SAR Test Report

For

Applicant Name:	**Senwa Global International, S.A. de C.V.**
Address:	Carretera Mexico-Toluca No. 5324 PB, Colonia El Yaqui Del. Cuajimalpa de Morelos, C.P. 05320 Ciudad de Mexico, Mexico
EUT Name:	TABLET
Brand Name:	ACER
Model Number:	AS10L

Issued By

Company Name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number:	BTF240524R00301
Test Standards:	47 CFR Part 2.1093 IEC/IEEE 62209-1528: 2020 IEEE C95.1-2019 KDB 447498 D04 KDB 865664 D01 KDB 865664 D02 KDB 941225 D01 KDB 941225 D05 KDB 941225 D06 KDB 248227 D01 KDB 616217 D04 KDB 648474 D04 KDB 690783 D01
FCC ID:	2AZYA-AS10L
Test Conclusion:	Pass
Test Date:	2024-06-14 to 2024-06-20
Date of Issue:	2024-06-21
Prepared By:	Amenda Zhong
	Amenda Zhong / Project Engineer
Date:	2024-06-21
Approved By:	Ryan.CJ
	Ryan.CJ / EMC Manager
Date:	2024-06-21

BTF Testing Lab (Shenzhen) Co., Ltd.

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-06-21	Original
Note:	*Once the revision has been made, then previous versions reports are invalid.*	

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BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101,201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number	518915
Designation Number	CN1330

1.3 Laboratory Condition

Ambient Temperature:	21℃ to 25℃
Ambient Relative Humidity:	48% to 59%
Ambient Pressure:	100 kPa to 102 kPa

1.4 Announcement

(1) The test report reference to the report template version v0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	Senwa Global International, S.A. de C.V.
Address:	Carretera Mexico-Toluca No. 5324 PB, Colonia El Yaqui Del. Cuajimalpa de Morelos, C.P. 05320 Ciudad de Mexico, Mexico

2.2 Manufacturer Information

Company Name:	Senwa Global International, S.A. de C.V.
Address:	Carretera Mexico-Toluca No. 5324 PB, Colonia El Yaqui Del. Cuajimalpa de Morelos, C.P. 05320 Ciudad de Mexico, Mexico

2.3 Factory Information

Company Name:	Senwa Global International, S.A. de C.V.
Address:	Carretera Mexico-Toluca No. 5324 PB, Colonia El Yaqui Del. Cuajimalpa de Morelos, C.P. 05320 Ciudad de Mexico, Mexico

2.4 General Description of Equipment under Test (EUT)

EUT Name	TABLET
Under Test Model Name	AS10L
Sample No.	BTFSN240524005/1 E1

2.5 Equipment under Test Ancillary Equipment

Ancillary Equipment 1	Rechargeable Battery	
	Capacity	5000mAh
	Rated Voltage	3.8V

2.6 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EGPRS 850/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band 2/5 4G Network FDD LTE Band 2/4/5/7/13/66 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) Bluetooth (EDR+BLE)

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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	GSM, WCDMA, LTE, WLAN, Bluetooth		
Frequency Range	GSM 850	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	GSM 1900	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
	LTE Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	LTE Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2200 MHz
	802.11b/g/n(HT20)	2412 ~ 2462 MHz	
	802.11n(HT40)	2422 ~ 2452 MHz	
	802.11a /802.11n(HT20/40) /802.11ac(VHT20/40/80)	5150 ~ 5250 MHz 5250 ~ 5350 MHz 5470 ~ 5725 MHz 5725 ~ 5850 MHz	
	Bluetooth	2402 ~ 2480 MHz	
Antenna Type	WWAN: FPC Antenna WLAN: FPC Antenna BT: FPC Antenna		
Hotspot Function	Support		
Power Reduction	Not Support		
Exposure Category	General Population/Uncontrolled exposure		
EUT Stage	Portable Device		
Product	Type		
	☐ Production unit	☒ Identical prototype	

3. Summary of Test Results

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices
2	IEC/IEEE 62209-1528: 2020	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)
3	IEEE C95.1-2019	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
4	KDB 447498 D04	Interim General RF Exposure Guidance v01
5	KDB 865664 D01	SAR measurement 100MHz to 6GHz v01r04
6	KDB 865664 D02	RF Exposure Reporting v01r02
7	KDB 941225 D01	3G SAR Procedures v03r01
8	KDB 941225 D05	SAR for LTE Devices v02r05
9	KDB 941225 D06	Hotspot Mode v02r01
10	KDB 248227 D01	802.11 Wi-Fi SAR v02r02
11	KDB 616217 D04	SAR for laptop and tablets v01r02
12	KDB 648474 D04	Handset SAR v01r03
13	KDB 690783 D01	SAR Listings on Grant v01r03

3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Body Position	SAR Value (W/Kg)	
	General Population/ Uncontrolled Exposure	Occupational/ Controlled Exposure
Whole-Body SAR (averaged over the entire body)	0.08	0.4
Partial-Body SAR (averaged over any 1 gram of tissue)	1.60	8.0
SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue)	4.0	20.0

NOTE:
General Population/Uncontrolled Exposure: Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment- related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Occupational/Controlled Exposure: Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

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3.3 Test Result Summary

The maximum results of Specific Absorption Rate (SAR) found during test as bellows:

<Highest Reported standalone SAR Summary>

Exposure Position	Frequency Band	Reported SAR (W/kg)	Equipment Class	Highest Reported SAR (W/kg)
Body 1-g SAR (0 mm Gap)	GSM 850	0.684	PCB	**1.079**
	GSM 1900	1.079		
	WCDMA Band II	0.656		
	WCDMA Band V	0.551		
	LTE Band 2	0.684		
	LTE Band 4	0.690		
	LTE Band 5	0.472		
	LTE Band 7	0.597		
	LTE Band 13	0.799		
	LTE Band 66	0.983		
	WLAN 2.4 GHz	0.294	DTS	
	Bluetooth	0.077	DSS	
	WLAN 5.2 GHz	0.451	NII	
	WLAN 5.4 GHz	0.460		
	WLAN 5.6 GHz	0.403		
	WLAN 5.8 GHz	0.447		

This device is in compliance with Specific Absorption Rate(SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC47 CFR part 2(2.1093) and ANSI/IEEE C95.1-2019, and had been tested in accordance with the measurement methods and procedures specified in IEC/IEEE 62209-1528: 2020.

<Highest Reported Simultaneous SAR>

Exposure Position	Simultaneous Configuration	Highest Reported Simultaneous Transmission SAR (W/kg)	Limit (W/kg)	Verdict
Body 1-g SAR (0 mm Gap)	GSM 1900 + 5G WIFI	1.539	1.6	Pass

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3.4 Test Uncertainty

3.4.1 Measurement uncertainly evaluation for SAR test

Measurement uncertainly evaluation for SAR test (300MHz to 6GHz)

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+- %)	10 g Ui (+-%)	Vi veff
Measurement System								
Probe calibration	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	√3	√0.5	√0.5	1.43	1.43	∞
Hemispherical Isotropy	5.9	R	√3	√0.5	√0.5	2.41	2.41	∞
Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
Linearity	4.7	R	√3	1	1	2.71	2.71	∞
System detection limits	1.0	R	√3	1	1	0.58	0.58	∞
Modulation response	3.0	R	√3	1	1	1.73	1.73	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	√3	1	1	0.00	0.00	∞
Integration Time	1.4	R	√3	1	1	0.81	0.81	∞
RF ambient Conditions - Noise	3.0	R	√3	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	3.0	R	√3	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to Phantom Shell	1.4	R	√3	1	1	0.81	0.81	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	2.3	R	√3	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.60	2.60	11
Device Holder Uncertainty	3.0	N	1	1	1	3.00	3.00	7
Output power Variation - SAR drift measurement	5.0	R	√3	1	1	2.89	2.89	∞
SAR scaling	2.0	R	√3	1	1	1.15	1.15	∞
Phantom and Tissue Parameters								
Phantom Shell Uncertainty - Shape,Thickness and Permittivity	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation in permittivity and conductivity	2.0	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity measurement	4.0	N	1	0.78	0.71	3.12	2.84	5
Liquid permittivity measurement	5.0	N	1	0.23	0.26	1.15	1.30	5
Liquid Conductivity - Temperature Uncertainty	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid permittivity - Temperature Uncertainty	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty		RSS				10.47	10.34	
Expanded Uncertainty (95% Confidence interval)		k				20.95	20.69	

* This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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3.4.2 Measurement uncertainly evaluation for system check

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10 g)	1g Ui (+- %)	10 g Ui (+-%)	Vi veff
Measurement System								
Probe calibration	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	√3	1	1	2.02	2.02	∞
Hemispherical Isotropy	5.9	R	√3	0	0	0.00	0.00	∞
Boundary effect	1	R	√3	1	1	0.58	0.58	∞
Linearity	4.7	R	√3	1	1	2.71	2.71	∞
System detection limits	1	R	√3	1	1	0.58	0.58	∞
Modulation response	0	N	√3	0	0	0.00	0.00	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	√3	0	0	0.00	0.00	∞
Integration Time	1.4	R	√3	0	0	0.00	0.00	∞
RF ambient Conditions - Noise	3	R	√3	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	3	R	√3	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to Phantom Shell	1.4	R	√3	1	1	0.81	0.81	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	2.3	R	√3	1	1	1.33	1.33	∞
Dipole								
Deviation of experimental source from numerical source	5	N	1	1	1	5.00	5.00	∞
Input Power and SAR driftmeasurement	0.5	R	√3	1	1	0.29	0.29	∞
Dipole Axis to Liquid Dist.	2.0	R	√3	1	1	1.15	1.15	∞
Phantom and Tissue Parameters								
Phantom Shell Uncertainty - Shape,Thickness and Permittivity	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation in permittivity and conductivity	2.0	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity measurement	4	N	1	0.78	0.71	3.12	2.84	5
Liquid permittivity measurement	5.0	N	1	0.23	0.26	1.15	1.30	5
Liquid Conductivity - Temperature Uncertainty	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid permittivity - Temperature Uncertainty	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty		RSS				10.16	10.03	
Expanded Uncertainty (95% Confidence interval)		k				20.32	20.06	

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4. Measurement System

4.1 Specific Absorption Rate (SAR) Definition

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

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

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

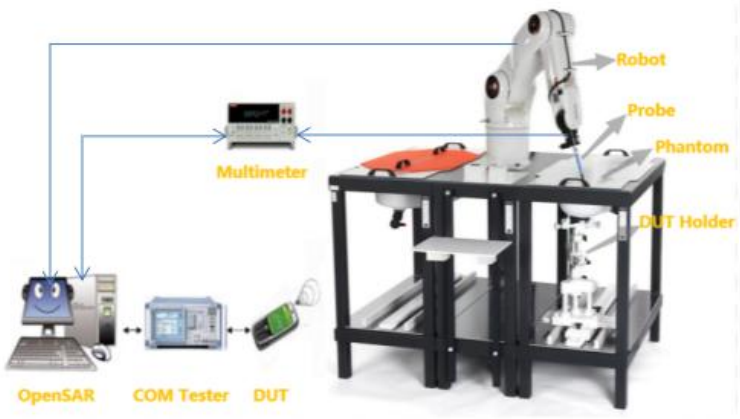
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

4.2 MVG SAR System

4.2.1 SAR system diagram



4.2.2 Robot

A standard high precision 6-axis robot (Denso) with teaches pendant with Scanning System
· It must be able to scan all the volume of the phantom to evaluate the tridimensional distribution of SAR.
· Must be able to set the probe orthogonal of the surface of the phantom (±30°).
· Detects stresses on the probe and stop itself if necessary to keep the integrity of the probe.

4.2.3 E-Field Probe

For the measurements, the Specific Dosimetric SSE2 E-Field Probe with following specifications is used:

- Dynamic range: 0.01-100 W/kg
- Tip diameter: 2mm for SSE2
- Distance between probe tip and sensor centre: 1mm for SSE2
- Distance between sensor centre and the inner phantom surface: 2mm for f>=4GHz.
- Probe linearity: <0.25dB.
- Axial Isotropy: <0.25dB.
- Spherical Isotropy: <0.50dB.
- Calibration range: 150 to 6000 MHz for head & body simulating liquid
- Angle between probe axis (evaluation axis) and surface normal line: less than 20°.

4.2.4 Phantoms

SAM Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The probe scanning of the E-Field is done in the 2 halves of the normalized head. The normalized shape of the phantom corresponds to the dimensions of 90% of an adult head size. It enables the dosimetric evaluation of left and right-hand phone usage and includes an additional flat phantom part for the simplified body performance check.The phantom set-up includes a cover, which prevents the evaporation of the liquid.

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The thickness of the phantom amounts to 2 mm±0.2 mm. The materials for the phantom do not affect the radiation of the device under test (DUT) : εr' <5
The head is filled with tissue simulating liquid. The hand do not have to be modeled.

SAM Phantom

TWIN SAM phantom			
	Mechanical	Electrical	
Overall thickness	2±0.2 mm(except ear area)	Relative permittivity	3.4
Dimensions	1000 mm(L) x 500 mm(W) x 200 mm(H)	Loss tangent	0.02
Maximum volume	27 L		
Material	Fiberglass based		

ELLIPTICAL Phantom

The phantom is for Body performance check filled with tissue-equivalent liquid to a depth of at least 150 mm, whose shell material is resistant to damage or reaction with tissue-equivalent liquid chemicals.

The shape of the phantom is an ellipse with length 600mm±5mm and width 400mm±5mm.
The phantom shell is made of low-loss and low-permittivity material, having loss tangent tanδ ≤ 0.05 and relative permittivity:
εr' ≤ 5 for f ≤ 3 GHz
3 ≤εr' ≤ 5 for f > 3 GHz
The thickness of the bottom-wall of the flat phantom is 2.0 mm with a tolerance of ± 0.2 mm.

ELLI Phantom

Technical & mechanical characteristics	
Shell thickness	2 mm ± 0.2 mm
Filling volume	25 L
Dimensions	600 mm x 400 mm x 200mm
Permittivity	4.4
Loss tangent	0.017

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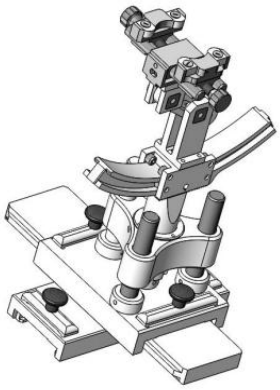
4.2.5 Device Holder



System Material	Permittivity	Loss tangent
Delrin	3.7	0.005

(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
PMMA	2.9	0.028

4.2.6 Simulating Liquid

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. 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. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.

Head Liquid Depth	Body Liquid Depth
	

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

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

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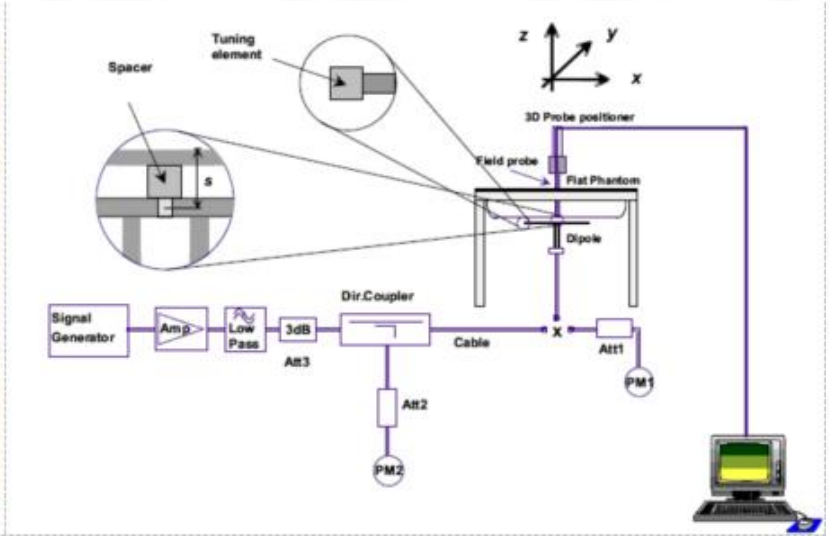
5. System Verification

5.1 Purpose of System 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. The 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.

5.2 System Check Setup



6. TEST POSITION CONFIGURATIONS

According to KDB 648474 D04 Handset, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

6.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEC IEEE 62209-1528:2020 using the SAM phantom illustrated as below.

6.1.1 Definition of the cheek position

The cheek position is established using steps a) to j) as follows.

(a) Configure the DUT for voice operation, if necessary. For example, for a DUT with a flip.a)swivel, or slide cover piece, open the cover if this is consistent with voice operation. If theDUT can also be used with the cover closed, both configurations shall be tested.

(b) Define two imaginary lines on the DUT, the vertical centreline and the horizontal linerelative to the DUT in vertical orientation as shown in Figure 15.

(c) The vertical centreline passes through two points on the front side of the DUT: themidpoint of the width w of the DUT at the level of the acoustic output (Point A inFigure 15), and the midpoint of the width wp at the bottom of the DUT (Point B). Thehorizontal line is perpendicular to the vertical centerline, and passes through the centre ofthe acoustic output (Fiqure 15). The two lines intersect at Point A. Note that for manyDUTs, Point A coincides with the centre of the acoustic output. However, the acousticoutput could be located elsewhere on the horizontal line. Also note that the verticacentreline is not necessarily parallel to the front face of the DUT, especially for clamshellDUTs,DUTs with flip cover pieces, and other irregularly shaped DUTs.

(d) Position the DUT close to the surface of the phantom such that Point A is on the (virtualextension of the line passing through points RE (right-ear ear reference point) and LEleft-ear ear reference point) on the phantom (see Figure 16a) and Figure 16b)). The planedetermined by the vertical centreline and the horizontal line of the DUT shall be parallel tothe sagittal plane of the phantom.

(e) Translate the DUT towards the phantom along the line passing through RE and LE untilethe DUT touches the ear (see Figure 16c)).

(f) Rotate the DUT around the (virtual) LE-RE Line until the DUT vertical centreline is in thef)reference plane(see Figure 16d)).

(g) Rotate the DUT around its vertical centreline until the plane established by the DUTgvertical centreline and horizontal line is parallel to the N-F line (see Annex G), and thentranslate the DUT towards the phantom along the LE-RE line until DUT Point A touchesthe ear at the ERP (ear reference point) (see Figure 16e))

(h) While keeping Point A on the line passing through RE and LE and maintaining the DUT incontact with the pinna, rotate the DUT about the N-F line until any point on the DUT is incontact with a phantom point below the pinna (cheek) (see Figure 16f)). The physicaangles of rotation shall be documented.

(i) While keeping DUT Point A in contact with the ERP rotate the DUT around a lineperpendicular to the plane established by the DUT vertical centreline and horizontal lineand passing through DUT Point A, until the DUT vertical centreline is in the referenceplane(see Figure 16g)).

(j) Verify that the cheek position is correct as follows:
1) the N-F line is in the plane established by the DUT vertical centreline and horizontalline;
2) DUT Point A touches the pinna at the ERP
3) the DUT vertical centreline is in the reference plane.

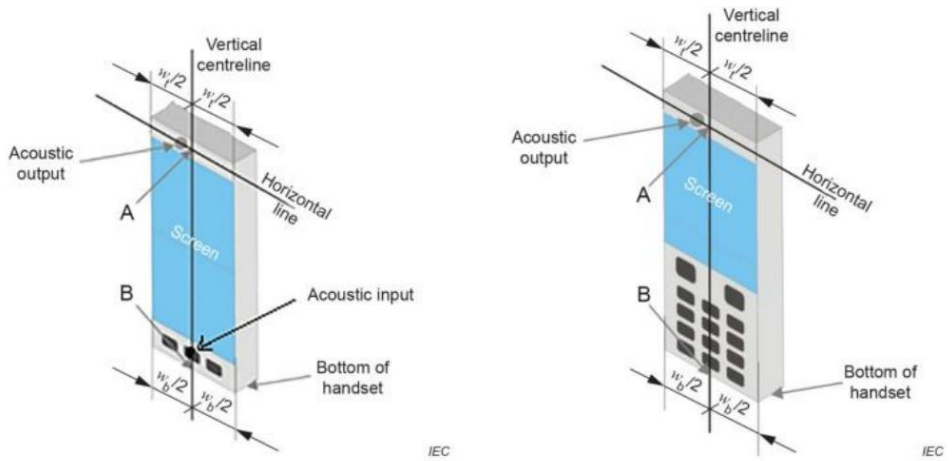
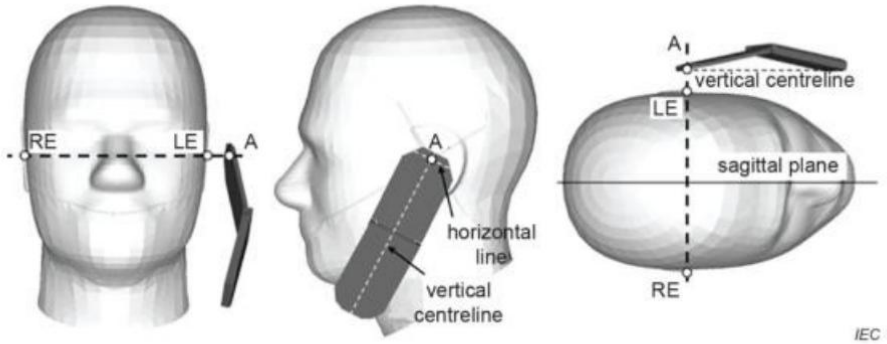


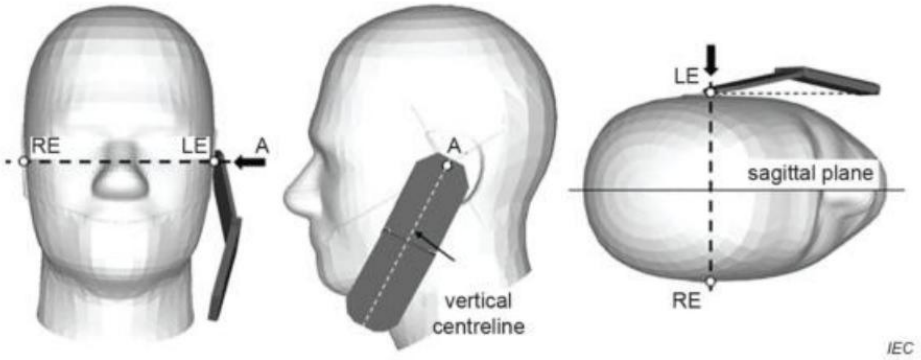
Figure 15 - Vertical and horizontal reference lines and referencepoints A and B on two example device types: a full touch-screensmart phone (left) and a DUT with a keypad (right)

NOTE The reference points for the right-ear ear reference point (RE), left-ear ear reference point (LE), and mouth (M), which establish the reference plane for DUT positioning, are indicated. This device position shall be maintained for the sagittal phantom test set-up shown in Figure G.4.

a) Phone position 1 – cheek position

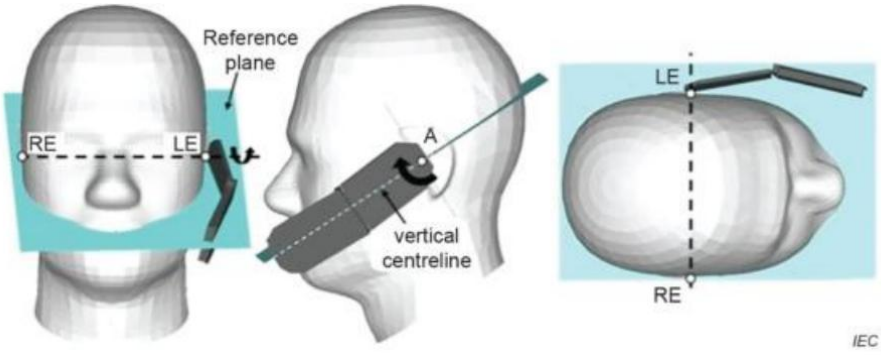


b) One possible DUT position against the head after applying 7.2.4.2.2 c)



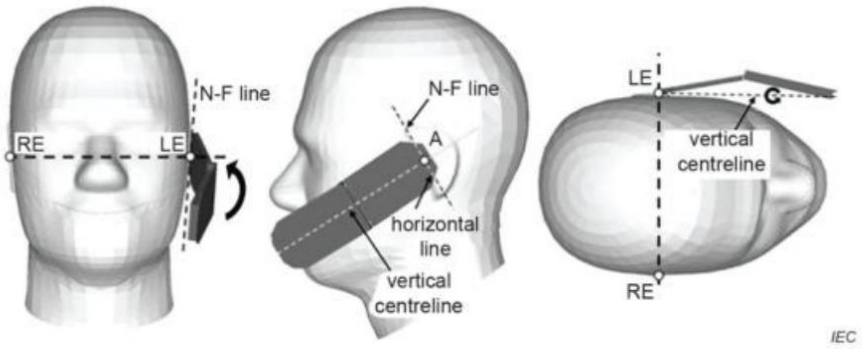
NOTE The black arrows show the direction of translation of the DUT for 7.2.4.2.2 d).

c) DUT position after applying 7.2.4.2.2 d)



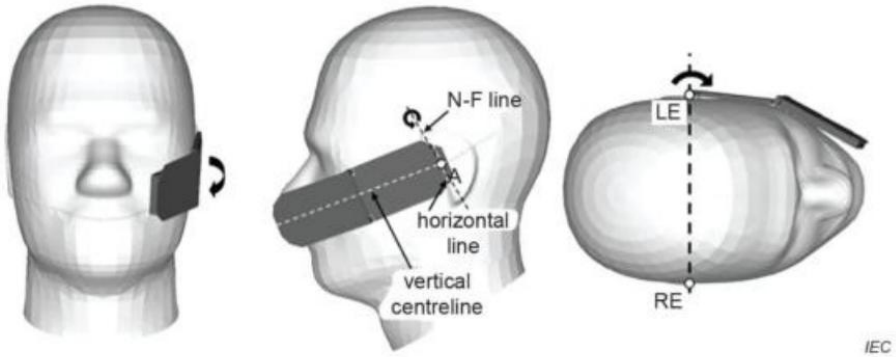
NOTE The curved black arrows show the direction of rotation of the DUT for 7.2.4.2.2 e).

d) DUT position after applying 7.2.4.2.2 e)



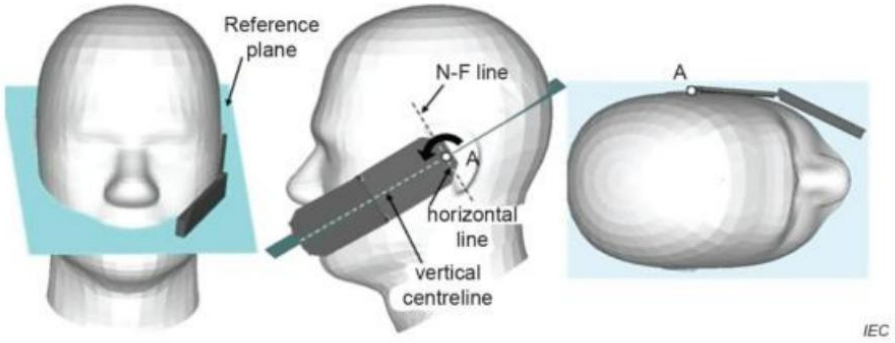
NOTE The curved black arrows show the direction of rotation of the DUT for 7.2.4.2.2 f).

e) DUT position after applying 7.2.4.2.2 f)



NOTE The curved black arrows show the direction of rotation of the DUT for 7.2.4.2.2 g)

f) DUT position after applying 7.2.4.2.2 g)



NOTE The curved black arrows show the direction of rotation of the DUT for 7.2.4.2.2 h).

g) DUT position after applying 7.2.4.2.2 h)

Figure 16 – Cheek position of the DUT on the left side of SAM where the device position shall be maintained for the phantom test set-up

6.1.2 Definition of the tilt position

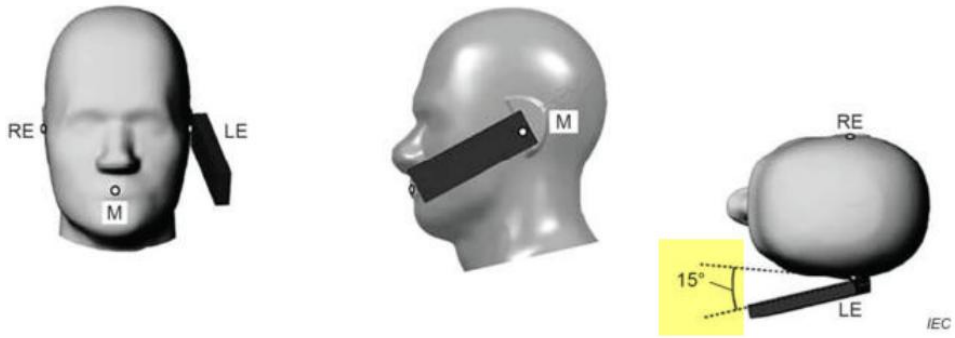
The tilt position is established using steps a) through d) as follows.

(a) Repeat steps a) through j) of 7.2.4.2.2 to place the DUT in the cheek positiona)(see Figure16).

(b) While maintaining the orientation of the DUT, move the DUT away from the pinna alongb)the line passing through RE and LE far enough to allow a rotation of the DUT away fromthe cheek by 15°.

(c) Rotate the DUT around the horizontal line by 15°(see Figure 17).

(d) While maintaining the orientation of the DUT. move the DUT towards the phantom on aline passing through RE and LE until any part of the DUT touches the ear. The tilt positionis obtained when the contact is on the pinna. If the contact is at any location other thanthe pinna, e.g. an extended antenna in contact with the back of the head phantom, theangle of the DUT shall be reduced. in this case, the tilt position is obtained if any part ofthe DUT is in contact with the pinna and a second point on the DUT is in contact with thephantom,e.g.the antenna in contact with the back of the head.



Key

M Mouth reference point

LE Left-ear ear reference point

RE Right-ear ear reference point

This device position shall be maintained for the phantom test set-up.

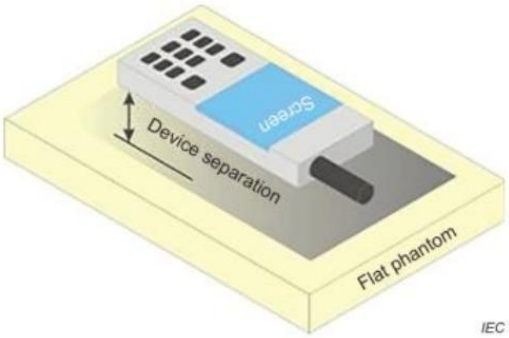
Figure 17 – Tilt position of the DUT on the left side of SAM

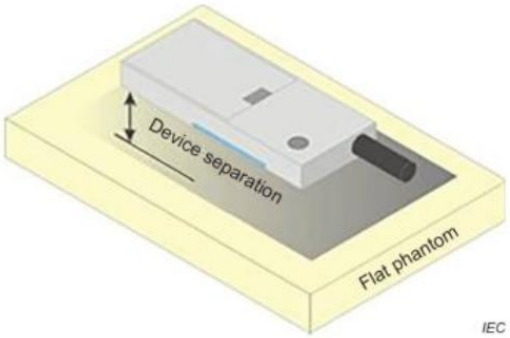
6.2 Body-worn Position Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

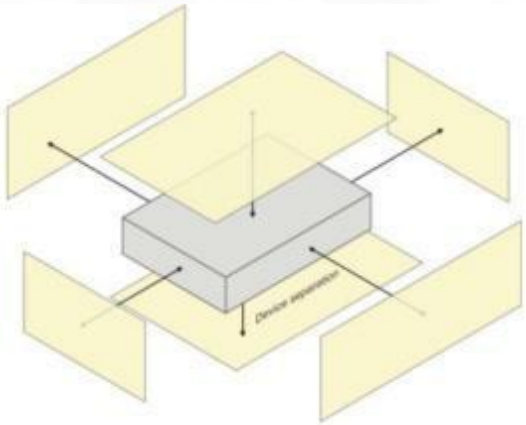
Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.





6.3 Hotspot Mode Exposure Position Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



6.4 Product Specific 10g Exposure Consideration

According with FCC KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, unless it is confirmed otherwise through KDB inquiries, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance;

The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

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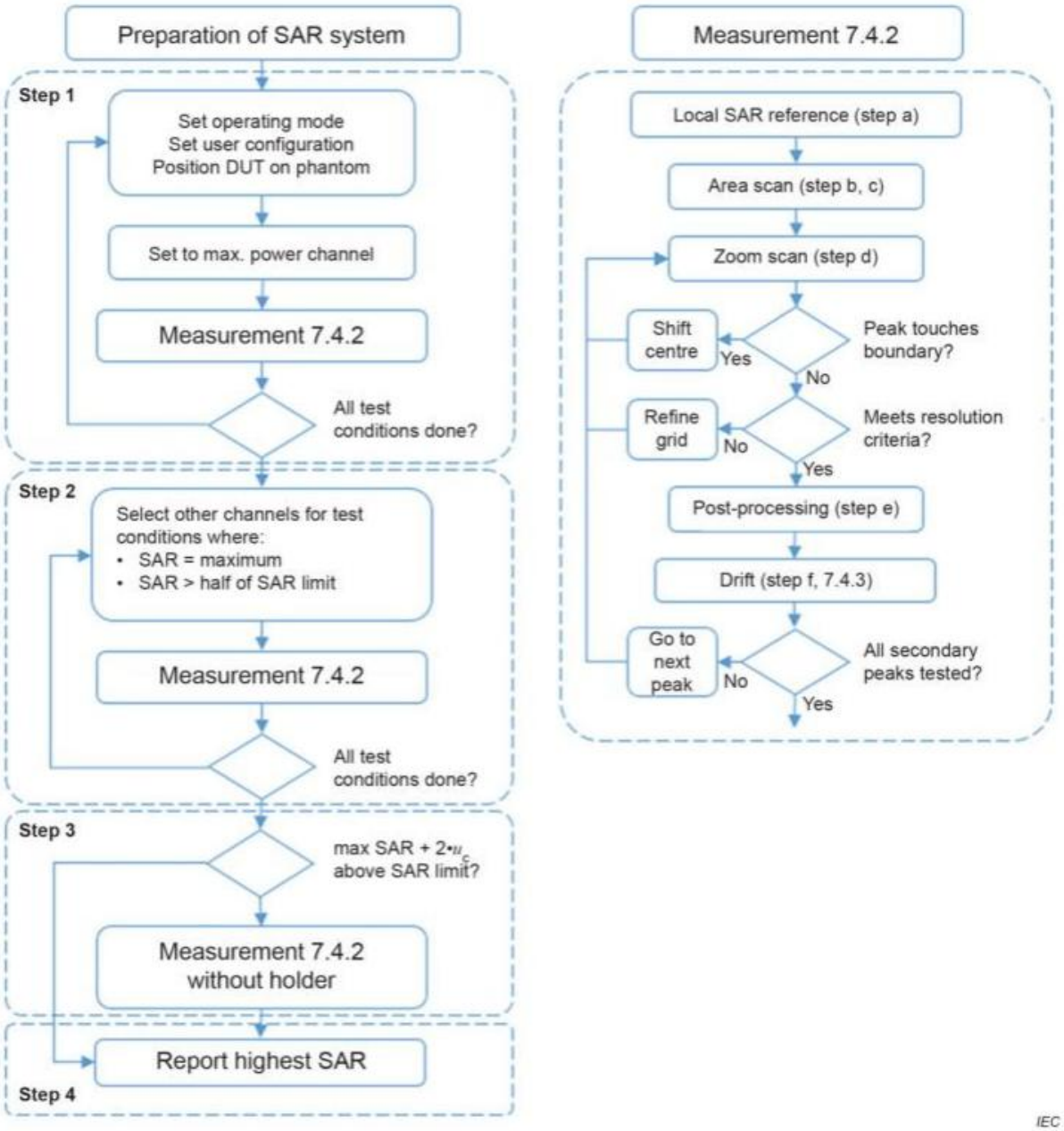
7. Measurement Procedure

7.1 Measurement Process Diagram

Body SAR



7.2 SAR Scan General Requirement

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1 g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEC/IEEE 62209-1528: 2020.

Table 3 – Area scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz < $f \leq 10$ GHz
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5$ [a]
Maximum spacing between adjacent measured points in mm (see O.8.3.1)[b]	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)[c]	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.

[c] The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.

Table 4 – Zoom scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz < $f \leq 10$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2$ [a]
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x- and y-directions (Δx and Δy, in mm)	8	$24/f$ [b]
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] This is the maximum spacing allowed, which might not work for all circumstances.

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7.3 Measurement Procedure

The following steps are used for each test position

a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface

b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.

c. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.

d. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 *32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

7.4 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

When the 1 g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

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8. Conducted RF Output Power

8.1 GSM

Mode: GSM850		Maximum Tune-up(dBm)	Burst Average Power (dBm)			Division Factors	Frame-Average Power (dBm)		
			CH128	CH190	CH251		CH128	CH190	CH251
			824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GSM		24.00	23.60	23.76	23.93	-9.03	14.57	14.73	14.90
GPRS (GMSK)	1Tx slot	24.00	23.60	23.76	23.92	-9.03	14.57	14.73	14.89
	2Tx slots	**22.00**	**21.71**	21.64	21.59	-6.02	**15.69**	15.62	15.57
	3Tx slots	20.00	19.77	19.73	19.69	-4.26	15.51	15.47	15.43
	4Tx slots	17.50	17.33	17.34	17.31	-3.01	14.32	14.33	14.30
EGPRS (8PSK)	1Tx slot	17.50	17.14	16.33	16.47	-9.03	8.11	7.30	7.44
	2Tx slots	17.00	16.61	16.12	16.33	-6.02	10.59	10.10	10.31
	3Tx slots	16.00	15.42	14.94	15.73	-4.26	11.16	10.68	11.47
	4Tx slots	13.50	13.23	12.89	12.96	-3.01	10.22	9.88	9.95
Mode: GSM1900		**Maximum Tune-up(dBm)**	**Burst Average Power (dBm)**			Division Factors	**Frame-Average Power (dBm)**		
			CH512	CH661	CH810		CH512	CH661	CH810
			1850.2MHz	1880.0MHz	1909.8MHz		1850.2MHz	1880.0MHz	1909.8MHz
GSM		20.50	20.23	20.27	20.25	-9.03	11.20	11.24	11.22
GPRS (GMSK)	1Tx slot	20.50	20.19	20.23	20.23	-9.03	11.16	11.20	11.20
	2Tx slots	18.50	18.15	17.96	17.77	-6.02	12.13	11.94	11.75
	3Tx slots	**17.00**	**16.53**	16.29	16.11	-4.26	**12.27**	12.03	11.85
	4Tx slots	14.50	14.46	14.21	13.99	-3.01	11.45	11.20	10.98
EGPRS (8PSK)	1Tx slot	16.50	15.93	16.05	16.14	-9.03	6.90	7.02	7.11
	2Tx slots	16.50	15.74	16.09	15.95	-6.02	9.72	10.07	9.93
	3Tx slots	14.00	13.95	13.74	13.84	-4.26	9.69	9.48	9.58
	4Tx slots	12.50	11.55	12.02	12.37	-3.01	8.54	9.01	9.36

Note:
1) Division Factors
To average the power, the division factor is as follows:
1Tx-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB
2Tx-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB
3Tx-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB
4Tx-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

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8.2 WCDMA

Mode		Maximum Tune-up(dBm)	WCDMA Band II		
			Conducted Power (dBm)		
			CH9262	CH9400	CH9538
			1852.4	1880.0	1907.6
RMC 12.2K		**14.00**	13.52	13.43	**13.64**
HSDPA	Subtest-1	14.00	13.51	13.43	13.59
	Subtest-2	13.50	13.22	13.19	13.31
	Subtest-3	13.50	12.99	12.98	13.35
	Subtest-4	13.50	12.84	12.80	13.28
HSUPA	Subtest-1	13.50	13.02	13.31	13.33
	Subtest-2	14.00	13.43	13.36	13.55
	Subtest-3	13.50	12.80	13.08	13.38
	Subtest-4	13.50	13.33	13.36	13.30
	Subtest-5	13.50	13.44	12.86	13.33
Mode		Maximum Tune-up(dBm)	WCDMA Band V		
			Conducted Power (dBm)		
			CH4132	CH4182	CH4233
			826.4	836.4	846.6
RMC 12.2K		**14.00**	13.79	**13.87**	13.74
HSDPA	Subtest-1	14.00	13.74	13.45	13.38
	Subtest-2	14.00	13.53	12.99	13.08
	Subtest-3	13.50	13.39	12.73	12.84
	Subtest-4	13.00	12.87	12.55	12.73
HSUPA	Subtest-1	14.00	13.72	13.20	13.29
	Subtest-2	14.00	13.78	13.51	13.36
	Subtest-3	14.00	13.66	13.16	13.08
	Subtest-4	14.00	13.76	13.43	13.30
	Subtest-5	14.00	13.56	13.19	13.14

Per KDB 941225 D01, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤1/2dB higher than the primary mode (RMC12.2kbps) 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.

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8.3 LTE

Band 2

LTE-FDD Band 2				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		18607	18900	19193
					1850.7MHz	1880.0MHz	1909.3MHz
1.4MHz	QPSK	1	0	15.00	14.44	14.42	14.65
			2	15.00	14.49	14.40	14.61
			5	15.00	14.40	14.48	14.59
		3	0	15.00	14.46	14.53	14.47
			2	14.50	14.49	14.47	14.45
			3	15.00	14.43	14.49	14.52
		6	0	14.00	13.59	13.50	13.54
	16QAM	1	0	15.50	14.82	13.96	15.07
			2	15.50	14.84	13.87	15.09
			5	15.50	14.86	13.82	15.06
		3	0	14.00	13.60	13.81	13.80
			2	14.00	13.68	13.70	13.85
			3	14.00	13.63	13.81	13.84
		6	0	13.00	12.50	12.71	12.78
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	18615	18900	19185
					1851.5MHz	1880.0MHz	1908.5MHz
3MHz	QPSK	1	0	15.00	14.38	14.39	14.56
			7	15.00	14.47	14.33	14.51
			14	15.00	14.37	14.53	14.52
		8	0	14.00	13.53	13.54	13.54
			4	14.00	13.52	13.42	13.54
			7	13.50	13.42	13.42	13.49
		15	0	14.00	13.56	13.54	13.53
	16QAM	1	0	15.50	14.81	13.96	15.28
			7	15.50	14.81	13.98	15.23
			14	15.50	14.68	13.88	15.26
		8	0	13.00	12.85	12.43	12.52
			4	13.00	12.79	12.47	12.52
			7	13.00	12.72	12.53	12.48
		15	0	13.00	12.69	12.62	12.68
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	18625	18900	19175
					1852.5MHz	1880.0MHz	1907.5MHz
5MHz	QPSK	1	0	15.00	14.50	14.46	14.45
			13	15.00	14.40	14.38	14.50
			24	15.00	14.48	14.49	14.54
		12	0	14.00	13.54	13.42	13.54
			6	14.00	13.34	13.40	13.58
			13	14.00	13.34	13.45	13.62
		25	0	13.50	13.48	13.47	13.47
	16QAM	1	0	14.50	13.75	14.03	14.09
			13	14.50	13.68	13.98	14.19
			24	14.50	13.75	13.97	14.16
		12	0	13.00	12.47	12.54	12.56
			6	13.00	12.37	12.48	12.54
			13	13.00	12.42	12.56	12.60
		25	0	13.00	12.63	12.52	12.77

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LTE-FDD Band 2				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		18650	18900	19150
					1855.0MHz	1880.0MHz	1905.0MHz
10MHz	QPSK	1	0	15.00	14.52	14.60	14.57
			25	15.00	14.42	14.57	14.57
			50	15.00	14.50	14.61	14.58
		25	0	14.00	13.36	13.49	13.61
			13	14.00	13.54	13.50	13.49
			50	14.00	13.56	13.54	13.54
		50	0	14.00	13.56	13.41	13.50
	16QAM	1	0	15.50	15.26	14.02	14.07
			25	15.50	15.23	14.08	14.07
			50	15.50	15.23	14.06	14.11
		25	0	13.00	12.46	12.55	12.61
			13	13.00	12.40	12.60	12.64
			50	13.00	12.54	12.59	12.68
		50	0	13.00	12.46	12.67	12.61
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	18675	18900	19125
					1857.5MHz	1880.0MHz	1902.5MHz
15MHz	QPSK	1	0	15.00	14.49	14.58	14.53
			38	15.00	14.45	14.60	14.49
			74	15.00	14.50	14.65	14.58
		36	0	14.00	13.42	13.56	13.57
			18	14.00	13.41	13.50	13.50
			39	14.00	13.59	13.53	13.63
		75	0	14.00	13.54	13.56	13.54
	16QAM	1	0	15.50	15.25	14.07	14.77
			38	15.50	15.23	14.03	14.76
			74	15.50	15.24	14.17	14.81
		36	0	13.00	12.63	12.62	12.63
			18	13.00	12.62	12.68	12.62
			39	13.00	12.65	12.70	12.62
		75	0	13.00	12.61	12.59	12.70
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	18700	18900	19100
					1860.0MHz	1880.0MHz	1900.0MHz
20MHz	QPSK	1	0	15.00	14.51	14.76	14.66
			50	15.00	14.46	14.72	14.68
			99	**15.00**	14.54	**14.83**	14.75
		50	0	14.00	13.55	13.45	13.56
			25	14.00	13.45	**13.59**	13.64
			50	14.00	13.57	13.59	13.59
		100	0	14.00	13.51	13.62	13.55
	16QAM	1	0	14.50	13.81	13.60	14.42
			50	14.50	13.66	13.62	14.45
			99	15.00	13.78	13.73	14.53
		50	0	13.00	12.63	12.55	12.64
			25	13.00	12.62	12.58	12.70
			50	13.00	12.74	12.63	12.69
		100	0	13.00	12.64	12.67	12.69

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Band 4

LTE-FDD Band 4				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		19957	20175	20393
					1710.7MHz	1732.5MHz	1754.3MHz
1.4MHz	QPSK	1	0	15.00	14.60	14.45	14.93
			2	15.00	14.60	14.43	14.98
			5	15.00	14.64	14.42	14.99
		3	0	15.00	14.48	14.54	14.60
			2	15.00	14.55	14.49	14.65
			3	15.00	14.50	14.45	14.58
		6	0	14.00	13.56	13.48	13.73
	16QAM	1	0	15.50	15.02	14.76	14.71
			2	15.50	15.05	14.79	14.67
			5	15.50	15.05	14.71	14.71
		3	0	14.50	13.70	13.57	14.08
			2	14.00	13.72	13.61	13.98
			3	14.00	13.71	13.58	13.91
		6	0	13.00	12.75	12.49	12.87
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	19965	20175	20385
					1711.5MHz	1732.5MHz	1753.5MHz
3MHz	QPSK	1	0	15.00	14.43	14.42	14.98
			7	15.00	14.35	14.45	14.89
			14	15.00	14.38	14.45	14.95
		8	0	14.00	13.39	13.45	13.66
			4	14.00	13.43	13.52	13.49
			7	14.00	13.56	13.55	13.64
		15	0	14.00	13.40	13.54	13.72
	16QAM	1	0	15.50	15.13	14.80	14.66
			7	15.00	15.00	14.82	14.61
			14	15.50	15.15	14.77	14.68
		8	0	13.00	12.57	12.80	12.65
			4	13.00	12.44	12.82	12.63
			7	13.00	12.63	12.81	12.71
		15	0	13.00	12.65	12.65	12.62
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	19975	20175	20375
					1712.5MHz	1732.5MHz	1752.5MHz
5MHz	QPSK	1	0	14.50	14.36	14.42	14.49
			13	15.00	14.44	14.43	14.57
			24	15.00	14.39	14.47	14.57
		12	0	14.00	13.46	13.55	13.61
			6	14.00	13.42	13.55	13.54
			13	14.00	13.55	13.48	13.60
		25	0	14.00	13.48	13.46	13.67
	16QAM	1	0	14.50	14.28	13.66	14.18
			13	14.50	14.20	13.67	14.19
			24	14.50	14.21	13.70	14.23
		12	0	13.00	12.49	12.49	12.68
			6	13.00	12.40	12.49	12.60
			13	13.00	12.47	12.52	12.66
		25	0	13.00	12.60	12.65	12.69

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LTE-FDD Band 4				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		20000	20175	20350
					1715.0MHz	1732.5MHz	1750.0MHz
10MHz	QPSK	1	0	15.00	14.47	14.70	14.62
			25	15.00	14.43	14.66	14.78
			49	15.00	14.55	14.69	14.77
		25	0	14.00	13.43	13.48	13.57
			13	14.00	13.45	13.42	13.75
			25	14.00	13.45	13.53	13.52
		50	0	14.00	13.46	13.54	13.62
	16QAM	1	0	15.50	15.19	14.07	14.26
			25	15.50	15.23	14.06	14.35
			49	15.50	15.14	14.18	14.31
		25	0	13.00	12.62	12.57	12.67
			13	13.00	12.61	12.65	12.80
			25	13.00	12.59	12.64	12.66
		50	0	13.00	12.65	12.75	12.73
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20025	20175	20325
					1717.5MHz	1732.5MHz	1747.5MHz
15MHz	QPSK	1	0	15.00	14.42	14.63	14.66
			38	15.00	14.54	14.60	14.65
			74	15.00	14.57	14.67	14.61
		36	0	14.00	13.46	13.53	13.55
			18	14.00	13.48	13.54	13.62
			39	14.00	13.53	13.52	13.64
		75	0	14.00	13.47	13.55	13.70
	16QAM	1	0	15.50	15.18	14.78	15.02
			38	15.50	15.25	14.75	15.11
			74	15.50	15.27	14.84	15.18
		36	0	13.00	12.52	12.66	12.56
			18	13.00	12.49	12.65	12.61
			39	13.00	12.55	12.71	12.59
		75	0	13.00	12.66	12.62	12.75
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20050	20175	20300
					1720.0MHz	1732.5MHz	1745.0MHz
20MHz	QPSK	1	0	15.00	14.57	14.51	14.65
			50	15.00	14.53	14.56	14.68
			99	**15.00**	14.58	14.63	**14.77**
		50	0	14.00	13.42	13.46	13.57
			25	14.00	13.44	13.50	13.62
			50	14.00	13.50	13.51	**13.68**
		100	0	14.00	13.56	13.48	13.52
	16QAM	1	0	14.50	14.17	14.08	14.26
			50	14.50	14.13	14.16	14.26
			99	14.50	14.17	14.23	14.35
		50	0	13.00	12.65	12.60	12.58
			25	13.00	12.68	12.59	12.62
			50	13.00	12.69	12.55	12.75
		100	0	13.00	12.57	12.62	12.63

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Band 5

LTE-FDD Band 5				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		20407	20525	20643
					824.7MHz	836.5MHz	848.3MHz
1.4MHz	QPSK	1	0	15.00	14.92	14.73	14.69
			2	15.00	14.90	14.76	14.80
			5	15.00	14.83	14.79	14.77
		3	0	15.00	14.73	14.93	14.60
			2	15.00	14.72	14.93	14.68
			3	15.00	14.74	14.88	14.68
		6	0	14.00	13.79	13.87	13.81
	16QAM	1	0	15.50	15.11	14.96	15.18
			2	15.50	15.18	14.92	15.28
			5	15.50	15.18	14.95	15.17
		3	0	14.00	13.91	13.85	14.00
			2	14.50	13.99	13.84	14.10
			3	14.00	13.91	13.81	13.98
		6	0	13.00	12.78	12.64	12.84
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20415	20525	20635
					825.5MHz	836.5MHz	847.5MHz
3MHz	QPSK	1	0	15.00	14.62	14.72	14.64
			7	15.00	14.66	14.70	14.79
			14	15.00	14.70	14.80	14.76
		8	0	14.00	13.63	13.82	13.66
			4	14.00	13.82	13.81	13.57
			7	14.00	13.72	13.86	13.66
		15	0	14.00	13.66	13.77	13.60
	16QAM	1	0	15.50	15.26	14.93	14.30
			7	15.50	15.23	14.90	14.26
			14	15.50	15.15	14.89	14.46
		8	0	13.00	12.60	12.94	12.77
			4	13.00	12.57	12.91	12.71
			7	13.50	13.13	12.93	12.84
		15	0	13.00	12.67	12.80	12.73

LTE-FDD Band 5				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		20425	20525	20625
					826.5MHz	836.5MHz	846.5MHz
5MHz	QPSK	1	0	15.00	14.57	14.89	14.60
			13	15.00	14.57	14.93	14.62
			24	15.00	14.58	14.86	14.66
		12	0	14.00	13.66	13.75	13.56
			6	14.00	13.75	13.82	13.75
			13	14.00	13.76	13.78	13.71
		25	0	14.00	13.73	13.87	13.68
	16QAM	1	0	14.50	14.37	14.08	14.17
			13	14.50	14.33	14.10	14.19
			24	14.50	14.34	14.06	14.27
		12	0	13.00	12.61	12.58	12.61
			6	13.50	13.03	12.62	12.68
			13	13.50	13.08	12.63	12.68
		25	0	13.50	13.16	12.84	12.69

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Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20450	20525	20600
					829.0MHz	836.5MHz	844.0MHz
10MHz	QPSK	1	0	15.00	14.72	14.76	14.81
			25	15.00	14.66	14.87	14.61
			49	**15.00**	14.84	**14.96**	14.86
		25	0	14.00	13.68	13.74	13.72
			13	14.00	13.71	13.77	13.53
			25	14.00	13.92	**13.84**	13.73
		50	0	14.00	13.72	13.68	13.64
	16QAM	1	0	15.50	15.30	14.27	14.51
			25	15.50	15.31	14.39	14.47
			49	15.50	15.32	14.35	14.50
		25	0	13.50	13.10	12.76	12.76
			13	13.50	13.10	12.77	13.20
			25	13.00	12.64	12.76	12.78
		50	0	13.50	13.20	12.76	13.12

Band 7

LTE-FDD Band 7				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		20775	21100	21425
					2502.5MHz	2535.0MHz	2567.5MHz
5MHz	QPSK	1	0	14.50	14.10	14.06	14.28
			12	14.50	14.08	14.08	14.18
			24	14.50	14.16	13.95	14.04
		12	0	13.50	13.16	13.20	13.26
			6	13.50	13.05	13.13	13.19
			13	13.50	13.17	13.15	13.20
		25	0	13.50	13.17	13.19	13.24
	16QAM	1	0	14.50	13.88	14.15	14.10
			12	14.50	13.79	14.12	13.98
			24	14.50	14.01	14.25	13.99
		12	0	12.50	12.10	12.18	12.21
			6	12.50	12.05	12.22	12.05
			13	12.50	12.11	12.15	12.09
		25	0	12.50	12.34	12.44	12.37
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20800	21100	21400
					2505.0MHz	2535.0MHz	2565.0MHz
10MHz	QPSK	1	0	14.50	14.14	14.09	14.27
			24	14.50	13.98	14.03	14.32
			49	14.50	14.02	14.12	14.26
		25	0	13.50	13.11	13.15	13.27
			12	13.50	13.19	12.96	13.21
			25	13.50	13.04	13.08	13.26
		50	0	13.50	13.16	13.07	13.24
	16QAM	1	0	15.00	14.83	14.43	14.06
			24	15.00	14.85	14.38	14.30
			49	15.00	14.87	14.53	14.14
		25	0	12.50	12.22	12.30	12.35
			12	12.50	12.20	12.28	12.44
			25	12.50	12.24	12.28	12.35
		50	0	12.50	12.30	12.31	12.37

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LTE-FDD Band 7				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		20825	21100	21375
					2507.5MHz	2535.0MHz	2562.5MHz
15MHz	QPSK	1	0	14.50	14.03	14.16	14.08
			38	14.50	14.05	14.15	14.16
			74	14.50	13.99	14.18	14.07
		38	0	13.50	12.99	13.15	13.13
			18	13.50	13.15	13.07	13.15
			37	13.50	13.08	13.07	13.15
		75	0	13.50	13.03	13.19	13.08
	16QAM	1	0	15.00	14.86	13.87	14.59
			38	15.00	14.86	13.76	14.77
			74	15.00	14.80	13.75	14.72
		38	0	12.50	12.28	12.35	12.16
			18	12.50	12.30	12.42	12.21
			37	12.50	12.29	12.43	12.20
		75	0	12.50	12.25	12.19	12.29
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	20850	21100	21350
					2510.0MHz	2535.0MHz	2560.0MHz
20MHz	QPSK	1	0	14.50	14.10	14.13	14.28
			49	**14.50**	13.96	14.22	**14.42**
			99	14.50	14.04	14.25	14.41
		50	0	13.50	13.00	13.11	13.17
			25	13.50	12.98	13.17	13.27
			50	13.50	13.05	13.12	**13.40**
		100	0	13.50	13.19	13.04	13.12
	16QAM	1	0	14.50	13.51	14.15	13.54
			49	14.50	13.41	14.02	13.64
			99	14.50	13.49	14.07	13.64
		50	0	12.50	12.31	12.29	12.27
			25	12.50	12.33	12.15	12.25
			50	12.50	12.32	12.21	12.34
		100	0	12.50	12.29	12.26	12.34

Band 13

LTE-FDD Band 13				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		23205	23230	23255
					779.5MHz	782.0MHz	784.5MHz
5MHz	QPSK	1	0	14.50	14.43	14.49	14.37
			13	14.50	14.48	14.48	14.49
			24	15.00	14.42	14.53	14.60
		12	0	14.00	13.50	13.39	13.43
			6	13.50	13.43	13.41	13.41
			13	13.50	13.48	13.43	13.47
		25	0	14.00	13.54	13.41	13.48
	16QAM	1	0	14.50	14.07	13.64	13.88
			13	14.50	14.05	14.01	13.90
			24	14.50	14.02	14.09	14.02
		12	0	13.00	12.27	12.77	12.93
			6	13.00	12.78	12.25	12.95
			13	13.00	12.83	12.79	12.46
		25	0	13.00	12.96	12.52	12.92

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Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	23230
					782.0MHz
10MHz	QPSK	1	0	14.50	14.45
			25	15.00	14.51
			49	15.00	**14.76**
		25	0	13.50	13.49
			13	14.00	13.52
			25	14.00	**13.62**
		50	0	14.00	13.53
	16QAM	1	0	15.00	14.95
			25	15.50	15.10
			49	15.50	15.22
		25	0	13.00	12.81
			13	12.50	12.35
			25	13.00	12.93
		50	0	12.50	12.45

Band 66

LTE-FDD Band 66				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		131979	132322	132665
					1710.7MHz	1745.0MHz	1779.3MHz
1.4MHz	QPSK	1	0	15.00	14.55	14.46	14.49
			2	15.00	14.61	14.58	14.55
			5	15.00	14.54	14.43	14.49
		3	0	15.00	14.37	14.61	14.47
			2	15.00	14.43	14.67	14.44
			3	15.00	14.50	14.62	14.52
		6	0	14.00	13.50	13.68	13.60
	16QAM	1	0	15.50	15.02	14.70	14.38
			2	15.00	14.98	14.67	14.40
			5	15.50	15.07	14.68	14.36
		3	0	14.00	13.79	13.93	13.94
			2	14.00	13.78	13.99	13.96
			3	14.00	13.80	13.98	13.91
		6	0	13.00	12.76	12.62	12.80
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	131987	132322	132657
					1711.5MHz	1745.0MHz	1778.5MHz
3MHz	QPSK	1	0	15.00	14.42	14.42	14.56
			7	15.00	14.38	14.46	14.51
			14	15.00	14.42	14.51	14.61
		8	0	14.00	13.42	13.62	13.45
			4	14.00	13.46	13.57	13.45
			7	14.00	13.49	13.58	13.54
		15	0	14.00	13.44	13.60	13.64
	16QAM	1	0	15.50	15.14	14.12	14.02
			7	15.00	14.97	14.15	14.09
			14	15.50	15.01	14.15	14.06
		8	0	13.00	12.45	12.79	12.53
			4	13.00	12.48	12.73	12.53
			7	13.00	12.43	12.74	12.60
		15	0	13.00	12.64	12.70	12.78

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Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	131997	132322	132647
					1712.5MHz	1745.0MHz	1777.5MHz
5MHz	QPSK	1	0	15.00	14.36	14.59	14.46
			13	15.00	14.38	14.56	14.52
			24	15.00	14.40	14.66	14.54
		12	0	14.00	13.59	13.58	13.57
			6	14.00	13.49	13.58	13.54
			13	14.00	13.56	13.51	13.49
		25	0	14.00	13.49	13.64	13.59
	16QAM	1	0	14.50	14.23	13.81	14.07
			13	14.50	14.21	13.84	14.03
			24	14.50	14.21	13.87	14.07
		12	0	13.00	12.50	12.48	12.57
			6	13.00	12.43	12.63	12.59
			13	13.00	12.49	12.51	12.58
		25	0	13.00	12.62	12.78	12.62
Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	132022	132322	132622
					1715.0MHz	1745.0MHz	1775.0MHz
10MHz	QPSK	1	0	15.00	14.54	14.59	14.57
			25	15.00	14.42	14.59	14.62
			49	15.00	14.56	14.65	14.63
		25	0	14.00	13.56	13.60	13.49
			13	14.00	13.47	13.61	13.59
			25	14.00	13.47	13.60	13.64
		50	0	14.00	13.48	13.64	13.67
	16QAM	1	0	15.50	15.20	14.73	14.10
			25	15.50	15.23	14.74	14.07
			49	15.50	15.26	14.73	14.08
		25	0	13.00	12.51	12.66	12.59
			13	13.00	12.53	12.78	12.62
			25	13.00	12.49	12.72	12.59
		50	0	13.00	12.56	12.75	12.63

LTE-FDD Band 66				Maximum Tune-up(dBm)	Conducted Power(dBm)		
Bandwidth	Modulation	RB allocation	RB offset		132047	132322	132597
					1717.5MHz	1745.0MHz	1772.5MHz
15MHz	QPSK	1	0	15.00	14.54	14.69	14.61
			38	15.00	14.52	14.68	14.54
			74	15.00	14.57	14.74	14.61
		36	0	14.00	13.50	13.58	13.49
			18	14.00	13.43	13.66	13.44
			39	14.00	13.42	13.60	13.47
		75	0	14.00	13.49	13.65	13.50
	16QAM	1	0	15.50	15.19	14.08	14.79
			38	15.50	15.22	14.09	14.78
			74	15.50	15.22	14.12	14.80
		36	0	13.00	12.54	12.75	12.57
			18	13.00	12.52	12.80	12.61
			39	13.00	12.46	12.77	12.60
		75	0	13.00	12.60	12.79	12.70

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Bandwidth	Modulation	RB allocation	RB offset	Maximum Tune-up(dBm)	132072	132322	132572
					1720.0MHz	1745.0MHz	1770.0MHz
20MHz	QPSK	1	0	15.00	14.52	14.69	14.57
			50	**15.00**	14.45	**14.76**	14.62
			99	15.00	14.59	14.75	14.64
		50	0	14.00	13.43	13.57	13.45
			25	14.00	13.51	13.64	13.51
			50	14.00	13.51	**13.71**	13.55
		100	0	14.00	13.45	13.67	13.50
	16QAM	1	0	14.50	14.19	14.18	14.36
			50	14.50	14.16	14.34	14.38
			99	14.50	14.19	14.39	14.48
		50	0	13.00	12.67	12.71	12.55
			25	13.00	12.71	12.66	12.64
			50	13.00	12.75	12.72	12.61
		100	0	13.00	12.59	12.74	12.62

8.4 Wi-Fi

Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Maximum Tune-up(dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	15.84	16.00	No
		6	2437	**17.05**	**17.50**	Yes
		11	2462	14.00	14.00	No
	802.11g	1	2412	14.85	15.00	No
		6	2437	16.79	17.00	No
		11	2462	12.26	12.50	No
	802.11n(HT20)	1	2412	15.10	15.50	No
		6	2437	17.01	17.50	No
		11	2462	12.49	12.50	No
	802.11n(HT40)	3	2422	14.10	14.50	No
		6	2437	13.57	14.00	No
		9	2452	10.11	10.50	No
Note: SAR is not required for the following 2.4 GHz OFDM conditions as the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2W/kg.						

Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Maximum Tune-up(dBm)	SAR Test Require.
U-NII-1 (5.150~5.250)	802.11a	36	5180	9.63	10.00	No
		40	5200	9.81	10.00	No
		48	5240	**10.49**	**10.50**	Yes
	802.11n(HT20)	36	5180	7.93	8.00	No
		40	5200	8.09	8.50	No
		48	5240	8.59	6.00	No
	802.11ac(VHT20)	36	5180	8.04	8.50	No
		40	5200	8.22	8.50	No
		48	5240	8.82	9.00	No
	802.11n(HT40)	38	5190	7.6	8.00	No
		46	5230	8.03	8.50	No
	802.11ac(VHT40)	38	5190	7.58	8.00	No
		46	5230	8.04	8.50	No
	802.11ac(VHT80)	42	5210	7.86	8.00	No

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Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Maximum Tune-up(dBm)	SAR Test Require.
U-NII-2a (5.250~5.350)	802.11a	52	5260	**10.53**	**11.00**	Yes
		60	5300	10.39	10.50	No
		64	5320	10.29	10.50	No
	802.11n(HT20)	52	5260	8.85	9.00	No
		60	5300	8.68	9.00	No
		64	5320	8.78	9.00	No
	802.11ac(VHT20)	52	5260	8.97	9.00	No
		60	5300	8.83	9.00	No
		64	5320	8.80	9.00	No
	802.11n(HT40)	54	5270	8.10	8.50	No
		62	5310	8.27	8.50	No
	802.11ac(VHT40)	54	5270	7.87	8.00	No
		62	5310	7.63	8.00	No
	802.11ac(VHT80)	58	5290	8.13	8.50	No
Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Maximum Tune-up(dBm)	SAR Test Require.
U-NII-2c (5.470~5.725)	802.11a	100	5500	10.85	11.00	No
		116	5580	12.66	13.00	No
		140	5700	**13.75**	**14.00**	Yes
	802.11n(HT20)	100	5500	9.84	10.00	No
		116	5580	11.18	11.50	No
		140	5700	11.99	12.00	No
	802.11ac(VHT20)	100	5500	9.98	10.00	No
		116	5580	11.24	11.50	No
		140	5700	11.46	11.50	No
	802.11n(HT40)	102	5510	9.30	9.50	No
		110	5550	10.04	10.50	No
		134	5670	11.17	11.50	No
	802.11ac(VHT40)	102	5510	8.48	8.50	No
		110	5550	9.00	9.00	No
		134	5670	10.71	11.00	No
	802.11ac(VHT80)	106	5530	9.93	10.00	No
		138	5690	10.06	10.50	No
Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Maximum Tune-up(dBm)	SAR Test Require.
U-NII-3 (5.725~5.850)	802.11a	149	5745	**12.98**	**13.00**	Yes
		157	5785	12.64	13.00	No
		165	5825	11.86	12.00	No
	802.11n(HT20)	149	5745	11.37	11.50	No
		157	5785	10.89	11.00	No
		165	5825	10.17	10.50	No
	802.11ac(VHT20)	149	5745	11.42	11.50	No
		157	5785	11.09	11.50	No
		165	5825	10.43	10.50	No
	802.11n(HT40)	151	5755	10.78	11.00	No
		159	5795	10.36	10.50	No
	802.11ac(VHT40)	151	5755	11.04	11.50	No
		159	5795	10.81	11.00	No
	802.11ac(VHT80)	155	5775	11.08	11.50	No

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8.5 Bluetooth

	Mode	Maximum Tune-up(dBm)	Average Conducted Output Power (dBm)		
EDR			0	39	78
			2402MHz	2441MHz	2480MHz
	GFSK	6.00	5.84	5.42	5.89
	π/4QPSK	6.00	5.90	5.62	5.87
	8DPSK	**6.50**	6.05	5.98	**6.18**
BLE	Mode	Maximum Tune-up(dBm)	Average Conducted Output Power (dBm)		
			0	20	39
			2402MHz	2440MHz	2480MHz
	1Mbps	0.50	0.21	-2.42	-2.13
	2Mbps	0.50	0.06	-2.56	-2.23

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Exclusion thresholds for 1-g SAR	RF exposure evaluation required
78	2.480	6.50	4.47	0	2.79	Yes

Note

1. Per KDB 447498 D04 Interim General RF Exposure Guidance v01, the 1-g SAR test exclusion thresholds for 300 MHz to 6 GHz at *test separation distances* ≤ 40 cm are determined by:

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\,\text{cm})^{x} & d \le 20\,\text{cm} \\ ERP_{20\,\text{cm}} & 20\,\text{cm} < d \le 40\,\text{cm} \end{cases} \quad \text{(B.2)}$$

where

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\,\text{GHz} \le f < 1.5\,\text{GHz} \\ 3060 & 1.5\,\text{GHz} \le f \le 6\,\text{GHz} \end{cases} \quad \text{(B.1)}$$

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).

*When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine estimated SAR.

2. Per KDB 248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
3. The output power of all data rate were prescan, just the worst case (the lowest data rate) of all mode were shown in report.

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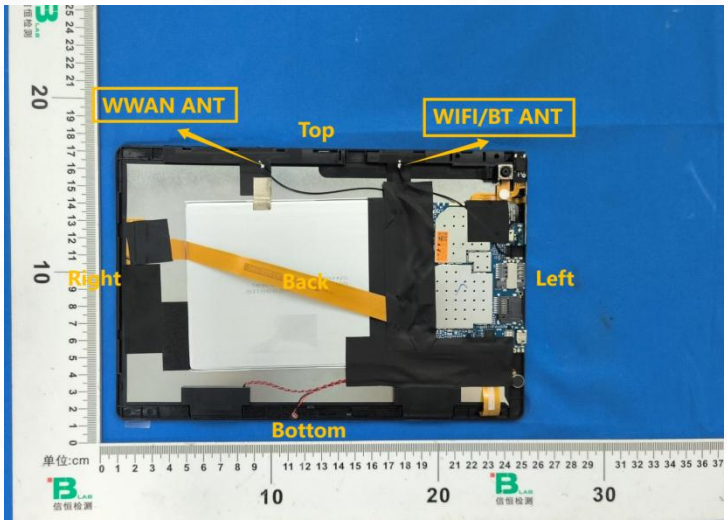
9. Test Exclusion Consideration

Antenna information:



WWAN Main Antenna	GSM/WCDMA/LTE TX/RX
WLAN/BT Antenna	WLAN/BT TX/RX

Note:
1. KDB 447498 D04v01, particular DUT edges were not required to be evaluated for SAR if the antenna-to-edge distance is greater than 2.5cm.
2. KDB 616217 D04 SAR for laptop and tablets v01r02, it doesn't require SAR evaluation for the front surface of a tablet.
3. Per KDB648474 D04,10-g extremity SAR is not required when Body-Worn mode 1-g reported SAR<1.2W/Kg.

Distance of The Antenna to the EUT surface and edge (mm）						
Antenna	Front Side (mm)	Back Side (mm)	Left Edge (mm)	Right Edge (mm)	Top Edge (mm)	Bottom Edge (mm)
WWAN	5	5	158	84	10	150
Wifi /BT	5	5	77	165	10	150

Mode	Tune-Up Limit (dBm)	Front Side (mm)	Back Side (mm)	Left Edge (mm)	Right Edge (mm)	Top Edge (mm)	Bottom Edge (mm)
GSM850	22.00	No	Yes	No	No	Yes	No
GSM1900	17.00	No	Yes	No	No	Yes	No
WCDMA Band II	14.00	No	Yes	No	No	Yes	No
WCDMA Band V	14.00	No	Yes	No	No	Yes	No
LTE Band 2	15.00	No	Yes	No	No	Yes	No
LTE Band 4	15.00	No	Yes	No	No	Yes	No
LTE Band 5	15.00	No	Yes	No	No	Yes	No
LTE Band 7	14.50	No	Yes	No	No	Yes	No
LTE Band 13	15.00	No	Yes	No	No	Yes	No
LTE Band 66	15.00	No	Yes	No	No	Yes	No
BT	6.50	No	Yes	No	No	Yes	No
2.4G WIFI	17.50	No	Yes	No	No	Yes	No
5.2G WIFI	10.50	No	Yes	No	No	Yes	No
5.4G WIFI	11.00	No	Yes	No	No	Yes	No
5.6G WIFI	14.00	No	Yes	No	No	Yes	No
5.8G WIFI	13.00	No	Yes	No	No	Yes	No

9.1 SAR Test Exclusion Consideration Table

Per KDB 447498 requires when the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following format to determine simultaneous transmission SAR test exclusion:

(max.power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(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.

0.4 W/Kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm

10. Test Result

Band	Mode	Test Position with 0 mm	CH.	Freq. (MHz)	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)	Meas. No.
GSM 850	GPRS 2slots	Back	128	824.2	21.71	22.00	-3.690	0.640	1.069	**0.684**	1#
		Top	128	824.2	21.71	22.00	0.820	0.571	1.069	0.610	/
GSM 1900	GPRS 3slots	Back	512	1850.2	16.53	17.00	3.270	0.969	1.114	**1.079**	2#
		Back-repeat	512	1850.2	16.53	17.00	1.690	0.960	1.114	1.069	/
		Back	661	1880.0	16.29	16.50	-2.780	0.953	1.050	1.001	/
		Back	810	1909.8	16.11	16.50	3.650	0.947	1.094	1.036	/
		Top	512	1850.2	16.53	17.00	-1.000	0.852	1.114	0.949	/
WCDMA Band II	RMC	Back	9538	1907.6	13.64	14.00	-2.410	0.604	1.086	**0.656**	3#
		Top	9538	1907.6	13.64	14.00	1.210	0.489	1.086	0.531	/
WCDMA Band V	RMC	Back	4182	836.4	13.87	14.00	-2.650	0.535	1.030	**0.551**	4#
		Top	4182	836.4	13.87	14.00	1.480	0.423	1.030	0.436	/
2.4 (2.4~2.4835)	802.11b	Back	6	2437	17.05	17.50	2.700	0.265	1.109	**0.294**	5#
		Top	6	2437	17.05	17.50	1.930	0.204	1.109	0.226	/
U-NII-1 (5.150~5.250)	802.11a	Back	48	5240	10.49	10.50	-4.130	0.450	1.002	**0.451**	6#
		Top	48	5240	10.49	10.50	2.740	0.372	1.002	0.373	/
U-NII-2a (5.250~5.350)	802.11a	Back	52	5260	10.53	11.00	-2.430	0.413	1.114	**0.460**	7#
		Top	52	5260	10.53	11.00	2.550	0.334	1.114	0.372	/
U-NII-2c (5.470~5.725)	802.11a	Back	140	5700	13.75	14.00	2.770	0.381	1.059	**0.403**	8#
		Top	140	5700	13.75	14.00	-0.470	0.312	1.059	0.330	/
U-NII-3 (5.725~5.850)	802.11a	Back	149	5745	12.98	13.00	2.300	0.445	1.005	**0.447**	9#
		Top	149	5745	12.98	13.00	-1.100	0.373	1.005	0.375	/
Bluetooth	Bluetooth	Back	78	2480	6.18	6.50	0.610	0.072	1.076	**0.077**	10#
		Top	78	2480	6.18	6.50	2.600	0.046	1.076	0.049	/

Band	Mode	Test Position with 0 mm	CH.	Freq. (MHz)	RB allocation	RB offset	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)	Meas. No.
LTE Band 2	QPSK (20MHz)	Back	18900	1880.0	1	99	14.83	15.00	-3.240	0.658	1.040	**0.684**	11#
					50	25	13.59	14.00	1.230	0.612	1.099	0.673	/
		Top	18900	1880.0	1	99	14.83	15.00	-1.240	0.587	1.040	0.610	/
					50	25	13.59	14.00	1.930	0.543	1.099	0.597	/
LTE Band 4	QPSK (20MHz)	Back	20300	1745.0	1	99	14.77	15.00	-3.280	0.655	1.054	**0.690**	12#
					50	50	13.68	14.00	2.150	0.607	1.076	0.653	/
		Top	20300	1745.0	1	99	14.77	15.00	0.420	0.580	1.054	0.611	/
					50	50	13.68	14.00	-1.520	0.534	1.076	0.575	/
LTE Band 5	QPSK (10MHz)	Back	20525	836.5	1	49	14.96	15.00	-3.320	0.468	1.009	**0.472**	13#
					25	25	13.84	14.00	2.740	0.423	1.038	0.439	/
		Top	20525	836.5	1	49	14.96	15.00	-3.230	0.415	1.009	0.419	/
					25	25	13.84	14.00	0.970	0.374	1.038	0.388	/
LTE Band 7	QPSK (20MHz)	Back	21350	2560.0	1	49	14.42	14.50	-1.160	0.586	1.019	**0.597**	14#
					50	50	13.40	13.50	-1.600	0.530	1.023	0.542	/
		Top	21350	2560.0	1	49	14.42	14.50	1.140	0.516	1.019	0.526	/
					50	50	13.40	13.50	-3.360	0.457	1.023	0.468	/
LTE Band 13	QPSK (10MHz)	Back	23230	782.0	1	25	14.76	15.00	-3.060	0.756	1.057	**0.799**	15#
					25	13	13.62	14.00	-4.110	0.712	1.091	0.777	/
		Top	23230	782.0	1	25	14.76	15.00	2.250	0.705	1.057	0.745	/
					25	13	13.62	14.00	-1.630	0.665	1.091	0.726	/
LTE Band 66	QPSK (20MHz)	Back	132322	1745.0	1	50	14.76	15.00	-1.150	0.930	1.057	**0.983**	16#
					50	50	13.71	14.00	0.590	0.891	1.069	0.952	/
		Back-repeat	132322	1745.0	1	50	14.76	15.00	0.790	0.922	1.057	0.975	/
		Back	132072	1720.0	1	50	14.45	14.50	-2.680	0.890	1.012	0.901	/
		Back	132572	1770.0	1	50	14.62	15.00	1.740	0.893	1.091	0.974	/
		Top	132322	1745.0	1	50	14.76	15.00	-2.100	0.889	1.057	0.940	/
					50	50	13.71	14.00	-3.070	0.840	1.069	0.898	/

Note:

1. Per KDB 447498 D04 v01, for each exposure position, if the highest output power channel Reported SAR ≤ 0.8W/kg, other channels SAR testing is not necessary.
2. Per KDB 447498 D04 v01, body use is evaluated with the device positioned at 0mm from a flat phantom respectively filled with body tissue-equivalent medium.
3. Per KDB 616217 D04 where SAR test considerations for tablets are based on a composite test separation distance of 0 mm from the back and edges of the device with antennas 2.5 cm or closer to the edge of the device, determined from general mixed use conditions for this type of devices.
4. Per KDB 447498 D04 v01, the report SAR is measured SAR value adjusted for maximum tune-up tolerance. Scaling Factor=10^[(tune-up limit power(dBm) - Ave.power power (dBm))/10], where tune-up limit is the maximum rated power among all production units.
   Reported SAR(W/kg)=Measured SAR (W/kg)*Scaling Factor.

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11. SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. 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, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

Note: For 1g SAR, the highest measured 1g SAR is 0.969 > 0.80 W/kg, repeated measurement is as below.

Mode	Position	Ch.	Freq. (MHz)	1g Meas SAR (W/kg)	the ratio of largest to smallest SAR for the original and first repeated measurements
GSM 1900	Back	512	1850.2	0.960	1.007
	Back-repeated	512	1850.2	0.953	
LTE Band 66 (BW: 20MHz)	Back	132322	1745.0	0.930	1.009
	Back-repeated	132322	1745.0	0.922	

According to the above ratio result, we don’t need to perform a second repeated measurement for these bands.

12. Simultaneous Transmission

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR 1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR 1g 1.6 W/kg), SAR test exclusion is determined by the SAR to Peak Location Ratio (SPLSR).

12.1 Simultaneous Transmission Mode Considerations

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. The device has 2 Tx antennas, WWAN main antenna, Wifi/BT antenna supports 2.4G/5G Wi-Fi & BT. The 2 antennas can always transmit simultaneously. The work mode combination is showed as below table.

Application Simultaneous Transmission information:

NO.	Configuration	Body
1	WWAN+WIFI(2.4g)	Yes
2	WWAN+WIFI(5g)	Yes
3	WWAN+BT	Yes

12.2 Sum SAR of Simultaneous Transmission

Body

Band	Test Position	Scaled SAR				Σ SAR (W/kg) WWAN + WIFI 2.4G	Σ SAR (W/kg) WWAN + WIFI 5G	Σ SAR (W/kg) WWAN + BT	SPLSR	Remark
		WWAN	WIFI 2.4G	WIFI 5G	BT					
GSM 1900	Back	**1.079**	**0.294**	**0.460**	**0.077**	1.373	**1.539**	1.156	N/A	N/A
	Top	0.949	0.226	0.372	0.049	1.175	1.321	0.998	N/A	N/A

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13. Test Equipment List

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
E-Field Probe	MVG	SSE2	04/22 EPGO365	2024/02/06	2025/02/05
6 1/2 Digital Multimeter	Keithley	DMM6500	4527164	2023/11/16	2024/11/15
Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	161997	2023/11/16	2024/11/15
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	2023/11/16	2024/11/15
E-Series Avg. Power Sensor	KEYSIGHT	E9300A	MY55050017	2024/03/20	2025/03/19
EPM Series Power Meter	KEYSIGHT	E4418B	MY41293435	2024/03/20	2025/03/19
10dB Attenuator	MIDWEST MICROWAVE	263-10dB	/	2024/03/20	2025/03/19
Coupler	MERRIMAC	CWM-10R-10.8G	LOT-83391	2024/03/20	2025/03/19
750MHz Validation Dipole	MVG	SID750	07/22 DIP 0750-655	2023/02/06	2025/02/05
835MHz Validation Dipole	MVG	SID835	07/22 DIP 0G835-656	2023/02/06	2025/02/05
1800MHz Validation Dipole	MVG	SID1800	07/22 DIP 1G800-657	2023/02/06	2025/02/05
1900MHz Validation Dipole	MVG	SID1900	07/22 DIP 1G900-658	2023/02/06	2025/02/05
2450MHz Validation Dipole	MVG	SID2450	07/22 DIP 2G450-662	2023/02/06	2025/02/05
2600MHz Validation Dipole	MVG	SID2600	07/22 DIP 2G600-663	2023/02/06	2025/02/05
5200MHz-5800MHz Validation Dipole	MVG	SID5000	07/22 DIP5G000-670	2023/02/06	2025/02/05
LIMESAR Dielectric Probe	MVG	SCLMP	06/22 OCPG88	/	/
ENA Series Network Analyzer	Agilent	E5071B	MY42301221	2023/11/16	2024/11/15
Thermometer	Riters	DT-232	21A11	2024/03/20	2025/03/19
Antenna network emulator	MVG	ANTA 74	07/22 ANTA 74	/	/
SAM Phantom	MVG	SAM	07/22 SAM149	/	/
Mobile Phone Positioning System	MVG	MSH 118	07/22 MSH 118	/	/
Mechanical Calibration Kit	PNA	/	/	/	/
Open SAR test software	MVG	/	V5.3.5	/	/

Note: For dipole antennas, BTF has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss in within 20% of calibrated measurement.
4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.

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ANNEX A Simulating Liquid Verification Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SCLMP Dielectric Probe Kit.

Dielectric performance of tissue simulating liquid									
Frequency (MHz)	εr		σ(s/m)		Delta (εr)	Delta (σ)	Limit	Temp (℃)	Date
	Target	Measured	Target	Measured					
750	41.90	41.80	0.89	0.86	-0.24%	-3.37%	±5%	20.5	14/6/2024
835	41.50	41.41	0.90	0.87	-0.22%	-3.33%	±5%	20.5	14/6/2024
1800	40.00	39.91	1.40	1.37	-0.23%	-2.14%	±5%	20.5	17/6/2024
1900	40.00	39.88	1.40	1.41	-0.30%	0.71%	±5%	20.5	17/6/2024
2450	39.20	39.08	1.80	1.81	-0.31%	0.56%	±5%	20.5	19/6/2024
2600	39.00	38.88	1.96	1.97	-0.31%	0.51%	±5%	20.5	19/6/2024
5200	36.00	35.88	4.66	4.70	-0.33%	0.86%	±5%	20.5	21/6/2024
5400	35.80	35.68	4.86	4.90	-0.34%	0.82%	±5%	20.5	21/6/2024
5600	35.50	35.38	5.07	5.11	-0.34%	0.79%	±5%	20.5	21/6/2024
5800	35.30	35.18	5.27	5.31	-0.34%	0.76%	±5%	20.5	21/6/2024
NOTE: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 ℃ of the conditions expected during the SAR evaluation to satisfy protocol requirements.									

ANNEX B System Check Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of 10 %(for 10 g).

Frequency (MHz)	Input Power (mW)	10g SAR (W/Kg)	1g SAR (W/Kg)	10g SAR 1W input power normalized (W/Kg)	1g SAR 1W input power normalized (W/Kg)	10g SAR Standard target (1W) (W/Kg)	1g SAR Standard target (1W) (W/Kg)	10g SAR Deviation	1g SAR Deviation
750	16	0.092	0.138	5.75	8.63	5.55	8.49	3.60%	1.59%
835	16	0.106	0.163	6.63	10.19	6.22	9.56	6.51%	6.56%
1800	16	0.312	0.588	19.50	36.75	20.10	38.40	-2.99%	-4.30%
1900	16	0.322	0.630	20.13	39.38	20.50	39.70	-1.83%	-0.82%
2450	16	0.352	0.793	22.00	49.56	23.86	54.4	-7.80%	-8.89%
2600	16	0.421	0.866	26.31	54.13	24.60	55.30	6.96%	-2.12%
5200	13	0.288	1.019	22.15	78.38	21.29	73.88	4.06%	6.10%
5400	13	0.299	1.051	23.00	80.85	23.23	81.47	-0.99%	-0.77%
5600	13	0.304	1.084	23.38	83.38	22.64	78.71	3.29%	5.94%
5800	13	0.277	0.981	21.31	75.46	21.5	74.21	-0.89%	1.69%

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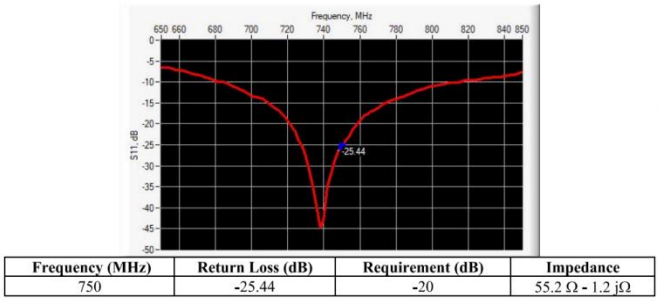
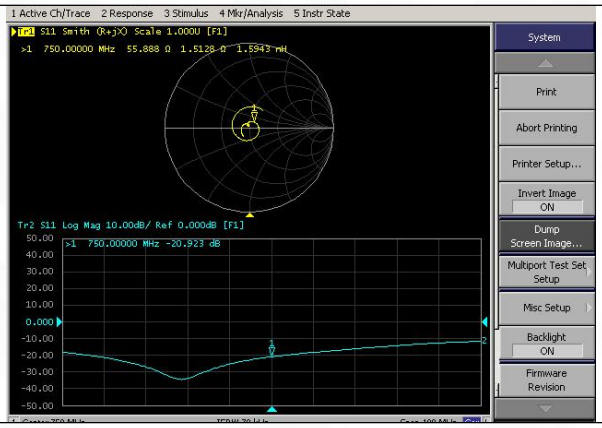
ANNEX C SAR Dipole Calibrations

Justification for Extended SAR Dipole Calibrations

Referring to KDB 865664D01V01r04, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration)and in impedance (within 5 ohm of prior calibration). the annual calibration is not necessary and the calibrationinterval can be extended.While calibration intervals not exceed 3 years.

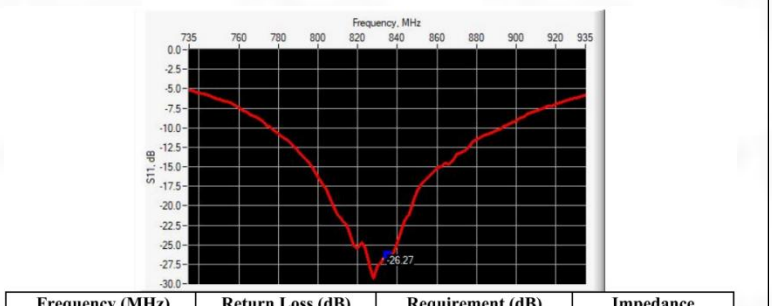
07/22 DIP 2G450-662 SID2450 2450MHz Validation Dipole Calibrations

Frequency (MHz)	Return loss(dB)		Impedance(Ω)				error range（%）		Results	Date of Measurement
	measurement	target	measurement		target		Return loss(±20%)	Impedance(±5 Ω)	(P/F)	
			real part	imaginary part	real part	imaginary part				
CW750	-20.92	-25.44	55.89	1.5	55.2	-1.2	-17.77%	3.4	P	2/5/2024
CW835	-29.88	-26.27	52.8	-1.7	52.5	-4.2	13.74%	2.8	P	2/5/2024
CW1800	-24.55	-26.54	52.4	-0.2	52.8	+3.8	-7.50%	4.4	P	2/5/2024
CW1900	-25.67	-23.01	51.9	-5.3	51.0	-7.0	11.56%	2.6	P	2/5/2024
CW2450	-24.37	-21.23	48.3	5.7	49.4	+8.6	14.79%	4.0	P	2/5/2024
CW2600	-20.56	-23.05	57.3	5.7	54.3	+5.5	-10.80%	3.2	P	2/5/2024
CW5200	-21.14	-20.29	58.4	-4.5	58.76	-4.43	4.19%	0.43	P	2/5/2024
CW5400	-27.63	-29.09	57.5	1.2	53.46	+0.61	-5.02%	4.63	P	2/5/2024
CW5600	-33.45	-31.06	51.7	0.7	52.76	-0.45	7.69%	2.21	P	2/5/2024
CW5800	-28.88	-28.48	50.8	0.1	50.12	-3.76	1.40%	4.34	P	2/5/2024

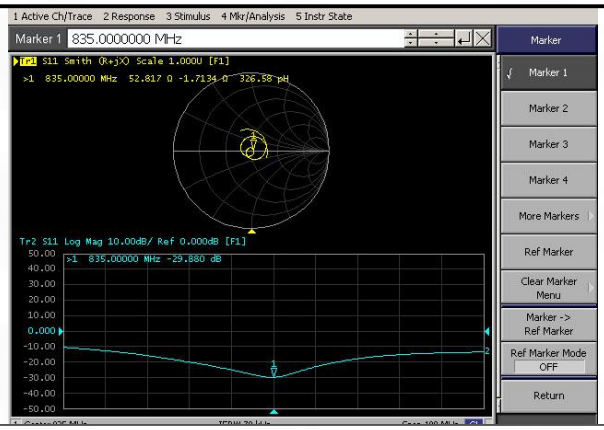
Dipole calibration report data	Self-examination data
750MHz Dipole	
	

Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
750	-25.44	-20	55.2 Ω - 1.2 jΩ

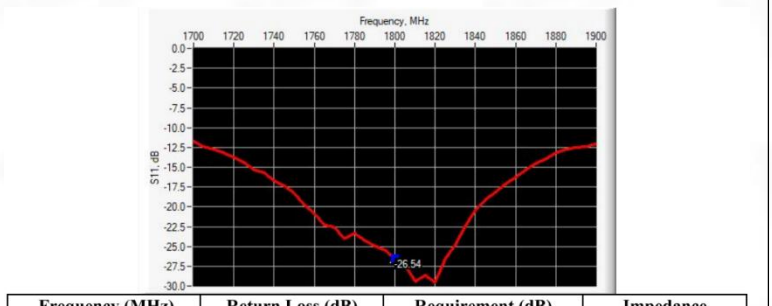
835MHz Dipole



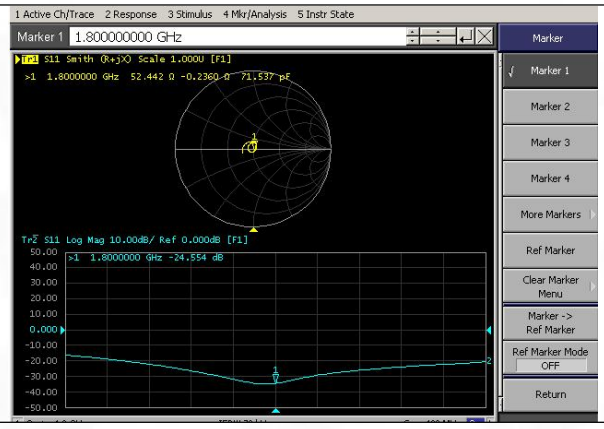
Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
835	-26.27	-20	52.5 Ω - 4.2 jΩ



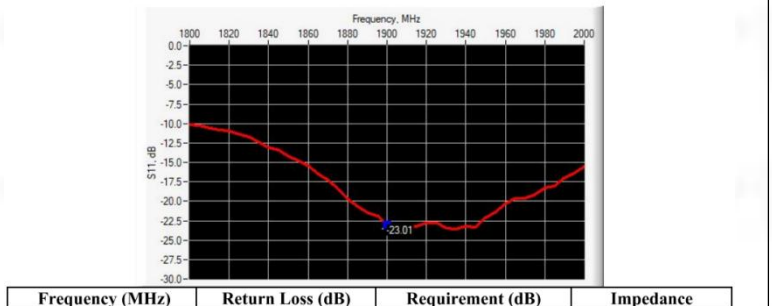
1800MHz Dipole



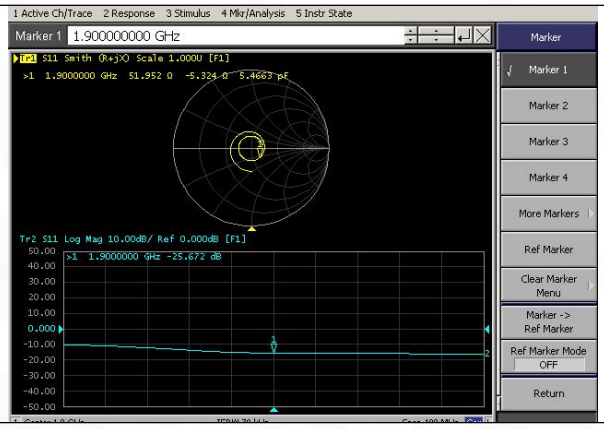
Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
1800	-26.54	-20	52.8 Ω + 3.8 jΩ



1900MHz Dipole



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
1900	-23.01	-20	51.0 Ω - 7.0 jΩ



2450MHz Dipole

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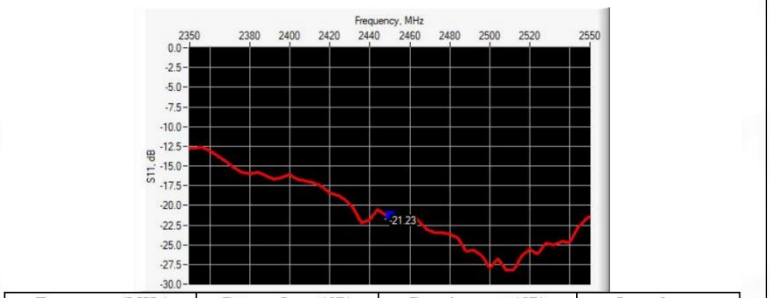
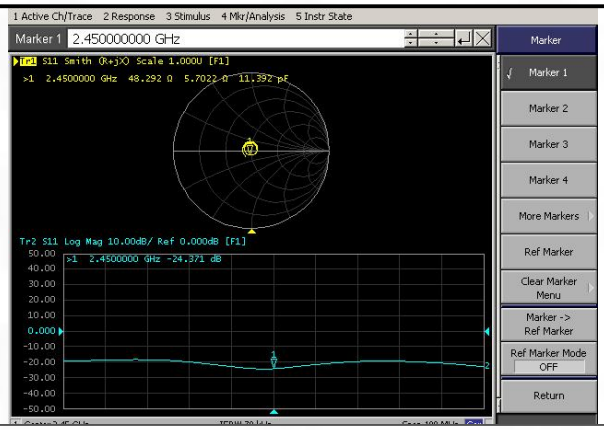
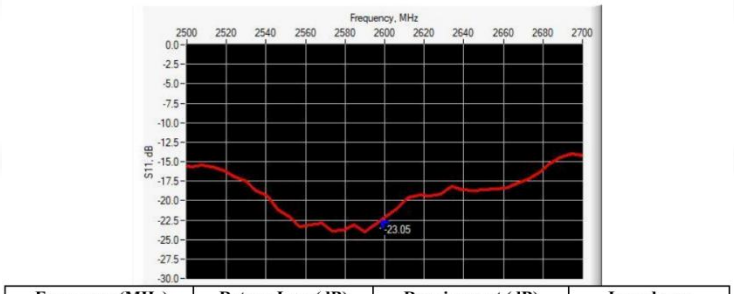


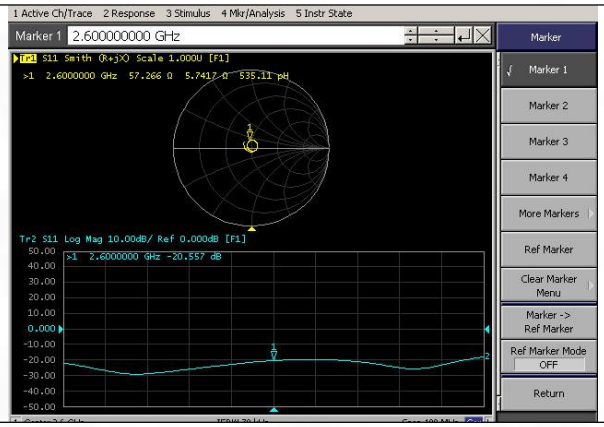
Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
2450	-21.23	-20	49.4 Ω + 8.6 jΩ



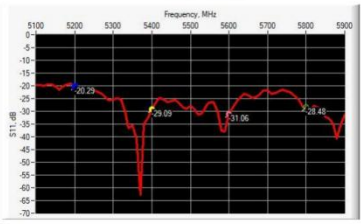
2600MHz Dipole



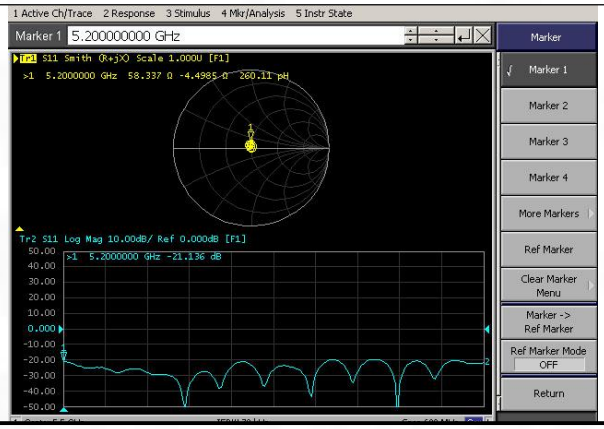
Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
2600	-23.05	-20	54.3 Ω + 5.5 jΩ



5000MHz Dipole



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
5200	-20.29	-20	58.76 Ω - 4.43 jΩ
5400	-29.09	-20	53.46 Ω + 0.61 jΩ
5600	-31.06	-20	52.76 Ω - 0.45 jΩ
5800	-28.48	-20	50.12 Ω - 3.76 jΩ



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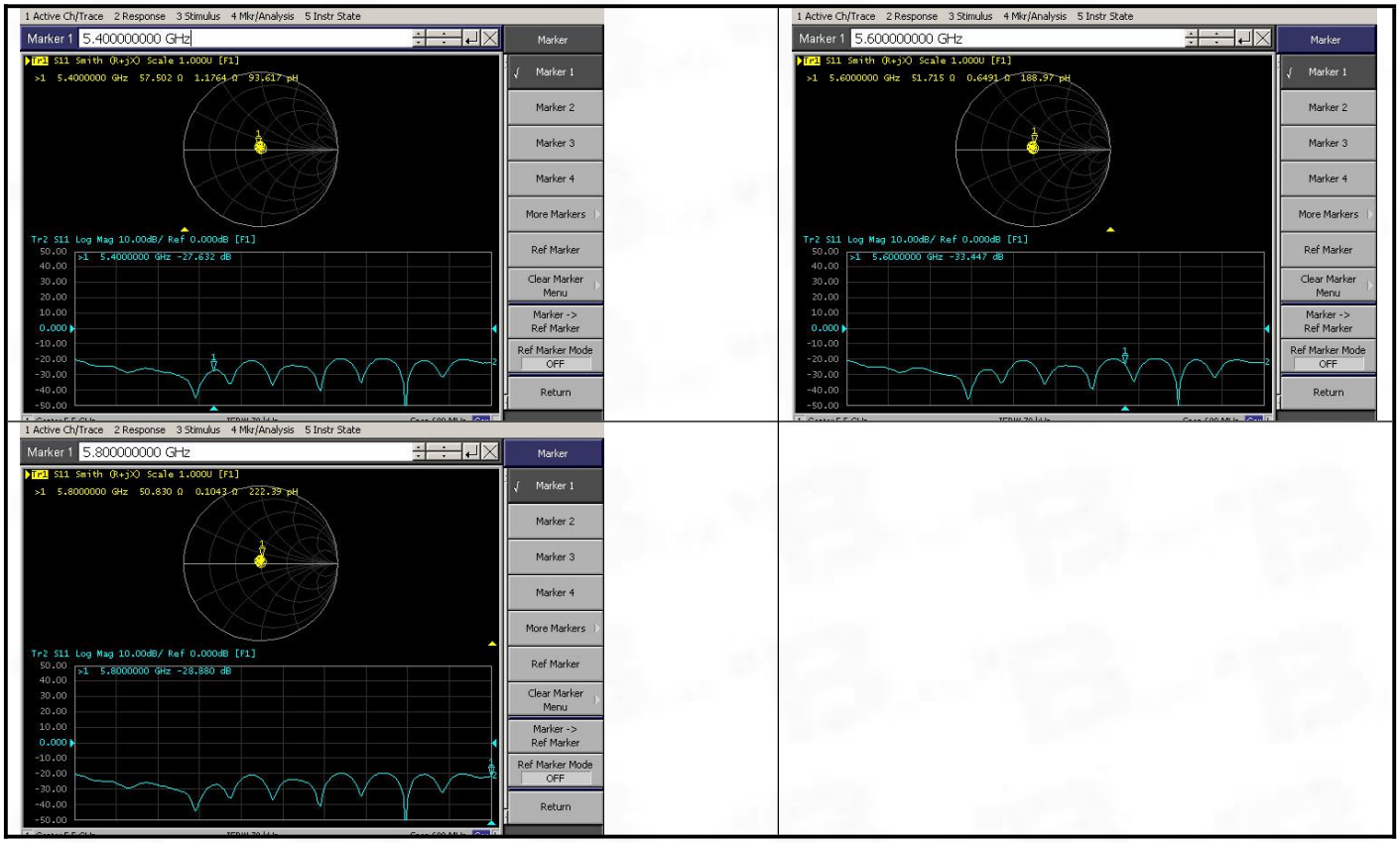

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System Performance Check Data (750 MHz)

System check at 750 MHz

Date of measurement: 14/6/2024

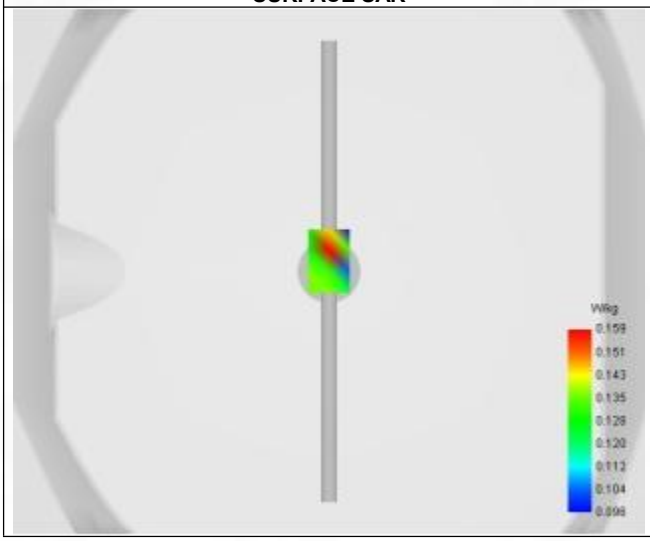
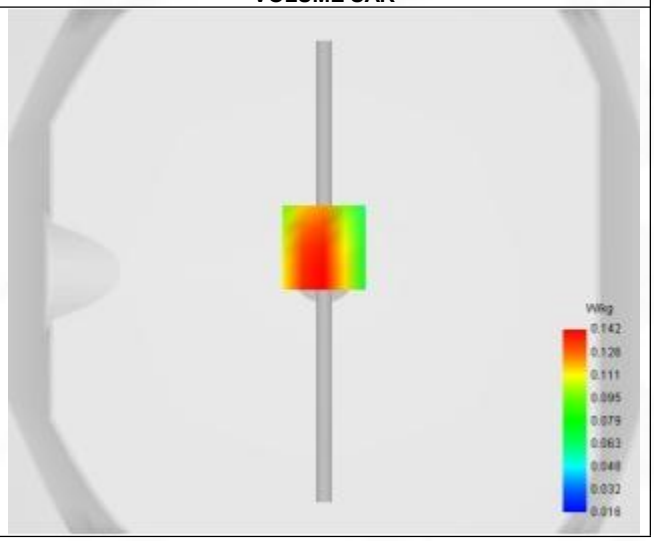
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	1.65
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW750
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	750.000
Relative permitivity (real part)	41.800
Relative permitivity (imaginary part)	21.460
Conductivity (S/m)	0.860

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=9.00 ; SAR Peak: 0.20 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.092
SAR 1g (W/Kg)	0.138
Variation (%)	-2.190
Horizontal validation criteria: minimum distance (mm)	8.000
Vertical validation criteria: SAR ratio M2/M1 (%)	64.79%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.287	0.142	0.092	0.073	0.042

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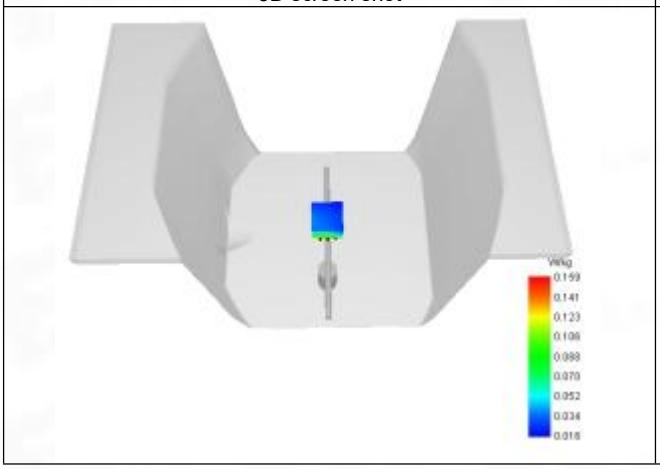
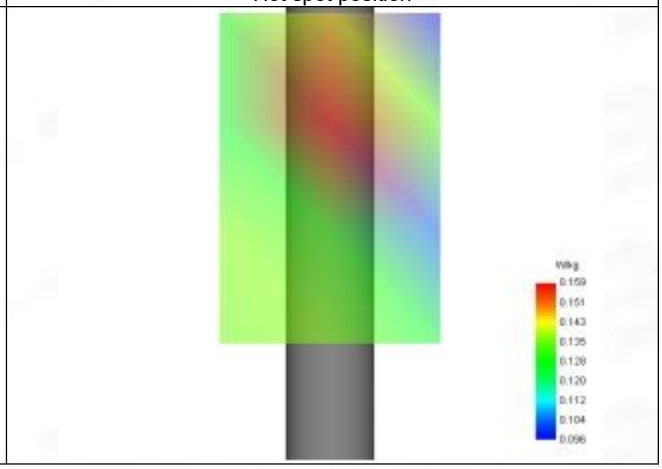
F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (835 MHz)

System check at 835 MHz

Date of measurement: 14/6/2024

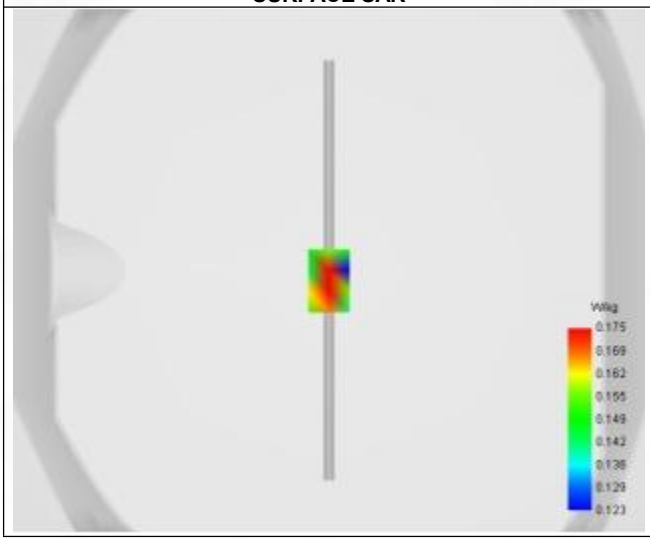
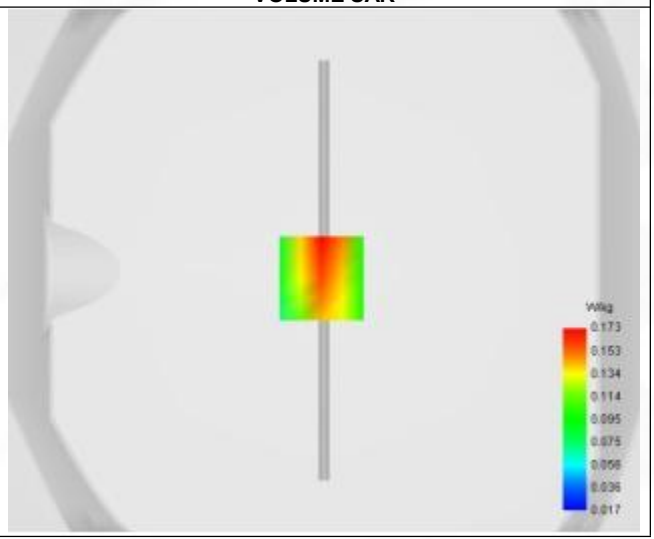
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	1.68
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	835.000
Relative permitivity (real part)	41.410
Relative permitivity (imaginary part)	19.490
Conductivity (S/m)	0.870

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-1.00, Y=-3.00 ; SAR Peak: 0.26 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.106
SAR 1g (W/Kg)	0.163
Variation (%)	-3.390
Horizontal validation criteria: minimum distance (mm)	8.890
Vertical validation criteria: SAR ratio M2/M1 (%)	66.47%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.059	0.173	0.115	0.061	0.072

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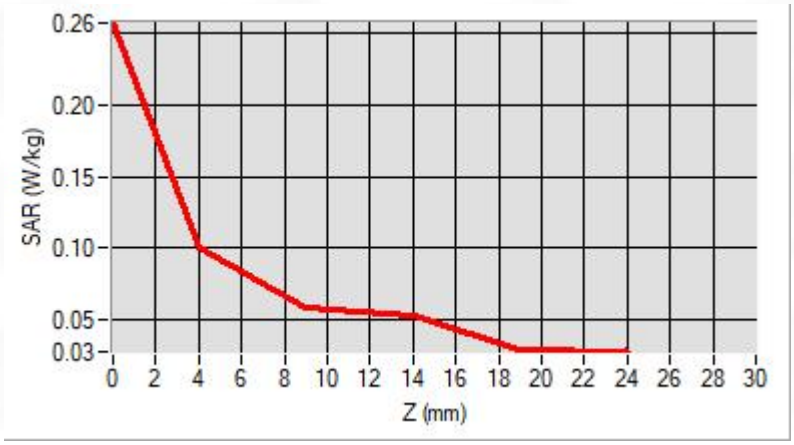
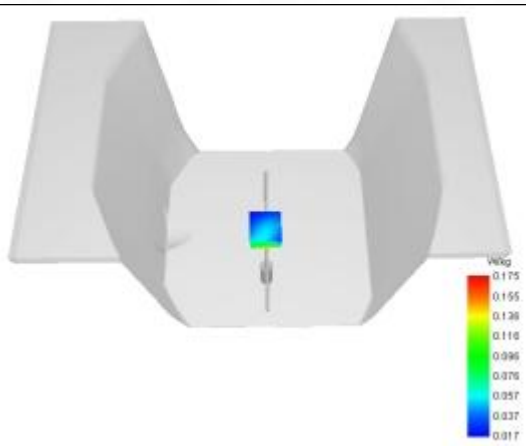
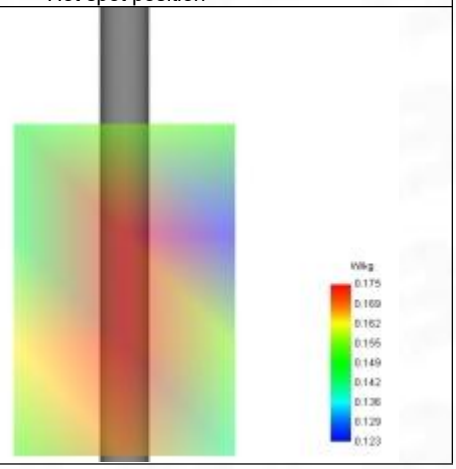


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (1800 MHz)

System check at 1800 MHz

Date of measurement: 17/6/2024

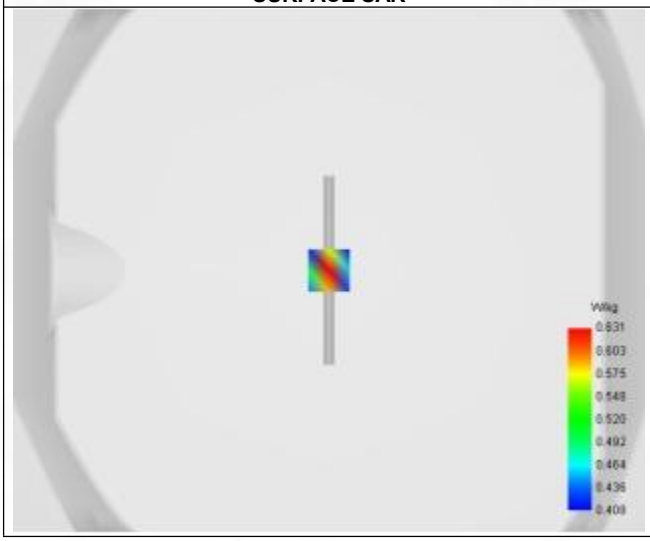
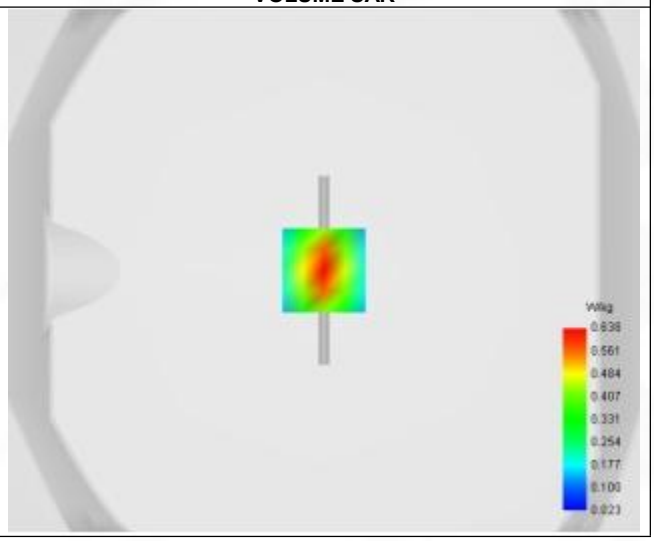
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	1.96
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	1800.000
Relative permitivity (real part)	39.910
Relative permitivity (imaginary part)	14.090
Conductivity (S/m)	1.370

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 1.00 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.312
SAR 1g (W/Kg)	0.588
Variation (%)	-0.250
Horizontal validation criteria: minimum distance (mm)	9.588
Vertical validation criteria: SAR ratio M2/M1 (%)	55.80%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.003	0.638	0.356	0.204	0.127

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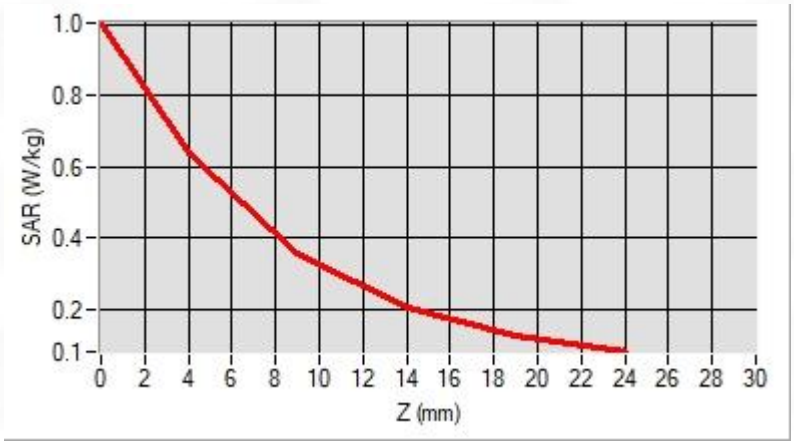
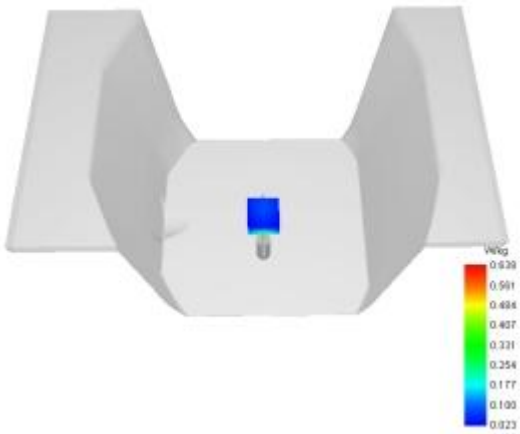
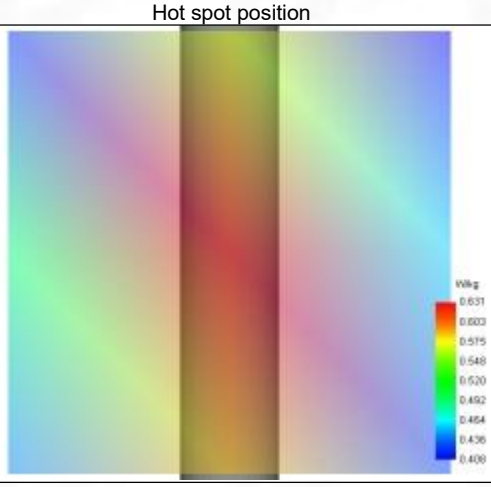


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (1900 MHz)

System check at 1900 MHz

Date of measurement: 18/6/2024

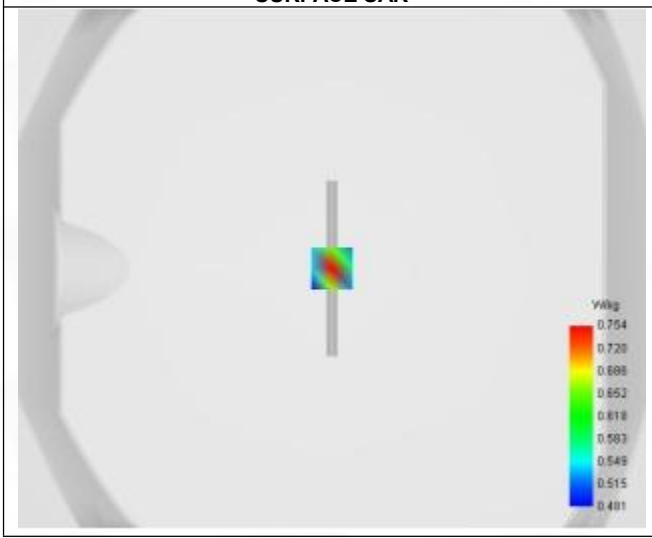
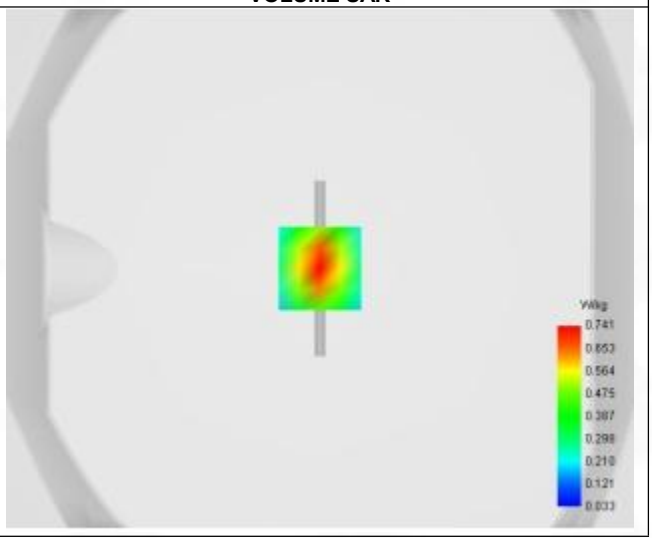
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.24
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	1900.000
Relative permitivity (real part)	39.880
Relative permitivity (imaginary part)	13.380
Conductivity (S/m)	1.410

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 1.18 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.322
SAR 1g (W/Kg)	0.630
Variation (%)	-2.080
Horizontal validation criteria: minimum distance (mm)	9.000
Vertical validation criteria: SAR ratio M2/M1 (%)	52.96%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.201	0.759	0.402	0.239	0.156

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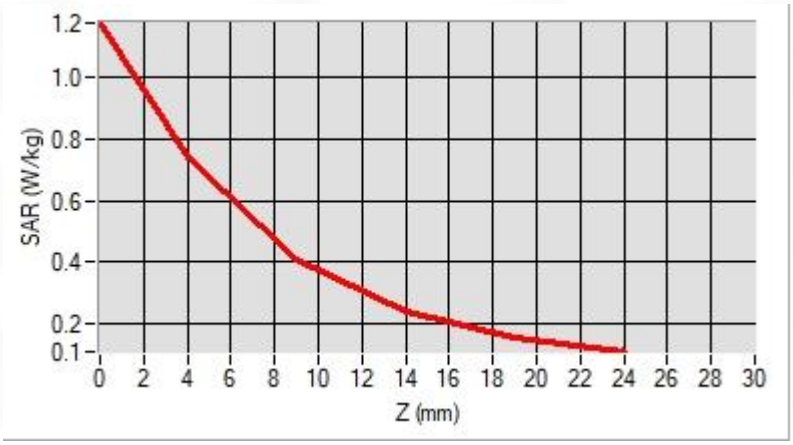
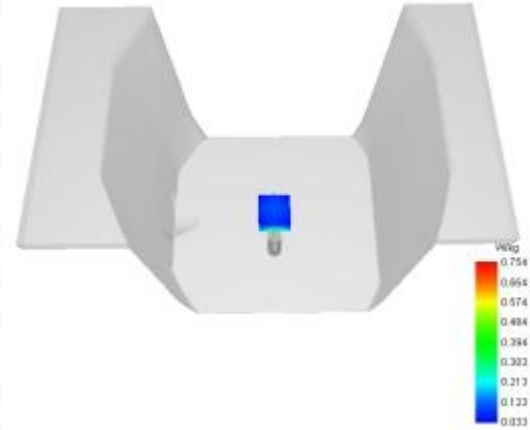
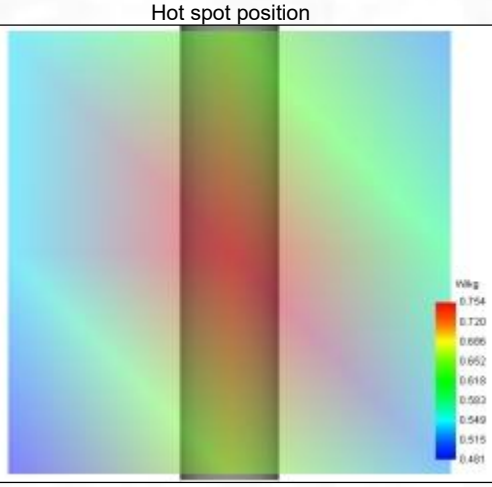


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (2450 MHz)

System check at 2450 MHz

Date of measurement: 19/6/2024

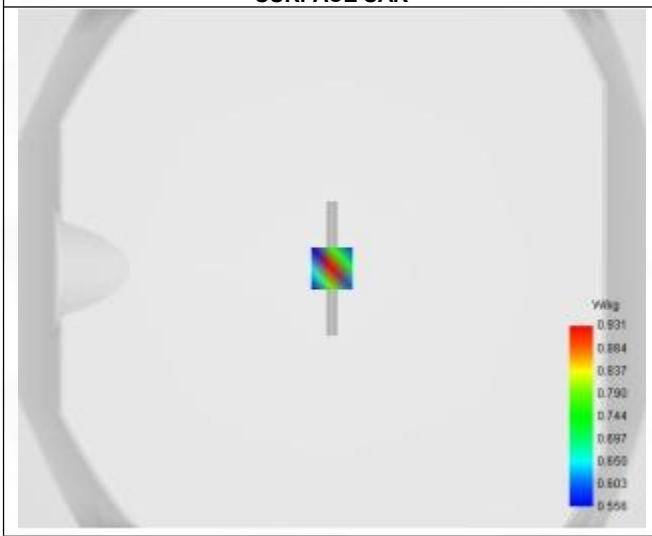
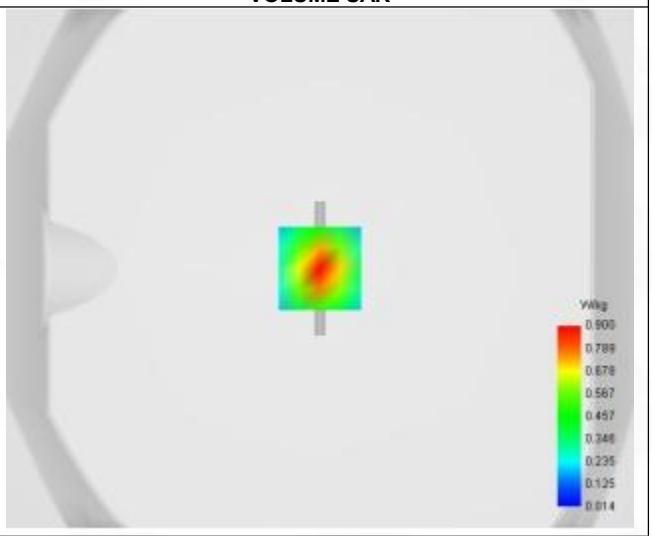
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.36
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	2450.000
Relative permitivity (real part)	39.080
Relative permitivity (imaginary part)	13.340
Conductivity (S/m)	1.810

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 1.47 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.352
SAR 1g (W/Kg)	0.793
Variation (%)	-2.570
Horizontal validation criteria: minimum distance (mm)	9.070
Vertical validation criteria: SAR ratio M2/M1 (%)	51.89%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.466	0.900	0.477	0.261	0.158

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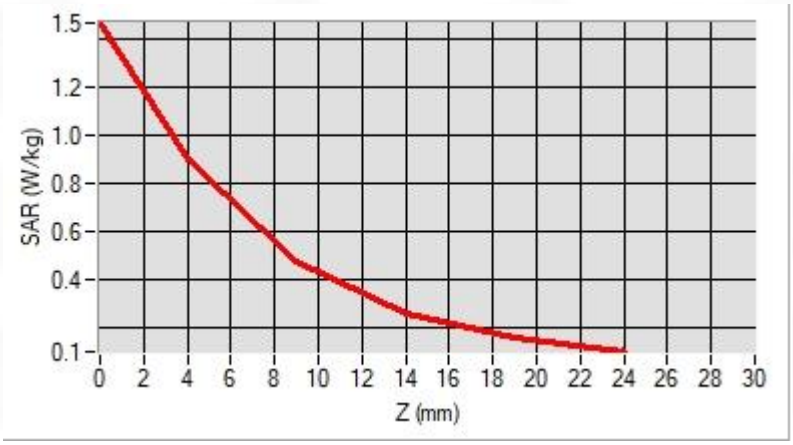
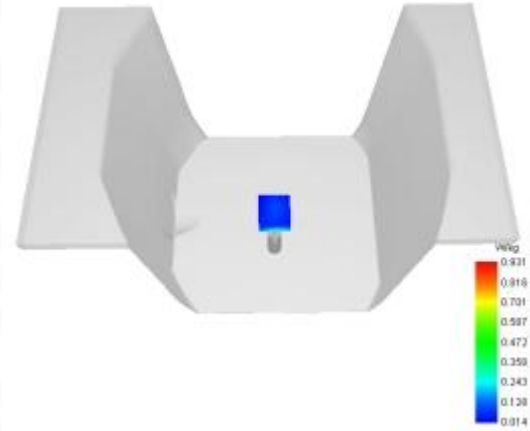
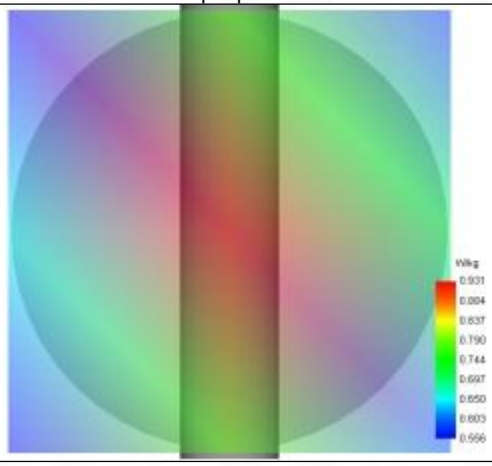


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (2600 MHz)

System check at 2600 MHz

Date of measurement: 19/6/2024

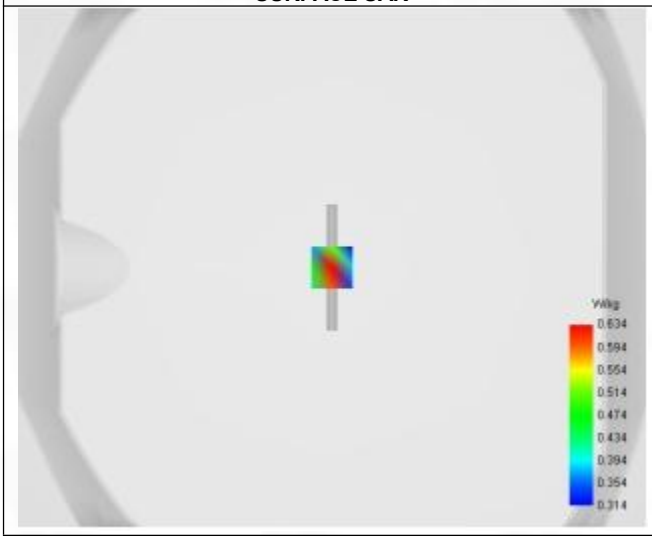
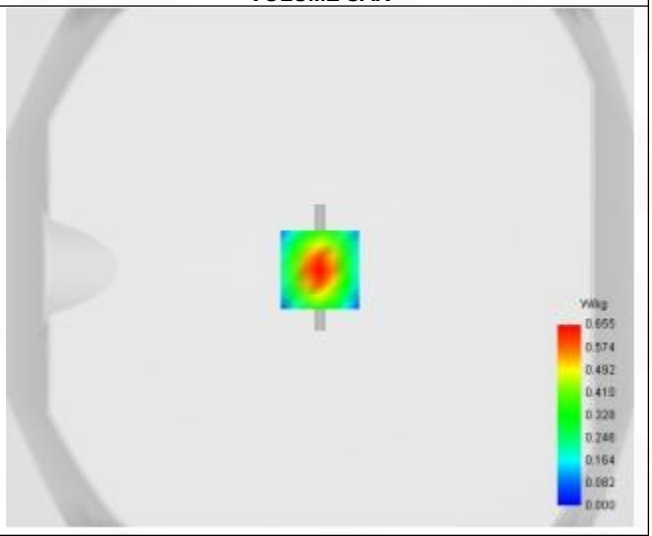
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.40
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW2600
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	2600.000
Relative permitivity (real part)	38.880
Relative permitivity (imaginary part)	12.690
Conductivity (S/m)	1.970

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=-1.00 ; SAR Peak: 1.02 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.421
SAR 1g (W/Kg)	0.866
Variation (%)	2.980
Horizontal validation criteria: minimum distance (mm)	8.298
Vertical validation criteria: SAR ratio M2/M1 (%)	54.81%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.020	0.655	0.359	0.187	0.091

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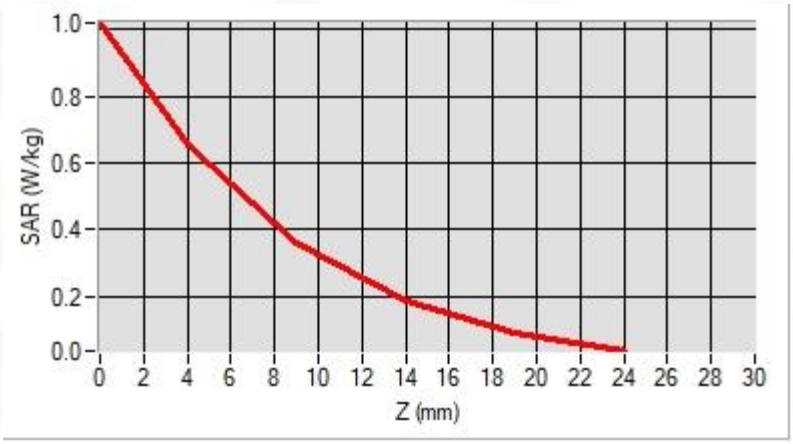
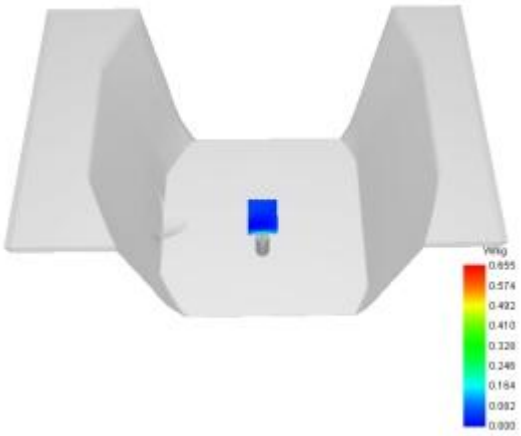
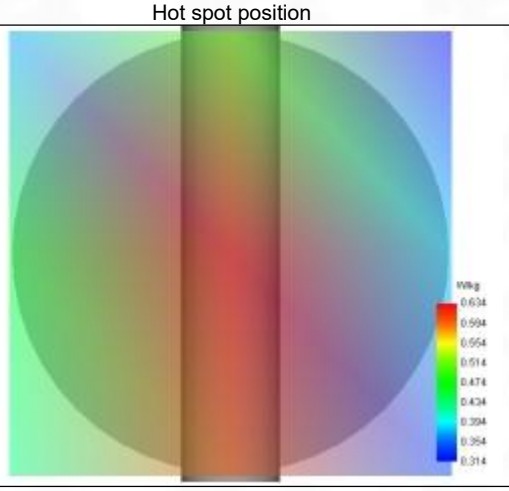


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (5200 MHz)

System check at 5200 MHz

Date of measurement: 21/6/2024

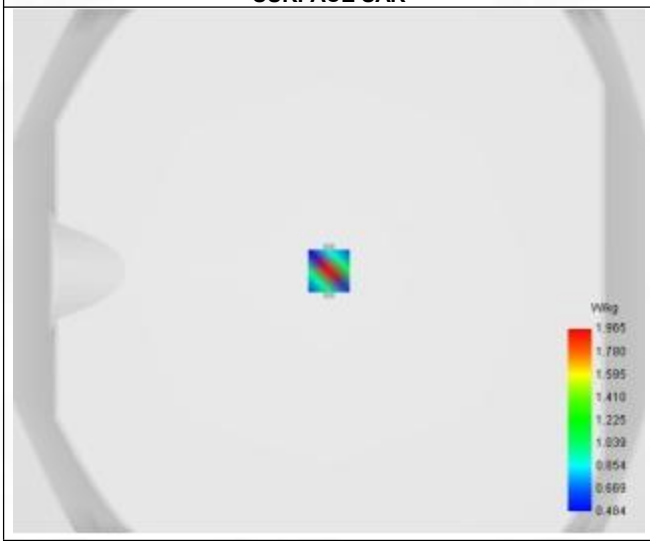
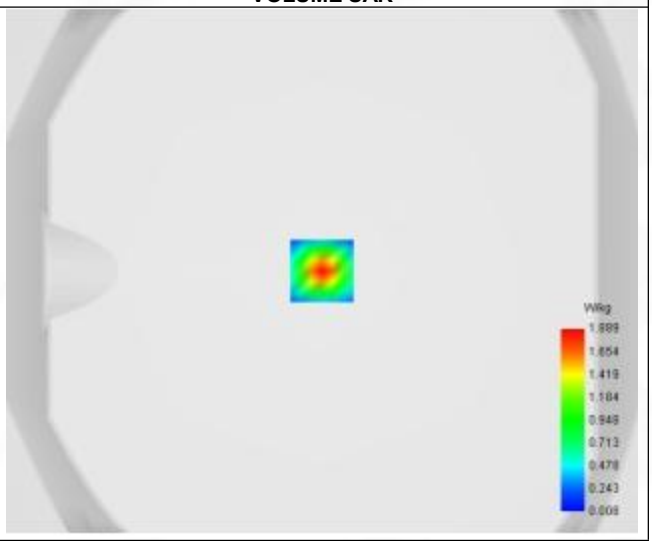
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.24
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	5200.000
Relative permitivity (real part)	35.880
Relative permitivity (imaginary part)	16.250
Conductivity (S/m)	4.700

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 3.38 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.288
SAR 1g (W/Kg)	1.019
Variation (%)	-3.400
Horizontal validation criteria: minimum distance (mm)	6.952
Vertical validation criteria: SAR ratio M2/M1 (%)	54.05%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	3.268	1.889	1.021	0.523	0.266	0.142	0.085	0.060	0.052

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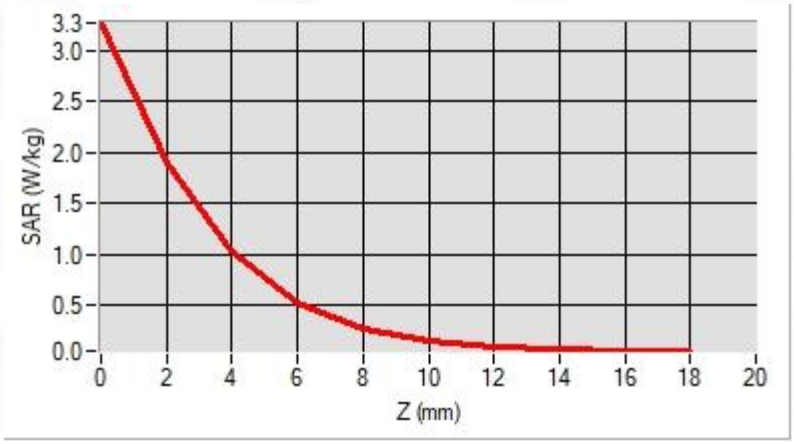
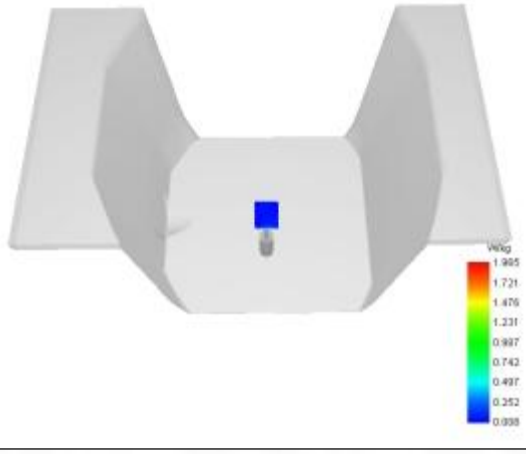
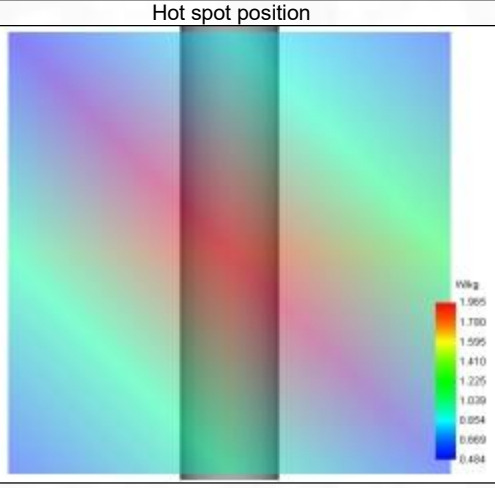


F. 3D Image

3D screen shot	Hot spot position
	

System Performance Check Data (5400 MHz)

System check at 5400 MHz

Date of measurement: 21/6/2024

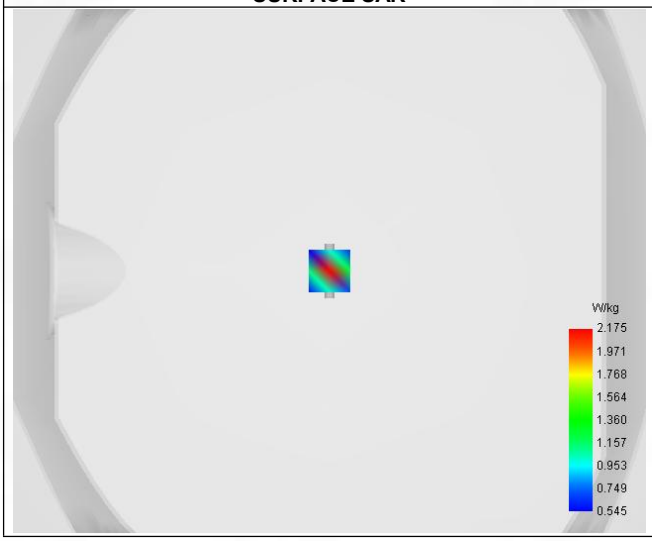
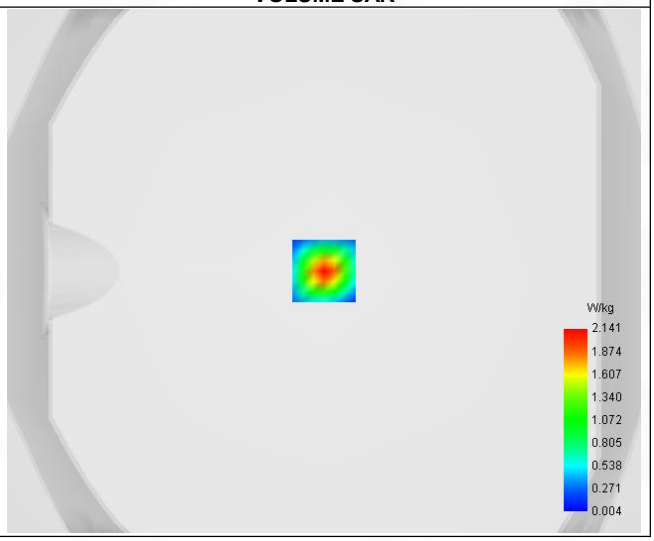
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.12
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5400
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	5400.000
Relative permitivity (real part)	35.680
Relative permitivity (imaginary part)	16.320
Conductivity (S/m)	4.900

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 3.78 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.299
SAR 1g (W/Kg)	1.051
Variation (%)	-4.610
Horizontal validation criteria: minimum distance (mm)	6.274
Vertical validation criteria: SAR ratio M2/M1 (%)	54.97%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	3.660	2.141	1.177	0.614	0.317	0.169	0.098	0.065	0.050

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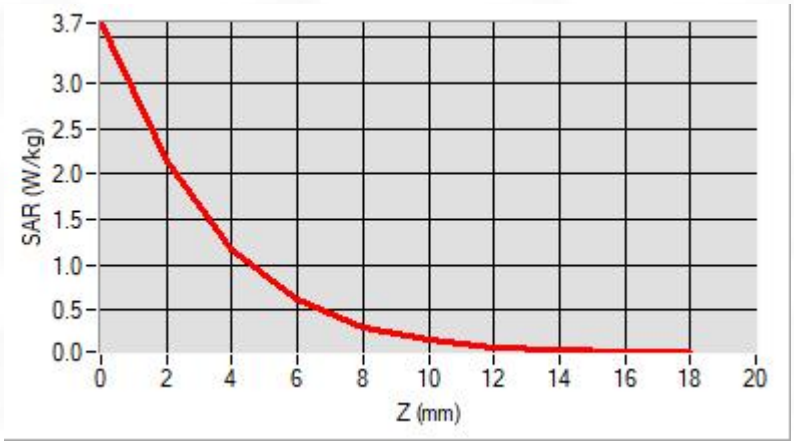
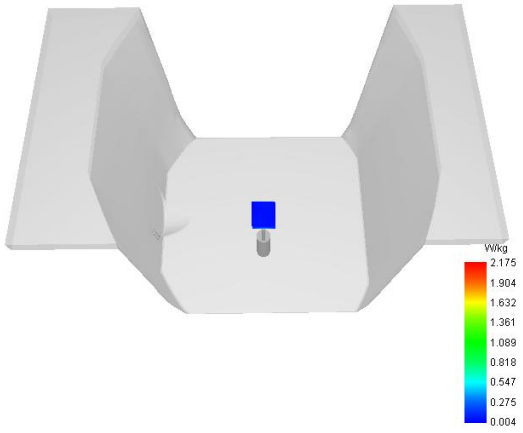
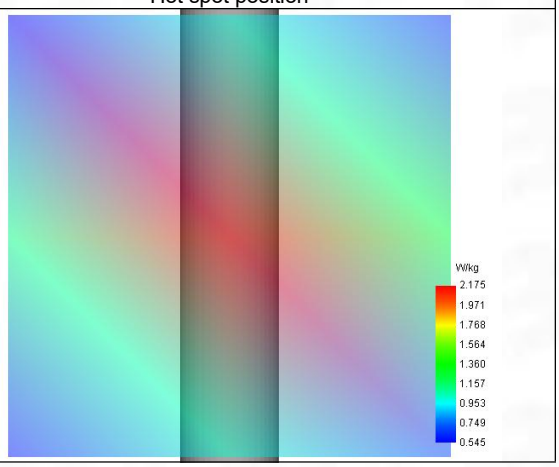


F. 3D Image

3D screen shot	Hot spot position
	

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System Performance Check Data (5600 MHz)

System check at 5600 MHz

Date of measurement: 21/6/2024

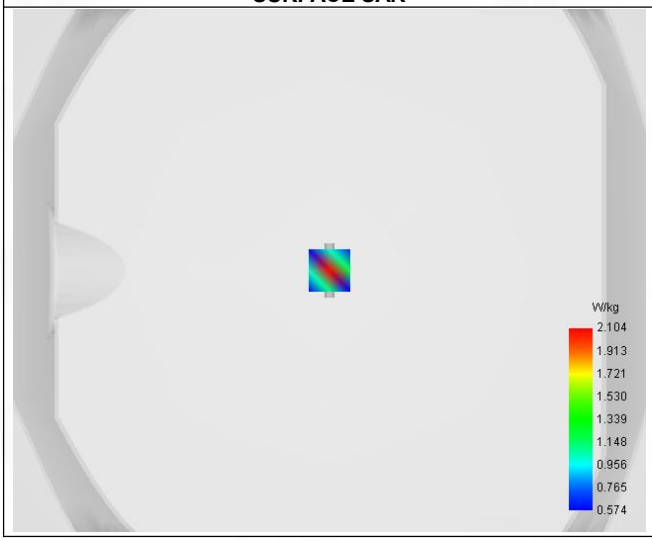
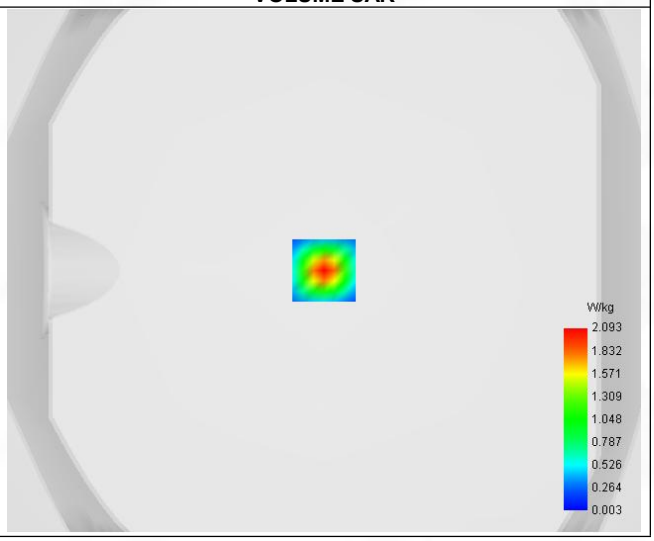
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.18
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5600
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	5600.000
Relative permitivity (real part)	35.380
Relative permitivity (imaginary part)	16.420
Conductivity (S/m)	5.110

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 3.90 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.304
SAR 1g (W/Kg)	1.084
Variation (%)	-0.190
Horizontal validation criteria: minimum distance (mm)	7.214
Vertical validation criteria: SAR ratio M2/M1 (%)	51.31%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	3.748	2.093	1.074	0.514	0.243	0.122	0.072	0.056	0.056

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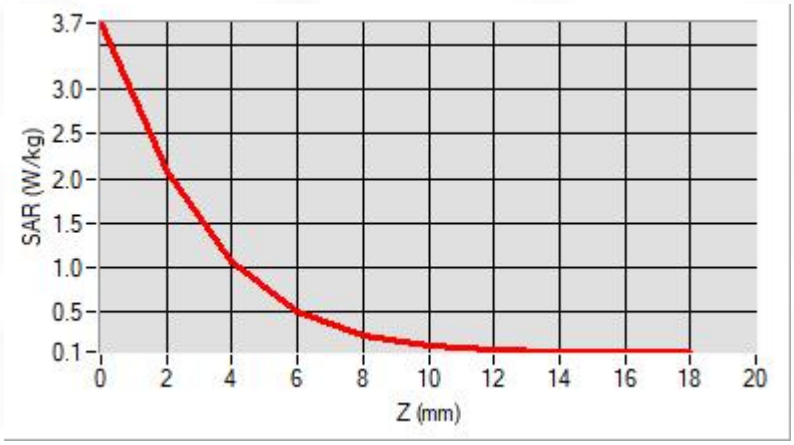
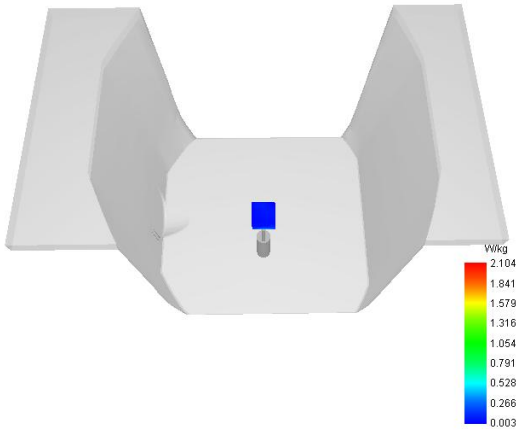
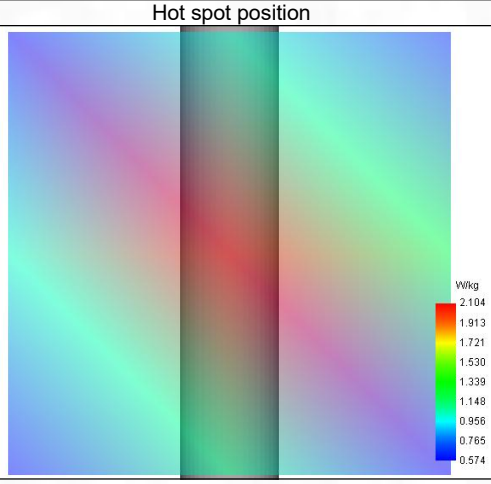


F. 3D Image

3D screen shot	Hot spot position
	

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System Performance Check Data (5800 MHz)

System check at 5800 MHz

Date of measurement: 21/6/2024

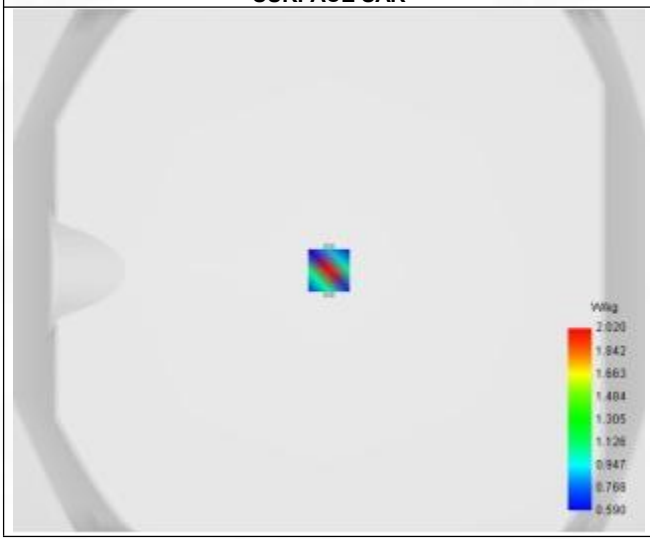
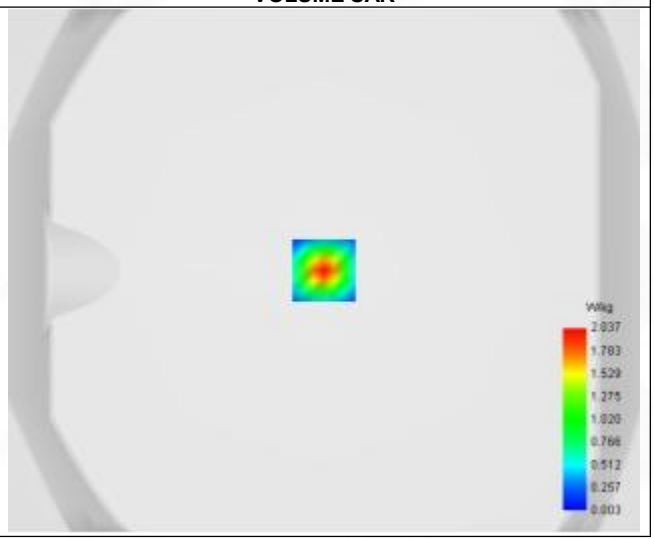
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.04
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW

B. Permitivity

Frequency (MHz)	5800.000
Relative permitivity (real part)	35.180
Relative permitivity (imaginary part)	16.480
Conductivity (S/m)	5.310

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00 ; SAR Peak: 4.17 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.277
SAR 1g (W/Kg)	0.981
Variation (%)	0.490
Horizontal validation criteria: minimum distance (mm)	6.487
Vertical validation criteria: SAR ratio M2/M1 (%)	44.92%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	3.948	2.037	0.915	0.361	0.135	0.055	0.033	0.037	0.059

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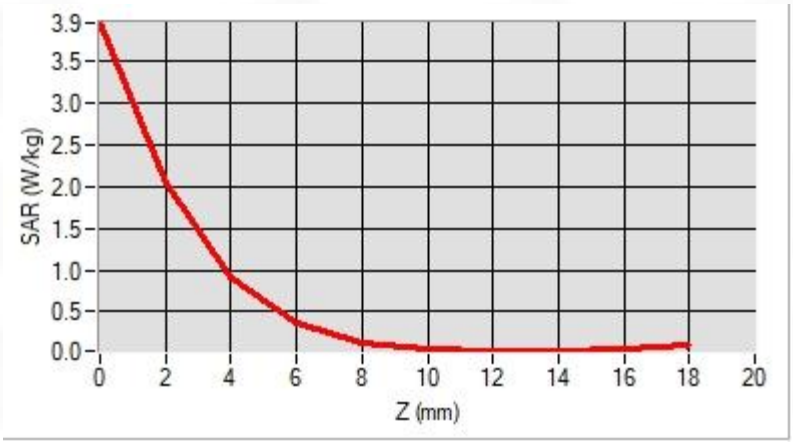
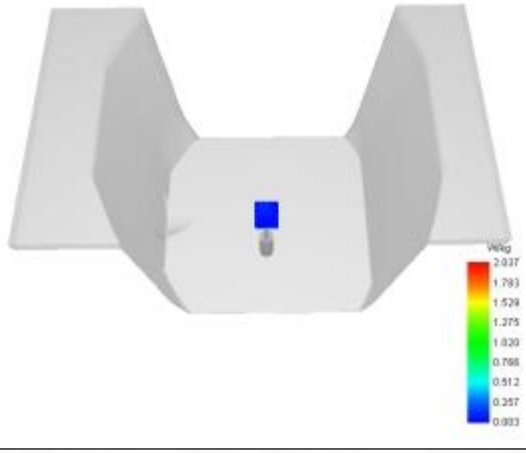
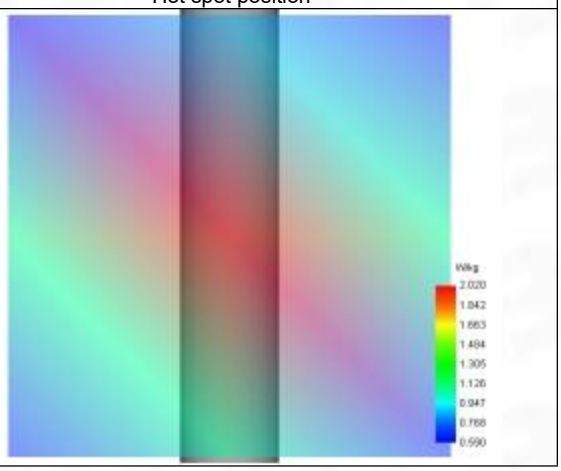


F. 3D Image

3D screen shot	Hot spot position
	

ANNEX D Test Data

1-Body with back position in dist. 0mm on Channel 128 in GPRS850+2slots

SAR Measurement at GPRS850 (Body, Validation Plane)

Date of measurement: 14/6/2024

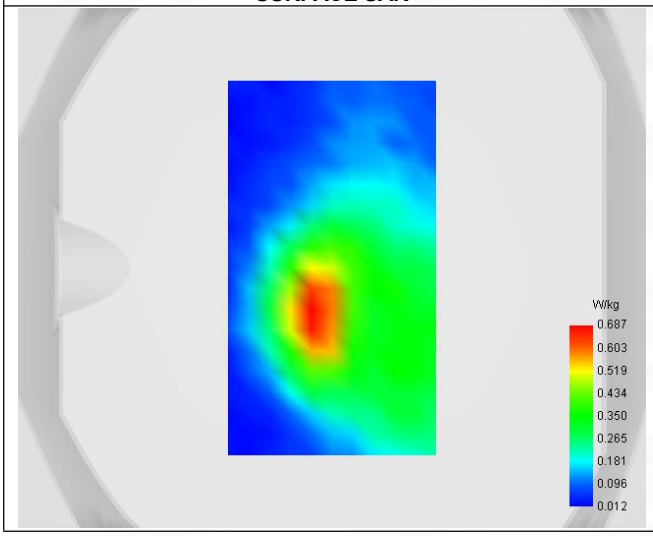
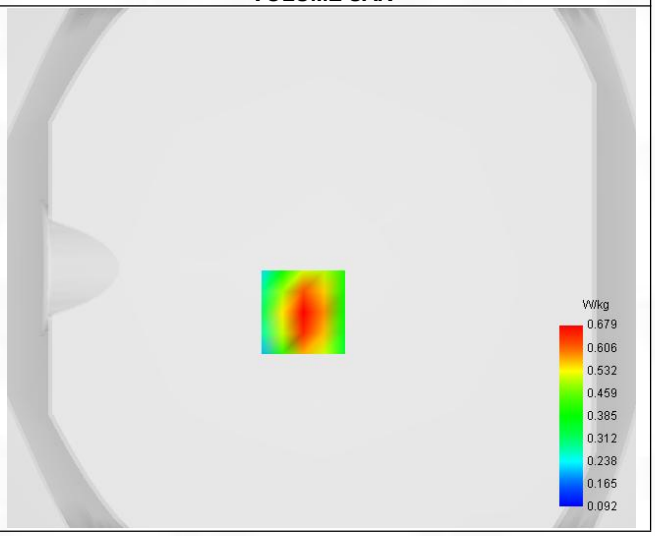
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.68
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GPRS850
Channels	Higher (251)
Signal	TDMA (GPRS)
Modulation	GMSK (CS-1)
TX-slots	2

B. Permitivity

Frequency (MHz)	848.800
Relative permitivity (real part)	41.389
Relative permitivity (imaginary part)	19.413
Conductivity (S/m)	0.877

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-7.00, Y=-17.00 ; SAR Peak: 0.94 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.398
SAR 1g (W/Kg)	0.640
Variation (%)	-3.320
Horizontal validation criteria: minimum distance (mm)	8.965
Vertical validation criteria: SAR ratio M2/M1 (%)	66.86%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00

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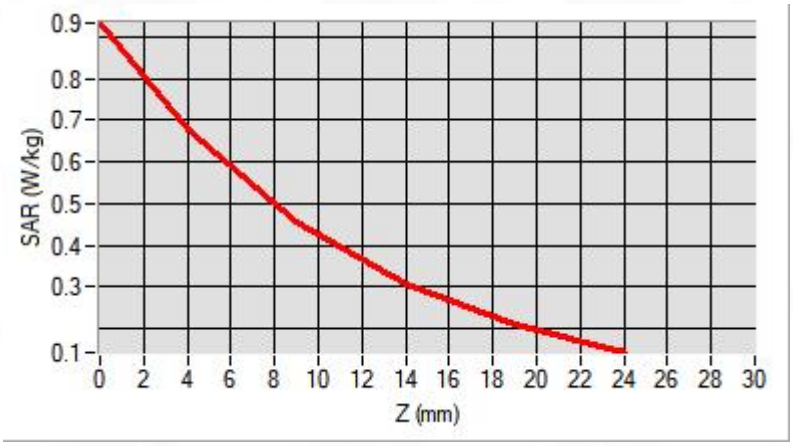
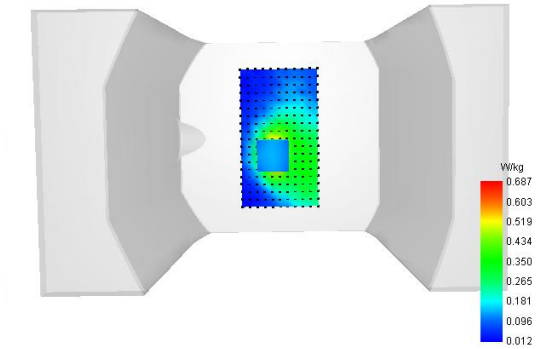
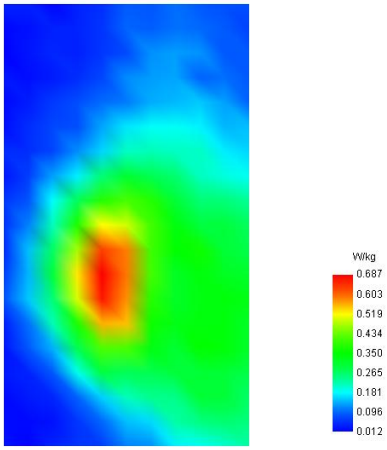
SAR (W/Kg)	0.933	0.679	0.454	0.306	0.211



F. 3D Image

3D screen shot	Hot spot position
	

2-Body with back position in dist. 0mm on Channel 512 in GPRS1900+3slots

SAR Measurement at GPRS1900 (Body, Validation Plane)

Date of measurement: 14/6/2024

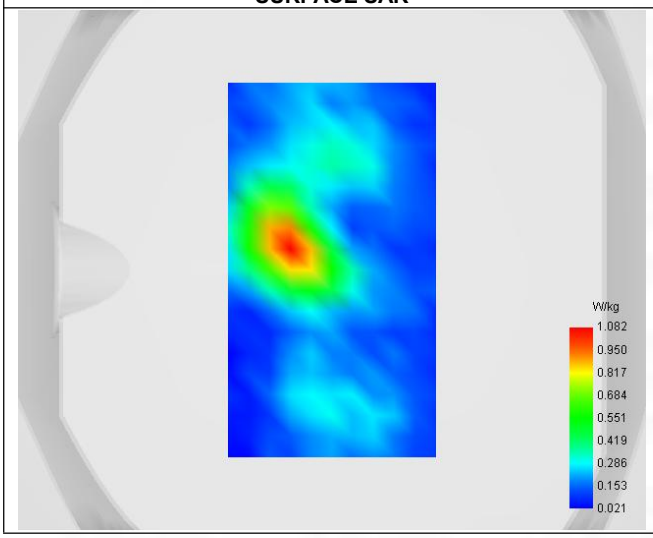
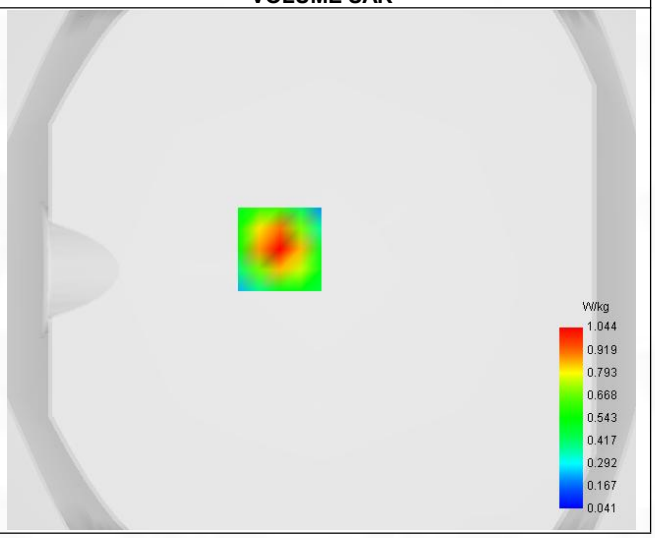
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	2.07
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GPRS1900
Channels	Lower (512)
Signal	TDMA (GPRS)
Modulation	GMSK (CS-1)
TX-slots	3

B. Permitivity

Frequency (MHz)	1850.200
Relative permitivity (real part)	39.895
Relative permitivity (imaginary part)	13.734
Conductivity (S/m)	1.390

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-16.00, Y=8.00 ; SAR Peak: 1.63 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.518
SAR 1g (W/Kg)	0.969
Variation (%)	3.270
Horizontal validation criteria: minimum distance (mm)	8.794
Vertical validation criteria: SAR ratio M2/M1 (%)	55.94%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.632	1.044	0.584	0.330	0.198

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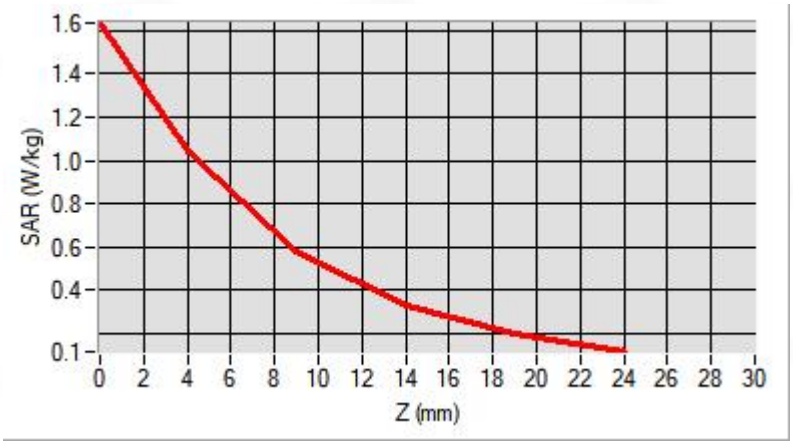
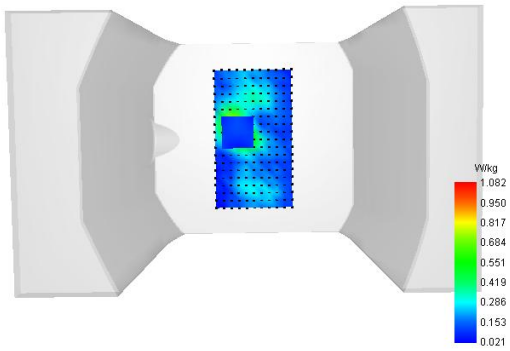
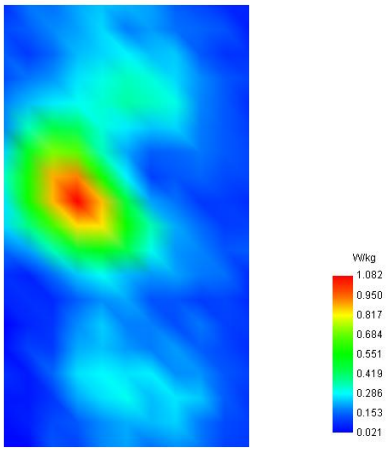


F. 3D Image

3D screen shot	Hot spot position
	

3-Body with back position in dist. 0mm on Channel 9538 in WCDMA Band 2

SAR Measurement at Band 2 (1900) (Body, Validation Plane)

Date of measurement: 18/6/2024

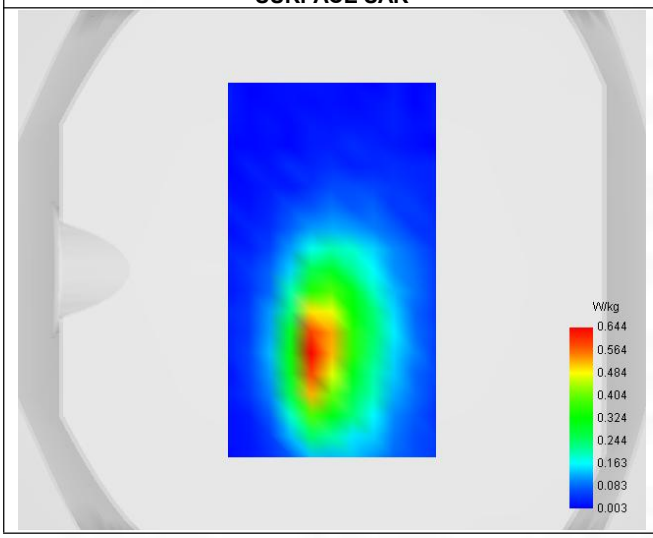
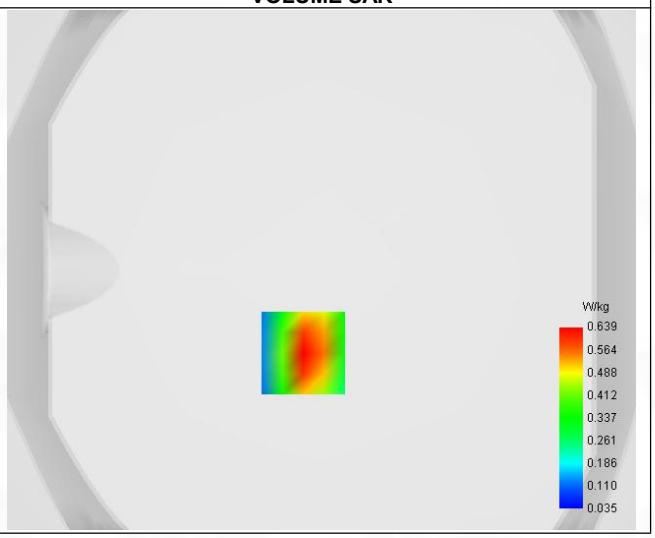
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	2.07
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band 2 (1900)
Channels	Higher (9538)
Signal	WCDMA
Mode	Release 99
Connection Type	RMC, 12.2 kbps

B. Permitivity

Frequency (MHz)	1907.600
Relative permitivity (real part)	39.869
Relative permitivity (imaginary part)	13.379
Conductivity (S/m)	1.416

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-7.00, Y=-32.00 ; SAR Peak: 1.04 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.327
SAR 1g (W/Kg)	0.604
Variation (%)	-2.410
Horizontal validation criteria: minimum distance (mm)	9.267
Vertical validation criteria: SAR ratio M2/M1 (%)	53.68%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.032	0.639	0.343	0.191	0.117

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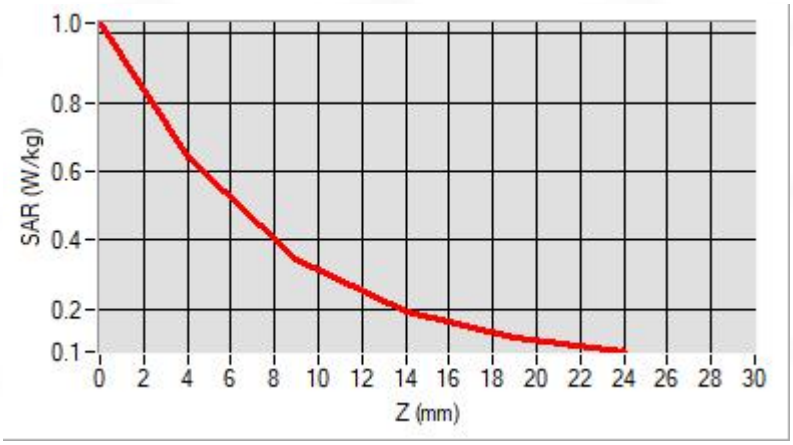
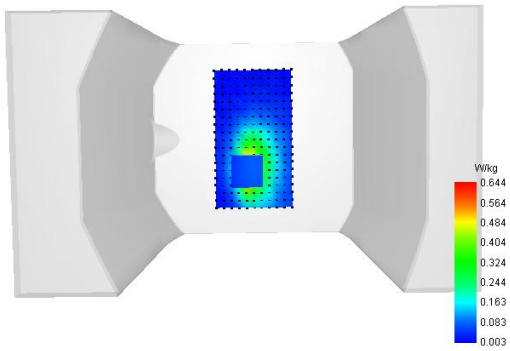
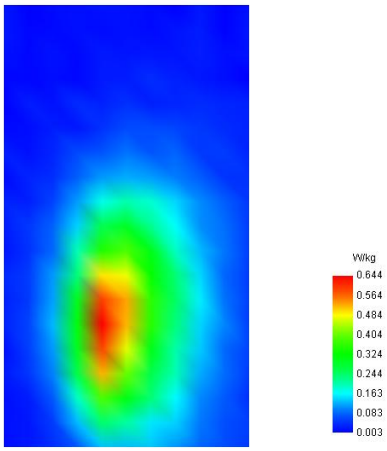


F. 3D Image

3D screen shot	Hot spot position
	

4-Body with back position in dist. 0mm on Channel 4182 in WCDMA Band 5

SAR Measurement at Band 5 (850) (Body, Validation Plane)

Date of measurement: 14/6/2024

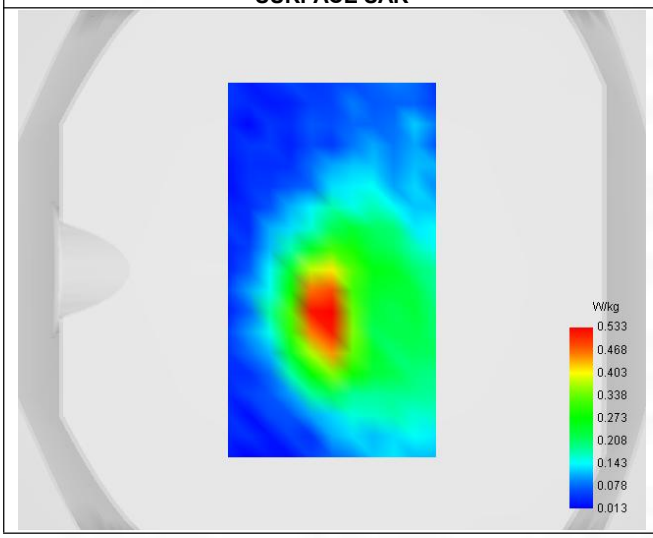
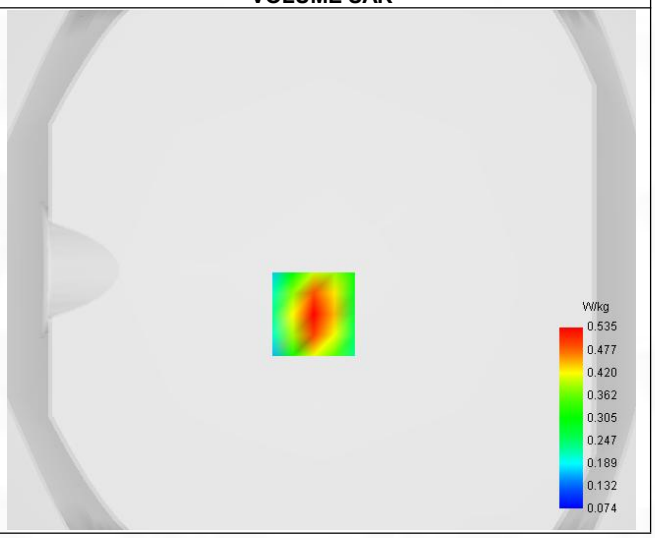
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.68
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band 5 (850)
Channels	Middle (4182)
Signal	WCDMA
Mode	Release 99
Connection Type	RMC, 12.2 kbps

B. Permitivity

Frequency (MHz)	836.600
Relative permitivity (real part)	41.408
Relative permitivity (imaginary part)	19.481
Conductivity (S/m)	0.871

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-3.00, Y=-17.00 ; SAR Peak: 0.73 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.315
SAR 1g (W/Kg)	0.535
Variation (%)	-2.650
Horizontal validation criteria: minimum distance (mm)	9.264
Vertical validation criteria: SAR ratio M2/M1 (%)	68.04%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.724	0.535	0.364	0.250	0.174

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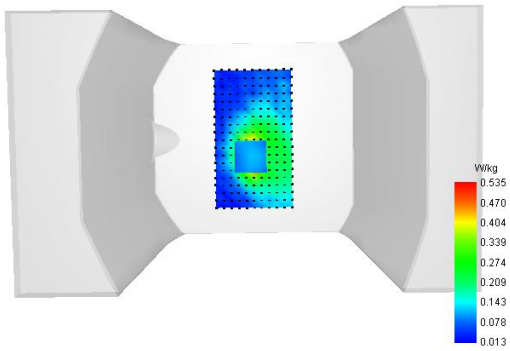
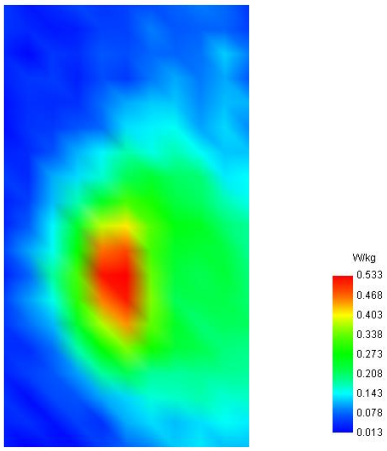
F. 3D Image

3D screen shot	Hot spot position
	

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5-Body with back position in dist. 0mm on Channel 6 in IEEE 802.11b ISM

SAR Measurement at IEEE 802.11b ISM (Body, Validation Plane)

Date of measurement: 19/6/2024

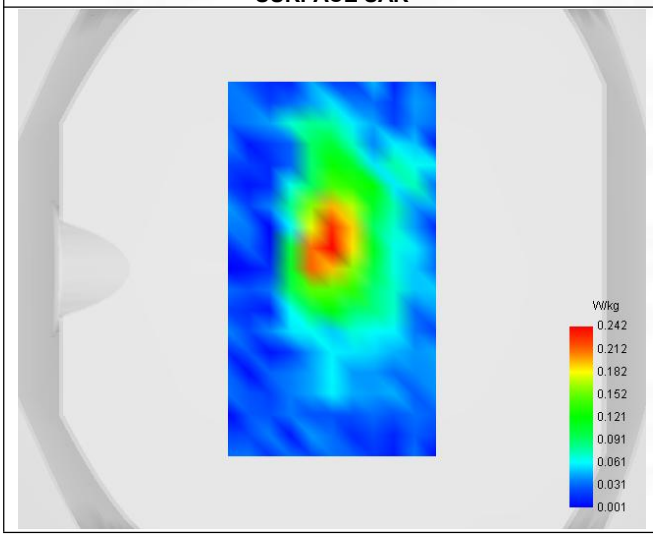
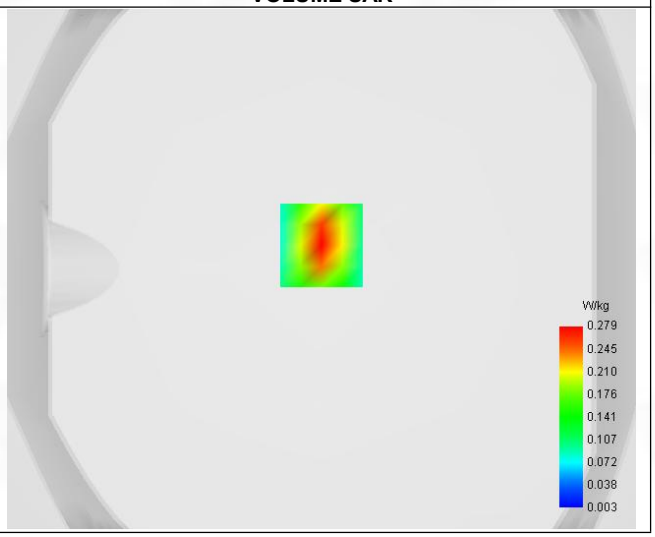
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.36
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	Middle (6)
Signal	IEEE 802.11

B. Permitivity

Frequency (MHz)	2437.000
Relative permitivity (real part)	39.099
Relative permitivity (imaginary part)	13.341
Conductivity (S/m)	1.801

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=9.00 ; SAR Peak: 0.53 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.132
SAR 1g (W/Kg)	0.265
Variation (%)	2.700
Horizontal validation criteria: minimum distance (mm)	8.596
Vertical validation criteria: SAR ratio M2/M1 (%)	41.94%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.529	0.279	0.117	0.051	0.029

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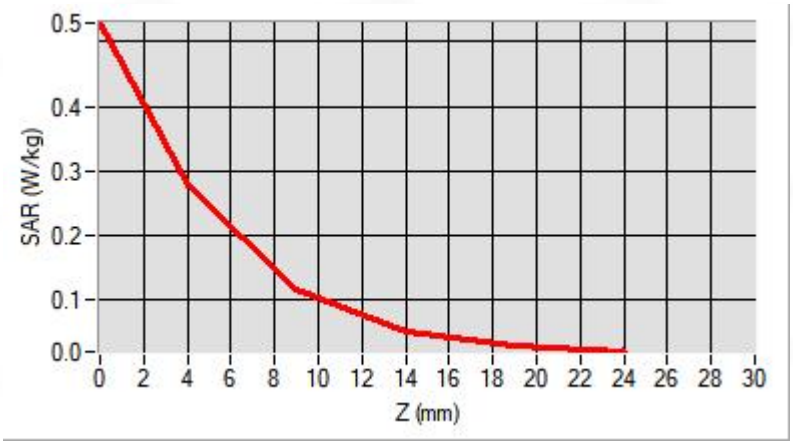
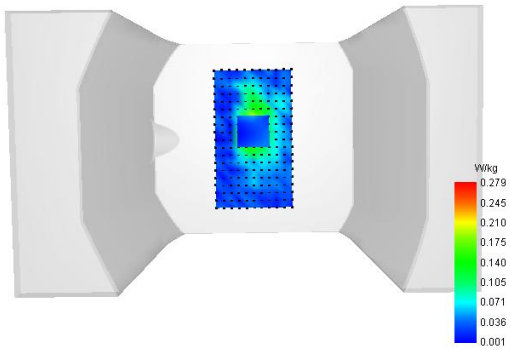
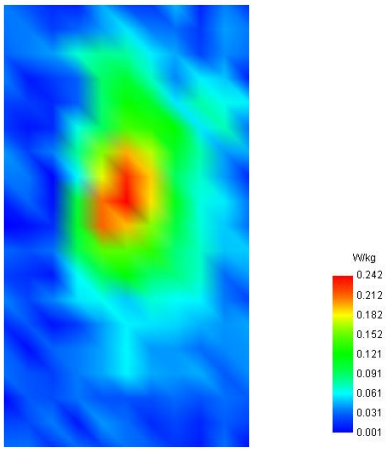


F. 3D Image

3D screen shot	Hot spot position
	

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6-Body with back position in dist. 0mm on Channel 48 in IEEE 802.11a U-NII

SAR Measurement at IEEE 802.11a U-NII (Body, Validation Plane)

Date of measurement: 21/6/2024

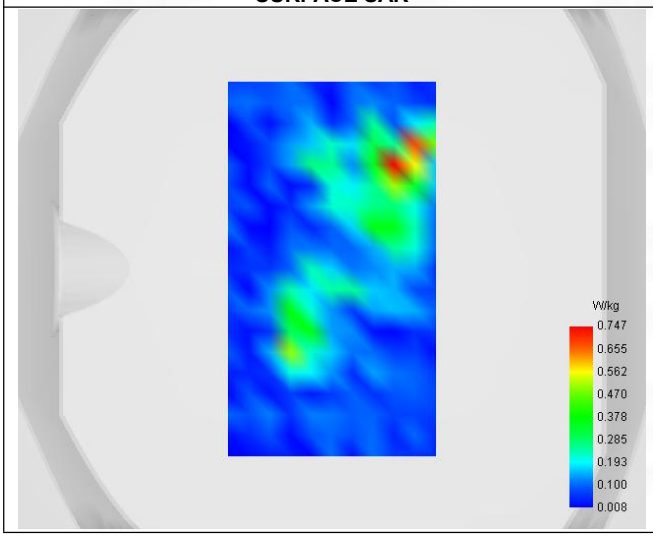
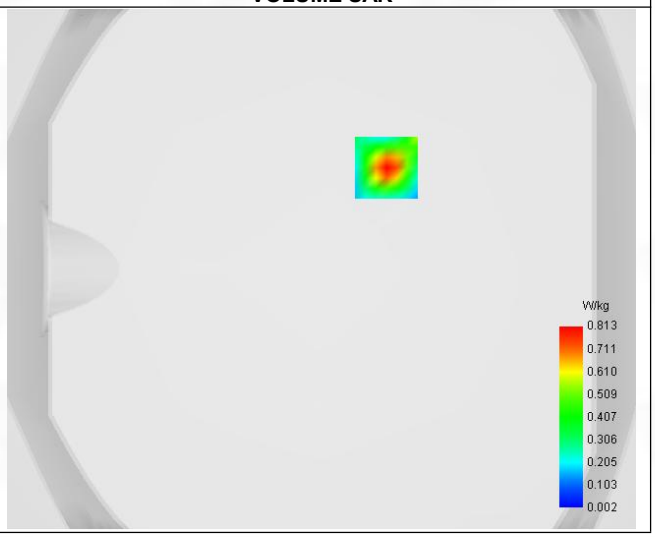
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.24
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Higher (48)
Signal	IEEE 802.11

B. Permitivity

Frequency (MHz)	5240.000
Relative permitivity (real part)	35.840
Relative permitivity (imaginary part)	16.264
Conductivity (S/m)	4.740

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=25.00, Y=39.00 ; SAR Peak: 1.37 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.158
SAR 1g (W/Kg)	0.450
Variation (%)	-4.130
Horizontal validation criteria: minimum distance (mm)	6.587
Vertical validation criteria: SAR ratio M2/M1 (%)	58.06%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	1.334	0.813	0.472	0.262	0.143	0.078	0.043	0.025	0.014

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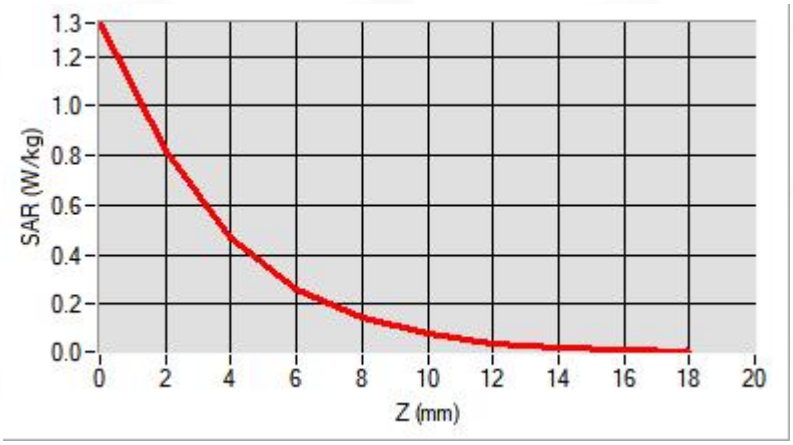
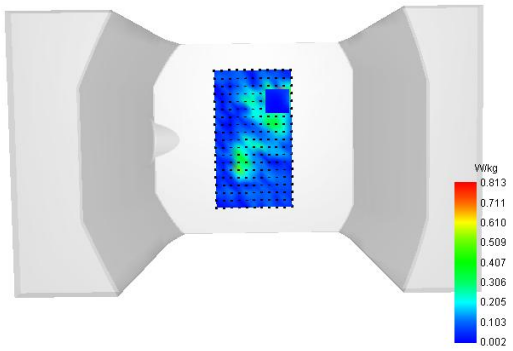
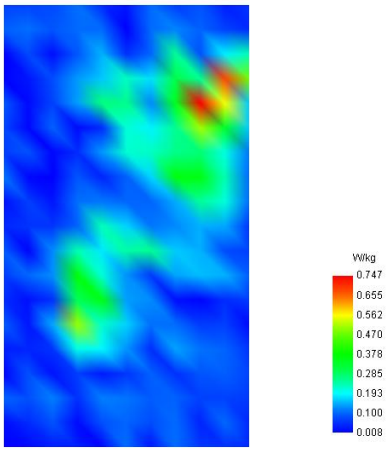


F. 3D Image

3D screen shot	Hot spot position
	

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7-Body with back position in dist. 0mm on Channel 52 in IEEE 802.11a U-NII

SAR Measurement at IEEE 802.11a U-NII (Body, Validation Plane)

Date of measurement: 21/6/2024

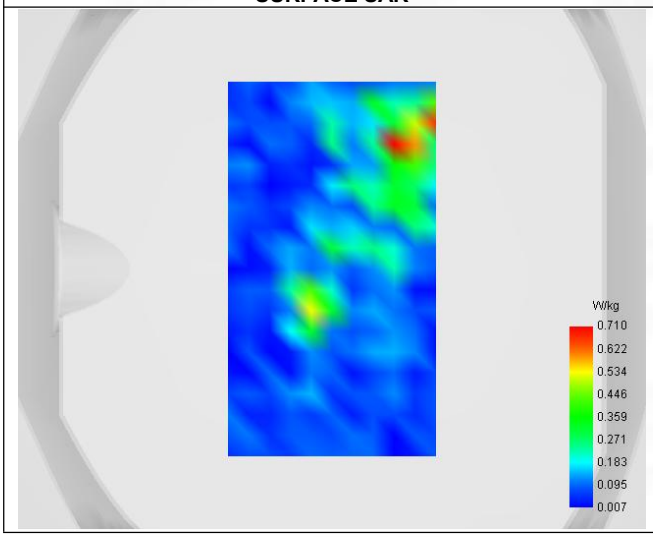
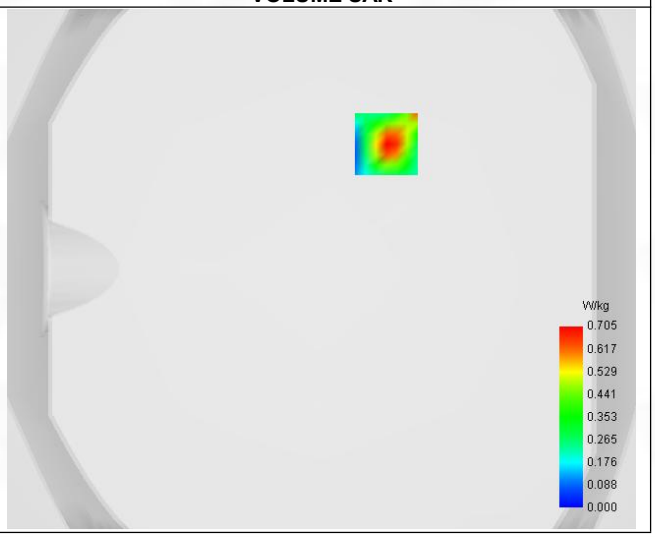
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.12
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Lower (52)
Signal	IEEE 802.11

B. Permitivity

Frequency (MHz)	5260.000
Relative permitivity (real part)	35.820
Relative permitivity (imaginary part)	16.271
Conductivity (S/m)	4.760

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=25.00, Y=48.00 ; SAR Peak: 1.34 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.154
SAR 1g (W/Kg)	0.413
Variation (%)	-2.430
Horizontal validation criteria: minimum distance (mm)	5.798
Vertical validation criteria: SAR ratio M2/M1 (%)	51.49%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	1.269	0.705	0.363	0.180	0.095	0.080	0.054	0.101	0.069

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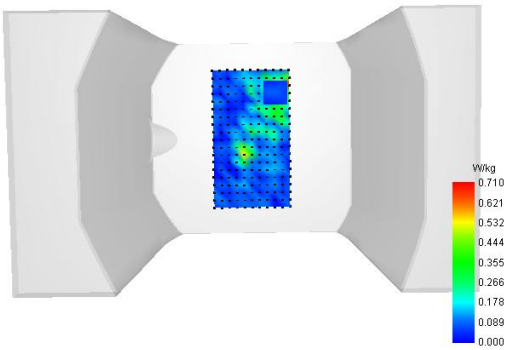
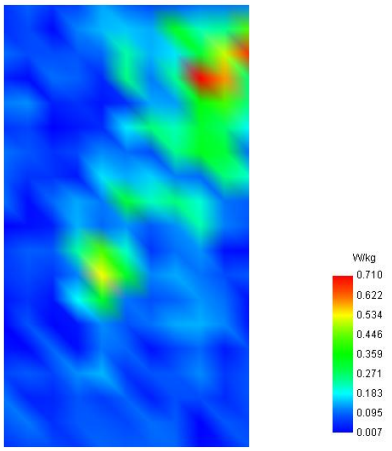
F. 3D Image

3D screen shot	Hot spot position
	

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8-Body with back position in dist. 0mm on Channel 140 in IEEE 802.11a U-NII

SAR Measurement at IEEE 802.11a U-NII (Body, Validation Plane)

Date of measurement: 21/6/2024

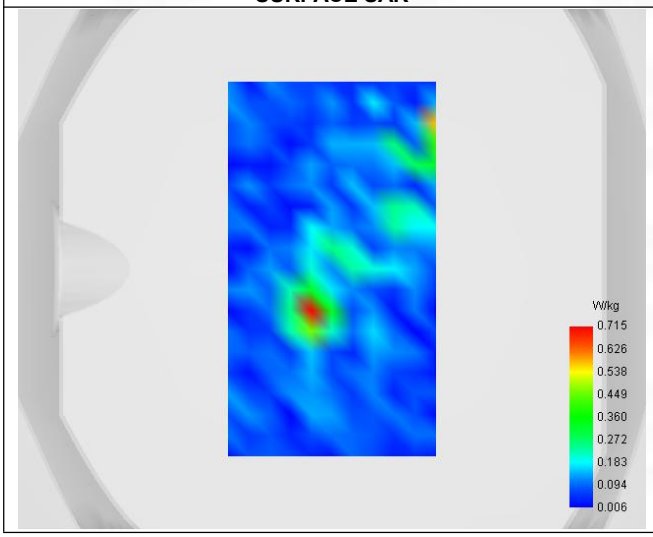
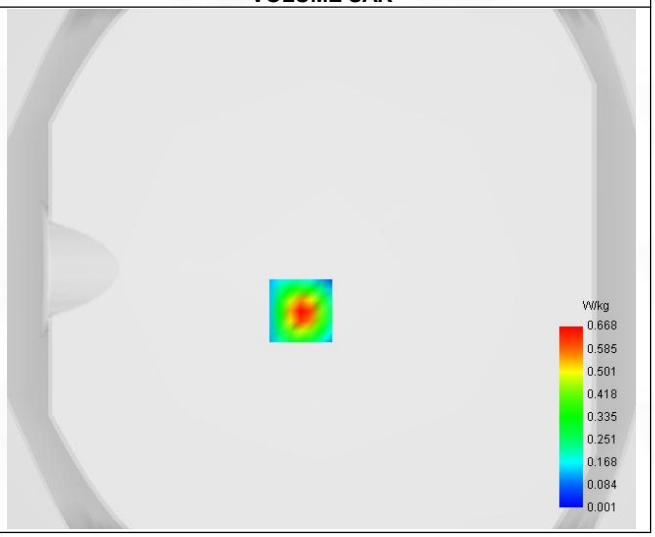
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.12
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Higher (140)
Signal	IEEE 802.11

B. Permitivity

Frequency (MHz)	5700.000
Relative permitivity (real part)	35.280
Relative permitivity (imaginary part)	16.450
Conductivity (S/m)	5.210

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-8.00, Y=-16.00 ; SAR Peak: 1.35 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.131
SAR 1g (W/Kg)	0.381
Variation (%)	2.770
Horizontal validation criteria: minimum distance (mm)	5.698
Vertical validation criteria: SAR ratio M2/M1 (%)	47.01%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	1.264	0.668	0.314	0.137	0.062	0.034	0.028	0.034	0.051

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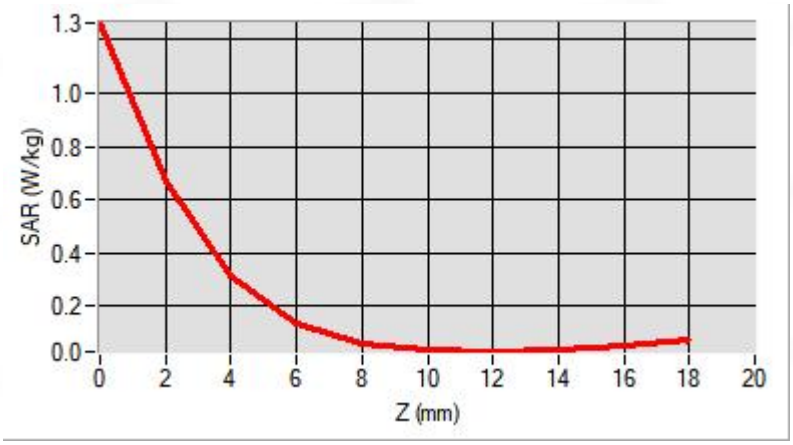
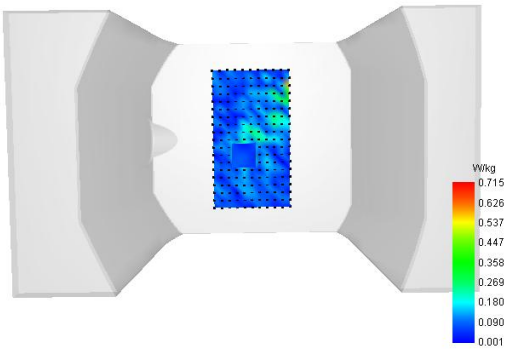
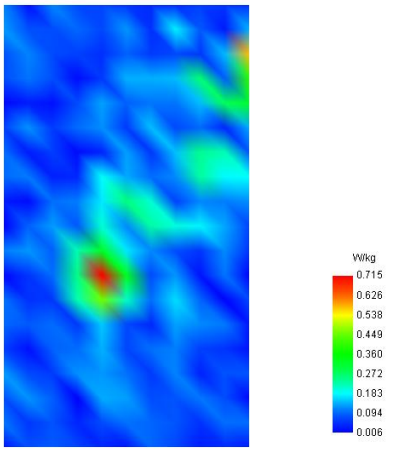


F. 3D Image

3D screen shot	Hot spot position
	

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9-Body with back position in dist. 0mm on Channel 149 in IEEE 802.11a U-NII

SAR Measurement at IEEE 802.11a U-NII (Body, Validation Plane)

Date of measurement: 21/6/2024

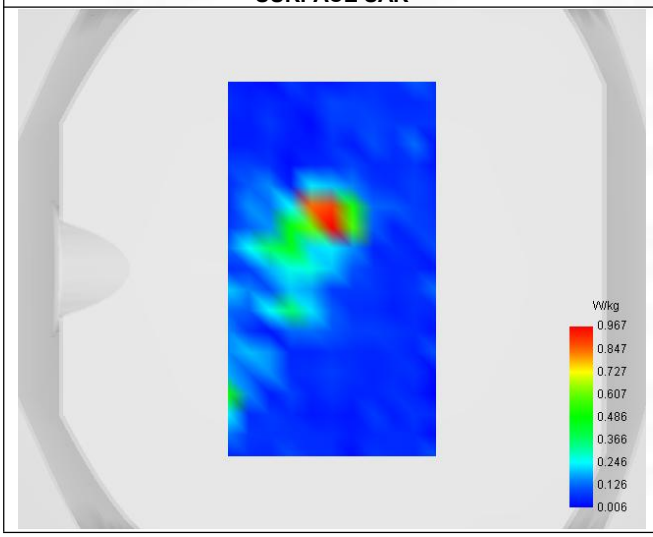
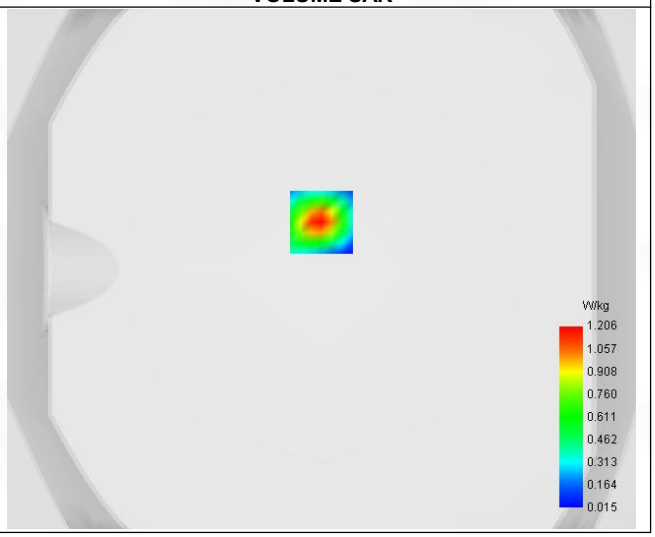
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.04
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Lower (149)
Signal	IEEE 802.11

B. Permitivity

Frequency (MHz)	5745.000
Relative permitivity (real part)	35.235
Relative permitivity (imaginary part)	16.464
Conductivity (S/m)	5.255

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=18.00 ; SAR Peak: 2.26 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.203
SAR 1g (W/Kg)	0.445
Variation (%)	2.300
Horizontal validation criteria: minimum distance (mm)	7.265
Vertical validation criteria: SAR ratio M2/M1 (%)	51.16%

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	2.165	1.206	0.617	0.296	0.142	0.074	0.047	0.039	0.042

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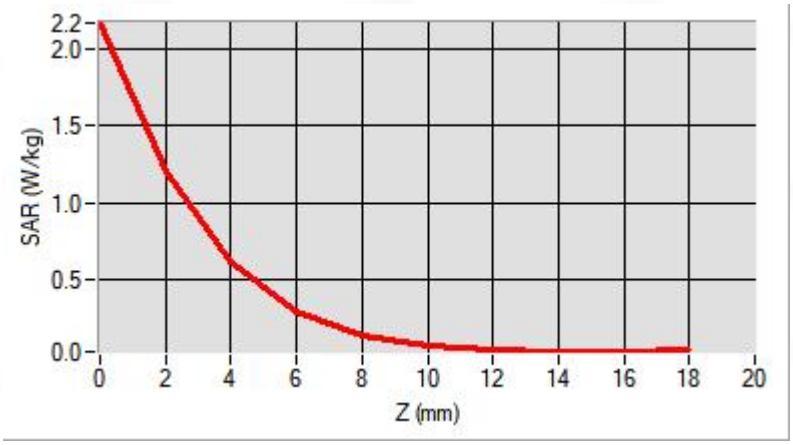
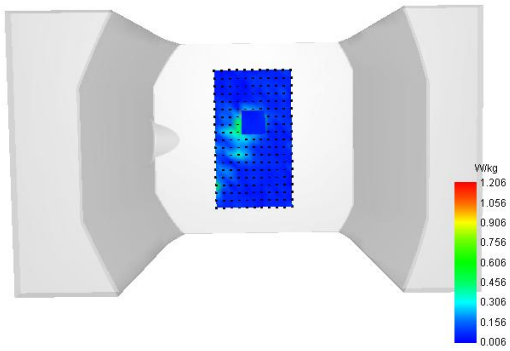
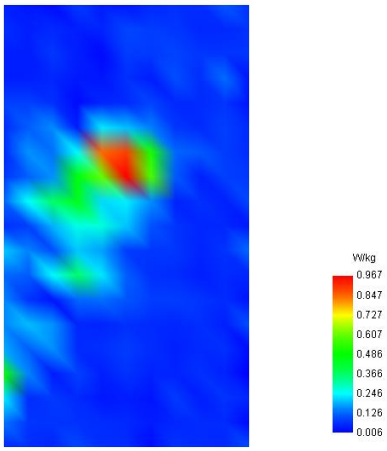


F. 3D Image

3D screen shot	Hot spot position
	

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10-Body with back position in dist. 0mm on Channel 78 in Bluetooth

SAR Measurement at Bluetooth (Body, Validation Plane)

Date of measurement: 19/6/2024

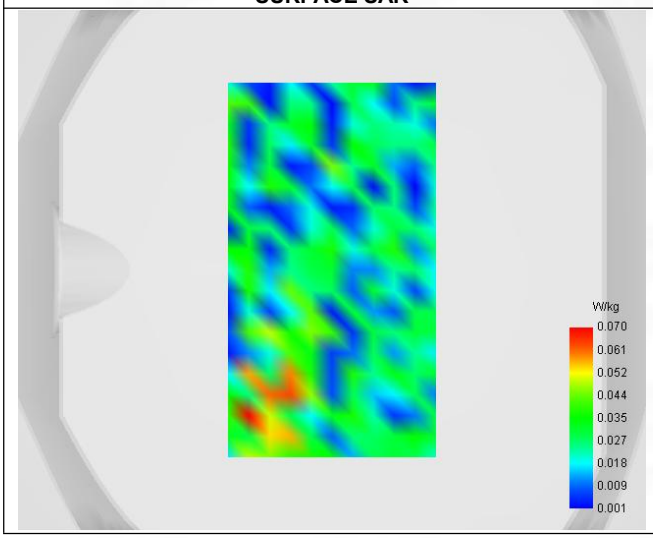
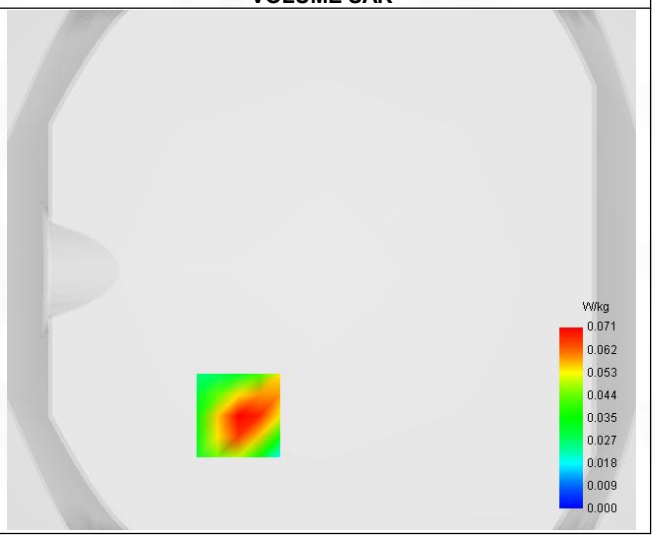
A. Experimental conditions.

Probe	SN 04/22 EPGO365
ConvF	2.36
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Bluetooth
Channels	Higher (78)
Signal	Bluetooth

B. Permitivity

Frequency (MHz)	2480.000
Relative permitivity (real part)	39.040
Relative permitivity (imaginary part)	13.210
Conductivity (S/m)	1.842

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-32.00, Y=-56.00 ; SAR Peak: 0.14 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.044
SAR 1g (W/Kg)	0.072
Variation (%)	0.610
Horizontal validation criteria: minimum distance (mm)	8.962
Vertical validation criteria: SAR ratio M2/M1 (%)	42.25%

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.140	0.071	0.030	0.019	0.022

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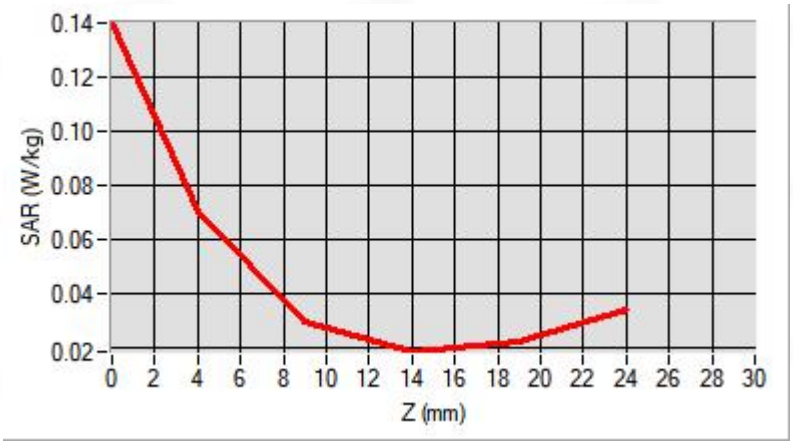
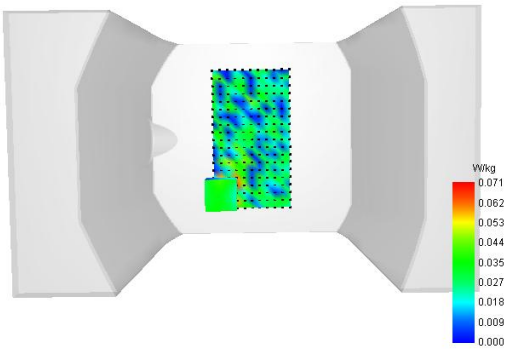
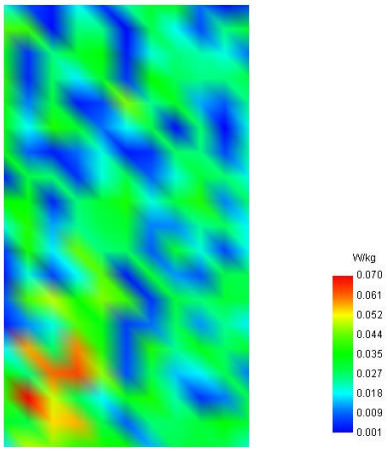


F. 3D Image

3D screen shot	Hot spot position
	

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11-Body with back position in dist. 0mm on Channel 18900 in LTE band 2

SAR Measurement at LTE band 2 (Body, Validation Plane)

Date of measurement: 18/6/2024

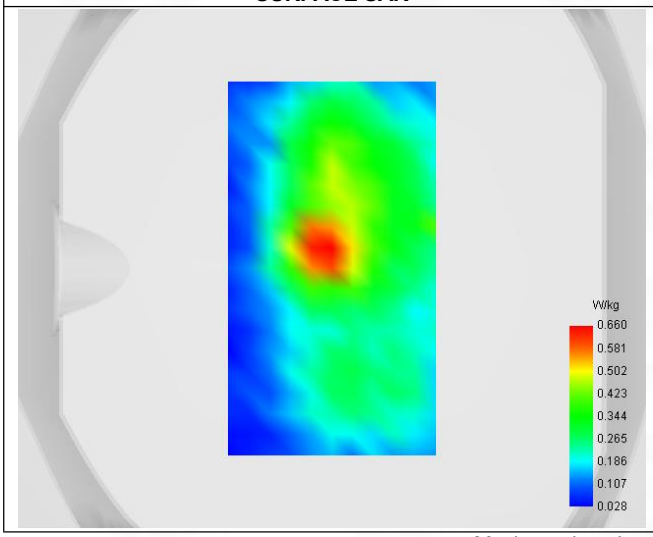
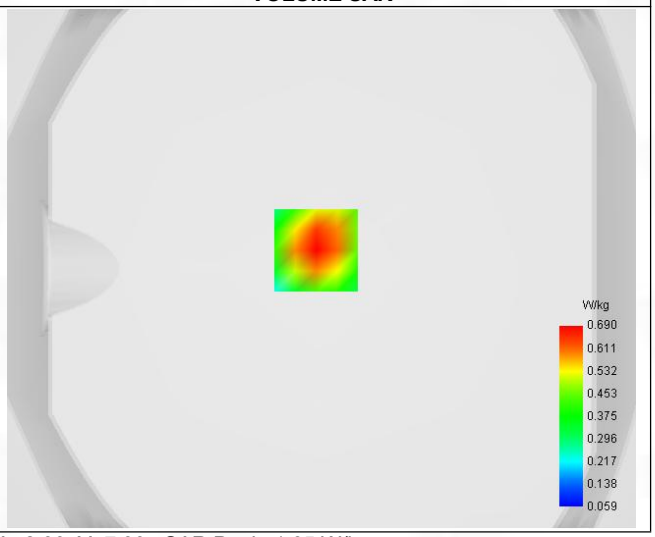
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	2.07
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Middle (18900)
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	99
RB size	1

B. Permitivity

Frequency (MHz)	1880.910
Relative permitivity (real part)	39.867
Relative permitivity (imaginary part)	13.379
Conductivity (S/m)	1.416

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-2.00, Y=7.00 ; SAR Peak: 1.05 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.385
SAR 1g (W/Kg)	0.658
Variation (%)	-3.240
Horizontal validation criteria: minimum distance (mm)	10.365
Vertical validation criteria: SAR ratio M2/M1 (%)	59.13%

E. Z Axis Scan

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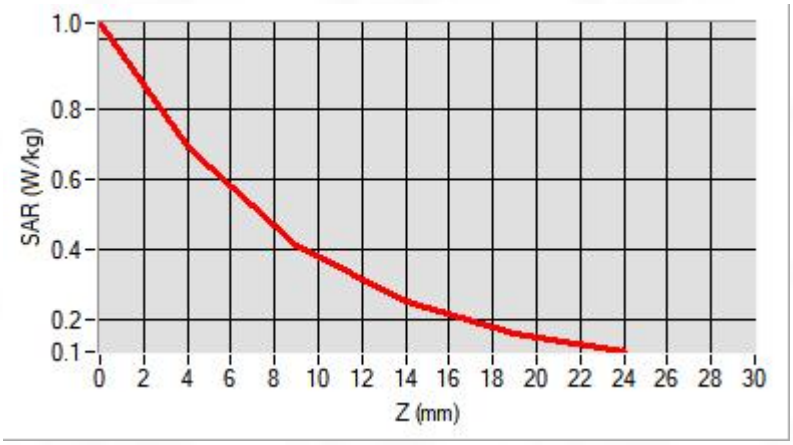
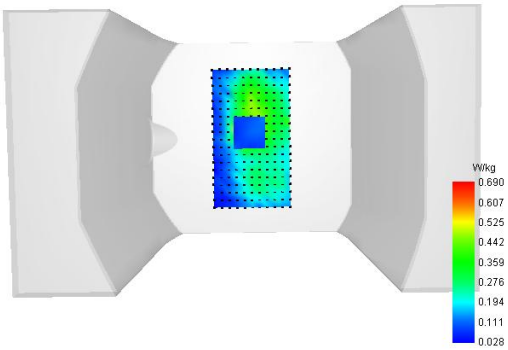
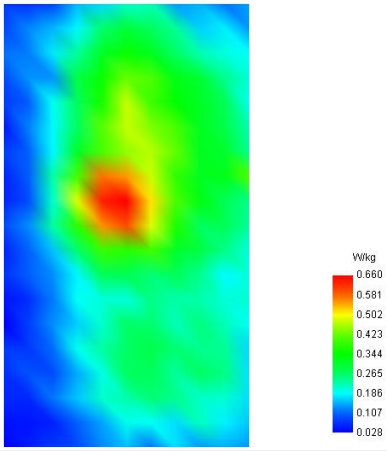
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.043	0.690	0.408	0.248	0.161



F. 3D Image

3D screen shot	Hot spot position
	

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12-Body with back position in dist. 0mm on Channel 20300 in LTE band 4

SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2024

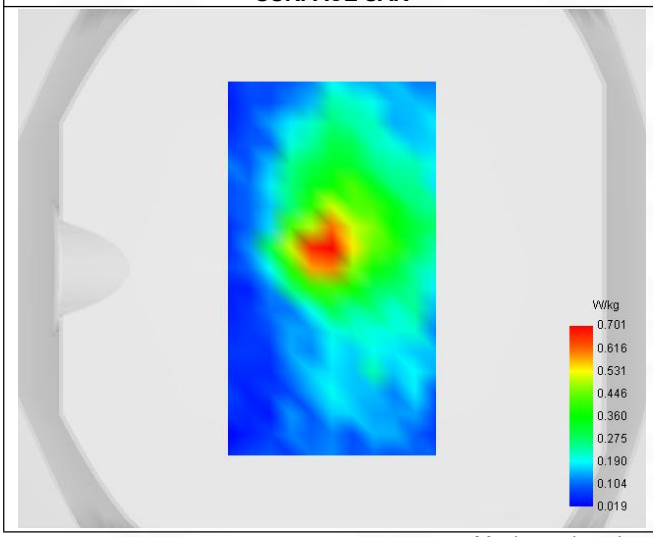
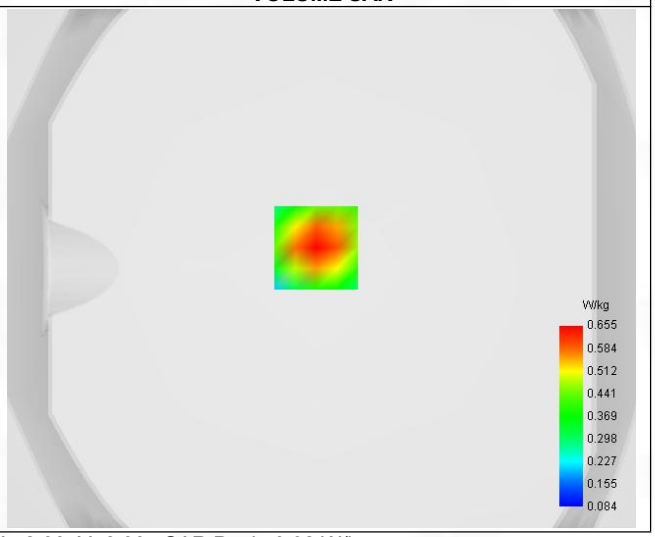
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.79
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	Higher (20300)
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	99
RB size	1

B. Permitivity

Frequency (MHz)	1753.910
Relative permitivity (real part)	39.982
Relative permitivity (imaginary part)	14.348
Conductivity (S/m)	1.346

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-2.00, Y=8.00 ; SAR Peak: 0.92 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.382
SAR 1g (W/Kg)	0.655
Variation (%)	-3.280
Horizontal validation criteria: minimum distance (mm)	8.971
Vertical validation criteria: SAR ratio M2/M1 (%)	64.73%

E. Z Axis Scan

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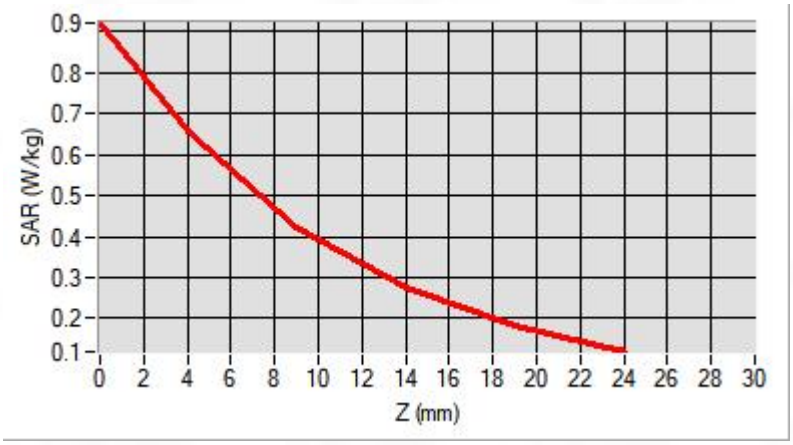
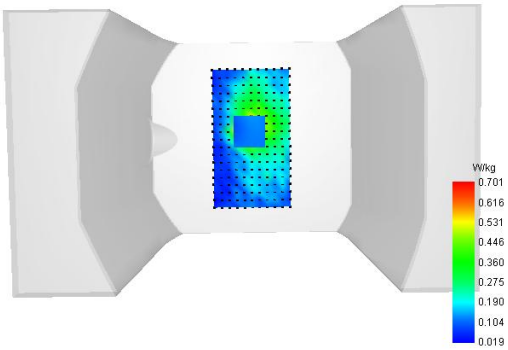
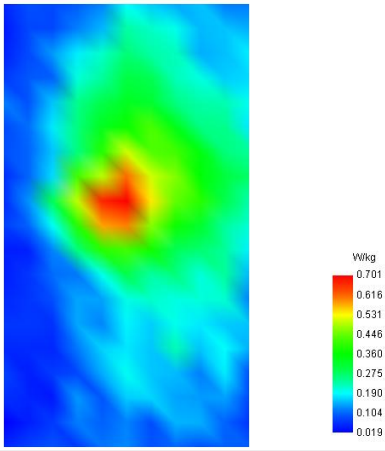
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.921	0.655	0.424	0.276	0.183



F. 3D Image

3D screen shot	Hot spot position
	

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13-Body with back position in dist. 0mm on Channel 20525 in LTE band 5

SAR Measurement at LTE band 5 (Body, Validation Plane)

Date of measurement: 14/6/2024

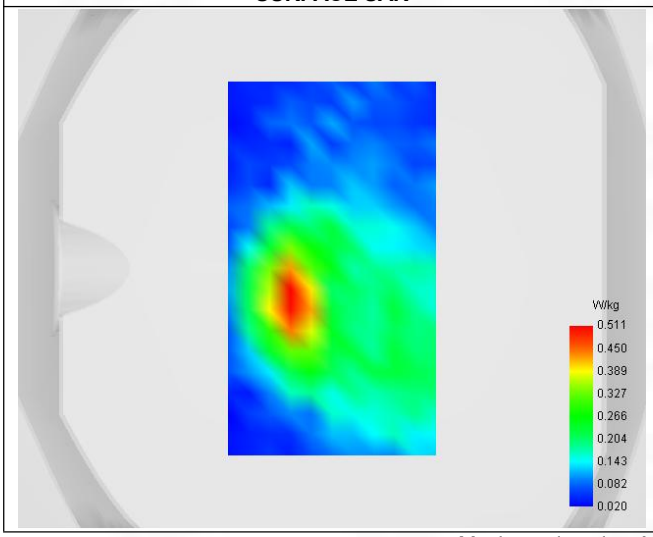
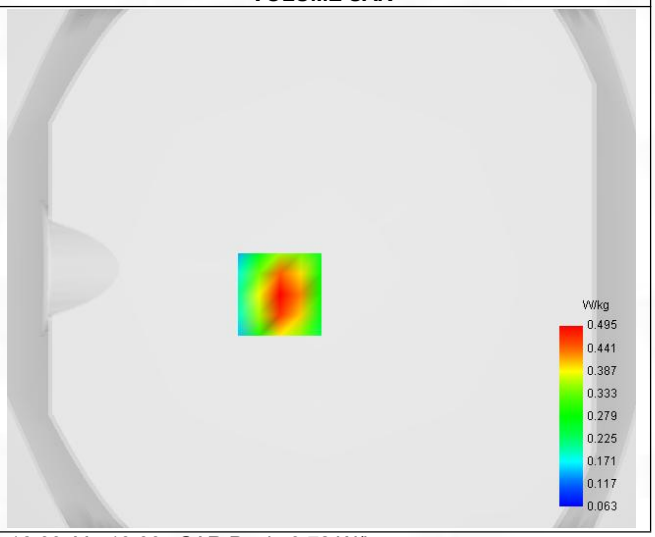
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.68
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Channels	Middle (20525)
Signal	LTE FDD
Cell Bandwidth	10 Mhz
Modulation	SC-OFDM - QPSK
RB offset	49
RB size	1

B. Permitivity

Frequency (MHz)	836.590
Relative permitivity (real part)	41.408
Relative permitivity (imaginary part)	19.481
Conductivity (S/m)	0.871

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-16.00, Y=-10.00 ; SAR Peak: 0.72 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.290
SAR 1g (W/Kg)	0.468
Variation (%)	-3.320
Horizontal validation criteria: minimum distance (mm)	9.482
Vertical validation criteria: SAR ratio M2/M1 (%)	63.64%

E. Z Axis Scan

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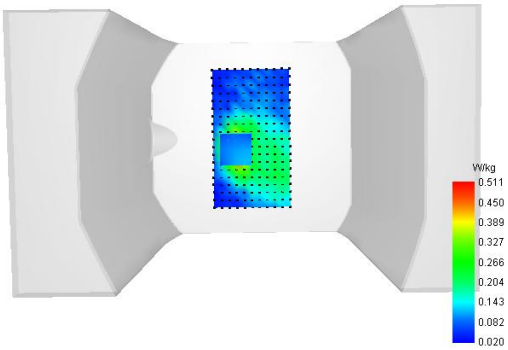
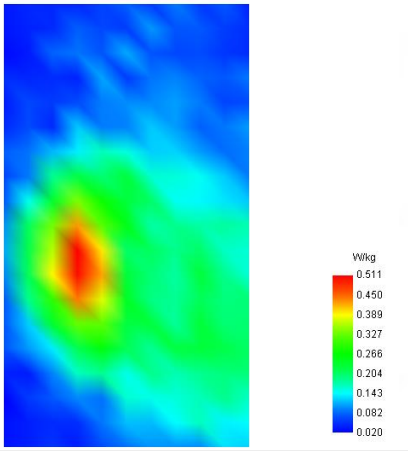
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.713	0.495	0.315	0.208	0.146

F. 3D Image

3D screen shot	Hot spot position
	

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14-Body with back position in dist. 0mm on Channel 21350 in LTE band 7

SAR Measurement at LTE band 7 (Body, Validation Plane)

Date of measurement: 19/6/2024

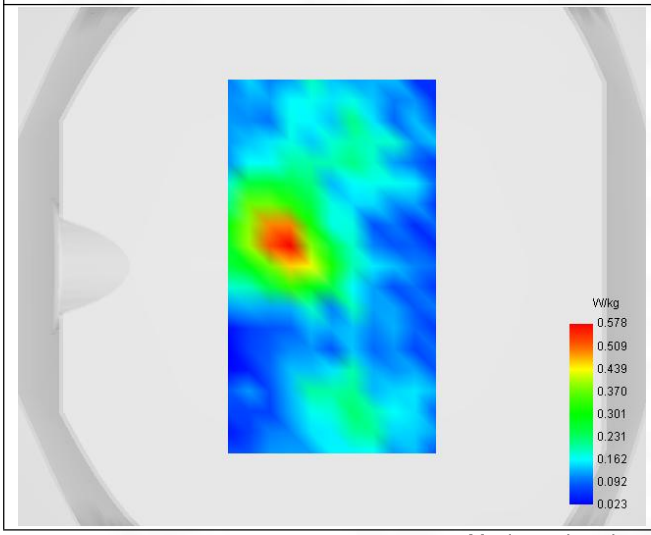
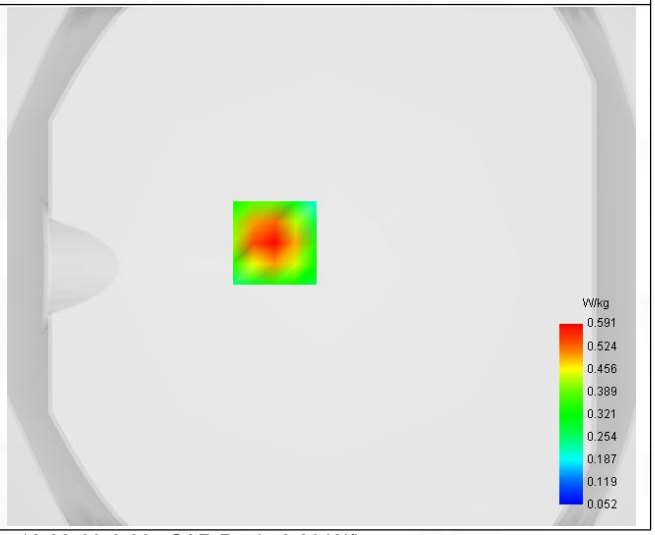
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	2.08
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	Higher (21350)
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	99
RB size	1

B. Permitivity

Frequency (MHz)	2568.910
Relative permitivity (real part)	38.921
Relative permitivity (imaginary part)	12.825
Conductivity (S/m)	1.937

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-18.00, Y=9.00 ; SAR Peak: 0.89 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.323
SAR 1g (W/Kg)	0.586
Variation (%)	-1.160
Horizontal validation criteria: minimum distance (mm)	8.636
Vertical validation criteria: SAR ratio M2/M1 (%)	60.74%

E. Z Axis Scan

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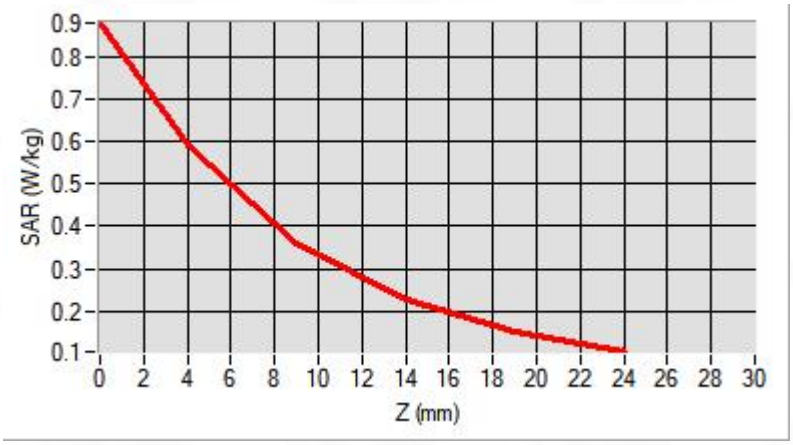
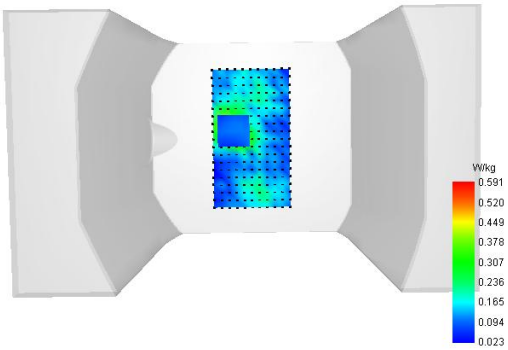
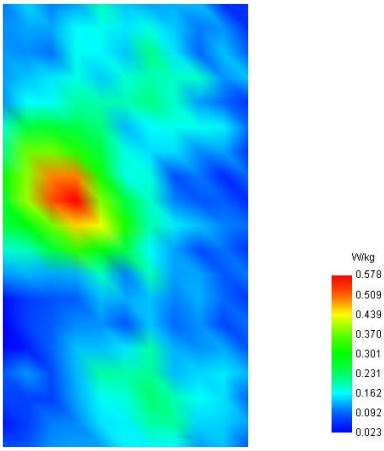
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.879	0.591	0.359	0.225	0.152



F. 3D Image

3D screen shot	Hot spot position
	

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15-Body with back position in dist. 0mm on Channel 23230 in LTE band 13

SAR Measurement at LTE band 13 (Body, Validation Plane)

Date of measurement: 14/6/2024

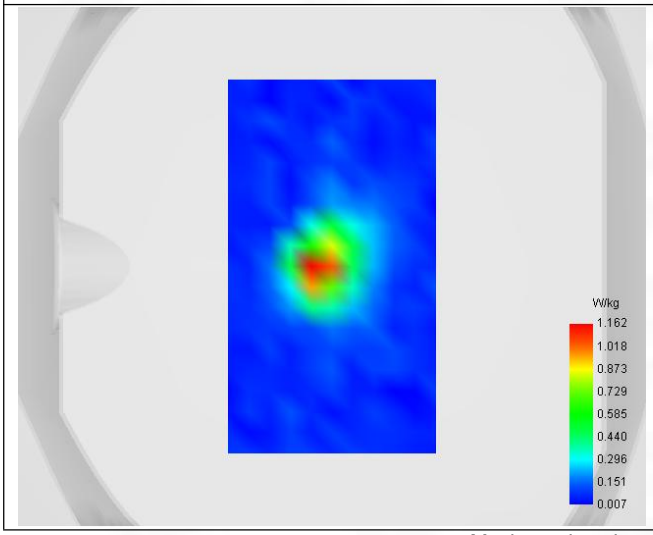
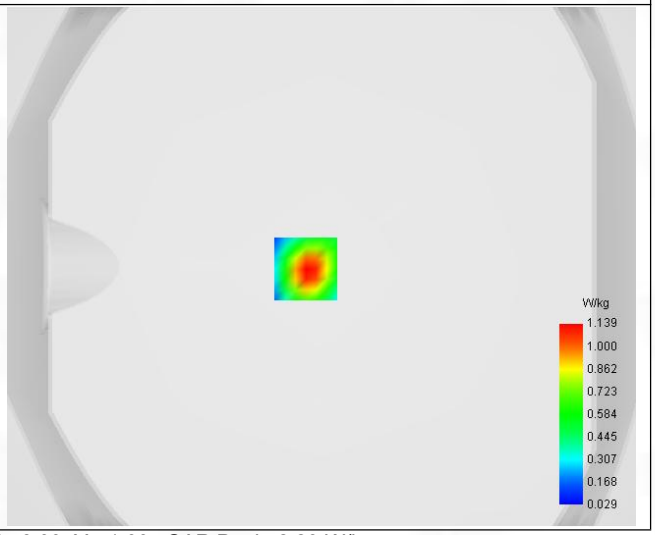
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.63
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 13
Channels	Middle (23230)
Signal	LTE FDD
Cell Bandwidth	10 Mhz
Modulation	SC-OFDM - QPSK
RB offset	49
RB size	1

B. Permitivity

Frequency (MHz)	786.410
Relative permitivity (real part)	41.633
Relative permitivity (imaginary part)	20.616
Conductivity (S/m)	0.864

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-6.00, Y=-1.00 ; SAR Peak: 2.23 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.213
SAR 1g (W/Kg)	0.756
Variation (%)	-3.060
Horizontal validation criteria: minimum distance (mm)	8.923
Vertical validation criteria: SAR ratio M2/M1 (%)	54.75%

E. Z Axis Scan

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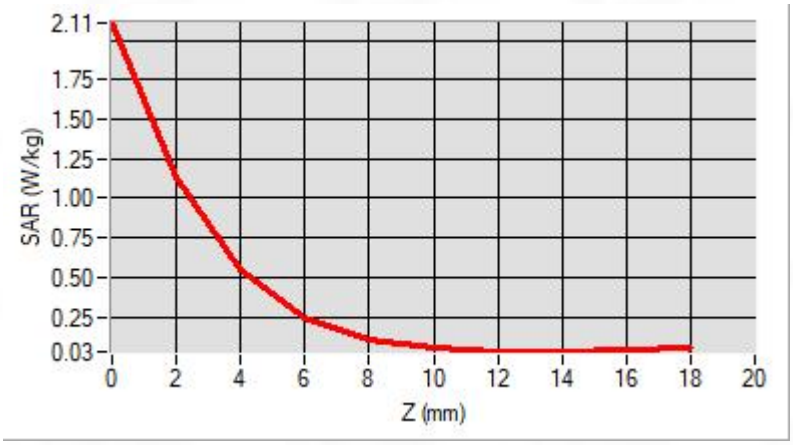
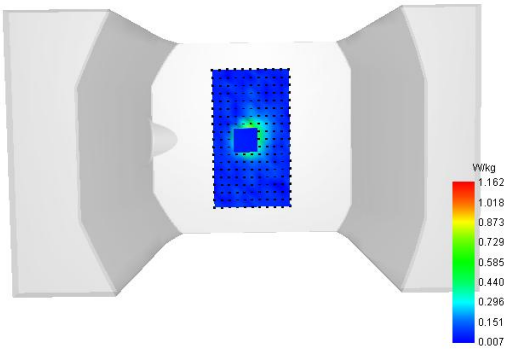
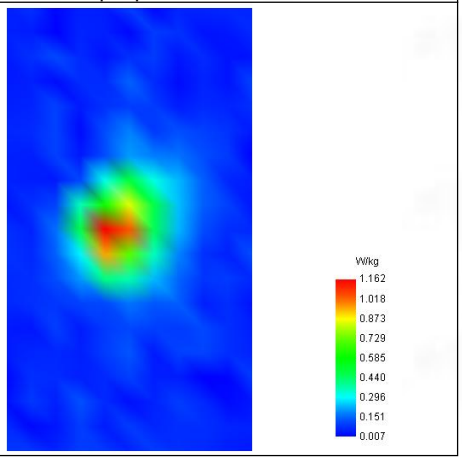
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.538	1.390	0.761	0.378	0.125



F. 3D Image

3D screen shot	Hot spot position
	

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16-Body with back position in dist. 0mm on Channel 132322 in LTE band 66

SAR Measurement at LTE band 66 (Body, Validation Plane)

Date of measurement: 17/6/2024

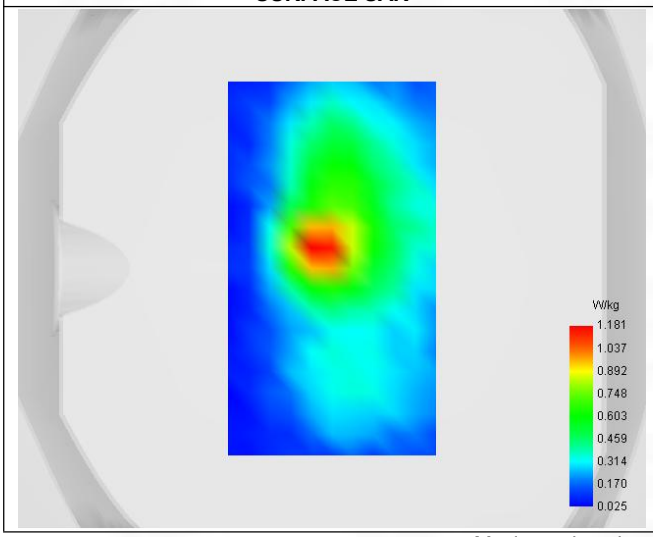
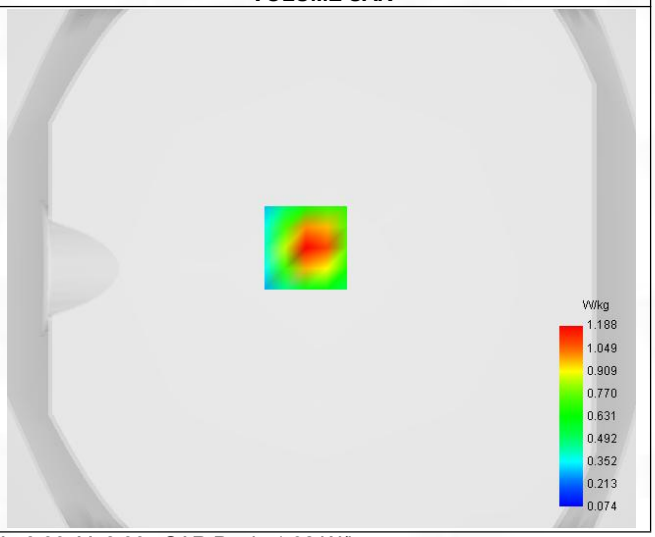
A. Experimental conditions.

Probe	SN 04/22 EPGO366
ConvF	1.79
Area Scan	dx=8mm dy=8mm, Adaptative 1 max
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 66
Channels	Middle (132322)
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	50
RB size	1

B. Permitivity

Frequency (MHz)	1745.910
Relative permitivity (real part)	39.994
Relative permitivity (imaginary part)	14.393
Conductivity (S/m)	1.342

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-6.00, Y=8.00 ; SAR Peak: 1.92 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.612
SAR 1g (W/Kg)	0.930
Variation (%)	-1.150
Horizontal validation criteria: minimum distance (mm)	9.415
Vertical validation criteria: SAR ratio M2/M1 (%)	54.97

E. Z Axis Scan

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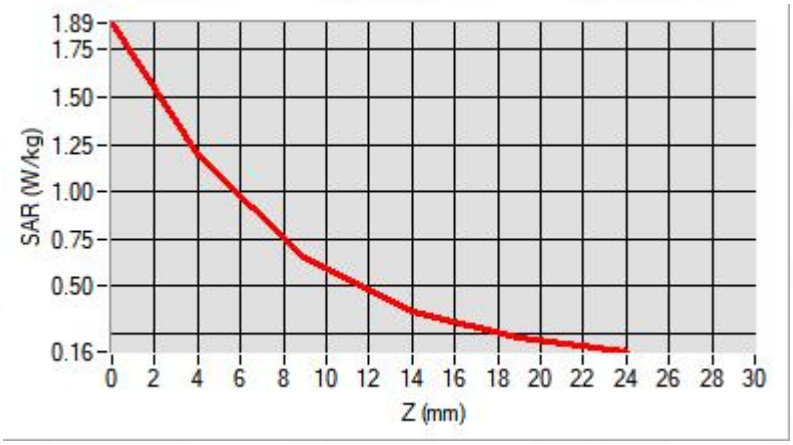
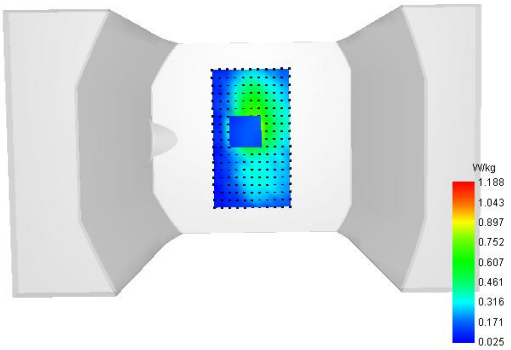
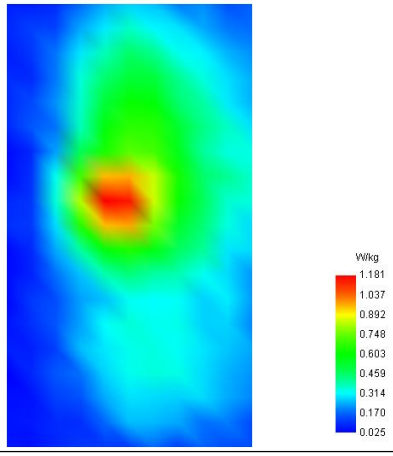
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.892	1.188	0.653	0.372	0.234



F. 3D Image

3D screen shot	Hot spot position
	

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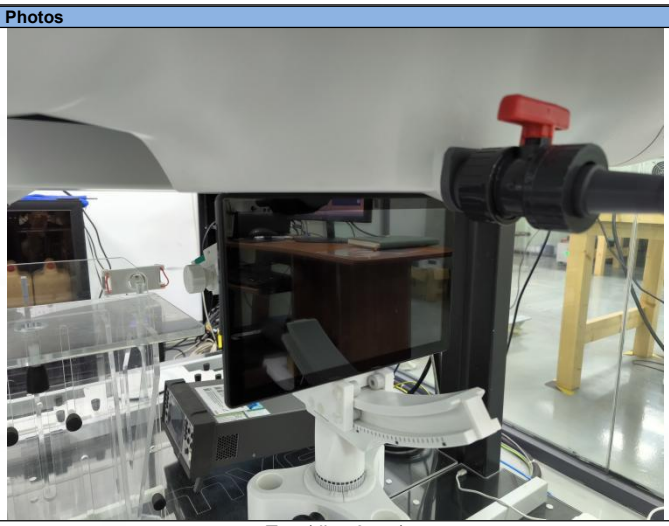
ANNEX E SAR Test Setup Photos

Reference Photo: simulation liquid depth 15cm


Reference Photos	
	
Back (dist. 0mm)	Top (dist. 0mm)

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ANNEX F EUT External and Internal Photos

Please refer to RF Report.

ANNEX G Calibration Information

Please refer to the document “Calibration.pdf”.

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--END OF REPORT--

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