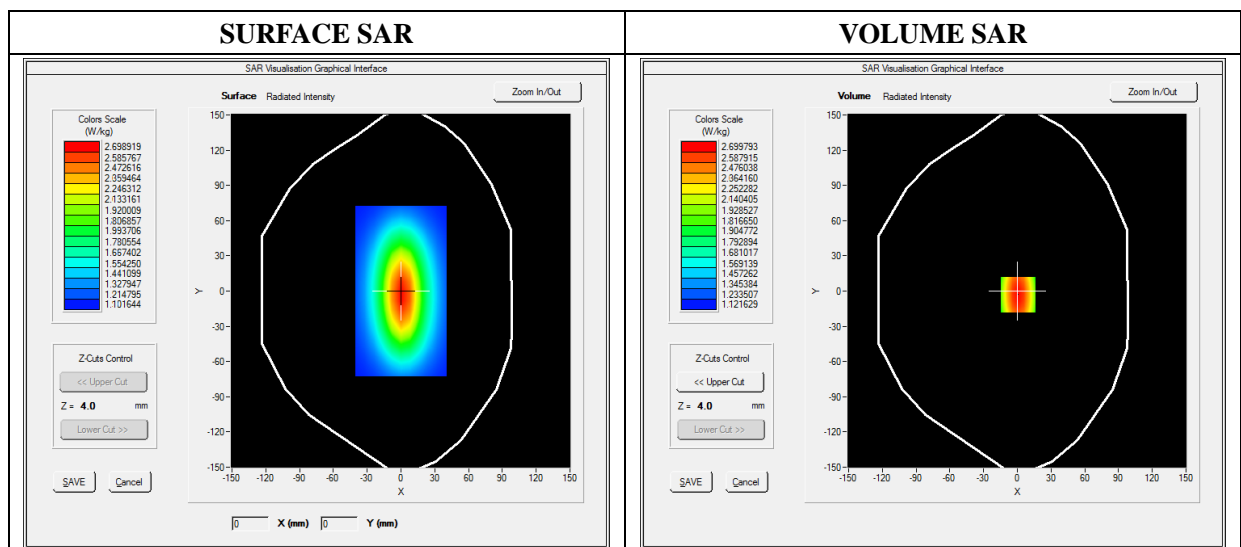
E-field Probe: SSE5 - SN 18/21 EPGO356; ConvF: 1.79; Calibrated: 2021-07-16

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative Permittivity (real part)	42.382156
Conductivity (S/m)	0.880439
Power Variation (%)	1.420000
Ambient Temperature	22.8
Liquid Temperature	22.8

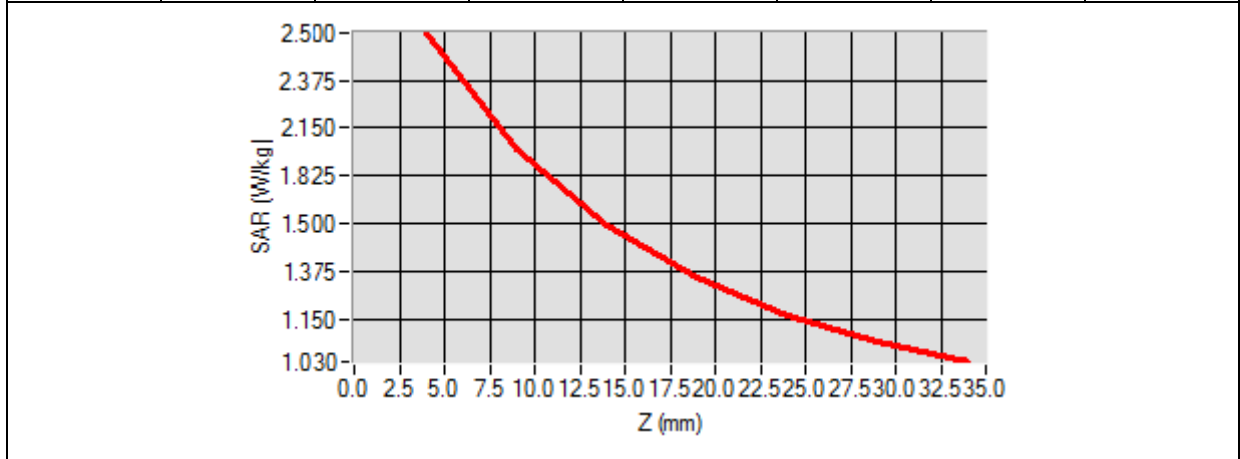


Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.581074
SAR 1g (W/Kg)	2.470352

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.4900	1.8942	1.4811	1.3541	1.1123	1.0539



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, L-shaped device. A rectangular area on the top surface is overlaid with a color-coded heatmap, showing a central red/orange region (high SAR) transitioning to yellow, green, and blue (lower SAR) towards the edges.</p>	<p>A 2D vertical heatmap showing a central, vertically-oriented oval-shaped hot spot. The color gradient transitions from red/orange in the center to yellow, then green, and finally blue at the outer edges, representing the spatial distribution of SAR.</p>

MEASUREMENT 2

Type: Validation measurement (Fast, 75.00 %)

Measurement duration: 12 minutes 21 seconds

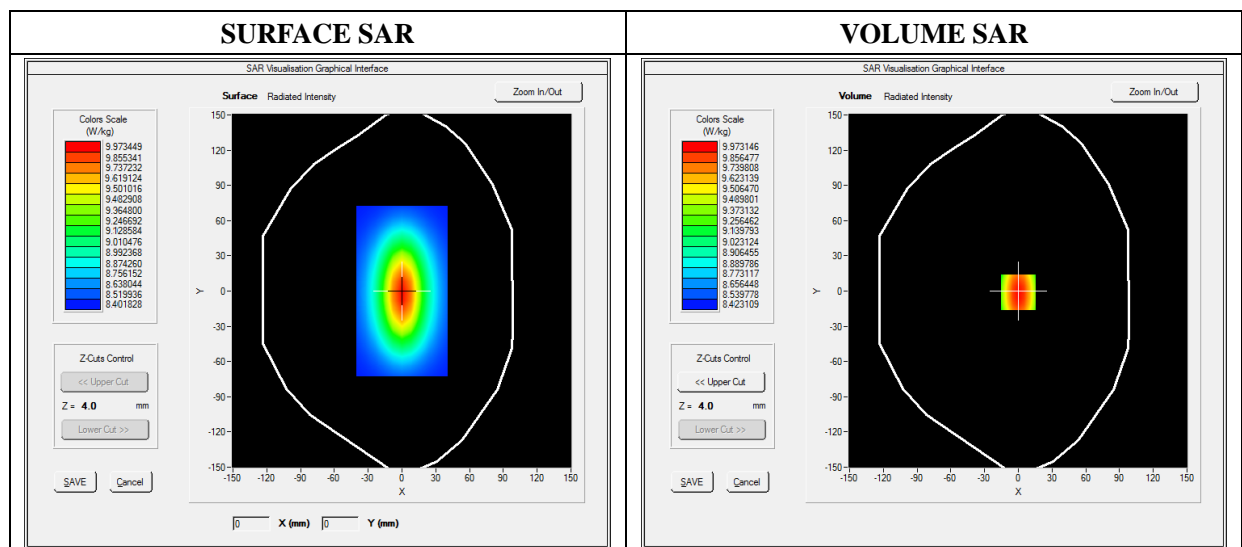
E-field Probe: SSE5 - SN 18/21 EPGO356; ConvF: 2.31; Calibrated: 2021-07-16

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative Permittivity (real part)	40.764379
Conductivity (S/m)	1.413746
Power Variation (%)	-1.710000
Ambient Temperature	22.5
Liquid Temperature	22.5

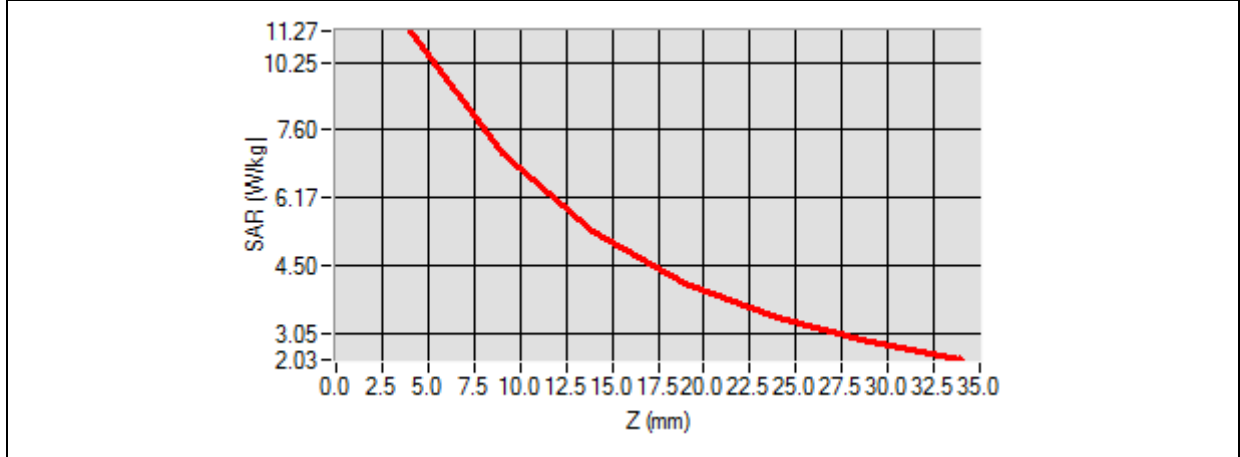


Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.281504
SAR 1g (W/Kg)	9.970523

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.3455	7.1125	5.1026	3.425	3.0242	2.1125



3D screen shot	Hot spot position

MEASUREMENT 3

Type: Validation measurement (Fast, 75.00 %)

Measurement duration: 12 minutes 21 seconds

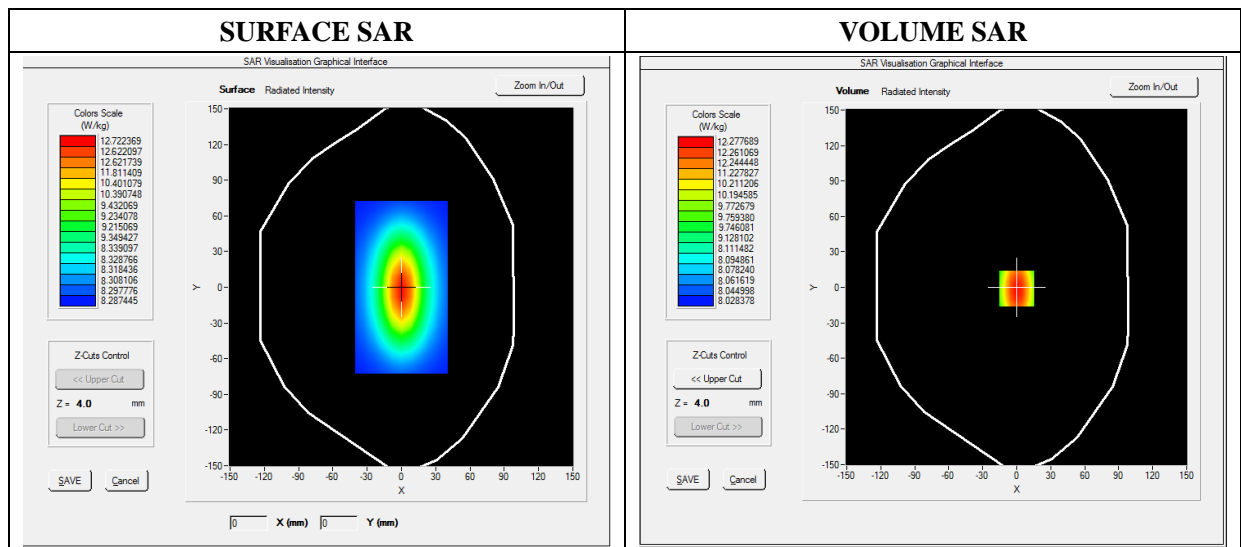
E-field Probe: SSE5 - SN 18/21 EPGO356; ConvF: 2.62; Calibrated: 2021-07-16

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Zoom Scan	dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative Permittivity (real part)	39.850317
Conductivity (S/m)	1.783504
Power Variation (%)	-1.220000
Ambient Temperature	22.3
Liquid Temperature	22.3

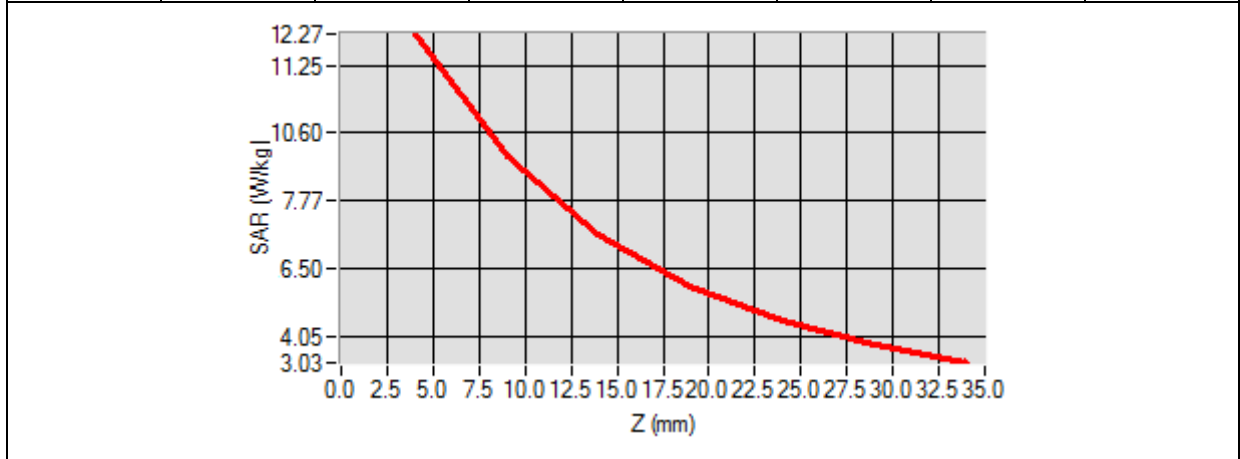


Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	6.053726
SAR 1g (W/Kg)	13.561382

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	12.2365	10.3321	8.4512	6.4365	5.6123	3.5621



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, L-shaped device. A color-coded heatmap is overlaid on the device's surface, showing a central red/orange area (high SAR) that transitions through yellow and green to blue (low SAR) towards the edges.</p>	<p>A 2D color-coded heatmap showing a vertical oval shape. The center is red, indicating the highest SAR value, surrounded by concentric rings of yellow, green, and blue, representing decreasing SAR levels.</p>

Annex B. Plots of SAR Measurement

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

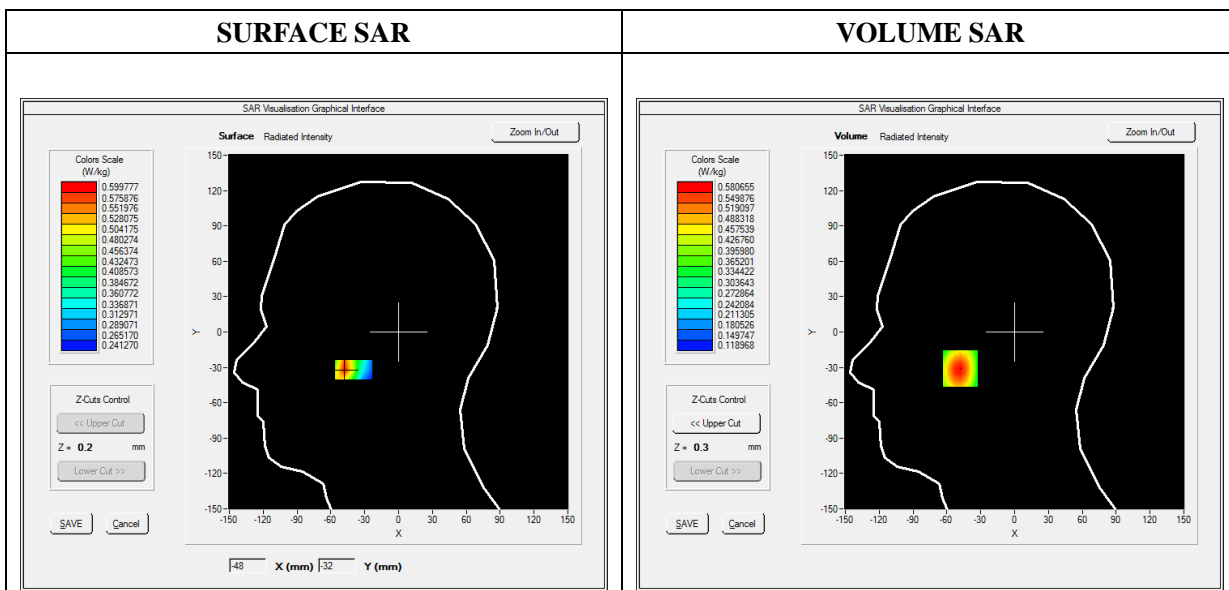
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

Frequency (MHz)	836.600000
Relative Permittivity (real part)	42.380415
Conductivity (S/m)	0.884808
Power Variation (%)	-0.640000
Ambient Temperature	22.8
Liquid Temperature	22.8

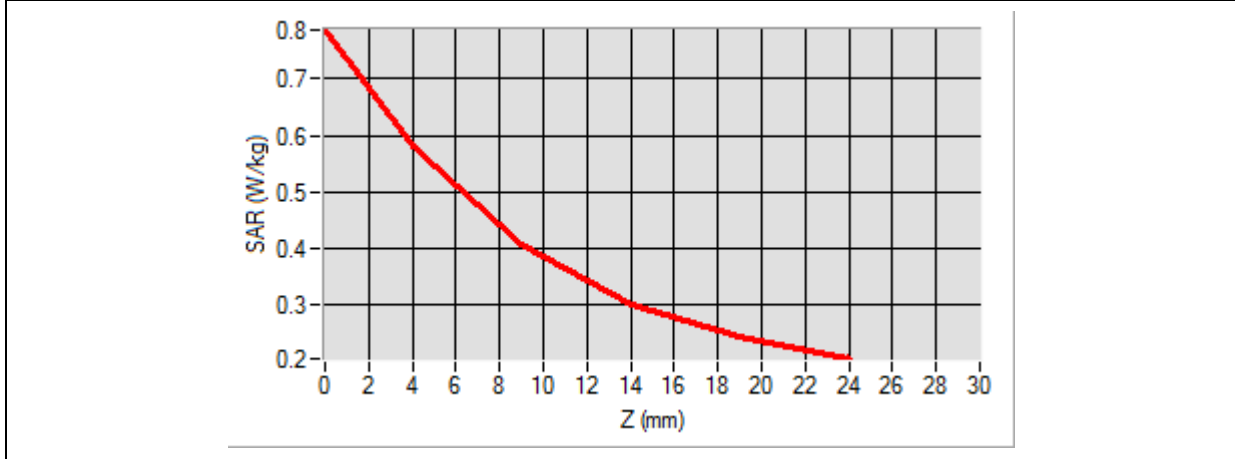


Maximum location: X=-48.00, Y=-31.00

SAR Peak: 0.79 W/kg

SAR 10g (W/Kg)	0.384017
SAR 1g (W/Kg)	0.549278

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.7870	0.5807	0.4060	0.3016	0.2426



3D screen shot	Hot spot position
<p>A 3D perspective view of a head model. A grid of blue dots is overlaid on the face area. A small rectangular region in the center of the face is highlighted with a color gradient from yellow to red, indicating the location of the maximum SAR (hot spot).</p>	<p>A small, rectangular icon with a color gradient from yellow to red, representing the hot spot position. It is oriented vertically and slightly tilted.</p>

MEASUREMENT 2

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

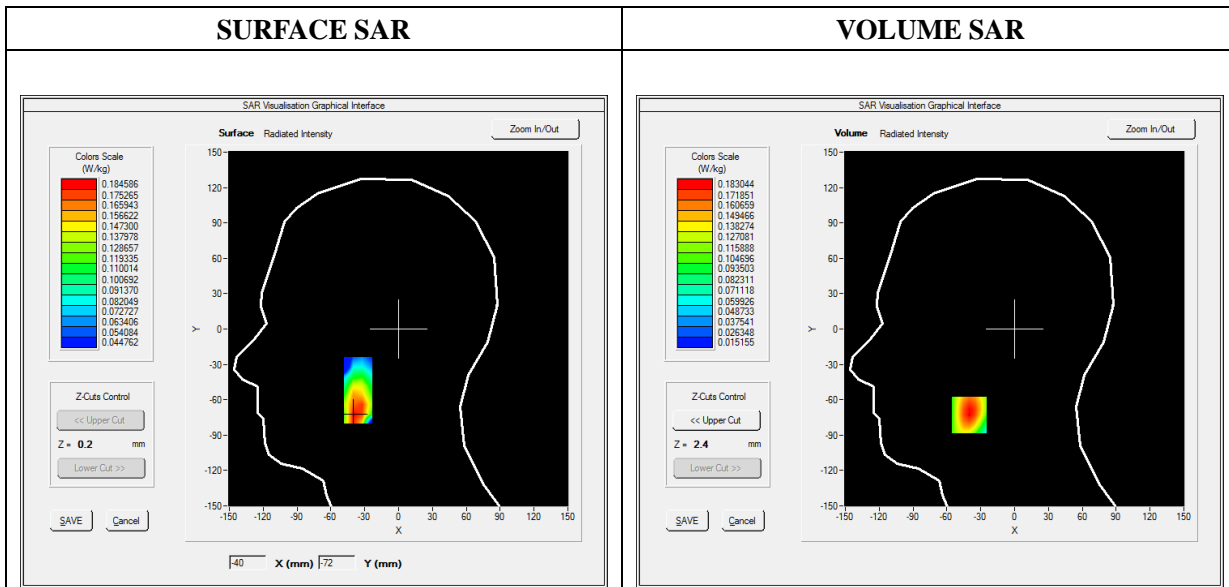
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

Frequency (MHz)	1850.200000
Relative Permittivity (real part)	40.761854
Conductivity (S/m)	1.414017
Power Variation (%)	-0.520000
Ambient Temperature	22.5
Liquid Temperature	22.5

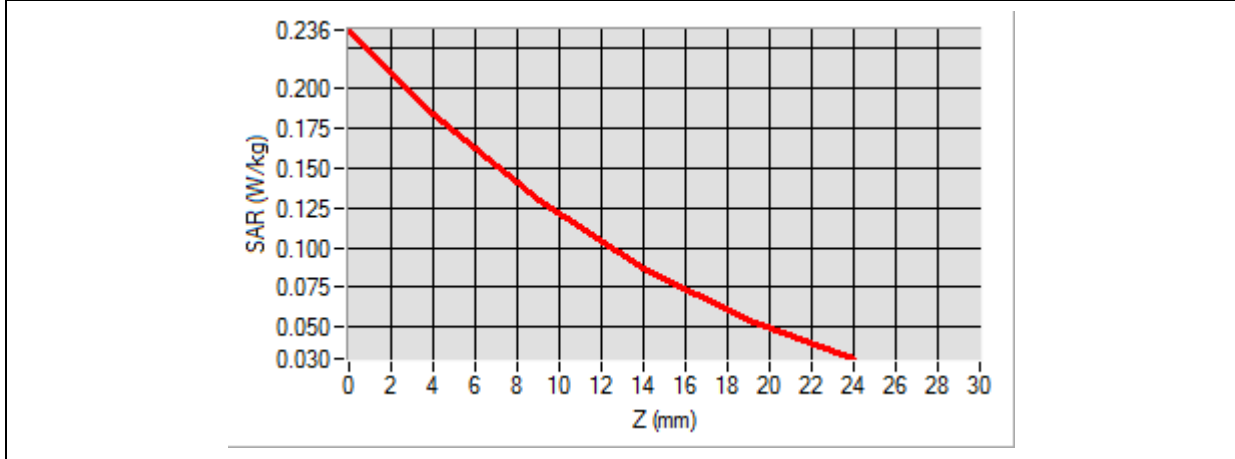


Maximum location: X=-38.00, Y=-73.00

SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.107966
SAR 1g (W/Kg)	0.171835

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2361	0.1830	0.1290	0.0868	0.0545



3D screen shot	Hot spot position

MEASUREMENT 3

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

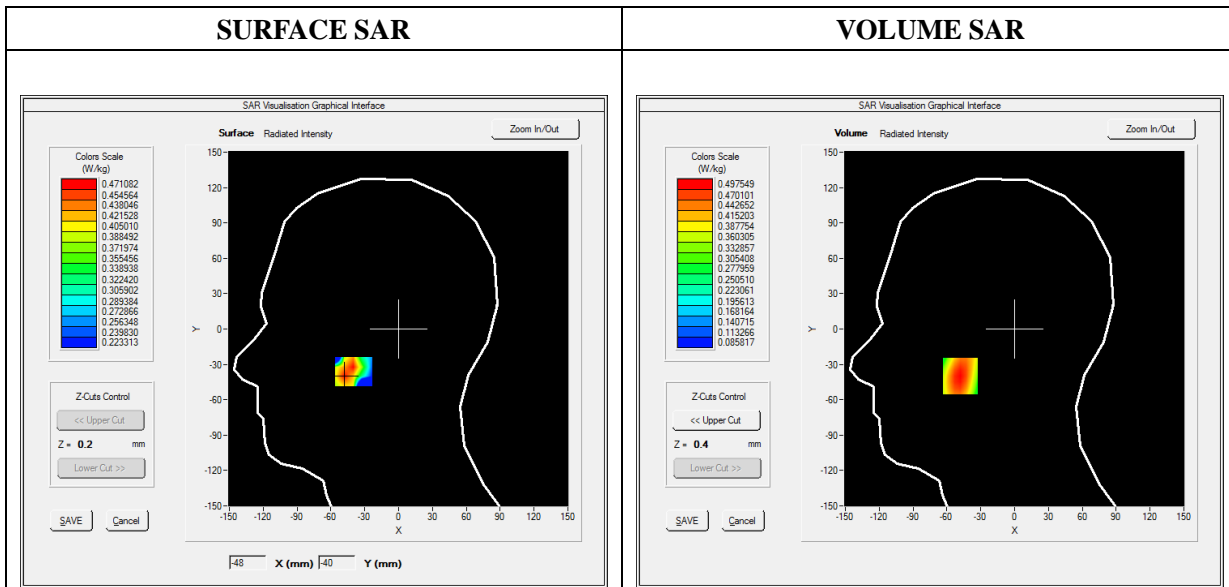
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GPRS850_2TX
Channels	Low
Signal	Duty Cycle: 1:4

B. SAR Measurement Results

Frequency (MHz)	824.200000
Relative Permittivity (real part)	42.380245
Conductivity (S/m)	0.881245
Power Variation (%)	1.536272
Ambient Temperature	21.1
Liquid Temperature	21.3

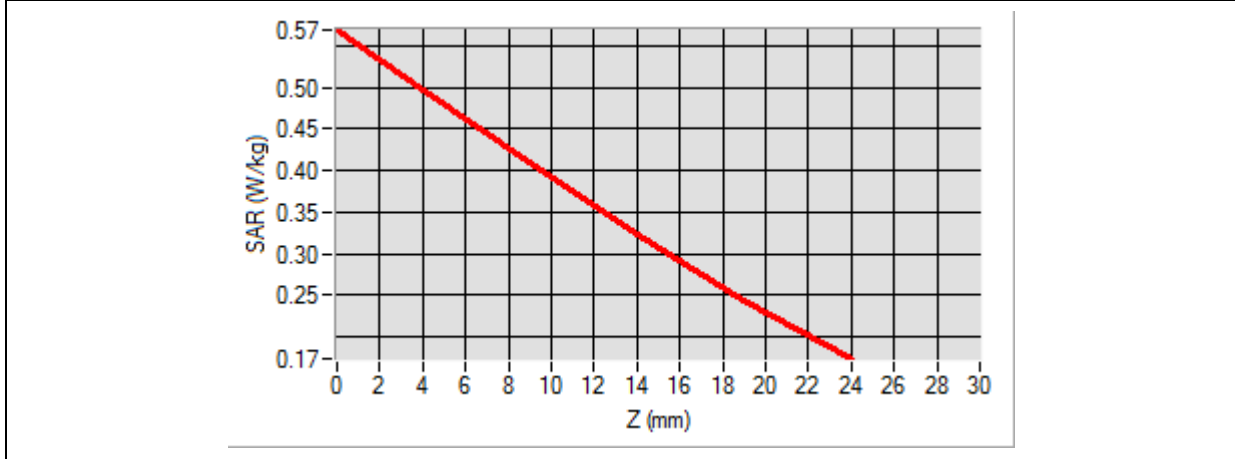


Maximum location: X=-48.00, Y=-40.00

SAR Peak: 0.60 W/kg

SAR 10g (W/Kg)	0.350573
SAR 1g (W/Kg)	0.474498

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.5694	0.4975	0.4089	0.3234	0.2437



3D screen shot	Hot spot position

MEASUREMENT 4

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

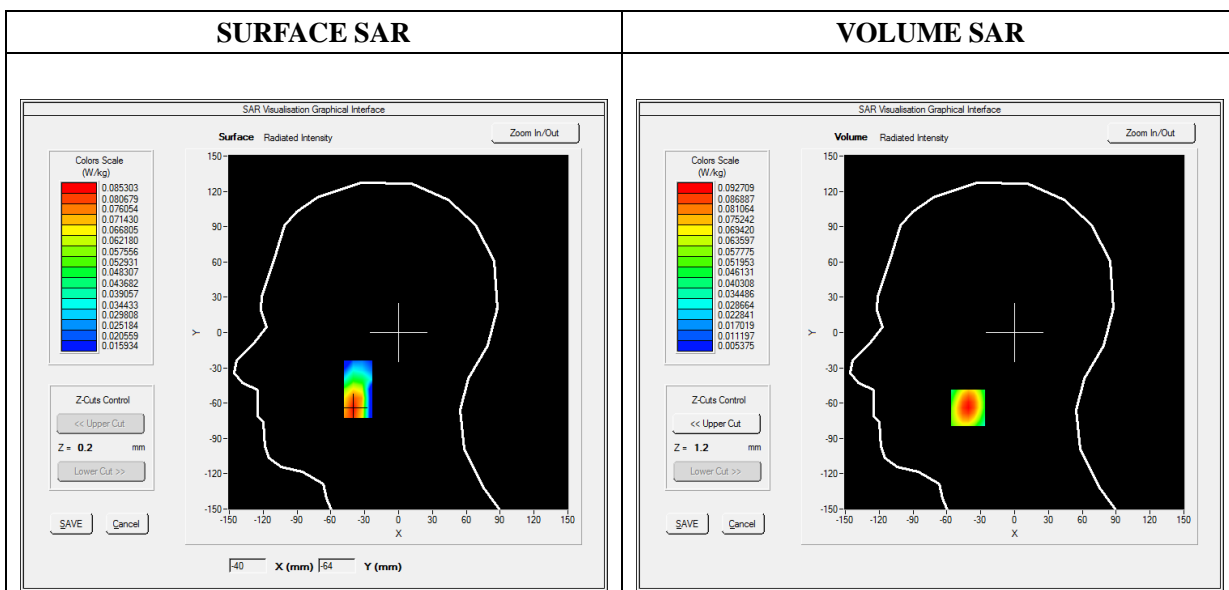
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GPRS1900_4TX
Channels	Low
Signal	Duty Cycle: 1:2

B. SAR Measurement Results

Frequency (MHz)	1850.200000
Relative Permittivity (real part)	40.760124
Conductivity (S/m)	1.410369
Power Variation (%)	1.536272
Ambient Temperature	21.1
Liquid Temperature	21.3

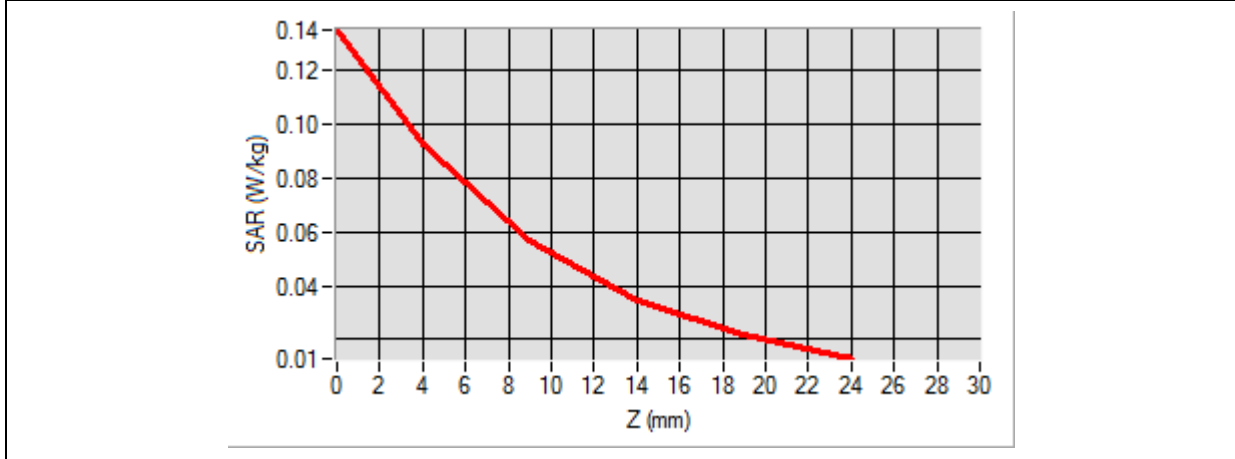


Maximum location: X=-40.00, Y=-64.00

SAR Peak: 0.14 W/kg

SAR 10g (W/Kg)	0.050898
SAR 1g (W/Kg)	0.086087

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1352	0.0927	0.0569	0.0348	0.0216



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, cup-like device. A grid of small blue dots is overlaid on the inner surface. A localized area of high SAR is highlighted with a color gradient from yellow to red, indicating the hot spot.</p>	<p>A small, isolated 3D model of the hot spot area, showing a color gradient from green at the edges to red in the center, representing the peak SAR location.</p>

MEASUREMENT 5

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

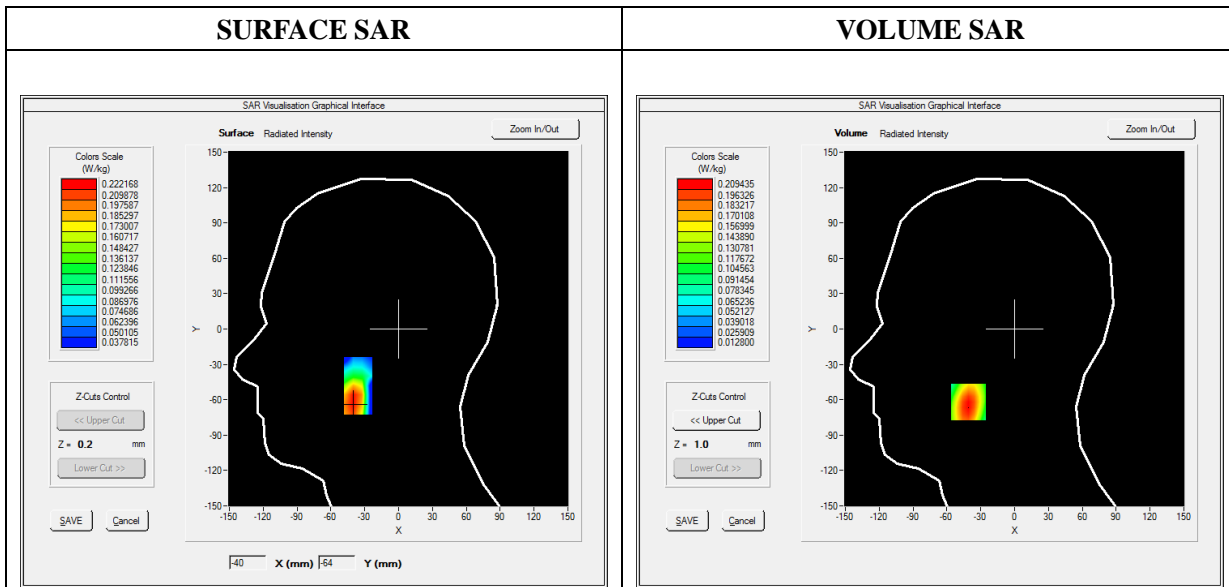
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Right head
Device Position	Cheek
Band	WCDMA1900_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative Permittivity (real part)	40.761854
Conductivity (S/m)	1.414017
Power Variation (%)	-1.400000
Ambient Temperature	22.5
Liquid Temperature	22.5

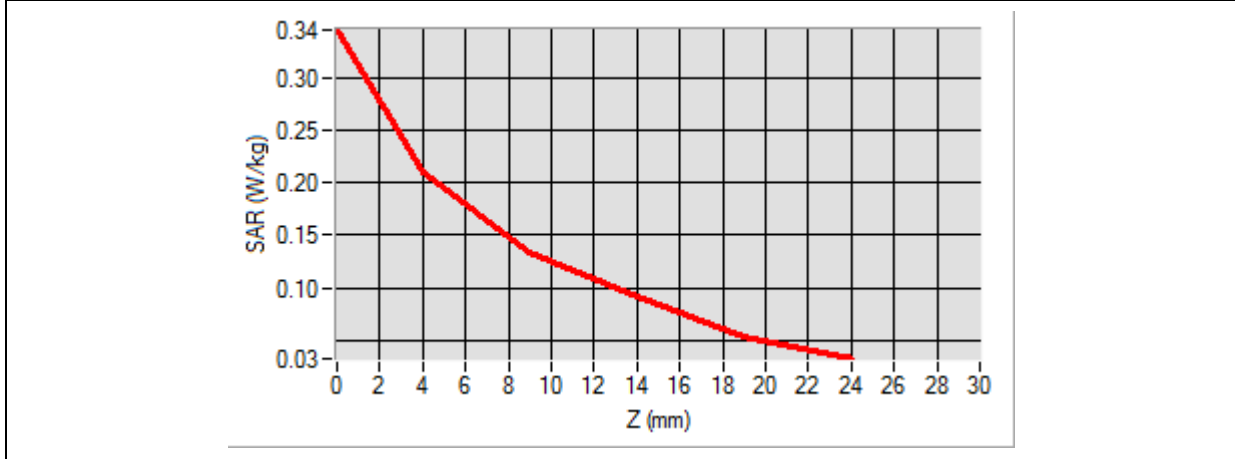


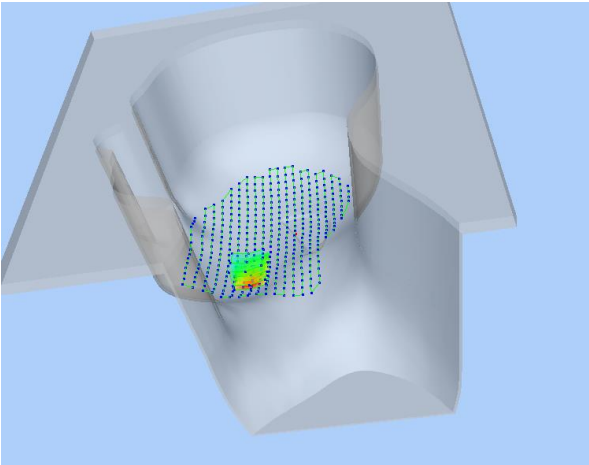
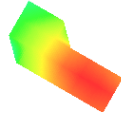
Maximum location: X=-40.00, Y=-62.00

SAR Peak: 0.29 W/kg

SAR 10g (W/Kg)	0.121014
SAR 1g (W/Kg)	0.195835

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3448	0.2094	0.1332	0.0914	0.0532



3D screen shot	Hot spot position
	

MEASUREMENT 6

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

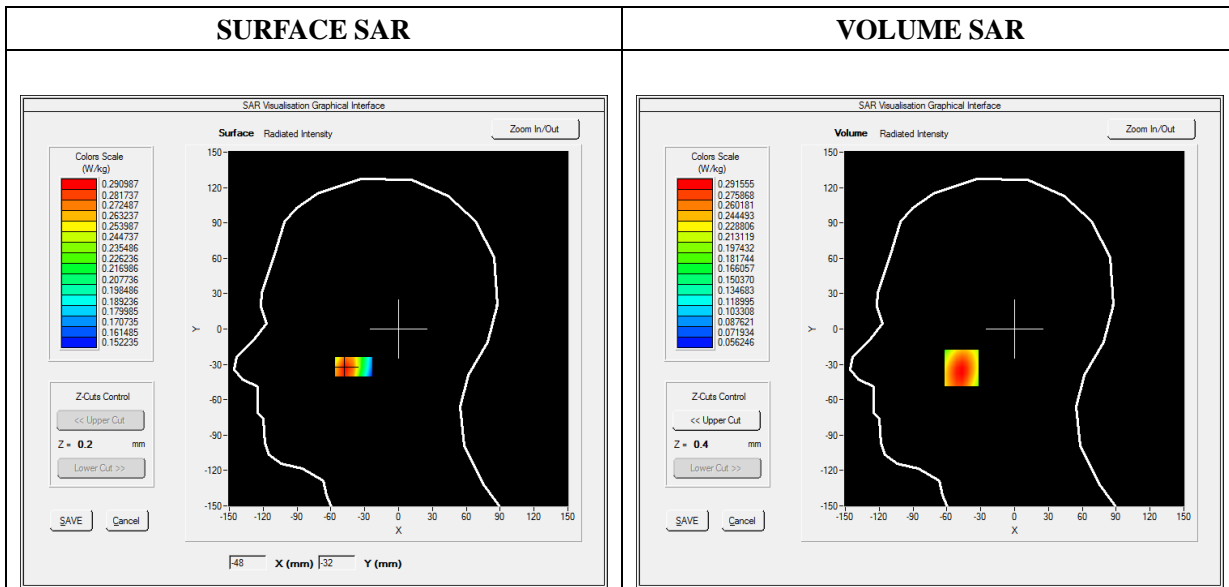
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Right head
Device Position	Cheek
Band	WCDMA850_RMC
Channels	Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	826.400000
Relative Permittivity (real part)	42.380328
Conductivity (S/m)	0.885216
Power Variation (%)	-1.350000
Ambient Temperature	22.8
Liquid Temperature	22.8

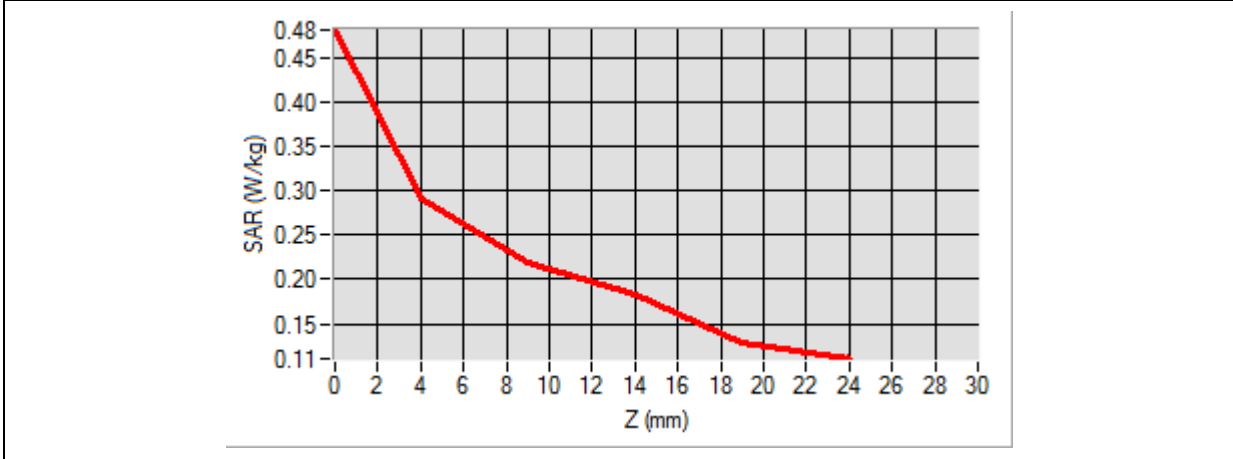


Maximum location: X=-47.00, Y=-33.00

SAR Peak: 0.35 W/kg

SAR 10g (W/Kg)	0.209047
SAR 1g (W/Kg)	0.279724

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4805	0.2916	0.2197	0.1838	0.1295



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, bowl-shaped device. A grid of blue dots is overlaid on the inner surface. A small rectangular area in the center of the grid is highlighted with a color gradient from yellow to red, indicating the hot spot position.</p>	<p>A small, rectangular area with a color gradient from yellow to red, representing the hot spot position.</p>

MEASUREMENT 7

Type: Phone measurement (Complete)

Date of measurement: 2021-11-18

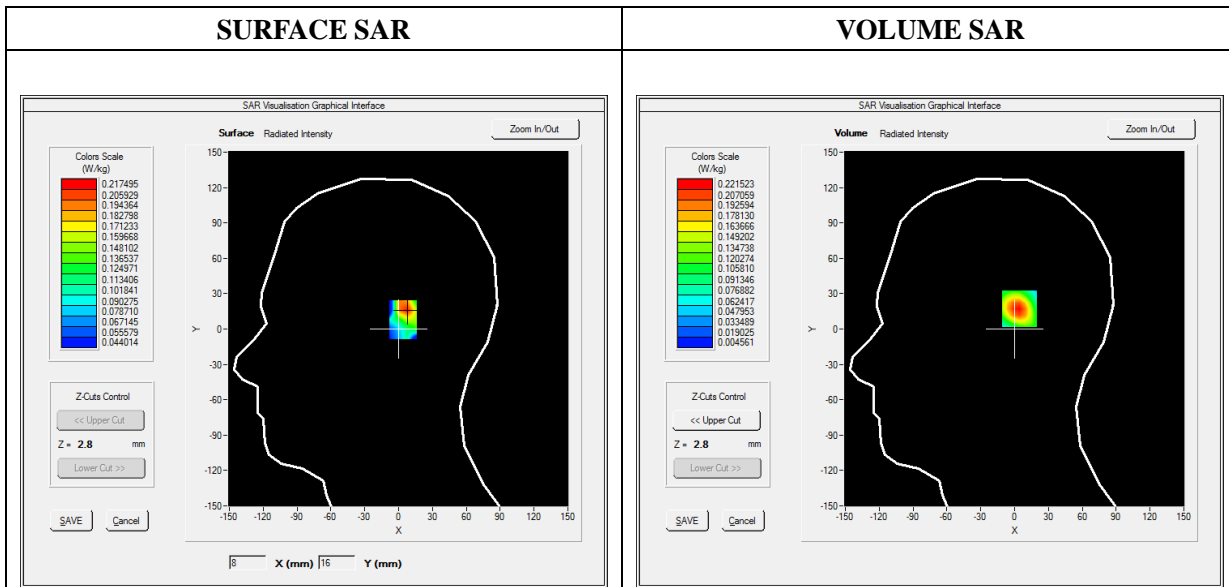
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Right head
Device Position	Cheek
Band	WiFi_802.11b
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative Permittivity (real part)	39.850212
Conductivity (S/m)	1.781248
Power Variation (%)	-1.760000
Ambient Temperature	22.3
Liquid Temperature	22.3

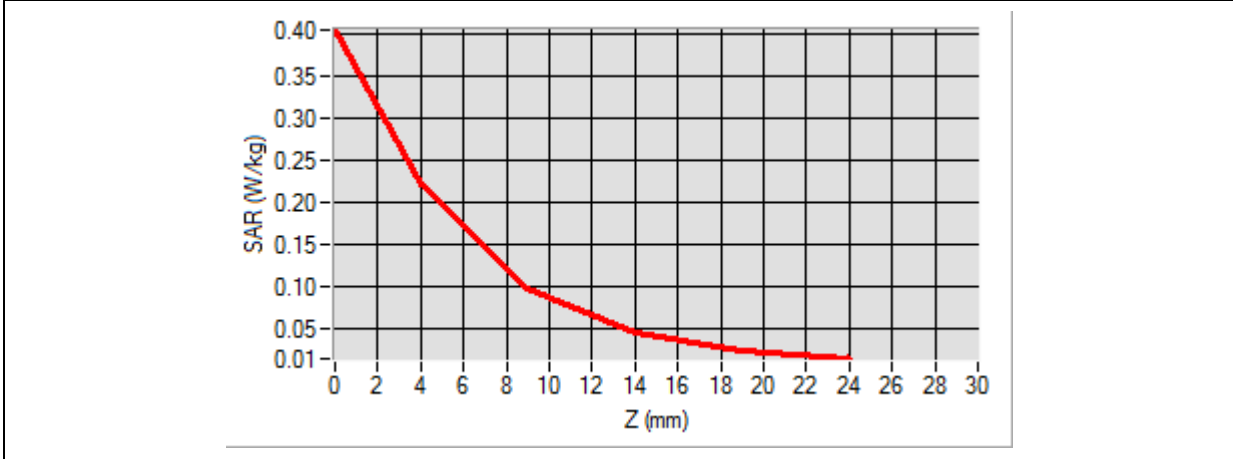


Maximum location: X=7.00, Y=17.00

SAR Peak: 0.40 W/kg

SAR 10g (W/Kg)	0.100285
SAR 1g (W/Kg)	0.205228

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4046	0.2215	0.0974	0.0431	0.0223



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, cup-like device. A grid of blue dots is overlaid on the inner surface. A small, irregularly shaped area in the center of the grid is highlighted with a color gradient from yellow to red, indicating the location of the maximum SAR (hot spot).</p>	<p>A small, isolated 3D model of the hot spot area, showing its irregular shape and color gradient from red (highest SAR) to green (lower SAR).</p>

MEASUREMENT 8

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

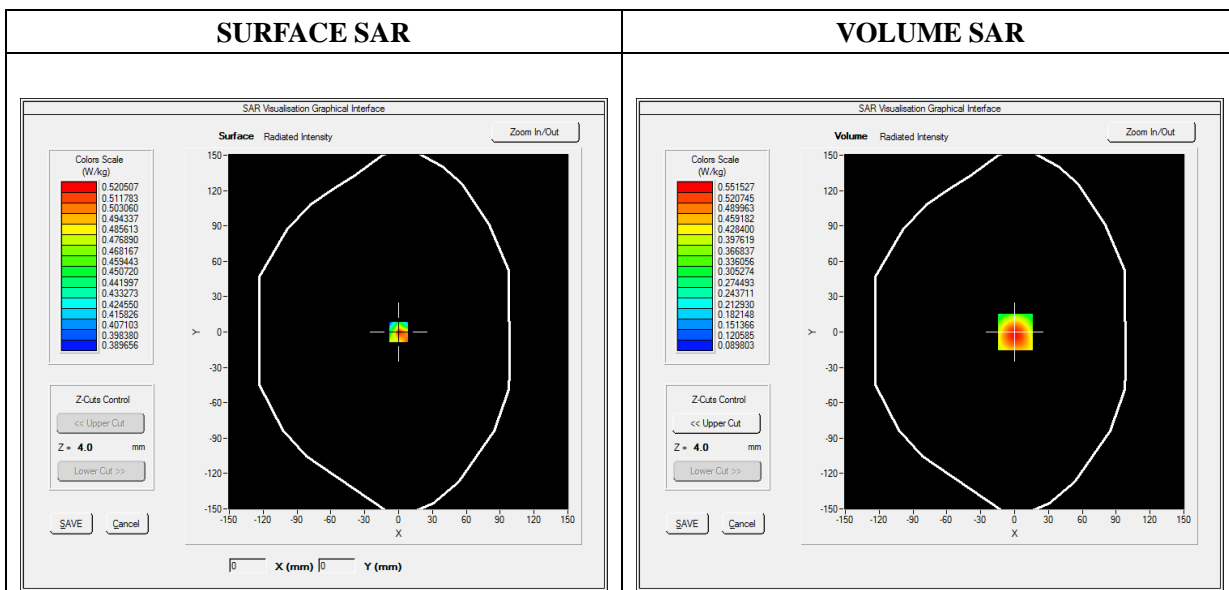
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

Frequency (MHz)	836.600000
Relative Permittivity (real part)	42.380415
Conductivity (S/m)	0.884808
Power Variation (%)	1.260000
Ambient Temperature	22.8
Liquid Temperature	22.8

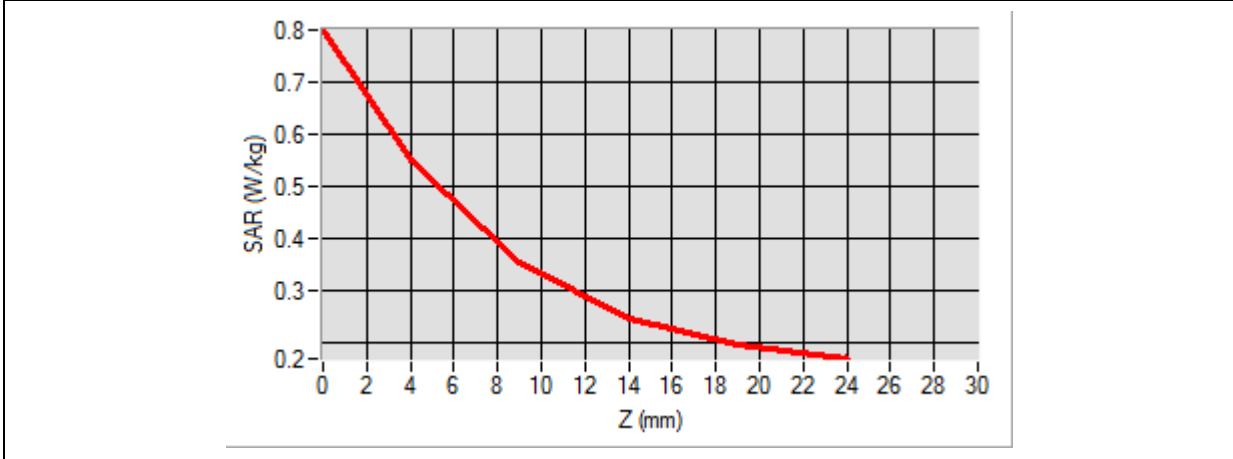


Maximum location: X=1.00, Y=0.00

SAR Peak: 0.80 W/kg

SAR 10g (W/Kg)	0.349730
SAR 1g (W/Kg)	0.523243

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8006	0.5515	0.3547	0.2488	0.1982



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey device with a grid of green dots on its surface. A small, multi-colored (yellow, orange, red) hot spot is visible on the grid, indicating the location of maximum SAR exposure.</p>	<p>A 2D square heatmap with a color gradient from red (high intensity) to orange (medium intensity), representing the spatial distribution of the hot spot.</p>

MEASUREMENT 9

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

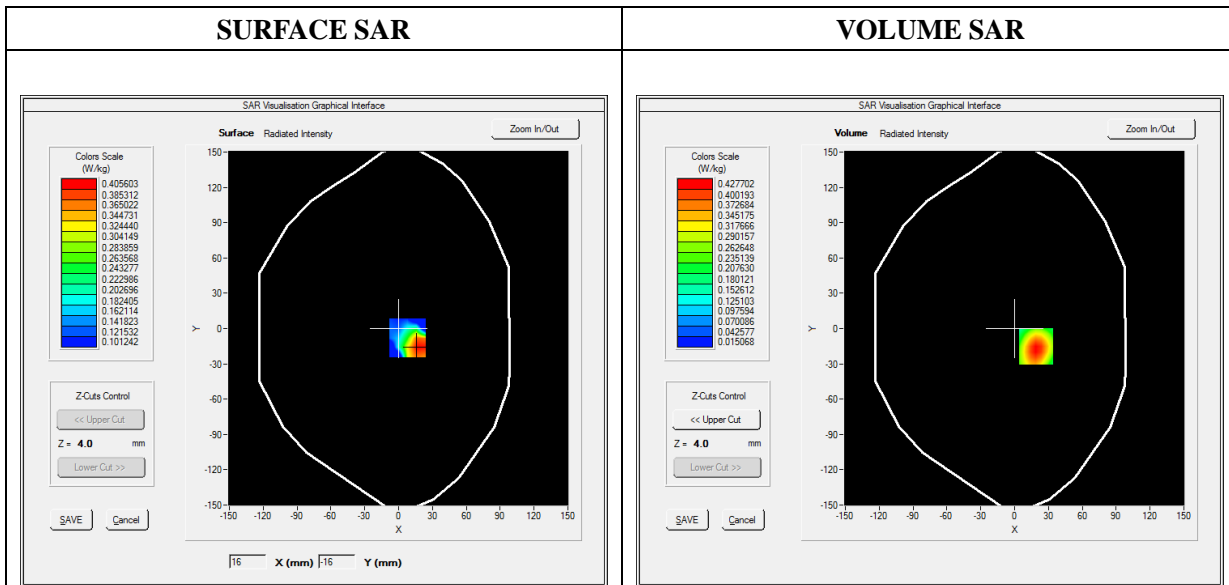
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	GSM1900
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

Frequency (MHz)	1850.200000
Relative Permittivity (real part)	40.761854
Conductivity (S/m)	1.414017
Power Variation (%)	0.430000
Ambient Temperature	22.5
Liquid Temperature	22.5

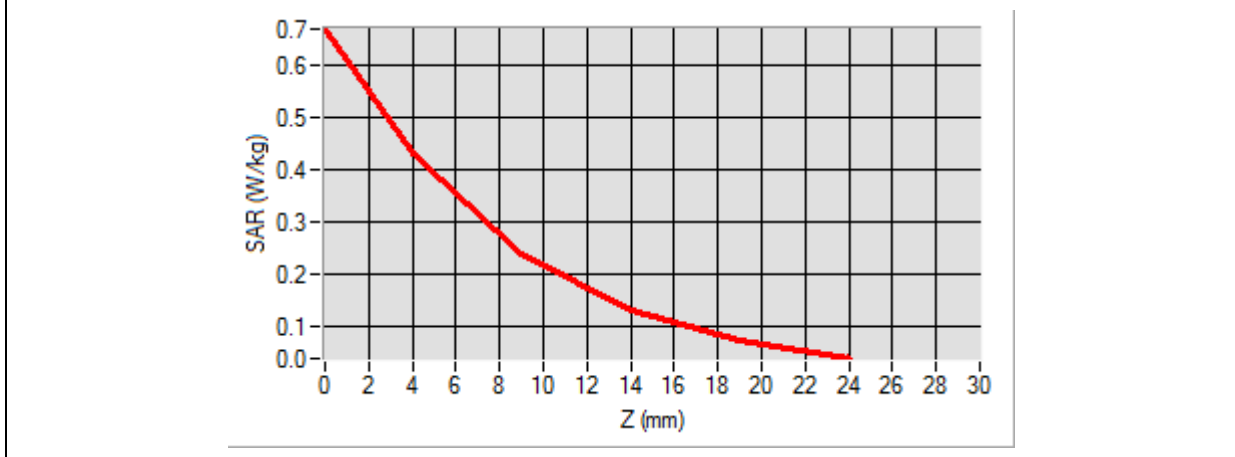


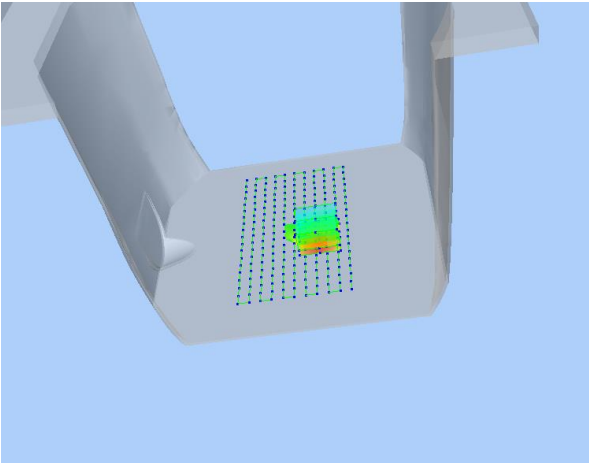
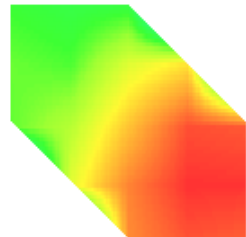
Maximum location: X=19.00, Y=-15.00

SAR Peak: 0.67 W/kg

SAR 10g (W/Kg)	0.222791
SAR 1g (W/Kg)	0.401127

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.6673	0.4277	0.2376	0.1306	0.0730



3D screen shot	Hot spot position
 <p>A 3D perspective view of a grey device. A grid of small blue dots is overlaid on the device's surface. A small rectangular area on the grid is highlighted with a color gradient from green to red, indicating the hot spot location.</p>	 <p>A 2D color-coded diagram of the hot spot. It shows a rectangular area with a color gradient from green (low SAR) to red (high SAR), indicating the spatial distribution of the maximum SAR value.</p>

MEASUREMENT 10/15

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

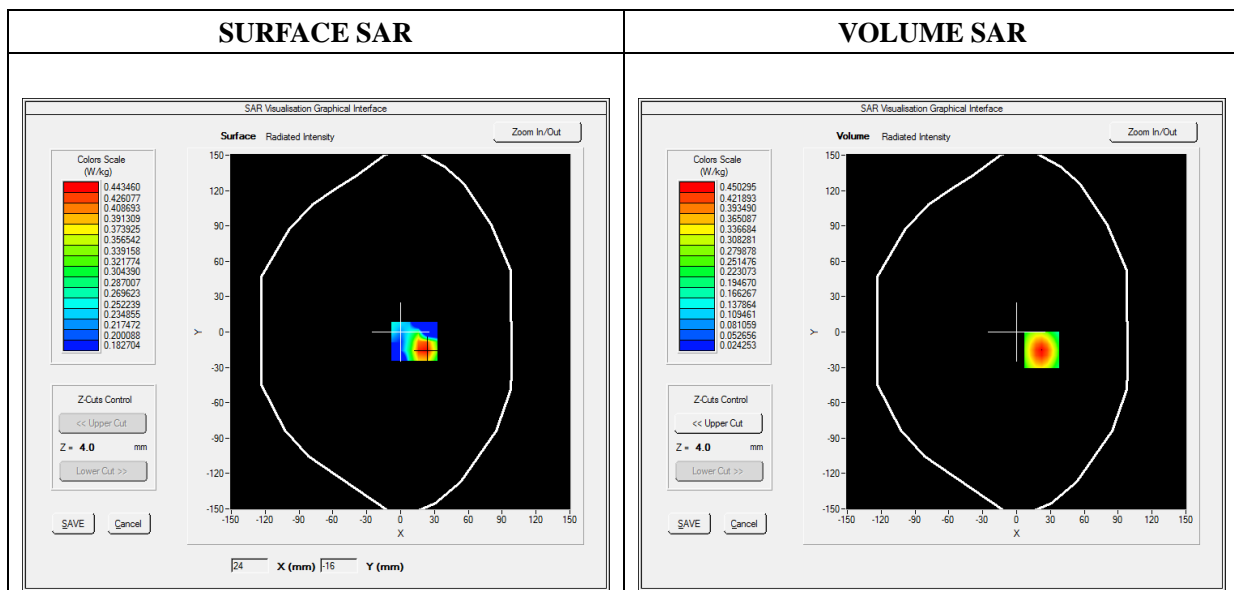
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	WCDMA1900_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative Permittivity (real part)	40.761854
Conductivity (S/m)	1.414017
Power Variation (%)	-0.710000
Ambient Temperature	22.5
Liquid Temperature	22.5

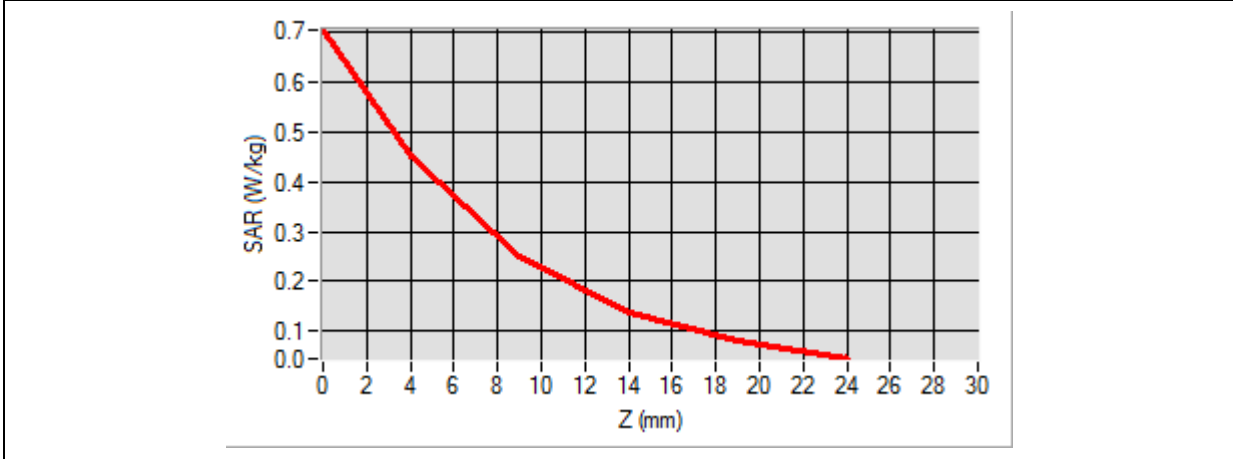


Maximum location: X=22.00, Y=-15.00

SAR Peak: 0.71 W/kg

SAR 10g (W/Kg)	0.231972
SAR 1g (W/Kg)	0.417469

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.7060	0.4503	0.2495	0.1383	0.0795



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey device with a grid of green dots on its surface. A small, localized area of high SAR is highlighted in yellow and red, indicating the hot spot position.</p>	<p>A 2D heatmap showing the spatial distribution of SAR. The highest intensity (red) is concentrated in a specific region, corresponding to the hot spot position.</p>

MEASUREMENT 11/16

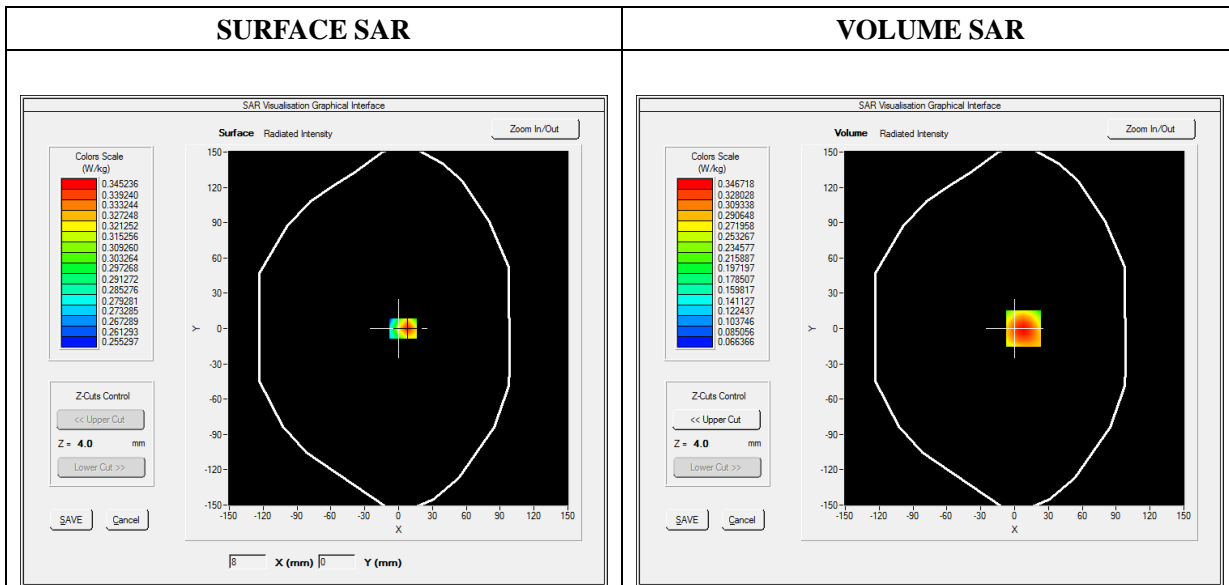
Type: Phone measurement (Complete)
 Date of measurement: 2021-11-19
 Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	WCDMA850_RMC
Channels	Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	826.400000
Relative Permittivity (real part)	42.380328
Conductivity (S/m)	0.875216
Power Variation (%)	-1.540000
Ambient Temperature	22.8
Liquid Temperature	22.8

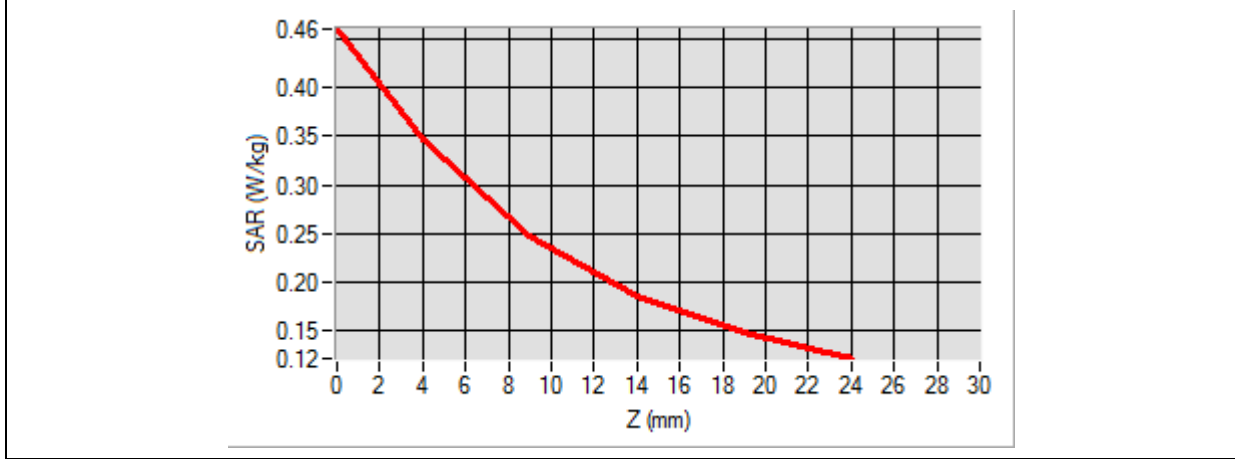


Maximum location: X=8.00, Y=0.00

SAR Peak: 0.46 W/kg

SAR 10g (W/Kg)	0.234368
SAR 1g (W/Kg)	0.330007

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4601	0.3467	0.2479	0.1859	0.1483



3D screen shot	Hot spot position

MEASUREMENT 12/17

Type: Phone measurement (Complete)

Date of measurement: 2021-11-18

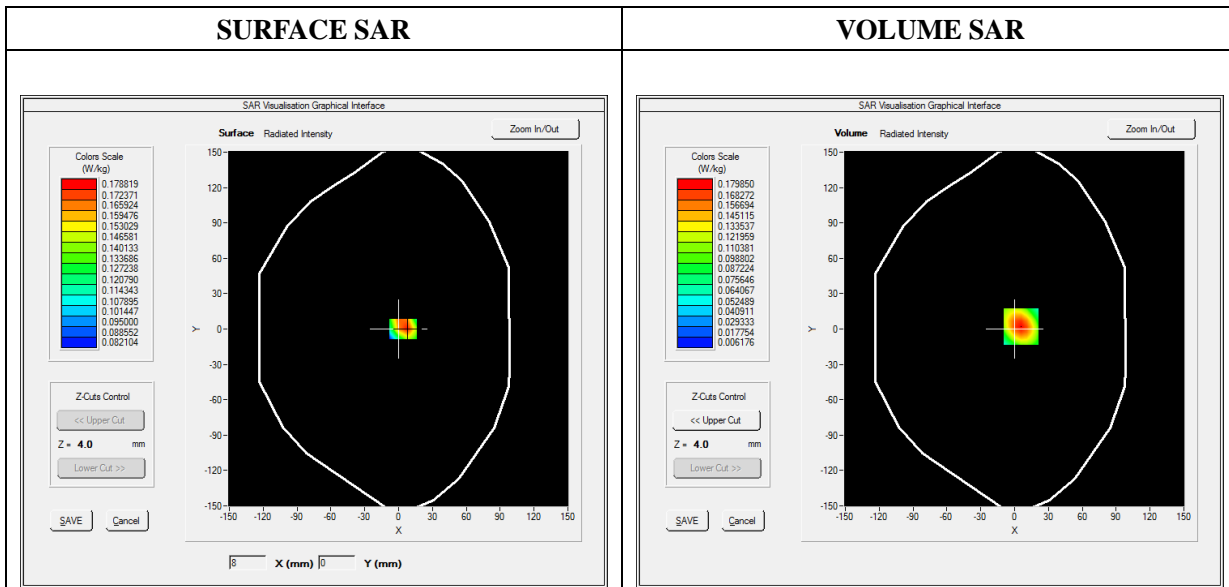
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	WiFi_802.11b
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative Permittivity (real part)	39.850212
Conductivity (S/m)	1.781248
Power Variation (%)	-1.980000
Ambient Temperature	22.3
Liquid Temperature	22.3

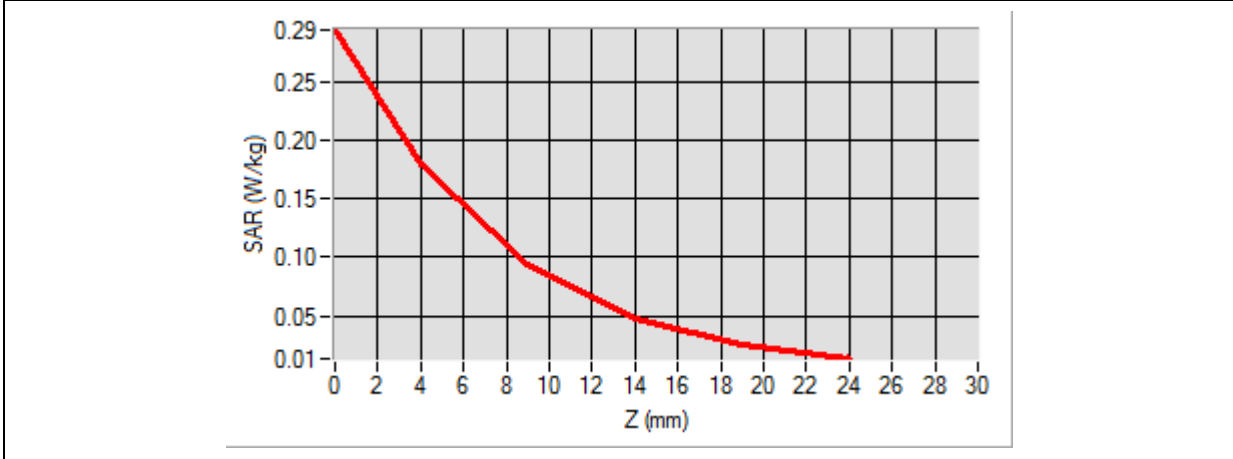


Maximum location: X=6.00, Y=2.00

SAR Peak: 0.29 W/kg

SAR 10g (W/Kg)	0.087721
SAR 1g (W/Kg)	0.166199

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2937	0.1799	0.0936	0.0482	0.0259



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey mobile phone. A grid of small blue dots is overlaid on the back cover, representing the measurement points for SAR analysis. A small green and yellow hot spot is visible on the grid.</p>	<p>A 2D color-coded heatmap representing the SAR hot spot position. The color transitions from yellow at the edges to a bright red in the center, indicating the area of maximum SAR exposure.</p>

MEASUREMENT 13

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

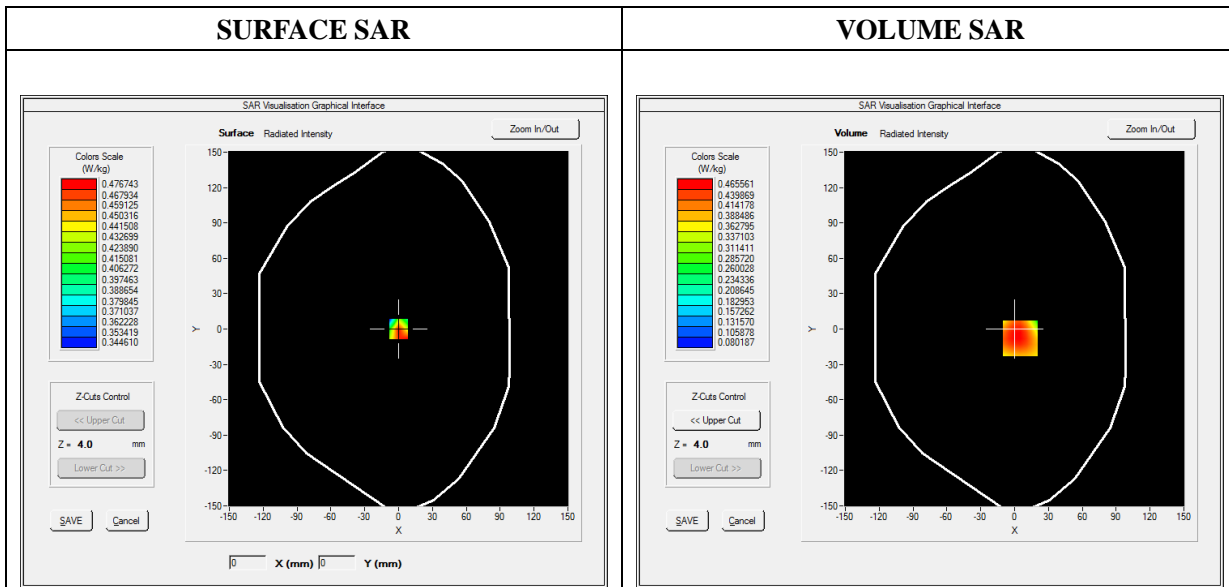
Measurement duration: 12 minutes 3 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	GPRS850_2TX
Channels	Low
Signal	Duty Cycle 1:4

B. SAR Measurement Results

Frequency (MHz)	824.200000
Relative Permittivity (real part)	42.380328
Conductivity (S/m)	0.885216
Power Variation (%)	-1.910000
Ambient Temperature	22.8
Liquid Temperature	22.8

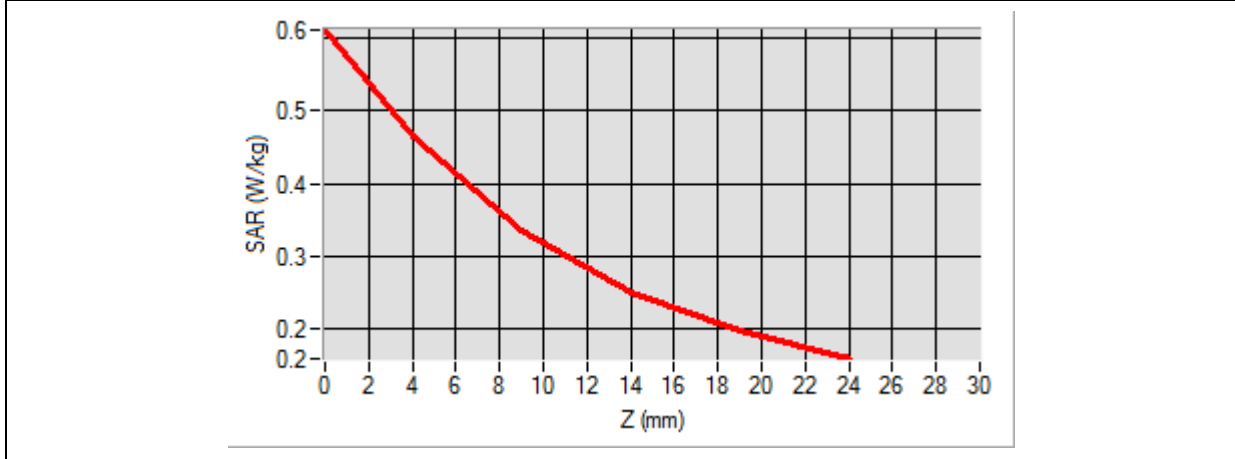


Maximum location: X=5.00, Y=-8.00

SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.317712
SAR 1g (W/Kg)	0.451949

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.6116	0.4656	0.3358	0.2516	0.1981



3D screen shot	Hot spot position

MEASUREMENT 14

Type: Phone measurement (Complete)

Date of measurement: 2021-11-19

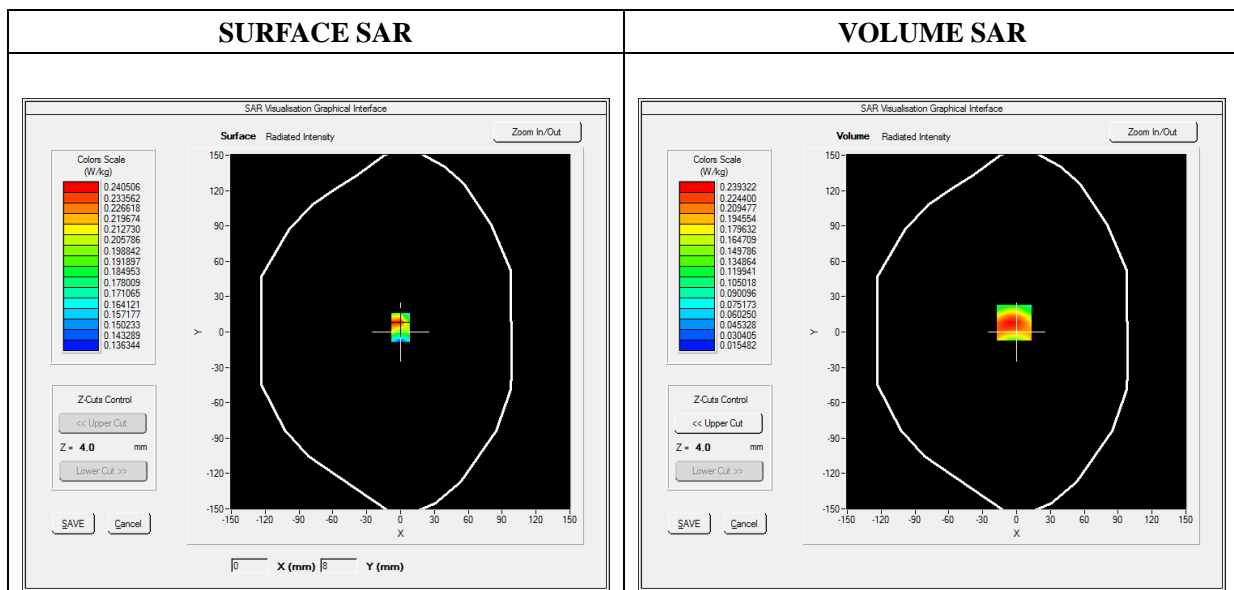
Measurement duration: 12 minutes 21 seconds

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Flat plane
Device Position	Back
Band	GPRS1900_4TX
Channels	Low
Signal	Duty Cycle 1:2.66

B. SAR Measurement Results

Frequency (MHz)	1850.200000
Relative Permittivity (real part)	40.761854
Conductivity (S/m)	1.414017
Power Variation (%)	-1.210000
Ambient Temperature	22.5
Liquid Temperature	22.5

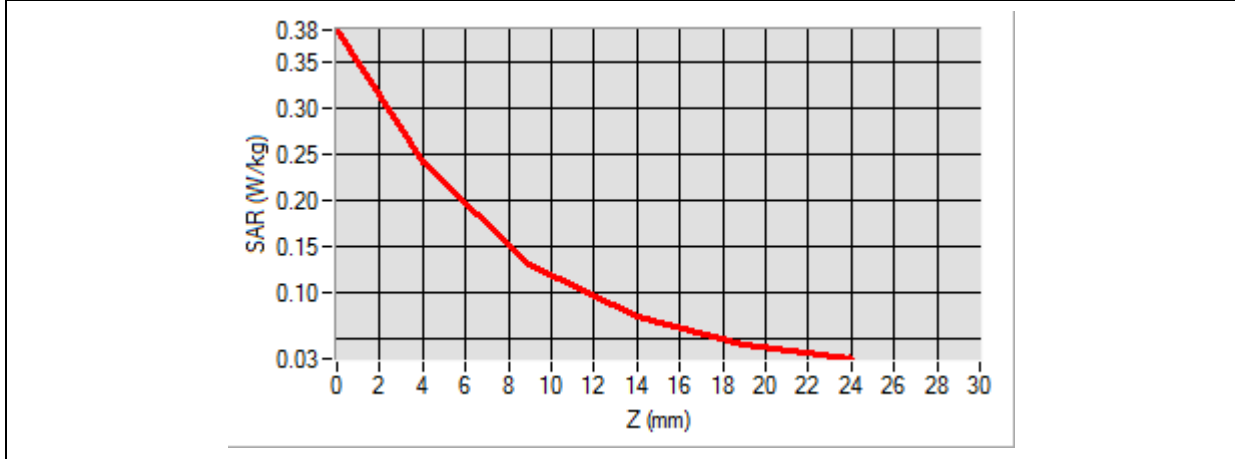


Maximum location: X=-2.00, Y=8.00

SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)	0.129003
SAR 1g (W/Kg)	0.226005

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3837	0.2393	0.1297	0.0721	0.0438



3D screen shot	Hot spot position

Annex C. EUT Photos

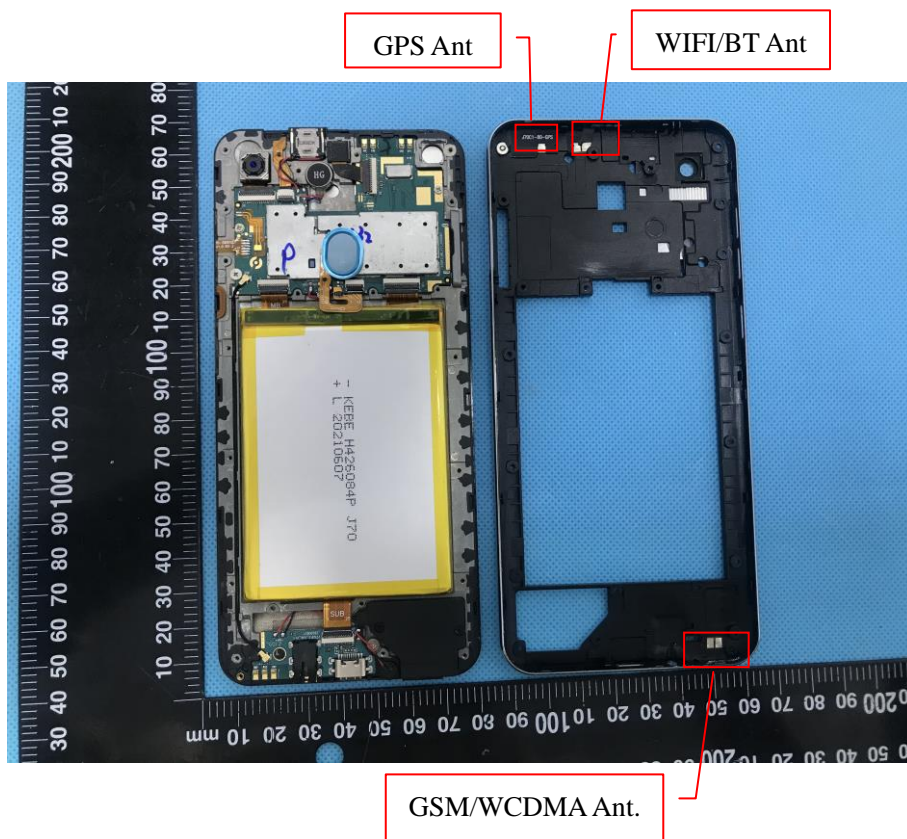
EUT View Front



EUT View Back



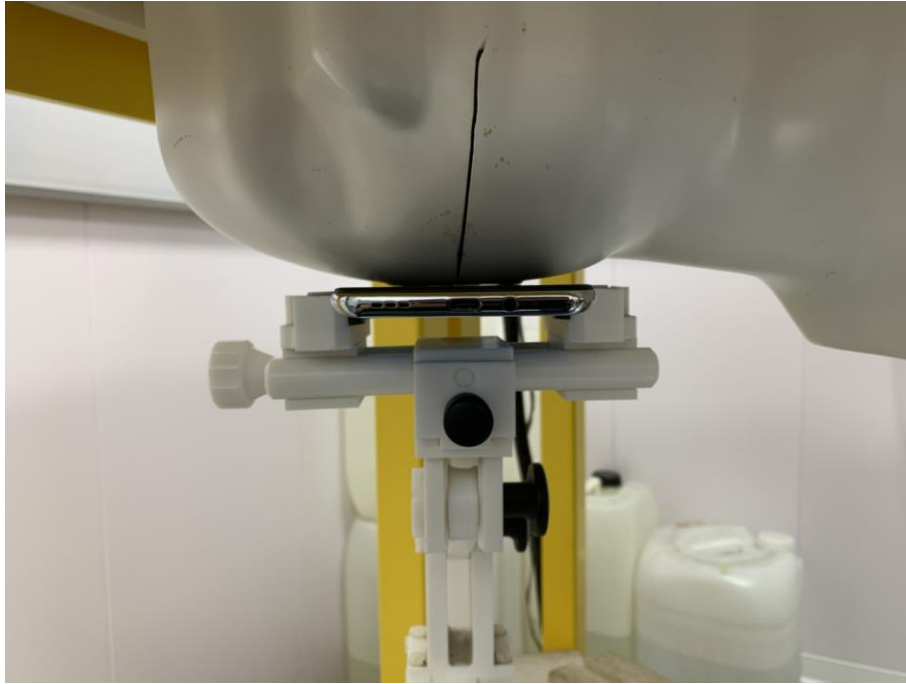
Antenna View



Annex D. Test Setup Photos

Head Exposure Conditions

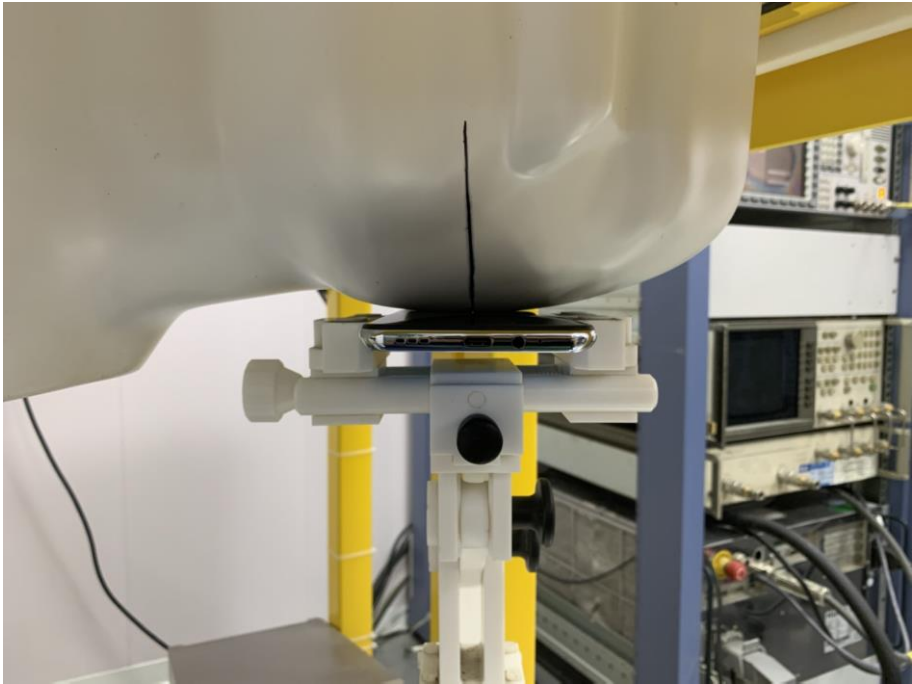
Right Cheek



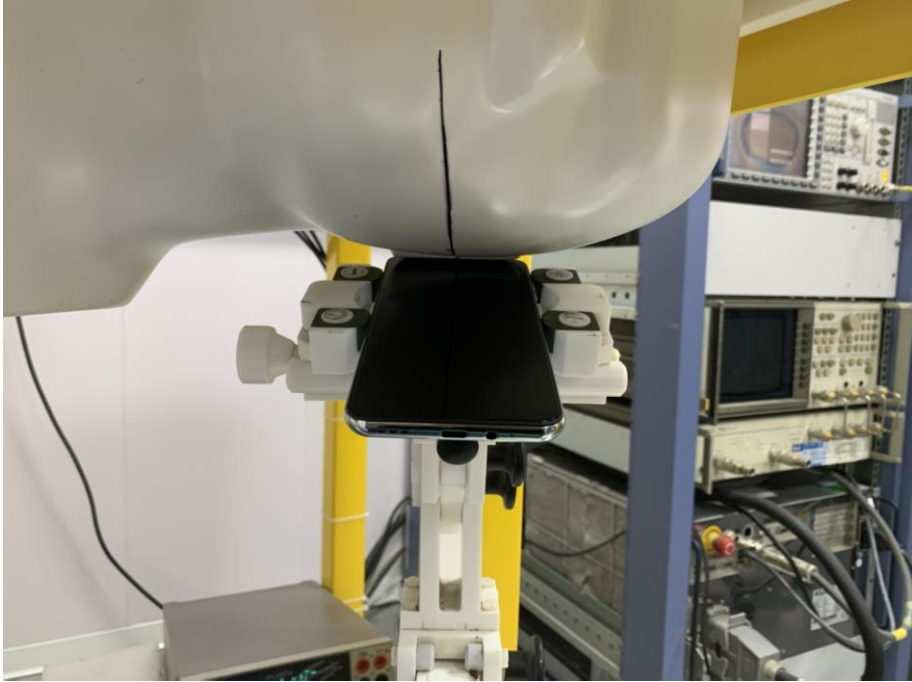
Tilt



Left Cheek



Tilt



Body mode Exposure Conditions

Test distance: 10mm

Body Front



Body Back



Body Right



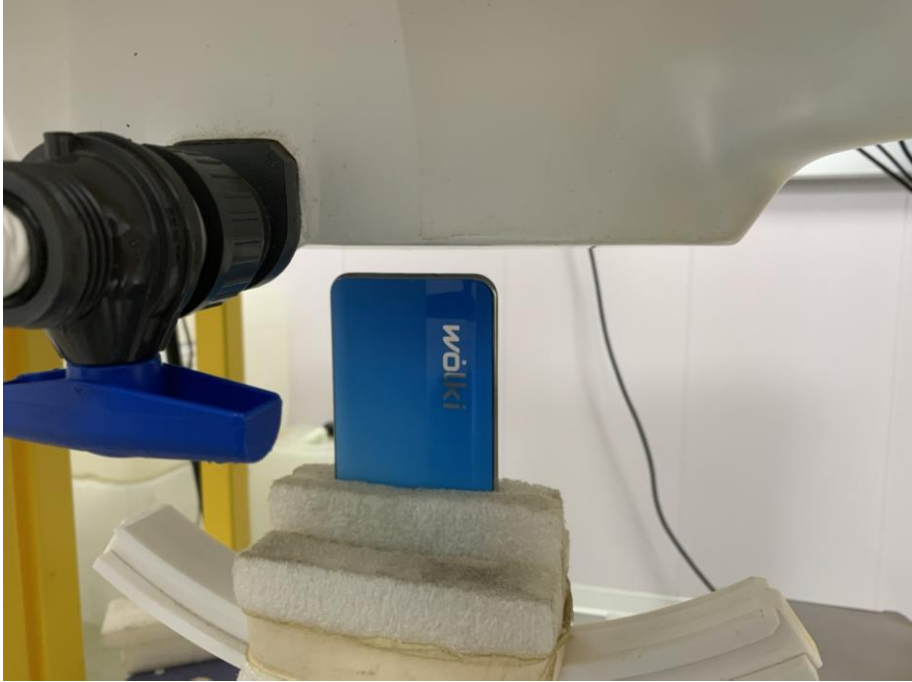
Body Left



Body Top



Body Bottom



Annex E. Calibration Certificate

Please refer to the exhibit for the calibration certificate

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