

MEASUREMENT 4

Date of measurement: 8/7/2024

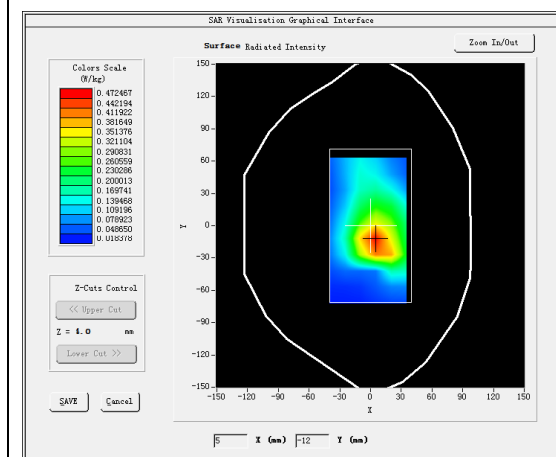
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>GSM1900</u>
Channels	<u>Middle</u>
Signal	<u>TDMA (Crest factor: 8.0)</u>
ConvF	<u>2.63</u>

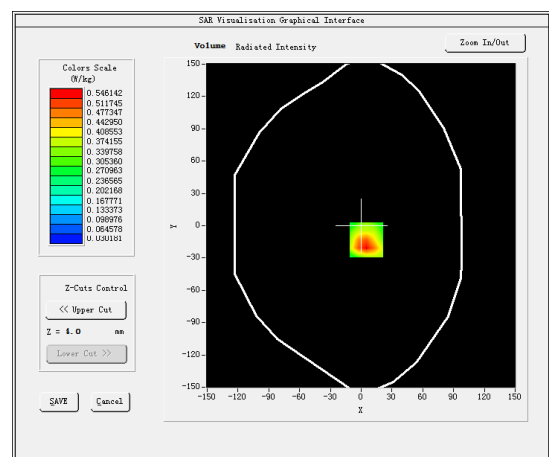
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	0.190000

SURFACE SAR



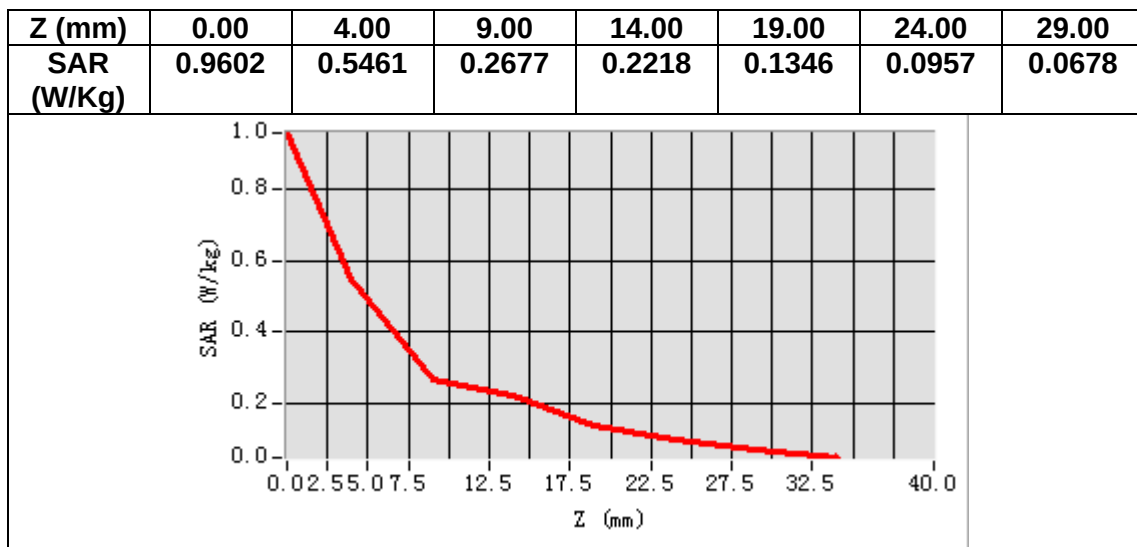
VOLUME SAR



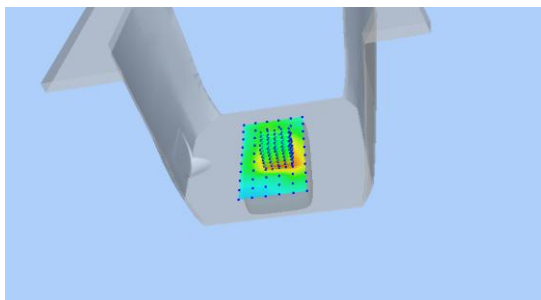
Maximum location: X=5.00, Y=-13.00

SAR Peak: 0.80 W/kg

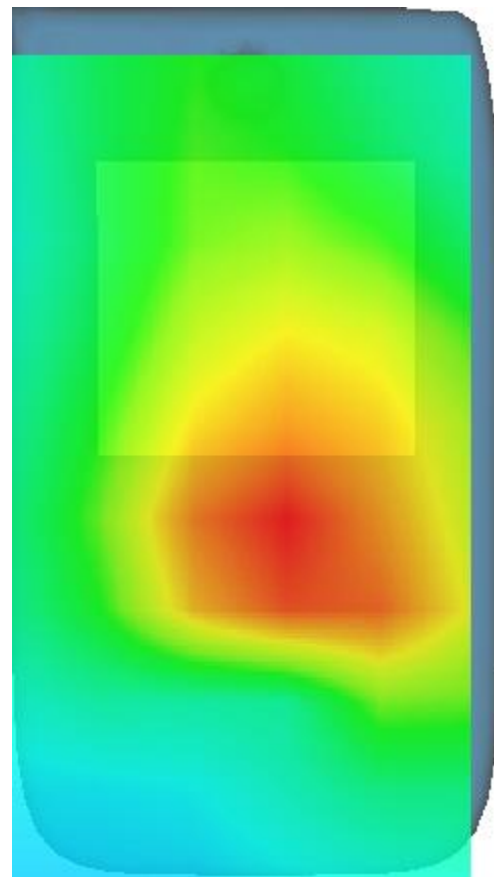
SAR 10g (W/Kg)	0.306058
SAR 1g (W/Kg)	0.534937



3D screen shot



Hot spot position



MEASUREMENT 5

Date of measurement: 8/7/2024

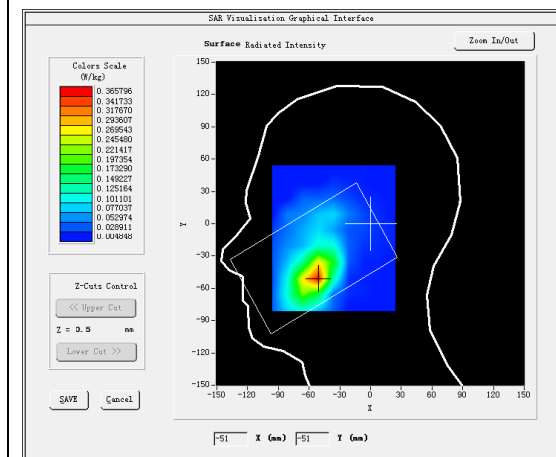
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>Band2 WCDMA1900</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>2.63</u>

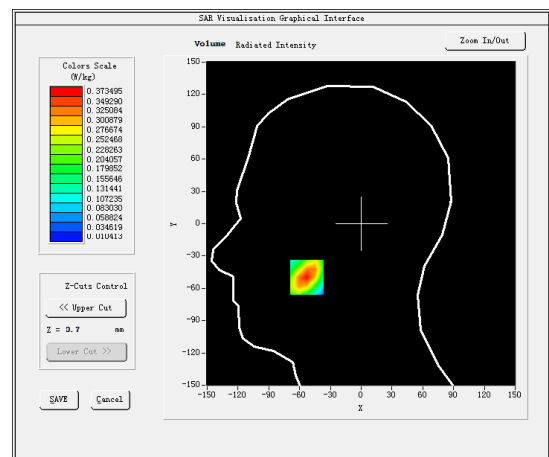
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	1.820000

SURFACE SAR



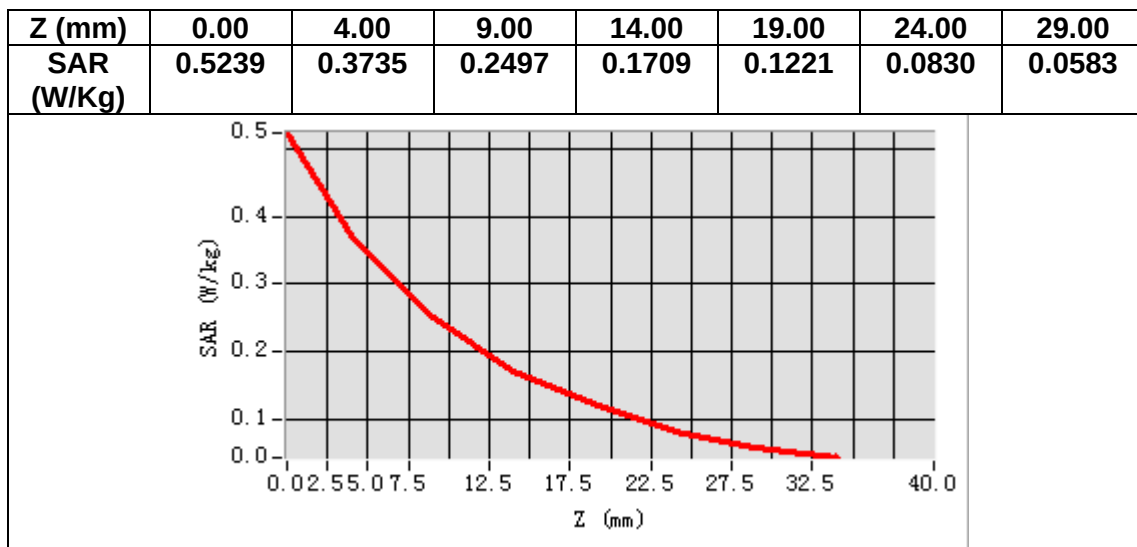
VOLUME SAR



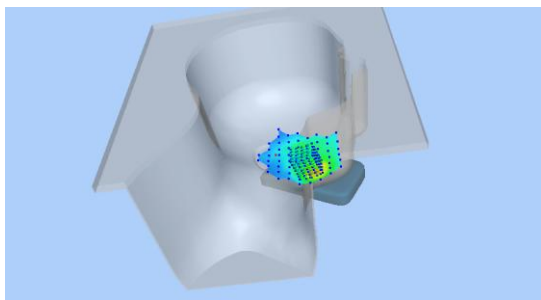
Maximum location: X=-53.00, Y=-50.00

SAR Peak: 0.52 W/kg

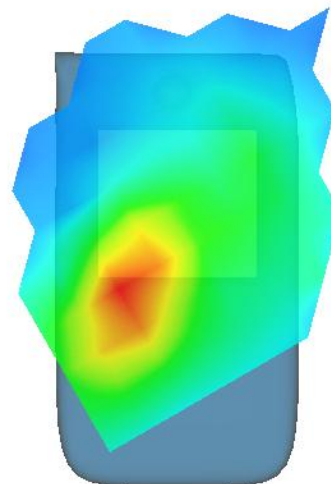
SAR 10g (W/Kg)	0.214080
SAR 1g (W/Kg)	0.360771



3D screen shot



Hot spot position



MEASUREMENT 6

Date of measurement: 8/7/2024

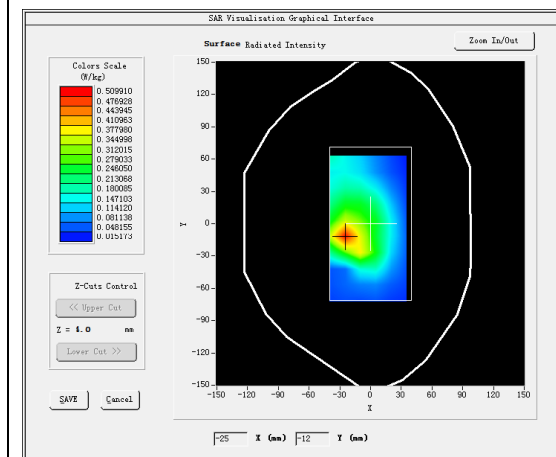
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band2 WCDMA1900</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>2.63</u>

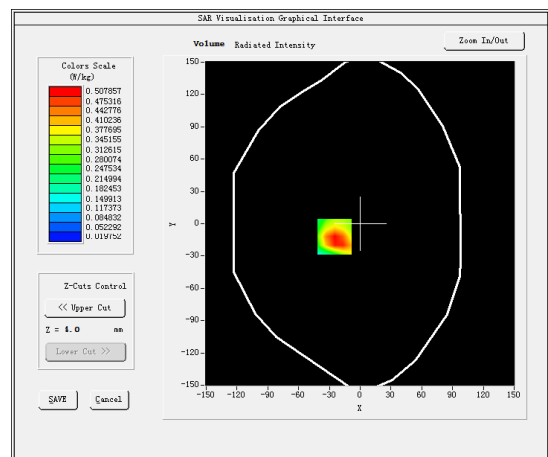
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-1.580000

SURFACE SAR



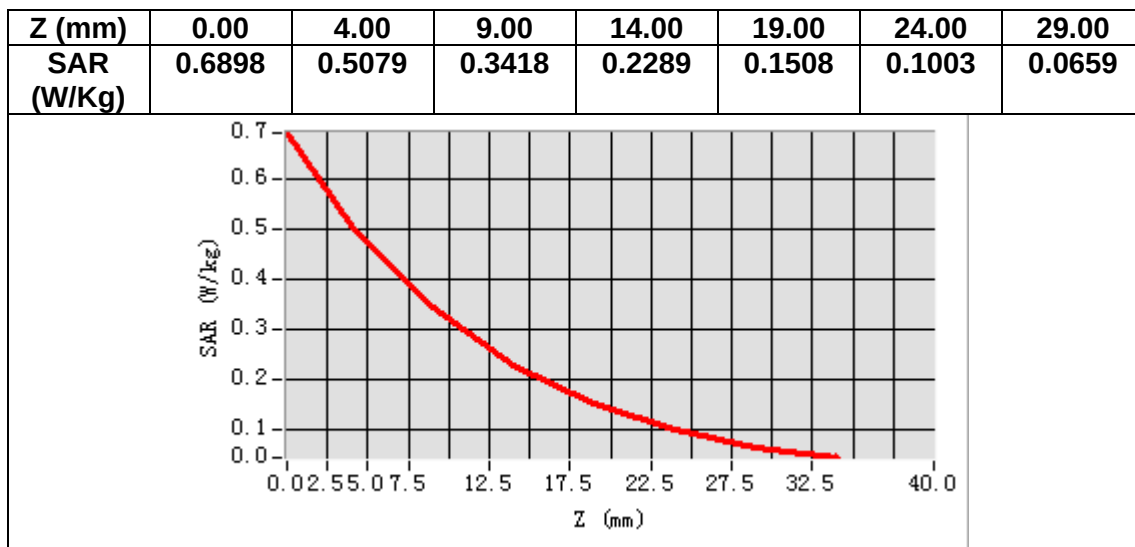
VOLUME SAR



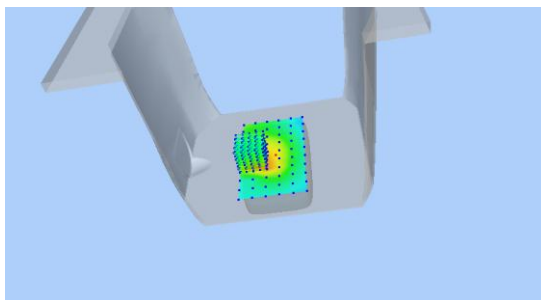
Maximum location: X=-25.00, Y=-12.00

SAR Peak: 0.77 W/kg

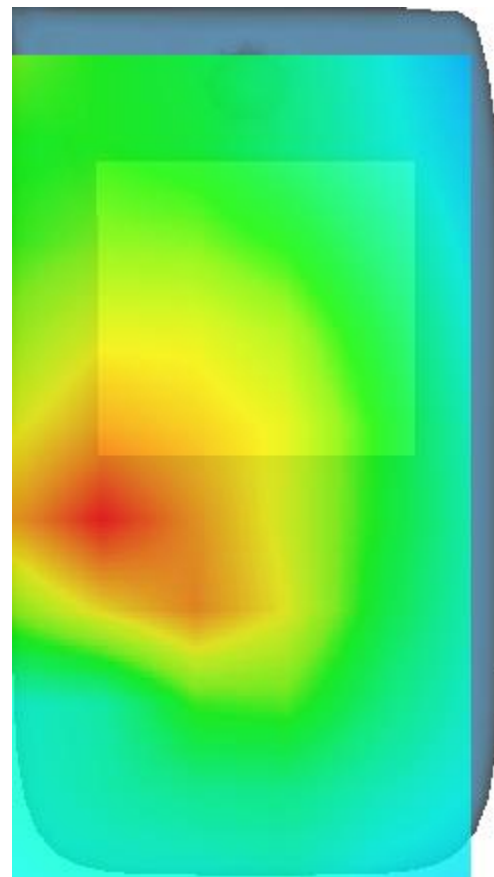
SAR 10g (W/Kg)	0.293995
SAR 1g (W/Kg)	0.511824



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 9/7/2024

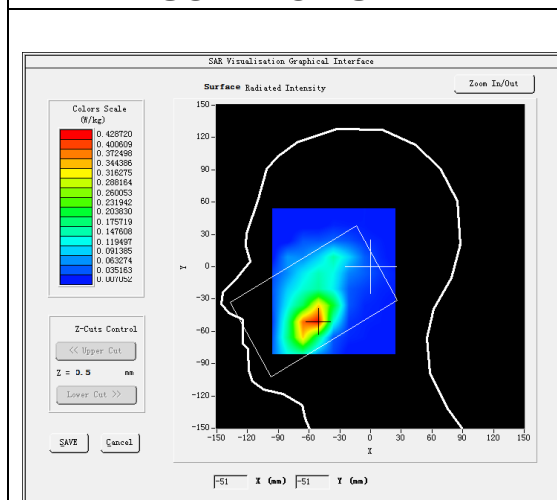
A. Experimental conditions.

<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>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

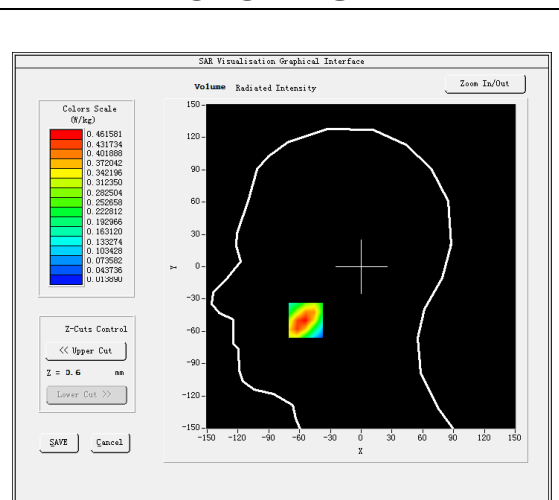
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.389881
Relative permittivity (imaginary part)	13.699847
Conductivity (S/m)	1.318230
Variation (%)	-0.250000

SURFACE SAR



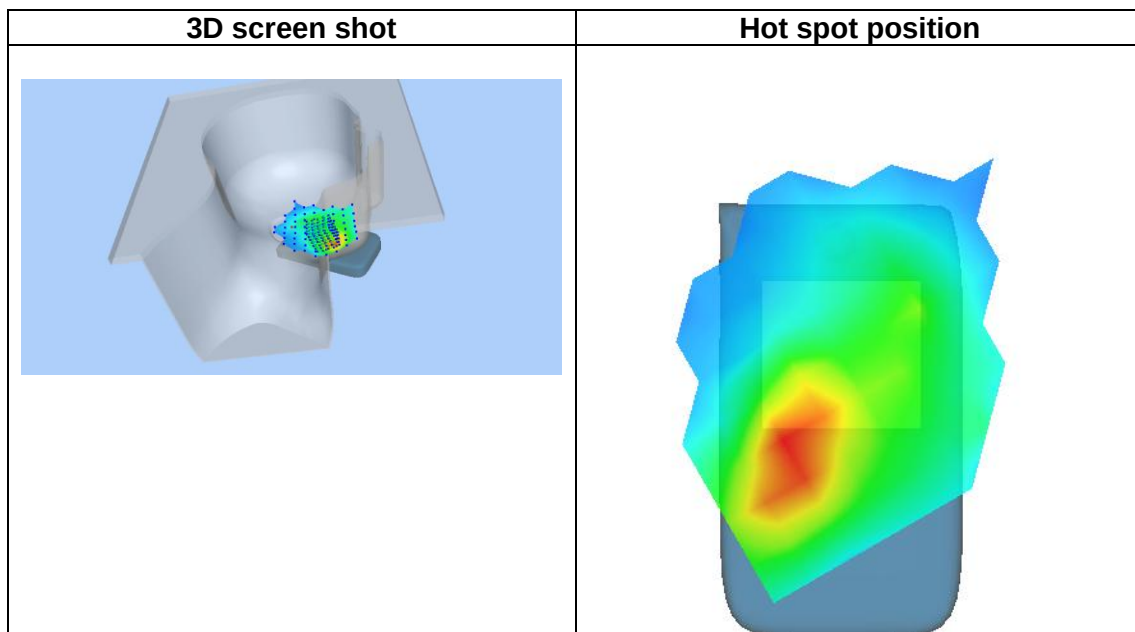
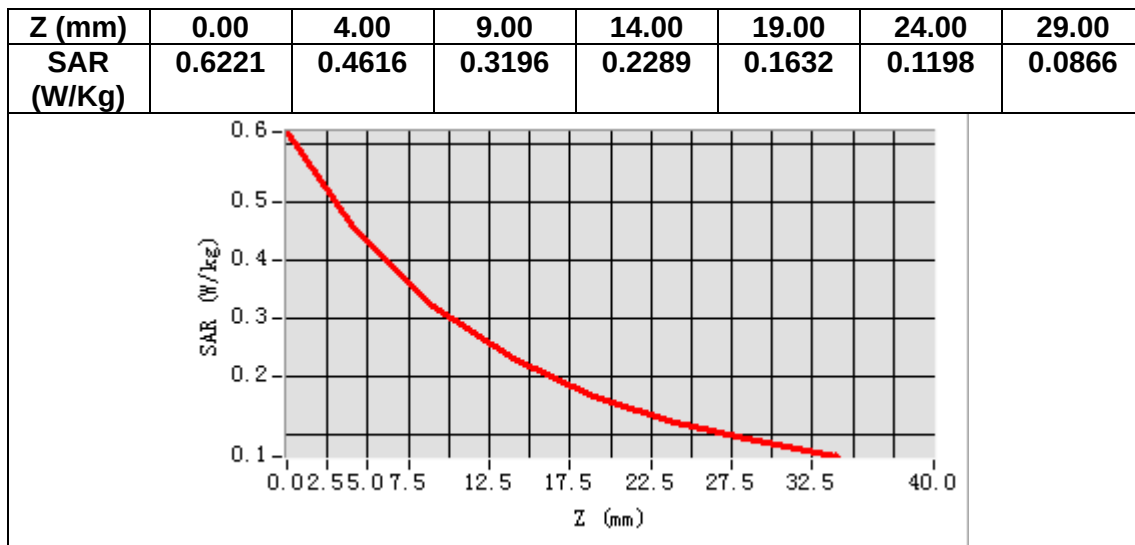
VOLUME SAR



Maximum location: X=-54.00, Y=-50.00

SAR Peak: 0.63 W/kg

SAR 10g (W/Kg)	0.271555
SAR 1g (W/Kg)	0.440077



MEASUREMENT 8

Date of measurement: 9/7/2024

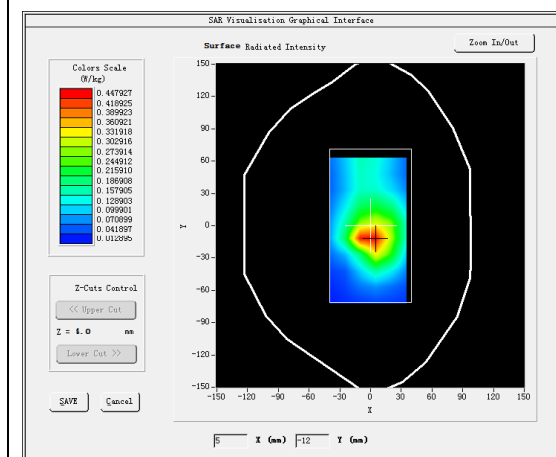
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band4 WCDMA1700</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>2.45</u>

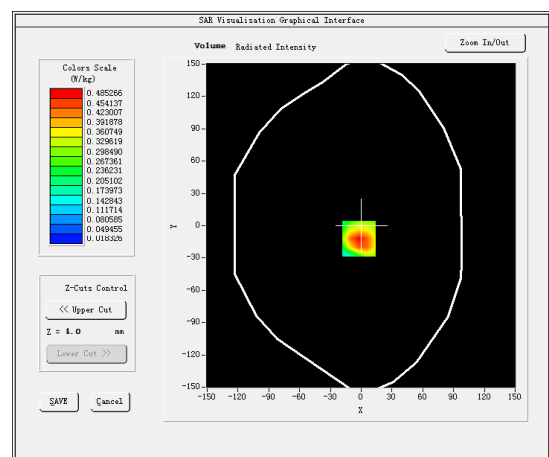
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.389881
Relative permittivity (imaginary part)	13.699847
Conductivity (S/m)	1.318230
Variation (%)	-2.400000

SURFACE SAR



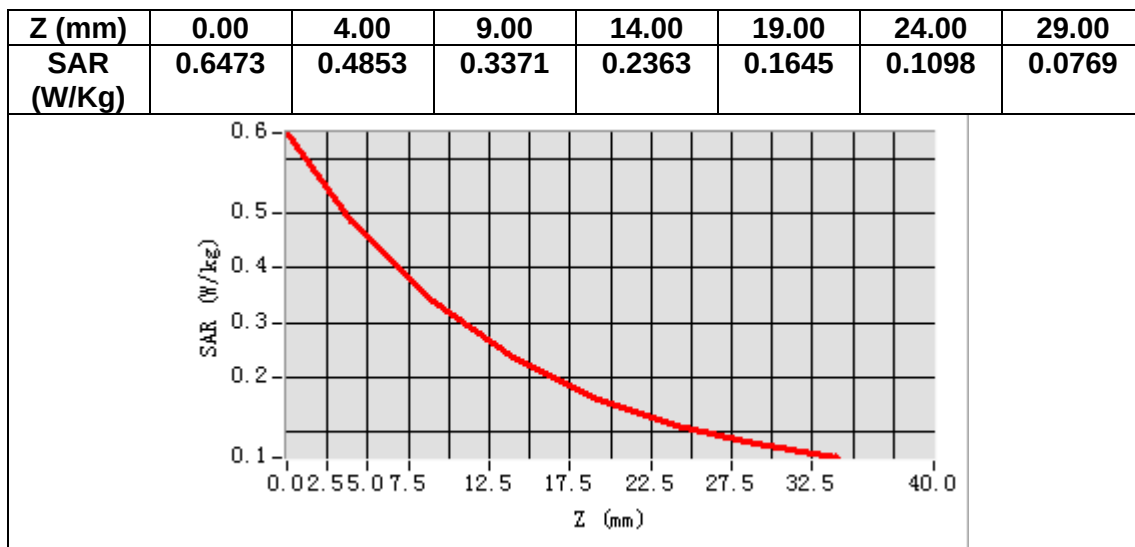
VOLUME SAR



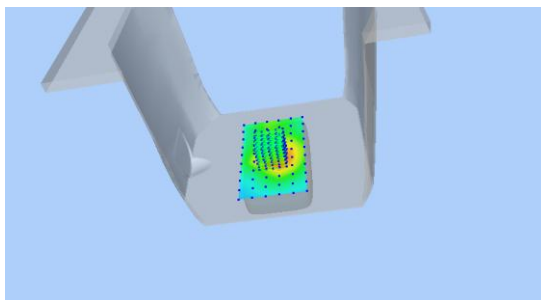
Maximum location: X=-2.00, Y=-12.00

SAR Peak: 0.67 W/kg

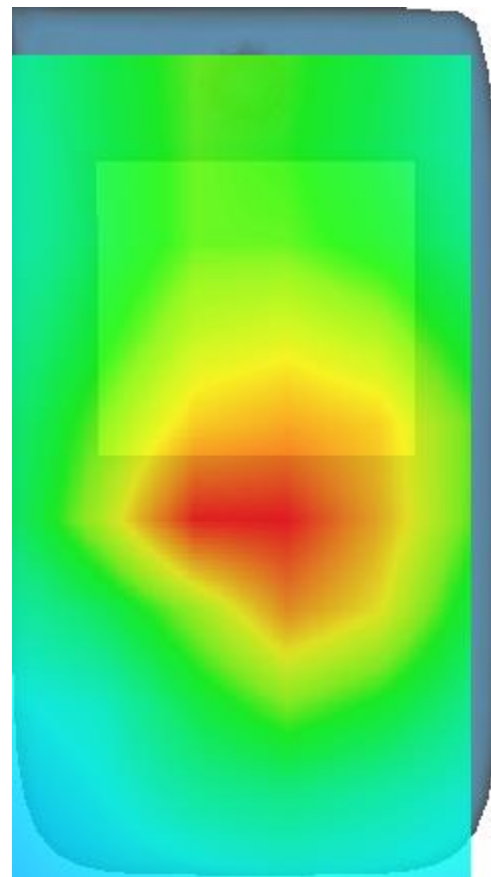
SAR 10g (W/Kg)	0.284556
SAR 1g (W/Kg)	0.467047



3D screen shot



Hot spot position



MEASUREMENT 9

Date of measurement: 7/7/2024

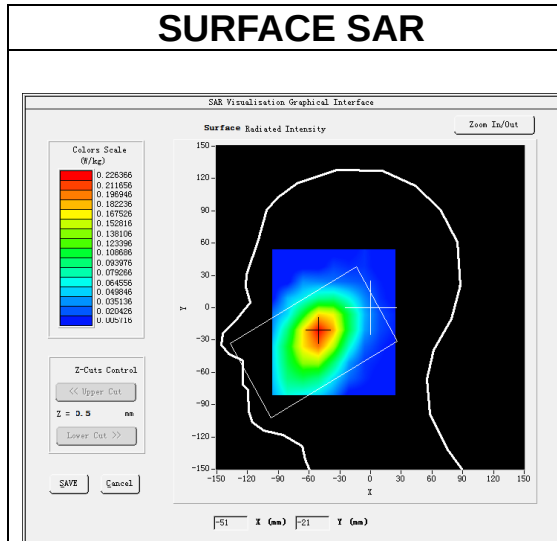
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>Band5 WCDMA850</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>2.32</u>

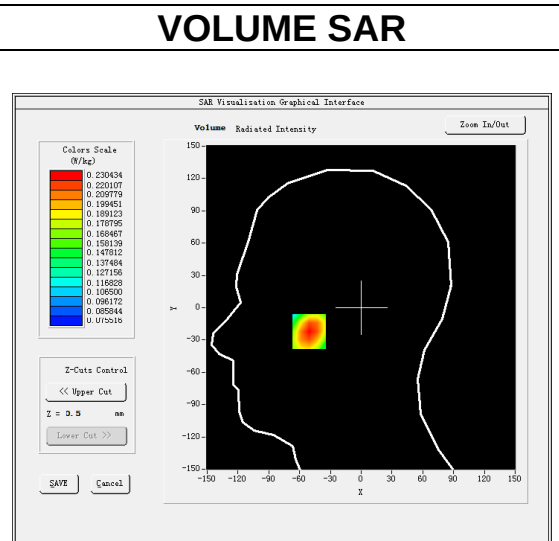
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	1.510000

SURFACE SAR



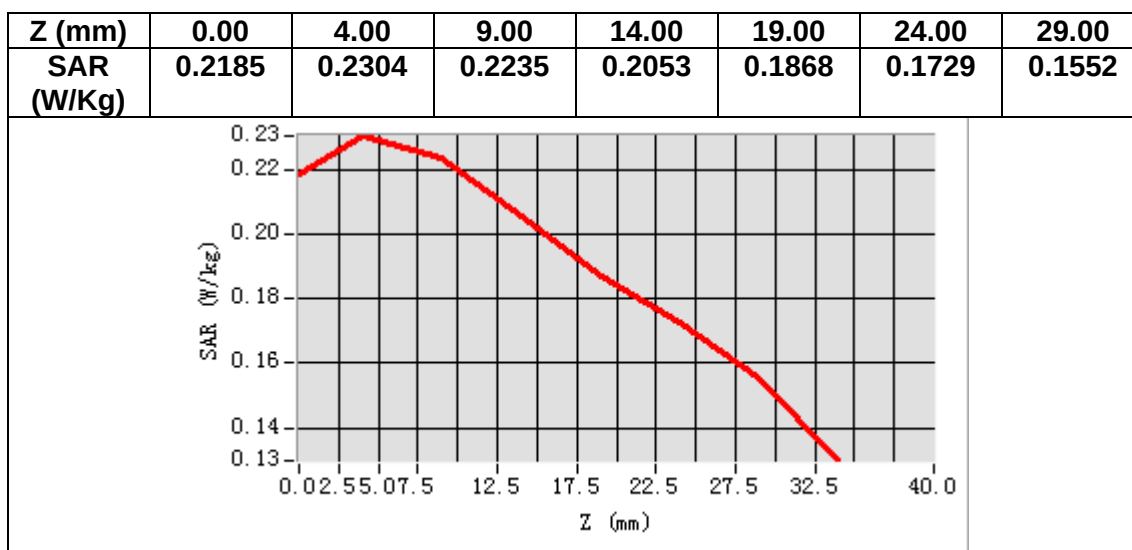
VOLUME SAR



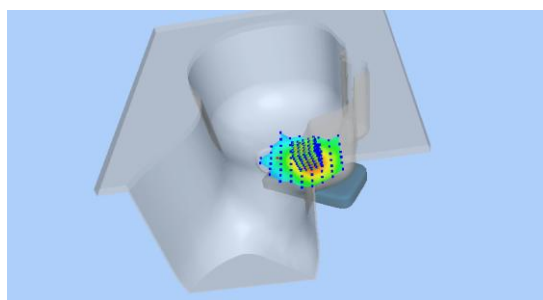
Maximum location: X=-51.00, Y=-22.00

SAR Peak: 0.23 W/kg

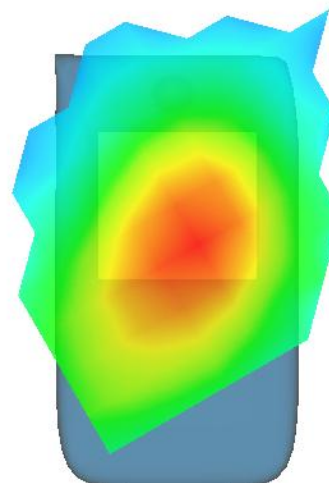
SAR 10g (W/Kg)	0.195432
SAR 1g (W/Kg)	0.222365



3D screen shot



Hot spot position



MEASUREMENT 10

Date of measurement: 7/7/2024

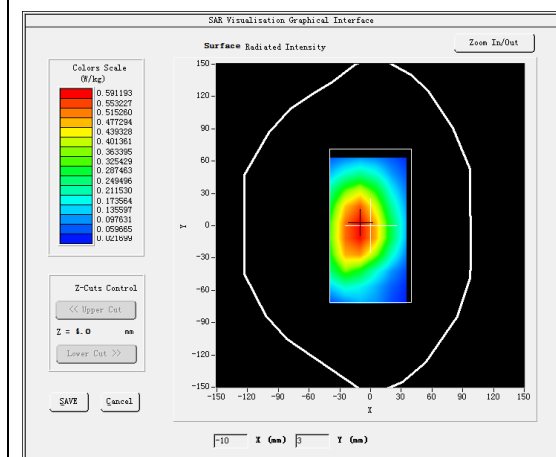
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band5_WCDMA850</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>2.32</u>

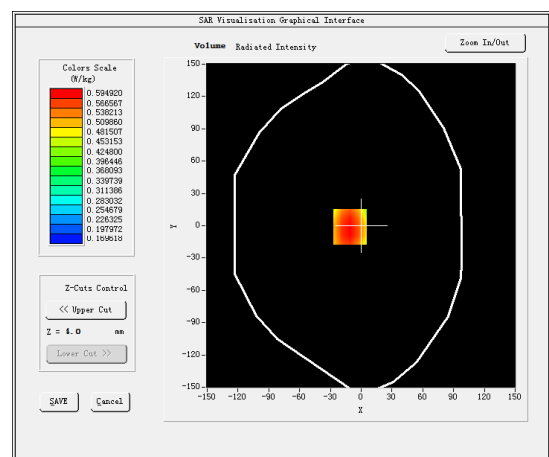
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	-1.580000

SURFACE SAR



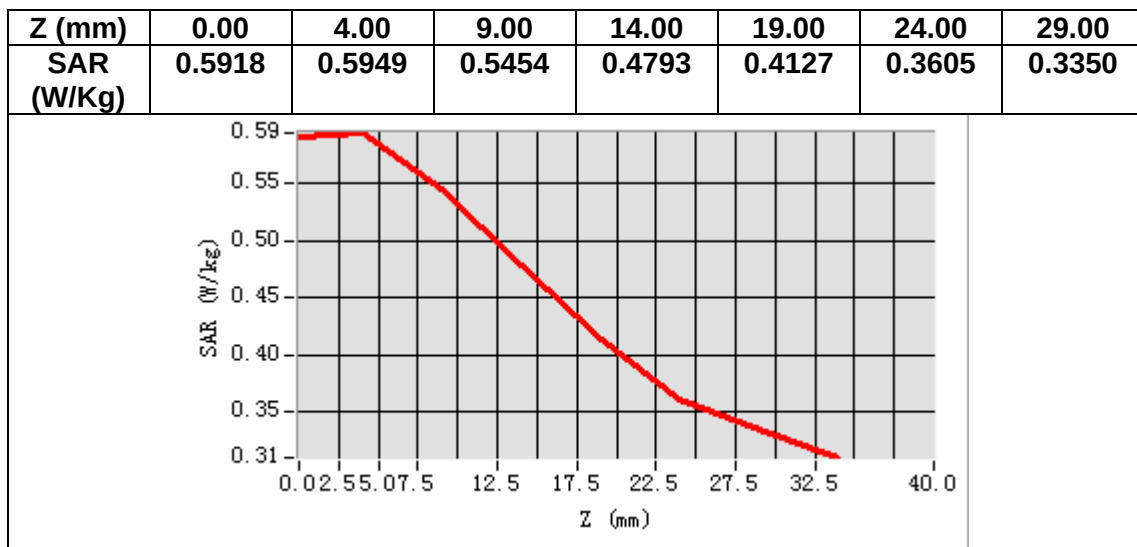
VOLUME SAR



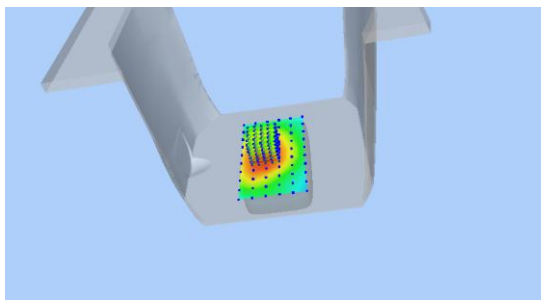
Maximum location: X=-11.00, Y=-1.00

SAR Peak: 0.61 W/kg

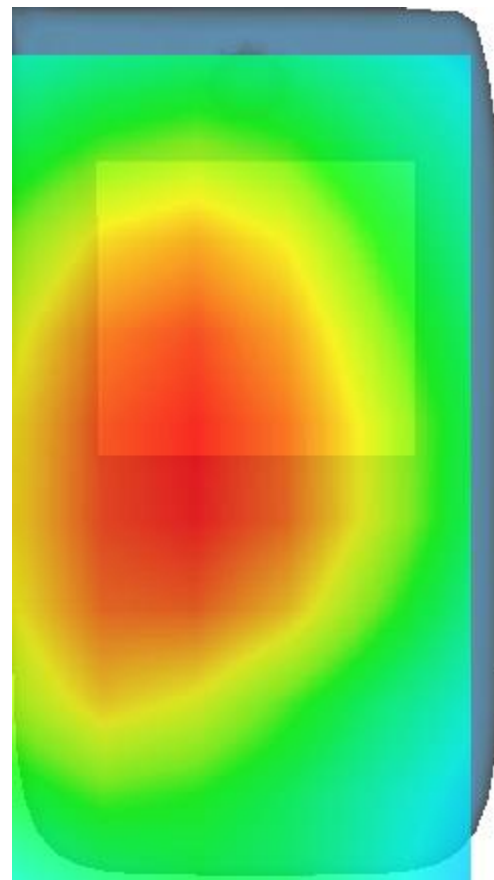
SAR 10g (W/Kg)	0.496065
SAR 1g (W/Kg)	0.579502



3D screen shot



Hot spot position



MEASUREMENT 11

Date of measurement: 10/7/2024

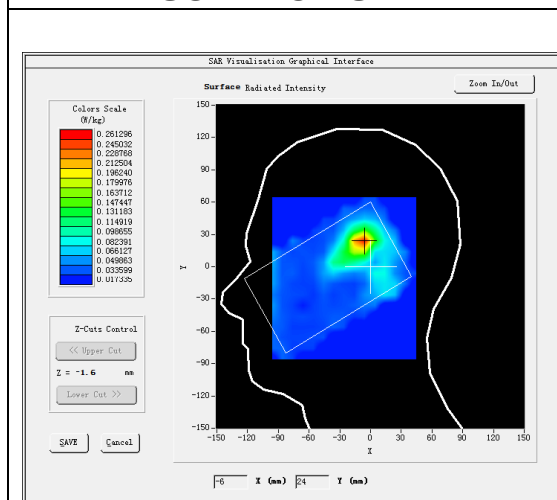
A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>
ConvF	<u>2.07</u>

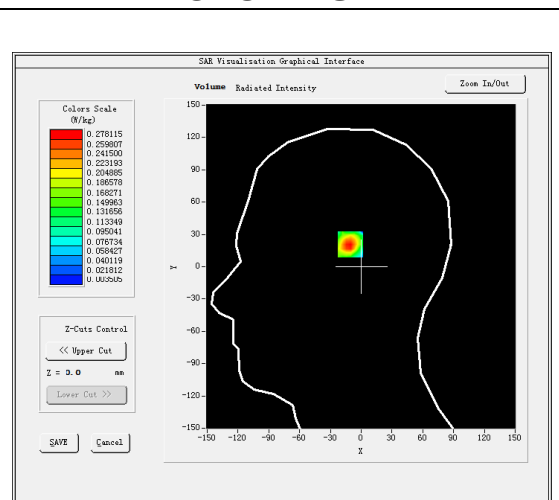
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.578384
Relative permittivity (imaginary part)	15.678512
Conductivity (S/m)	4.529348
Variation (%)	-2.310000

SURFACE SAR



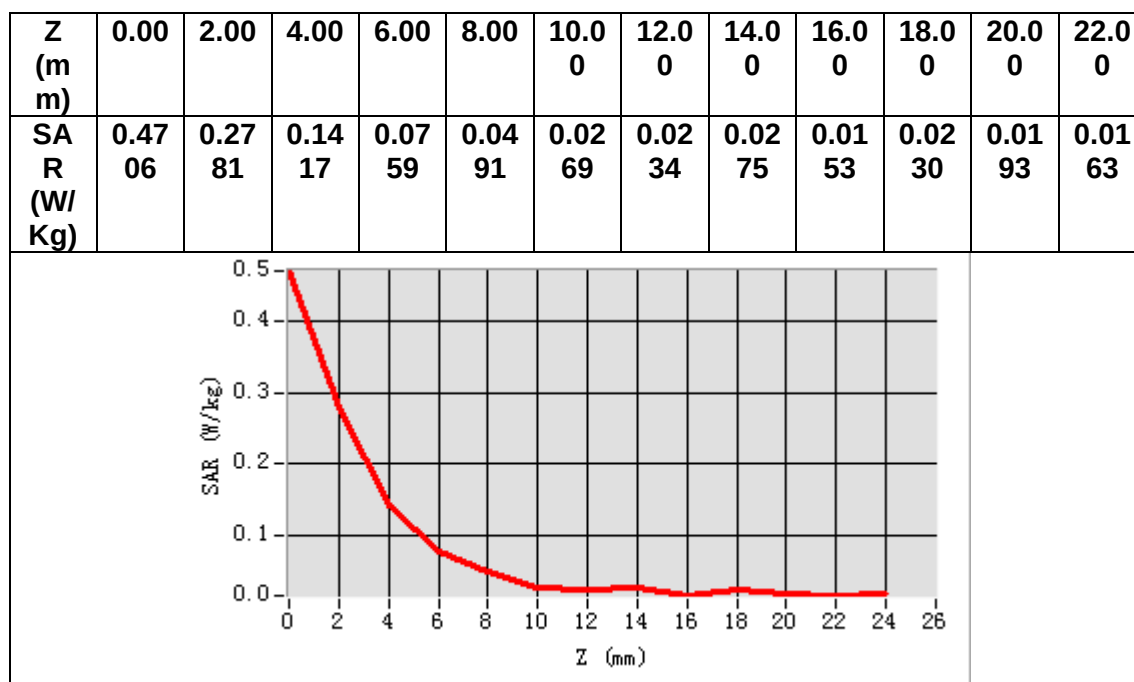
VOLUME SAR



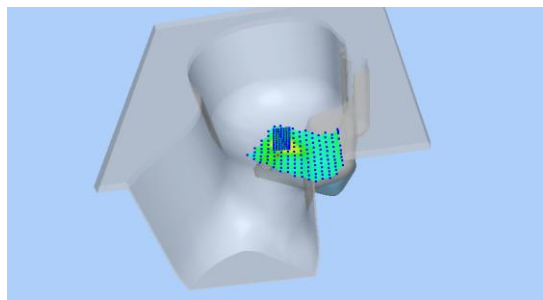
Maximum location: X=-7.00, Y=23.00

SAR Peak: 0.76 W/kg

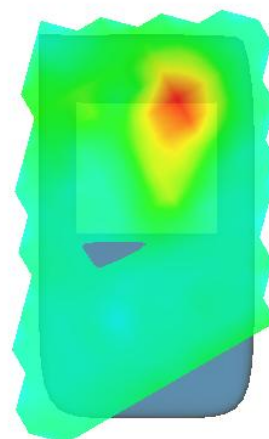
SAR 10g (W/Kg)	0.112438
SAR 1g (W/Kg)	0.281974



3D screen shot



Hot spot position



MEASUREMENT 12

Date of measurement: 11/7/2024

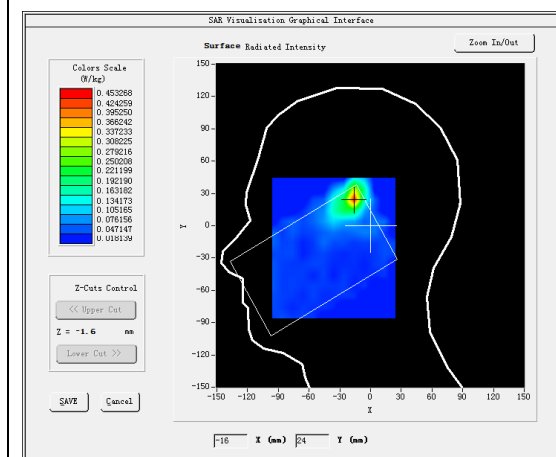
A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>
ConvF	<u>2.04</u>

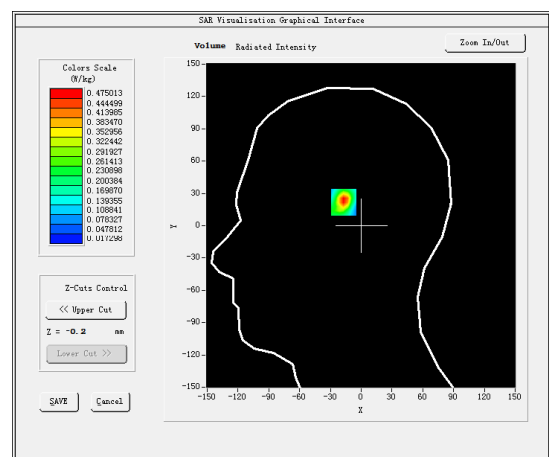
B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	34.085487
Relative permittivity (imaginary part)	15.940840
Conductivity (S/m)	5.123209
Variation (%)	2.930000

SURFACE SAR



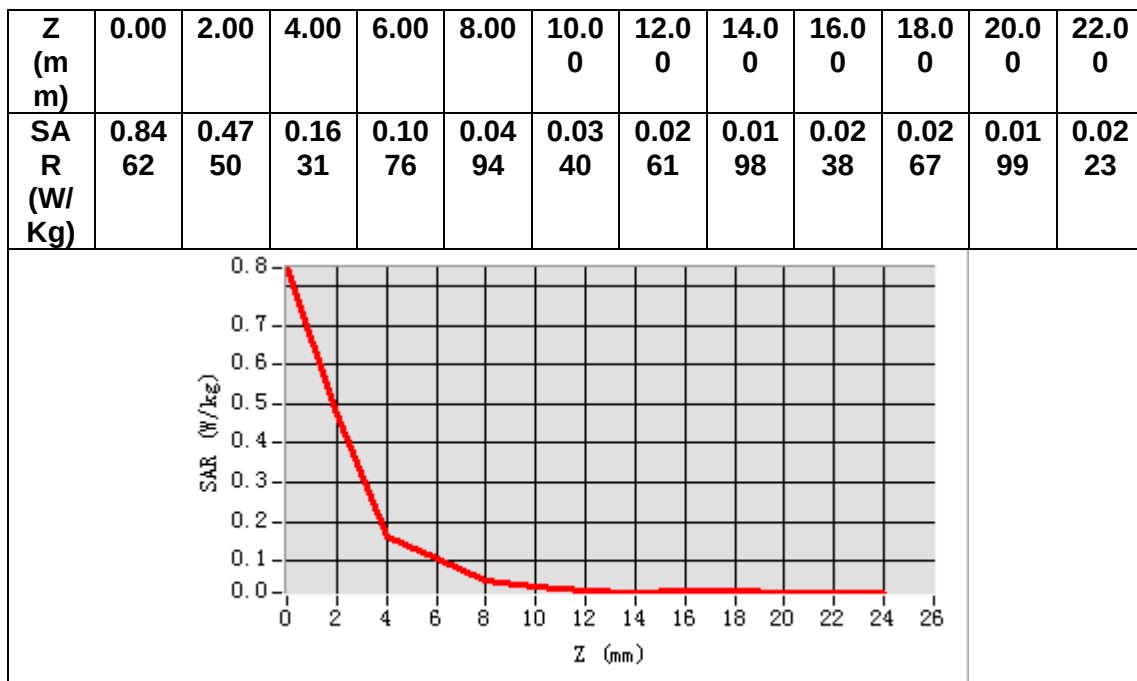
VOLUME SAR



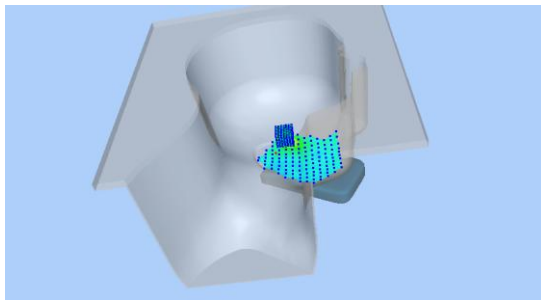
Maximum location: X=-16.00, Y=25.00

SAR Peak: 1.38 W/kg

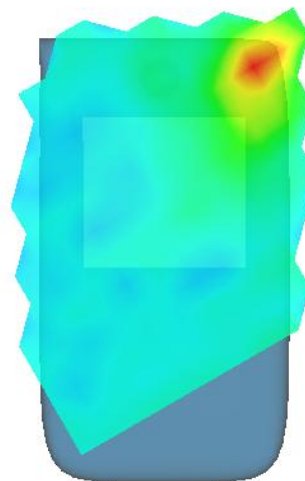
SAR 10g (W/Kg)	0.155713
SAR 1g (W/Kg)	0.463685



3D screen shot



Hot spot position



MEASUREMENT 13

Date of measurement: 10/7/2024

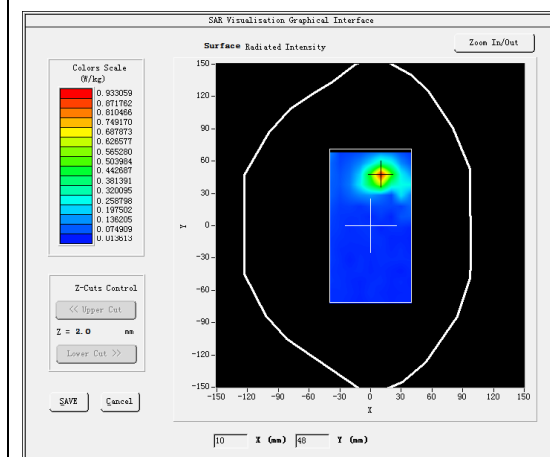
A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>
ConvF	<u>2.07</u>

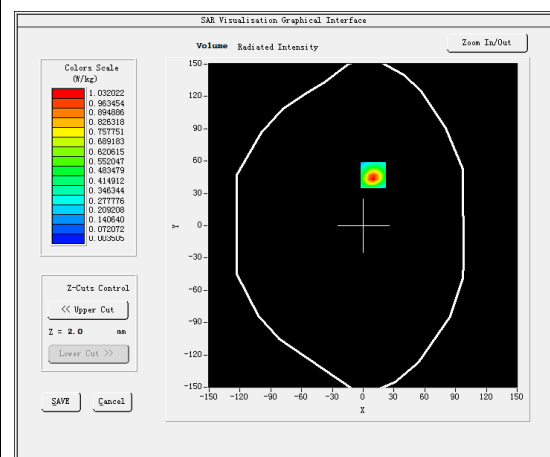
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.578384
Relative permittivity (imaginary part)	15.678512
Conductivity (S/m)	4.529348
Variation (%)	-2.459999

SURFACE SAR



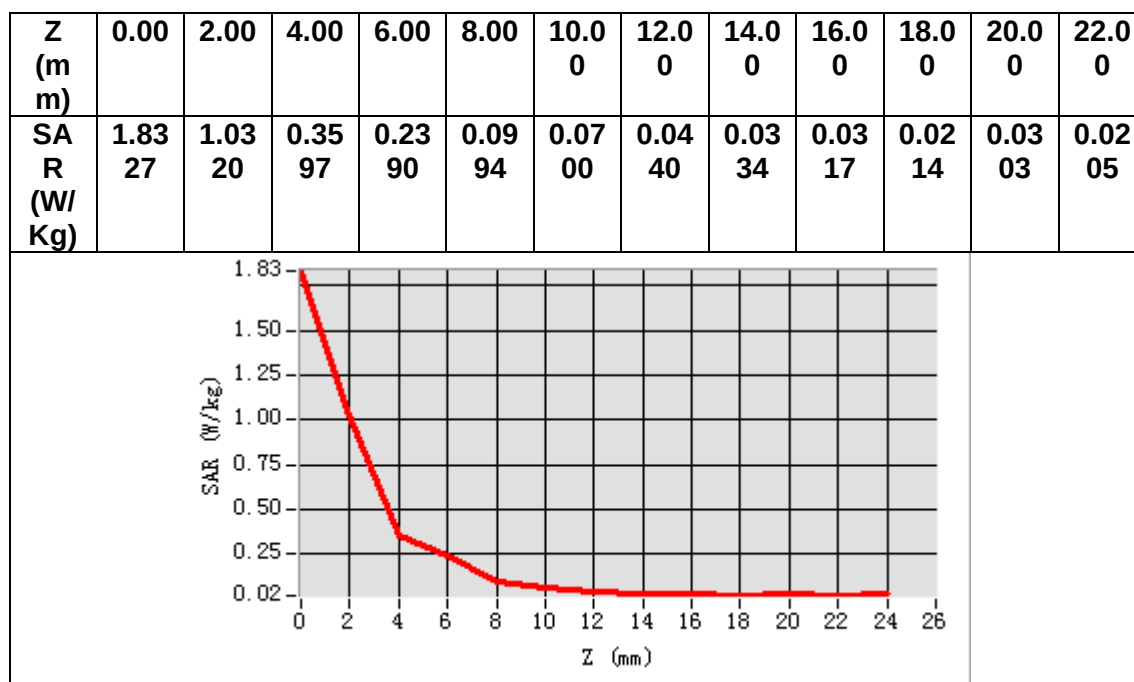
VOLUME SAR



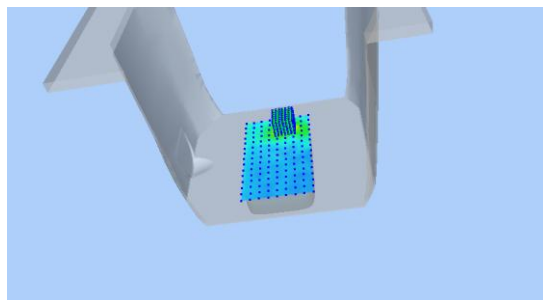
Maximum location: X=10.00, Y=47.00

SAR Peak: 1.92 W/kg

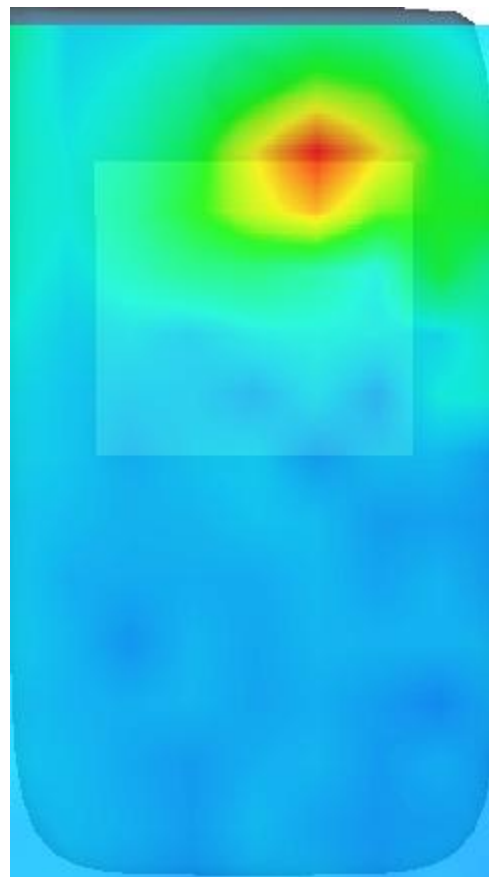
SAR 10g (W/Kg)	0.197334
SAR 1g (W/Kg)	0.569428



3D screen shot



Hot spot position



MEASUREMENT 14

Date of measurement: 11/7/2024

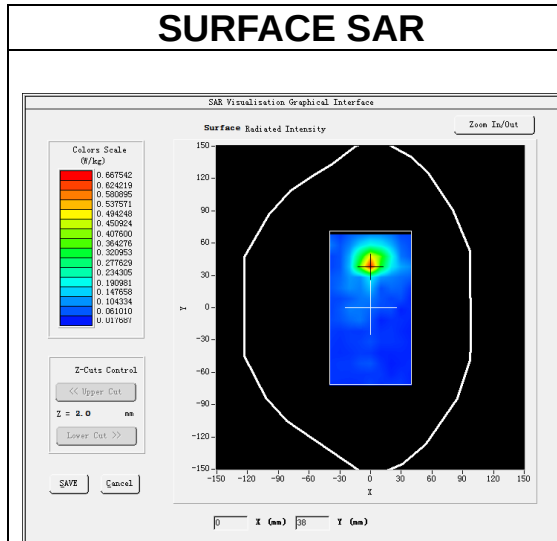
A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>
ConvF	<u>2.04</u>

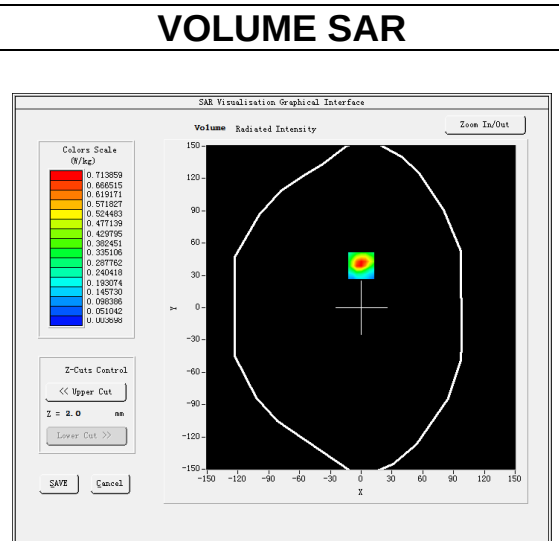
B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	34.085487
Relative permittivity (imaginary part)	15.940840
Conductivity (S/m)	5.123209
Variation (%)	-0.960000

SURFACE SAR



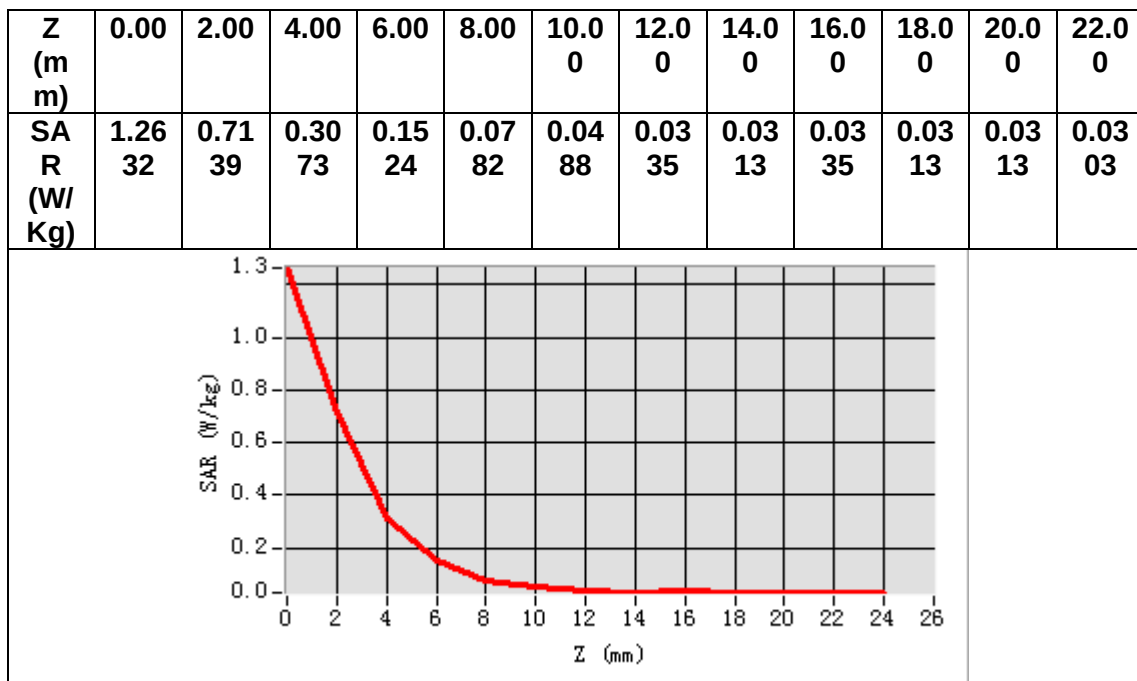
VOLUME SAR



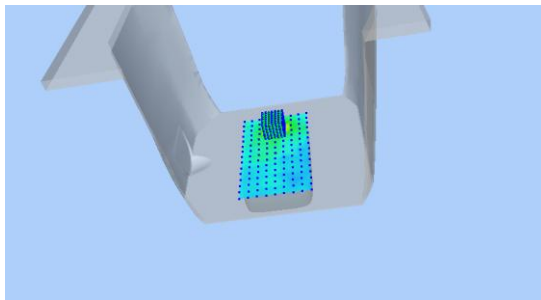
Maximum location: X=0.00, Y=39.00

SAR Peak: 1.41 W/kg

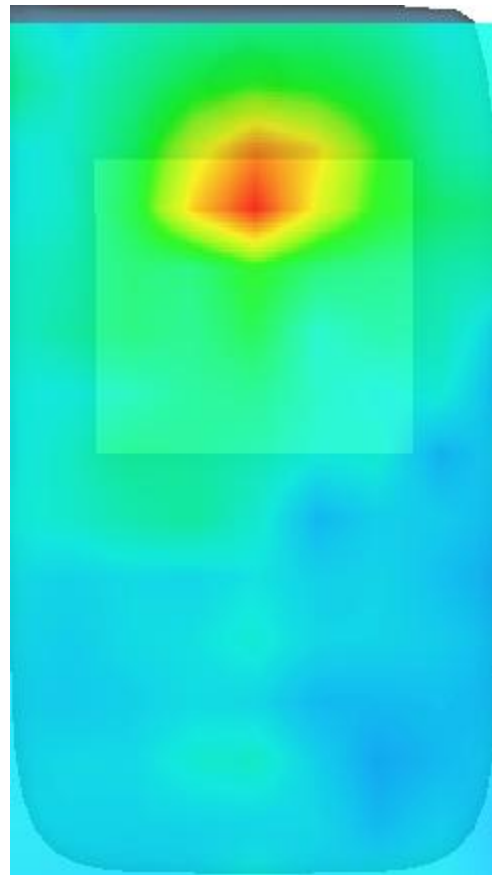
SAR 10g (W/Kg)	0.146162
SAR 1g (W/Kg)	0.404408



3D screen shot



Hot spot position



MEASUREMENT 15

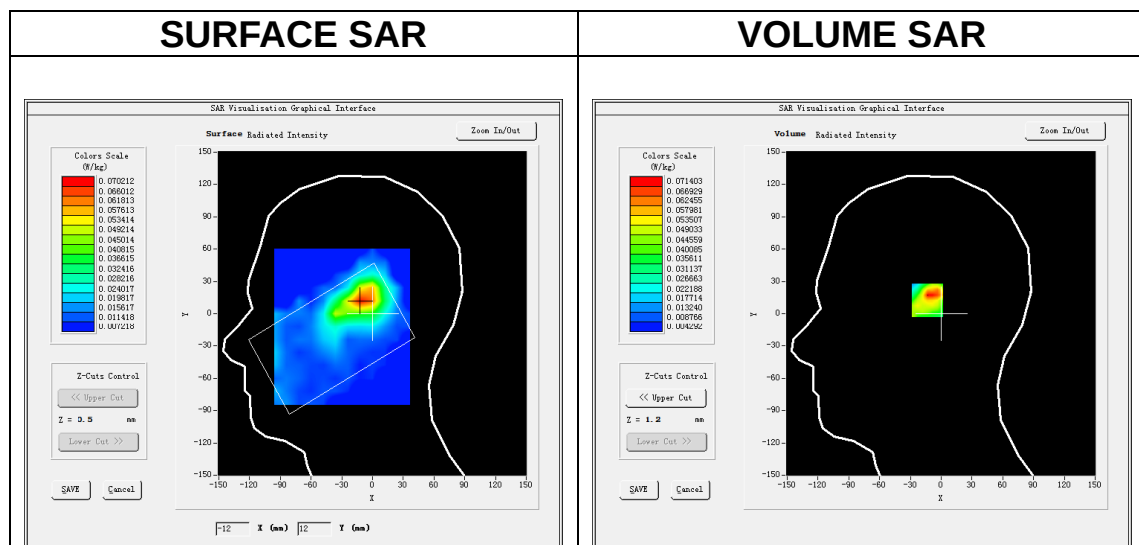
Date of measurement: 18/7/2024

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11b (Crest factor: 1.0)</u>
ConvF	<u>2.85</u>

B. SAR Measurement Results

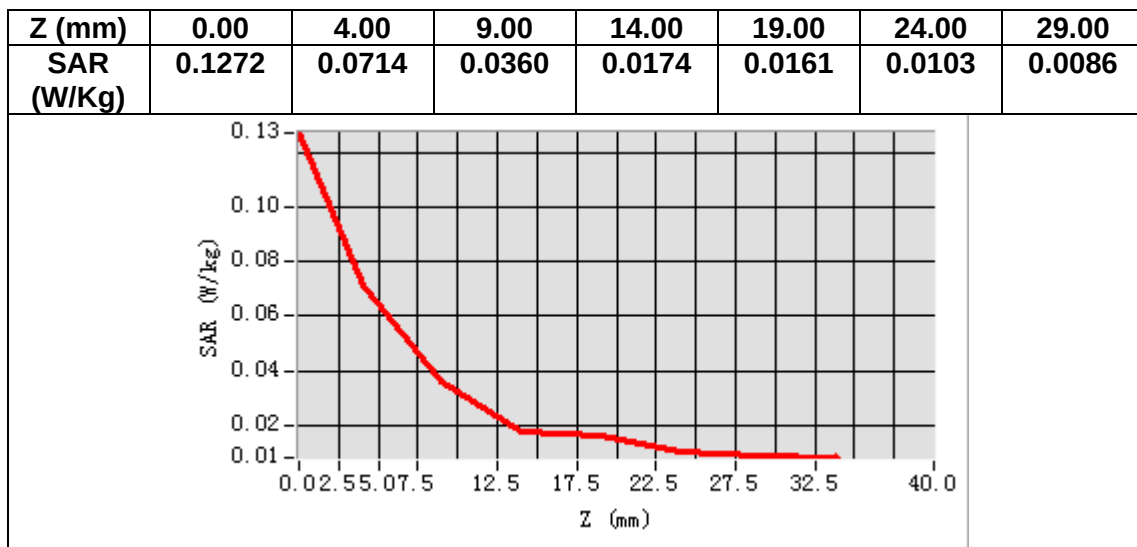
Frequency (MHz)	2437.000000
Relative permittivity (real part)	37.843567
Relative permittivity (imaginary part)	12.946621
Conductivity (S/m)	1.752829
Variation (%)	1.270000



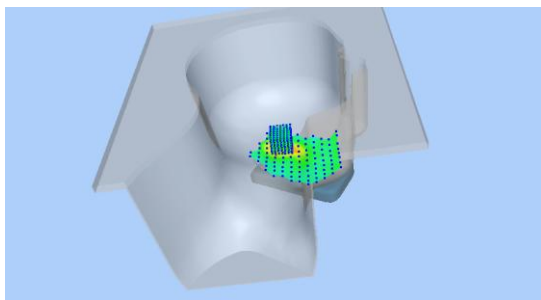
Maximum location: X=-11.00, Y=13.00

SAR Peak: 0.14 W/kg

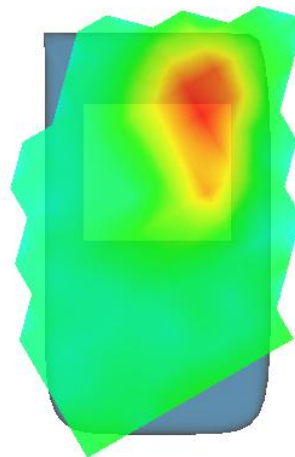
SAR 10g (W/Kg)	0.035028
SAR 1g (W/Kg)	0.067374



3D screen shot



Hot spot position



MEASUREMENT 16

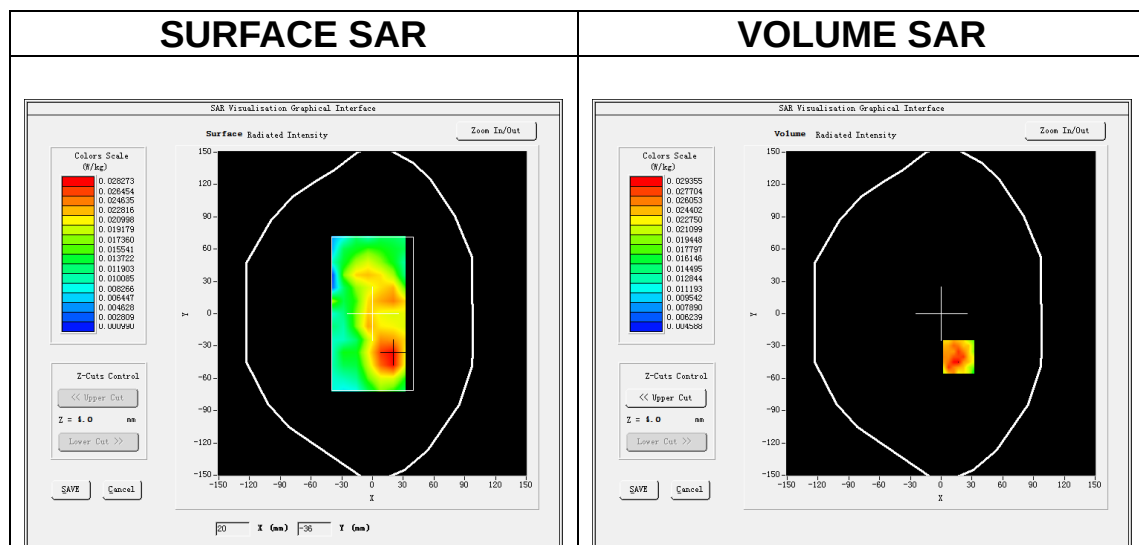
Date of measurement: 18/7/2024

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11b (Crest factor: 1.0)</u>
ConvF	<u>2.85</u>

B. SAR Measurement Results

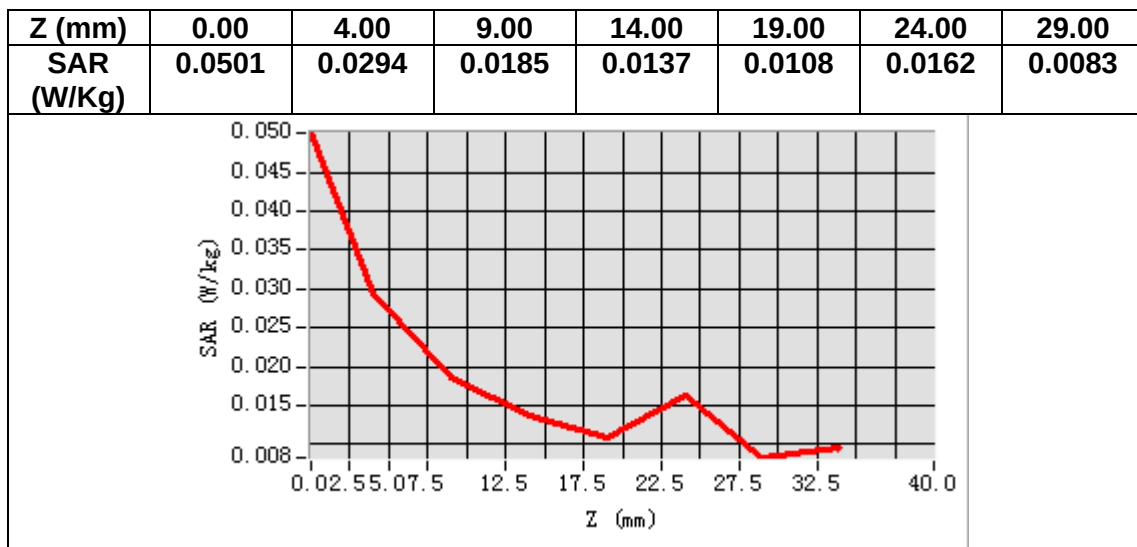
Frequency (MHz)	2437.000000
Relative permittivity (real part)	37.843567
Relative permittivity (imaginary part)	12.946621
Conductivity (S/m)	1.752829
Variation (%)	4.270000



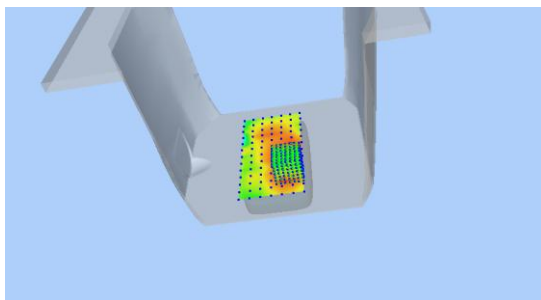
Maximum location: X=17.00, Y=-40.00

SAR Peak: 0.05 W/kg

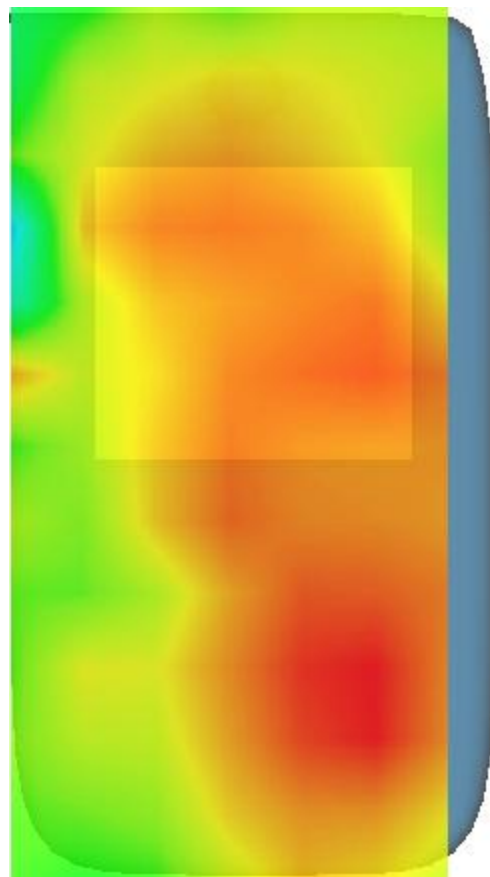
SAR 10g (W/Kg)	0.018878
SAR 1g (W/Kg)	0.027544



3D screen shot



Hot spot position



MEASUREMENT 17

Date of measurement: 8/7/2024

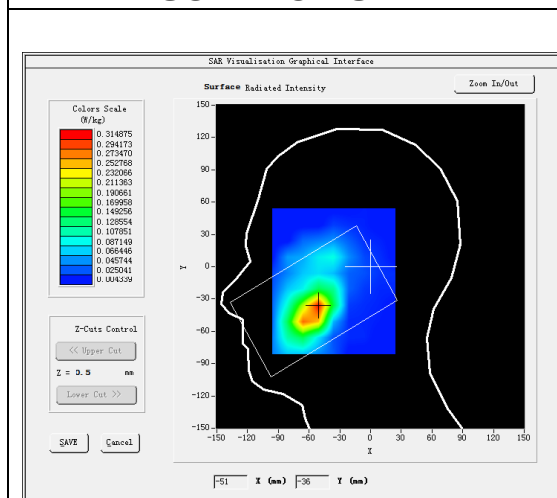
A. Experimental conditions.

<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>
<u>ConvF</u>	<u>2.63</u>

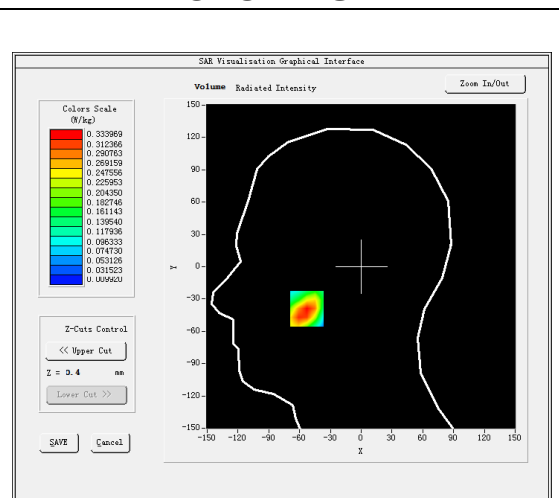
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	2.740000

SURFACE SAR



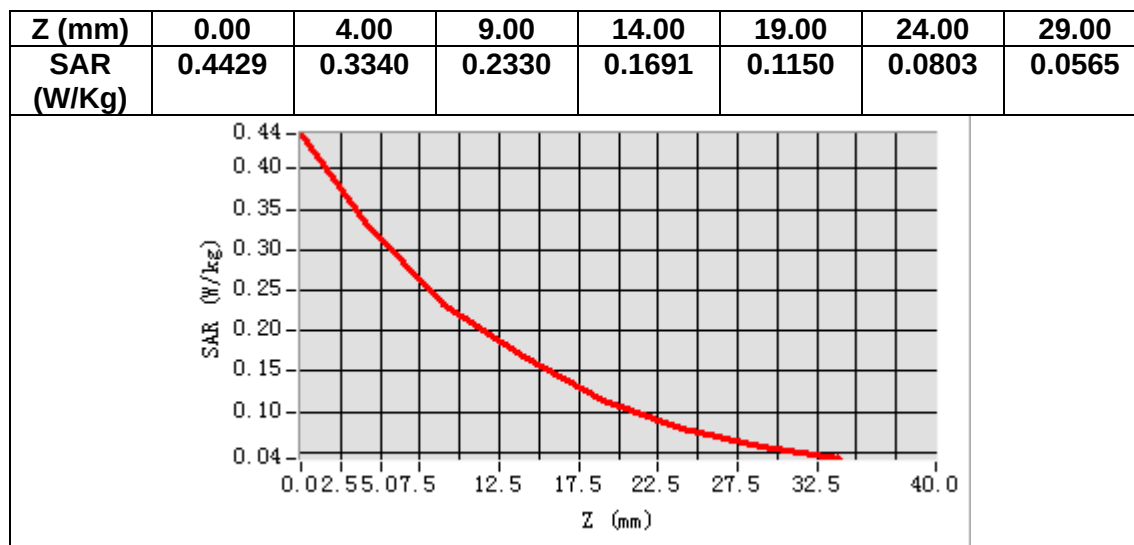
VOLUME SAR



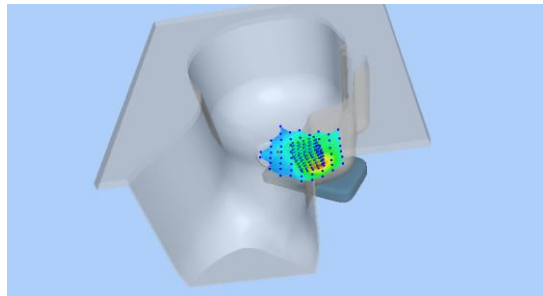
Maximum location: X=-53.00, Y=-39.00

SAR Peak: 0.47 W/kg

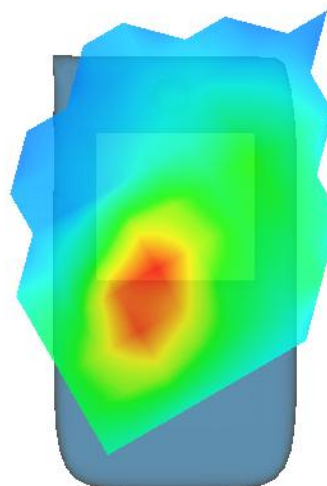
SAR 10g (W/Kg)	0.197117
SAR 1g (W/Kg)	0.330401



3D screen shot



Hot spot position



MEASUREMENT 18

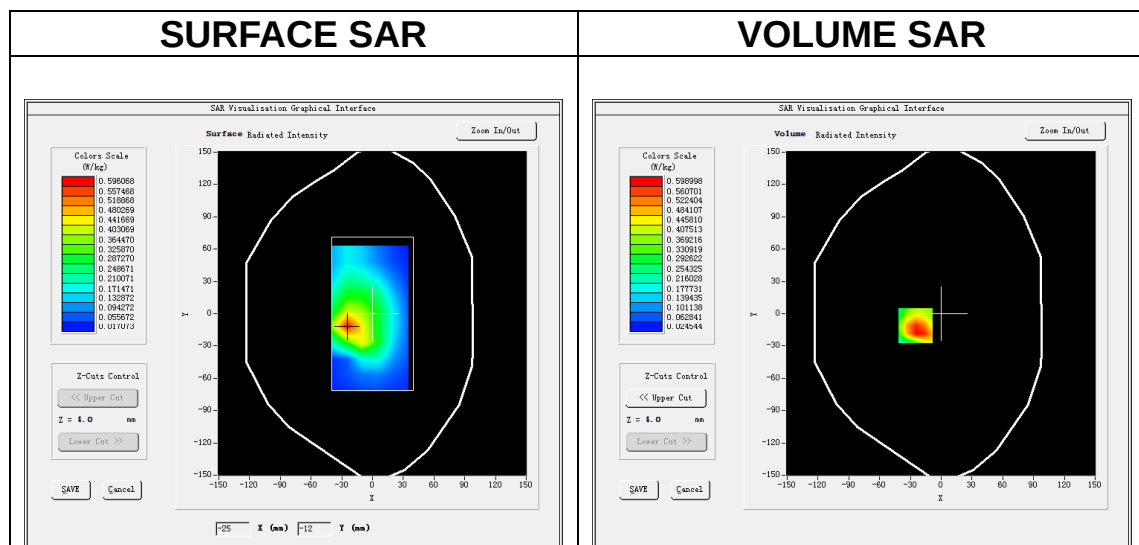
Date of measurement: 8/7/2024

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>
<u>ConvF</u>	<u>2.63</u>

B. SAR Measurement Results

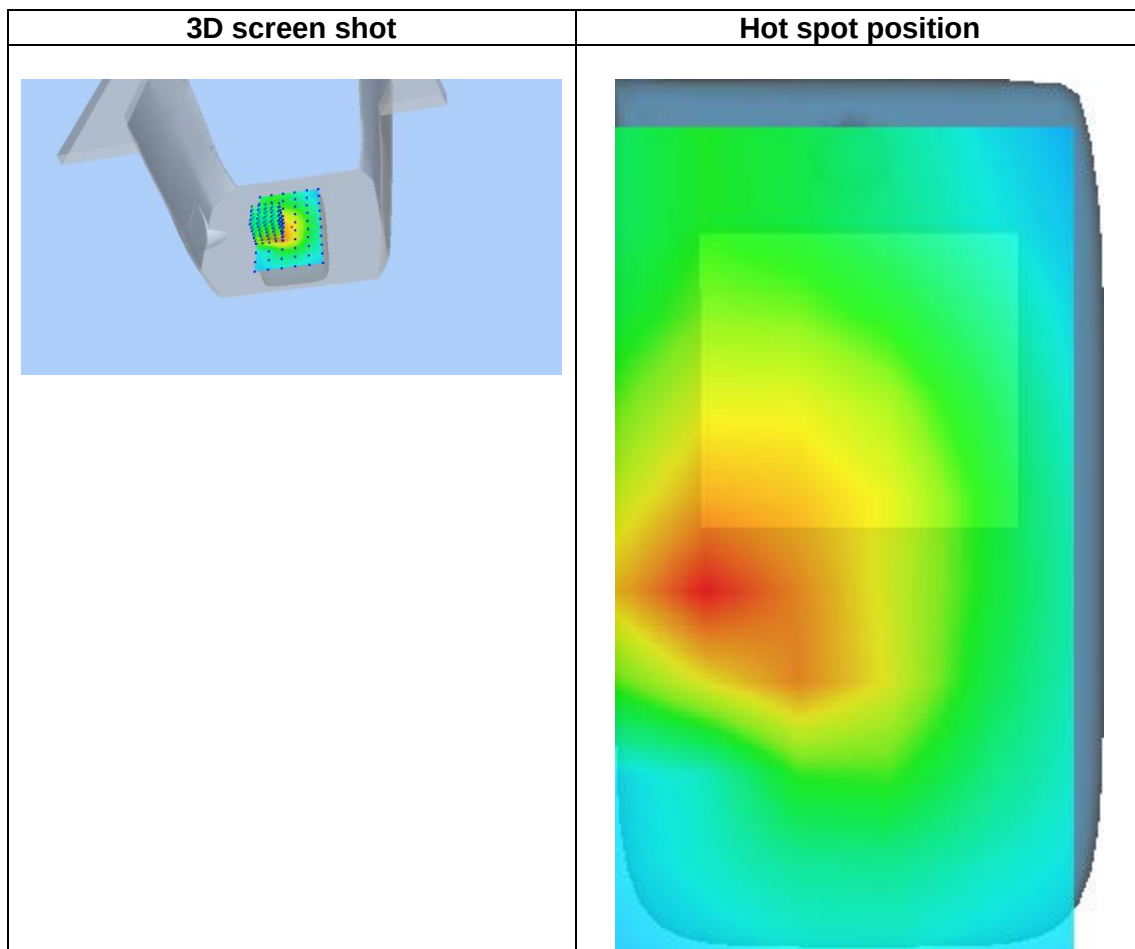
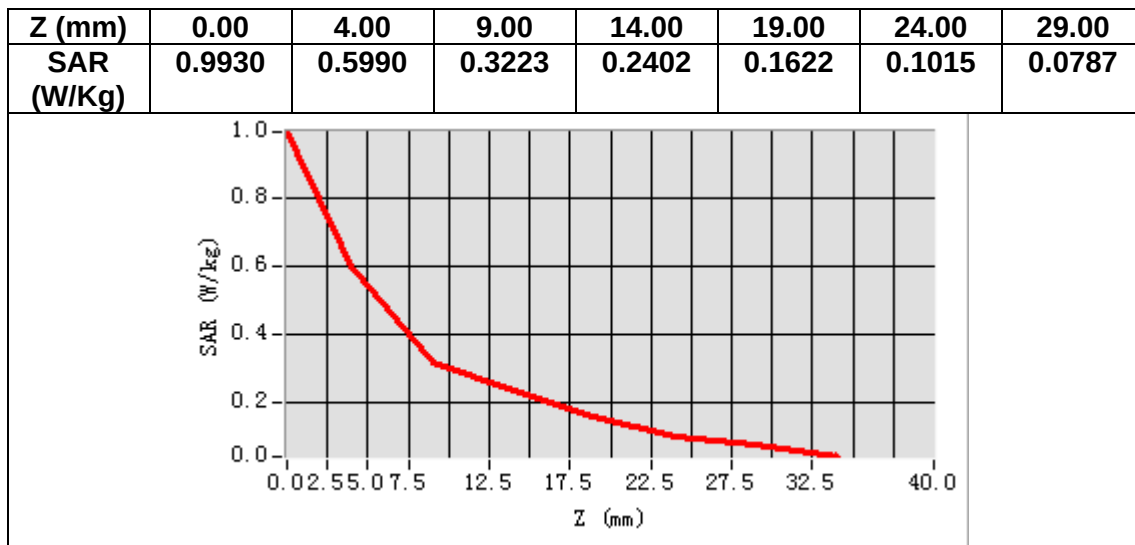
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-0.480000



Maximum location: X=-25.00, Y=-11.00

SAR Peak: 0.91 W/kg

SAR 10g (W/Kg)	0.347362
SAR 1g (W/Kg)	0.603603



MEASUREMENT 19

Date of measurement: 9/7/2024

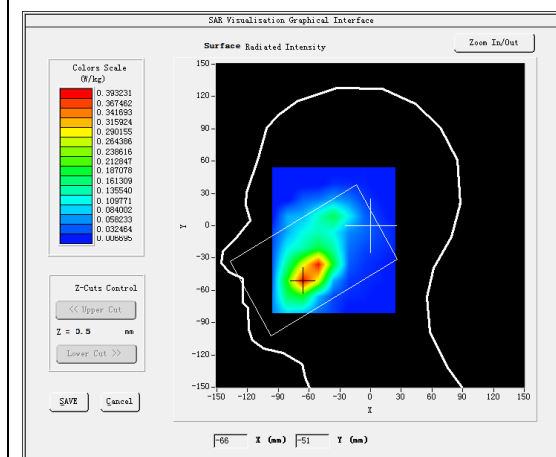
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 4</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.45</u>

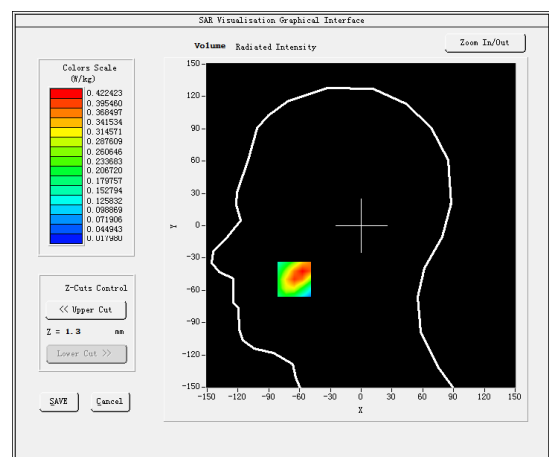
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.397781
Relative permittivity (imaginary part)	13.684697
Conductivity (S/m)	1.317152
Variation (%)	3.420000

SURFACE SAR



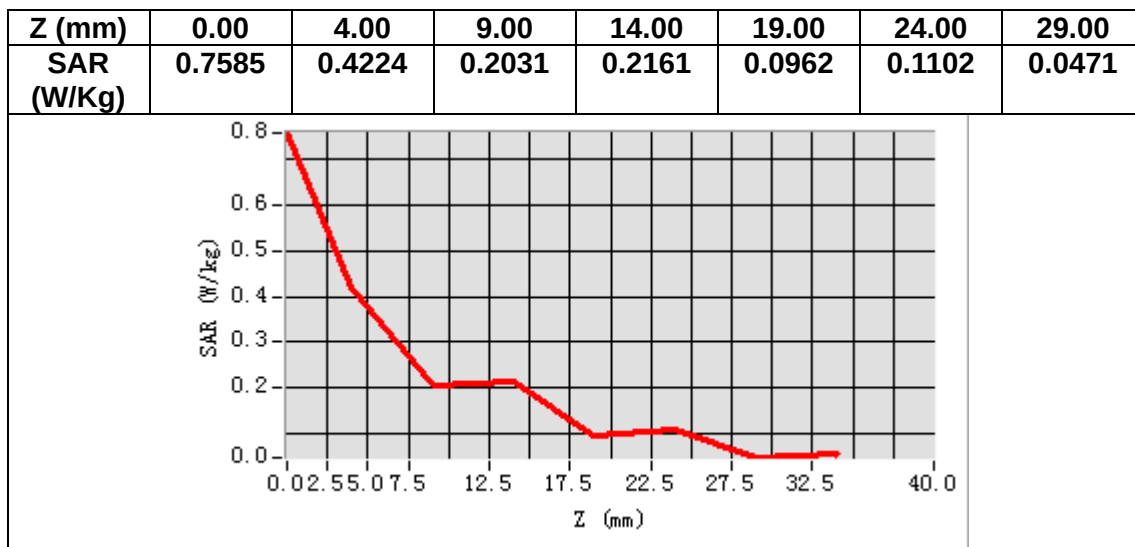
VOLUME SAR



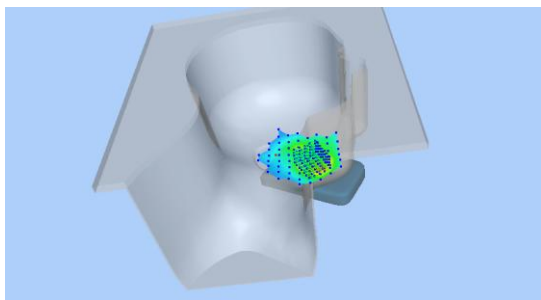
Maximum location: X=-65.00, Y=-50.00

SAR Peak: 0.58 W/kg

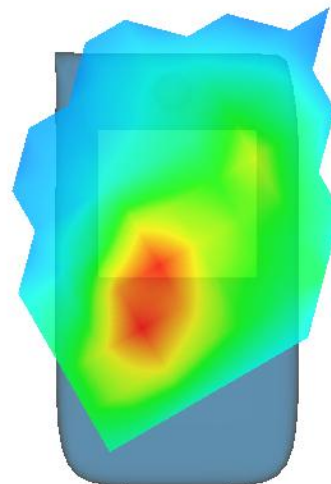
SAR 10g (W/Kg)	0.250214
SAR 1g (W/Kg)	0.398678



3D screen shot



Hot spot position



MEASUREMENT 20

Date of measurement: 9/7/2024

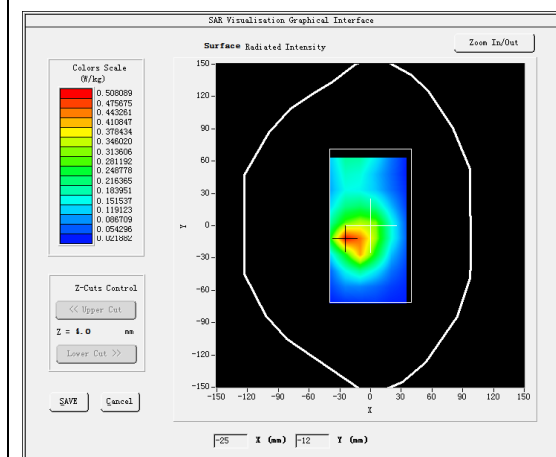
A. Experimental conditions.

<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>
<u>ConvF</u>	<u>2.45</u>

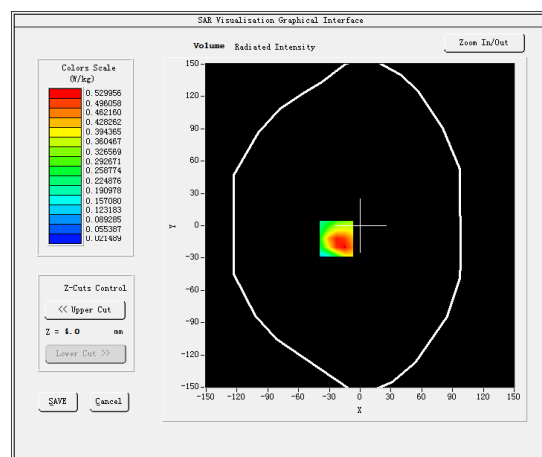
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.397781
Relative permittivity (imaginary part)	13.684697
Conductivity (S/m)	1.317152
Variation (%)	-0.930000

SURFACE SAR



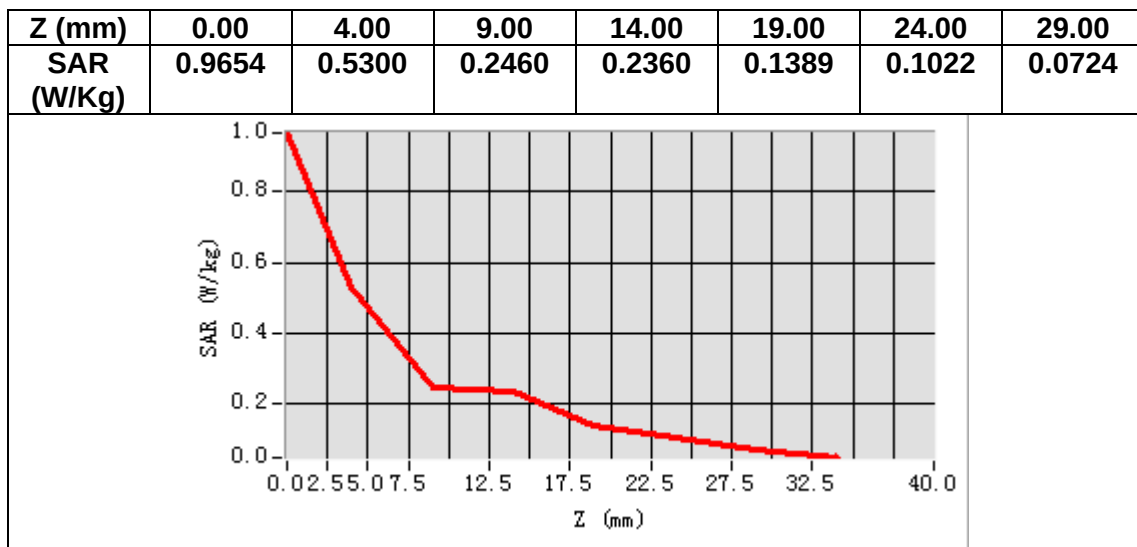
VOLUME SAR



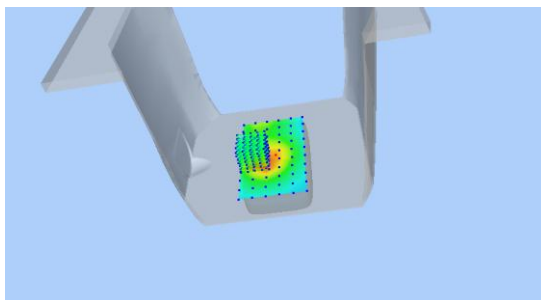
Maximum location: X=-23.00, Y=-12.00

SAR Peak: 0.76 W/kg

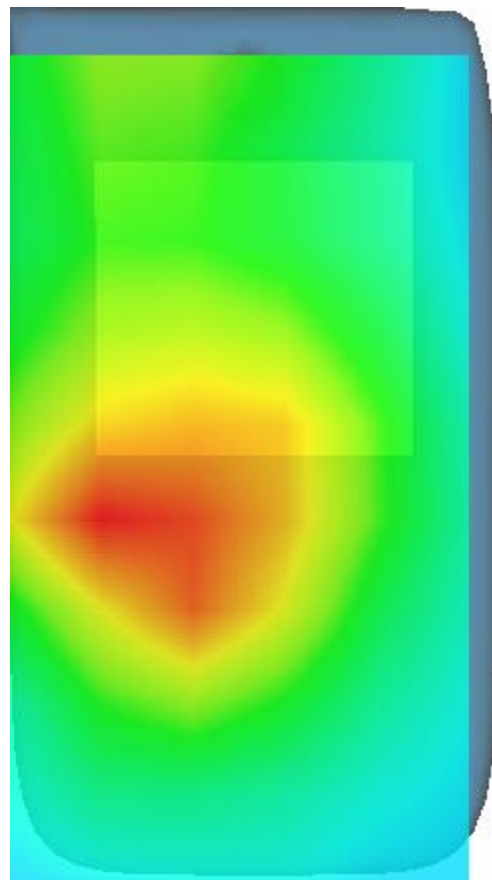
SAR 10g (W/Kg)	0.315522
SAR 1g (W/Kg)	0.517656



3D screen shot



Hot spot position



MEASUREMENT 21

Date of measurement: 7/7/2024

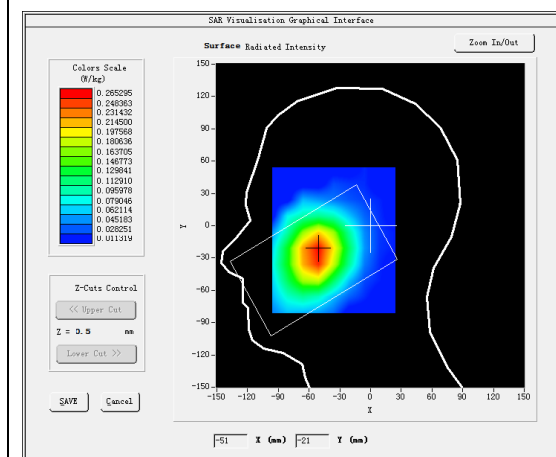
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 5</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.32</u>

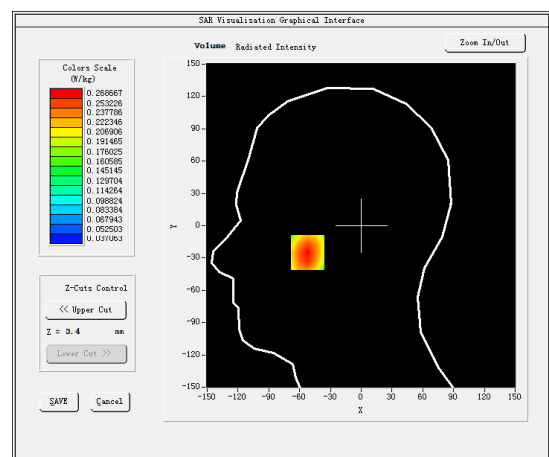
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.524487
Relative permittivity (imaginary part)	19.558945
Conductivity (S/m)	0.908948
Variation (%)	-3.140000

SURFACE SAR



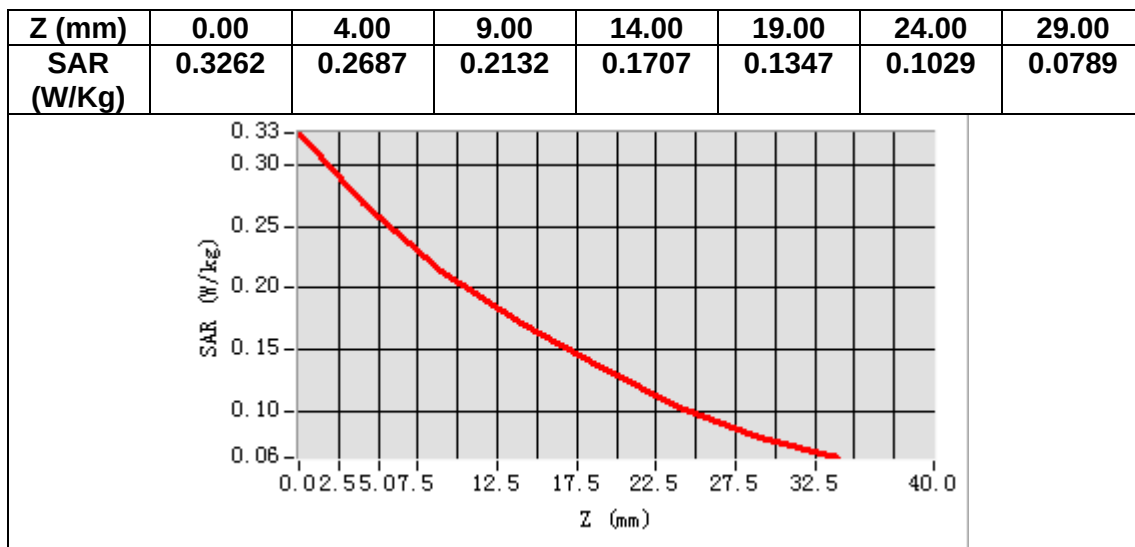
VOLUME SAR



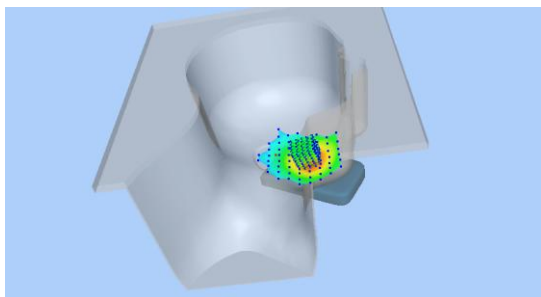
Maximum location: X=-52.00, Y=-25.00

SAR Peak: 0.33 W/kg

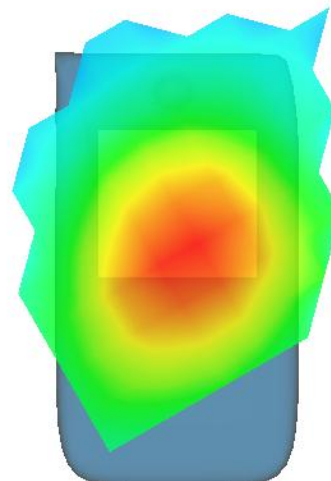
SAR 10g (W/Kg)	0.192452
SAR 1g (W/Kg)	0.261143



3D screen shot



Hot spot position



MEASUREMENT 22

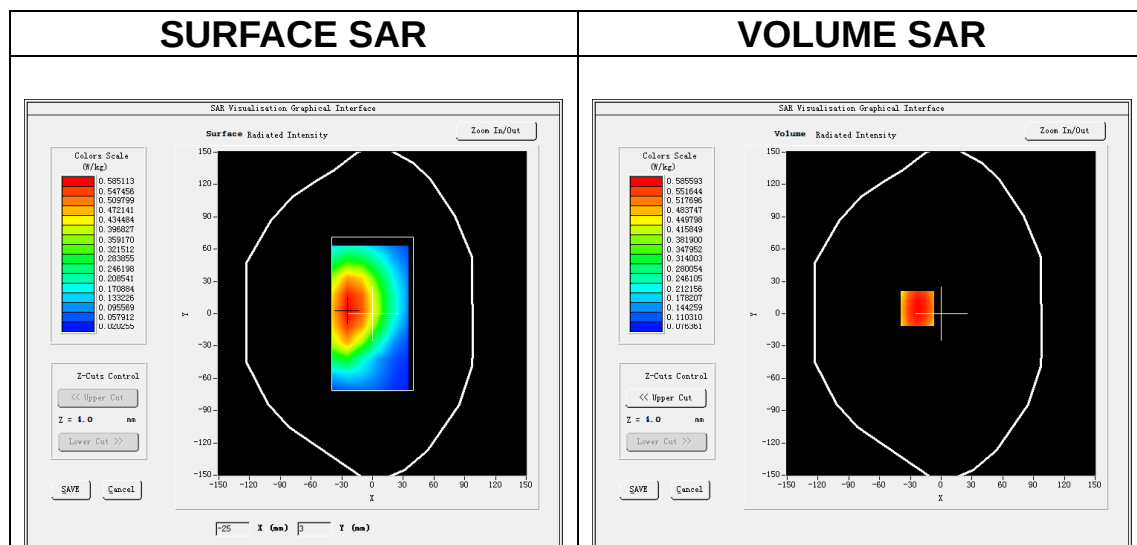
Date of measurement: 7/7/2024

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>
<u>ConvF</u>	<u>2.32</u>

B. SAR Measurement Results

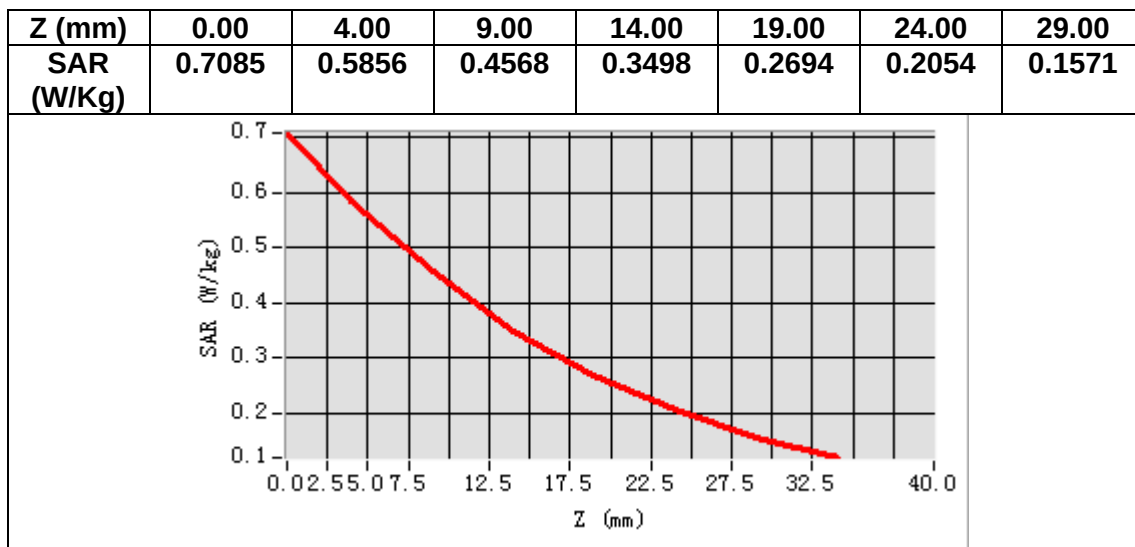
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.524487
Relative permittivity (imaginary part)	19.558945
Conductivity (S/m)	0.908948
Variation (%)	-0.030000



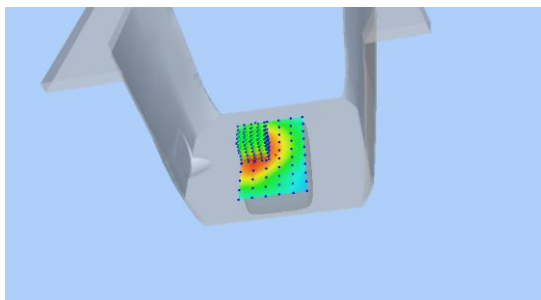
Maximum location: X=-23.00, Y=5.00

SAR Peak: 0.71 W/kg

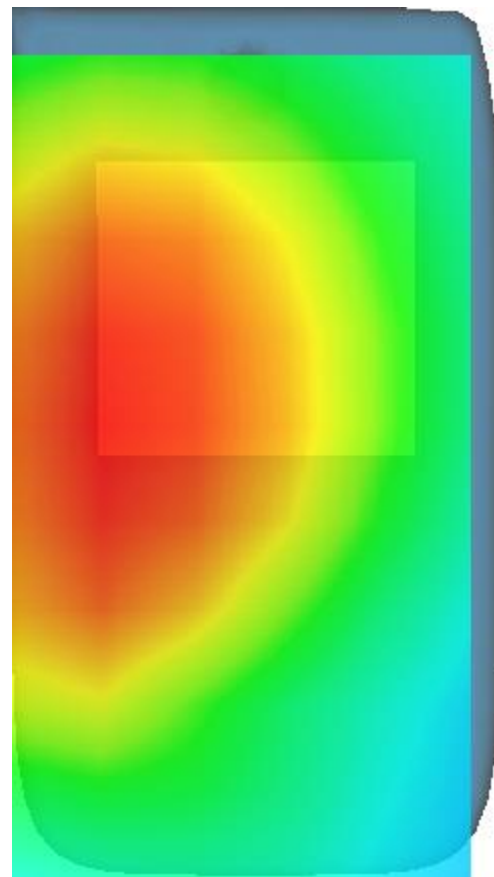
SAR 10g (W/Kg)	0.422950
SAR 1g (W/Kg)	0.569395



3D screen shot



Hot spot position



MEASUREMENT 23

Date of measurement: 19/7/2024

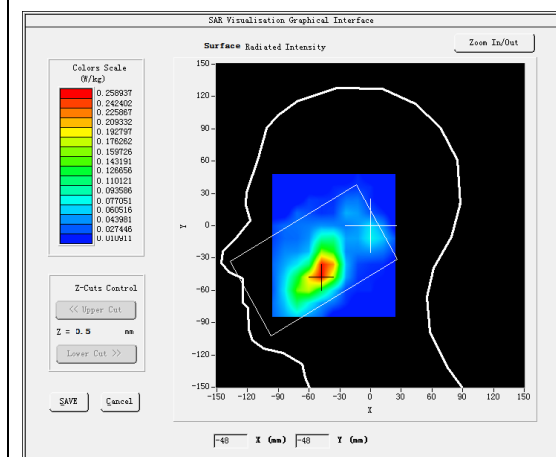
A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 7</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.65</u>

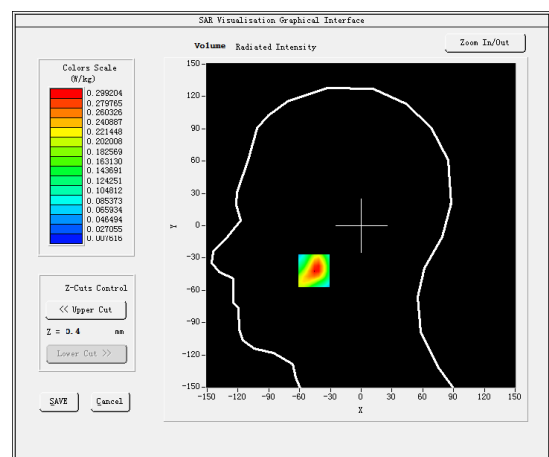
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.461262
Relative permittivity (imaginary part)	13.776830
Conductivity (S/m)	1.940237
Variation (%)	1.480000

SURFACE SAR



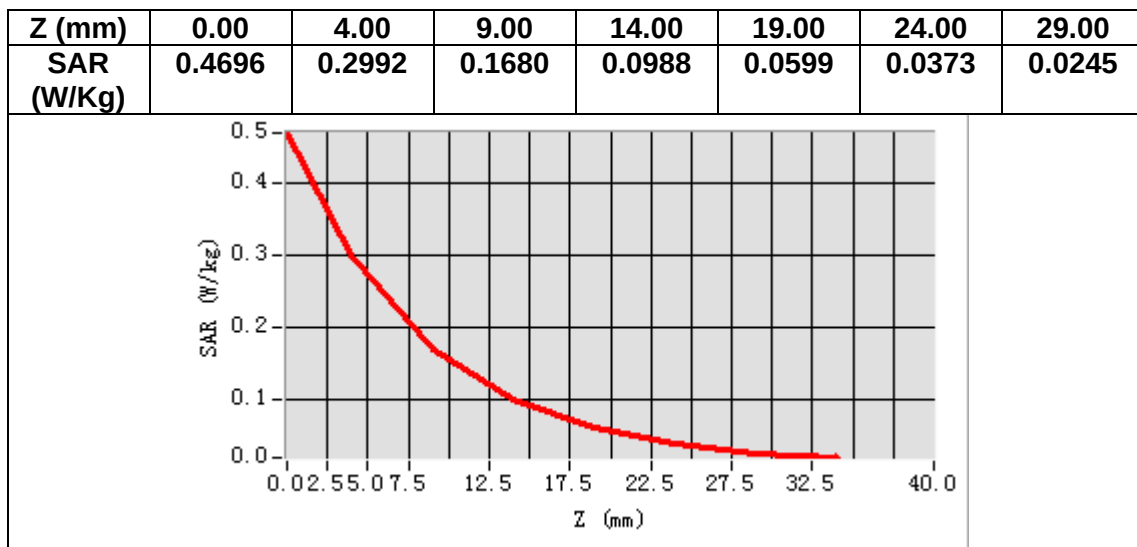
VOLUME SAR



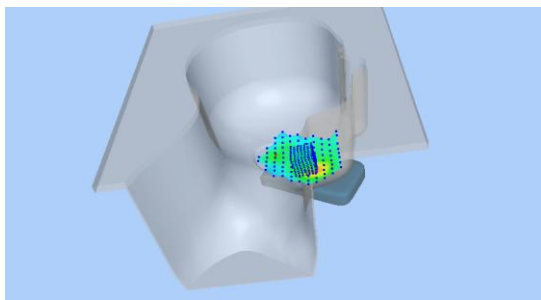
Maximum location: X=-46.00, Y=-42.00

SAR Peak: 0.47 W/kg

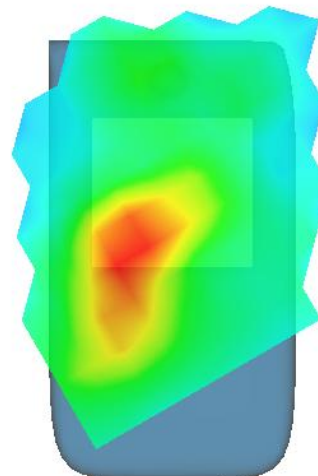
SAR 10g (W/Kg)	0.143928
SAR 1g (W/Kg)	0.284001



3D screen shot



Hot spot position



MEASUREMENT 24

Date of measurement: 19/7/2024

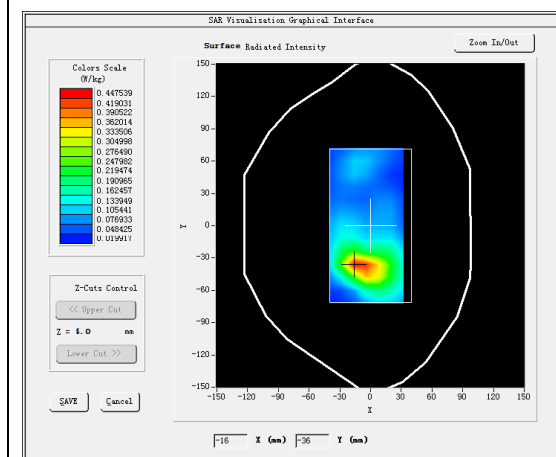
A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 7</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.65</u>

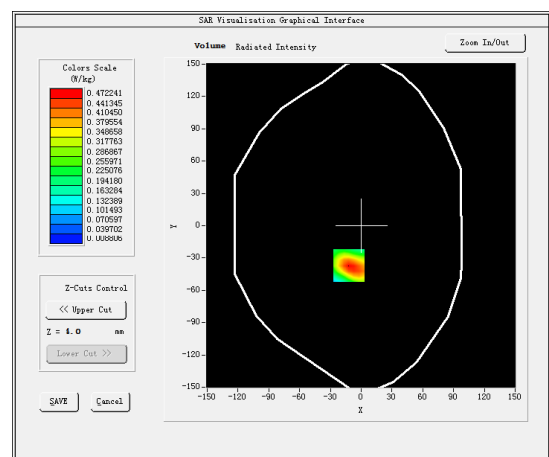
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.461262
Relative permittivity (imaginary part)	13.776830
Conductivity (S/m)	1.940237
Variation (%)	-3.460000

SURFACE SAR



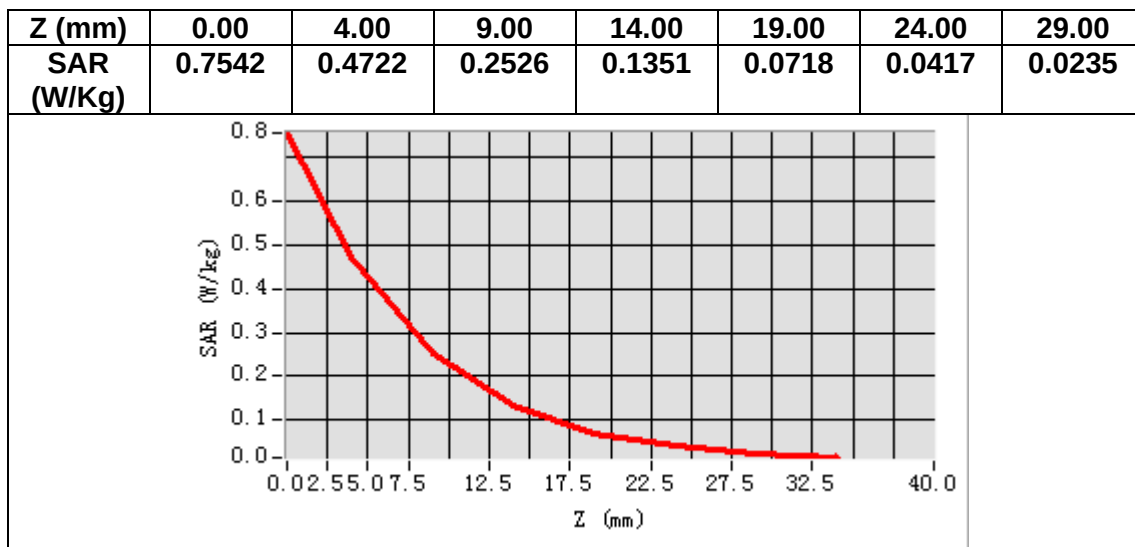
VOLUME SAR



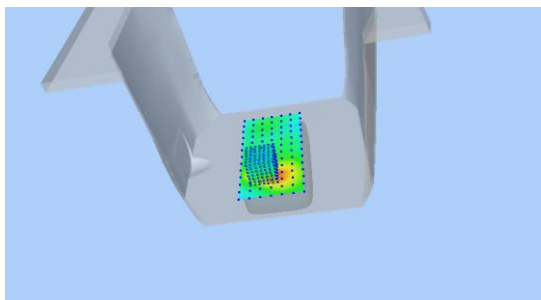
Maximum location: X=-12.00, Y=-37.00

SAR Peak: 0.75 W/kg

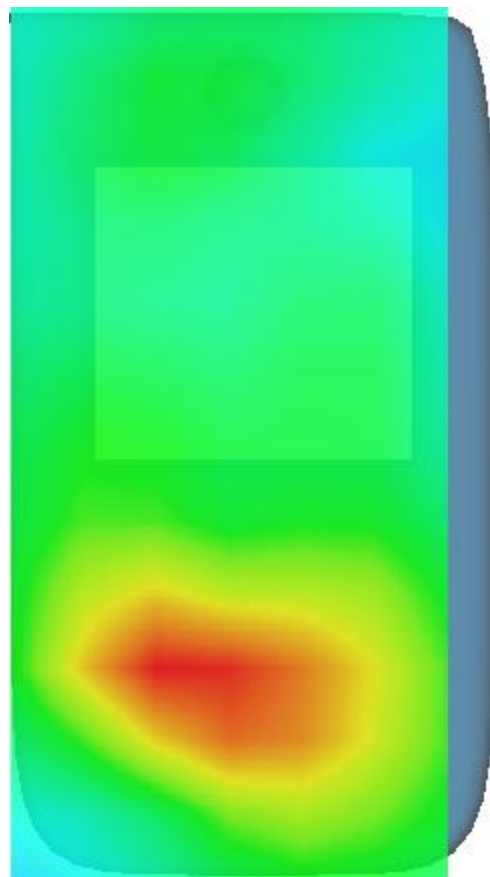
SAR 10g (W/Kg)	0.226622
SAR 1g (W/Kg)	0.442211



3D screen shot



Hot spot position



MEASUREMENT 25

Date of measurement: 14/7/2024

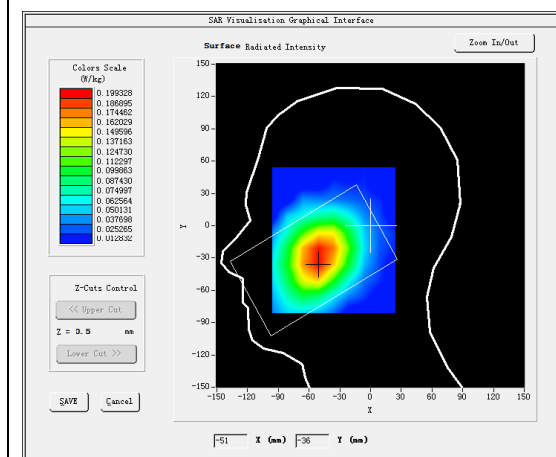
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 12</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.37</u>

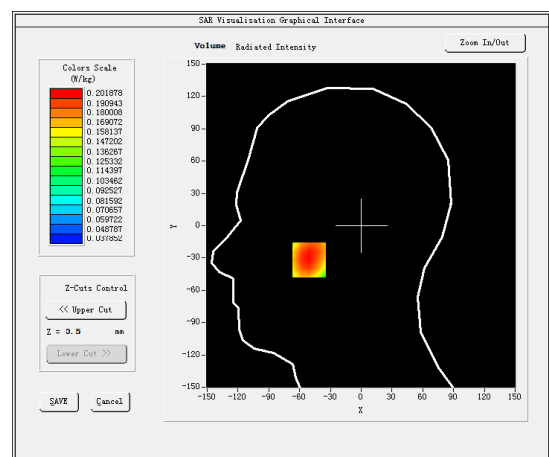
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	41.264652
Relative permittivity (imaginary part)	21.977755
Conductivity (S/m)	0.863848
Variation (%)	-0.130000

SURFACE SAR



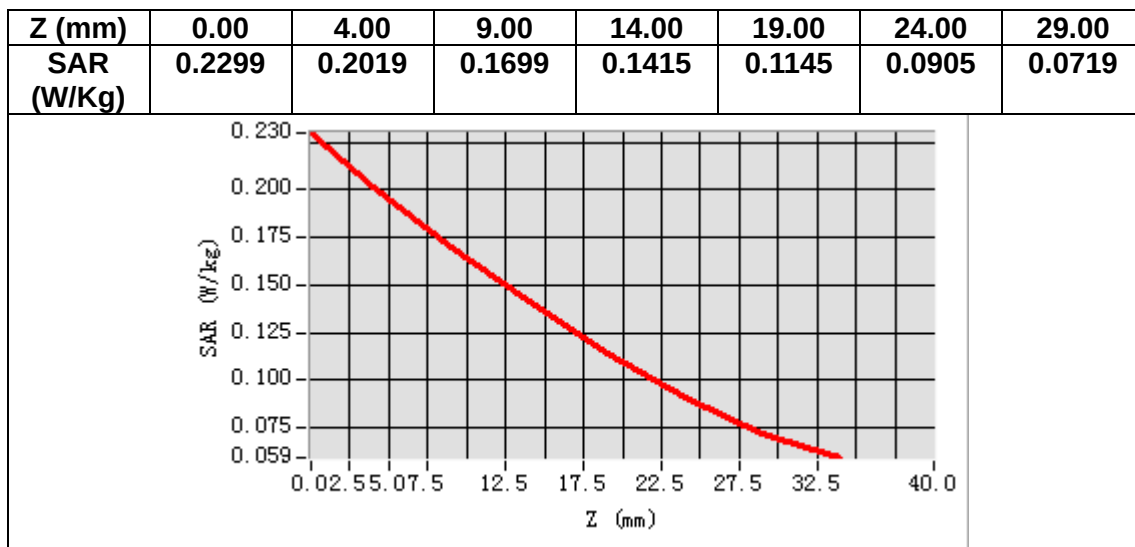
VOLUME SAR



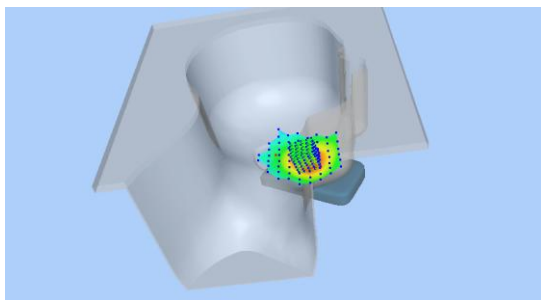
Maximum location: X=-51.00, Y=-32.00

SAR Peak: 0.23 W/kg

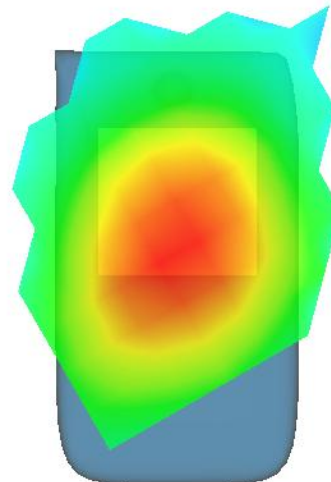
SAR 10g (W/Kg)	0.155101
SAR 1g (W/Kg)	0.197490



3D screen shot



Hot spot position



MEASUREMENT 26

Date of measurement: 14/7/2024

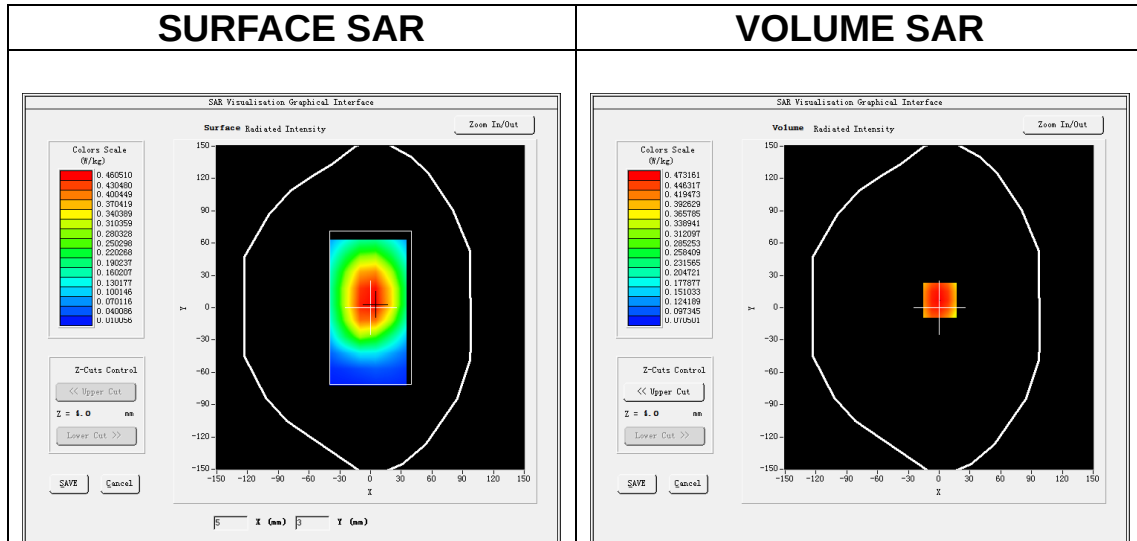
A. Experimental conditions.

<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>
<u>ConvF</u>	<u>2.37</u>

B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	41.264652
Relative permittivity (imaginary part)	21.977755
Conductivity (S/m)	0.863848
Variation (%)	-0.020000

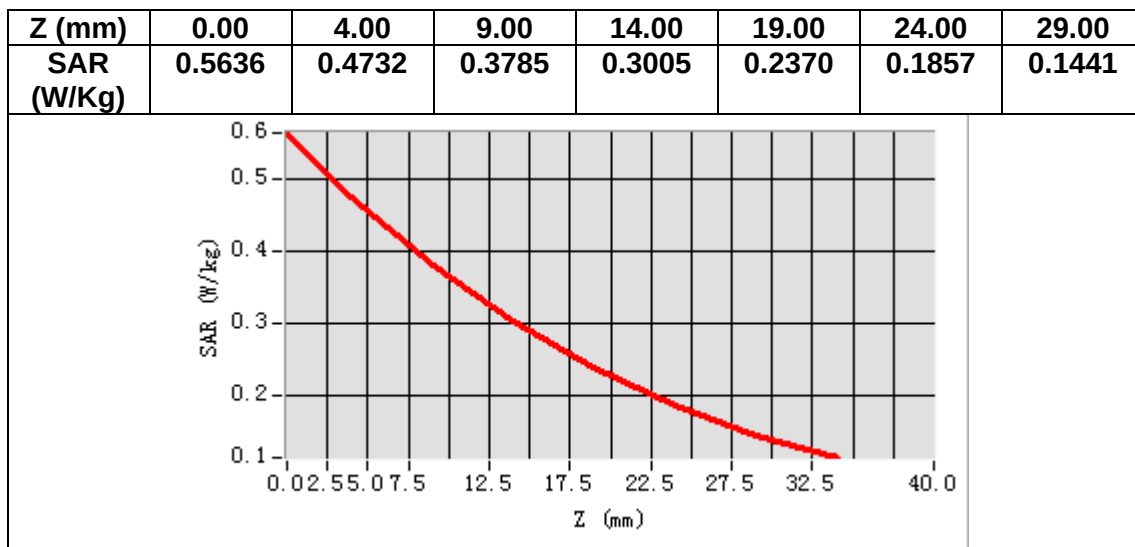
SURFACE SAR



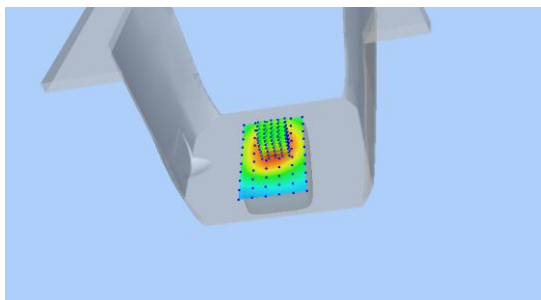
Maximum location: X=1.00, Y=7.00

SAR Peak: 0.57 W/kg

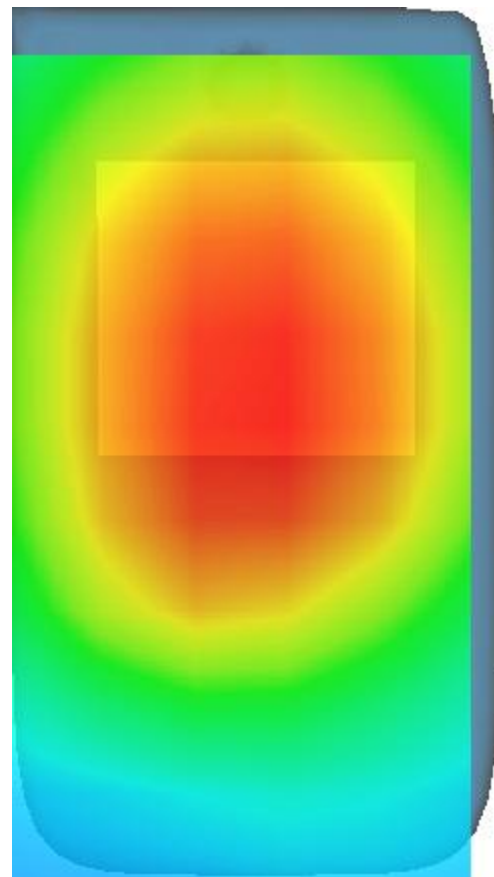
SAR 10g (W/Kg)	0.350851
SAR 1g (W/Kg)	0.459904



3D screen shot



Hot spot position



MEASUREMENT 27

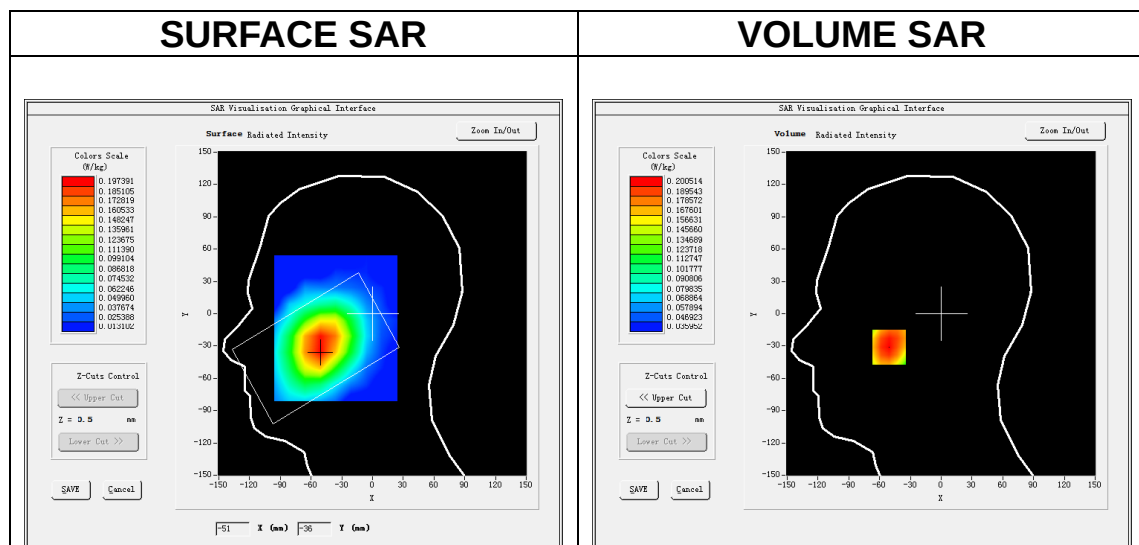
Date of measurement: 14/7/2024

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>
<u>ConvF</u>	<u>2.37</u>

B. SAR Measurement Results

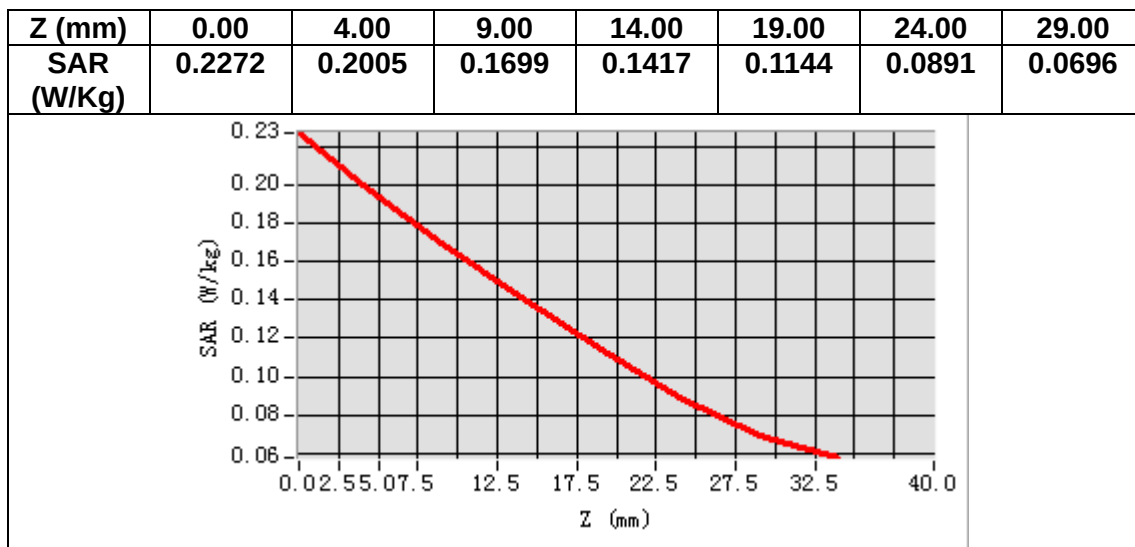
Frequency (MHz)	710.000000
Relative permittivity (real part)	41.249302
Relative permittivity (imaginary part)	21.918203
Conductivity (S/m)	0.864551
Variation (%)	-1.830000



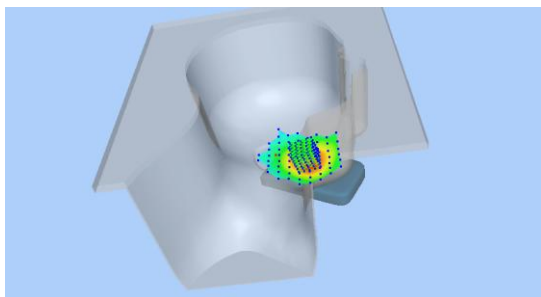
Maximum location: X=-51.00, Y=-31.00

SAR Peak: 0.23 W/kg

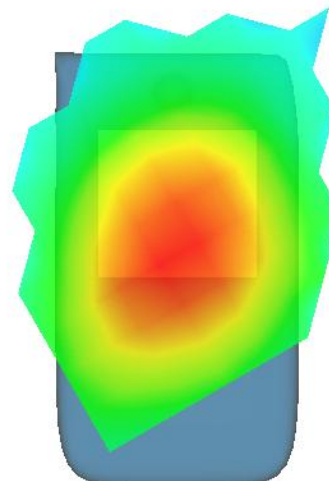
SAR 10g (W/Kg)	0.154019
SAR 1g (W/Kg)	0.195777



3D screen shot



Hot spot position



MEASUREMENT 28

Date of measurement: 14/7/2024

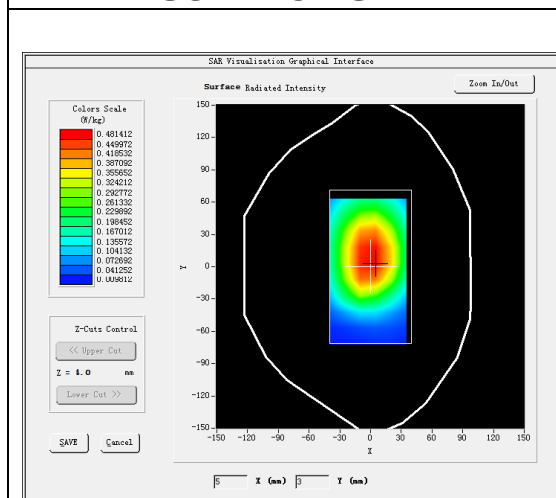
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 17</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.37</u>

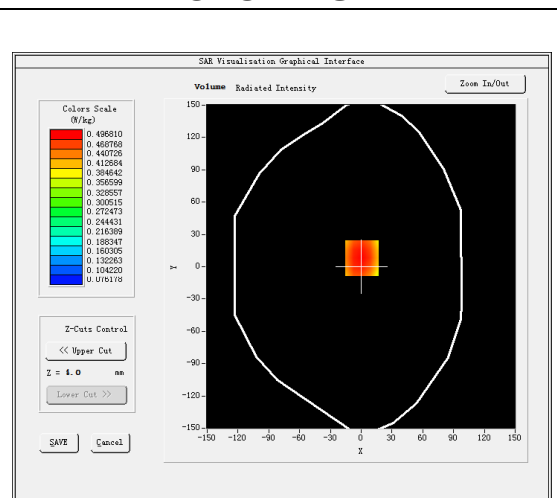
B. SAR Measurement Results

Frequency (MHz)	710.000000
Relative permittivity (real part)	41.249302
Relative permittivity (imaginary part)	21.918203
Conductivity (S/m)	0.864551
Variation (%)	0.630000

SURFACE SAR



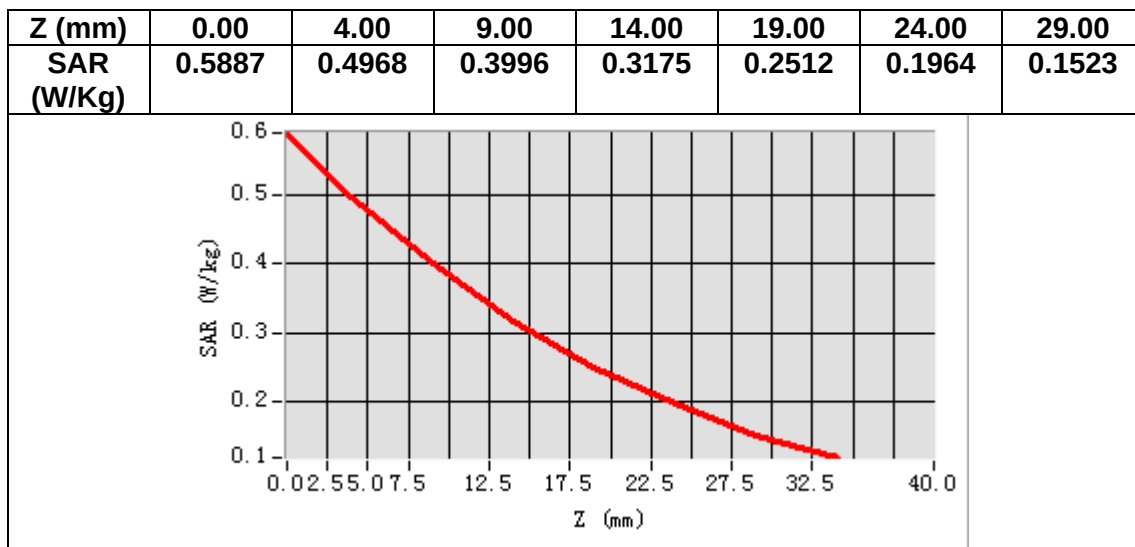
VOLUME SAR



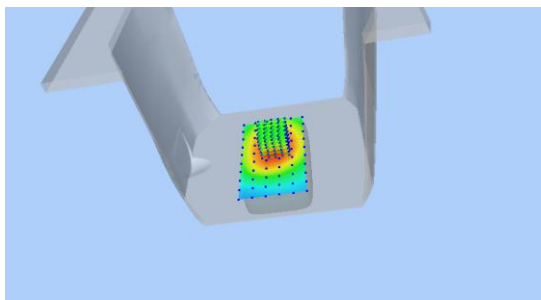
Maximum location: X=1.00, Y=8.00

SAR Peak: 0.59 W/kg

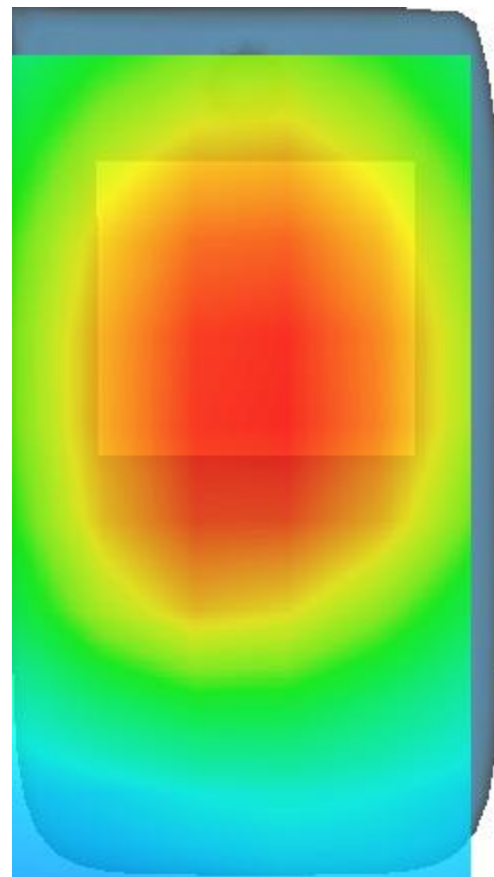
SAR 10g (W/Kg)	0.368798
SAR 1g (W/Kg)	0.482037



3D screen shot



Hot spot position



MEASUREMENT 29

Date of measurement: 19/7/2024

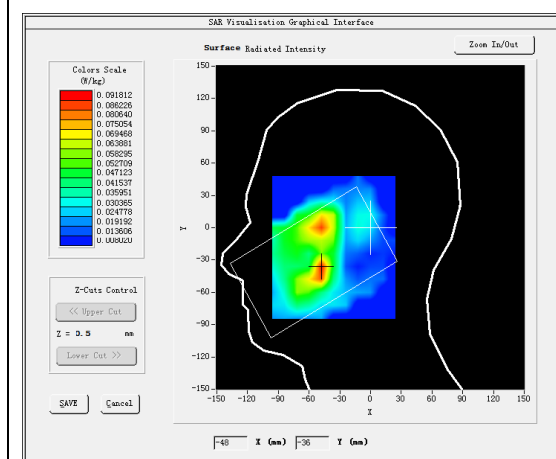
A. Experimental conditions.

<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>
<u>ConvF</u>	<u>2.65</u>

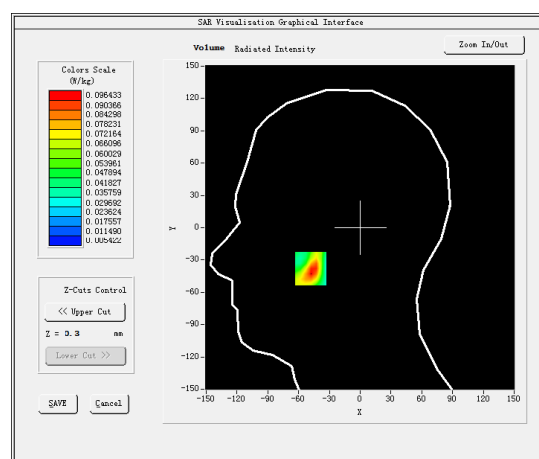
B. SAR Measurement Results

Frequency (MHz)	2593.000000
Relative permittivity (real part)	39.179764
Relative permittivity (imaginary part)	13.940430
Conductivity (S/m)	2.008196
Variation (%)	-3.439999

SURFACE SAR



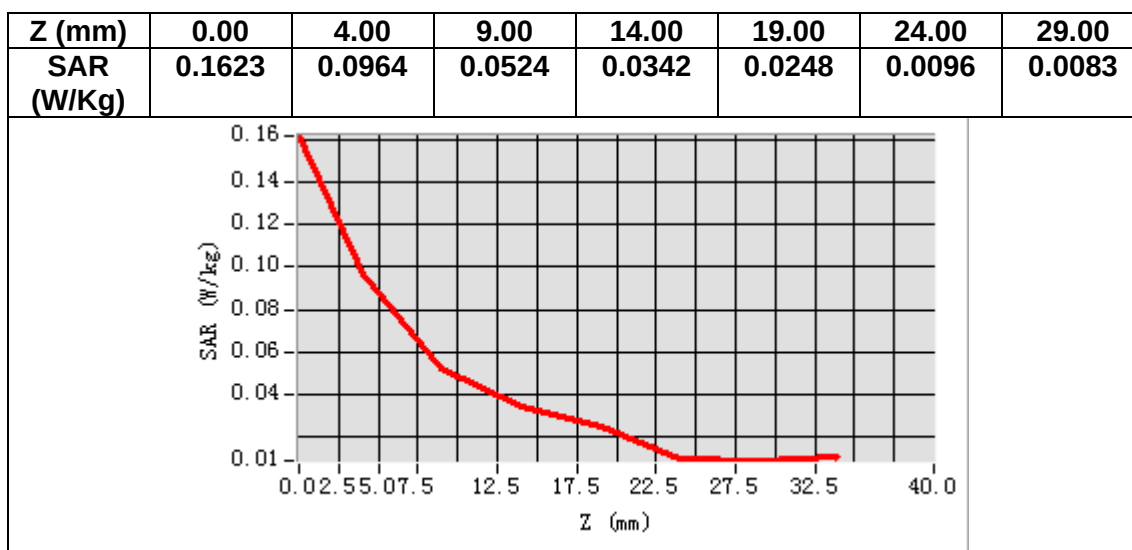
VOLUME SAR



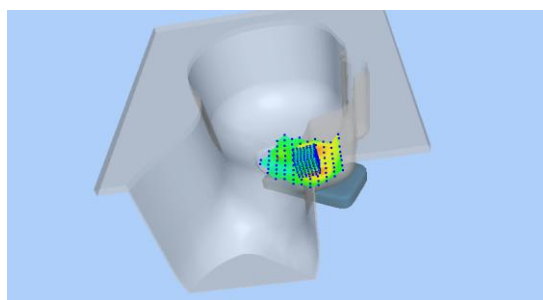
Maximum location: X=-48.00, Y=-38.00

SAR Peak: 0.15 W/kg

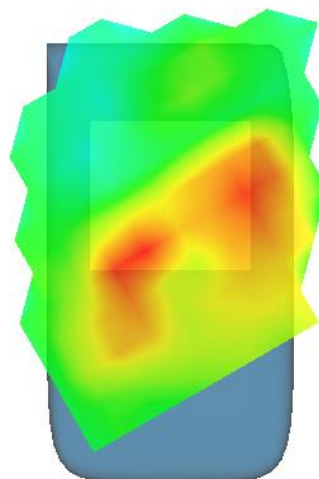
SAR 10g (W/Kg)	0.047087
SAR 1g (W/Kg)	0.090695



3D screen shot



Hot spot position



MEASUREMENT 30

Date of measurement: 19/7/2024

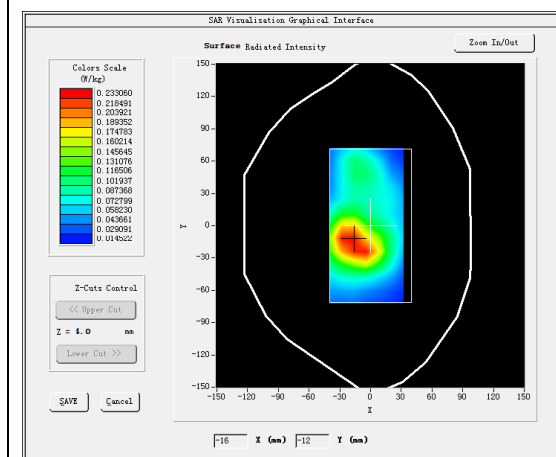
A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 41</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.6)</u>
ConvF	<u>2.65</u>

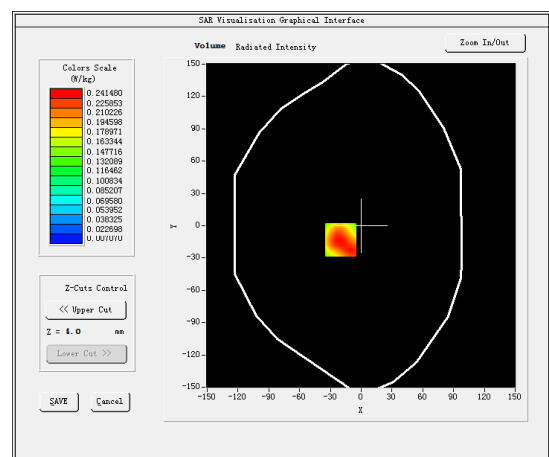
B. SAR Measurement Results

Frequency (MHz)	2593.000000
Relative permittivity (real part)	39.179764
Relative permittivity (imaginary part)	13.940430
Conductivity (S/m)	2.008196
Variation (%)	-0.040000

SURFACE SAR



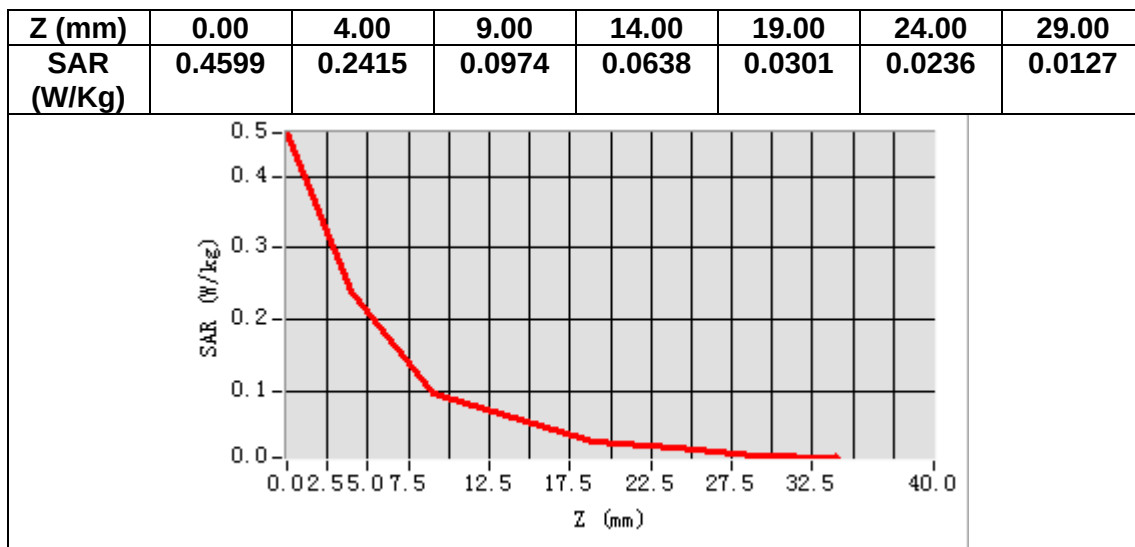
VOLUME SAR



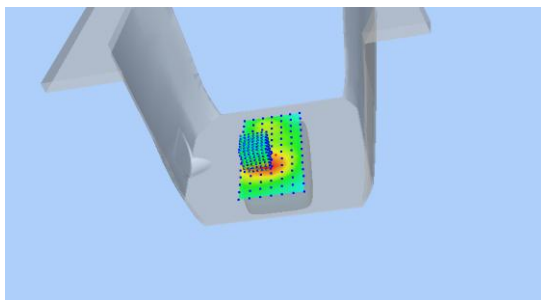
Maximum location: X=-20.00, Y=-13.00

SAR Peak: 0.41 W/kg

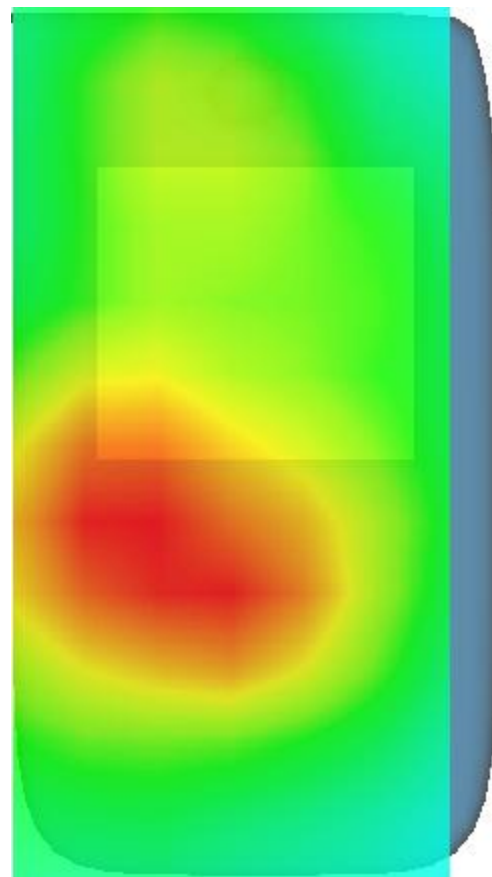
SAR 10g (W/Kg)	0.127053
SAR 1g (W/Kg)	0.236353



3D screen shot



Hot spot position



15. Appendix D. Calibration Certificate

Table of contents
E Field Probe - 3423-EPGO-426
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.261.11.23.BES.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.: 3423-EPGO-426

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 09/18/2023



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

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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).



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

	Name	Function	Date	Signature
Prepared by :	Cyrille ONNEE	Measurement Responsible	9/18/2023	
Checked & approved by:	Jérôme Luc	Technical Manager	9/18/2023	
Authorized by:	Yann Toutain	Laboratory Director	9/19/2023	

Yann
Toutain ID

Signature
numérique de
Yann Toutain ID
Date: 2023.09.19
09:08:14 +02'00'

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

Issue	Name	Date	Modifications
A	Cyrille ONNEE	9/18/2023	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	3423-EPGO-426
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-7.5GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.261 MΩ Dipole 2: R2=0.213 MΩ Dipole 3: R3=0.233 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 effect. All calibrations / measurements performed meet the fore-mentioned standards.

3.1 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 for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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3.2 LINEARITY

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

3.3 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°).

3.4 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
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., $\delta \approx 14 \text{ mm}$ 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.

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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 a SAR probe calibration using the waveguide or calorimetric cell technique depending on the frequency.

The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-11% for the frequency range 150-450MHz.

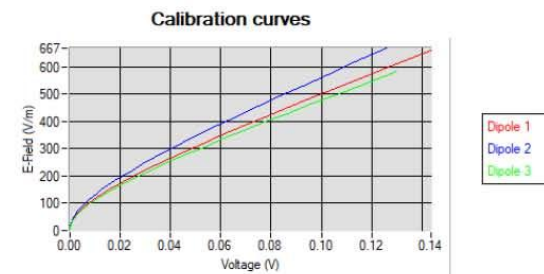
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

Ambient condition	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 CALIBRATION IN AIR

The following curve represents the measurement in waveguide of the voltage picked up by the probe toward the E-field generated inside the waveguide.



From this curve, the sensitivity in air is calculated using the below formula.

$$E^2 = \sum_{i=1}^3 \frac{V_i (1 + V_i / DCP_i)}{Norm_i}$$

where

V_i =voltage readings on the 3 channels of the probe

DCP_i =diode compression point given below for the 3 channels of the probe

$Norm_i$ =dipole sensitivity given below for the 3 channels of the probe



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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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 ($\mu\text{V}/(\text{V}/\text{m})^2$)
0.78	0.62	0.85

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
105	108	107

5.2 CALIBRATION IN LIQUID

The calorimeter cell or the waveguide is used to determine the calibration in liquid using the formula below.

$$\text{ConvF} = \frac{E_{\text{liquid}}^2}{E_{\text{air}}^2}$$

The E-field in the liquid is determined from the SAR measurement according to the below formula.

$$E_{\text{liquid}}^2 = \frac{\rho \text{ SAR}}{\sigma}$$

where

σ =the conductivity of the liquid

ρ =the volumetric density of the liquid

SAR=the SAR measured from the formula that depends on the setup used. The SAR formulas are given below

For the calorimeter cell (150-450 MHz), the formula is:

$$\text{SAR} = c \frac{dT}{dt}$$

where

c =the specific heat for the liquid

dT/dt =the temperature rises over the time

For the waveguide setup (600-75000 MHz), the formula is:

$$\text{SAR} = \frac{4P_W}{ab\delta} e^{-\frac{2z}{\delta}}$$

where

a =the larger cross-sectional of the waveguide

b =the smaller cross-sectional of the waveguide

δ =the skin depth for the liquid in the waveguide

P_W =the power delivered to the liquid



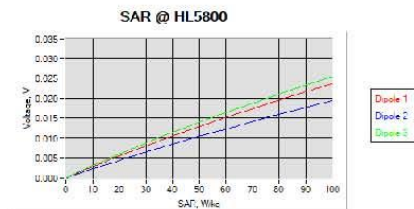
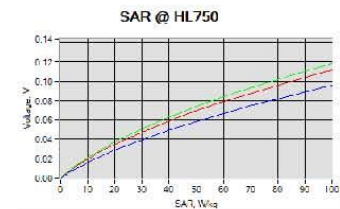
COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

The below table summarize the ConvF for the calibrated liquid. The curves give examples for the measured SAR depending on the voltage in some liquid.

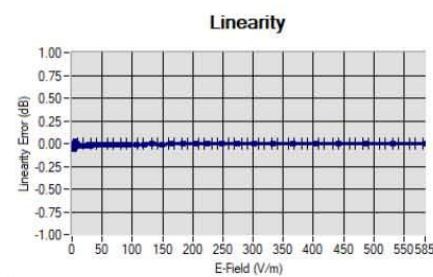
Liquid	Frequency (MHz*)	ConvF
HL750	750	2.37
HL850	835	2.32
HL900	900	2.23
HL1800	1800	2.45
HL1900	1900	2.63
HL2000	2000	2.83
HL2300	2300	2.81
HL2450	2450	2.85
HL2600	2600	2.65
HL3300	3300	2.21
HL3500	3500	2.20
HL3700	3700	2.11
HL3900	3900	2.40
HL4200	4200	2.40
HL4600	4600	2.33
HL4900	4900	2.37
HL5200	5200	2.07
HL5400	5400	2.11
HL5600	5600	2.20
HL5800	5800	2.04

(*) Frequency validity is ± 50 MHz below 600 MHz, ± 100 MHz from 600 MHz to 6 GHz and ± 700 MHz above 6 GHz

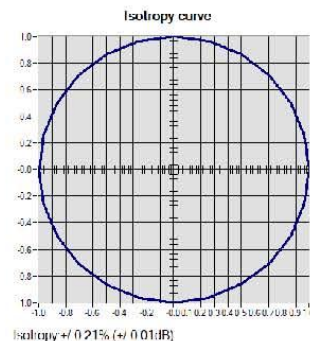


6 VERIFICATION RESULTS

The figures below represent the measured linearity and axial isotropy for this probe. The probe specification is ± 0.2 dB for linearity and ± 0.15 dB for axial isotropy.



Linearity: $\pm 1.42\%$ (± 0.06 dB)



Isotropy: $\pm 0.21\%$ (± 0.01 dB)



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer	Agilent 8753ES	MY40003210	10/2019	10/2023
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Multimeter	Keithley 2000	4013982	02/2023	02/2026
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2021	06/2024
Power Meter	Keysight U2000A	SN: MY62340002	10/2022	10/2025
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Fluoroptic Thermometer	LumaSense Luxtron 812	94264	09/2022	09/2025
Coaxial cell	MVG	SN 32/16 COAXCELL_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG2_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G600_1	Validated. No cal required.	Validated. No cal required.

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_5G000_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG14_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_7G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.23.24.BES.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 03/15DIP0G750-355

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.