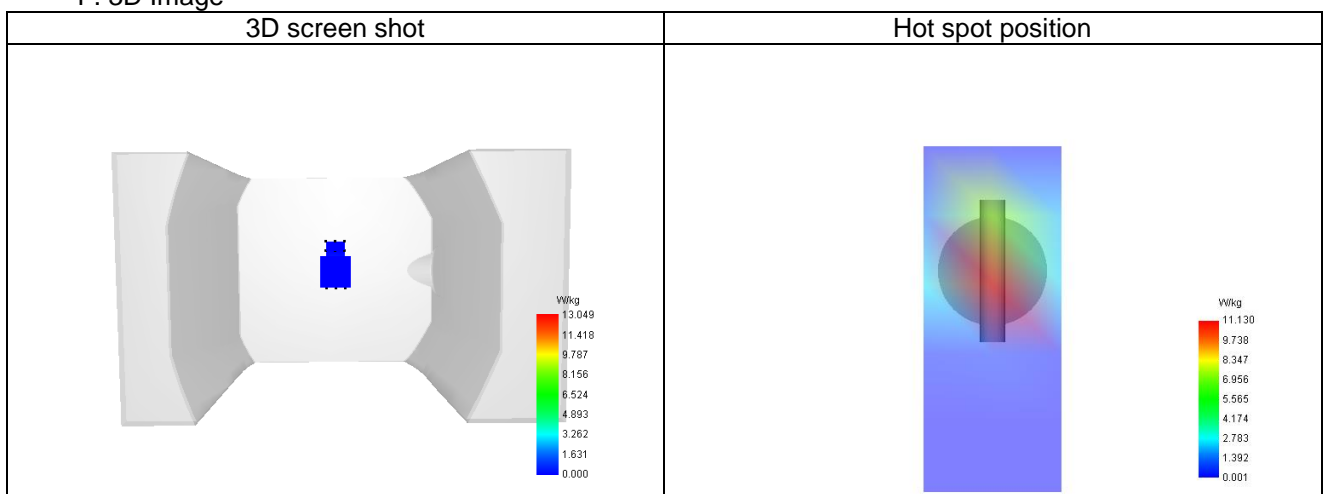


F. 3D Image



## 15.2 SAR Test Graph Results

SAR plots for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination according to FCC KDB 865664 D02

### Plot 1

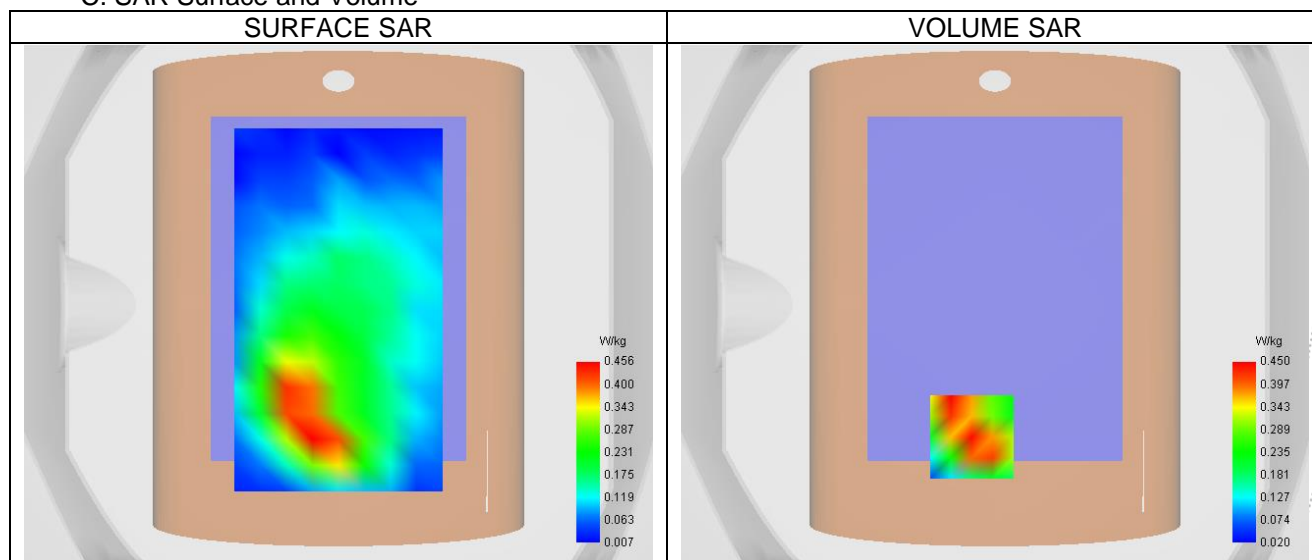
#### A. Experimental conditions.

Probe	SN 25/22 EPGO373
ConvF	3.01
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low (128)
Signal	TDMA (Crest factor: 8.0)

#### B. Permittivity

Frequency (MHz)	824.200
Relative permittivity (real part)	41.500
Relative permittivity (imaginary part)	19.400
Conductivity (S/m)	0.902

#### C. SAR Surface and Volume



Maximum location: X=-9.00, Y=-51.00 ; SAR Peak: 0.72 W/kg

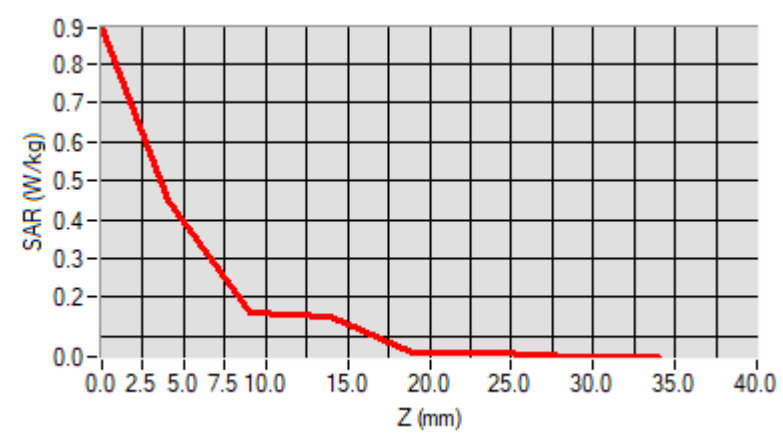
#### D. SAR 1g & 10g

SAR 10g (W/Kg)	0.242
SAR 1g (W/Kg)	0.432
Variation (%)	2.420
Horizontal validation criteria: minimum distance (mm)	17.888544
Vertical validation criteria: SAR ratio M2/M1 (%)	54.604241

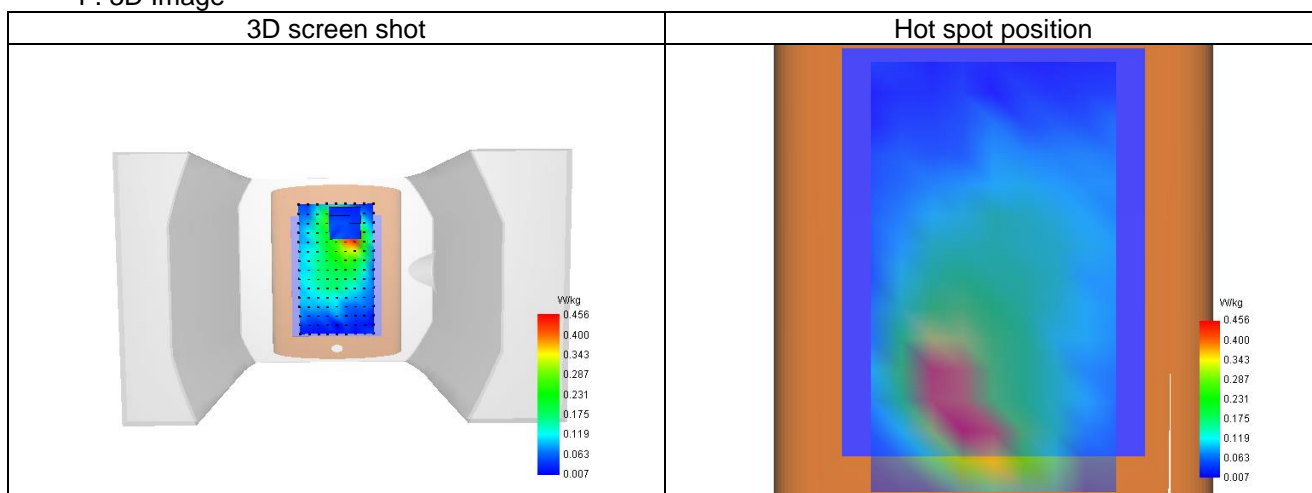
#### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
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SAR (W/Kg)	0.893	0.450	0.159	0.152	0.059	0.060	0.047
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F. 3D Image



## Plot 2

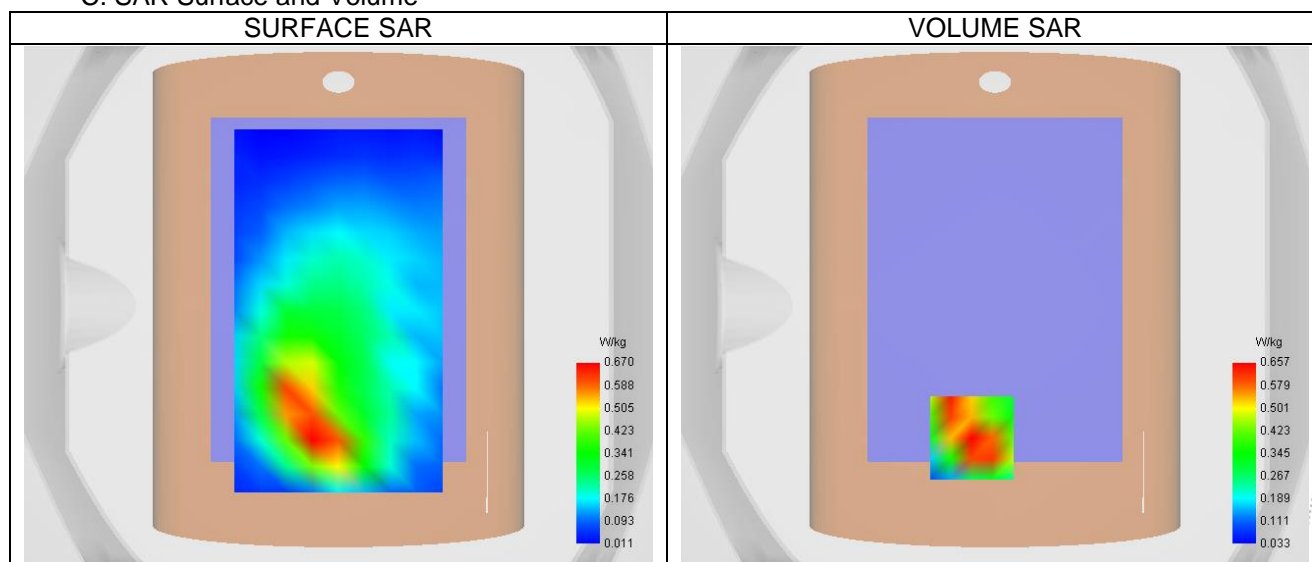
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.27
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High (810)
Signal	TDMA (Crest factor: 8.0)

### B. Permittivity

Frequency (MHz)	1909.800
Relative permittivity (real part)	40.000
Relative permittivity (imaginary part)	13.408
Conductivity (S/m)	1.400

### C. SAR Surface and Volume

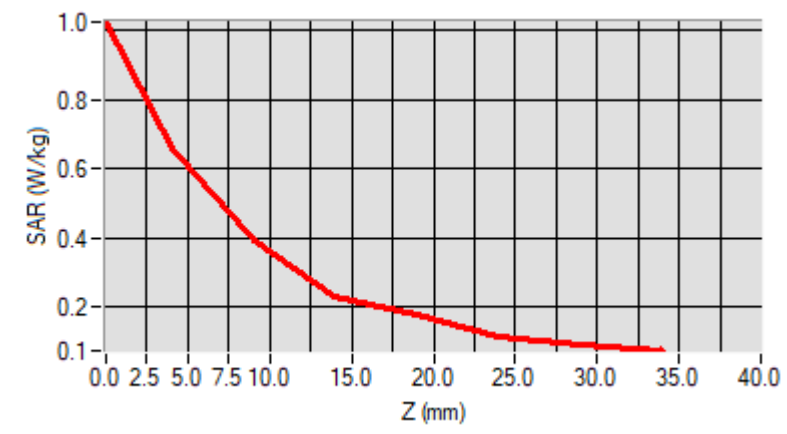


### D. SAR 1g & 10g

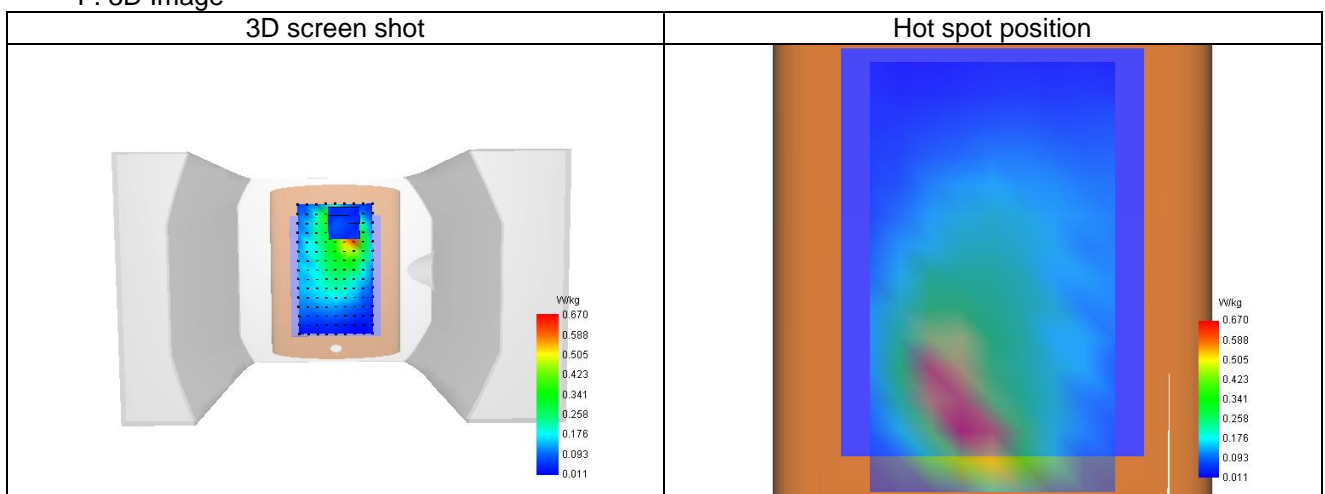
SAR 10g (W/Kg)	0.349
SAR 1g (W/Kg)	0.648
Variation (%)	-1.920
Horizontal validation criteria: minimum distance (mm)	16.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	59.345460

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.023	0.657	0.390	0.231	0.180	0.116	0.093



F. 3D Image



## Plot 3

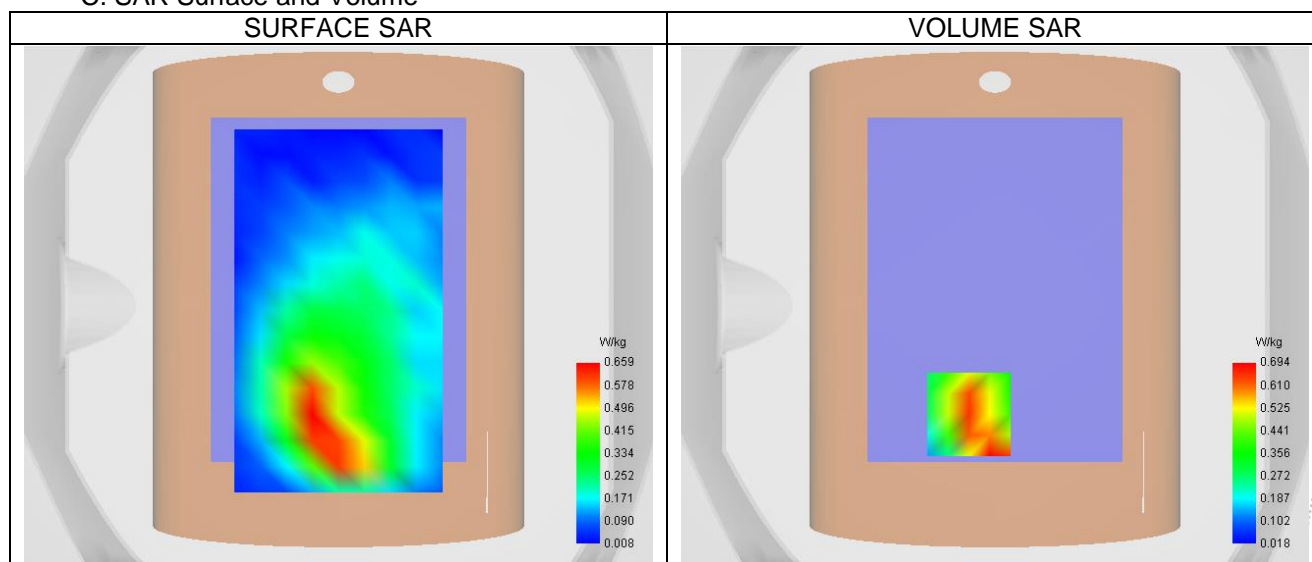
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.27
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	High (9538)
Signal	WCDMA (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	1907.600
Relative permittivity (real part)	40.000
Relative permittivity (imaginary part)	13.408
Conductivity (S/m)	1.400

### C. SAR Surface and Volume

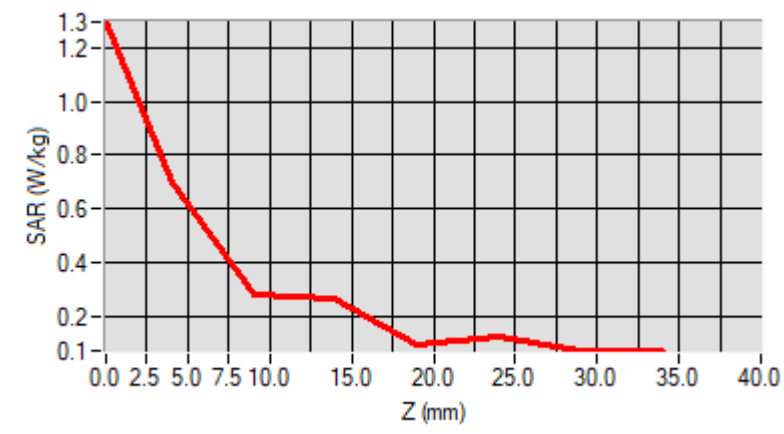


### D. SAR 1g & 10g

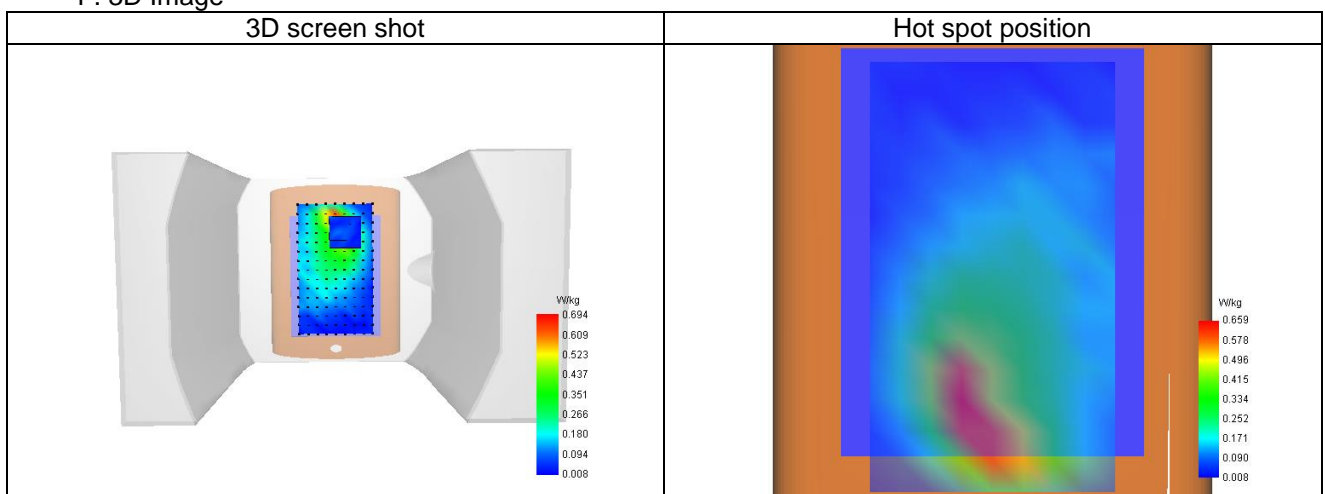
SAR 10g (W/Kg)	0.369
SAR 1g (W/Kg)	0.598
Variation (%)	0.170
Horizontal validation criteria: minimum distance (mm)	16.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	56.570484

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.295	0.694	0.282	0.263	0.095	0.119	0.070



F. 3D Image





## Plot 4

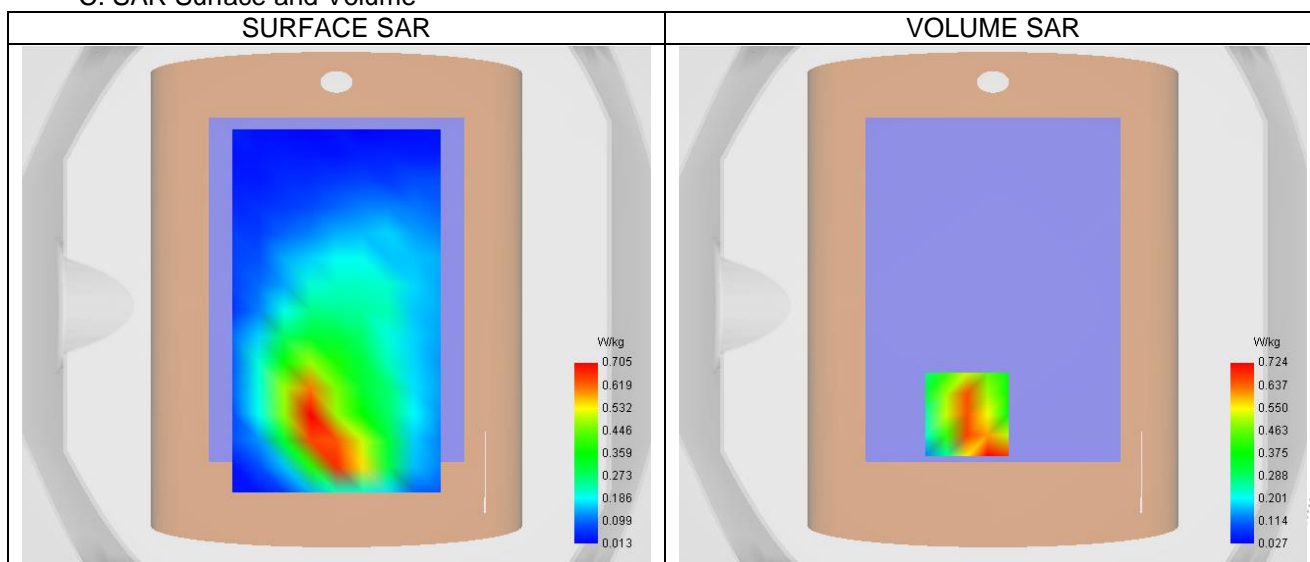
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.35
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band4_WCDMA1700
Channels	Low (1312)
Signal	WCDMA (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	1712.400
Relative permittivity (real part)	40.116
Relative permittivity (imaginary part)	14.136
Conductivity (S/m)	1.361

### C. SAR Surface and Volume



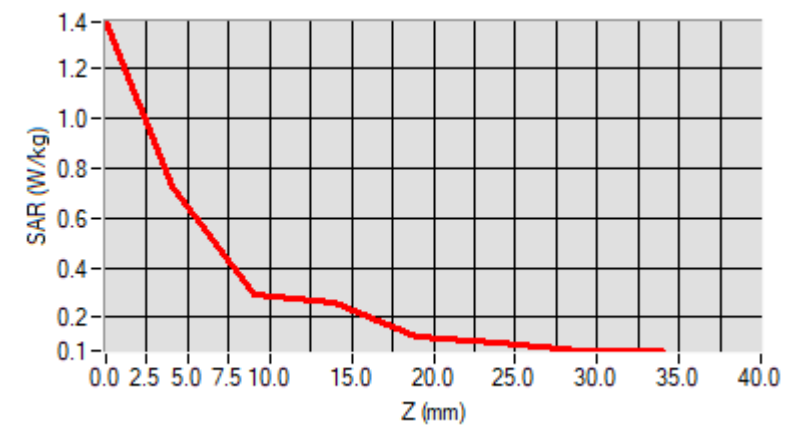
### D. SAR 1g & 10g

SAR 10g (W/Kg)	0.380
SAR 1g (W/Kg)	0.605
Variation (%)	-0.060
Horizontal validation criteria: minimum distance (mm)	16.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	58.602703

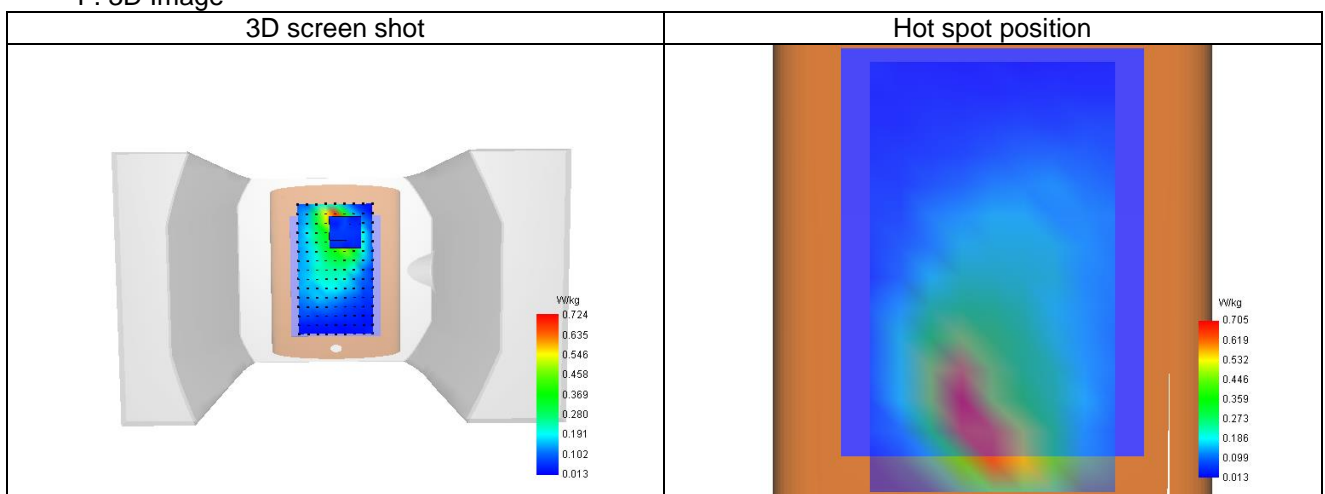
### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.384	0.724	0.293	0.258	0.126	0.100	0.071





F. 3D Image



## Plot 5

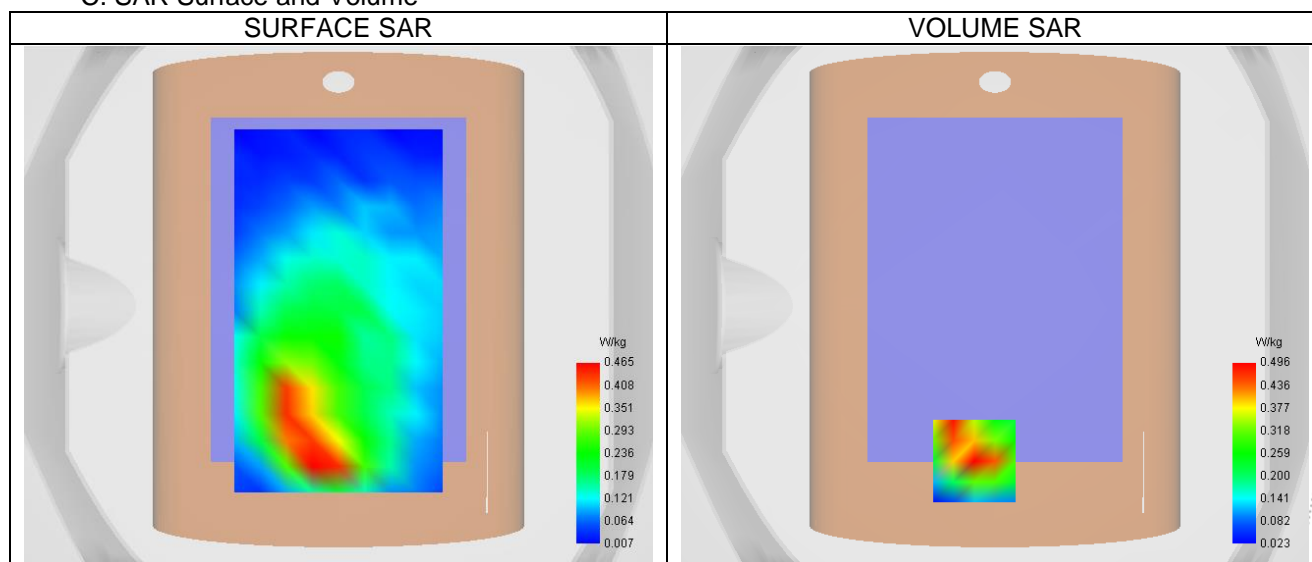
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.01
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band5_WCDMA850
Channels	Middle (4182)
Signal	WCDMA (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	836.400
Relative permittivity (real part)	42.285
Relative permittivity (imaginary part)	20.226
Conductivity (S/m)	0.940

### C. SAR Surface and Volume

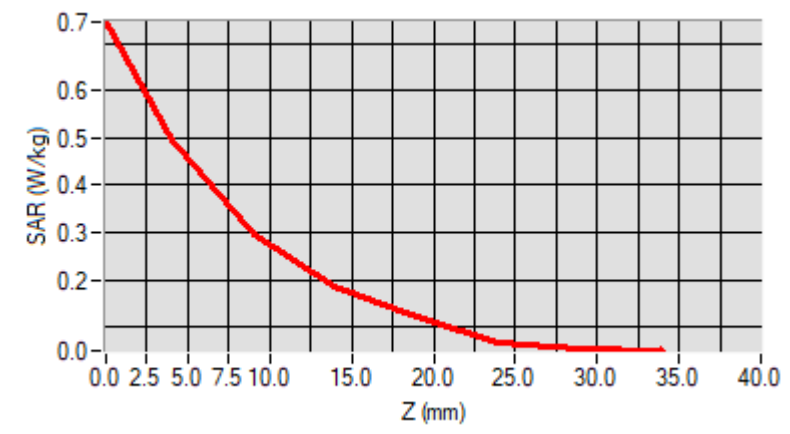


### D. SAR 1g & 10g

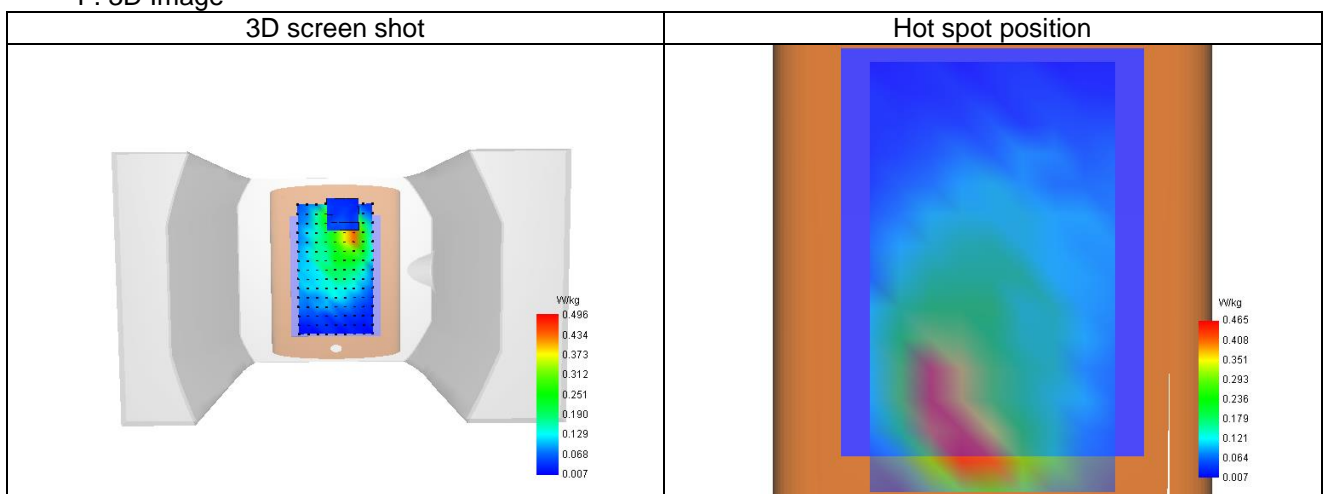
SAR 10g (W/Kg)	0.267
SAR 1g (W/Kg)	0.464
Variation (%)	-2.460
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	59.900697

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.745	0.496	0.297	0.188	0.123	0.068	0.055



F. 3D Image



## Plot 6

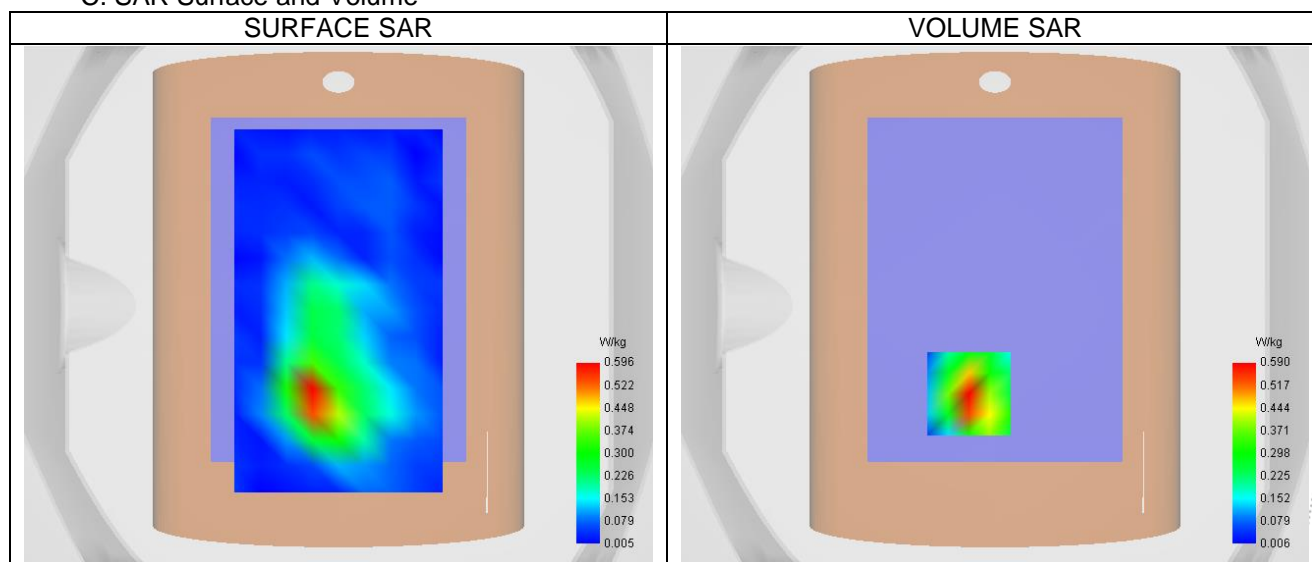
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.27
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	High (19100)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	1900.000
Relative permittivity (real part)	40.000
Relative permittivity (imaginary part)	13.408
Conductivity (S/m)	1.400

### C. SAR Surface and Volume

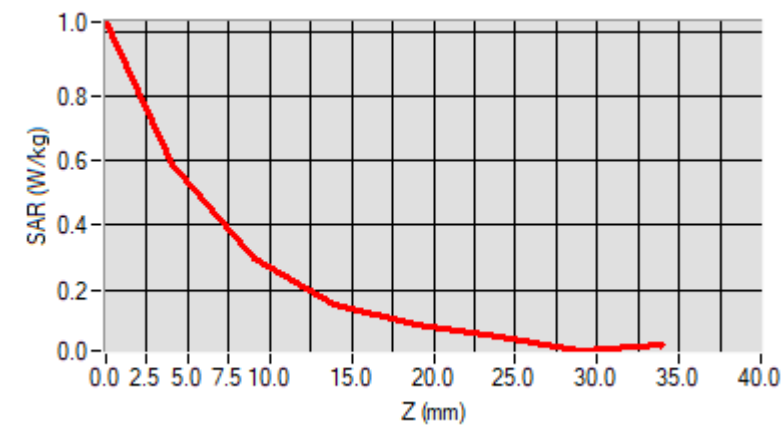


### D. SAR 1g & 10g

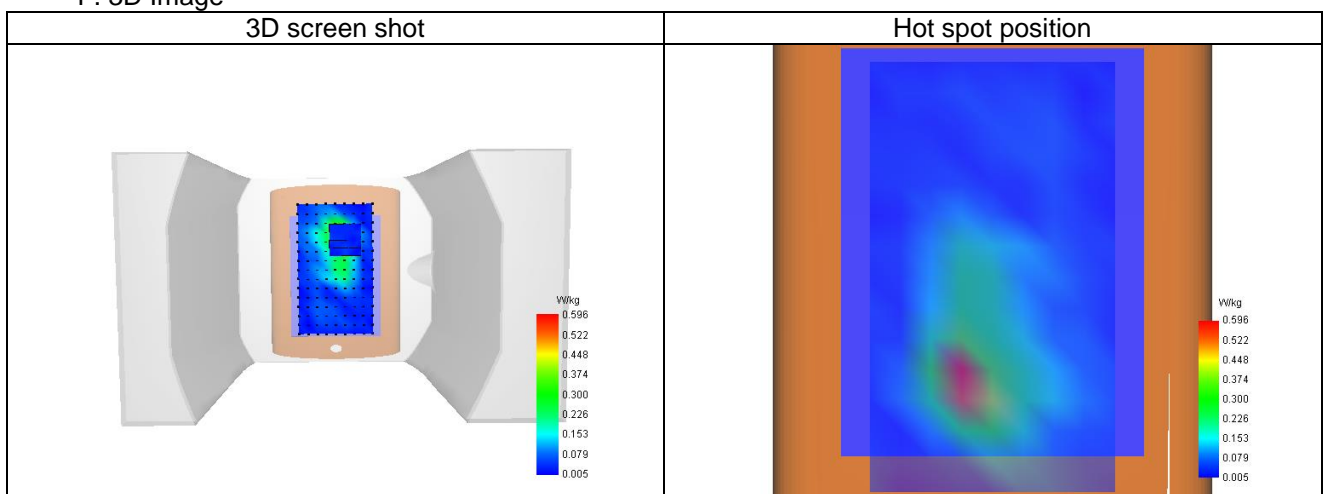
SAR 10g (W/Kg)	0.257
SAR 1g (W/Kg)	0.548
Variation (%)	-2.650
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	50.758390

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.030	0.590	0.299	0.150	0.090	0.056	0.011



F. 3D Image



## Plot 7

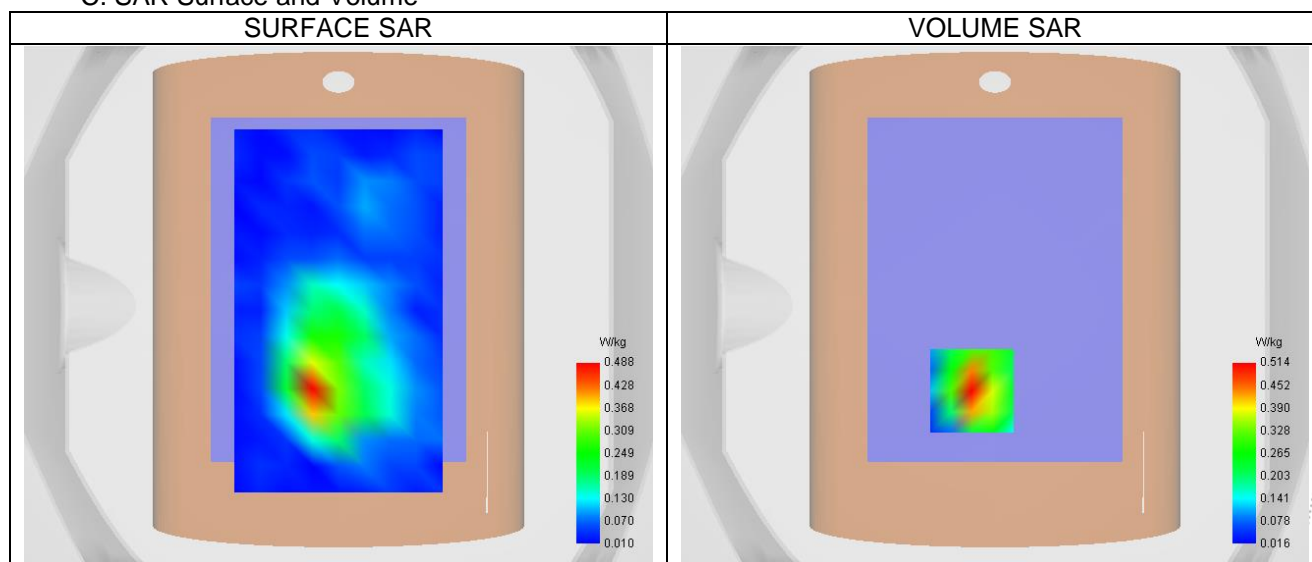
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.35
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	High (20300)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	1745.000
Relative permittivity (real part)	40.116
Relative permittivity (imaginary part)	14.136
Conductivity (S/m)	1.361

### C. SAR Surface and Volume

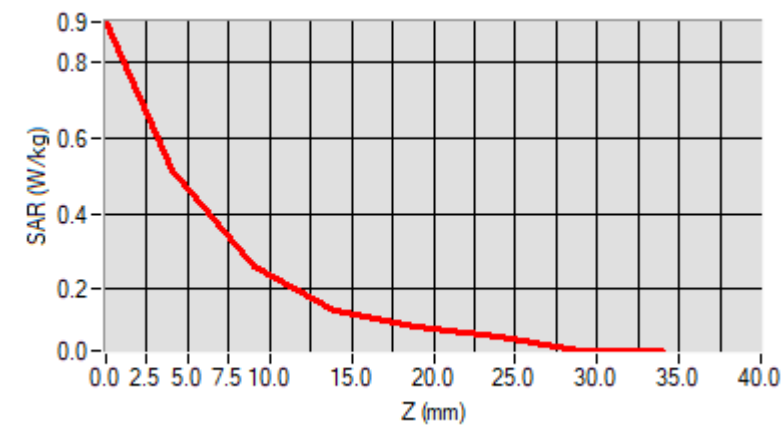


### D. SAR 1g & 10g

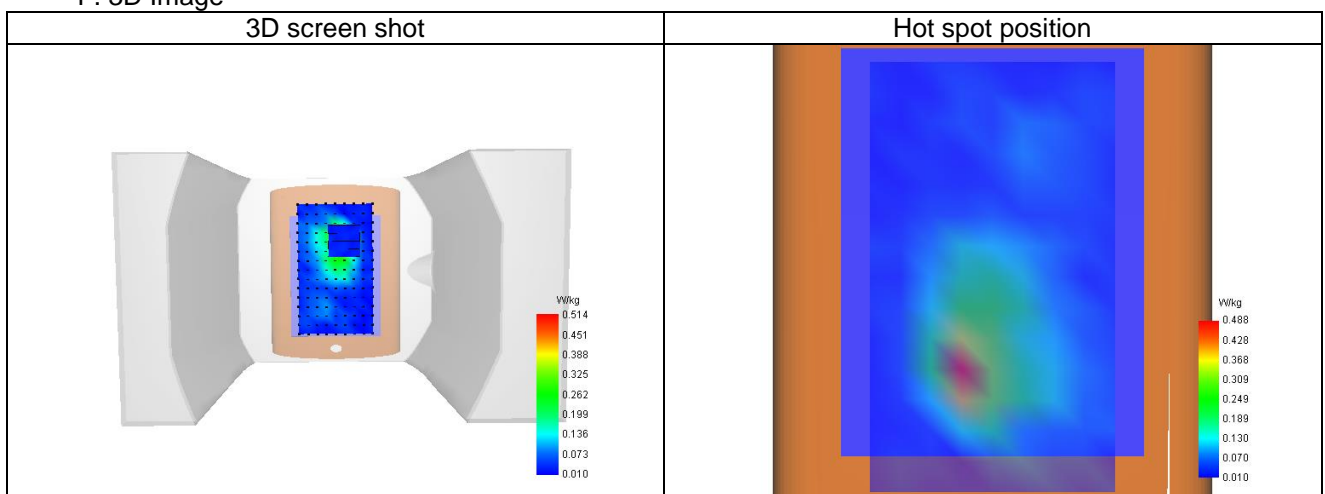
SAR 10g (W/Kg)	0.225
SAR 1g (W/Kg)	0.479
Variation (%)	2.540
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	50.553657

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.907	0.514	0.260	0.141	0.100	0.072	0.038



F. 3D Image





## Plot 8

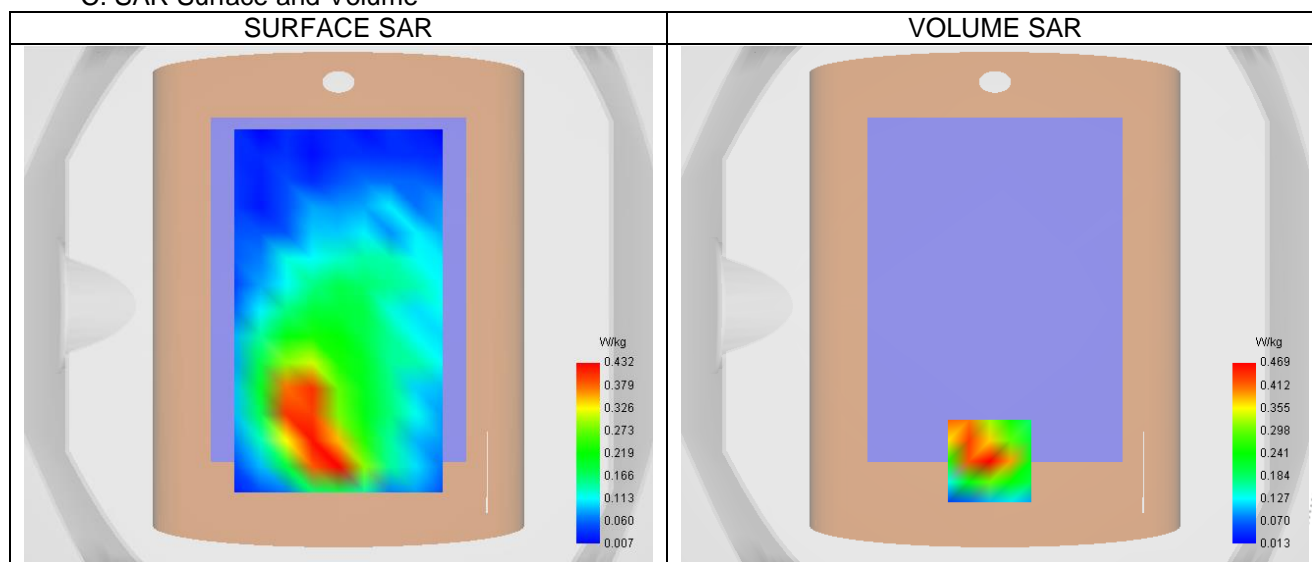
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.01
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Channels	Middle (20450)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	836.500
Relative permittivity (real part)	42.285
Relative permittivity (imaginary part)	20.225
Conductivity (S/m)	0.940

### C. SAR Surface and Volume

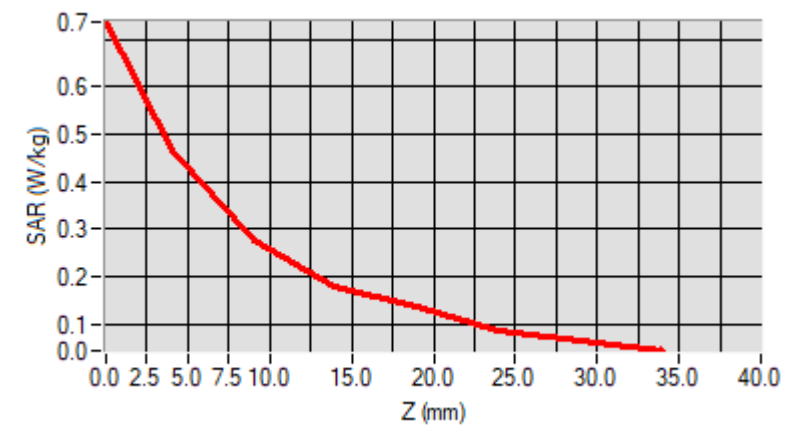


### D. SAR 1g & 10g

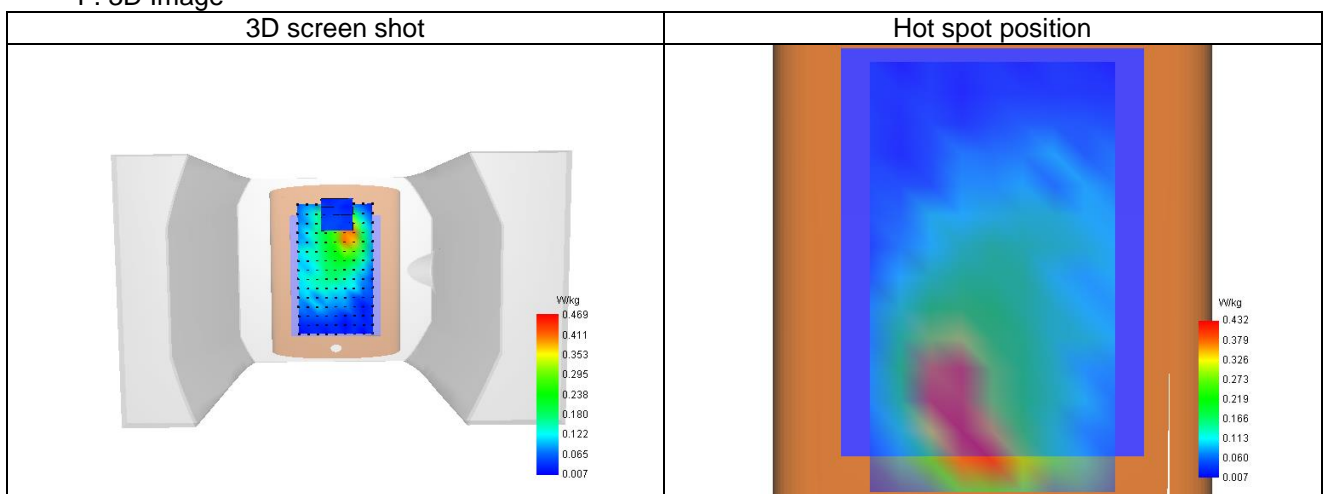
SAR 10g (W/Kg)	0.254
SAR 1g (W/Kg)	0.451
Variation (%)	-1.610
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	58.976070

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.736	0.469	0.276	0.182	0.139	0.085	0.068



F. 3D Image



## Plot 9

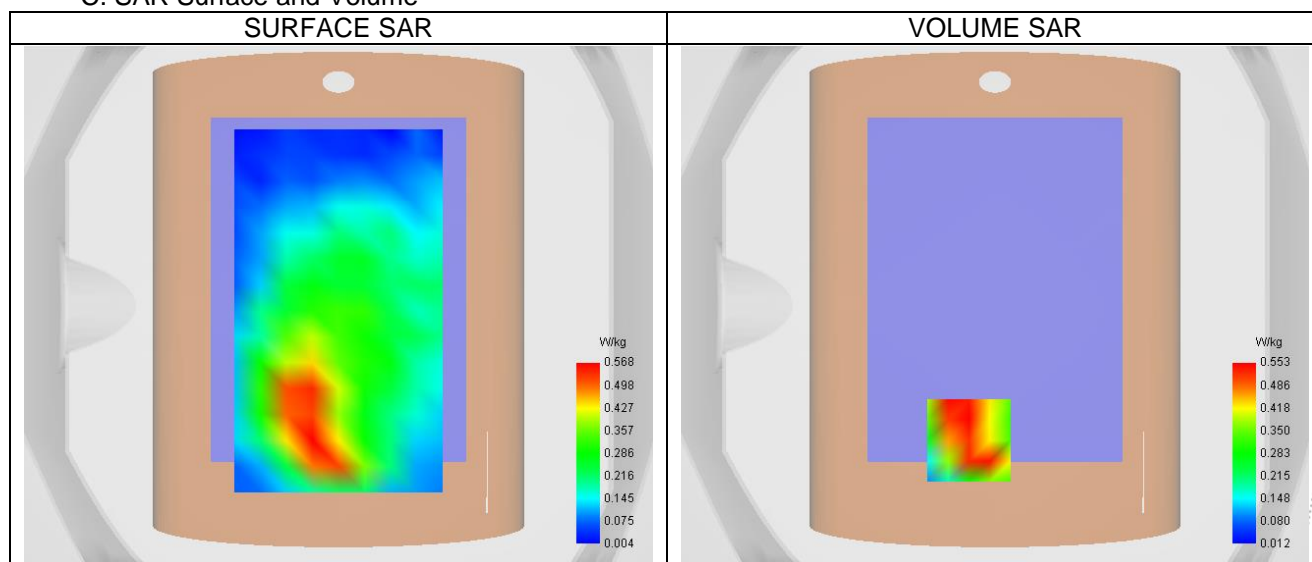
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.63
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	Low (20850)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	2510.000
Relative permittivity (real part)	39.087
Relative permittivity (imaginary part)	13.418
Conductivity (S/m)	1.890

### C. SAR Surface and Volume



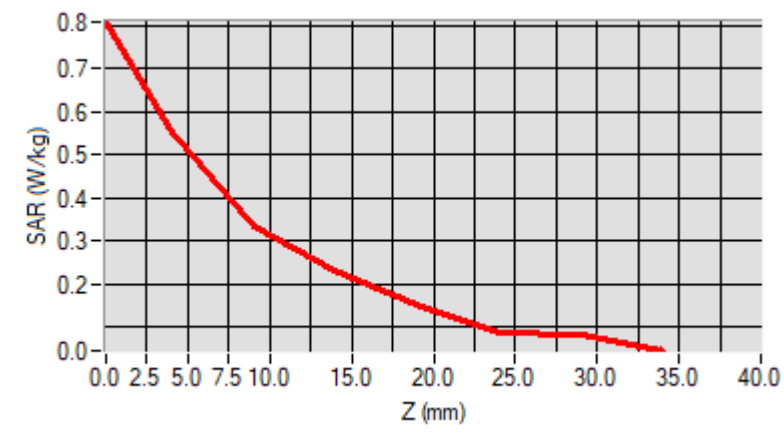
Maximum location: X=-10.00, Y=-52.00 ; SAR Peak: 0.86 W/kg

### D. SAR 1g & 10g

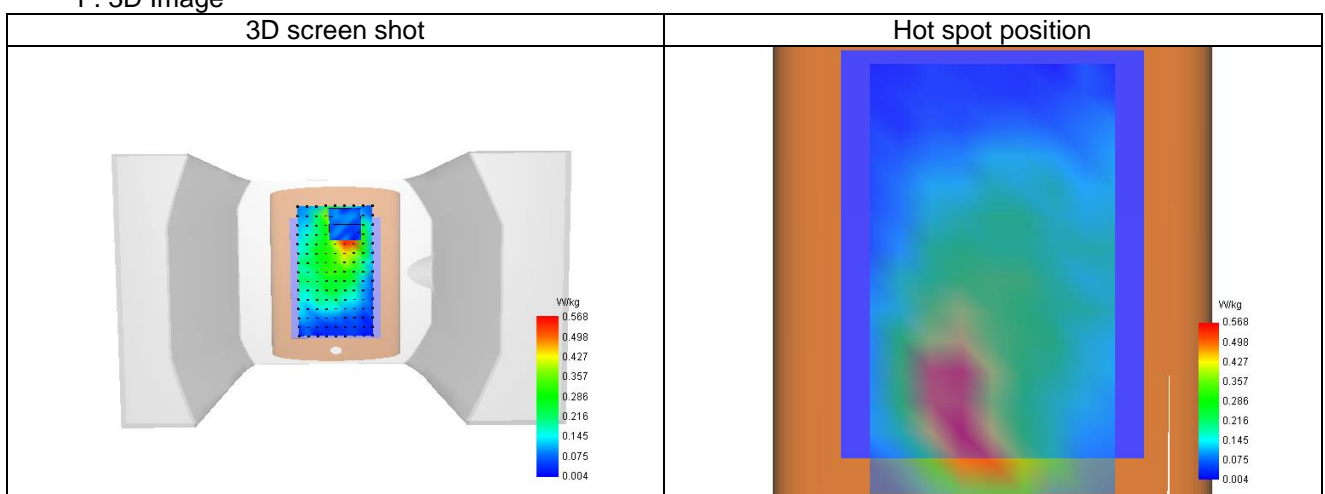
SAR 10g (W/Kg)	0.310
SAR 1g (W/Kg)	0.524
Variation (%)	-4.730
Horizontal validation criteria: minimum distance (mm)	17.888544
Vertical validation criteria: SAR ratio M2/M1 (%)	62.641982

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.808	0.553	0.333	0.230	0.149	0.087	0.081



F. 3D Image



## Plot 10

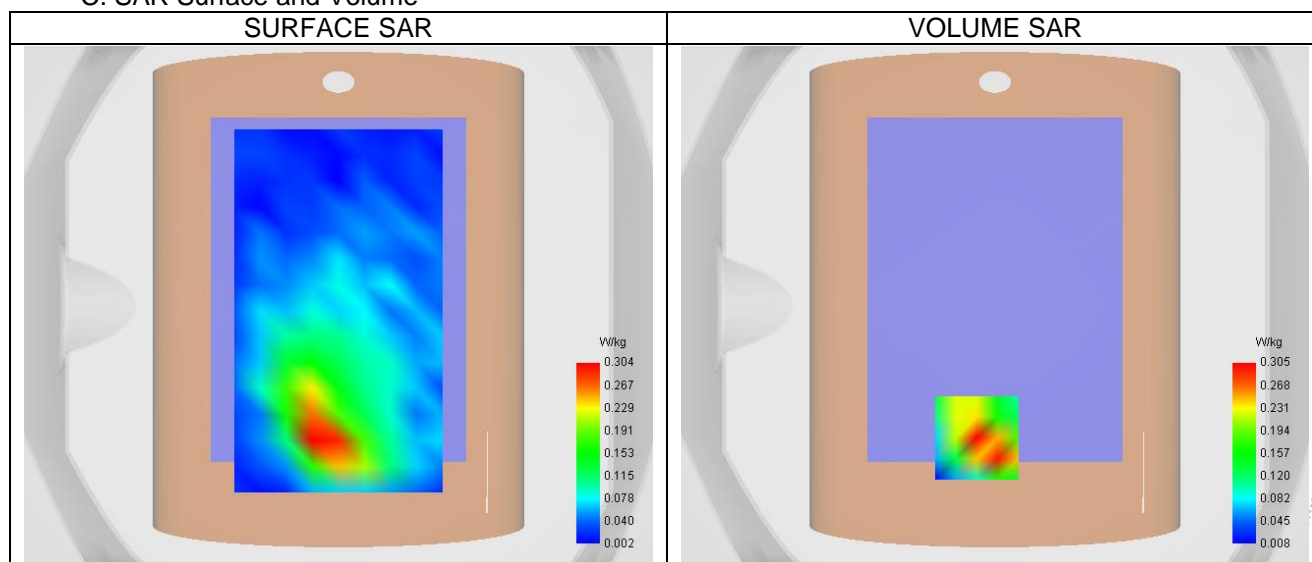
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	2.96
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 12
Channels	Low (23060)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	704.000
Relative permittivity (real part)	42.127
Relative permittivity (imaginary part)	23.264
Conductivity (S/m)	0.914

### C. SAR Surface and Volume



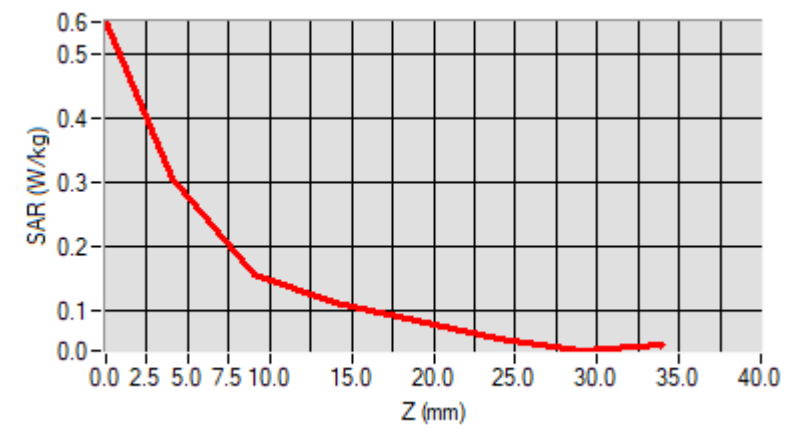
Maximum location: X=-7.00, Y=-51.00 ; SAR Peak: 0.54 W/kg

### D. SAR 1g & 10g

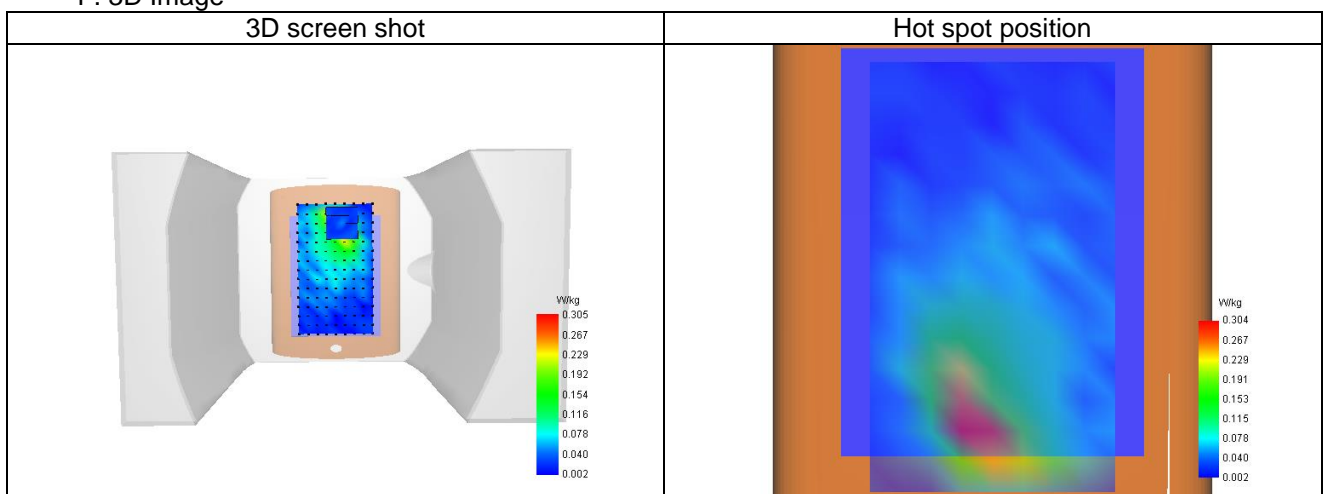
SAR 10g (W/Kg)	0.155
SAR 1g (W/Kg)	0.298
Variation (%)	-1.500
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	51.856253

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.550	0.305	0.158	0.113	0.086	0.057	0.038



F. 3D Image





## Plot 11

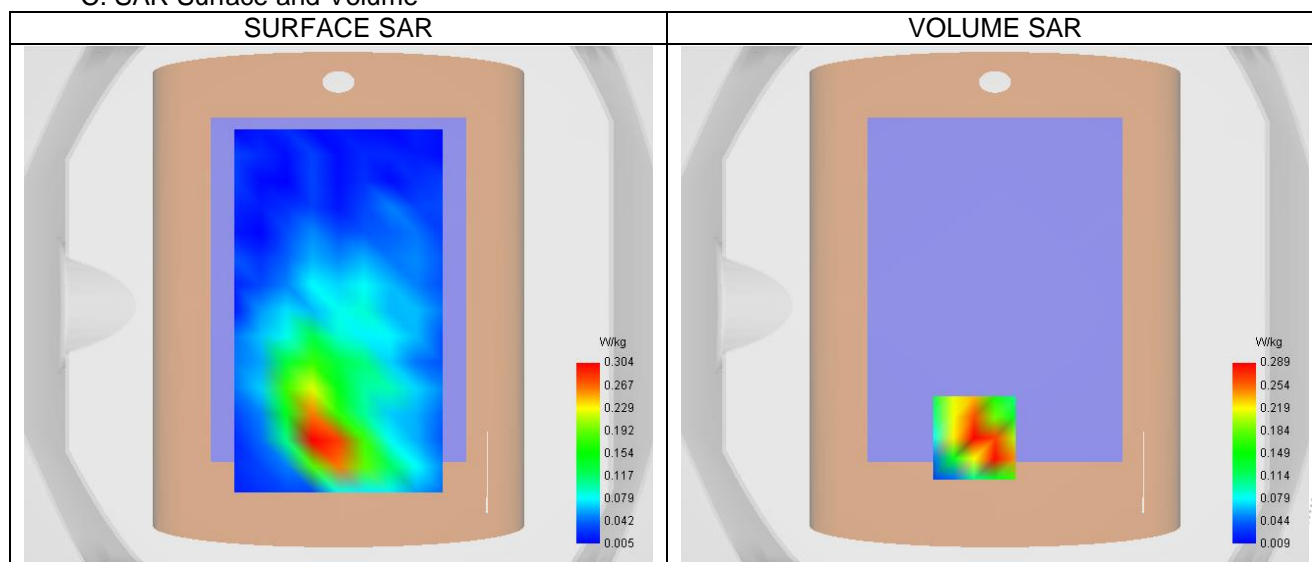
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	2.96
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 17
Channels	Low (23780)
Signal	LTE (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	709.000
Relative permittivity (real part)	42.113
Relative permittivity (imaginary part)	23.152
Conductivity (S/m)	0.913

### C. SAR Surface and Volume



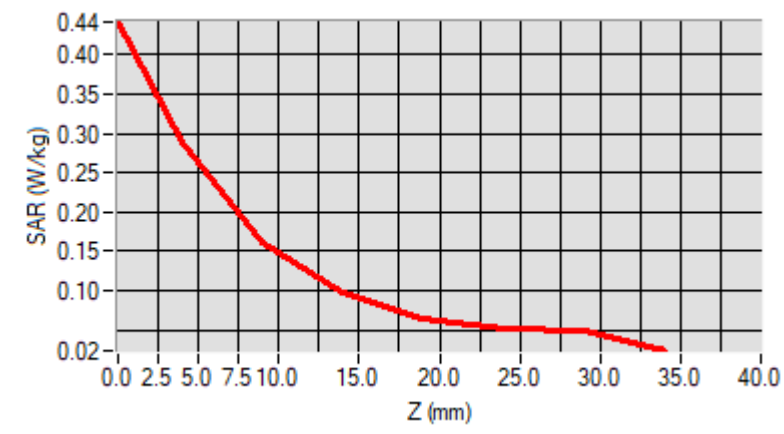
### D. SAR 1g & 10g

SAR 10g (W/Kg)	0.150
SAR 1g (W/Kg)	0.280
Variation (%)	0.020
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	56.102146

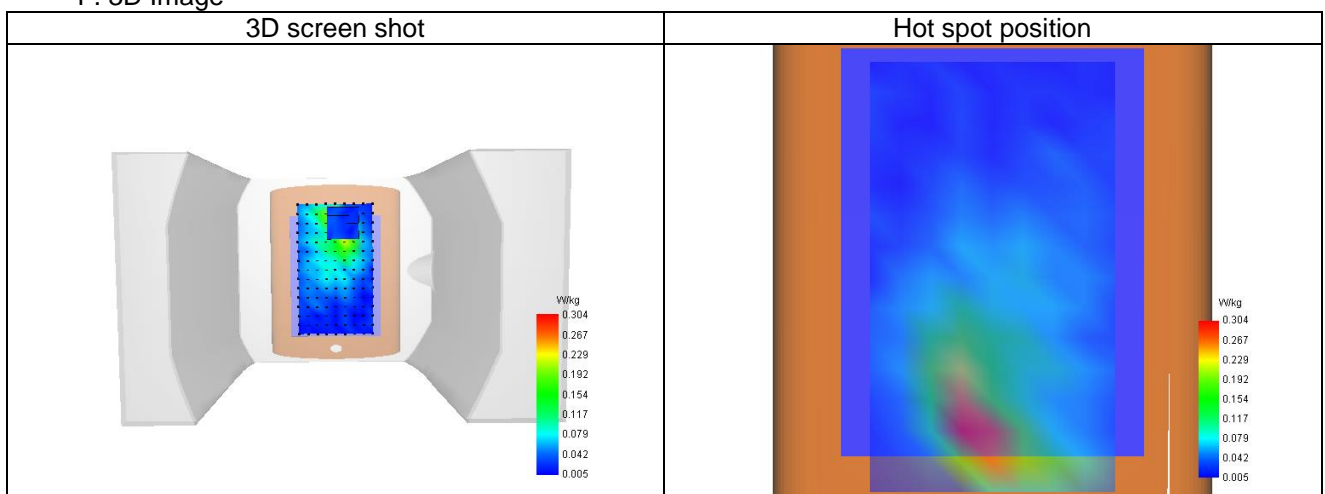
### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.442	0.289	0.162	0.097	0.065	0.053	0.048





F. 3D Image



## Plot 12

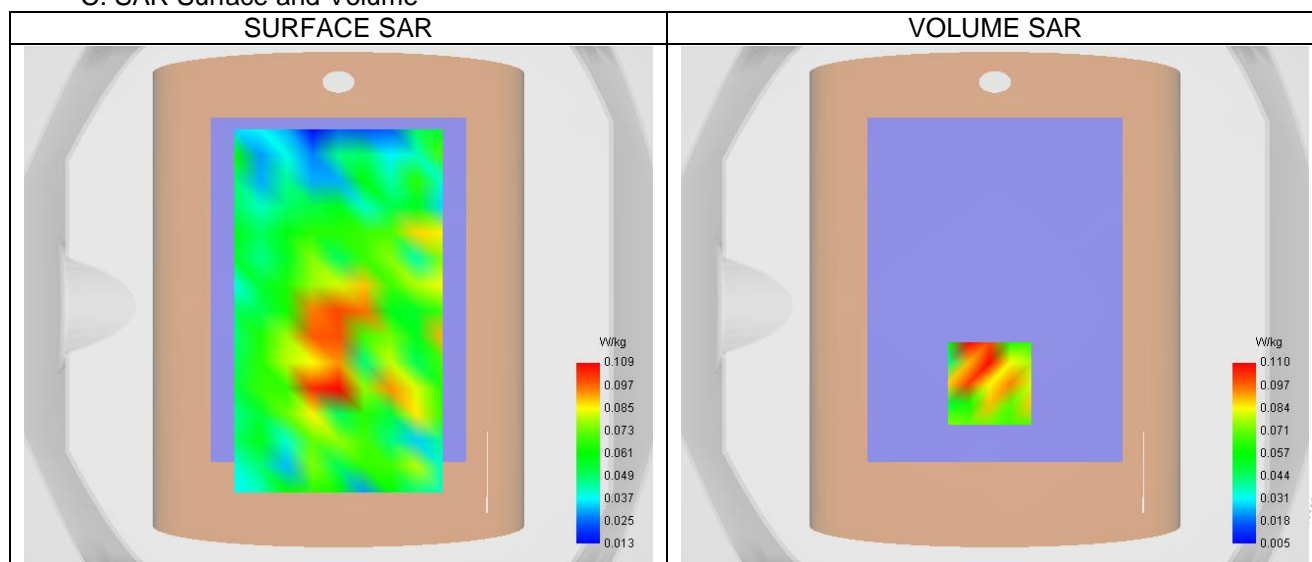
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.96
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Bluetooth
Channels	Middle (19)
Signal	Bluetooth (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	2441.000
Relative permittivity (real part)	39.202
Relative permittivity (imaginary part)	13.219
Conductivity (S/m)	1.799

### C. SAR Surface and Volume

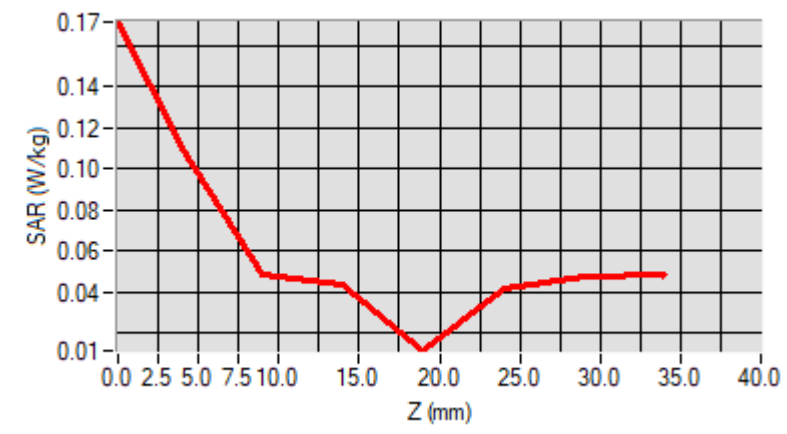


### D. SAR 1g & 10g

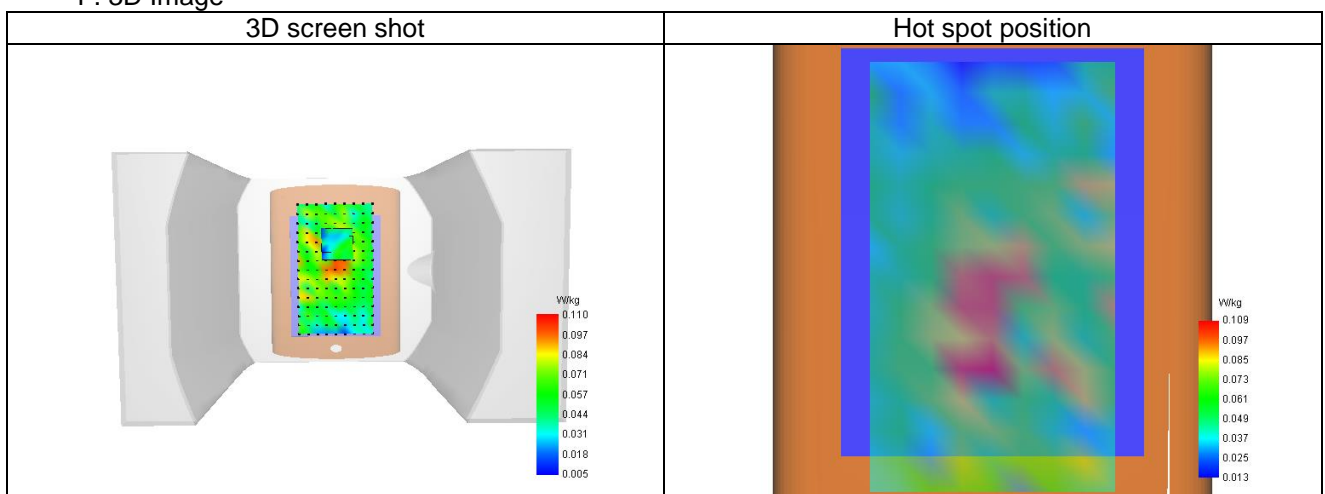
SAR 10g (W/Kg)	0.070
SAR 1g (W/Kg)	0.121
Variation (%)	2.480
Horizontal validation criteria: minimum distance (mm)	11.313708
Vertical validation criteria: SAR ratio M2/M1 (%)	40.375342

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.171	0.110	0.048	0.044	0.011	0.042	0.048



F. 3D Image



## Plot 13

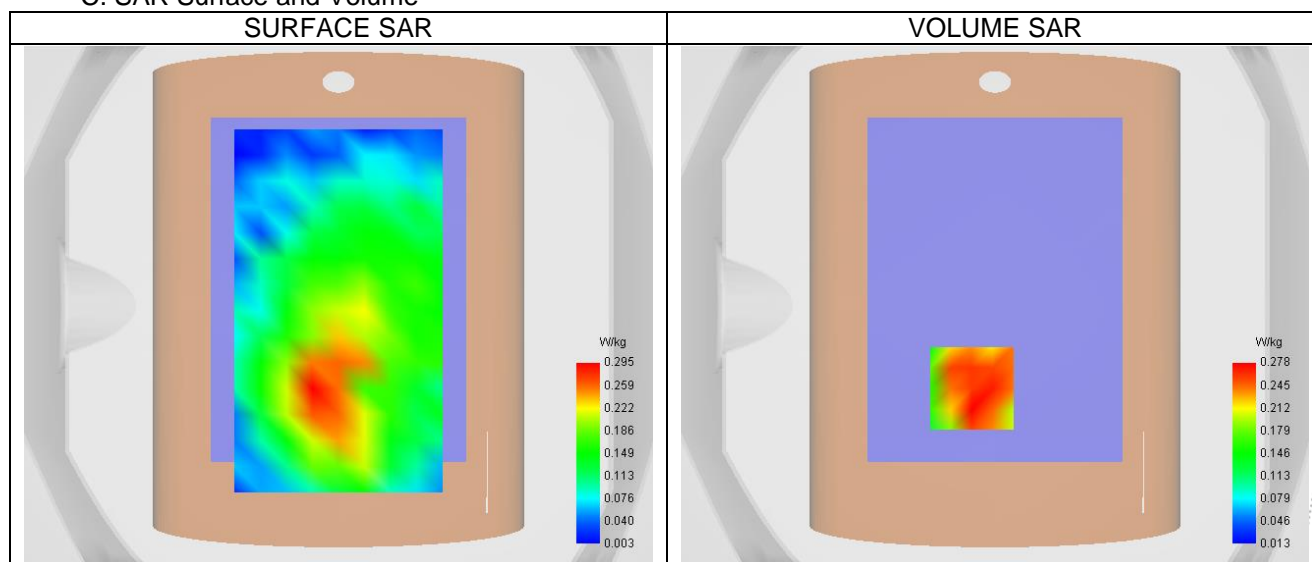
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	3.96
Area Scan	surf_sam_plan.txt
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	IEEE802.b (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	2437.000
Relative permittivity (real part)	39.226
Relative permittivity (imaginary part)	13.207
Conductivity (S/m)	1.788

### C. SAR Surface and Volume

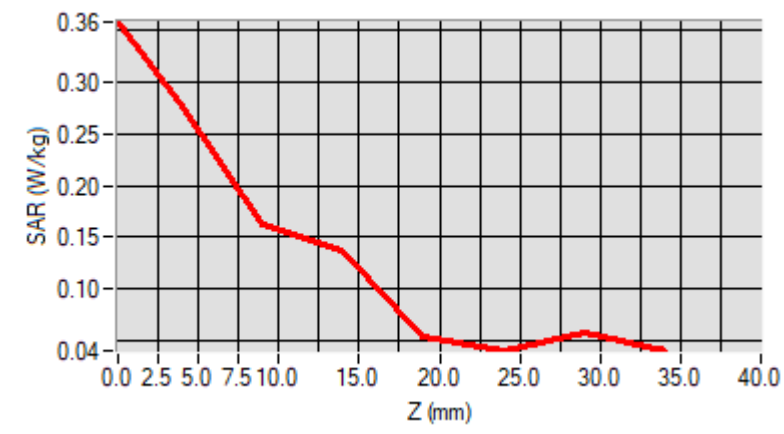


### D. SAR 1g & 10g

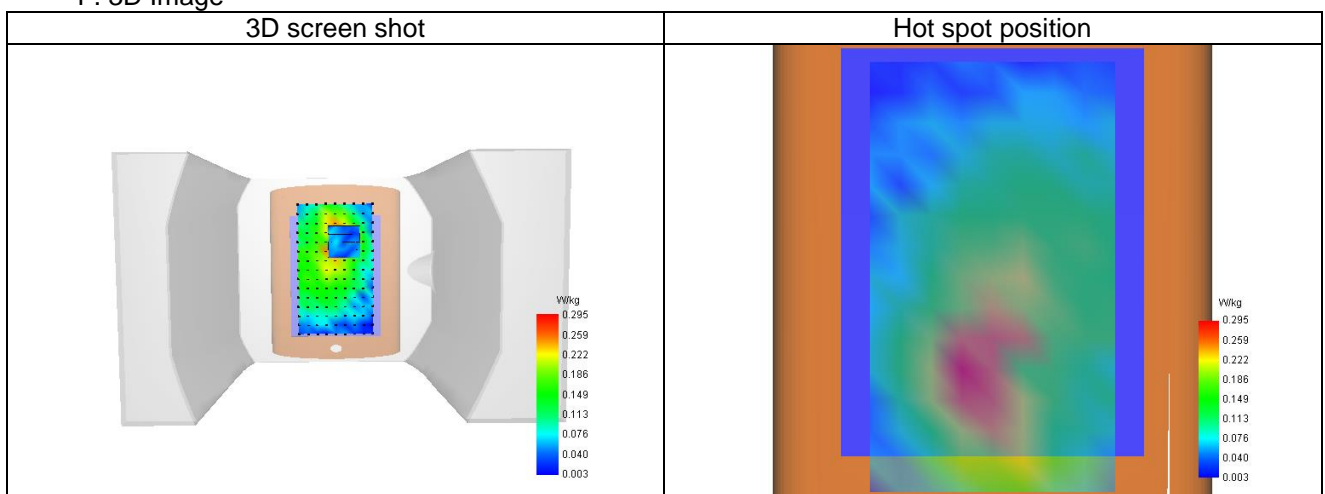
SAR 10g (W/Kg)	0.170
SAR 1g (W/Kg)	0.267
Variation (%)	-4.620
Horizontal validation criteria: minimum distance (mm)	17.888544
Vertical validation criteria: SAR ratio M2/M1 (%)	56.627688

### E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.358	0.278	0.161	0.138	0.054	0.040	0.057



F. 3D Image



## Plot 14

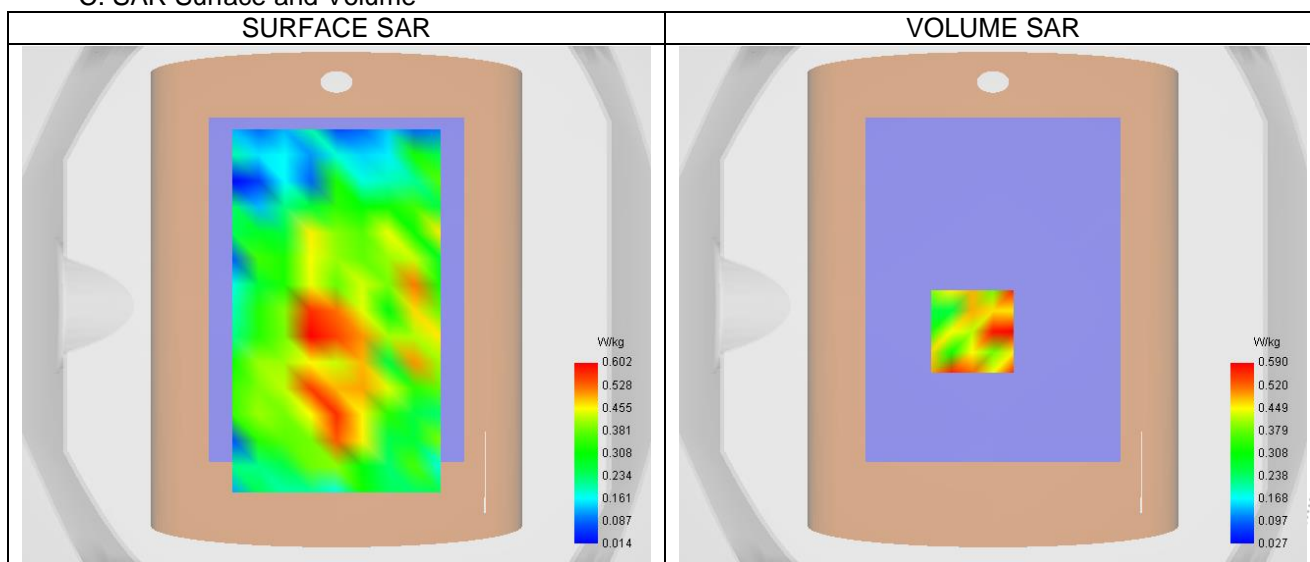
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	2.92
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Low (36)
Signal	IEEE802.a (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	5180.000
Relative permittivity (real part)	35.650
Relative permittivity (imaginary part)	16.250
Conductivity (S/m)	4.965

### C. SAR Surface and Volume



Maximum location: X=-8.00, Y=-10.00 ; SAR Peak: 0.92 W/kg

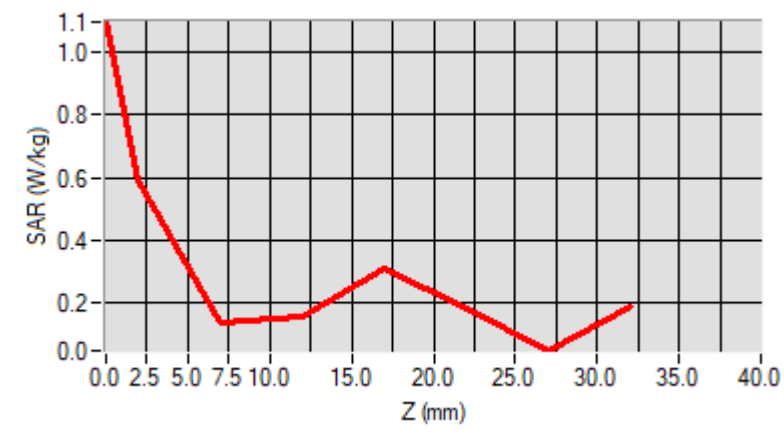
### D. SAR 1g & 10g

SAR 10g (W/Kg)	0.328
SAR 1g (W/Kg)	0.438
Variation (%)	-1.780
Horizontal validation criteria: minimum distance (mm)	25.298221
Vertical validation criteria: SAR ratio M2/M1 (%)	70.962413

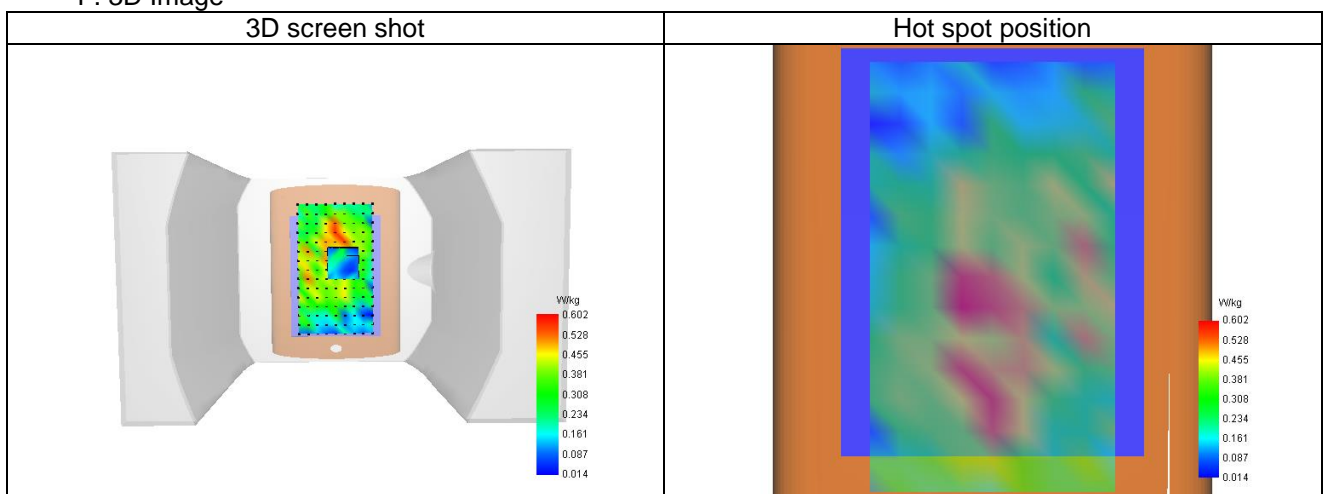
### E. Z Axis Scan

Z (mm)	0.00	2.00	7.00	12.00	17.00	22.00	27.00
SAR (W/Kg)	1.097	0.590	0.135	0.156	0.310	0.179	0.048





F. 3D Image





## Plot 15

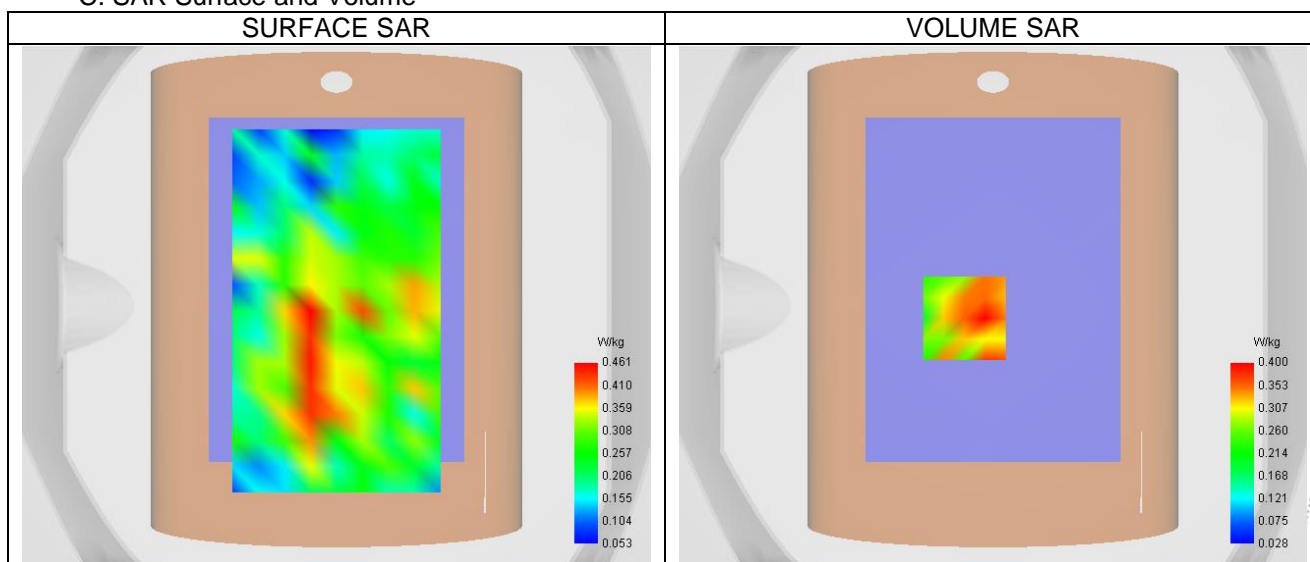
### A. Experimental conditions.

Probe	SN 25/22 EPG0373
ConvF	2.92
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Low (149)
Signal	IEEE802.a (Crest factor: 1.0)

### B. Permittivity

Frequency (MHz)	5745.000
Relative permittivity (real part)	35.650
Relative permittivity (imaginary part)	16.250
Conductivity (S/m)	4.965

### C. SAR Surface and Volume



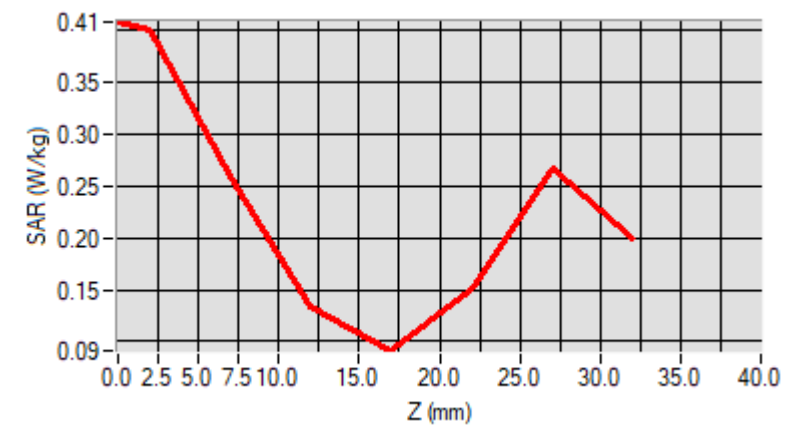
Maximum location: X=-11.00, Y=-5.00 ; SAR Peak: 0.61 W/kg

### D. SAR 1g & 10g

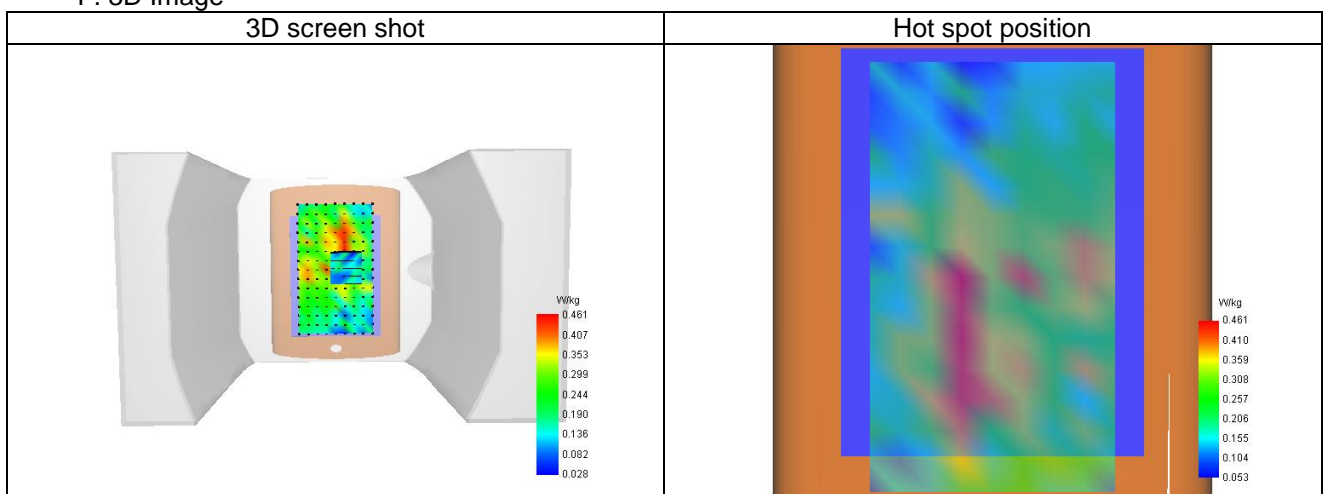
SAR 10g (W/Kg)	0.252
SAR 1g (W/Kg)	0.357
Variation (%)	-0.800
Horizontal validation criteria: minimum distance (mm)	24.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	66.189302

### E. Z Axis Scan

Z (mm)	0.00	2.00	7.00	12.00	17.00	22.00	27.00
SAR (W/Kg)	0.408	0.400	0.259	0.134	0.091	0.151	0.267

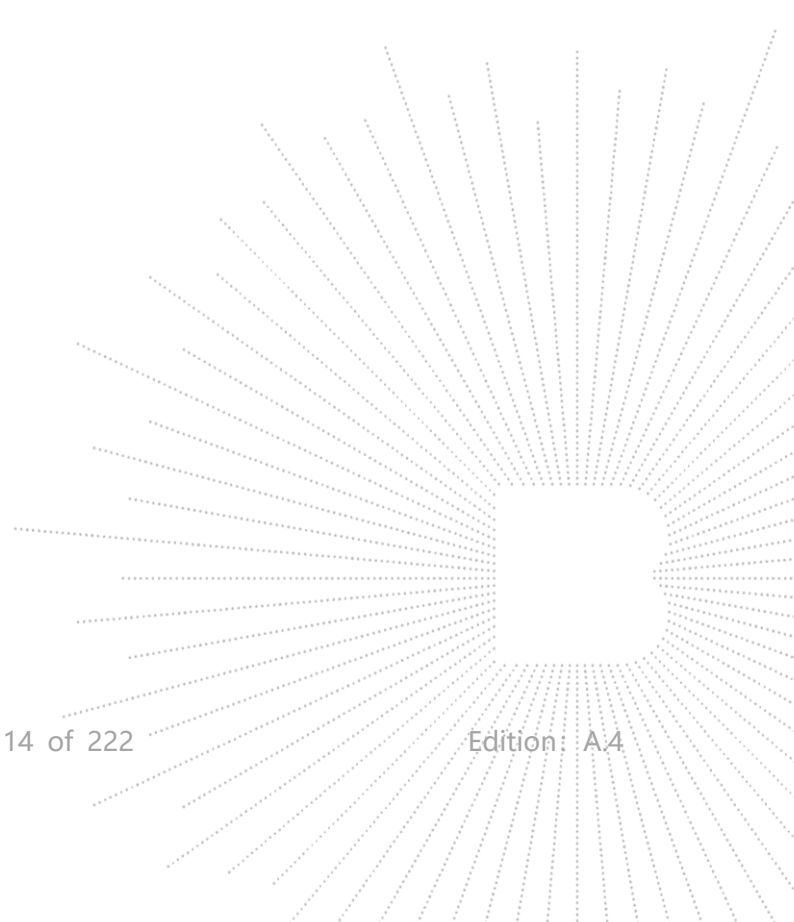


F. 3D Image



## 16. CALIBRATION CERTIFICATES

**Probe-EPGO373 Calibration Certificate**  
**SID835Dipole Calibration Certificate**  
**SID900Dipole Calibration Certificate**  
**SID1800Dipole Calibration Certificate**  
**SID2100Dipole Calibration Certificate**  
**SID2450Dipole Calibration Certificate**  
**SID2600Dipole Calibration Certificate**  
**SID5000Dipole Calibration Certificate**



**COMOSAR E-Field Probe Calibration Report**

Ref : ACR.180.5.22.BES.A

**SHENZHEN BCTC TECHNOLOGY CO., LTD.**  
1 ~2/ F, NO. B FACTORY BUILDING, PENGZHOU INDUSTRIAL  
PARK, FUYUAN 1ST ROAD,  
TANGWEI COMMUNITY, FUHAI STREET, BAO'AN DISTRICT,  
SHENZHEN, GUANGDONG, CHINA  
**MVG COMOSAR DOSIMETRIC E-FIELD PROBE**  
SERIAL NO.: SN 25/22 EPG0373

**Calibrated at MVG**  
**Z.I. de la pointe du diable**  
Technopôle Brest Iroise – 295 avenue Alexis de Rochon  
29280 PLOUZANE - FRANCE

Calibration date: 06/29/2022



Accreditations #2-6789  
Scope available on [www.cofrac.fr](http://www.cofrac.fr)



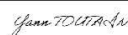
The use of the Cofrac brand and the accreditation references is prohibited from any reproduction.

*Summary:*

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).

Page: 1/11



	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Jérôme Le Gall	Measurement Responsible	6/30/2022	
<i>Checked &amp; approved by:</i>	Jérôme Luc	Technical Manager	6/30/2022	
<i>Authorized by:</i>	Yann Toutain	Laboratory Director	6/30/2022	

2022.06.30

13:38:42 +02'00'

	<i>Customer Name</i>
<i>Distribution :</i>	Shenzhen BCTC Technology Co., Ltd.

<i>Issue</i>	<i>Name</i>	<i>Date</i>	<i>Modifications</i>
A	Jérôme Le Gall	6/30/2022	Initial release



## TABLE OF CONTENTS

1	Device Under Test .....	4
2	Product Description .....	4
2.1	General Information .....	4
3	Measurement Method .....	4
3.1	Linearity .....	4
3.2	Sensitivity .....	4
3.3	Lower Detection Limit .....	5
3.4	Isotropy .....	5
3.1	Boundary Effect .....	5
4	Measurement Uncertainty .....	6
5	Calibration Measurement Results .....	6
5.1	Sensitivity in air .....	6
5.2	Linearity .....	7
5.3	Sensitivity in liquid .....	8
5.4	Isotropy .....	9
6	List of Equipment .....	10

Page: 3/11

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## 1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 25/22 EPG0373
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.234 MΩ Dipole 2: R2=0.195 MΩ Dipole 3: R3=0.250 MΩ

## 2 PRODUCT DESCRIPTION

### 2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards.



**Figure 1 – MVG COMOSAR Dosimetric E field Probe**

Probe Length	330 mm
Length of Individual Dipoles	2 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.5 mm
Distance between dipoles / probe extremity	1 mm

## 3 MEASUREMENT METHOD

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

### 3.1 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

### 3.2 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards.

Page: 4/11

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### 3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

### 3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 to 360 degrees in 15-degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

### 3.1 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and  $d_{be} + d_{step}$  along lines that are approximately normal to the surface:

$$SAR_{uncertainty} [\%] = \Delta SAR_{be} \frac{(d_{be} + d_{step})^2}{2d_{step}} \frac{(e^{-d_{be}/(\delta/2)})}{\delta/2} \quad \text{for } (d_{be} + d_{step}) < 10 \text{ mm}$$

where

$SAR_{uncertainty}$	is the uncertainty in percent of the probe boundary effect
$d_{be}$	is the distance between the surface and the closest <i>zoom-scan</i> measurement point, in millimetre
$\Delta_{step}$	is the separation distance between the first and second measurement points that are closest to the phantom surface, in millimetre, assuming the boundary effect at the second location is negligible
$\delta$	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14 \text{ mm}$ at 3 GHz,
$\Delta SAR_{be}$	in percent of SAR is the deviation between the measured SAR value, at the distance $d_{be}$ from the boundary, and the analytical SAR value.

The measured worst case boundary effect SAR uncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

Page: 5/11

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#### 4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ , traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Expanded uncertainty 95 % confidence level $k = 2$					14 %

#### 5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

##### 5.1 SENSITIVITY IN AIR

Normx dipole 1 ( $\mu\text{V}/(\text{V}/\text{m})^2$ )	Normy dipole 2 ( $\mu\text{V}/(\text{V}/\text{m})^2$ )	Normz dipole 3 ( $\mu\text{V}/(\text{V}/\text{m})^2$ )
1.19	0.77	1.05

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
108	109	110

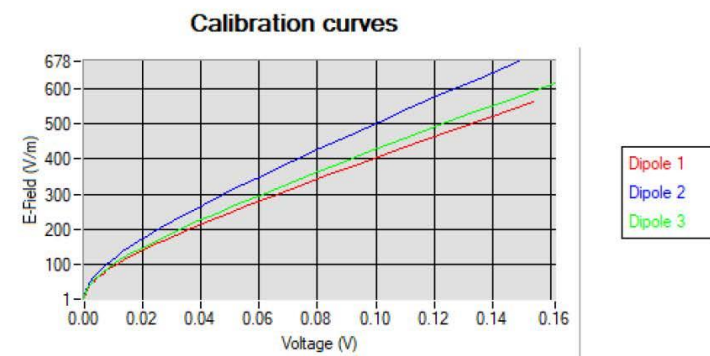
Calibration curves  $e_i=f(V)$  ( $i=1,2,3$ ) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$

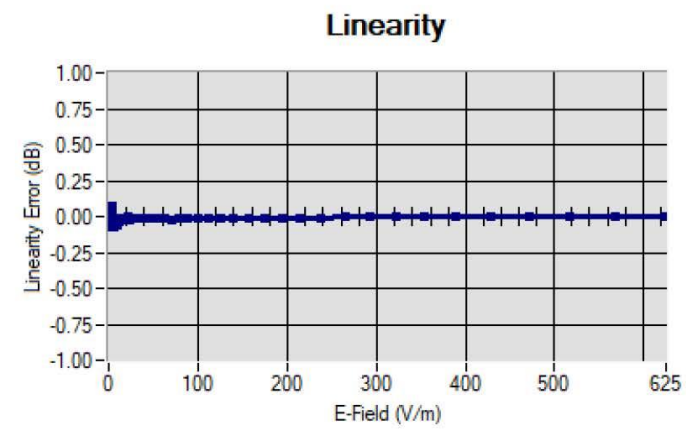
Page: 6/11

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## 5.2 LINEARITY



**Linearity:  $\pm 1.77\%$  ( $\pm 0.08\text{dB}$ )**

Page: 7/11

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### 5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL450*	450*	3.00*
BL450*	450*	2.83*
HL750	750	2.96
BL750	750	3.07
HL850	835	3.01
BL850	835	3.13
HL900	900	3.08
BL900	900	3.18
HL1800	1800	3.35
BL1800	1800	3.42
HL1900	1900	3.27
BL1900	1900	3.55
HL2100	2100	3.77
BL2100	2100	3.92
HL2300	2300	3.77
BL2300	2300	3.94
HL2450	2450	3.96
BL2450	2450	4.13
HL2600	2600	3.63
BL2600	2600	3.79
HL5200	5200	2.72
BL5200	5200	2.45
HL5400	5400	2.92
BL5400	5400	2.74
HL5600	5600	3.09
BL5600	5600	2.90
HL5800	5800	2.86
BL5800	5800	2.72

\* Frequency not cover by COFRAC scope, calibration not accredited

LOWER DETECTION LIMIT: 7mW/kg

Page: 8/11

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