

MEASUREMENT 8

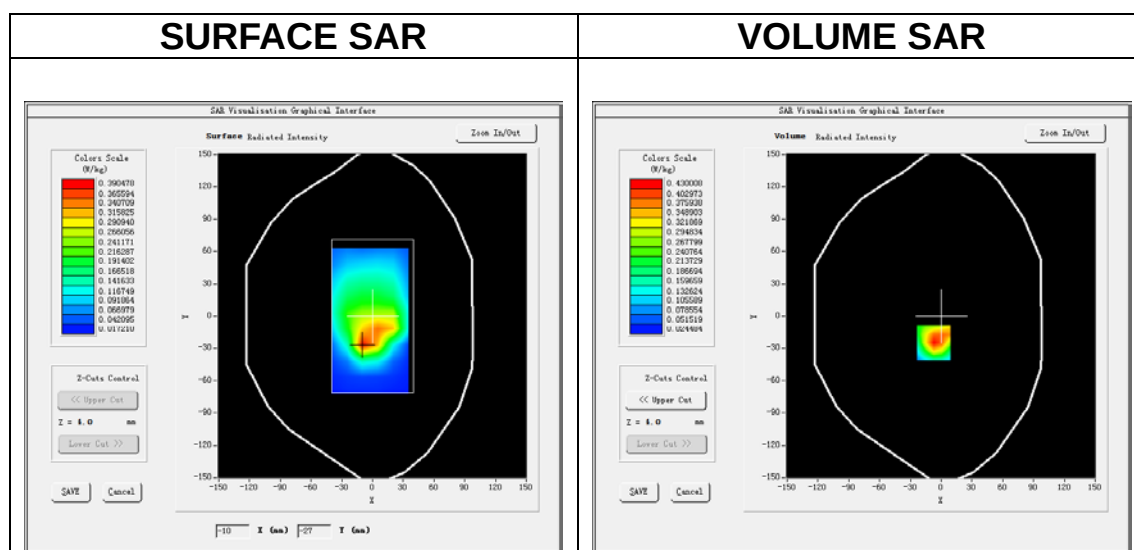
Date of measurement: 10/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

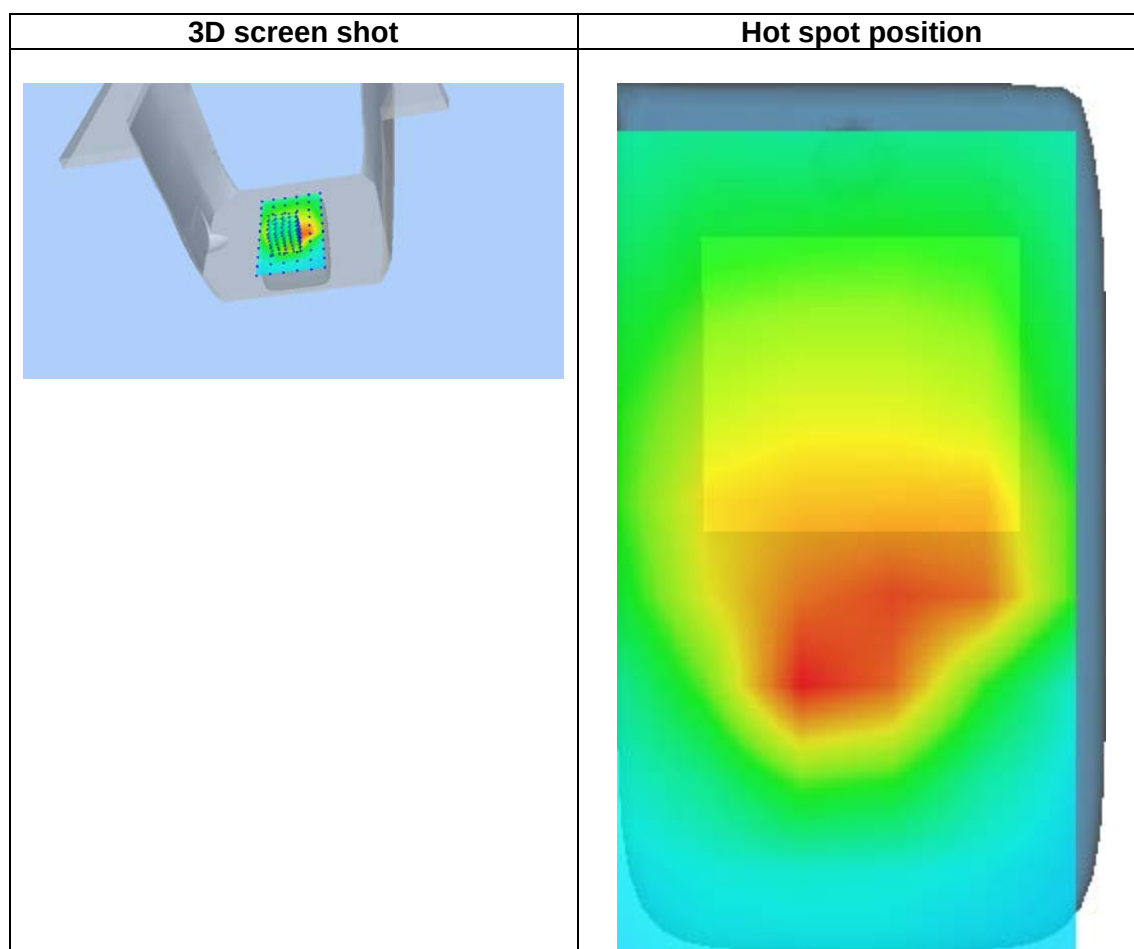
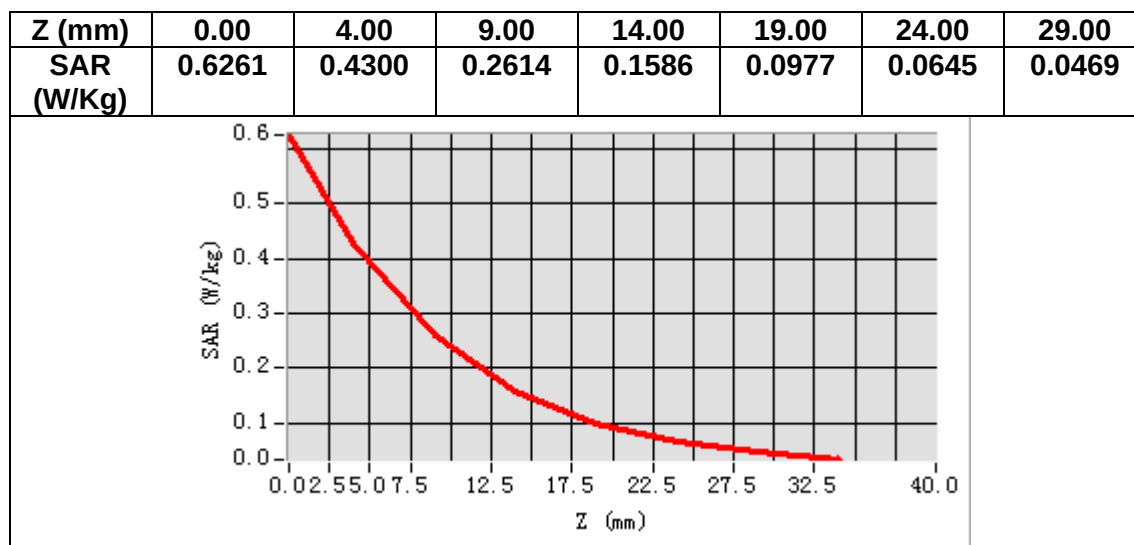
Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.784424
Relative permittivity (imaginary part)	13.825180
Conductivity (S/m)	1.330290
Variation (%)	-0.060000



Maximum location: X=-7.00, Y=-25.00

SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.226106
SAR 1g (W/Kg)	0.406832



MEASUREMENT 9

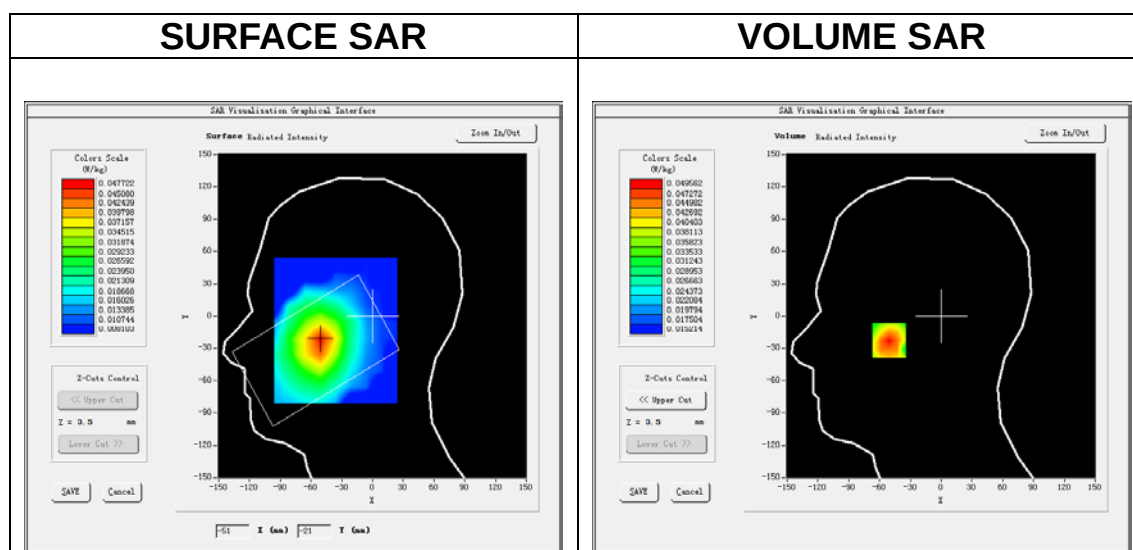
Date of measurement: 7/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

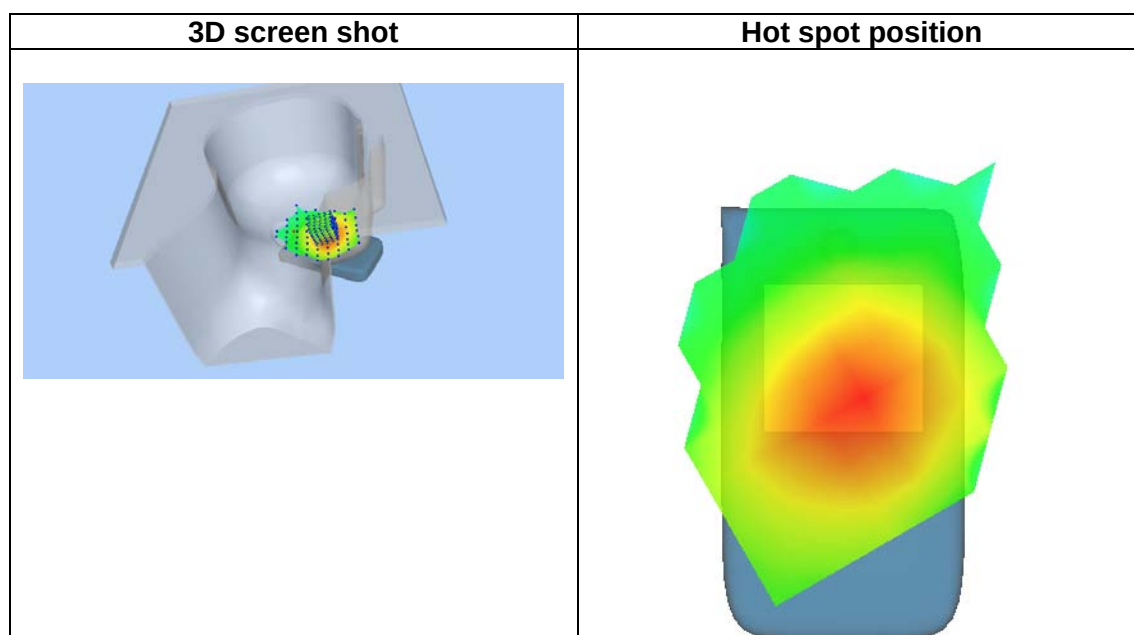
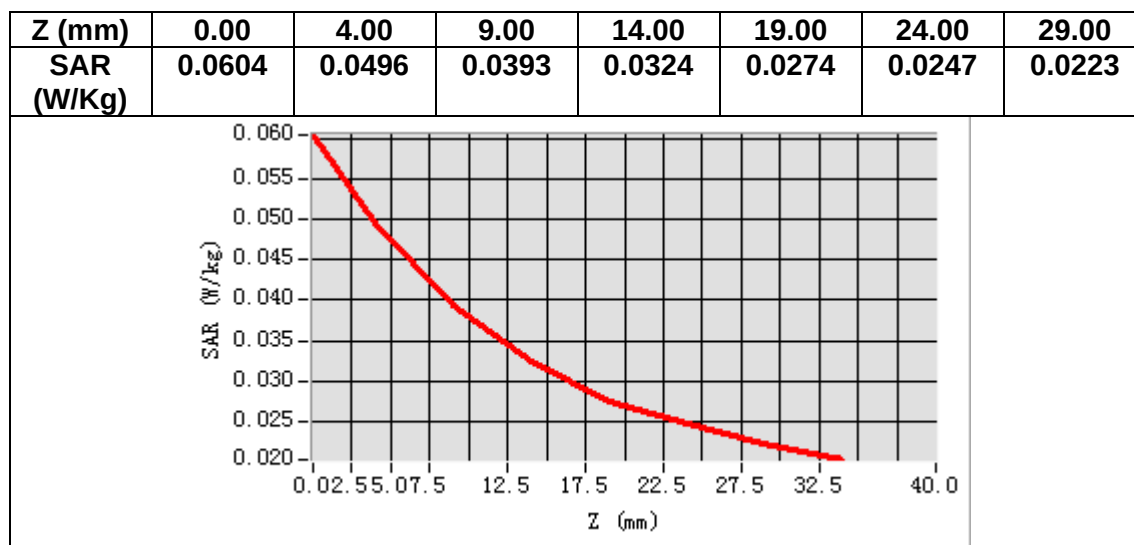
Frequency (MHz)	836.400000
Relative permittivity (real part)	42.726318
Relative permittivity (imaginary part)	19.994938
Conductivity (S/m)	0.929098
Variation (%)	0.290000



Maximum location: X=-51.00, Y=-23.00

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.036783
SAR 1g (W/Kg)	0.048046



MEASUREMENT 10

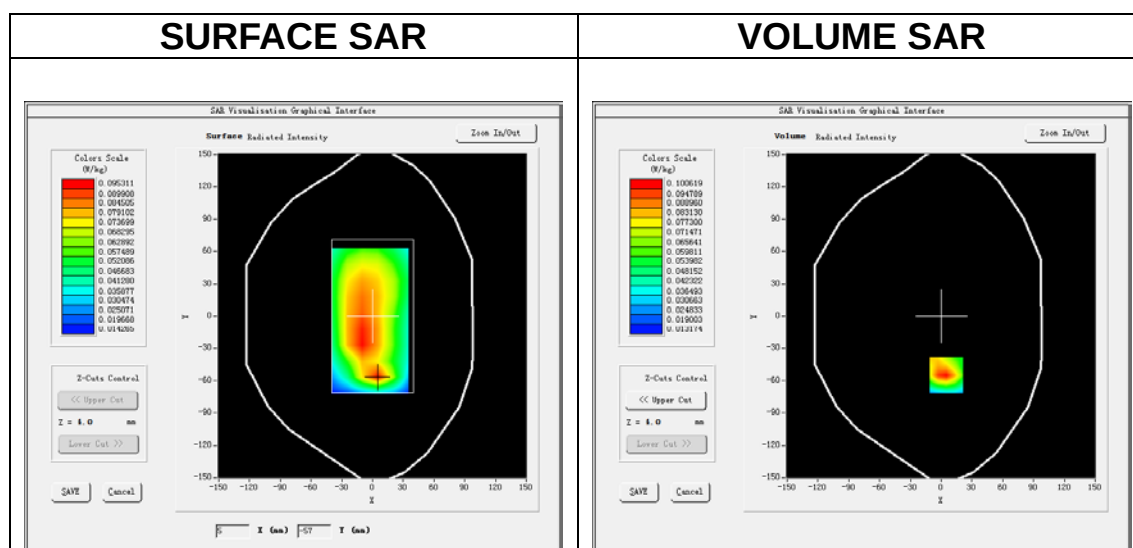
Date of measurement: 7/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	42.726318
Relative permittivity (imaginary part)	19.994938
Conductivity (S/m)	0.929098
Variation (%)	0.070000

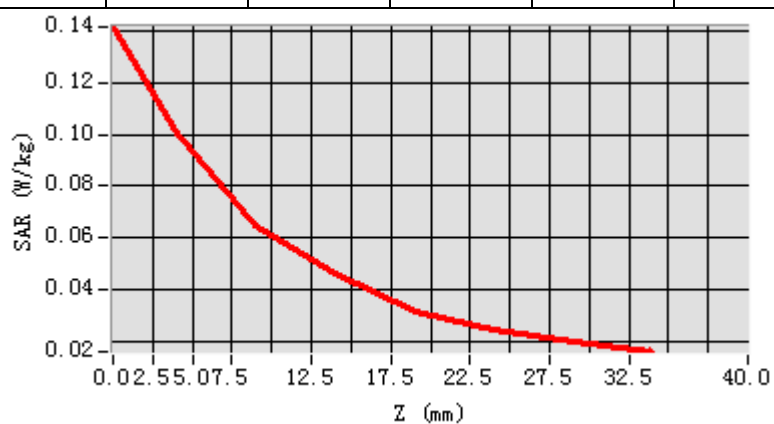


Maximum location: X=5.00, Y=-55.00

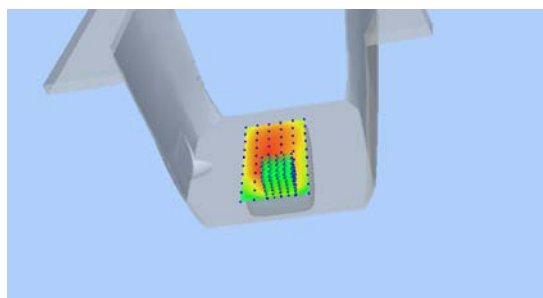
SAR Peak: 0.14 W/kg

SAR 10g (W/Kg)	0.058657
SAR 1g (W/Kg)	0.095342

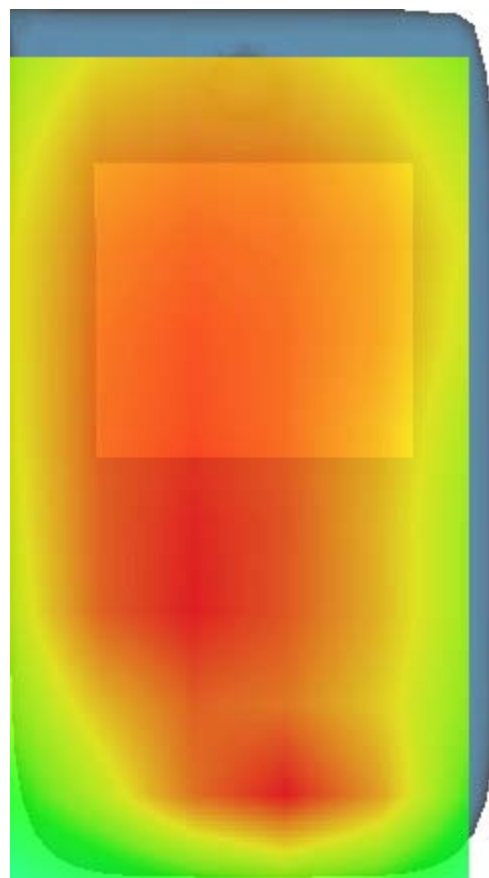
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.1416	0.1006	0.0649	0.0457	0.0312	0.0240	0.0200



3D screen shot



Hot spot position



MEASUREMENT 11

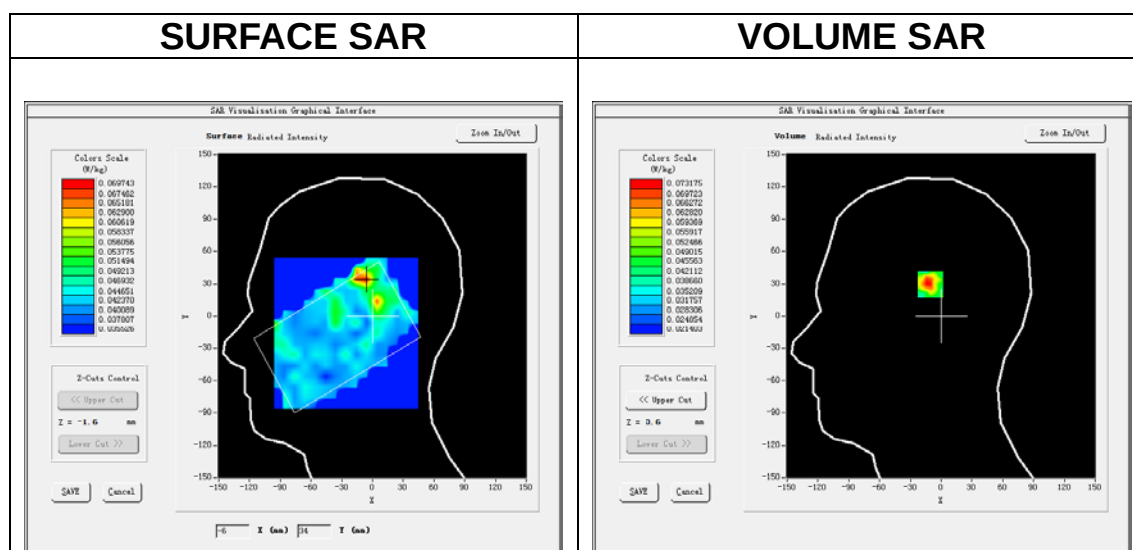
Date of measurement: 15/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	37.305325
Relative permittivity (imaginary part)	15.721080
Conductivity (S/m)	4.541645
Variation (%)	-2.920000

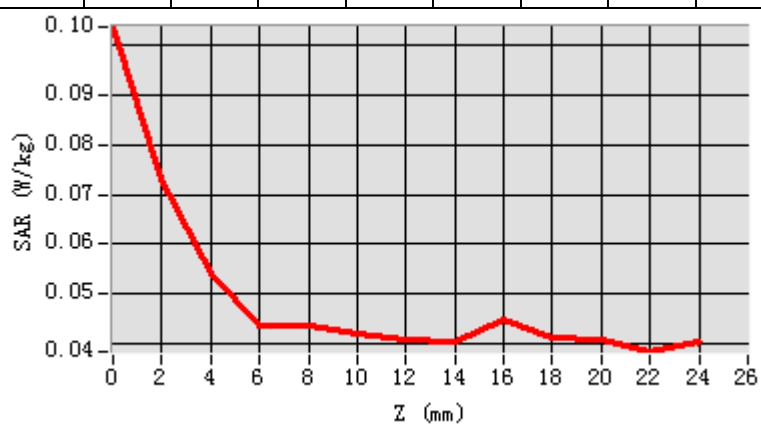


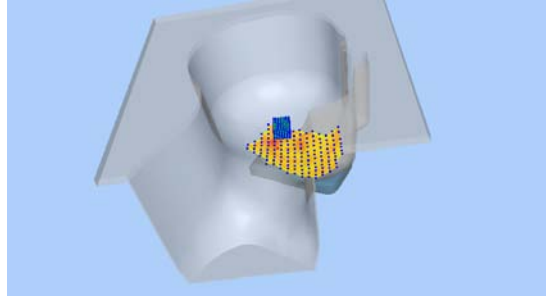
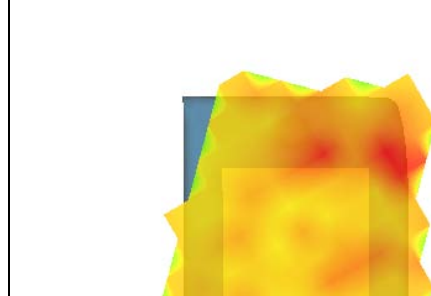
Maximum location: X=-8.00, Y=34.00

SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.048853
SAR 1g (W/Kg)	0.072986

Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SA R (W/ Kg)	0.10 38	0.07 32	0.05 41	0.04 36	0.04 33	0.04 18	0.04 09	0.04 03	0.04 47	0.04 12	0.04 07	0.03 83



3D screen shot	Hot spot position
	

MEASUREMENT 12

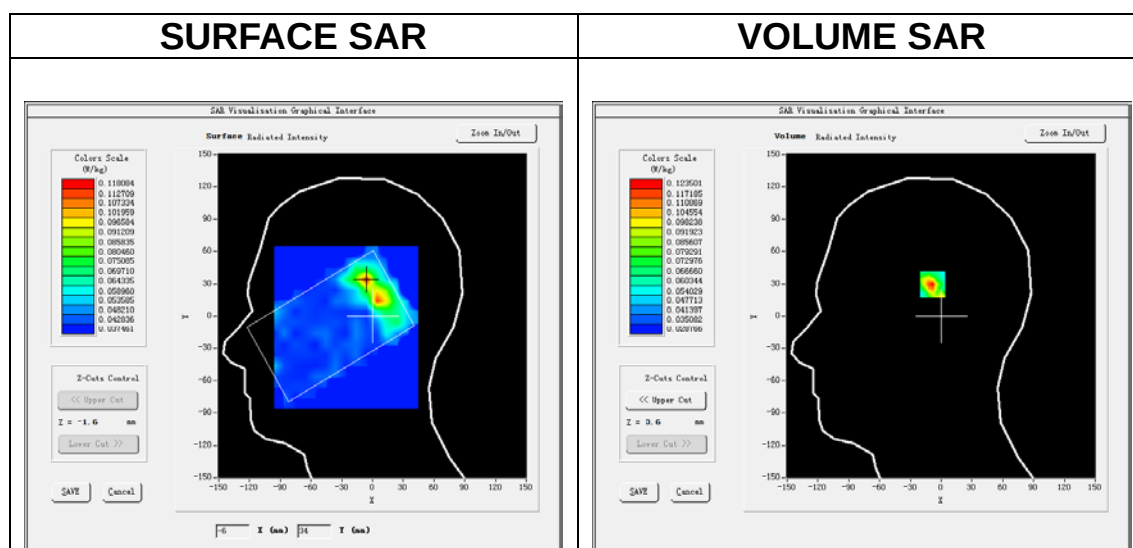
Date of measurement: 16/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	36.372192
Relative permittivity (imaginary part)	15.914046
Conductivity (S/m)	5.114598
Variation (%)	-0.110000

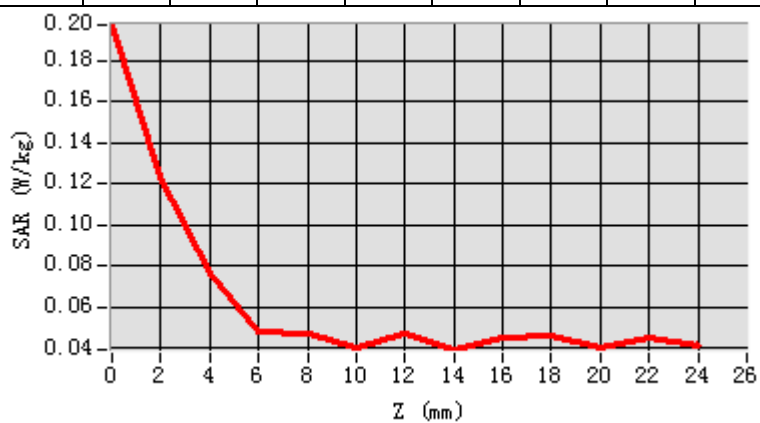


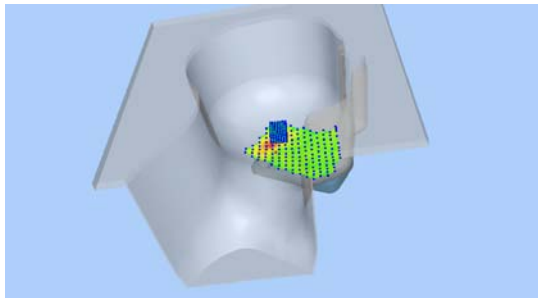
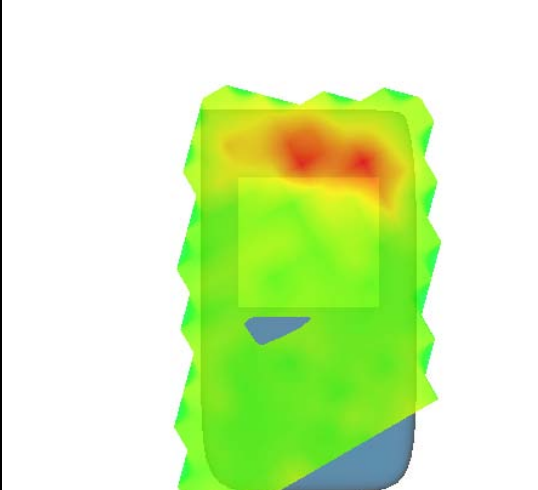
Maximum location: X=-6.00, Y=34.00

SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)	0.063604
SAR 1g (W/Kg)	0.112732

Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SA R (W/ Kg)	0.19 76	0.12 35	0.07 63	0.04 77	0.04 64	0.04 00	0.04 66	0.03 90	0.04 45	0.04 57	0.04 00	0.04 47



3D screen shot	Hot spot position
 A 3D CAD model of a mechanical part, possibly a bracket or housing, rendered in a light gray color. The part is shown from a perspective view. A small, rectangular area on the side of the part is highlighted with a color gradient, indicating a hot spot. The gradient transitions from blue (low intensity) to green, yellow, and red (high intensity). A small blue cube is positioned near the hot spot area.	 A 2D cross-section of the hot spot position, showing a color gradient map. The map is predominantly green, with a small, irregularly shaped area in the upper right corner colored red and yellow, indicating the hot spot. The map is overlaid on a white background.

MEASUREMENT 13

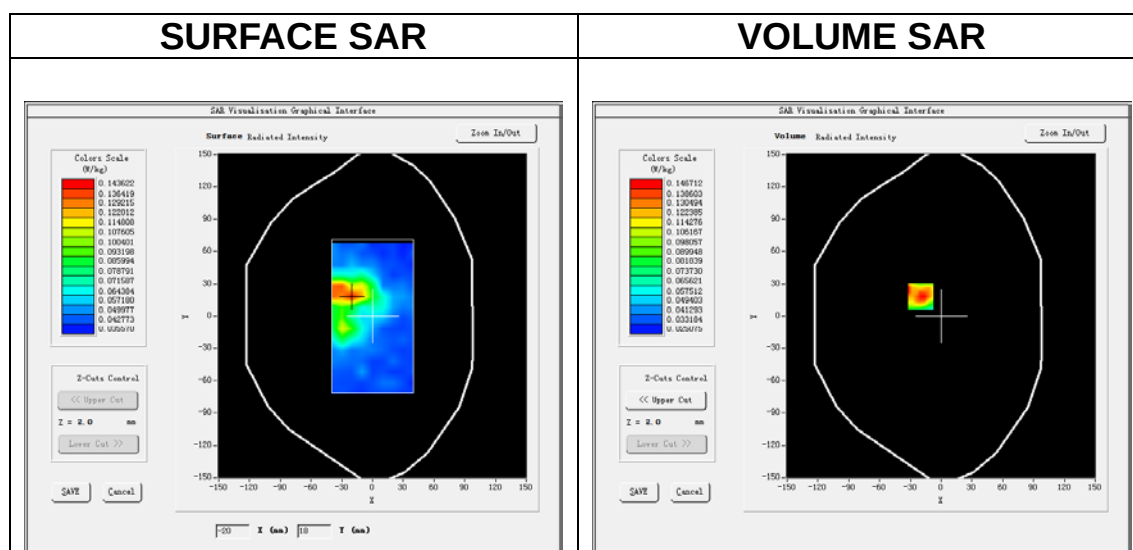
Date of measurement: 15/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	37.305325
Relative permittivity (imaginary part)	15.721080
Conductivity (S/m)	4.541645
Variation (%)	-0.510000

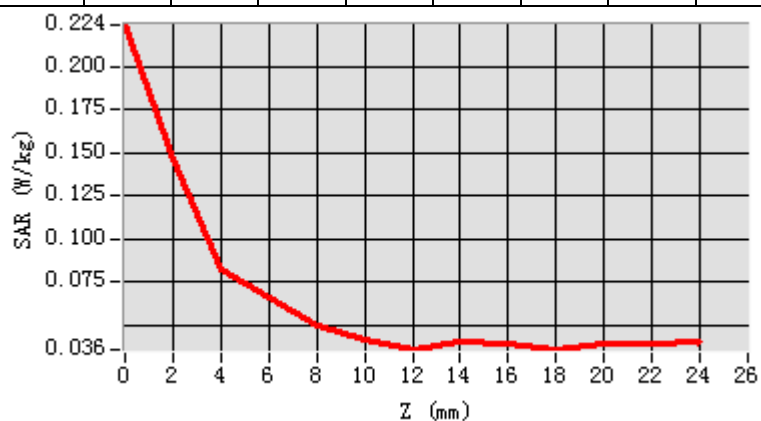


Maximum location: X=-20.00, Y=18.00

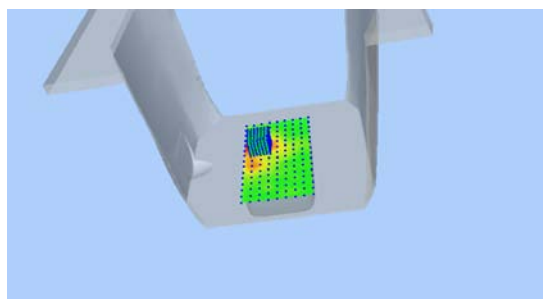
SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.062644
SAR 1g (W/Kg)	0.093372

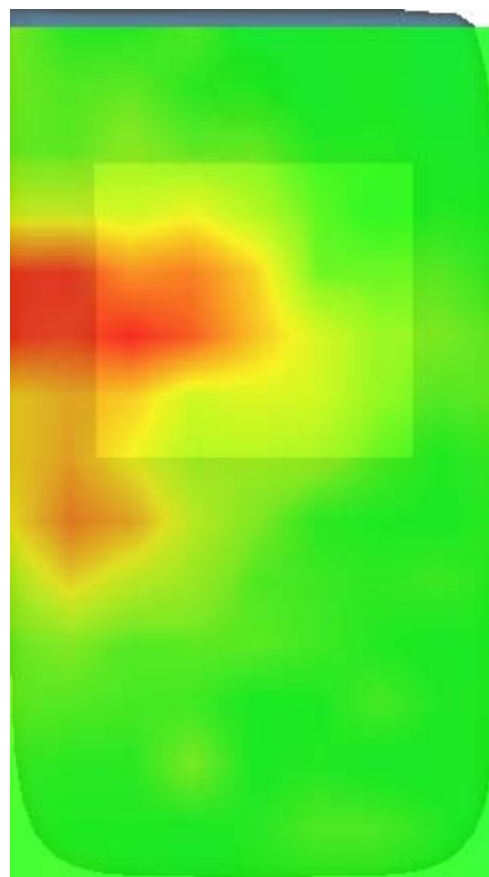
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SA R (W/ Kg)	0.22 44	0.14 67	0.08 17	0.06 62	0.04 99	0.04 15	0.03 61	0.04 08	0.03 91	0.03 57	0.03 92	0.03 91



3D screen shot



Hot spot position



MEASUREMENT 14

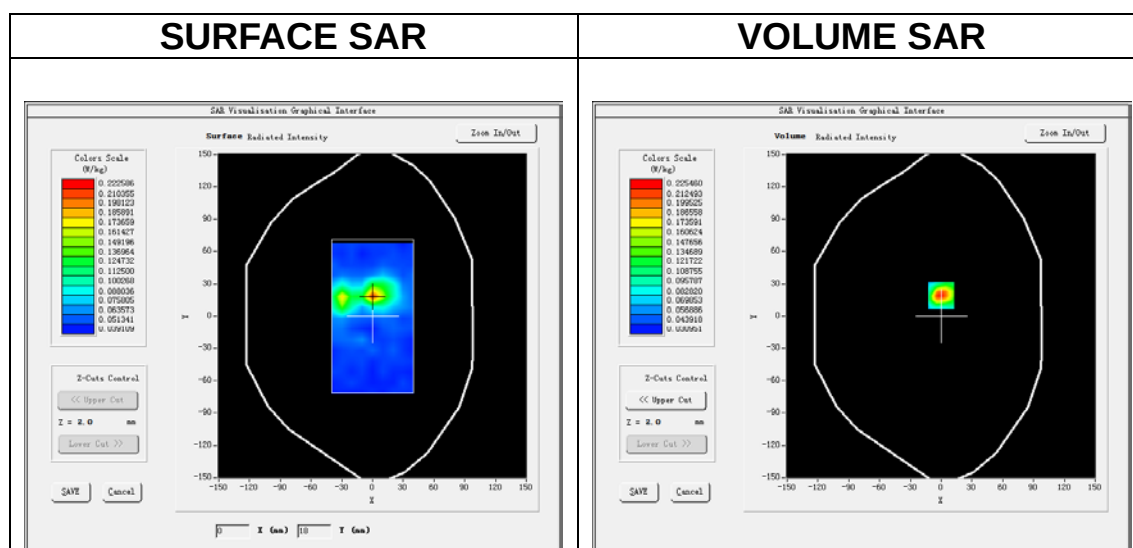
Date of measurement: 16/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	36.372192
Relative permittivity (imaginary part)	15.914046
Conductivity (S/m)	5.114598
Variation (%)	-1.110000

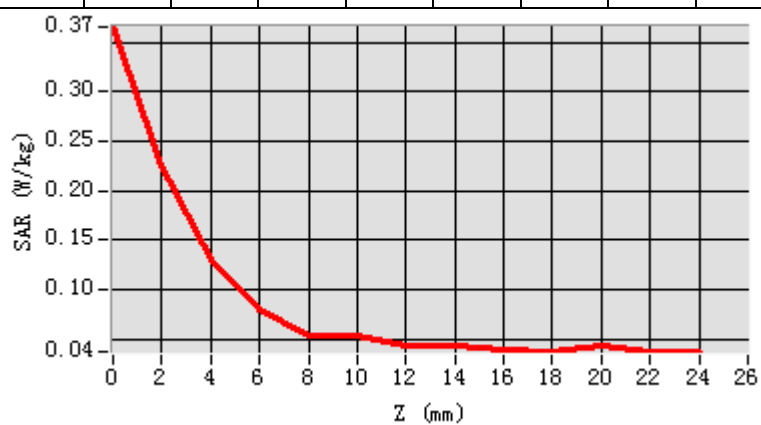


Maximum location: X=0.00, Y=19.00

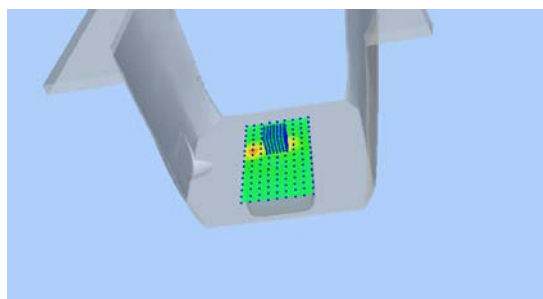
SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)	0.073148
SAR 1g (W/Kg)	0.140240

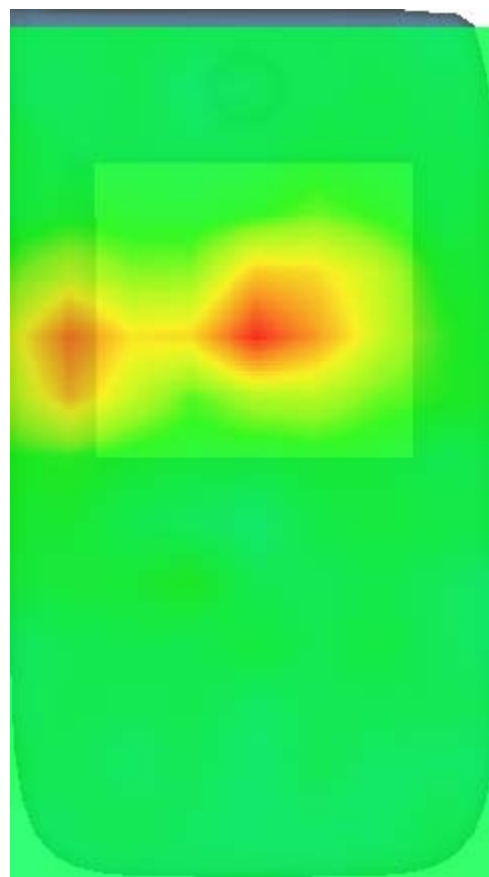
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SA R (W/ Kg)	0.36 52	0.22 55	0.13 04	0.07 96	0.05 40	0.05 39	0.04 44	0.04 34	0.03 94	0.03 77	0.04 43	0.03 80



3D screen shot



Hot spot position



MEASUREMENT 15

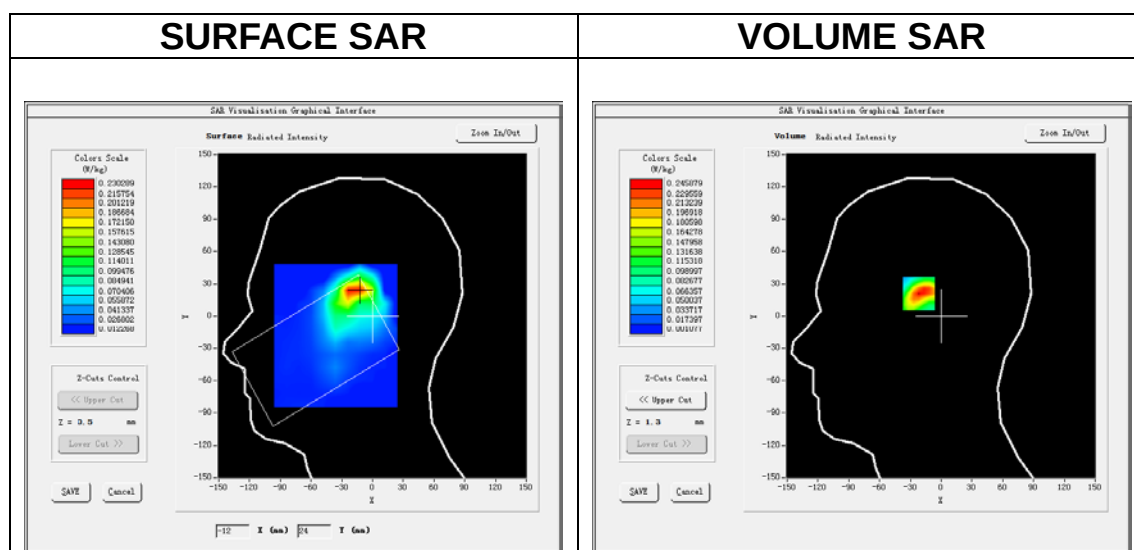
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11b ISM</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11b (Crest factor: 1.0)</u>

B. SAR Measurement Results

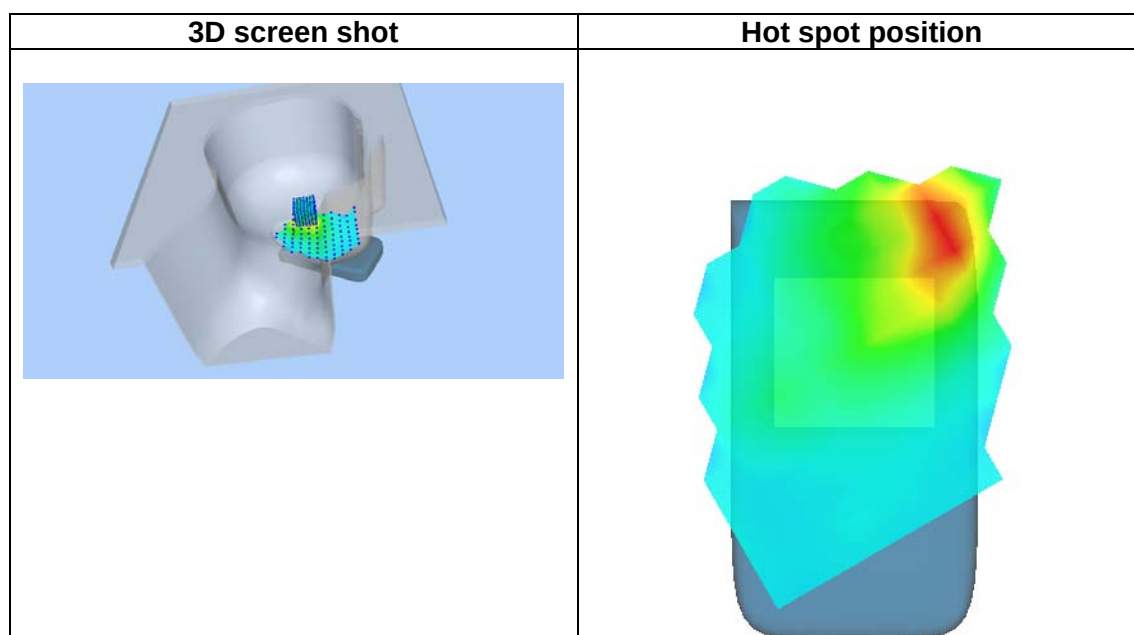
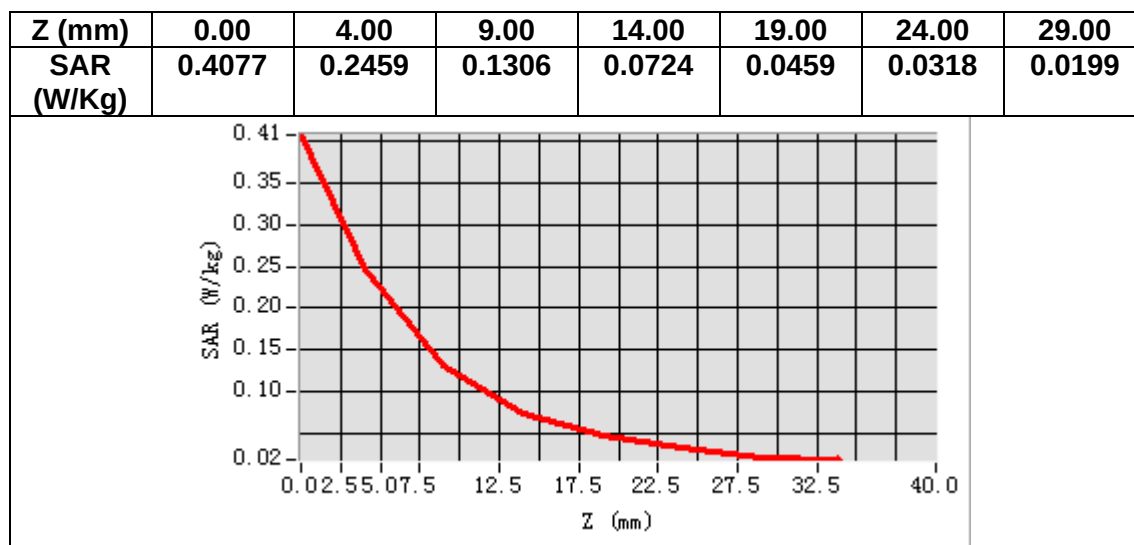
Frequency (MHz)	2437.000000
Relative permittivity (real part)	40.953663
Relative permittivity (imaginary part)	12.822094
Conductivity (S/m)	1.735969
Variation (%)	3.110000



Maximum location: X=-21.00, Y=23.00

SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.114910
SAR 1g (W/Kg)	0.227833



MEASUREMENT 16

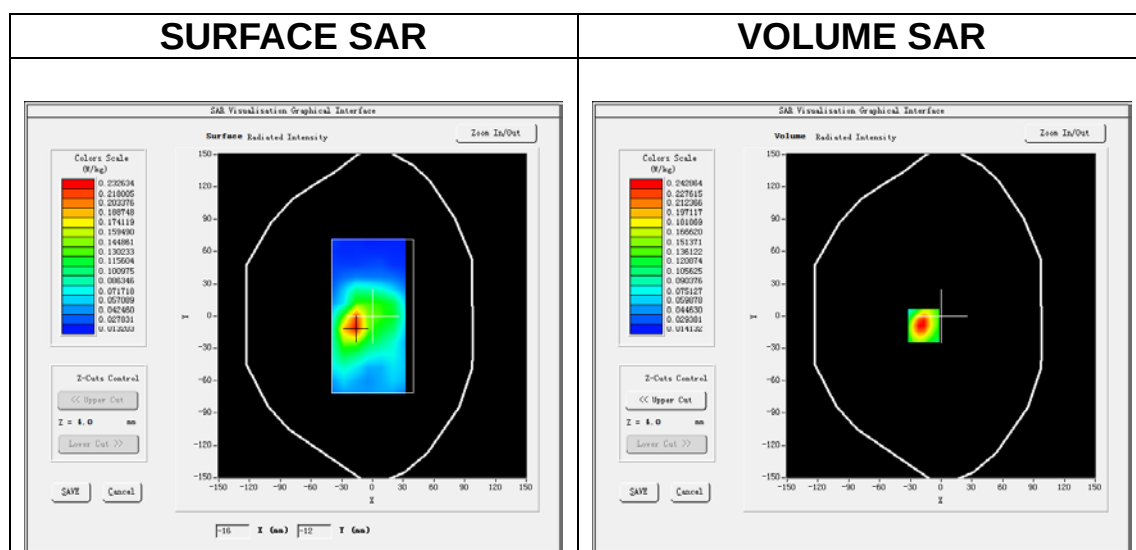
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11b ISM</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11b (Crest factor: 1.0)</u>

B. SAR Measurement Results

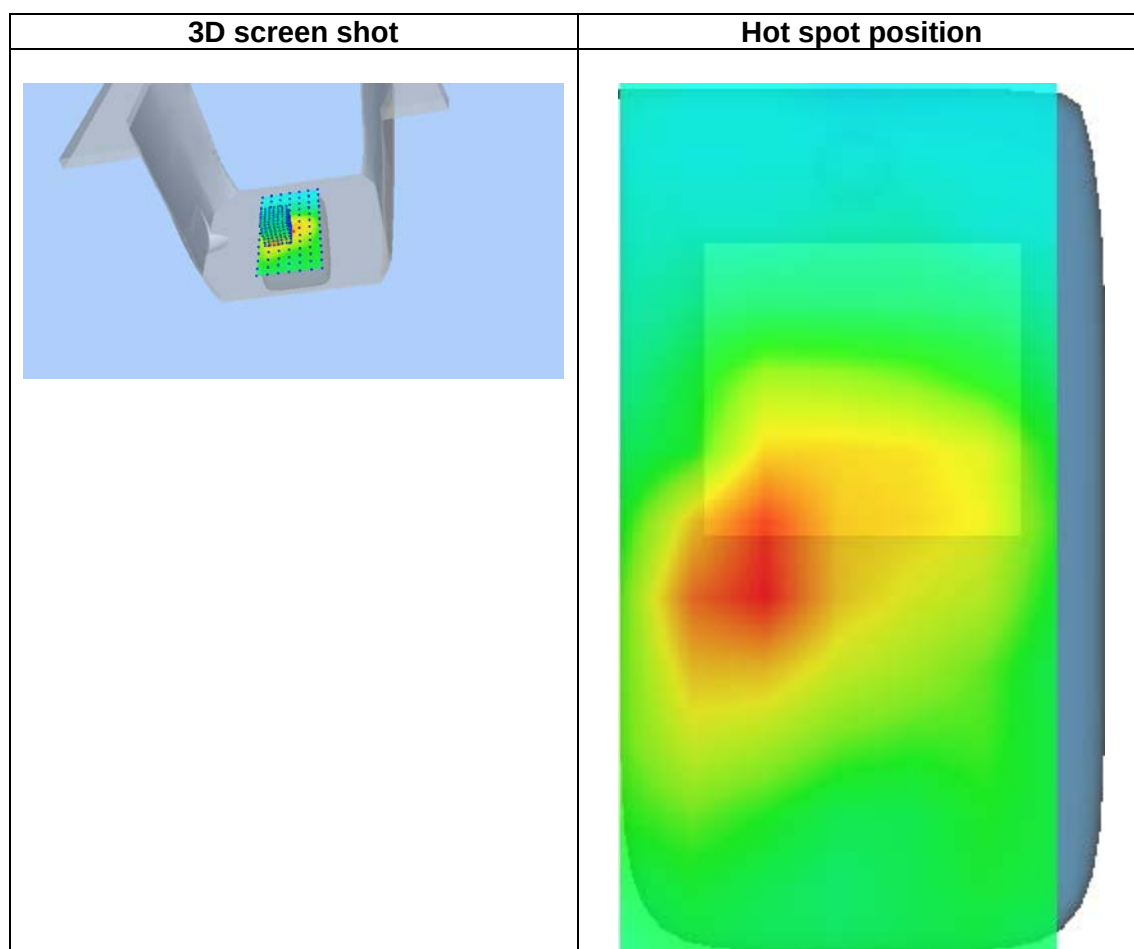
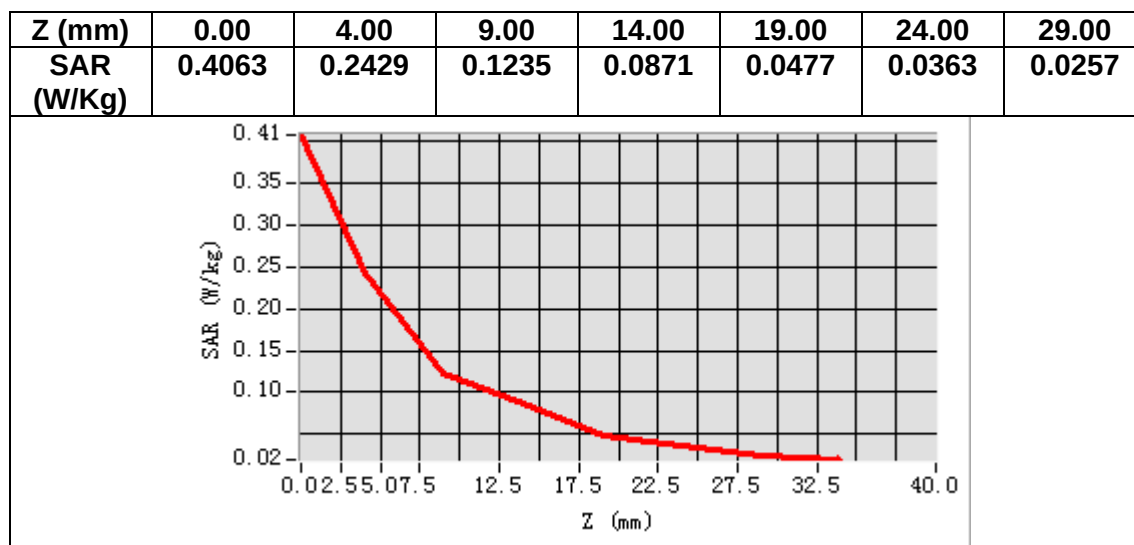
Frequency (MHz)	2437.000000
Relative permittivity (real part)	40.953663
Relative permittivity (imaginary part)	12.822094
Conductivity (S/m)	1.735969
Variation (%)	-4.650000



Maximum location: X=-17.00, Y=-9.00

SAR Peak: 0.37 W/kg

SAR 10g (W/Kg)	0.123826
SAR 1g (W/Kg)	0.227580



MEASUREMENT 17

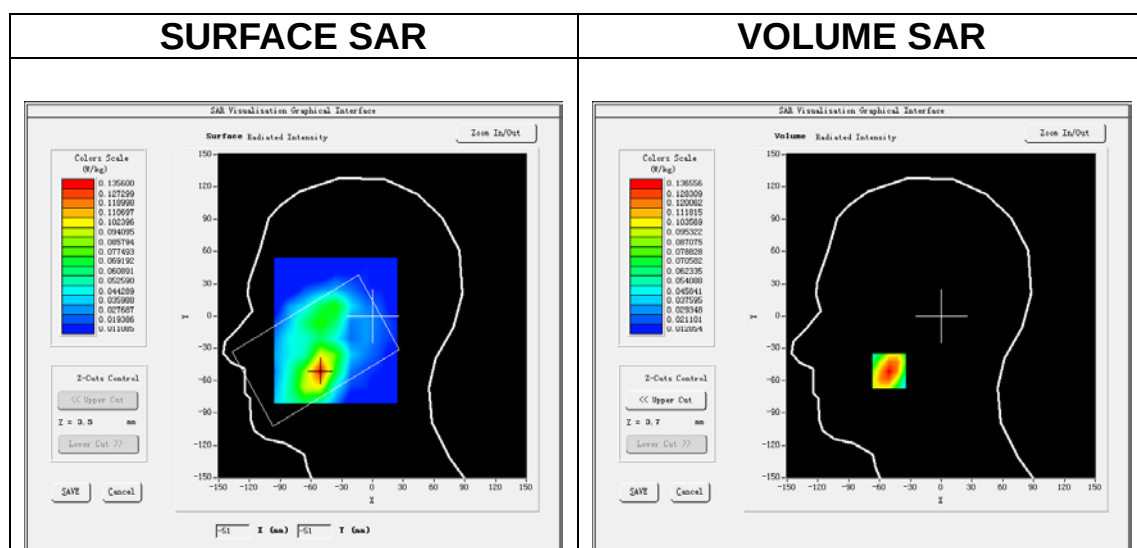
Date of measurement: 30/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

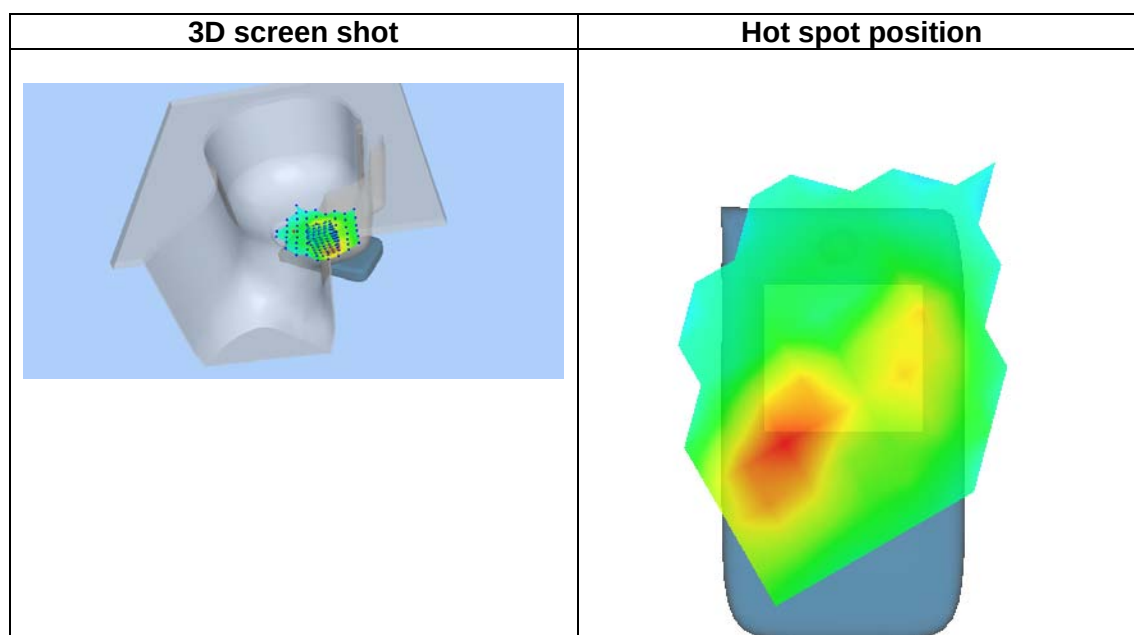
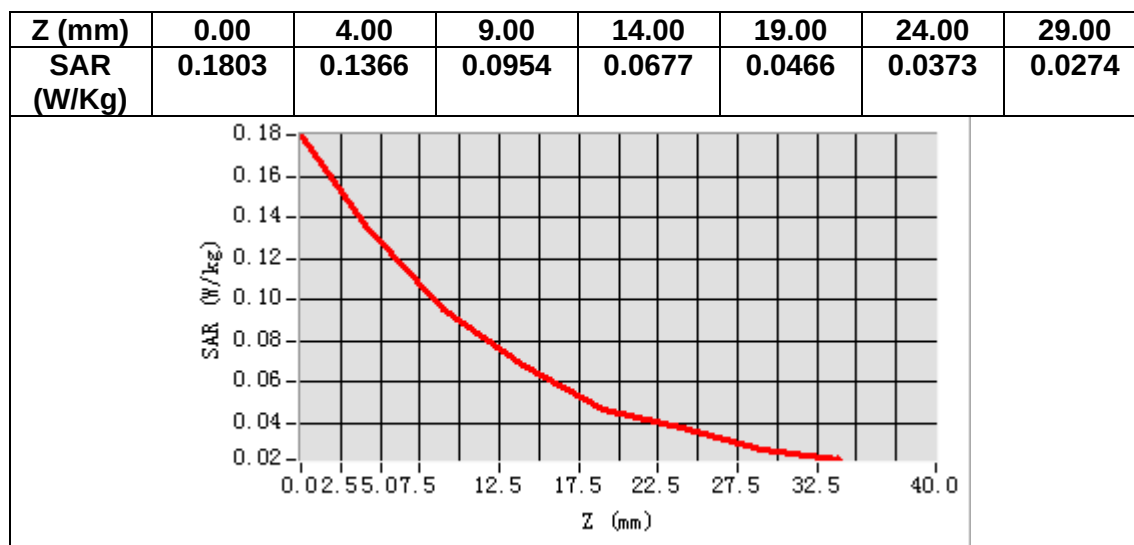
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.023312
Relative permittivity (imaginary part)	13.834666
Conductivity (S/m)	1.444954
Variation (%)	-2.600000



Maximum location: X=-51.00, Y=-51.00

SAR Peak: 0.19 W/kg

SAR 10g (W/Kg)	0.083276
SAR 1g (W/Kg)	0.132354



MEASUREMENT 18

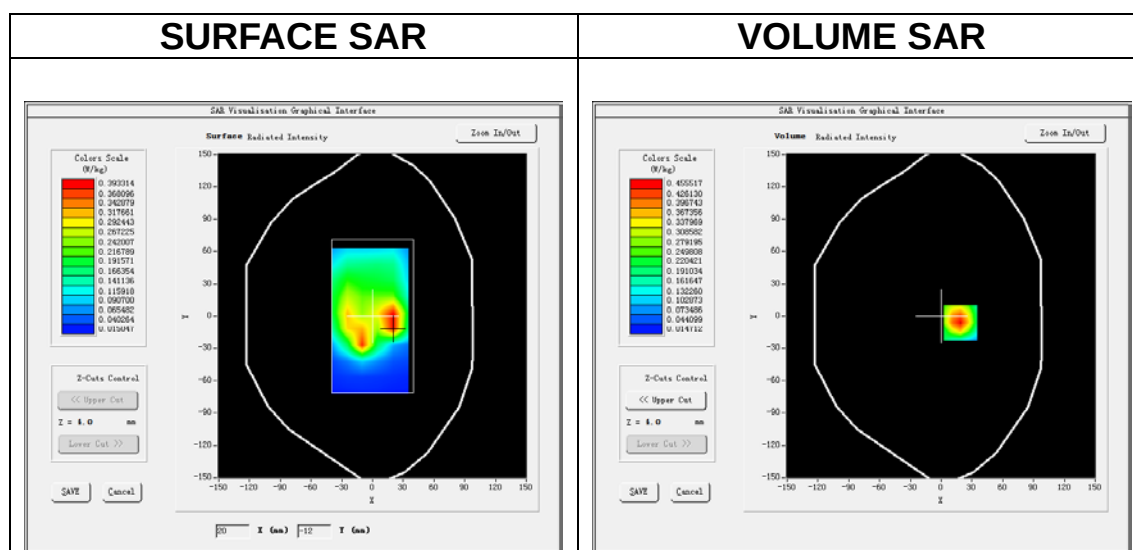
Date of measurement: 30/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.023312
Relative permittivity (imaginary part)	13.834666
Conductivity (S/m)	1.444954
Variation (%)	-0.590000

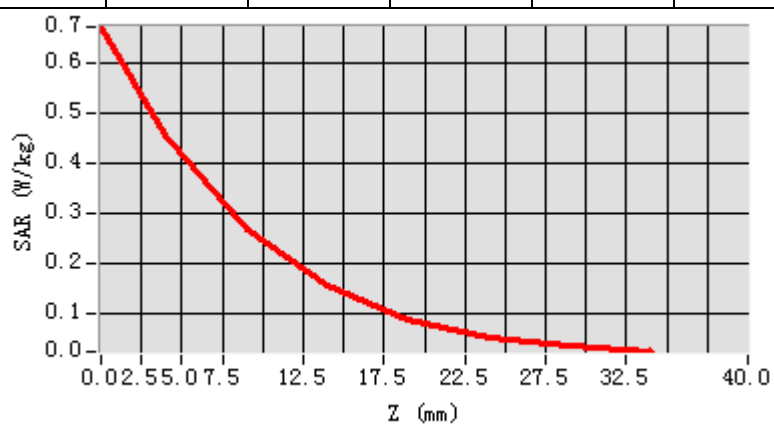


Maximum location: X=19.00, Y=-6.00

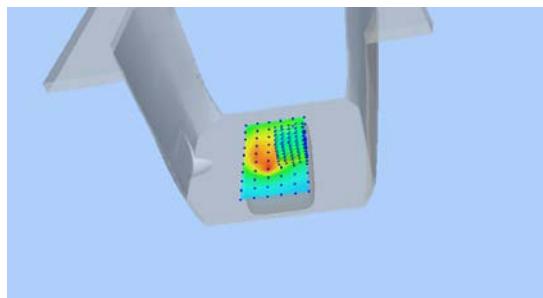
SAR Peak: 0.69 W/kg

SAR 10g (W/Kg)	0.237027
SAR 1g (W/Kg)	0.438122

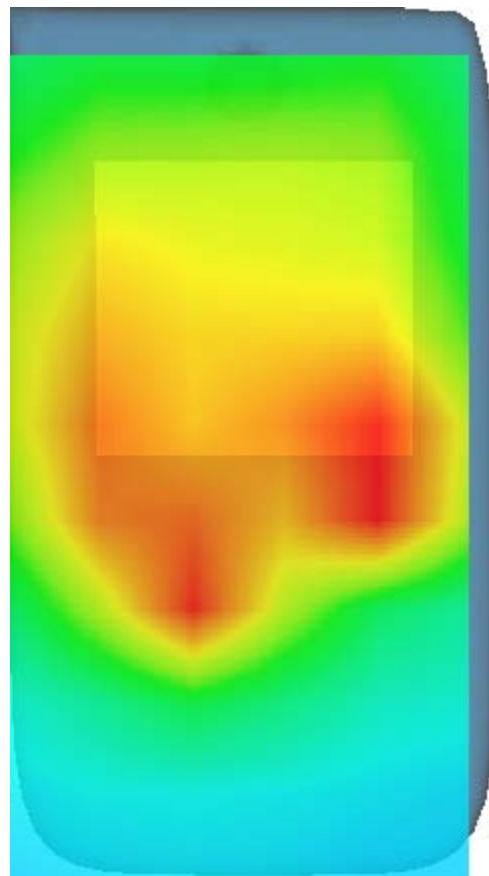
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6737	0.4555	0.2676	0.1554	0.0867	0.0524	0.0353



3D screen shot



Hot spot position



MEASUREMENT 19

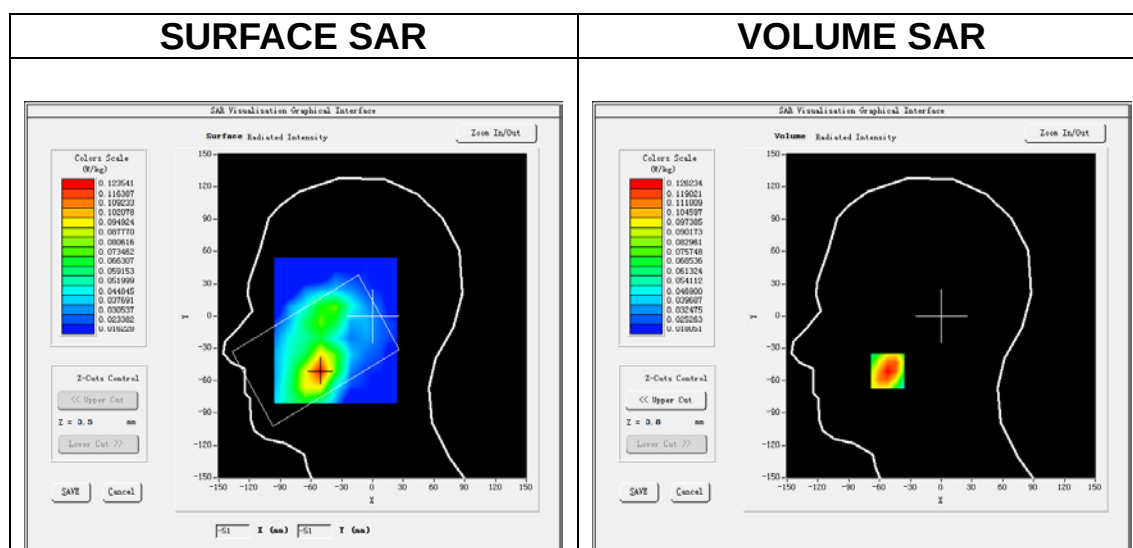
Date of measurement: 10/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

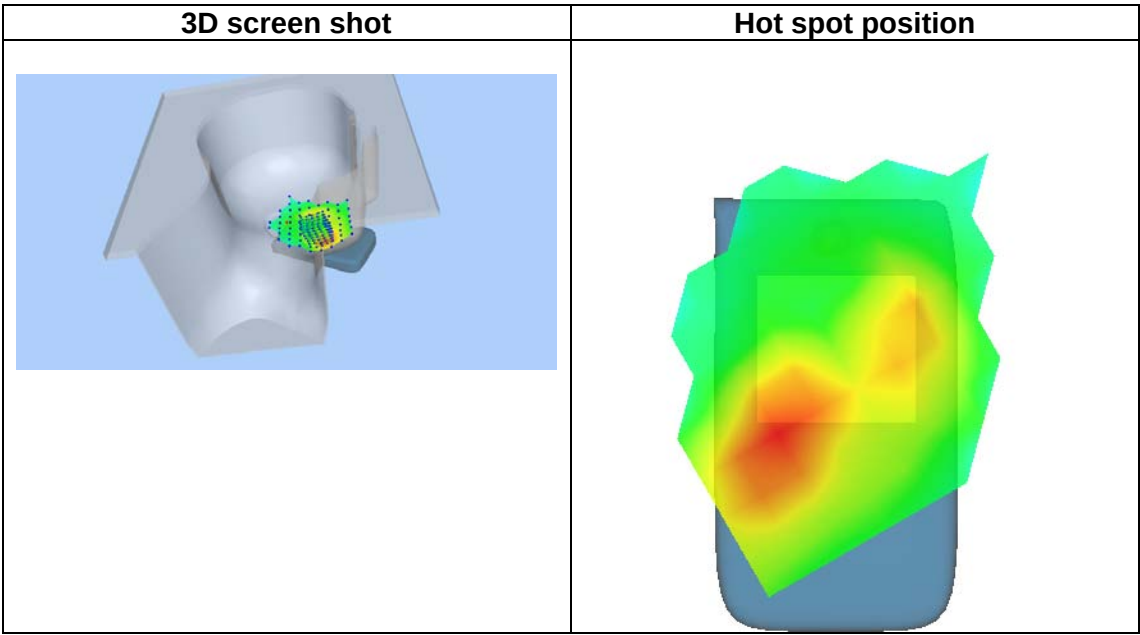
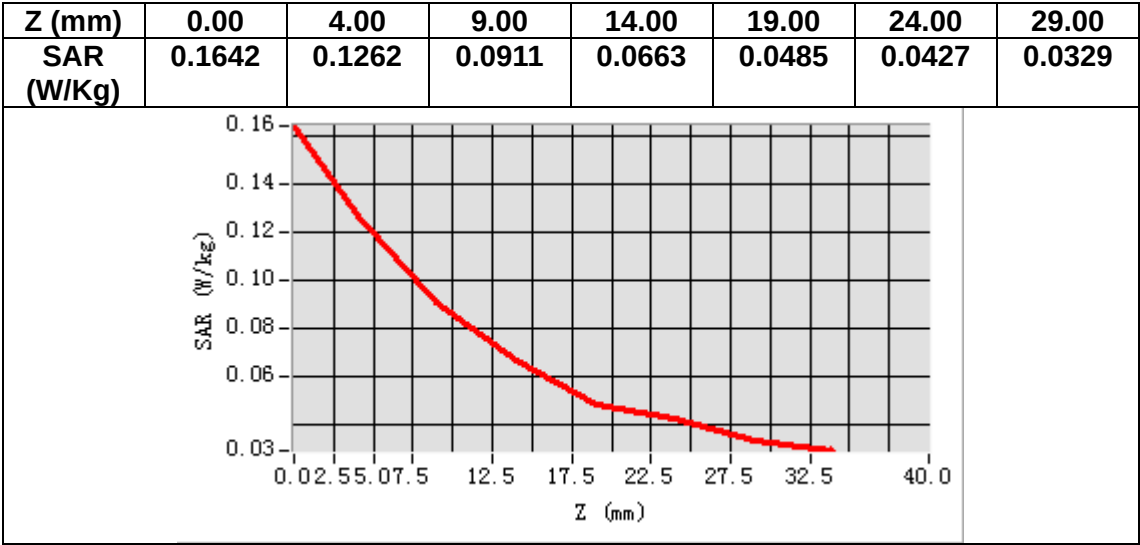
Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.792324
Relative permittivity (imaginary part)	13.810030
Conductivity (S/m)	1.329215
Variation (%)	-3.300000



Maximum location: X=-52.00, Y=-51.00

SAR Peak: 0.18 W/kg

SAR 10g (W/Kg)	0.080250
SAR 1g (W/Kg)	0.121229



MEASUREMENT 20

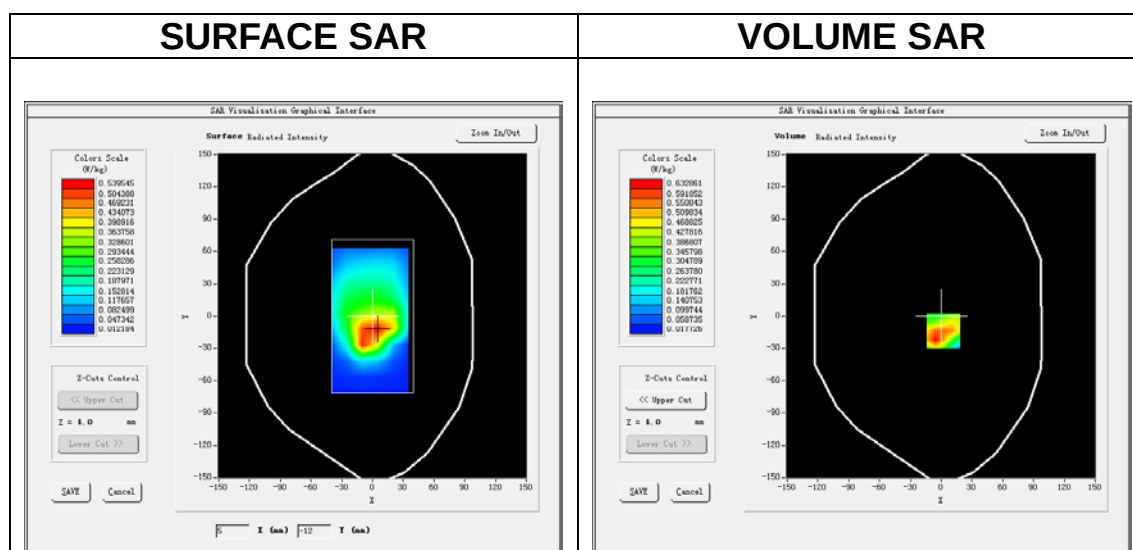
Date of measurement: 10/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

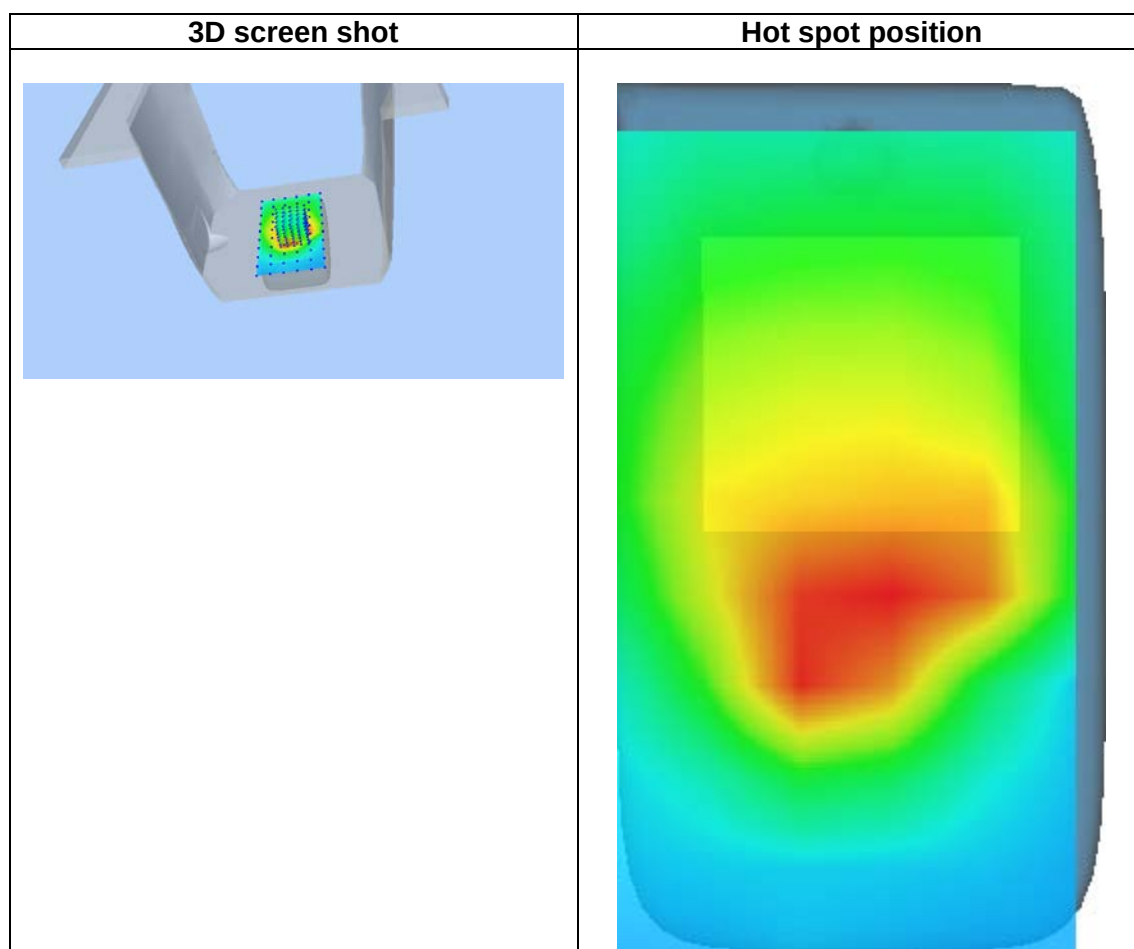
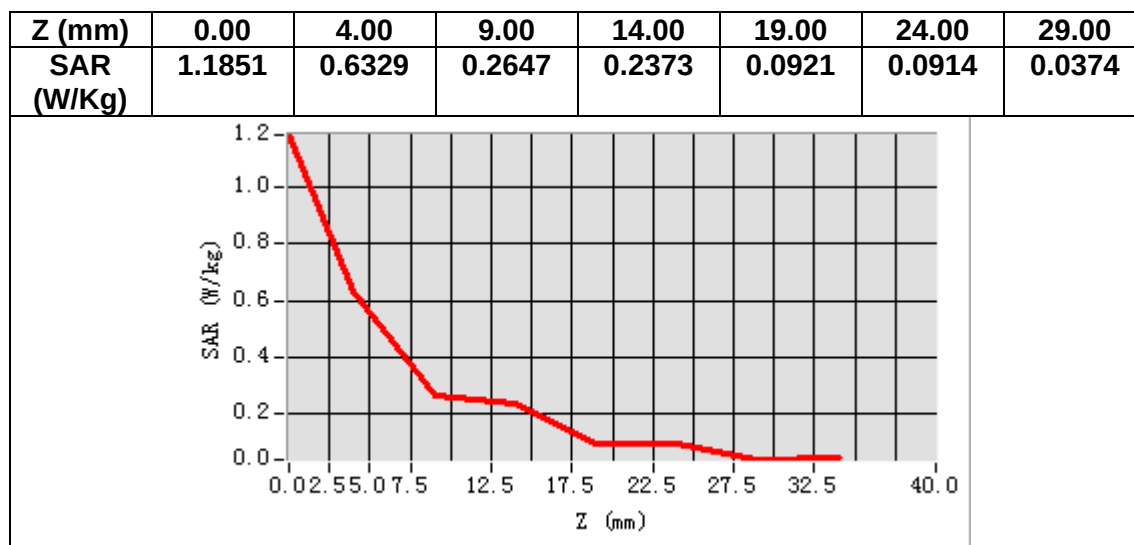
Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.792324
Relative permittivity (imaginary part)	13.810030
Conductivity (S/m)	1.329215
Variation (%)	-0.260000



Maximum location: X=2.00, Y=-14.00

SAR Peak: 0.97 W/kg

SAR 10g (W/Kg)	0.323748
SAR 1g (W/Kg)	0.594018



MEASUREMENT 21

Date of measurement: 7/11/2021

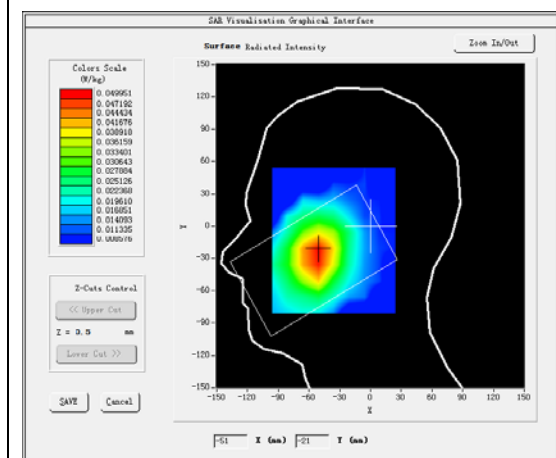
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

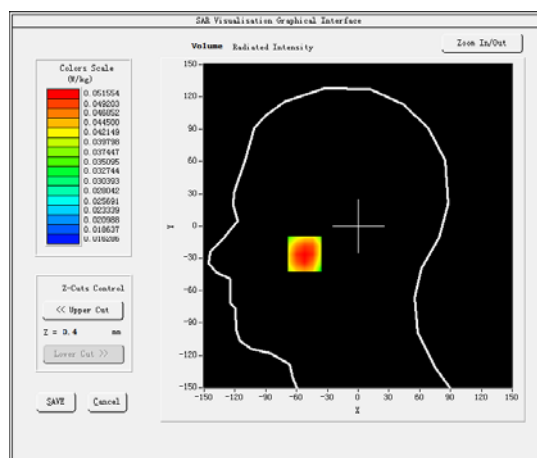
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	42.728909
Relative permittivity (imaginary part)	19.993597
Conductivity (S/m)	0.929147
Variation (%)	-0.420000

SURFACE SAR



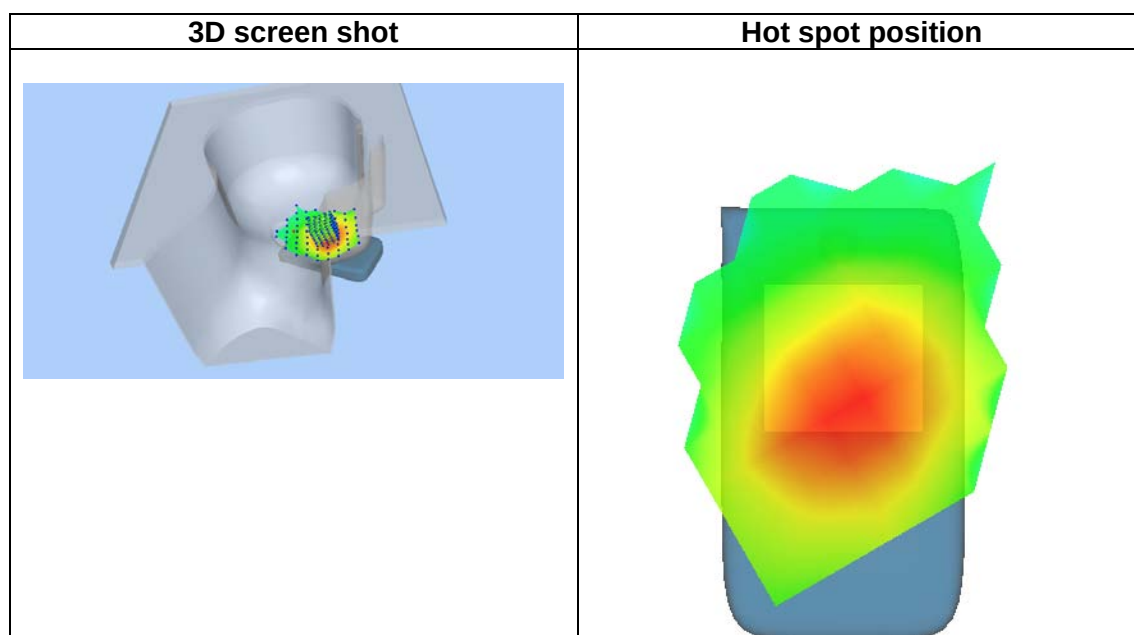
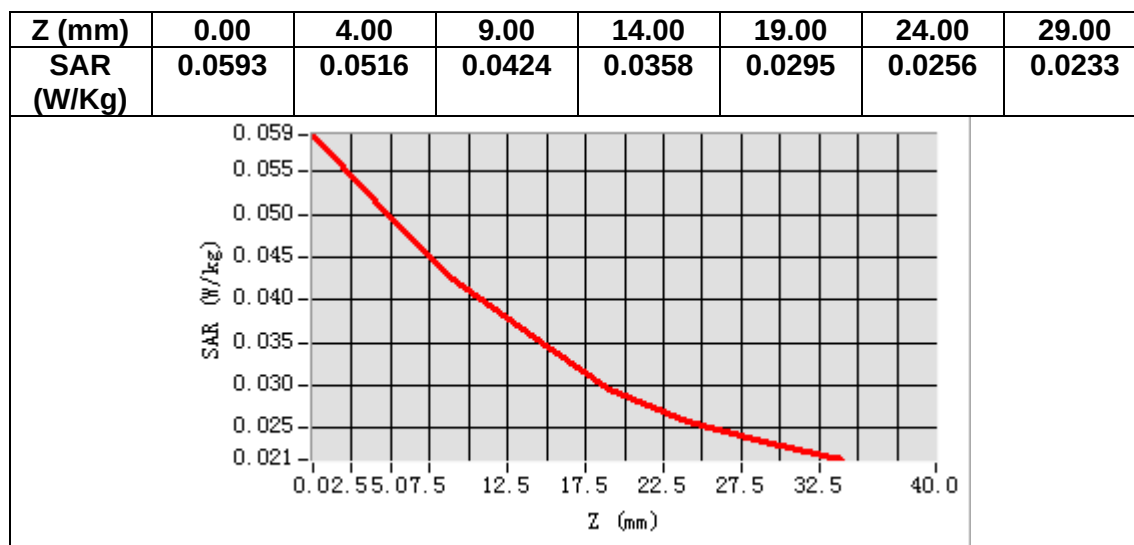
VOLUME SAR



Maximum location: X=-52.00, Y=-26.00

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.039592
SAR 1g (W/Kg)	0.050859



MEASUREMENT 22

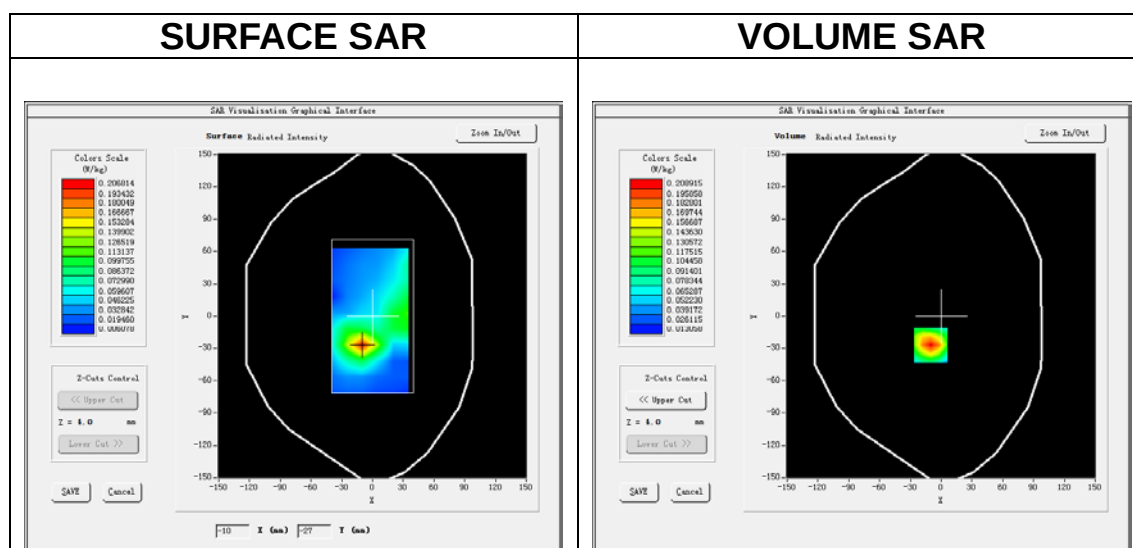
Date of measurement: 7/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

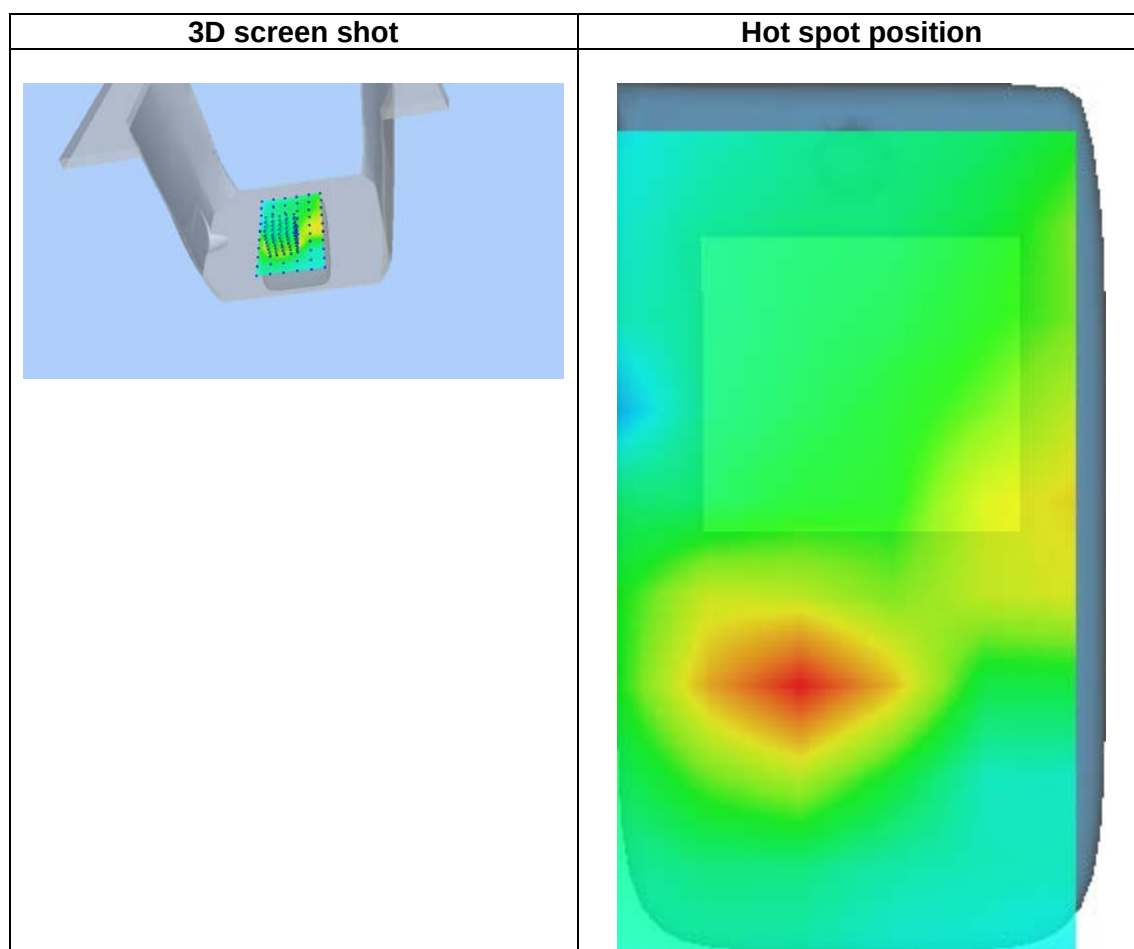
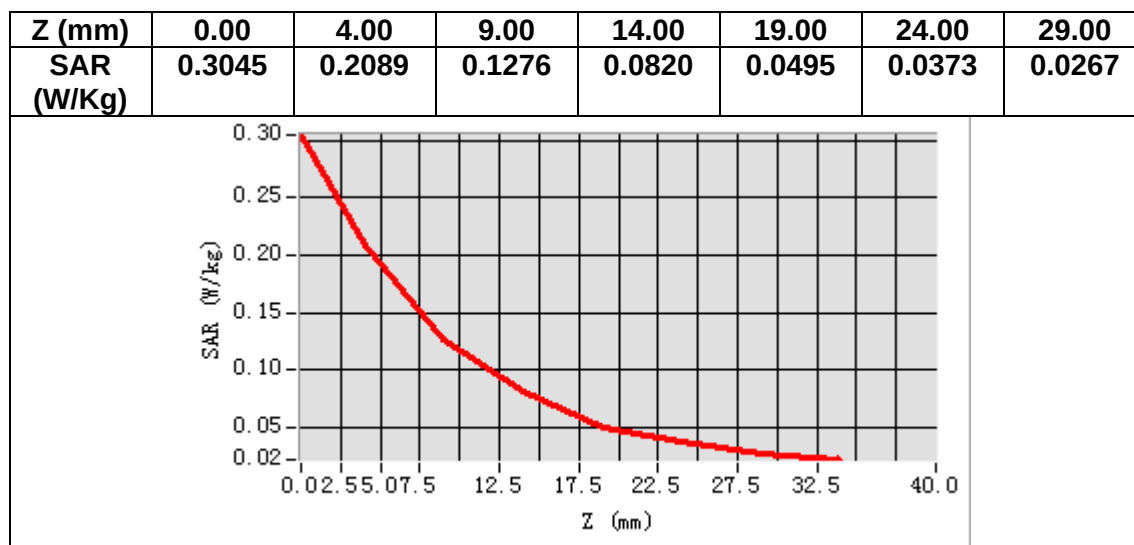
Frequency (MHz)	836.500000
Relative permittivity (real part)	42.728909
Relative permittivity (imaginary part)	19.993597
Conductivity (S/m)	0.929147
Variation (%)	-1.680000



Maximum location: X=-10.00, Y=-27.00

SAR Peak: 0.30 W/kg

SAR 10g (W/Kg)	0.074284
SAR 1g (W/Kg)	0.101173



MEASUREMENT 23

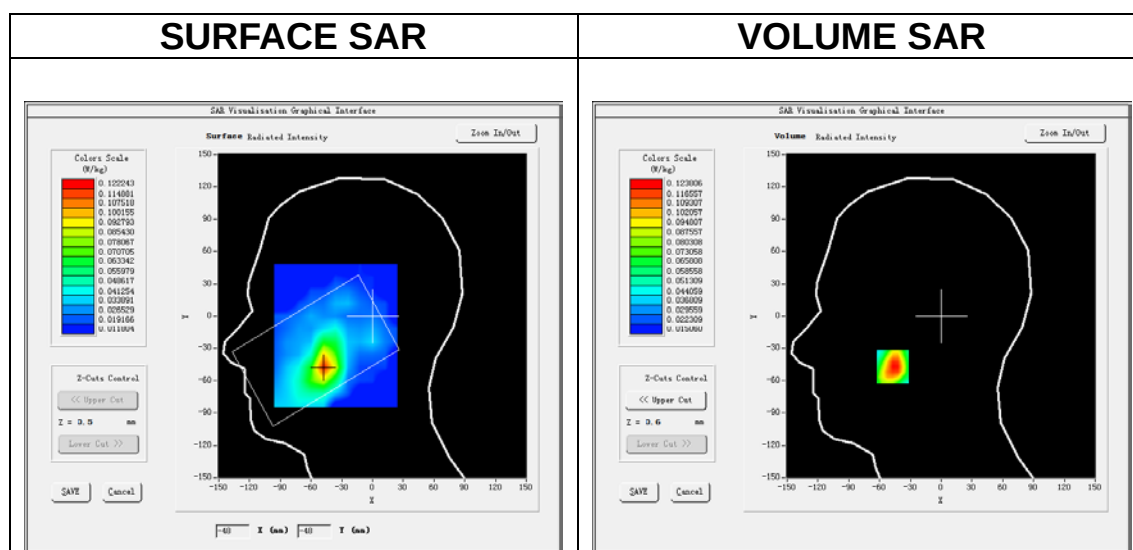
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

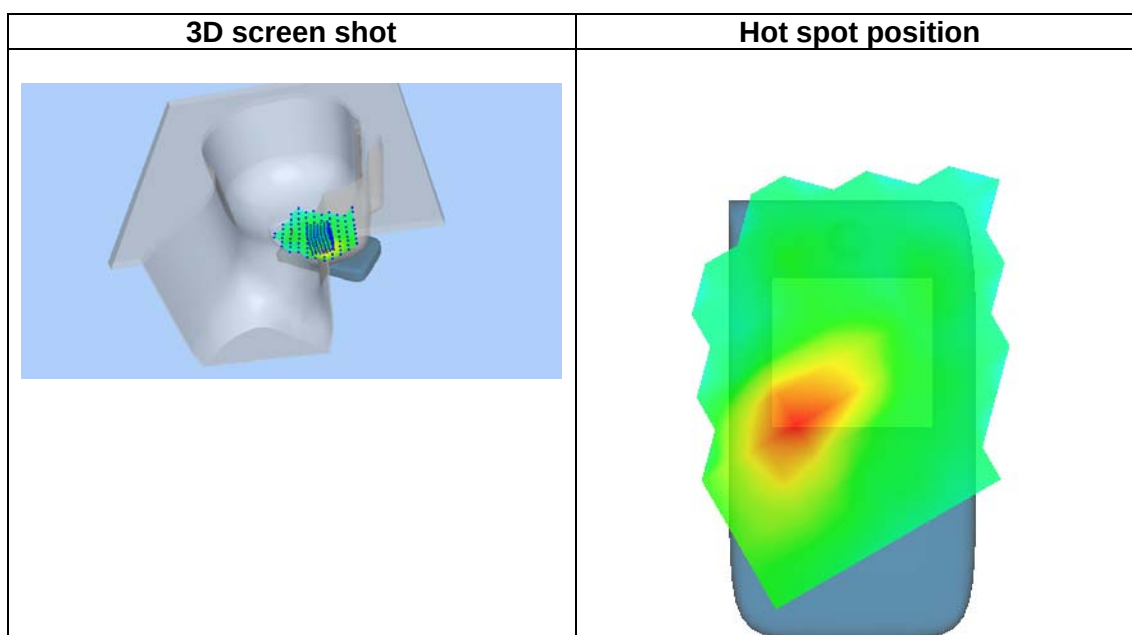
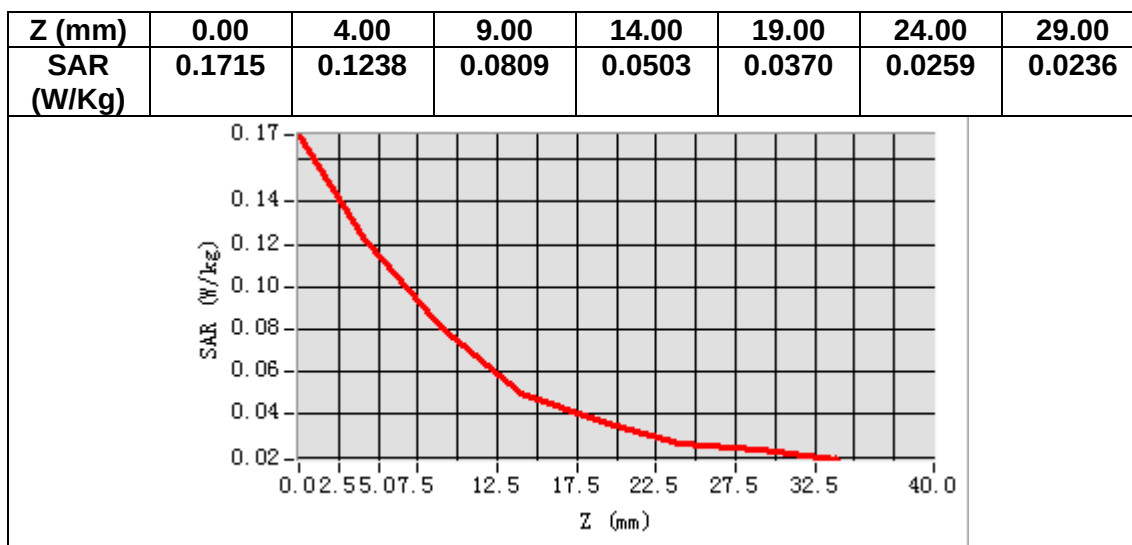
Frequency (MHz)	2535.000000
Relative permittivity (real part)	40.088703
Relative permittivity (imaginary part)	13.248922
Conductivity (S/m)	1.865890
Variation (%)	0.260000



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

SAR Peak: 0.18 W/kg

SAR 10g (W/Kg)	0.067958
SAR 1g (W/Kg)	0.116732



MEASUREMENT 24

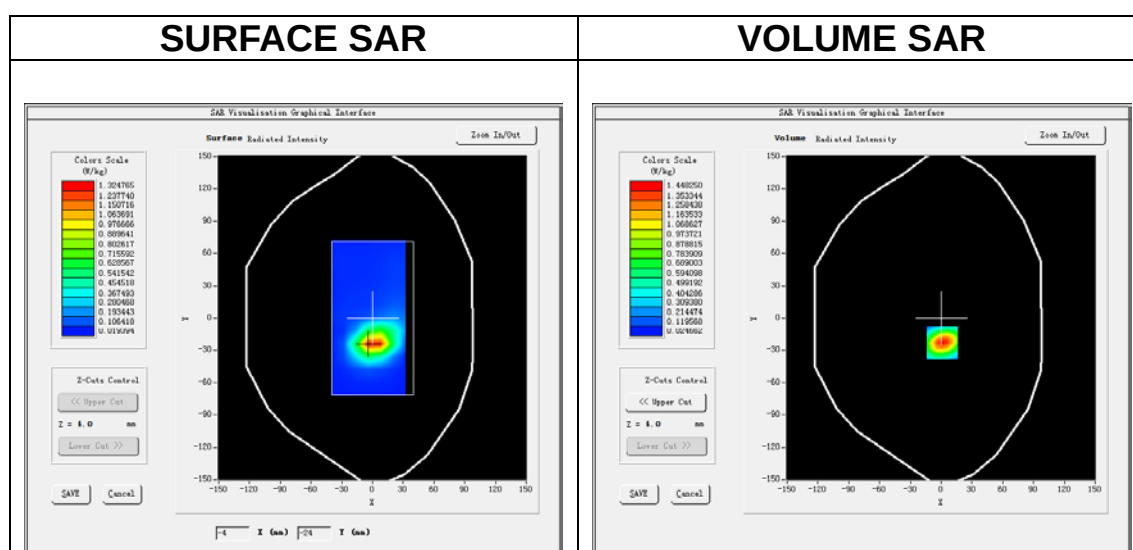
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

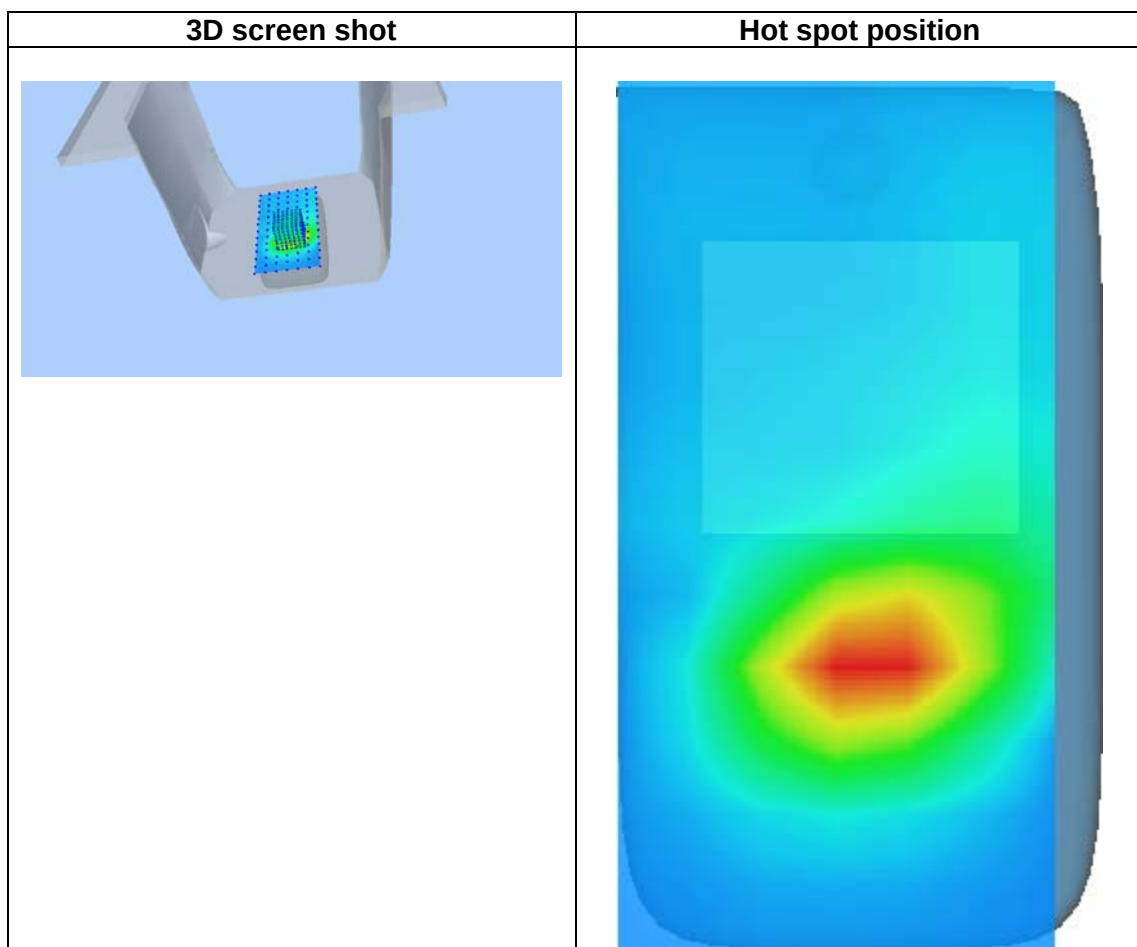
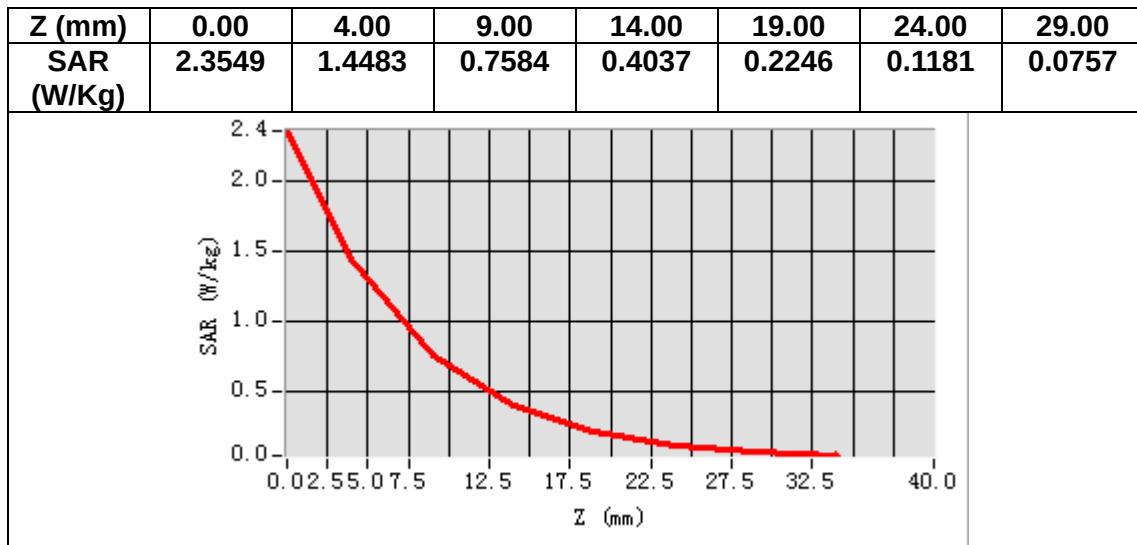
Frequency (MHz)	2535.000000
Relative permittivity (real part)	40.088703
Relative permittivity (imaginary part)	13.248922
Conductivity (S/m)	1.865890
Variation (%)	0.820000



Maximum location: X=1.00, Y=-23.00

SAR Peak: 2.35 W/kg

SAR 10g (W/Kg)	0.632088
SAR 1g (W/Kg)	1.024635



MEASUREMENT 25

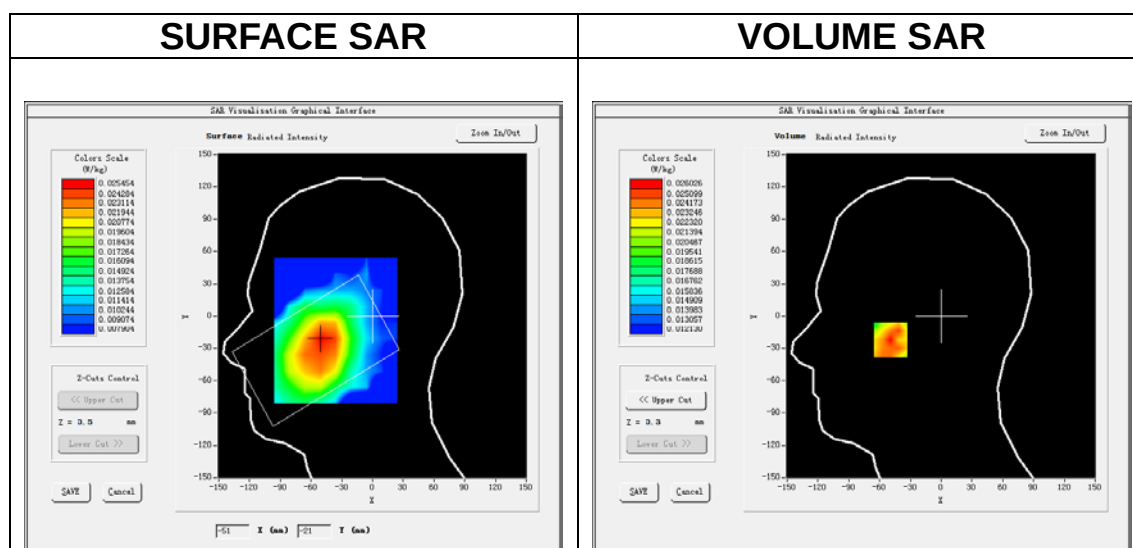
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

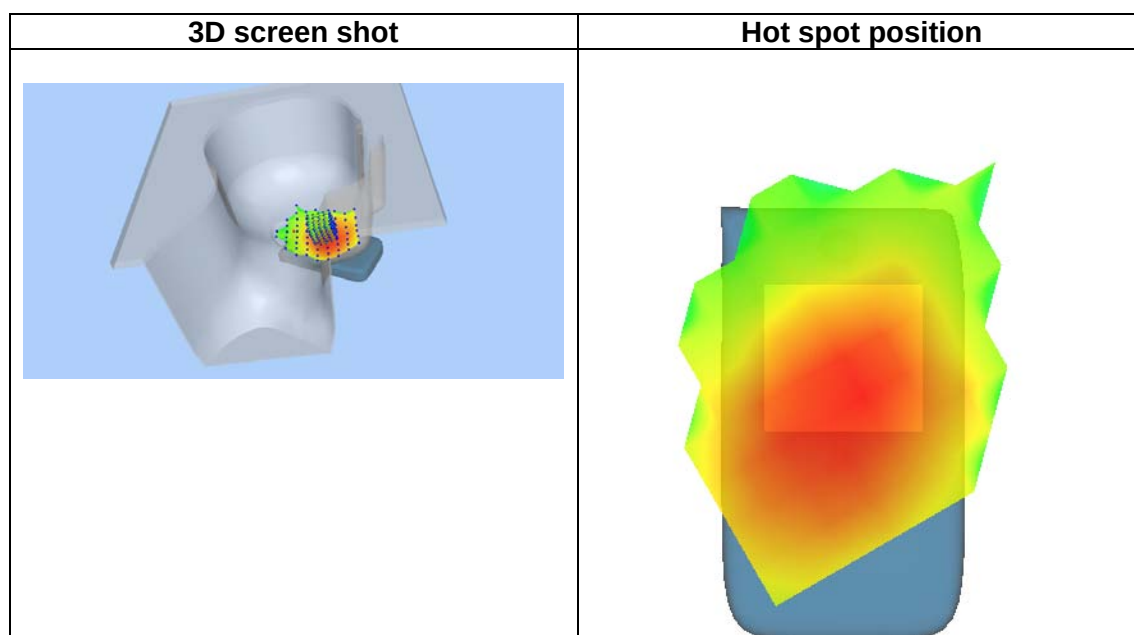
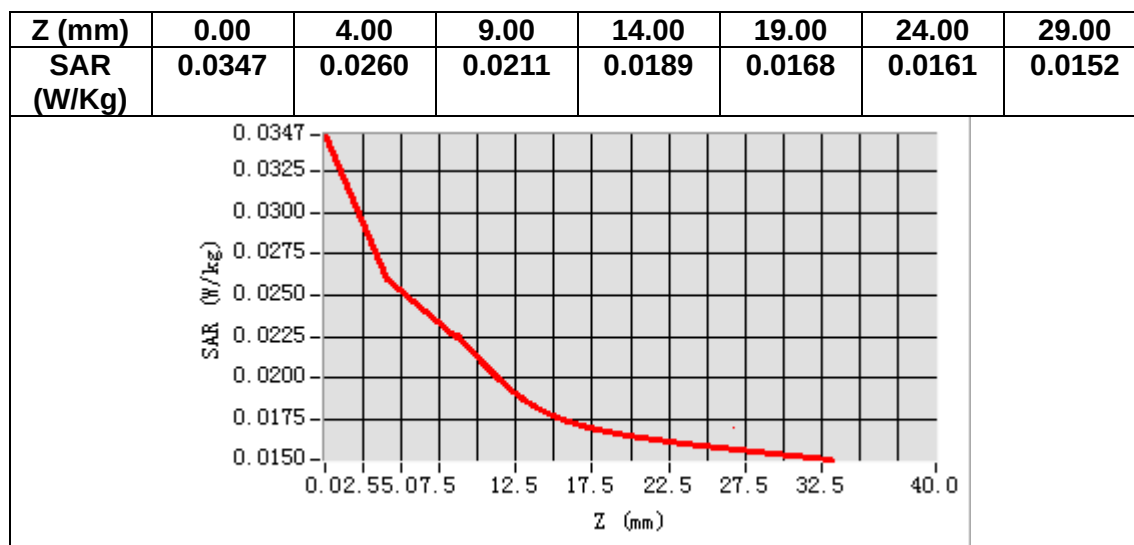
Frequency (MHz)	707.500000
Relative permittivity (real part)	42.674095
Relative permittivity (imaginary part)	21.601351
Conductivity (S/m)	0.849053
Variation (%)	-3.260000



Maximum location: X=-49.00, Y=-22.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.022541
SAR 1g (W/Kg)	0.026219



MEASUREMENT 26

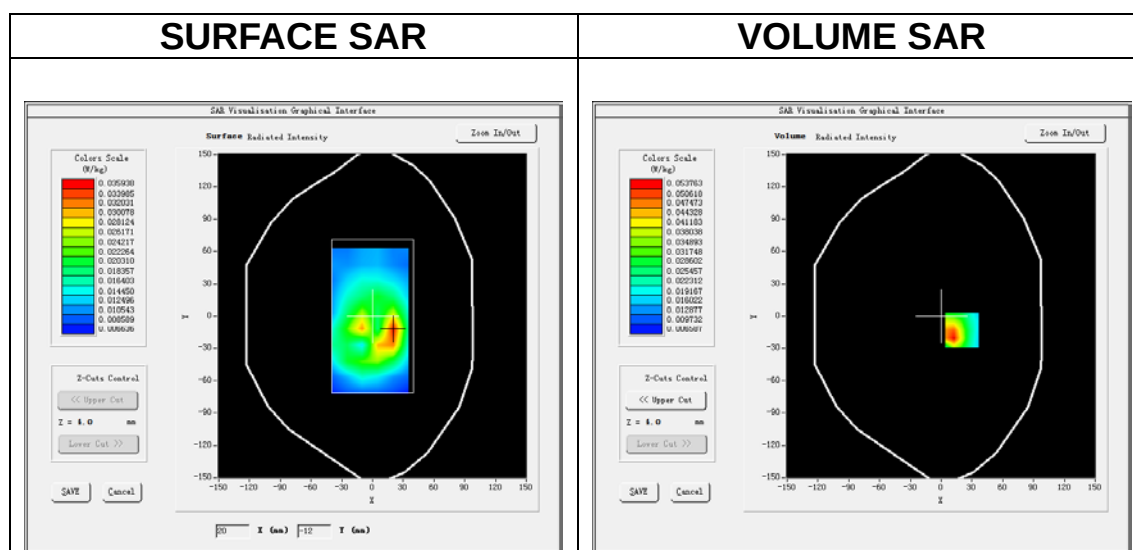
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	42.674095
Relative permittivity (imaginary part)	21.601351
Conductivity (S/m)	0.849053
Variation (%)	0.130000

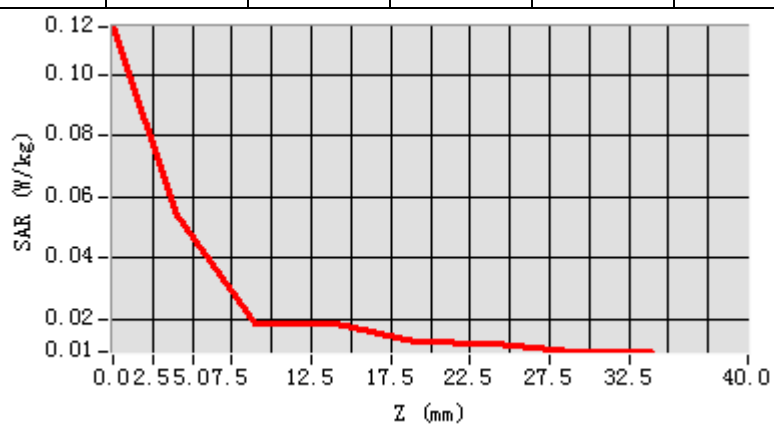


Maximum location: X=20.00, Y=-13.00

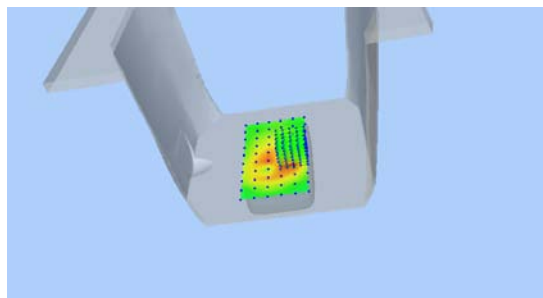
SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.046992
SAR 1g (W/Kg)	0.062594

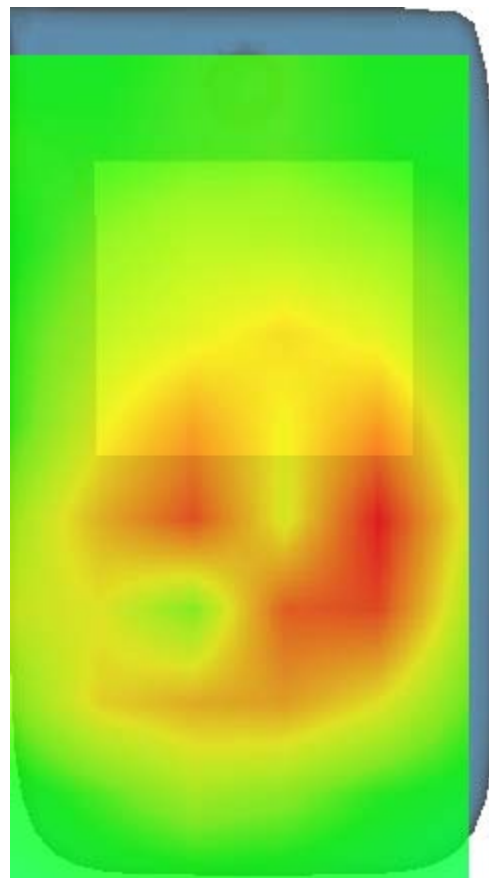
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.1156	0.0538	0.0186	0.0181	0.0127	0.0119	0.0092



3D screen shot



Hot spot position



MEASUREMENT 27

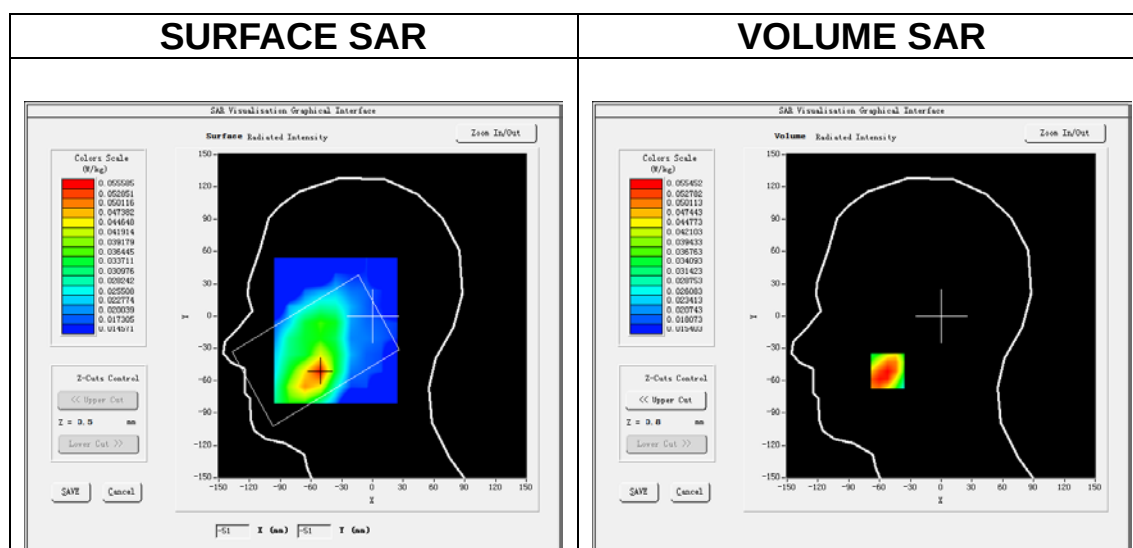
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 13</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

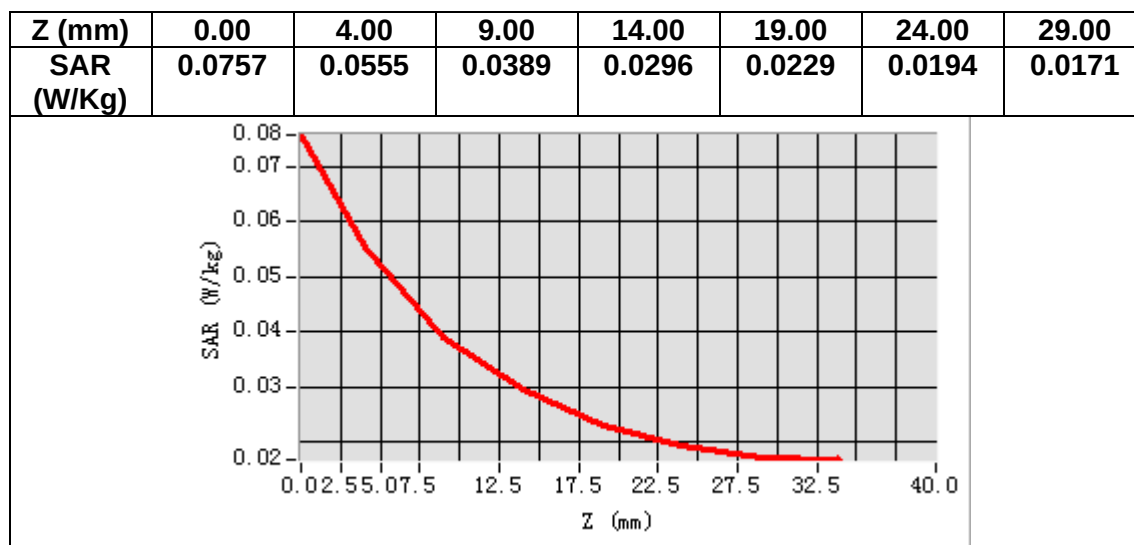
Frequency (MHz)	782.000000
Relative permittivity (real part)	41.786447
Relative permittivity (imaginary part)	20.858900
Conductivity (S/m)	0.906203
Variation (%)	2.370000



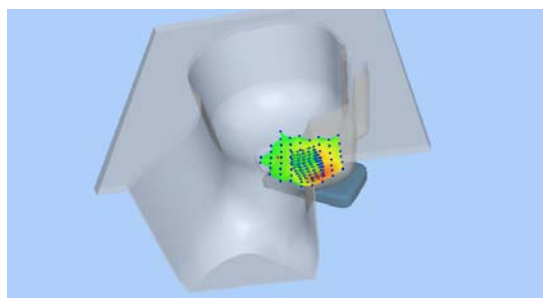
Maximum location: X=-52.00, Y=-51.00

SAR Peak: 0.08 W/kg

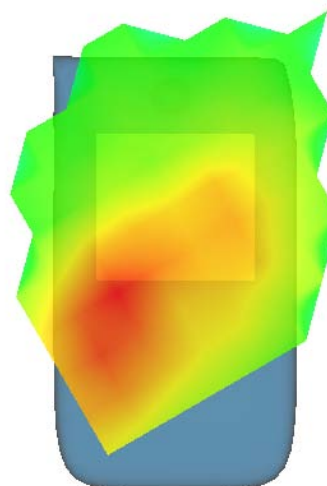
SAR 10g (W/Kg)	0.037172
SAR 1g (W/Kg)	0.055078



3D screen shot



Hot spot position



MEASUREMENT 28

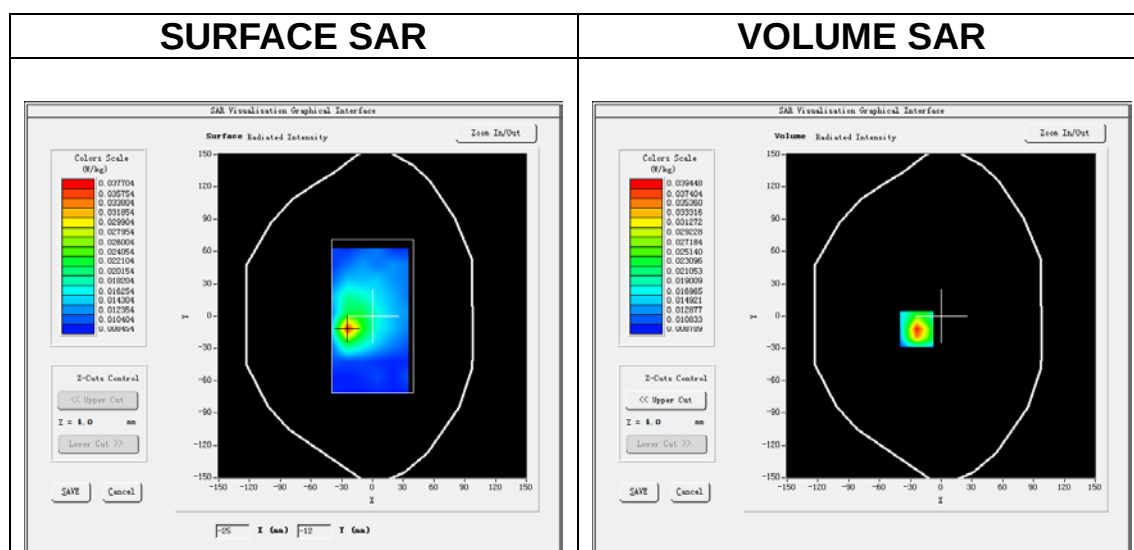
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 13</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

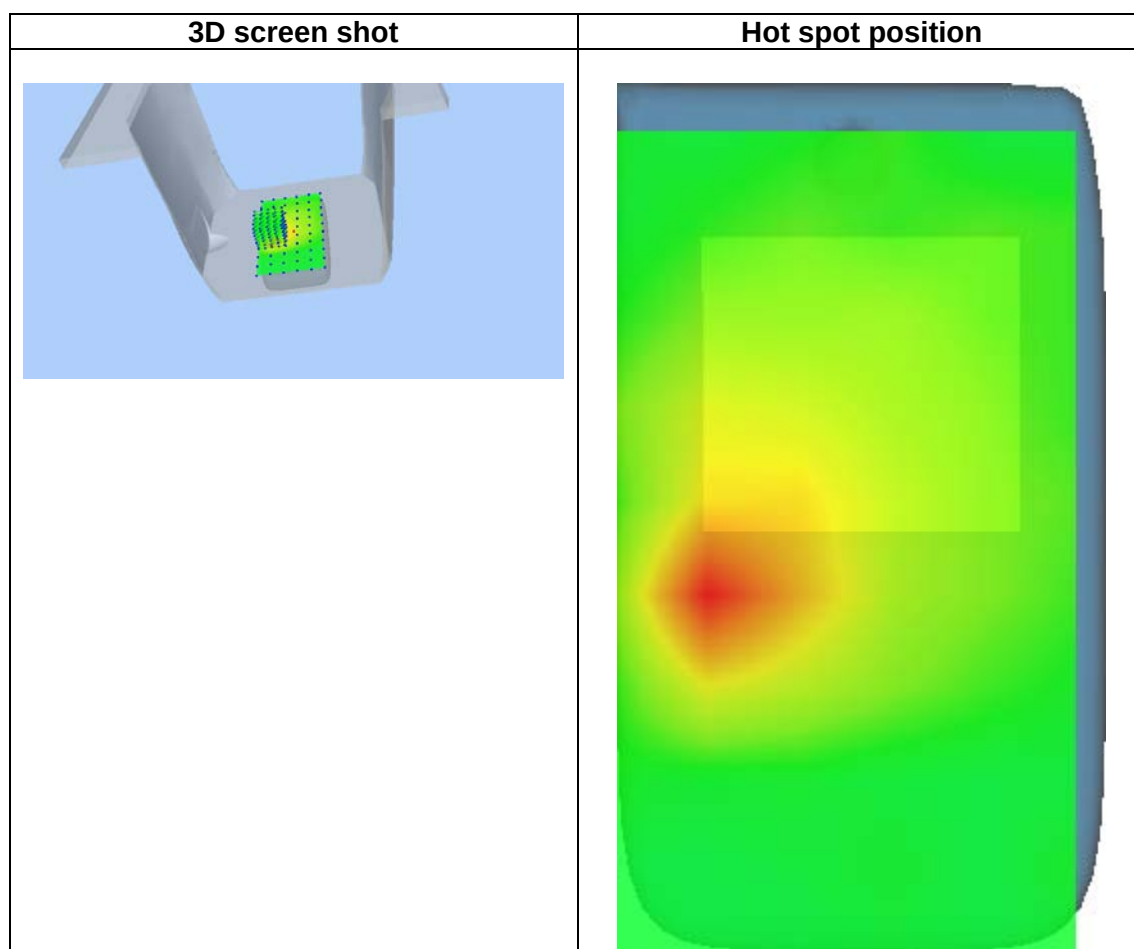
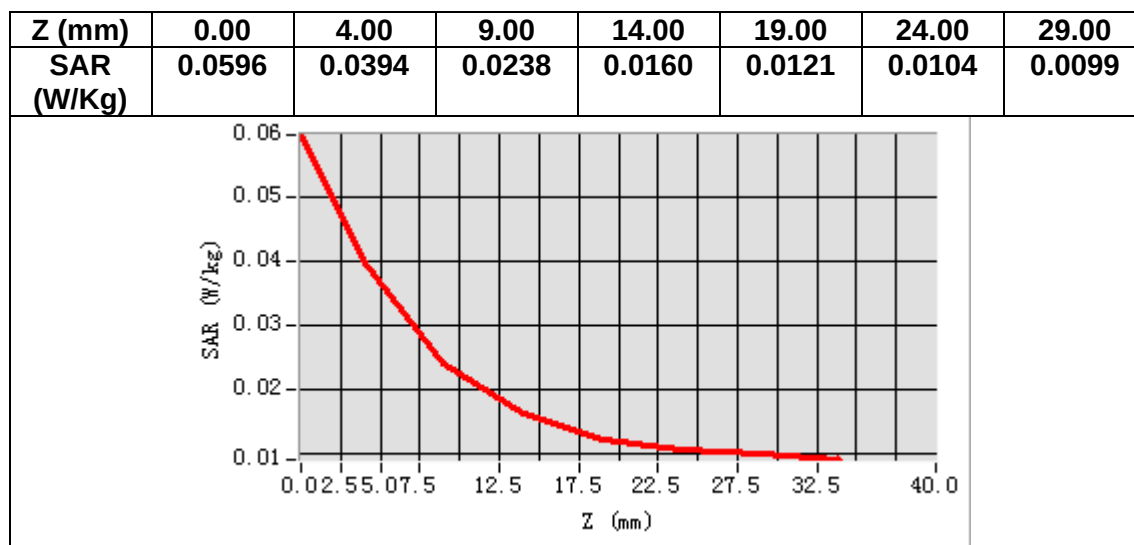
Frequency (MHz)	782.000000
Relative permittivity (real part)	41.786447
Relative permittivity (imaginary part)	20.858900
Conductivity (S/m)	0.906203
Variation (%)	-1.580000



Maximum location: X=-24.00, Y=-12.00

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.021761
SAR 1g (W/Kg)	0.037443



MEASUREMENT 29

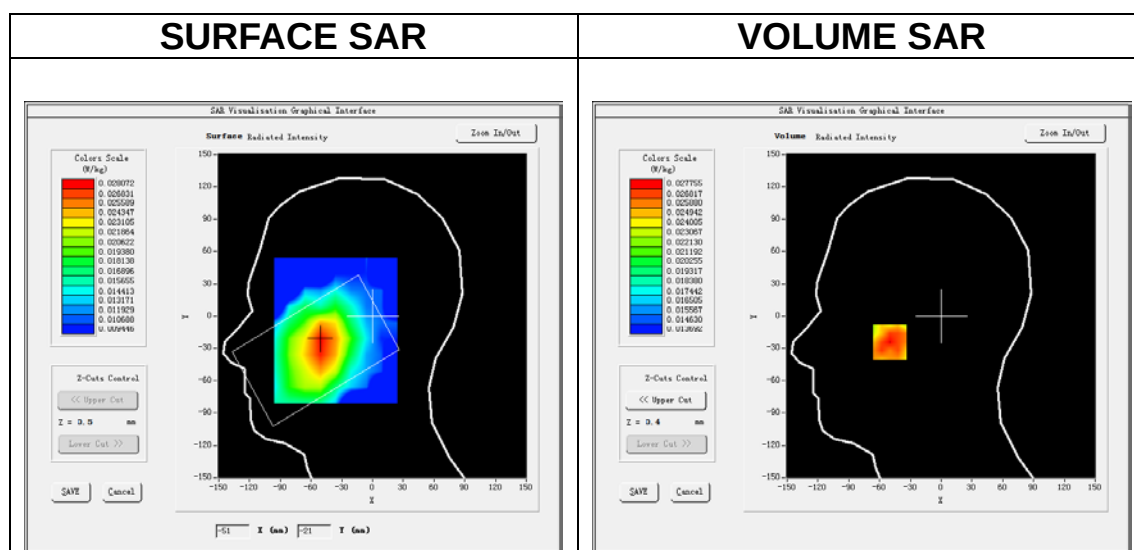
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

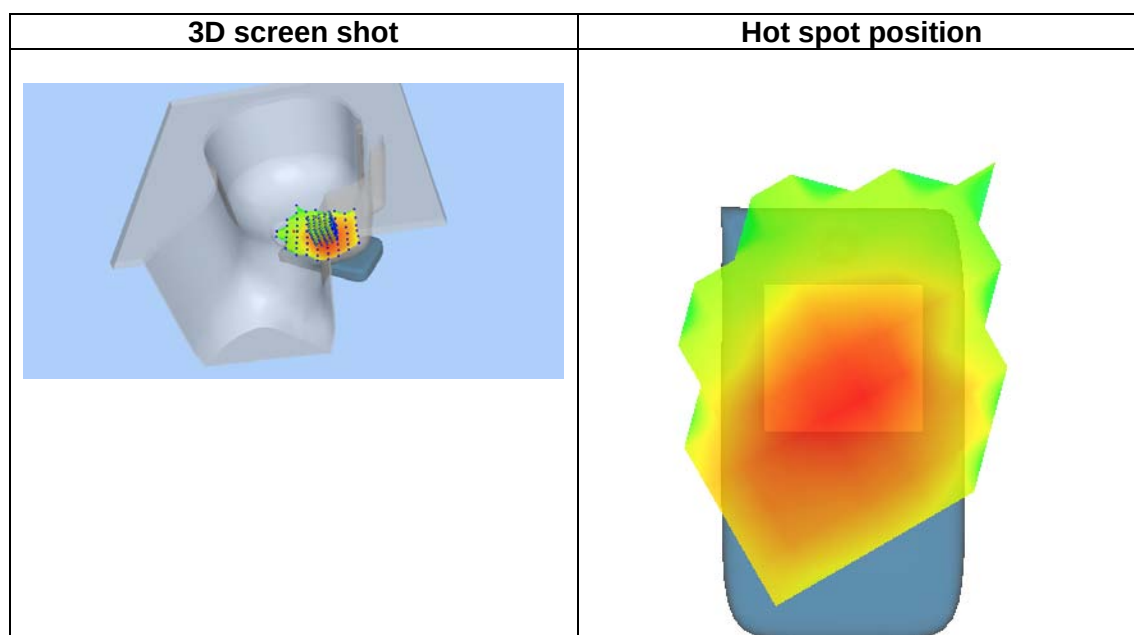
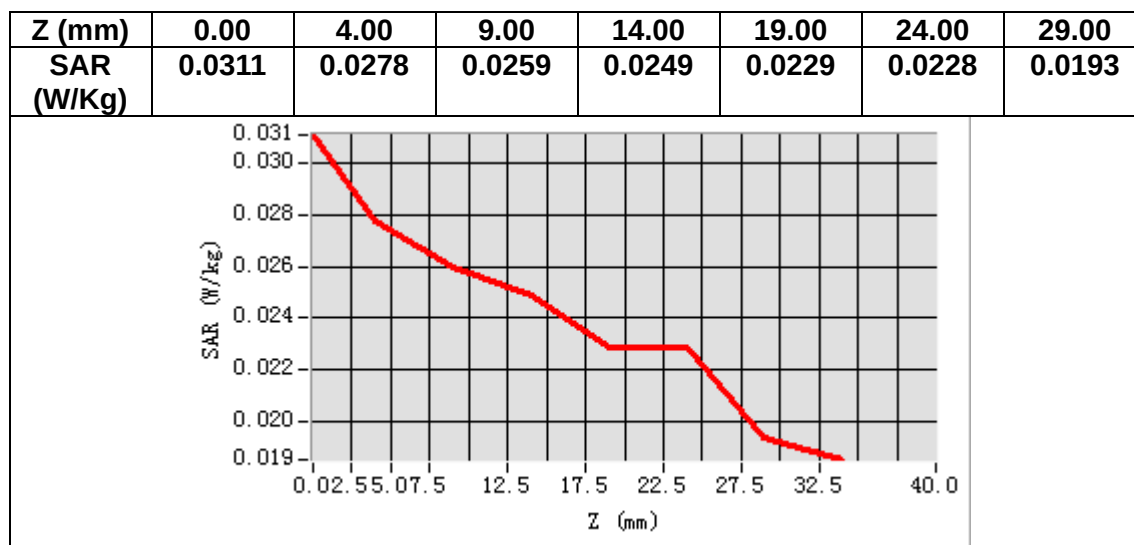
Frequency (MHz)	710.000000
Relative permittivity (real part)	42.658749
Relative permittivity (imaginary part)	21.541800
Conductivity (S/m)	0.849704
Variation (%)	-2.070000



Maximum location: X=-50.00, Y=-24.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.024481
SAR 1g (W/Kg)	0.028012



MEASUREMENT 30

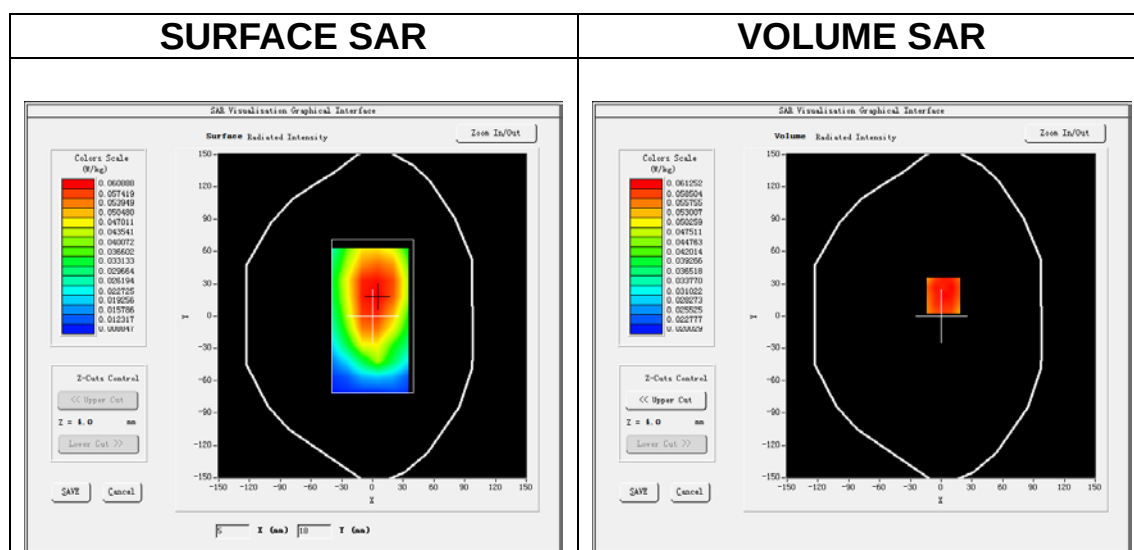
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

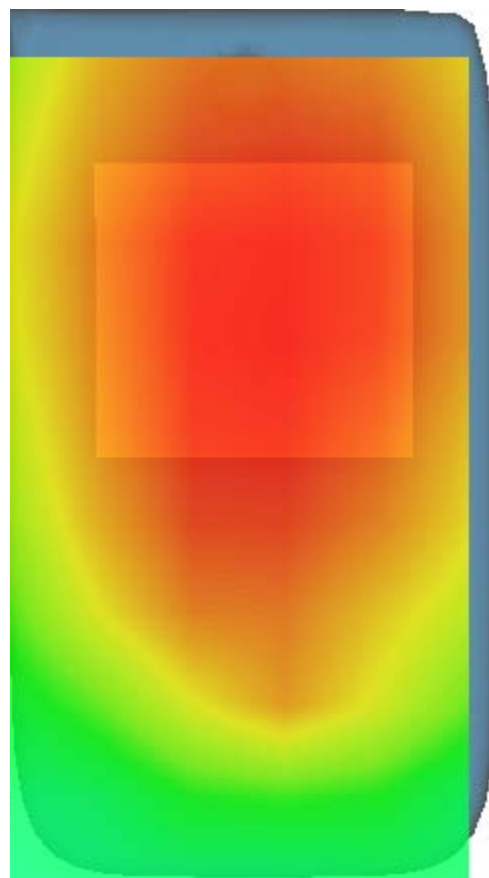
Frequency (MHz)	710.000000
Relative permittivity (real part)	42.658749
Relative permittivity (imaginary part)	21.541800
Conductivity (S/m)	0.849704
Variation (%)	-1.040000



Maximum location: X=2.00, Y=19.00

SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.049524
SAR 1g (W/Kg)	0.060061



MEASUREMENT 31

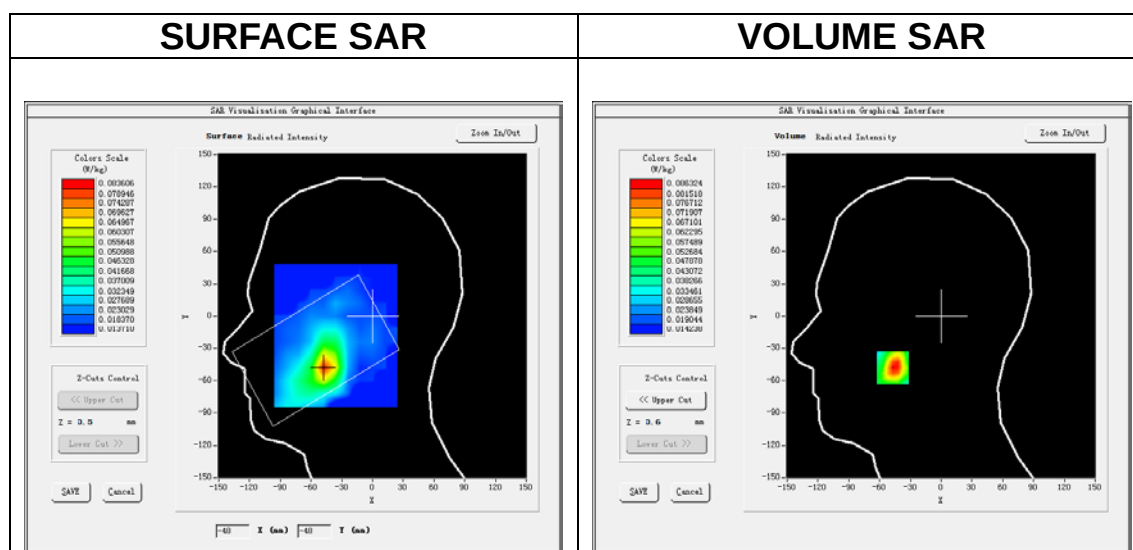
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>

B. SAR Measurement Results

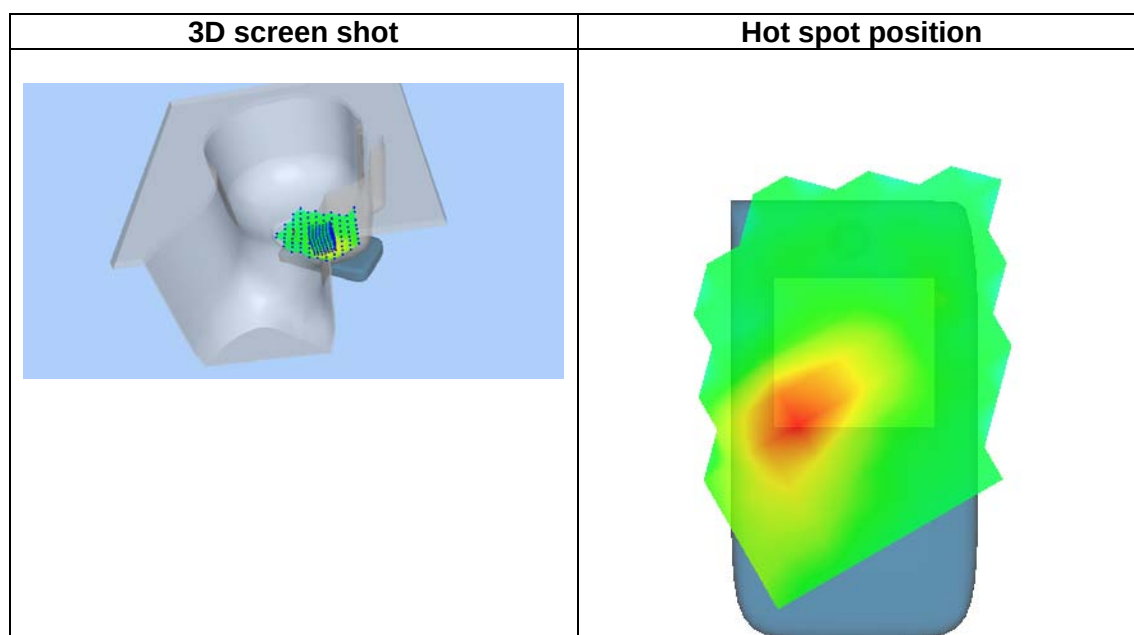
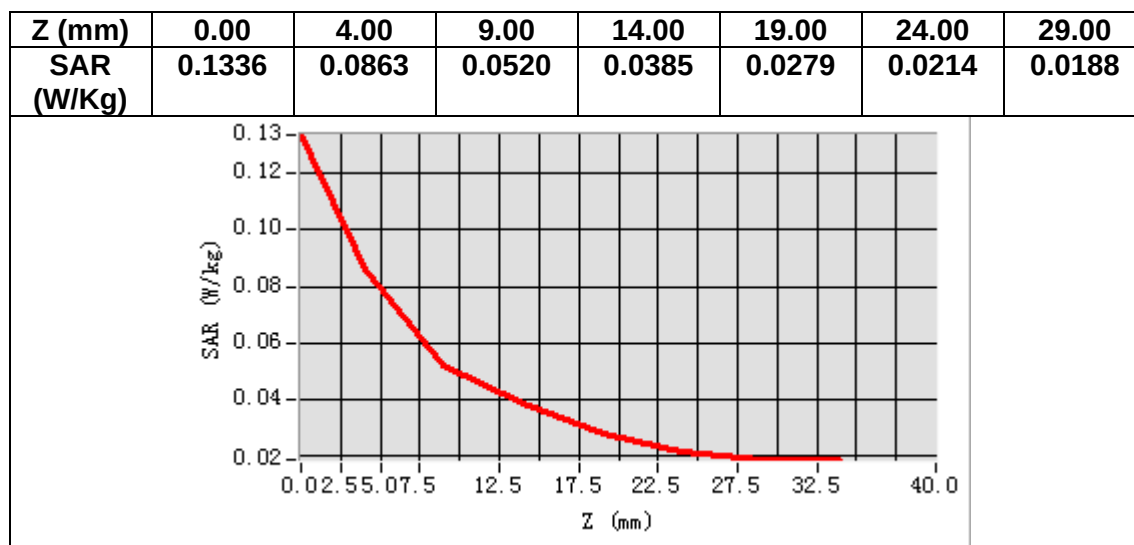
Frequency (MHz)	2610.000000
Relative permittivity (real part)	39.669202
Relative permittivity (imaginary part)	13.430922
Conductivity (S/m)	1.947484
Variation (%)	-0.570000



Maximum location: X=-47.00, Y=-48.00

SAR Peak: 0.14 W/kg

SAR 10g (W/Kg)	0.048235
SAR 1g (W/Kg)	0.082778



MEASUREMENT 32

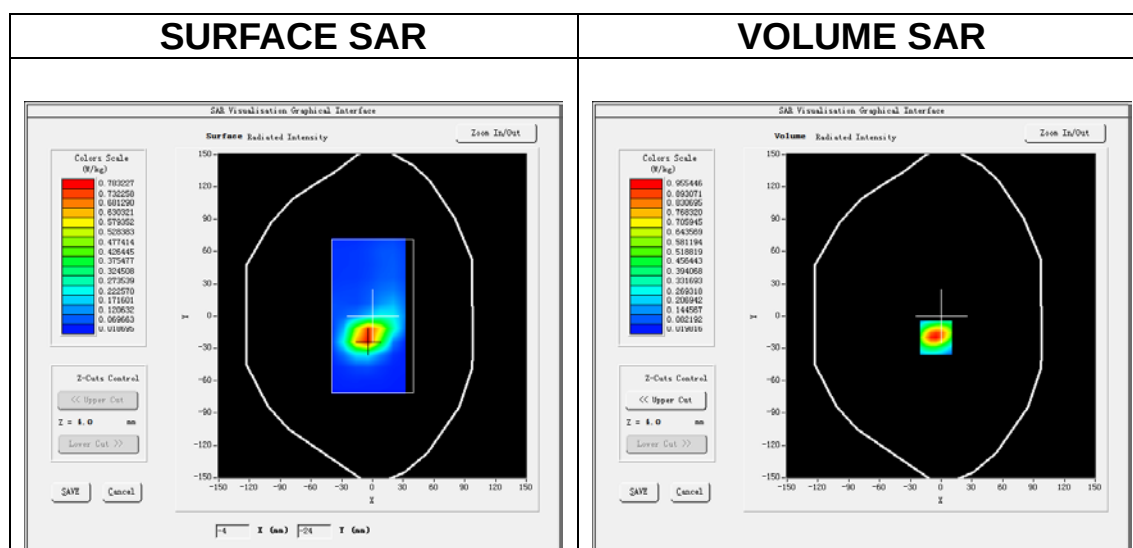
Date of measurement: 29/10/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>

B. SAR Measurement Results

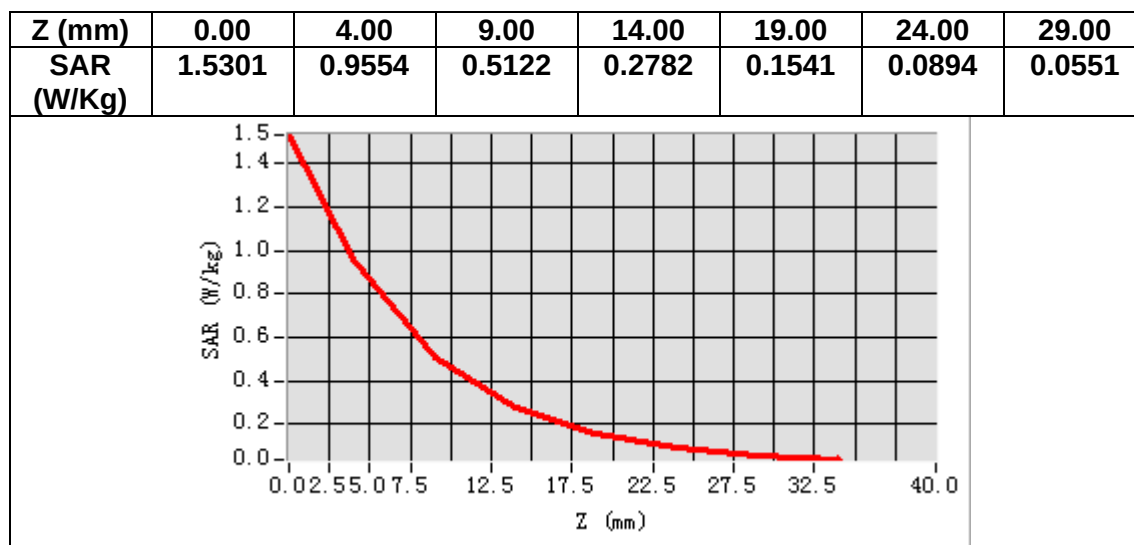
Frequency (MHz)	2610.000000
Relative permittivity (real part)	39.669202
Relative permittivity (imaginary part)	13.430922
Conductivity (S/m)	1.947484
Variation (%)	-0.770000



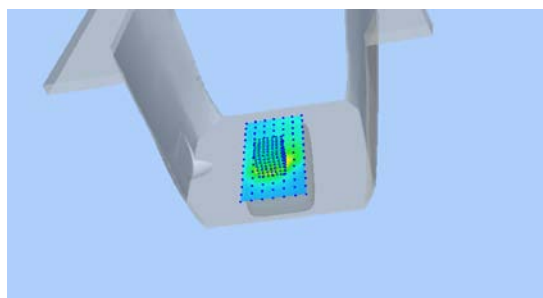
Maximum location: X=-5.00, Y=-20.00

SAR Peak: 1.55 W/kg

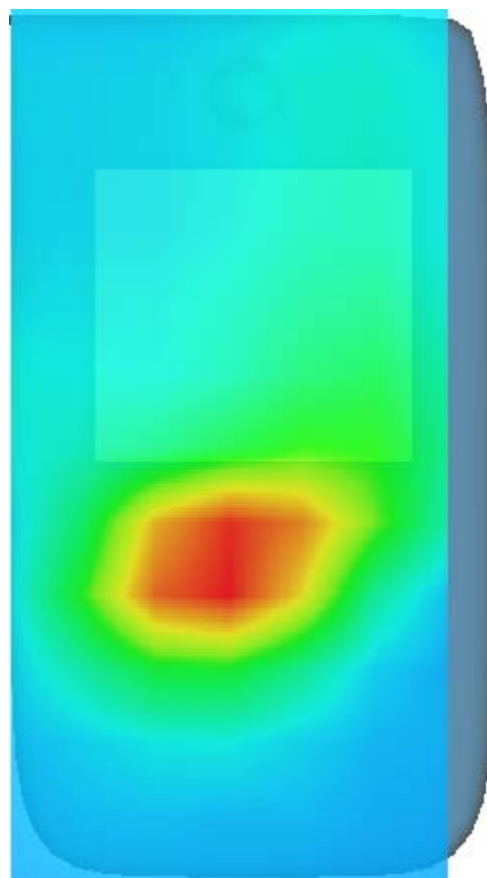
SAR 10g (W/Kg)	0.422868
SAR 1g (W/Kg)	0.881633



3D screen shot



Hot spot position



MEASUREMENT 33

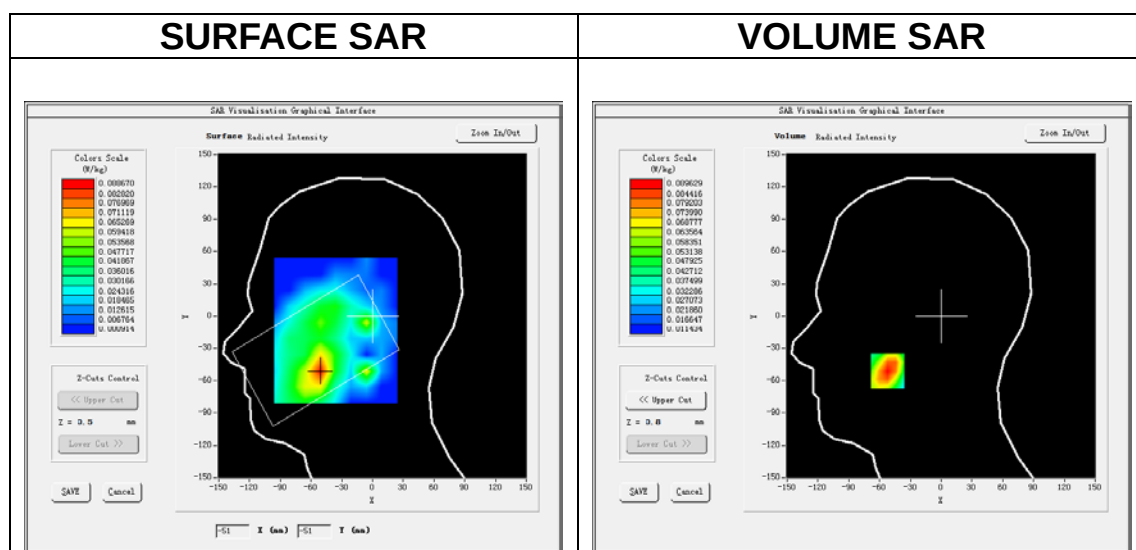
Date of measurement: 10/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 66</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

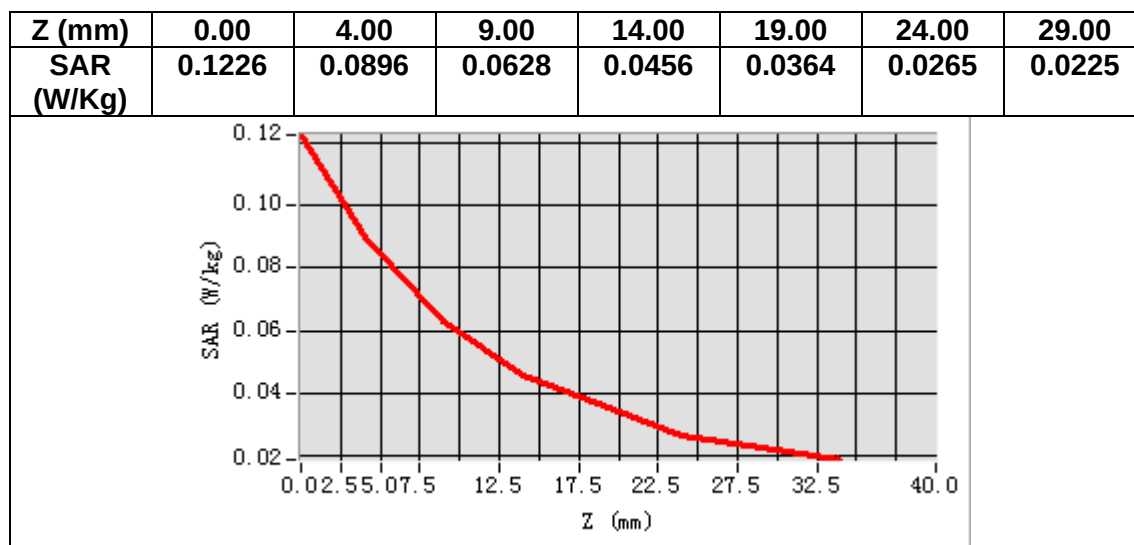
Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.720524
Relative permittivity (imaginary part)	13.807580
Conductivity (S/m)	1.338568
Variation (%)	2.540000



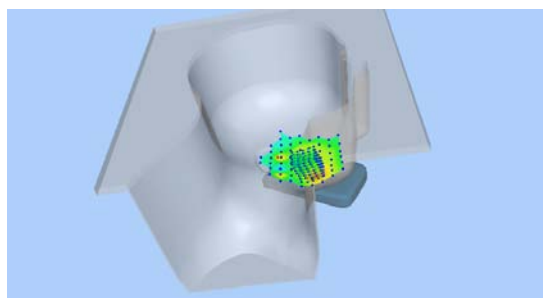
Maximum location: X=-52.00, Y=-51.00

SAR Peak: 0.13 W/kg

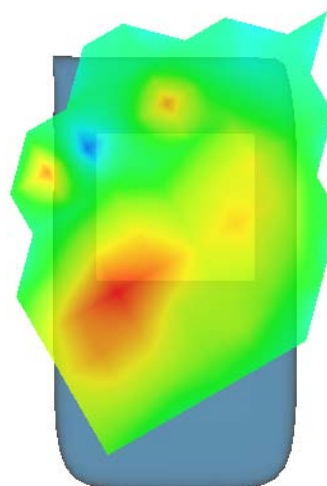
SAR 10g (W/Kg)	0.055226
SAR 1g (W/Kg)	0.085947



3D screen shot



Hot spot position



MEASUREMENT 34

Date of measurement: 10/11/2021

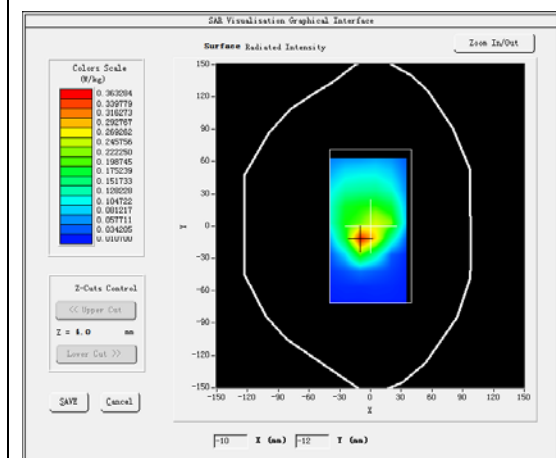
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 66</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

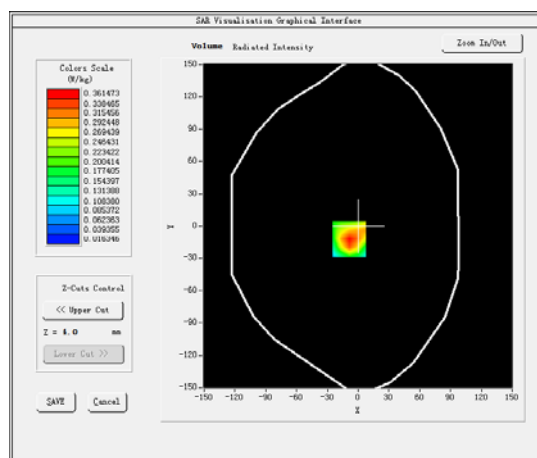
B. SAR Measurement Results

Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.720524
Relative permittivity (imaginary part)	13.807580
Conductivity (S/m)	1.338568
Variation (%)	-2.720000

SURFACE SAR



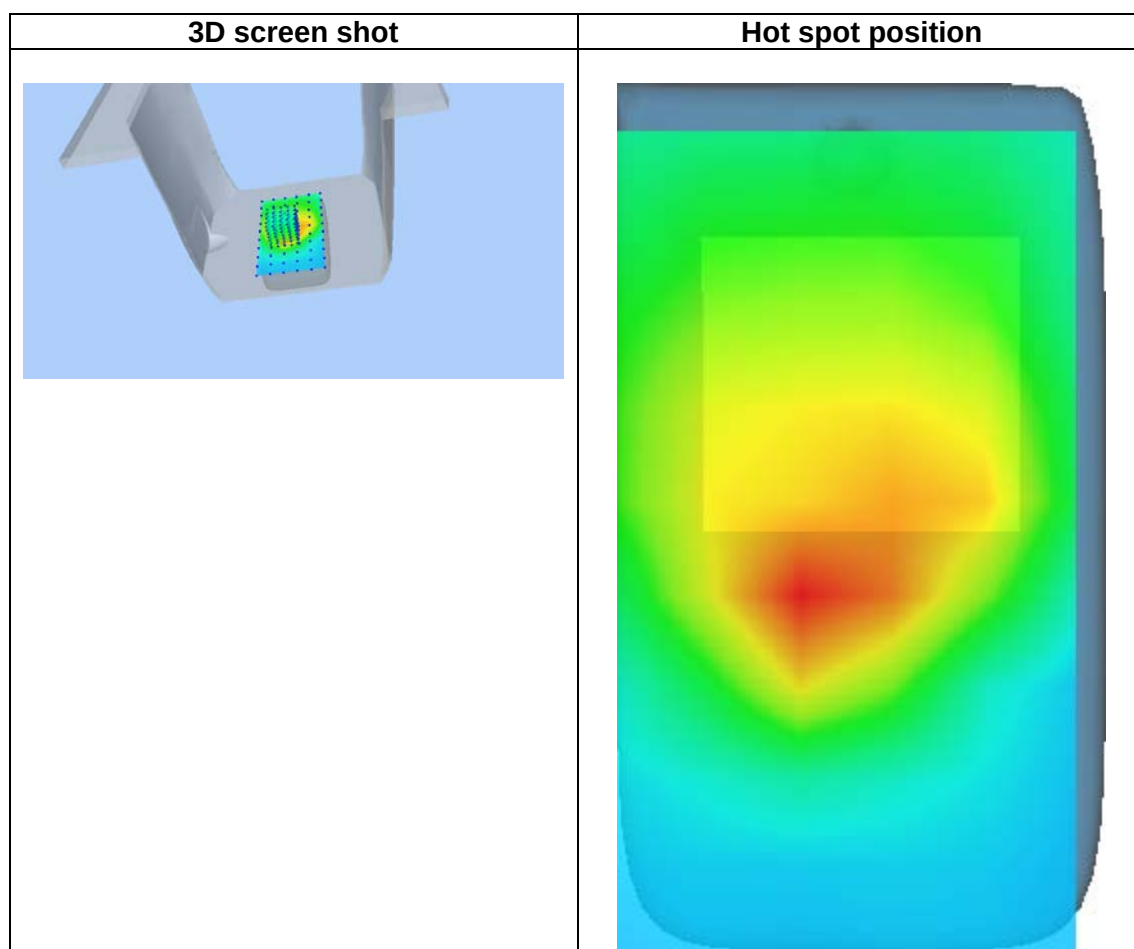
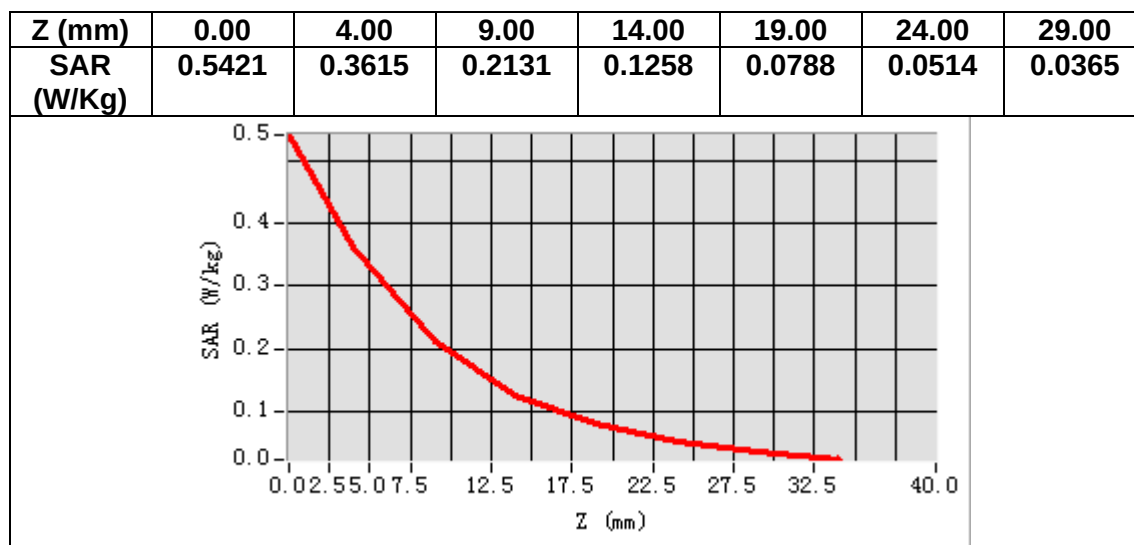
VOLUME SAR



Maximum location: X=-9.00, Y=-12.00

SAR Peak: 0.54 W/kg

SAR 10g (W/Kg)	0.187014
SAR 1g (W/Kg)	0.342184



MEASUREMENT 35

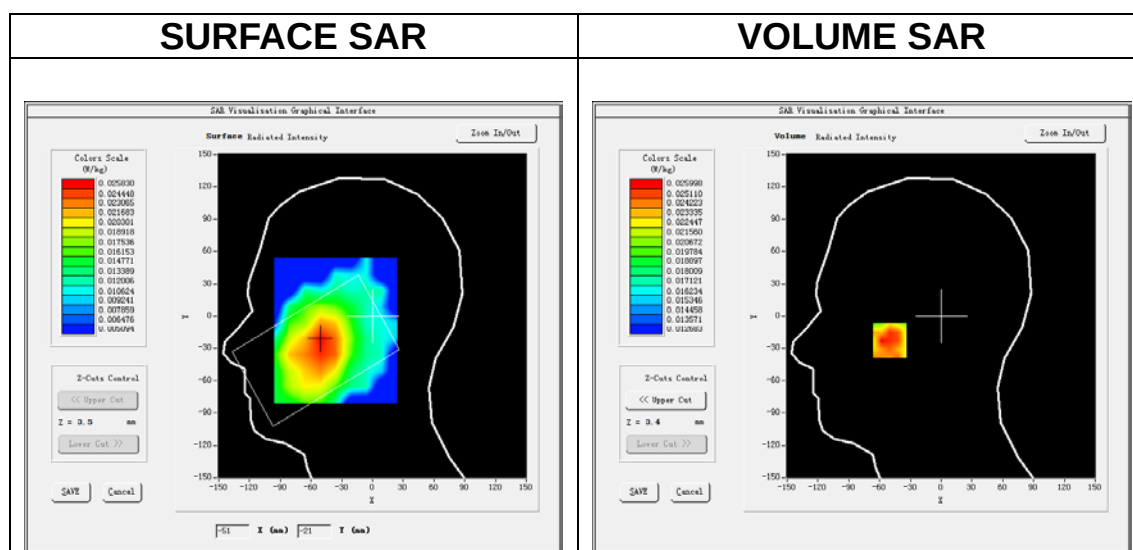
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 71</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

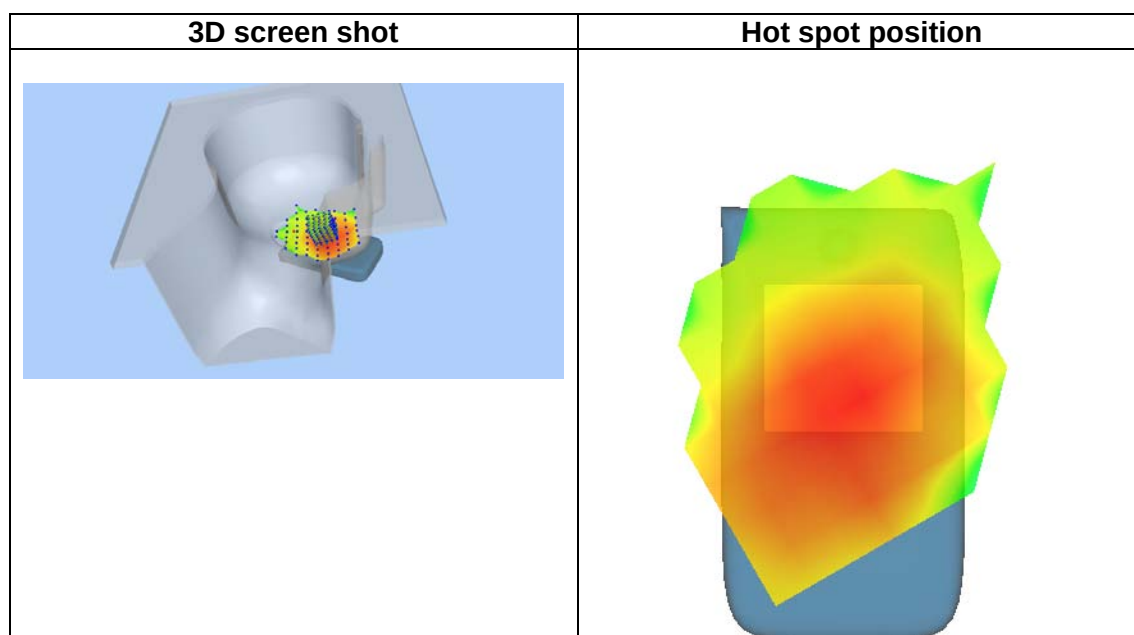
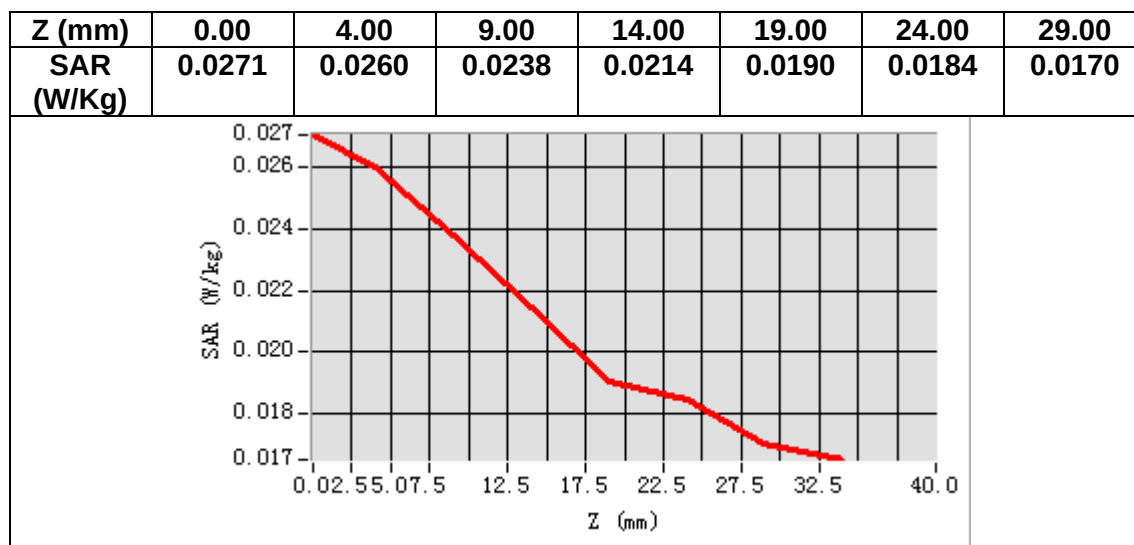
Frequency (MHz)	683.000000
Relative permittivity (real part)	42.972147
Relative permittivity (imaginary part)	22.344100
Conductivity (S/m)	0.847834
Variation (%)	-4.160000



Maximum location: X=-50.00, Y=-23.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.022453
SAR 1g (W/Kg)	0.025367



MEASUREMENT 36

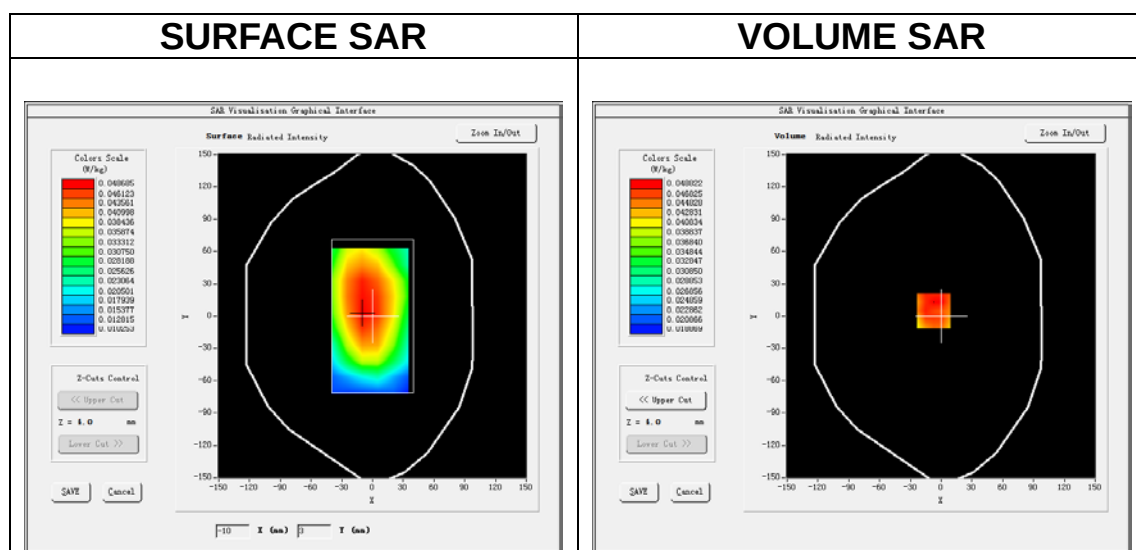
Date of measurement: 6/11/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 71</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

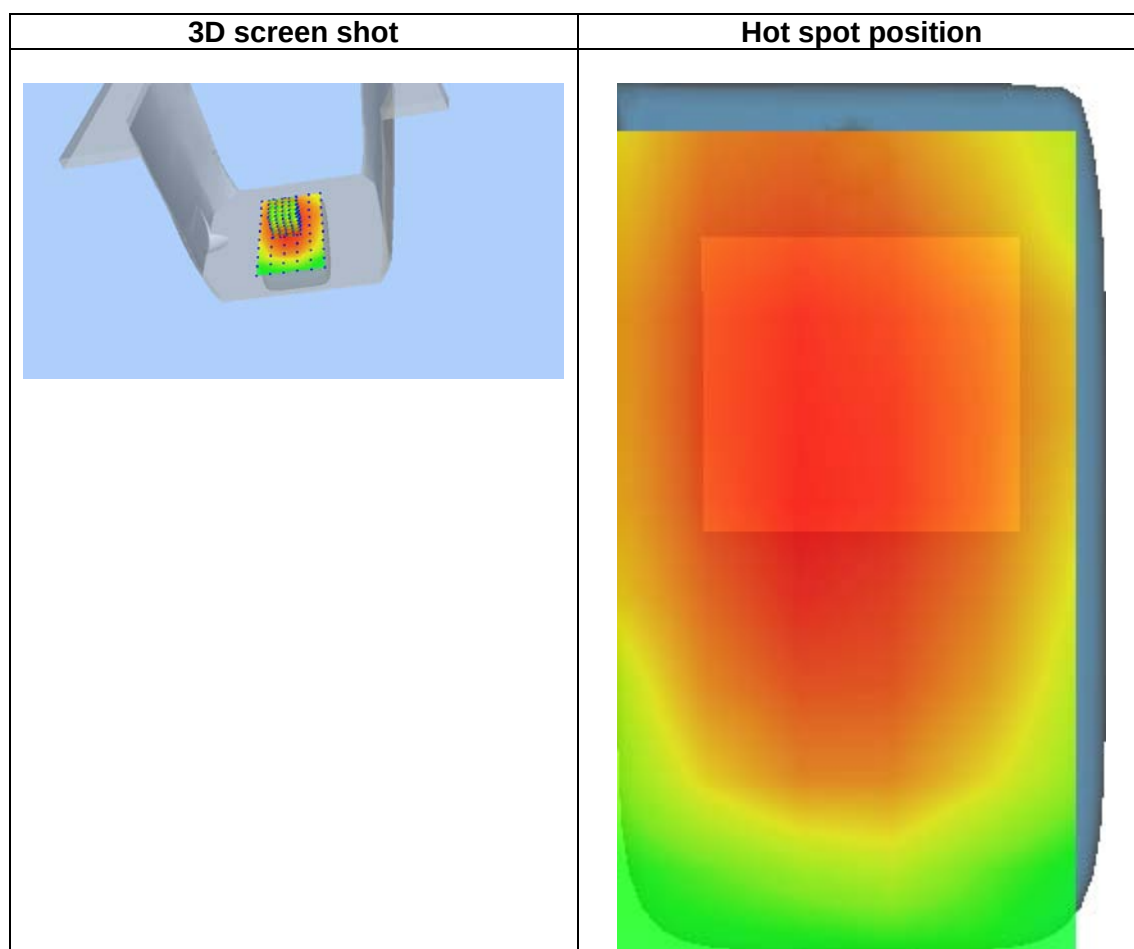
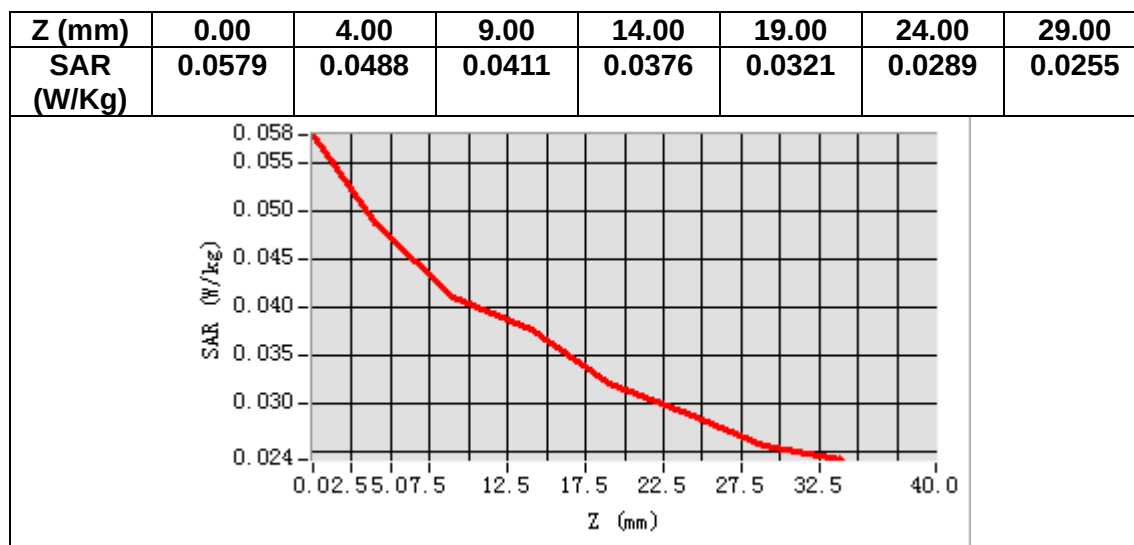
Frequency (MHz)	683.000000
Relative permittivity (real part)	42.972147
Relative permittivity (imaginary part)	22.344100
Conductivity (S/m)	0.847834
Variation (%)	-2.700000



Maximum location: X=-7.00, Y=5.00

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.040212
SAR 1g (W/Kg)	0.047926



14. Appendix D. Calibration Certificate

Table of contents
E Field Probe - SN 08/16 EPGO287
750 MHz Dipole - SN 03/15 DIP 0G750-355
835 MHz Dipole - SN 03/15 DIP 0G835-347
1800 MHz Dipole - SN 03/15 DIP 1G800-349
1900 MHz Dipole - SN 03/15 DIP 1G900-350
2450 MHz Dipole - SN 03/15 DIP 2G450-352
2600 MHz Dipole - SN 03/15 DIP 2G600-356
5000-6000 MHz Dipole - SN 13/14 WGA 33



COMOSAR E-Field Probe Calibration Report

Ref : ACR.60.1.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 08/16 EPG0287

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 03/01/2021



Accreditations #2-6789 and #2-6814
Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited COMOSAR 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).



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	3/1/2021	
Checked by :	Jérôme Luc	Technical Manager	3/1/2021	
Approved by :	Yann Toutain	Laboratory Director	3/1/2021	

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 PHILIPS

	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	3/1/2021	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 08/16 EPGO287
Product Condition (new / used)	Used
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.211 MΩ Dipole 2: R2=0.199 MΩ Dipole 3: R3=0.199 MΩ

2 PRODUCT DESCRIPTION**2.1 GENERAL INFORMATION**

MVG's COMOSAR E field Probes are built in accordance to the IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 standards.



Figure 1 – MVG COMOSAR Dosimetric E field Dipole

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 IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 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.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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.

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:

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

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
Δ_{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
δ	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;
ΔSAR_{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.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 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 (μV/(V/m) ²)	Normy dipole 2 (μV/(V/m) ²)	Normz dipole 3 (μV/(V/m) ²)
0.72	0.66	0.77

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
107	110	110

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

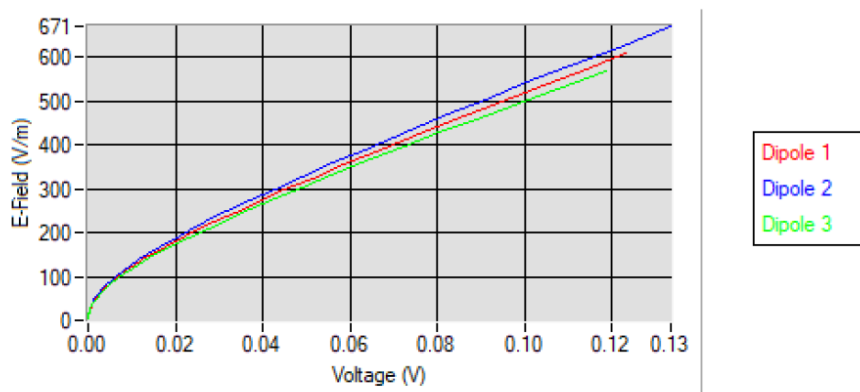
$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

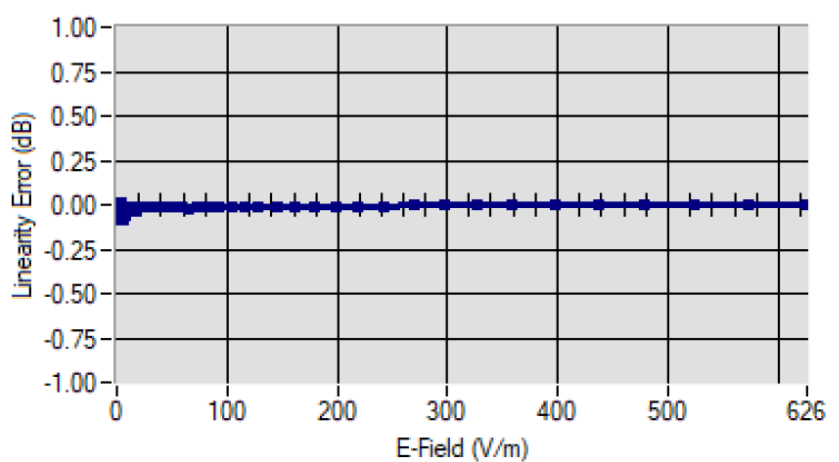
Ref: ACR.60.1.21.MVGB.A

Calibration curves



5.2 LINEARITY

Linearity



Linearity: +/-1.90% (+/-0.08dB)



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL750	750	1.49
HL850	835	1.50
HL900	900	1.61
HL1800	1800	1.73
HL1900	1900	1.91
HL2000	2000	1.97
HL2300	2300	1.92
HL2450	2450	1.98
HL2600	2600	1.87
HL3300	3300	1.79
HL3500	3500	1.85
HL3700	3700	1.79
HL3900	3900	2.07
HL4200	4200	2.21
HL4600	4600	2.25
HL4900	4900	2.05
HL5200	5200	1.80
HL5400	5400	2.05
HL5600	5600	2.16
HL5800	5800	2.07

LOWER DETECTION LIMIT: 8mW/kg

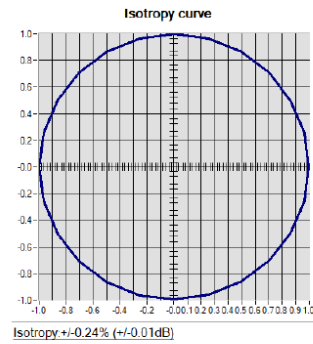


COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

5.4 ISOTROPY

HL1800 MHz





COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
Flat Phantom	MVG	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	05/2019	05/2022
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	05/2019	05/2022
Multimeter	Keithley 2000	1160271	02/2020	02/2023
Signal Generator	Rohde & Schwarz SMB	106589	04/2019	04/2022
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	05/2019	05/2022
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	Mega Industries	069Y7-158-13-712	Validated. No cal required.	Validated. No cal required.
Waveguide Transition	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Waveguide Termination	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44220687	05/2020	05/2023



SAR Reference Dipole Calibration Report

Ref : ACR.60.2.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE

FREQUENCY: 750 MHZ

SERIAL NO.: SN 03/15 DIP0G750-355

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 03/01/2021



Accreditations #2-6789 and #2-6814
Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed at MVG, using the COMOSAR test bench. The test results covered by accreditation are traceable to the International System of Units (SI).



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.2.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	3/1/2021	<i>JS</i>
Checked by :	Jérôme Luc	Technical Manager	3/1/2021	<i>JS</i>
Approved by :	Yann Toutain	Laboratory Director	3/1/2021	<i>Yann Toutain</i>

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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	3/1/2021	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.2.21.MVGB.A

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