MEASUREMENT 2

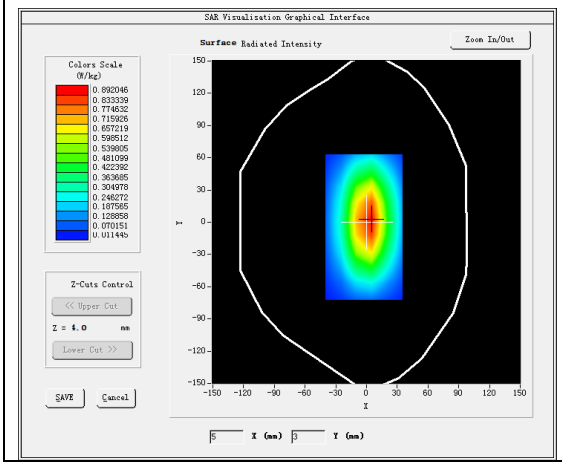
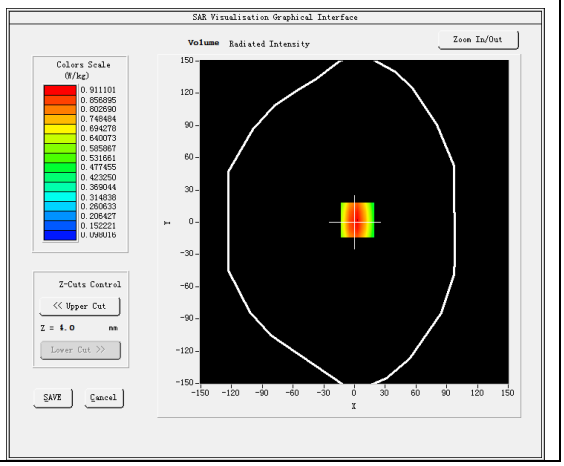
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.5

B. SAR Measurement Results

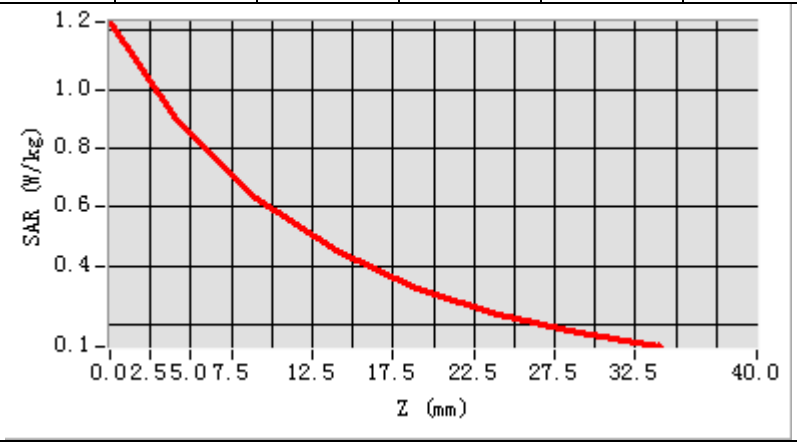
Frequency (MHz)	835.000000
Relative permittivity (real part)	41.503672
Relative permittivity (imaginary part)	20.044007
Conductivity (S/m)	0.929819
Variation (%)	-2.720000

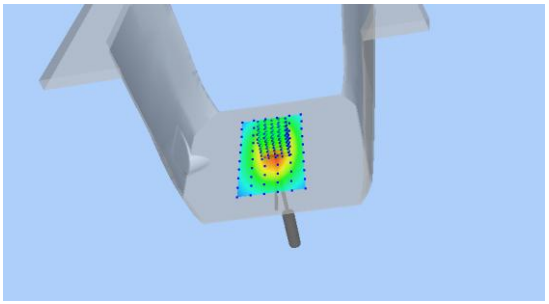
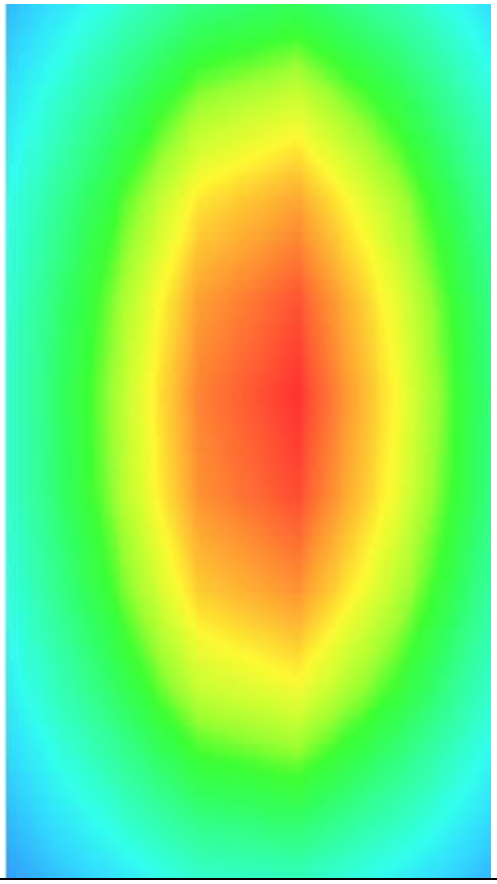
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=3.00, Y=2.00
SAR Peak: 1.23 W/kg

SAR 10g (W/Kg)	0.607333
SAR 1g (W/Kg)	1.066172

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2221	0.9159	0.6332	0.4562	0.3263	0.2309	0.1726



3D screen shot	Hot spot position
	

MEASUREMENT 3

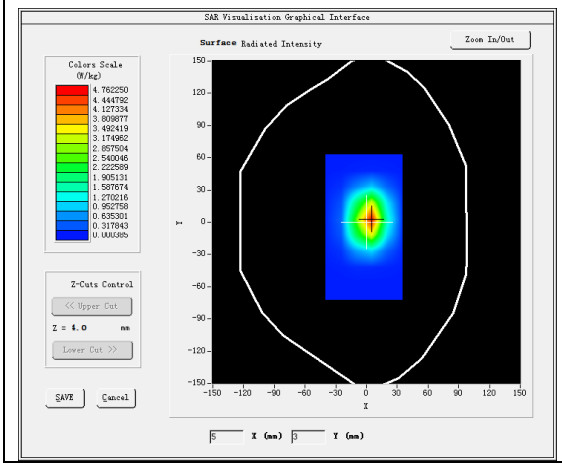
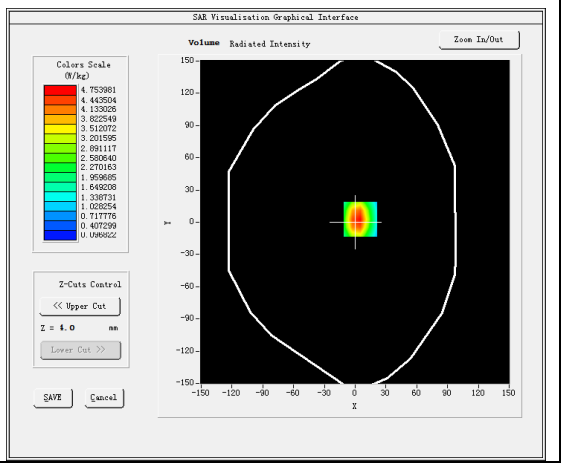
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

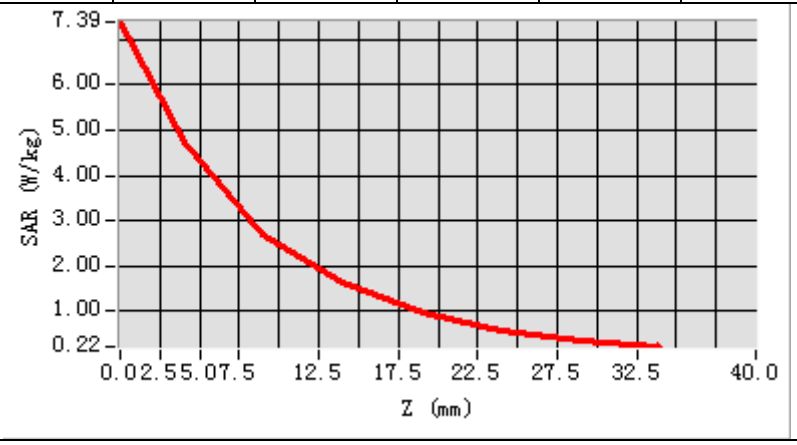
Frequency (MHz)	1800.000000
Relative permittivity (real part)	38.677062
Relative permittivity (imaginary part)	13.847581
Conductivity (S/m)	1.384758
Variation (%)	2.980000

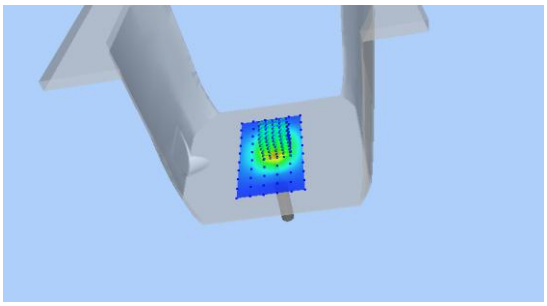
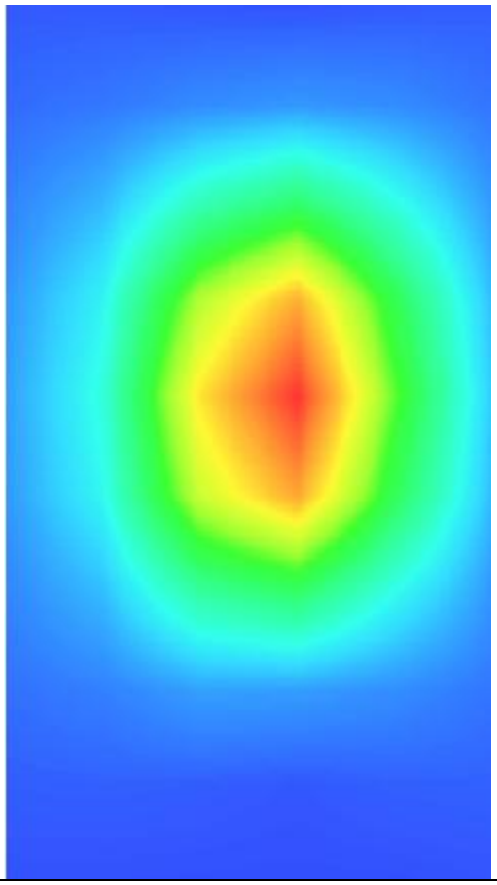
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=3.00
SAR Peak: 7.59 W/kg

SAR 10g (W/Kg)	2.045307
SAR 1g (W/Kg)	4.118066

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	7.3874	4.7511	2.7029	1.6103	0.9672	0.5831	0.3534



3D screen shot	Hot spot position
	

MEASUREMENT 4

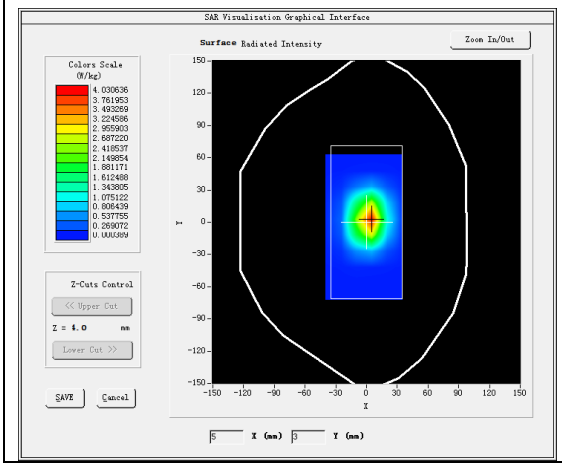
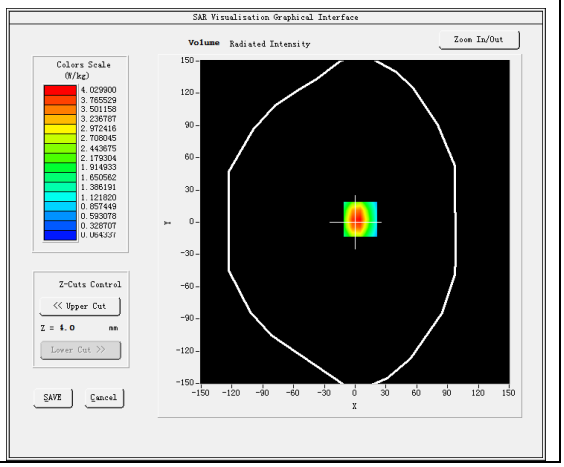
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.91

B. SAR Measurement Results

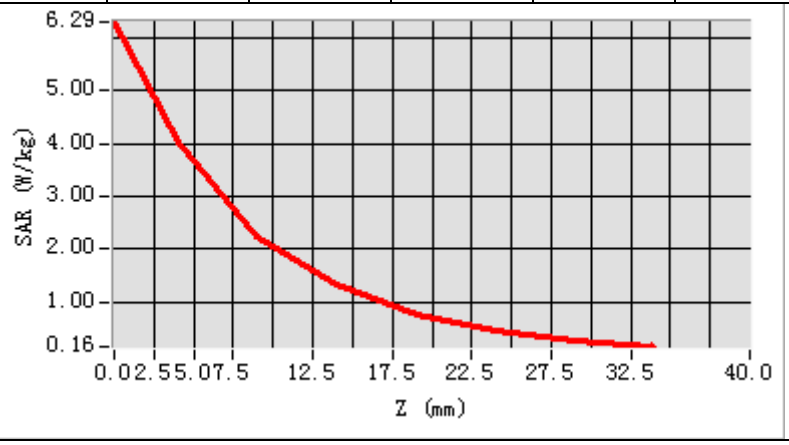
Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.479130
Relative permittivity (imaginary part)	13.867253
Conductivity (S/m)	1.463766
Variation (%)	2.220000

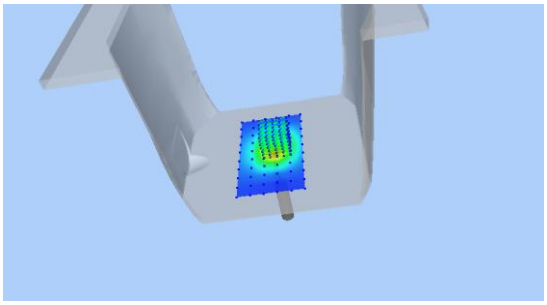
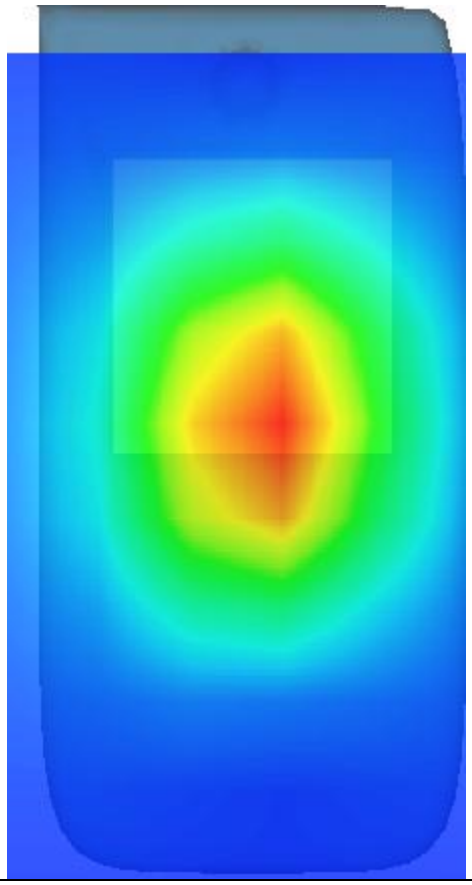
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=3.00
SAR Peak: 6.57 W/kg

SAR 10g (W/Kg)	1.887347
SAR 1g (W/Kg)	3.960221

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.2947	4.0219	2.2530	1.3126	0.7618	0.4514	0.2694



3D screen shot	Hot spot position
	

MEASUREMENT 5

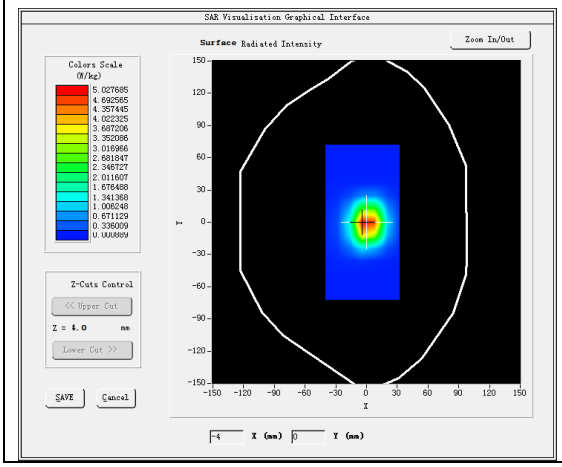
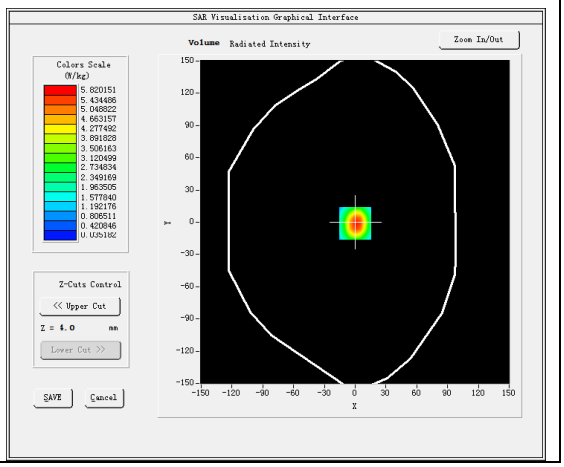
Date of measurement: 30/5/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.98

B. SAR Measurement Results

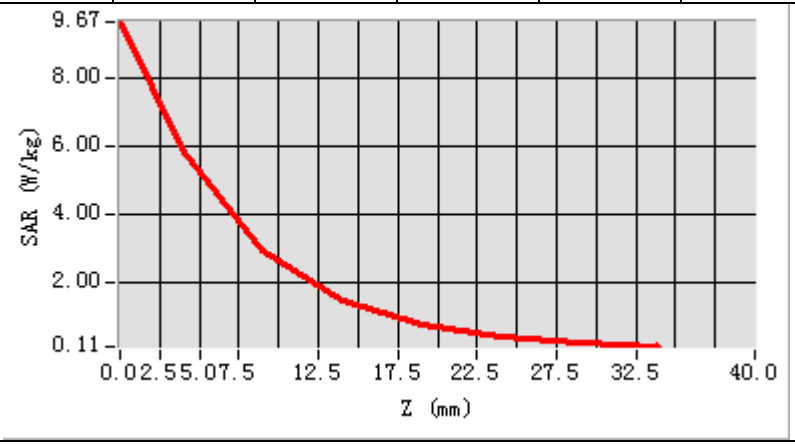
Frequency (MHz)	2450.000000
Relative permittivity (real part)	37.775371
Relative permittivity (imaginary part)	13.261121
Conductivity (S/m)	1.804986
Variation (%)	2.020000

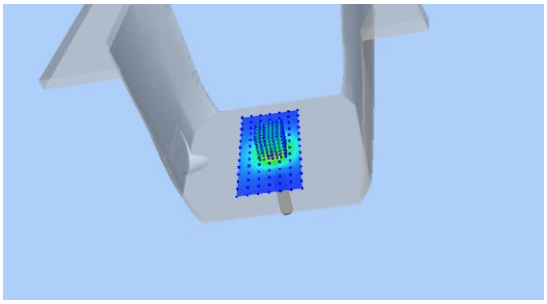
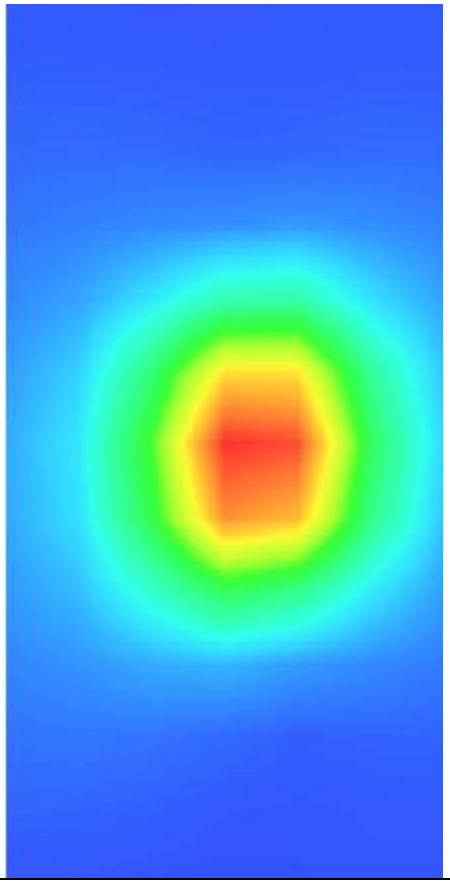
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=-1.00
SAR Peak: 9.64 W/kg

SAR 10g (W/Kg)	2.512087
SAR 1g (W/Kg)	5.171334

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	9.6788	5.8211	2.9301	1.4831	0.7698	0.3957	0.2012



3D screen shot	Hot spot position
	

MEASUREMENT 6

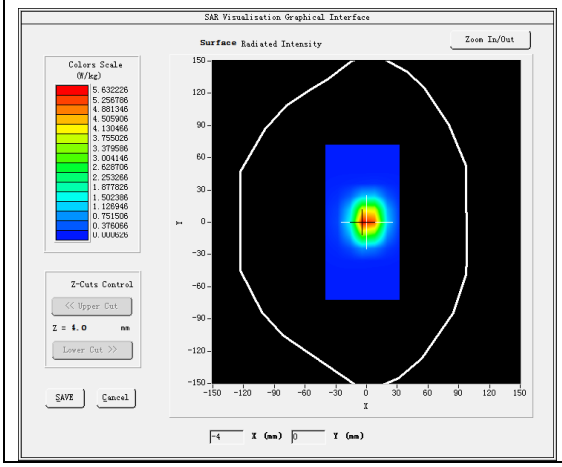
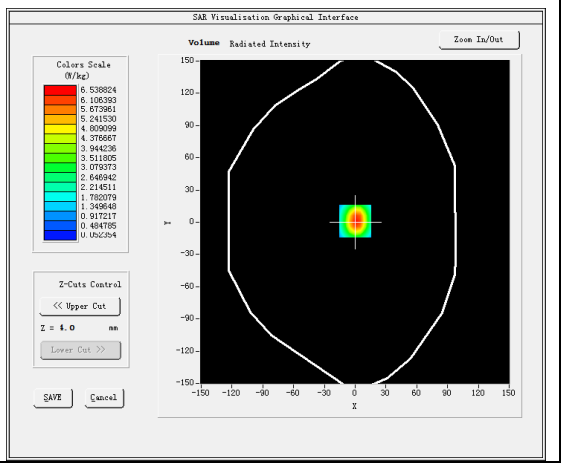
Date of measurement: 22/9/2022

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2600
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.87

B. SAR Measurement Results

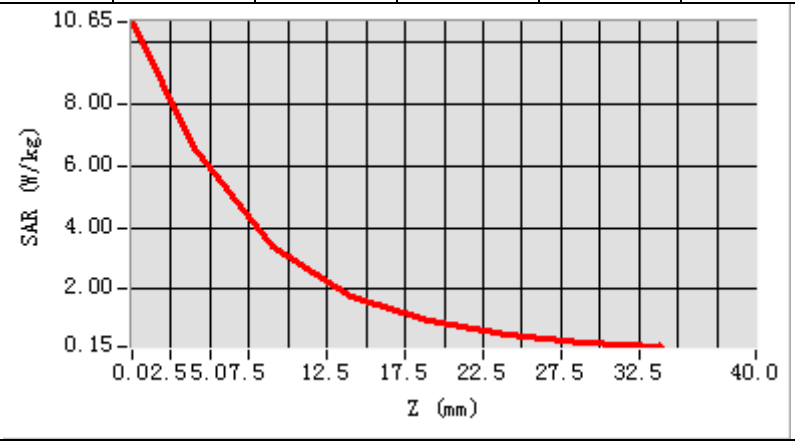
Frequency (MHz)	2600.000000
Relative permittivity (real part)	37.685852
Relative permittivity (imaginary part)	13.243335
Conductivity (S/m)	1.912926
Variation (%)	0.250000

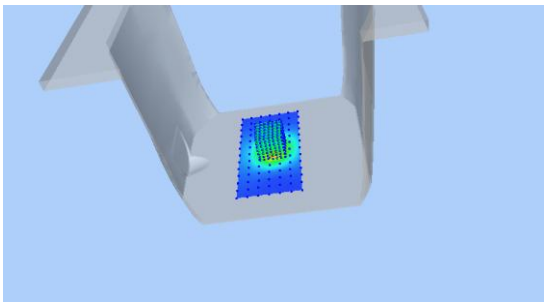
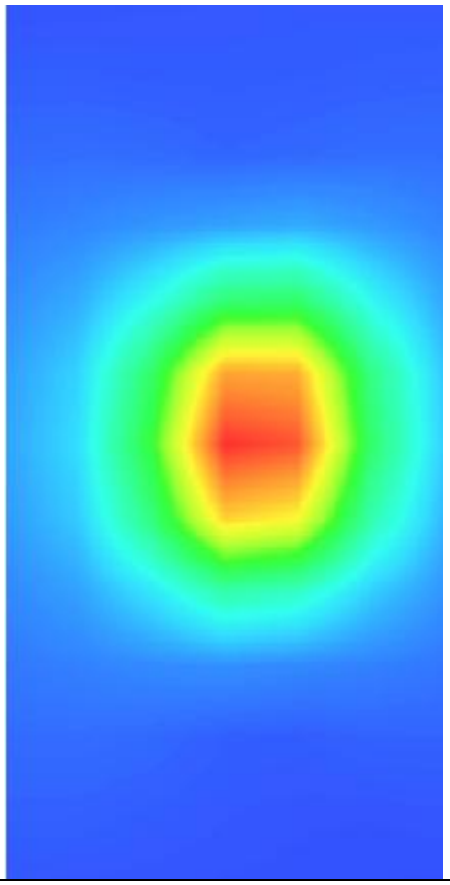
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=1.00
SAR Peak: 10.67 W/kg

SAR 10g (W/Kg)	2.203037
SAR 1g (W/Kg)	5.963199

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	10.668	6.5332	3.4163	1.7956	0.9661	0.5169	0.2779



3D screen shot	Hot spot position
	

MEASUREMENT 7

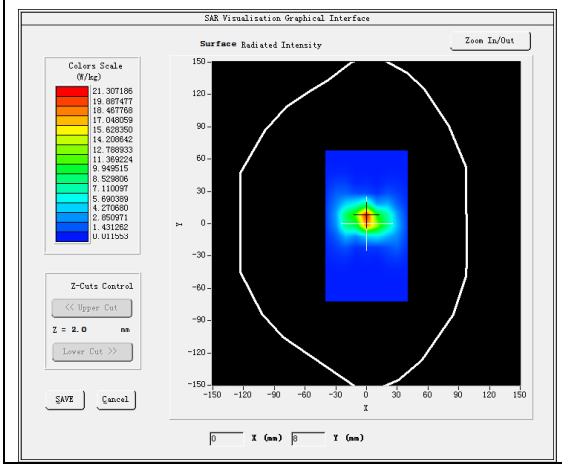
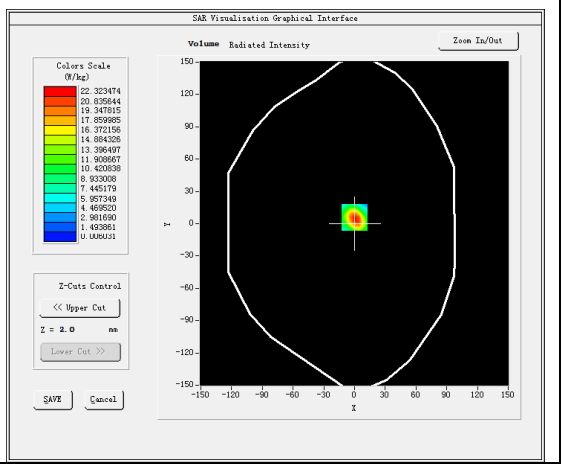
Date of measurement: 6/6/2023

A. Experimental conditions.

Area Scan	dx=10mm dy=10mm, h= 2.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	1.80

B. SAR Measurement Results

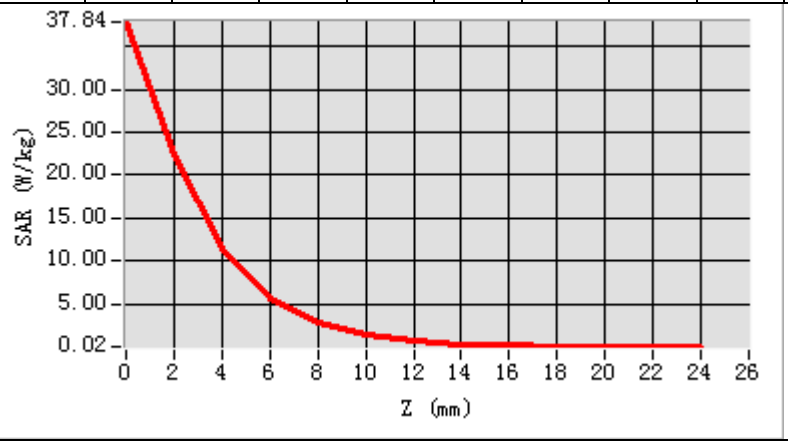
Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.244599
Relative permittivity (imaginary part)	15.809350
Conductivity (S/m)	4.567146
Variation (%)	0.440000

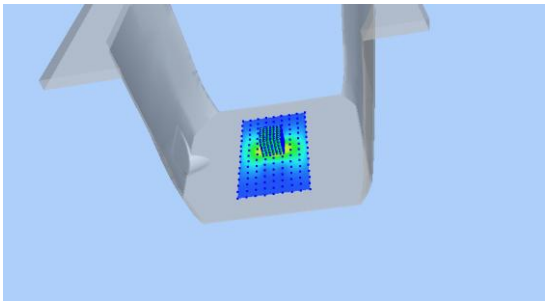
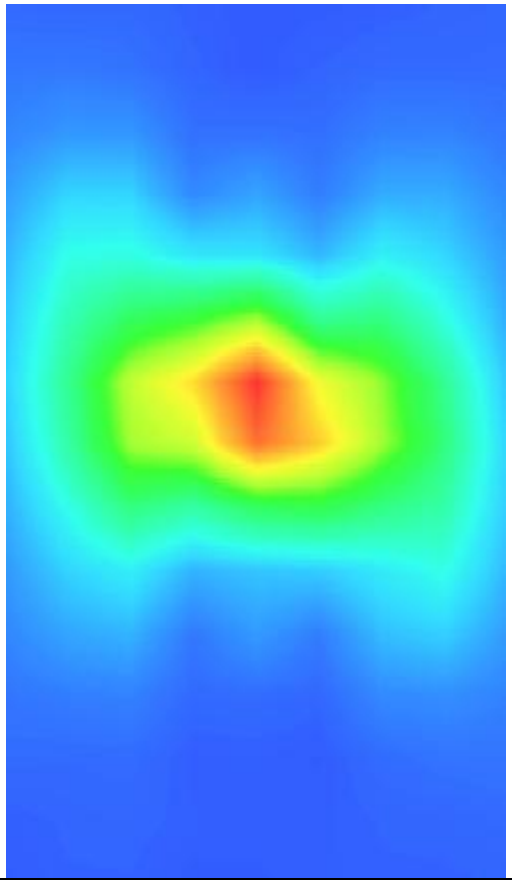
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=6.00
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.849161
SAR 1g (W/Kg)	15.636023

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	37.885	22.322	11.335	5.6635	2.8245	1.4005	0.7129	0.3699	0.1884	0.1089	0.0521	0.0360



3D screen shot	Hot spot position
	

MEASUREMENT 8

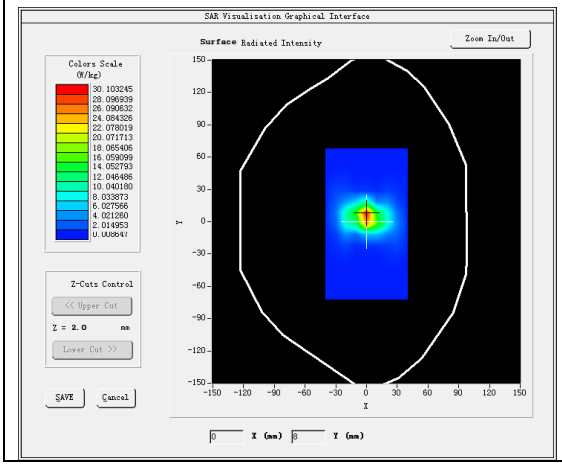
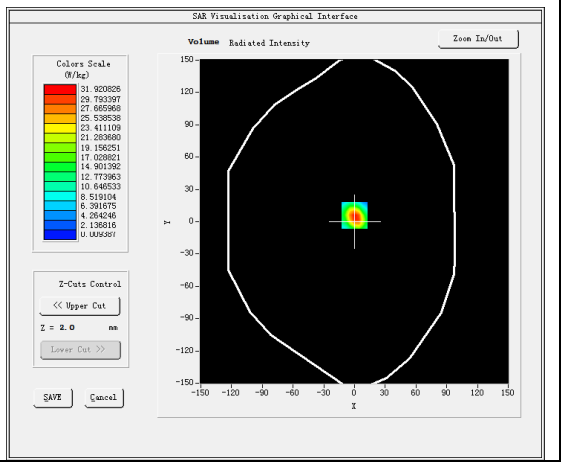
Date of measurement: 5/6/2023

A. Experimental conditions.

Area Scan	dx=10mm dy=10mm, h= 2.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	2.07

B. SAR Measurement Results

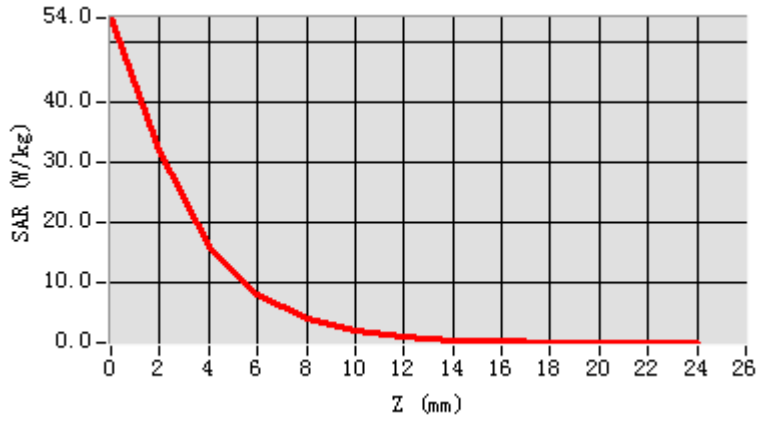
Frequency (MHz)	5800.000000
Relative permittivity (real part)	33.823516
Relative permittivity (imaginary part)	16.228369
Conductivity (S/m)	5.229141
Variation (%)	0.470000

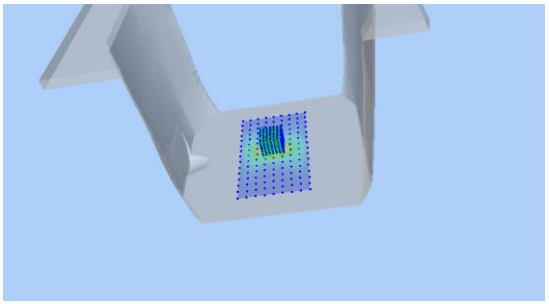
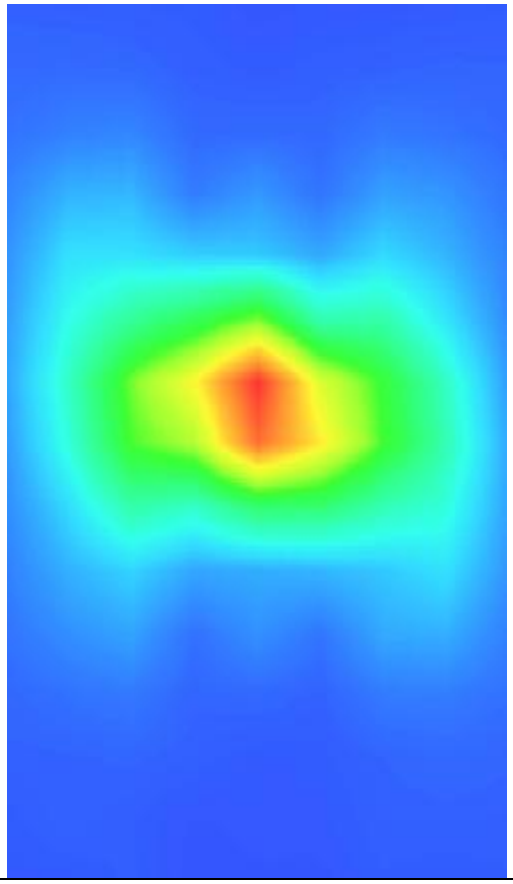
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=6.00
SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	5.510029
SAR 1g (W/Kg)	17.026356

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	54.032	31.983	16.134	8.1784	4.0876	2.0549	1.0365	0.5125	0.2774	0.1592	0.0768	0.0423



3D screen shot	Hot spot position
	

13. Appendix C. Plots of High SAR Measurement

Table of contents
MEASUREMENT 1 GSM 850 Head
MEASUREMENT 2 GSM 850 Body
MEASUREMENT 3 GSM 1900 Head
MEASUREMENT 4 GSM 1900 Body
MEASUREMENT 5 WCDMA Band 2 Head
MEASUREMENT 6 WCDMA Band 2 Body
MEASUREMENT 7 WCDMA Band 4 Head
MEASUREMENT 8 WCDMA Band 4 Body
MEASUREMENT 9 WCDMA Band 5 Head
MEASUREMENT 10 WCDMA Band 5 Body
MEASUREMENT 11 WLAN 5.2G Head
MEASUREMENT 12 WLAN 5.8G Head
MEASUREMENT 13 WLAN 5.2G Body
MEASUREMENT 14 WLAN 5.8G Body
MEASUREMENT 15 WLAN 2.4G Head
MEASUREMENT 16 WLAN 2.4G Body
MEASUREMENT 17 LTE Band 2 Head
MEASUREMENT 18 LTE Band 2 Body
MEASUREMENT 19 LTE Band 4 Head
MEASUREMENT 20 LTE Band 4 Body
MEASUREMENT 21 LTE Band 5 Head
MEASUREMENT 22 LTE Band 5 Body
MEASUREMENT 23 LTE Band 7 Head
MEASUREMENT 24 LTE Band 7 Body
MEASUREMENT 25 LTE Band 12 Head
MEASUREMENT 26 LTE Band 12 Body
MEASUREMENT 27 LTE Band 13 Head
MEASUREMENT 28 LTE Band 13 Body
MEASUREMENT 29 LTE Band 17 Head
MEASUREMENT 30 LTE Band 17 Body
MEASUREMENT 31 LTE Band 41 Head
MEASUREMENT 32 LTE Band 41 Body
MEASUREMENT 33 LTE Band 66 Head
MEASUREMENT 34 LTE Band 66 Body
MEASUREMENT 35 LTE Band 71 Head
MEASUREMENT 36 LTE Band 71 Body

MEASUREMENT 1

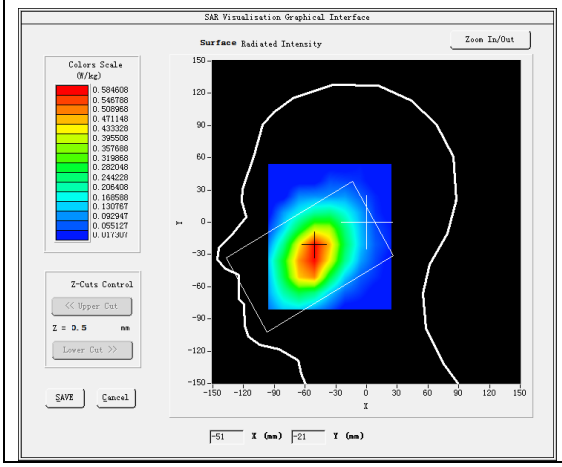
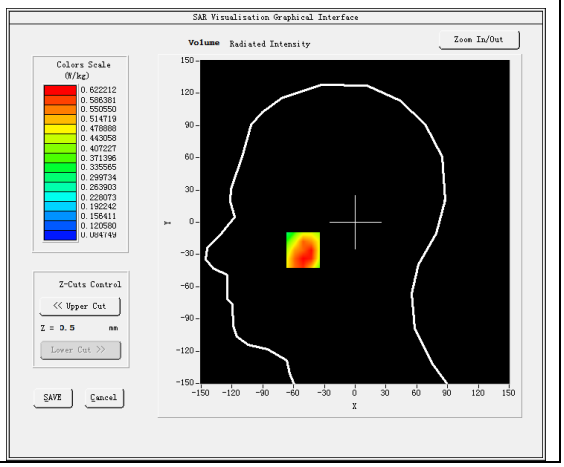
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 2.0)
ConvF	1.50

B. SAR Measurement Results

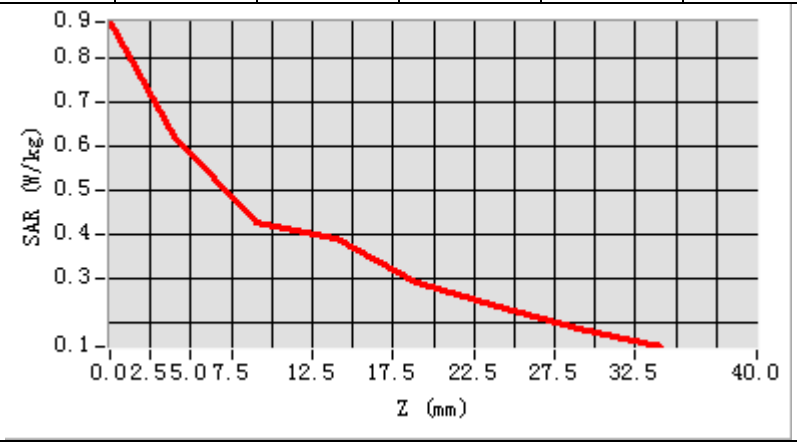
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.419331
Relative permittivity (imaginary part)	20.069847
Conductivity (S/m)	0.932579
Variation (%)	-4.140000

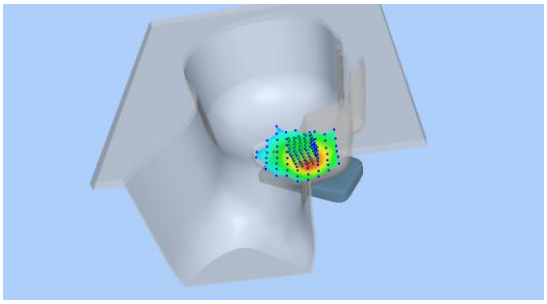
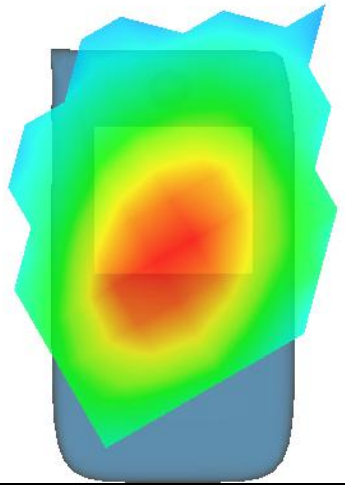
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-51.00, Y=-26.00
SAR Peak: 0.84 W/kg

SAR 10g (W/Kg)	0.447851
SAR 1g (W/Kg)	0.622170

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8813	0.6222	0.4301	0.3926	0.2937	0.2382	0.1895



3D screen shot	Hot spot position
	

MEASUREMENT 2

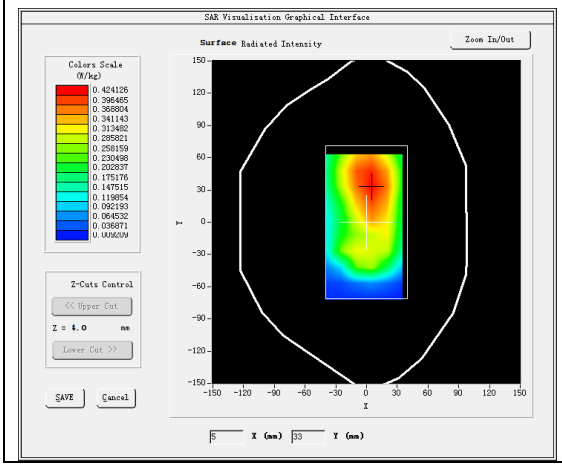
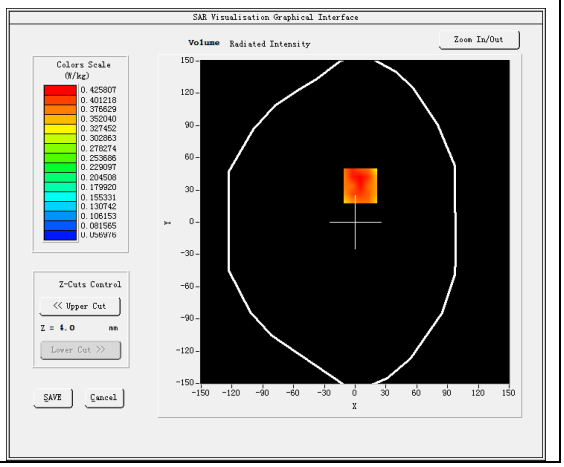
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 2.0)
ConvF	1.50

B. SAR Measurement Results

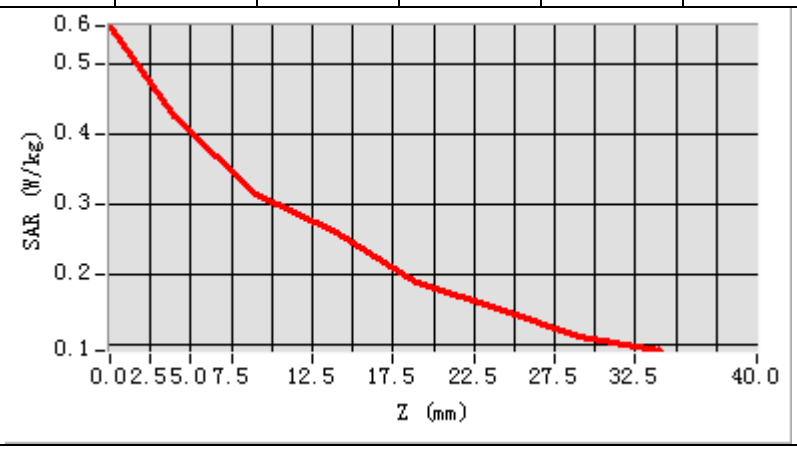
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.419331
Relative permittivity (imaginary part)	20.069847
Conductivity (S/m)	0.932579
Variation (%)	-1.050000

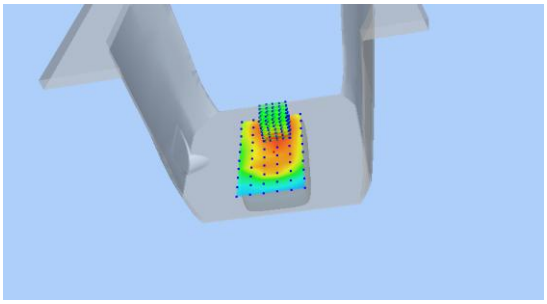
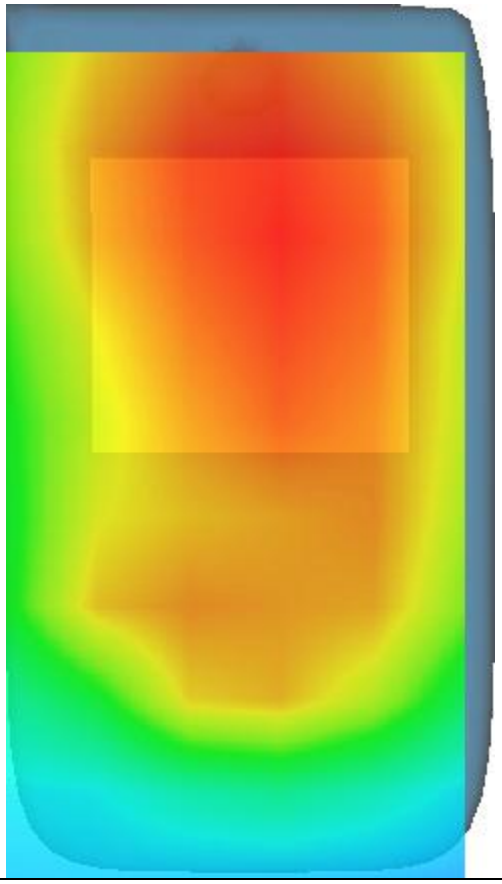
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=34.00
SAR Peak: 0.55 W/kg

SAR 10g (W/Kg)	0.307263
SAR 1g (W/Kg)	0.420481

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5555	0.4258	0.3140	0.2621	0.1900	0.1537	0.1126



3D screen shot	Hot spot position
	

MEASUREMENT 3

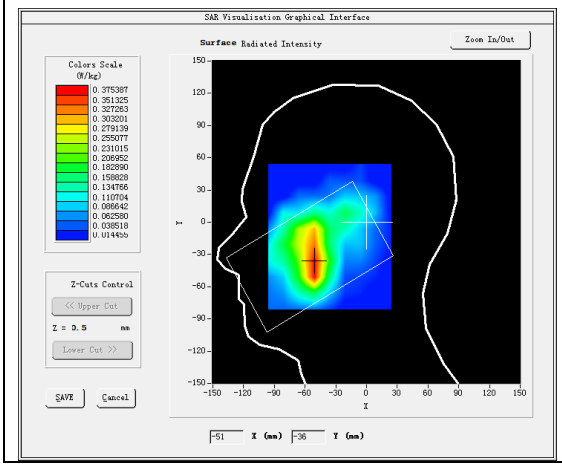
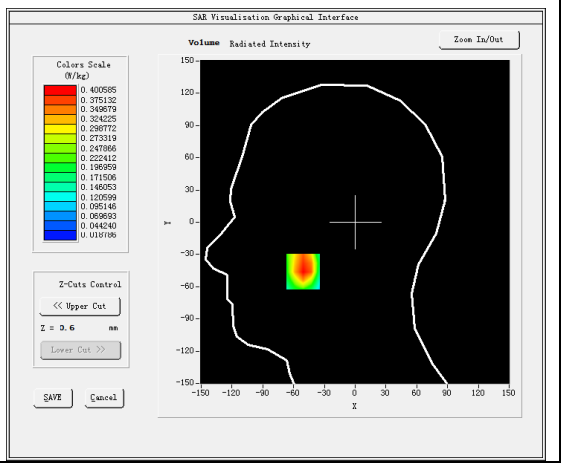
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	TDMA (Crest factor: 2.7)
ConvF	1.91

B. SAR Measurement Results

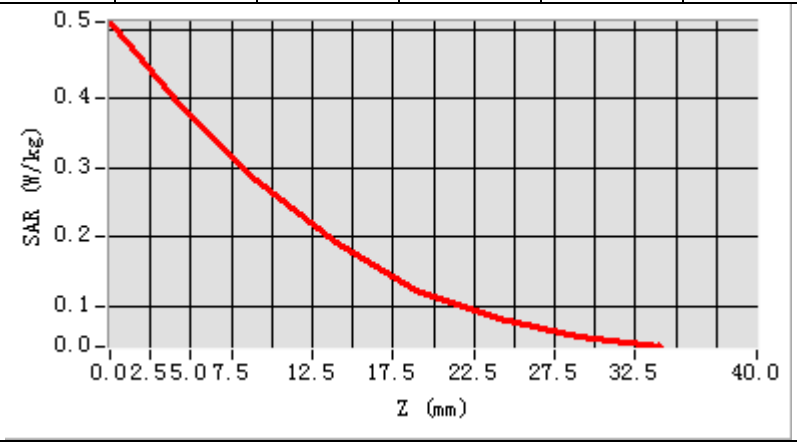
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.565529
Relative permittivity (imaginary part)	13.885053
Conductivity (S/m)	1.450217
Variation (%)	2.290000

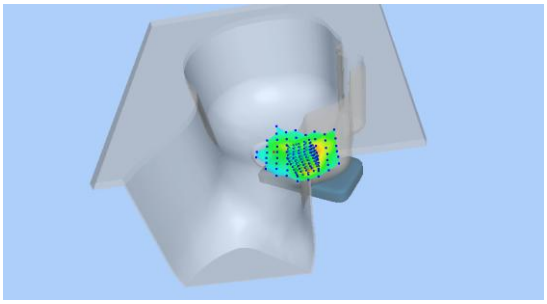
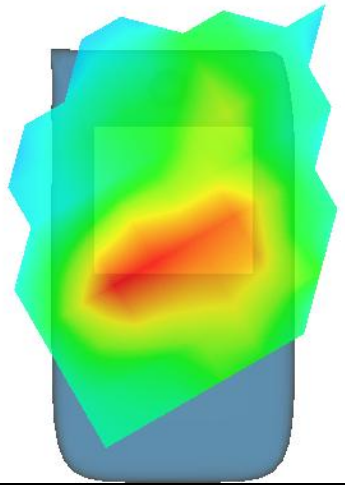
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-51.00, Y=-46.00
SAR Peak: 0.56 W/kg

SAR 10g (W/Kg)	0.233485
SAR 1g (W/Kg)	0.388959

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5117	0.4006	0.2816	0.1929	0.1232	0.0832	0.0569



3D screen shot	Hot spot position
	

MEASUREMENT 4

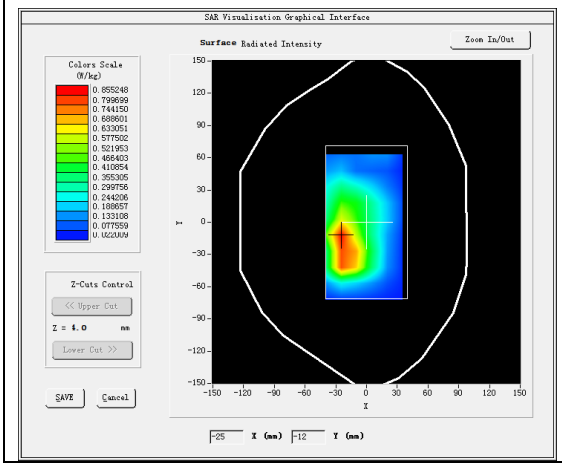
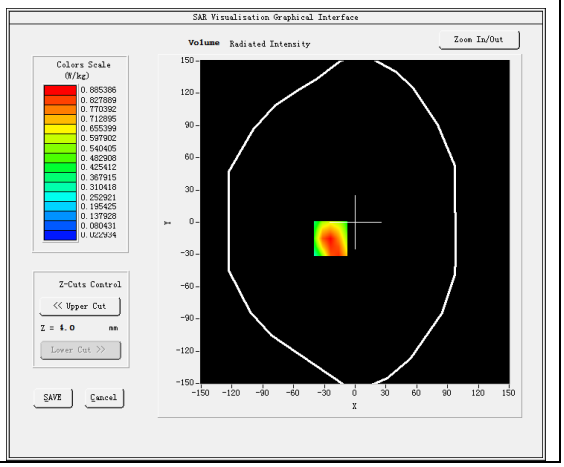
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	TDMA (Crest factor: 2.7)
ConvF	1.91

B. SAR Measurement Results

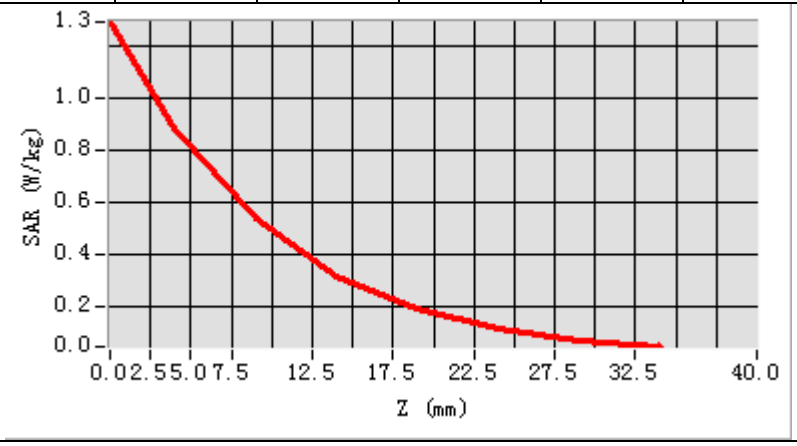
Frequency (MHz)	1909.800000
Relative permittivity (real part)	38.442810
Relative permittivity (imaginary part)	13.812053
Conductivity (S/m)	1.465459
Variation (%)	0.660000

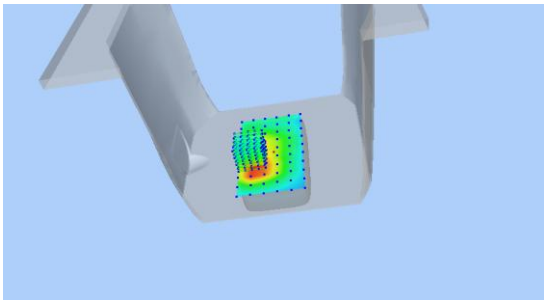
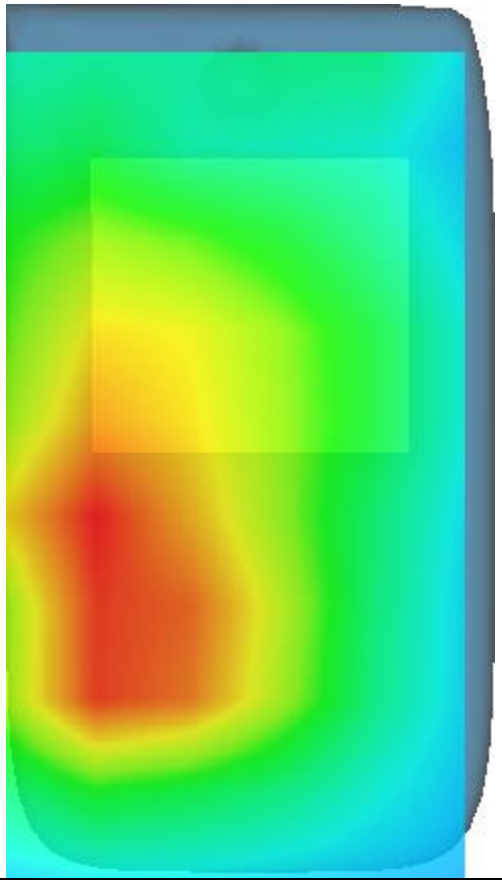
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-24.00, Y=-15.00
SAR Peak: 1.34 W/kg

SAR 10g (W/Kg)	0.490850
SAR 1g (W/Kg)	0.867269

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2928	0.8854	0.5409	0.3178	0.1951	0.1194	0.0742



3D screen shot	Hot spot position
	

MEASUREMENT 5

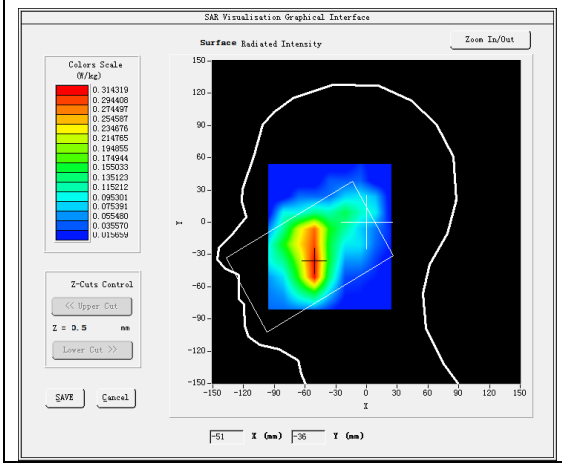
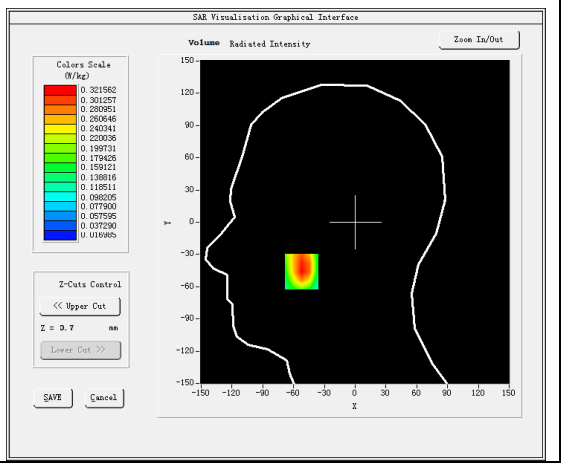
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	Band2_WCDMA1900
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.91

B. SAR Measurement Results

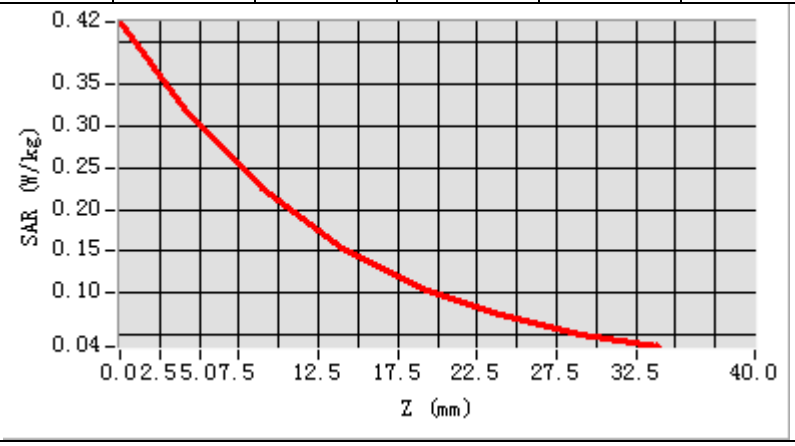
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.565529
Relative permittivity (imaginary part)	13.885053
Conductivity (S/m)	1.450217
Variation (%)	-1.740000

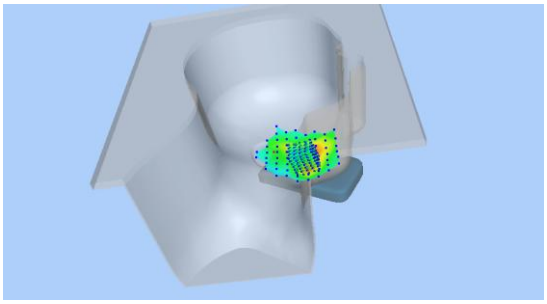
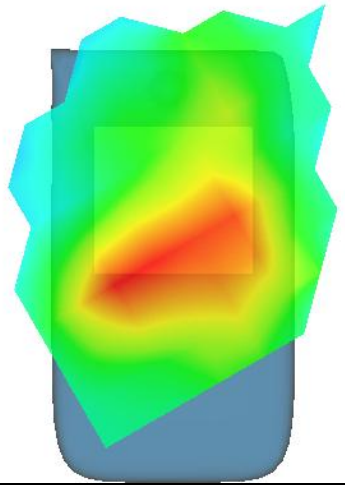
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-46.00
SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.195117
SAR 1g (W/Kg)	0.316095

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.4247	0.3216	0.2250	0.1531	0.1050	0.0750	0.0498



3D screen shot	Hot spot position
	

MEASUREMENT 6

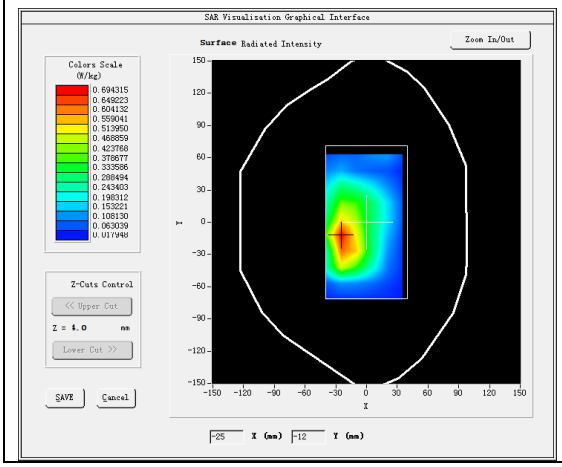
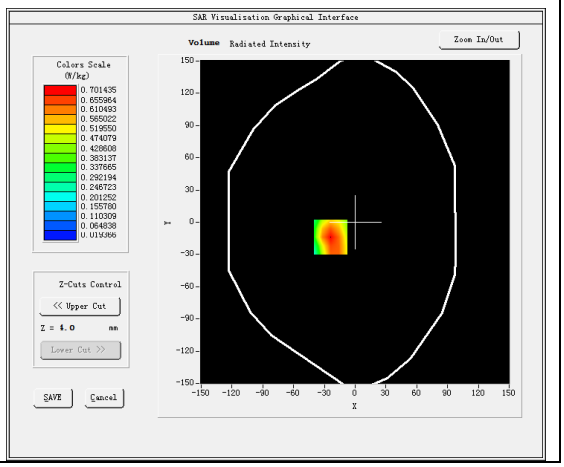
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.91

B. SAR Measurement Results

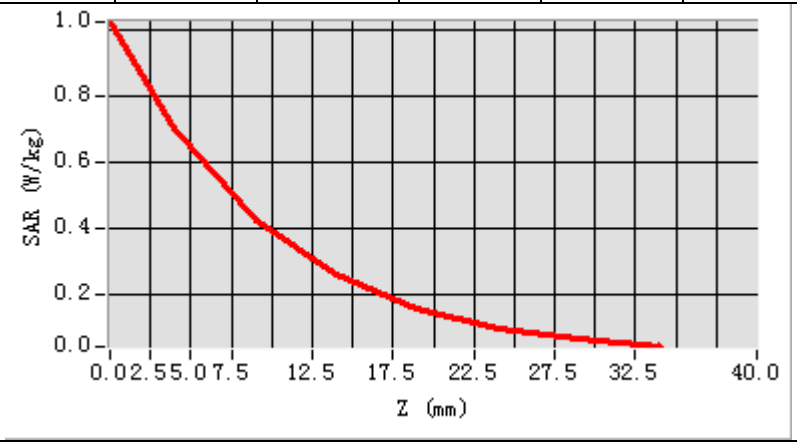
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.565529
Relative permittivity (imaginary part)	13.885053
Conductivity (S/m)	1.450217
Variation (%)	-1.240000

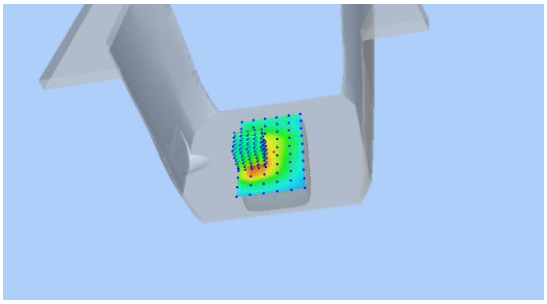
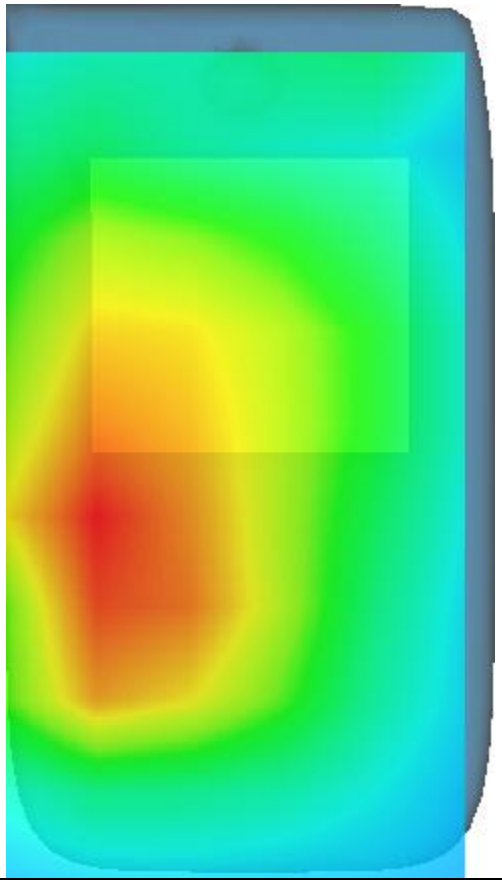
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-24.00, Y=-14.00
SAR Peak: 1.02 W/kg

SAR 10g (W/Kg)	0.394215
SAR 1g (W/Kg)	0.681593

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.0254	0.7014	0.4250	0.2610	0.1558	0.0947	0.0625



3D screen shot	Hot spot position
	

MEASUREMENT 7

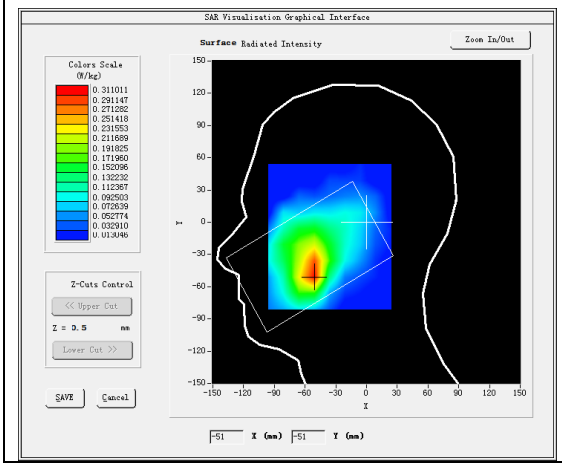
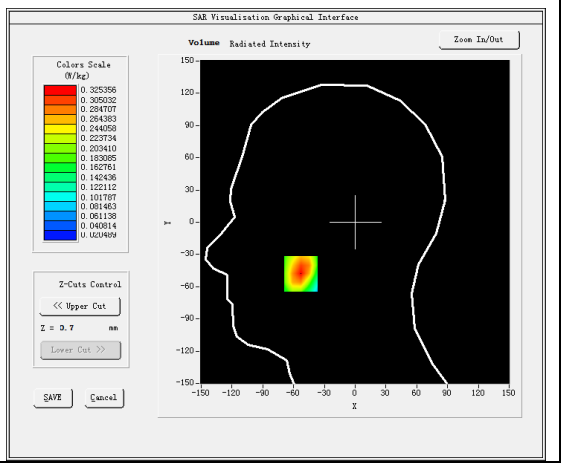
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

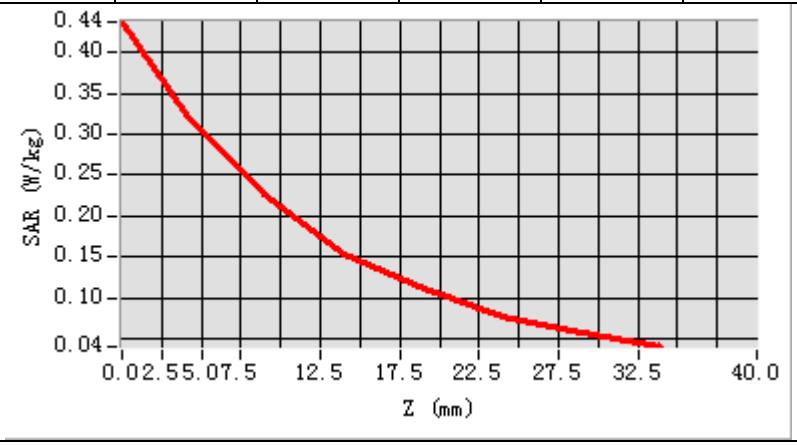
Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.136761
Relative permittivity (imaginary part)	13.799881
Conductivity (S/m)	1.327855
Variation (%)	-0.650000

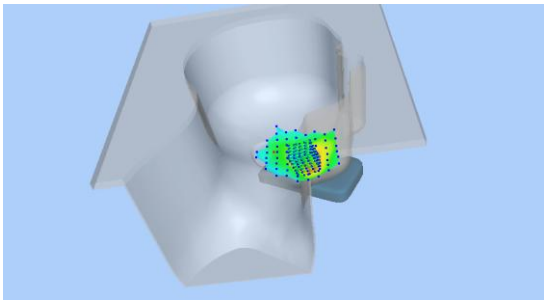
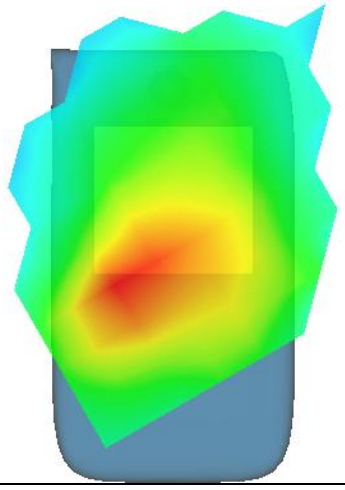
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-53.00, Y=-48.00
SAR Peak: 0.44 W/kg

SAR 10g (W/Kg)	0.196558
SAR 1g (W/Kg)	0.308323

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.4372	0.3254	0.2256	0.1534	0.1123	0.0777	0.0579



3D screen shot	Hot spot position
	

MEASUREMENT 8

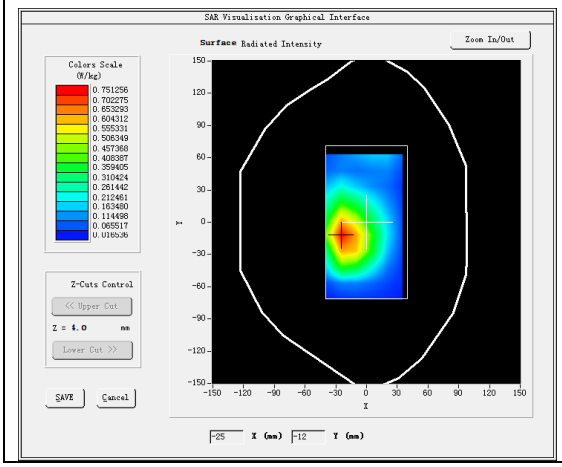
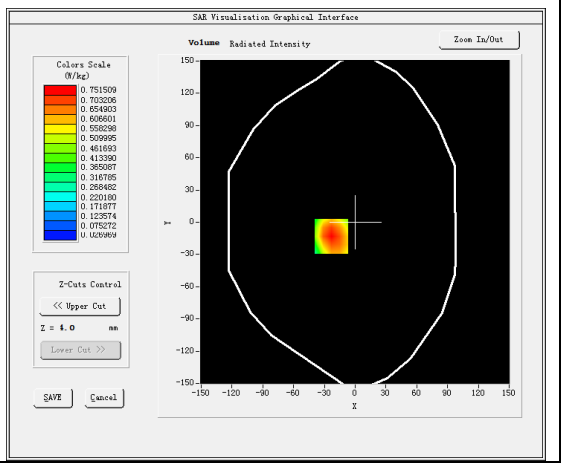
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

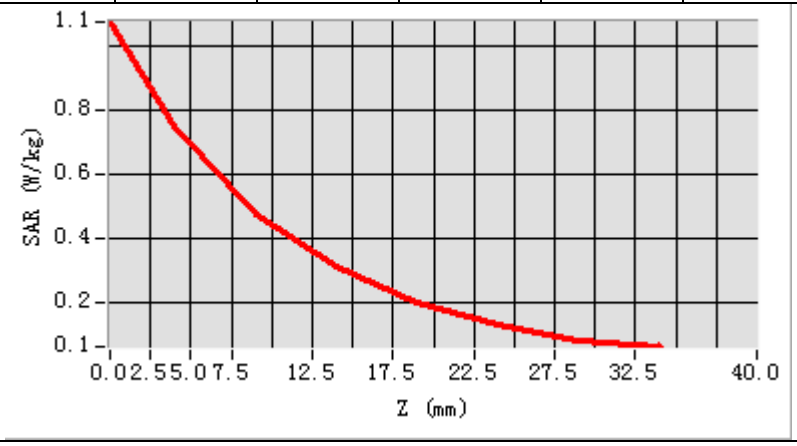
Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.136761
Relative permittivity (imaginary part)	13.799881
Conductivity (S/m)	1.327855
Variation (%)	-0.620000

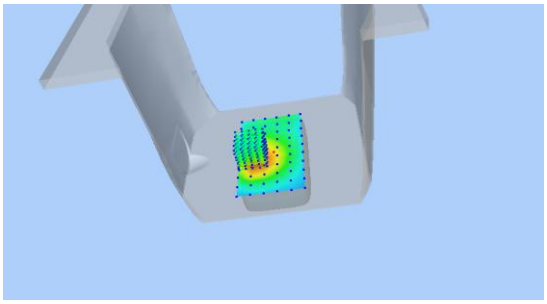
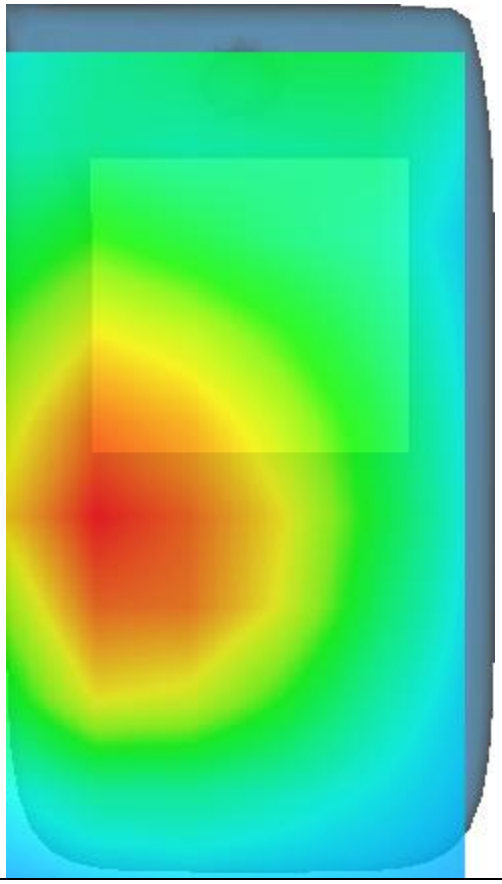
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-23.00, Y=-13.00
SAR Peak: 1.08 W/kg

SAR 10g (W/Kg)	0.440894
SAR 1g (W/Kg)	0.719304

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.0778	0.7515	0.4763	0.3082	0.1955	0.1258	0.0801



3D screen shot	Hot spot position
	

MEASUREMENT 9

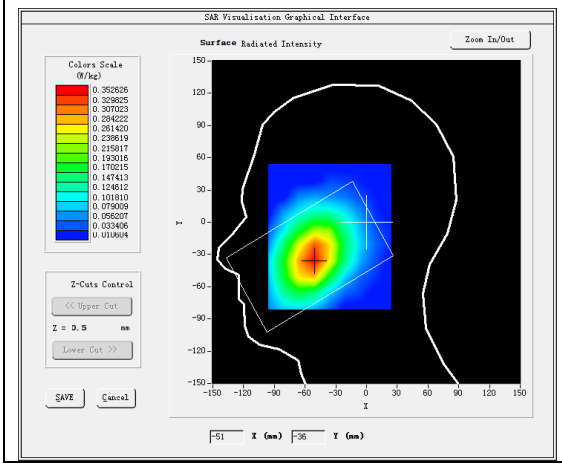
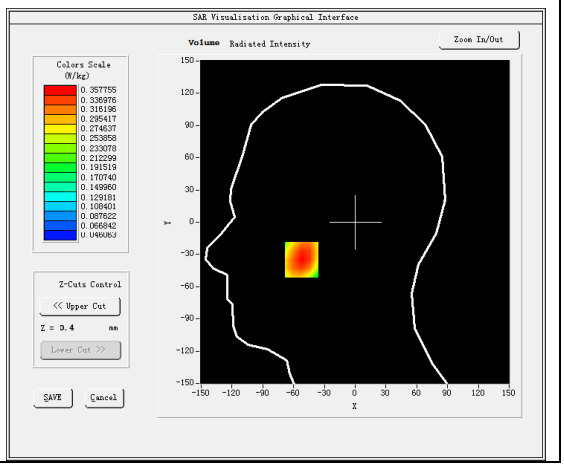
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	Band5_WCDMA850
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.50

B. SAR Measurement Results

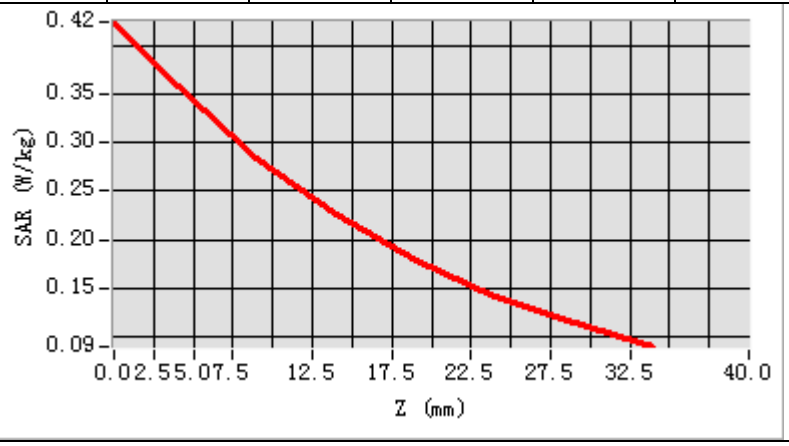
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.419331
Relative permittivity (imaginary part)	20.069847
Conductivity (S/m)	0.932579
Variation (%)	-0.420000

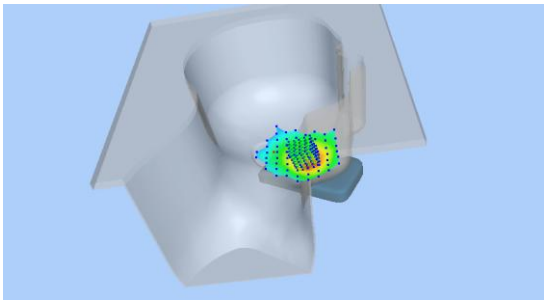
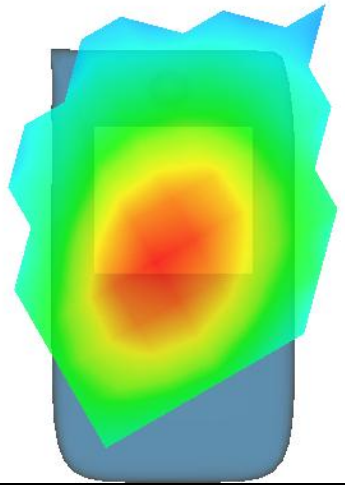
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-35.00
SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)	0.263333
SAR 1g (W/Kg)	0.353974

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.4250	0.3578	0.2848	0.2266	0.1783	0.1416	0.1134



3D screen shot	Hot spot position
	

MEASUREMENT 10

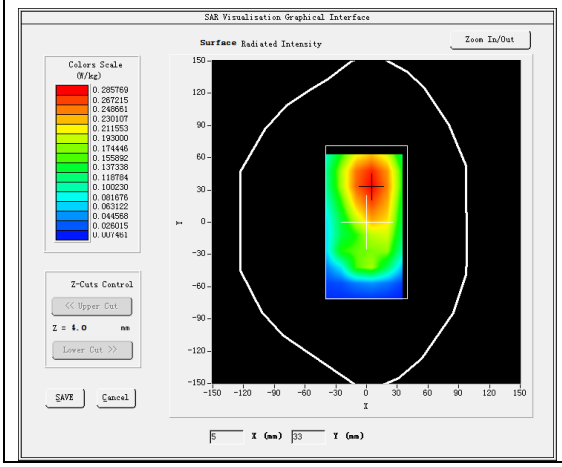
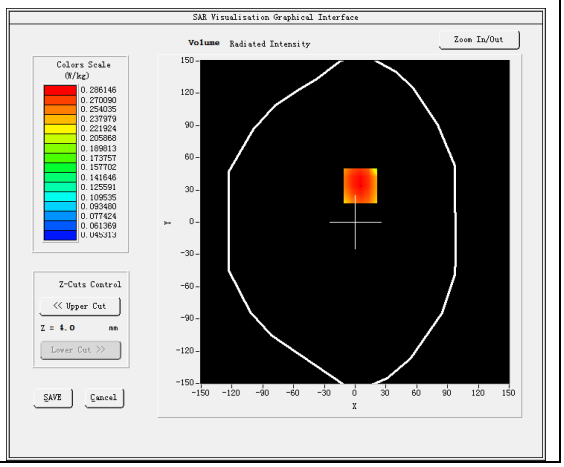
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band5_WCDMA850
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	1.50

B. SAR Measurement Results

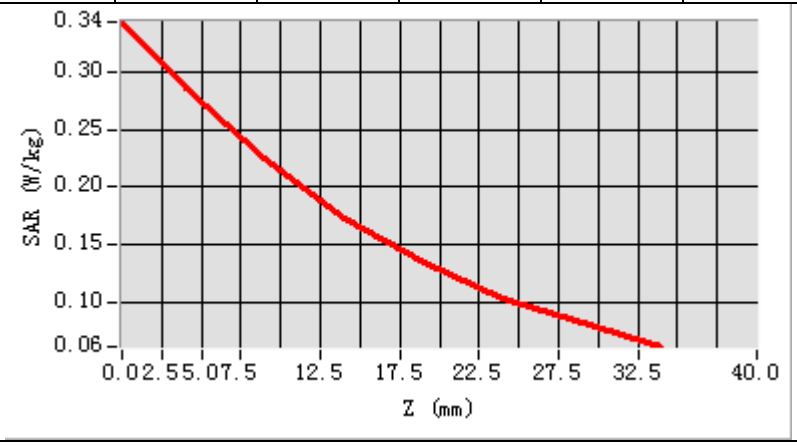
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.419331
Relative permittivity (imaginary part)	20.069847
Conductivity (S/m)	0.932579
Variation (%)	0.210000

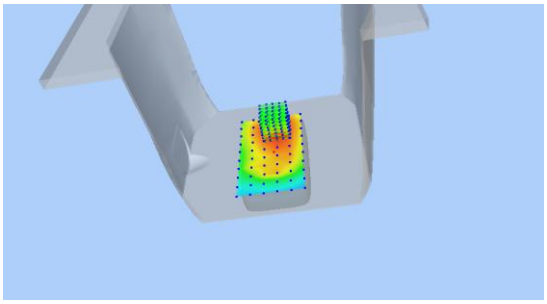
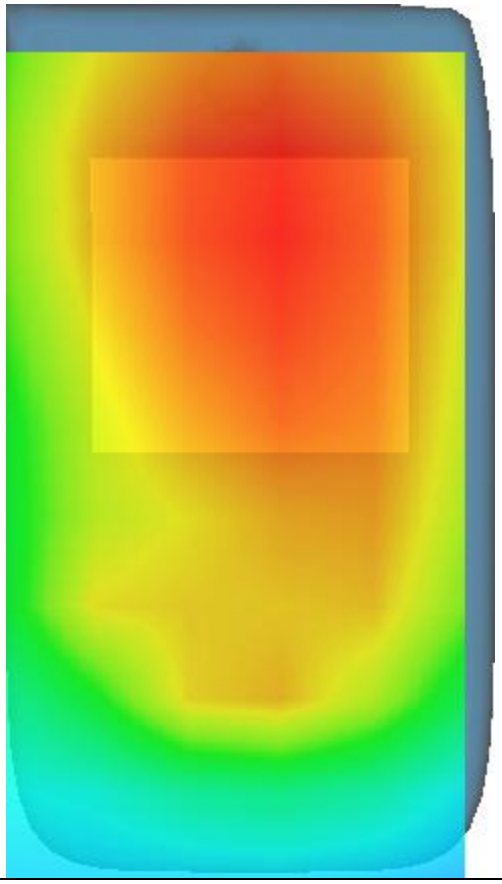
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=34.00
SAR Peak: 0.35 W/kg

SAR 10g (W/Kg)	0.211536
SAR 1g (W/Kg)	0.283489

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.3429	0.2861	0.2242	0.1728	0.1343	0.1040	0.0822



3D screen shot	Hot spot position
	

MEASUREMENT 11

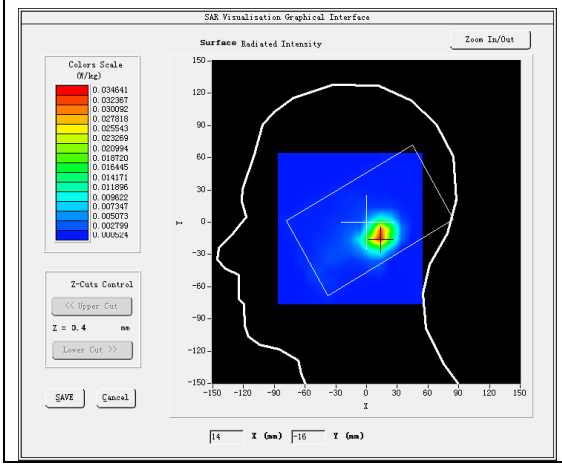
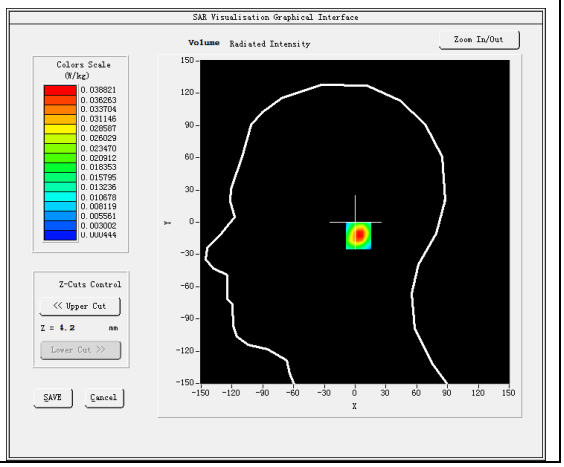
Date of measurement: 6/6/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11a ISM
Channels	Middle
Signal	IEEE802.11a (Crest factor: 1.0)
ConvF	1.80

B. SAR Measurement Results

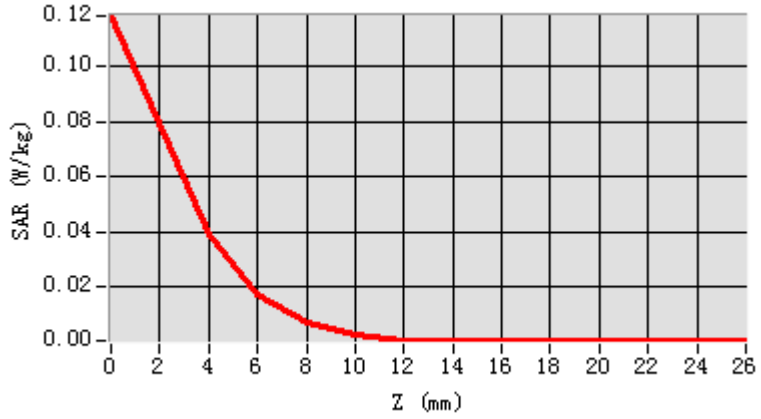
Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.244599
Relative permittivity (imaginary part)	15.809350
Conductivity (S/m)	4.567146
Variation (%)	-2.270000

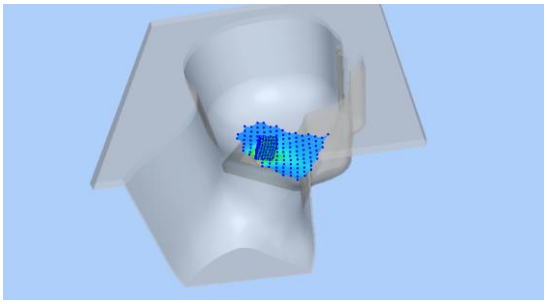
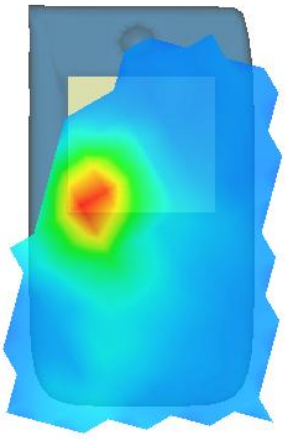
SURFACE SAR	VOLUME SAR
	

Maximum location: X=13.00, Y=-13.00
SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.013791
SAR 1g (W/Kg)	0.040613

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
SAR (W/Kg)	0.1183	0.0388	0.0172	0.0067	0.0026	0.0008	0.0006	0.0004	0.0005	0.0004	0.0005	0.0005



3D screen shot	Hot spot position
	

MEASUREMENT 12

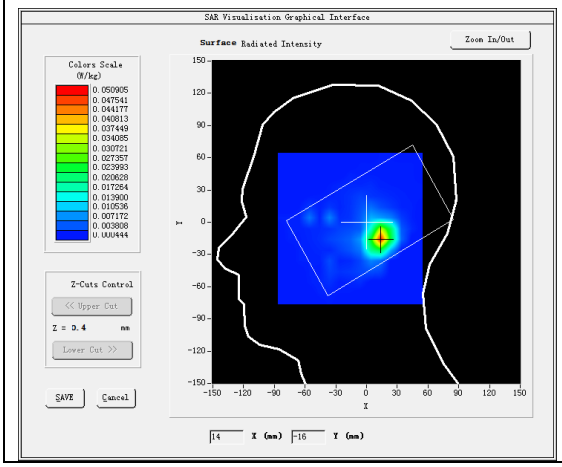
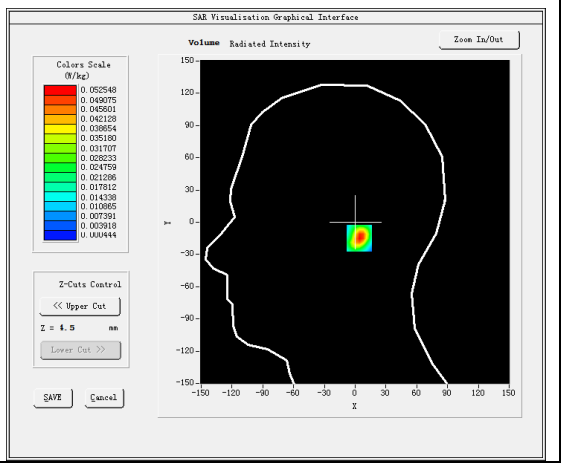
Date of measurement: 5/6/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11a ISM
Channels	High
Signal	IEEE802.11a (Crest factor: 1.0)
ConvF	2.07

B. SAR Measurement Results

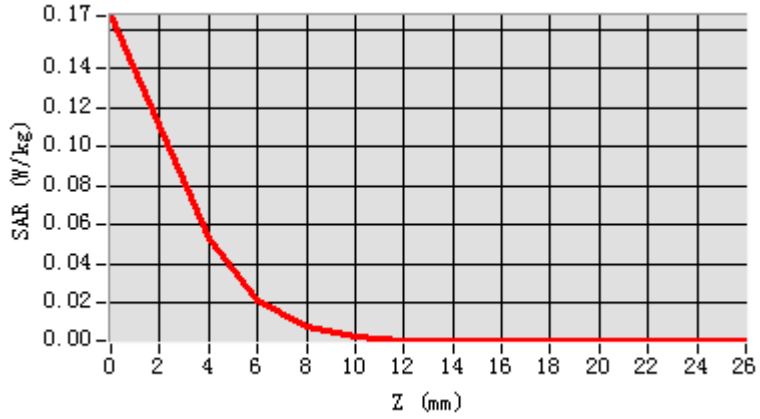
Frequency (MHz)	5795.000000
Relative permittivity (real part)	33.813724
Relative permittivity (imaginary part)	16.275045
Conductivity (S/m)	5.239660
Variation (%)	-0.260000

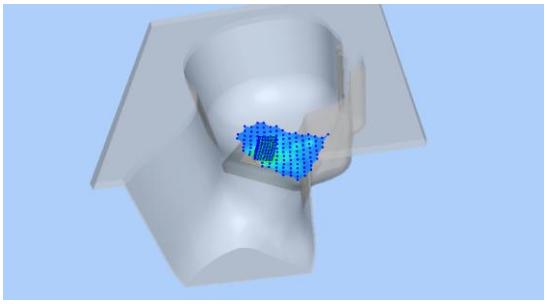
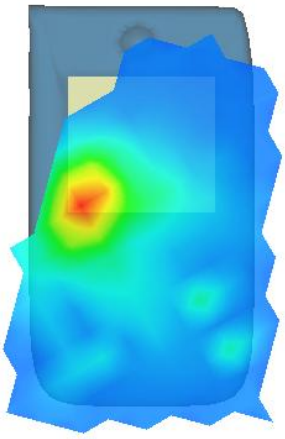
SURFACE SAR	VOLUME SAR
	

Maximum location: X=14.00, Y=-15.00
SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.017637
SAR 1g (W/Kg)	0.054223

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
SAR (W/Kg)	0.1671	0.0525	0.0208	0.0077	0.0028	0.0006	0.0006	0.0005	0.0004	0.0004	0.0004	0.0004



3D screen shot	Hot spot position
	

MEASUREMENT 13

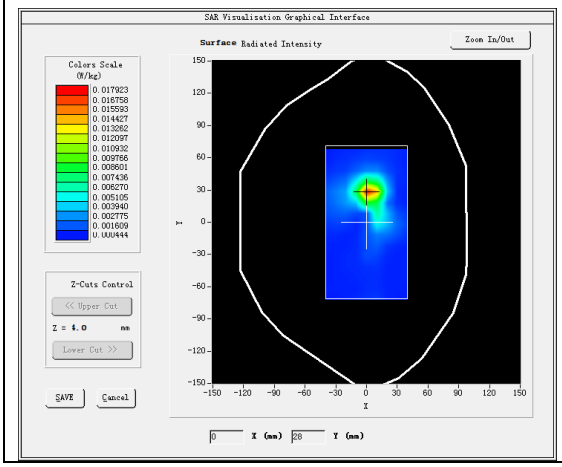
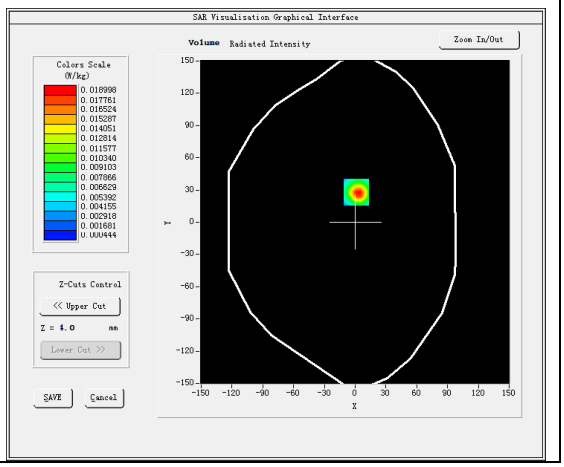
Date of measurement: 6/6/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a ISM
Channels	Middle
Signal	IEEE802.11a (Crest factor: 1.0)
ConvF	1.98

B. SAR Measurement Results

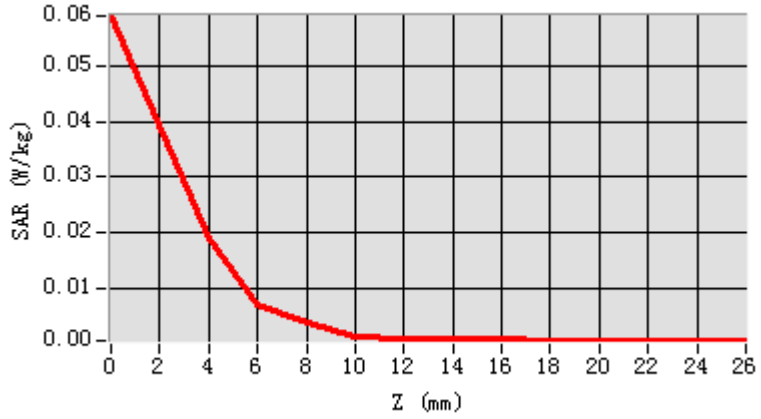
Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.244599
Relative permittivity (imaginary part)	15.809350
Conductivity (S/m)	4.567146
Variation (%)	4.959999

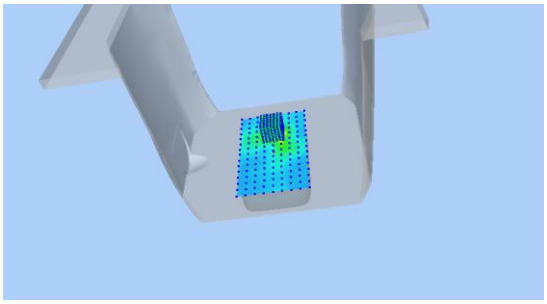
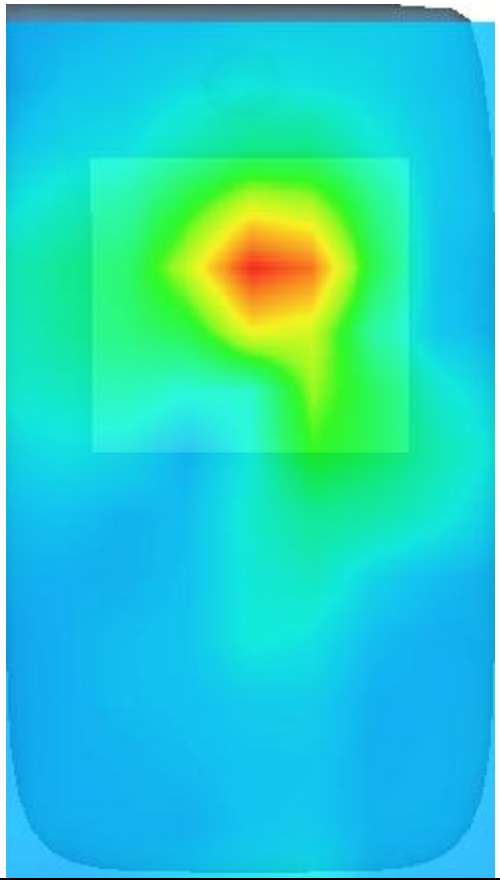
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=28.00
SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.006569
SAR 1g (W/Kg)	0.019553

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
SAR (W/Kg)	0.0592	0.0190	0.0068	0.0039	0.0012	0.0010	0.0007	0.0007	0.0005	0.0006	0.0005	0.0005



3D screen shot	Hot spot position
	

MEASUREMENT 14

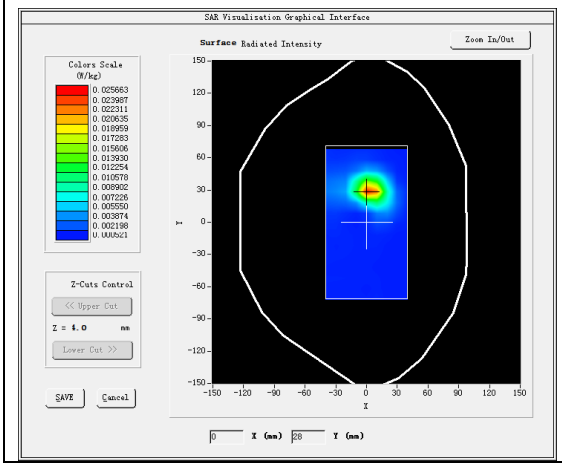
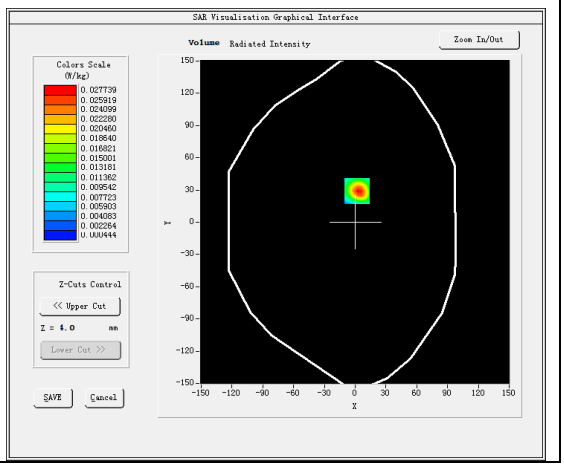
Date of measurement: 5/6/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11n ISM
Channels	High
Signal	IEEE802.11n (Crest factor: 1.0)
ConvF	1.98

B. SAR Measurement Results

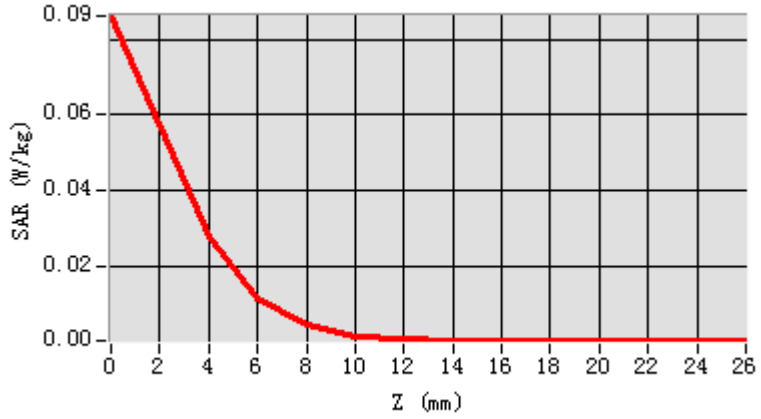
Frequency (MHz)	5795.000000
Relative permittivity (real part)	33.813724
Relative permittivity (imaginary part)	16.275045
Conductivity (S/m)	5.239660
Variation (%)	-0.300000

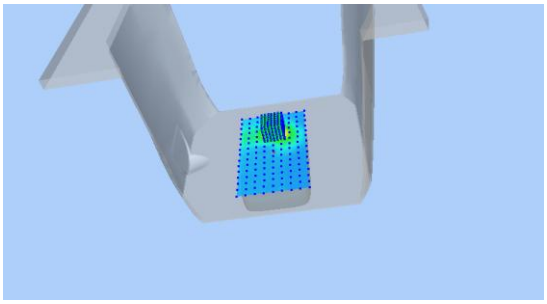
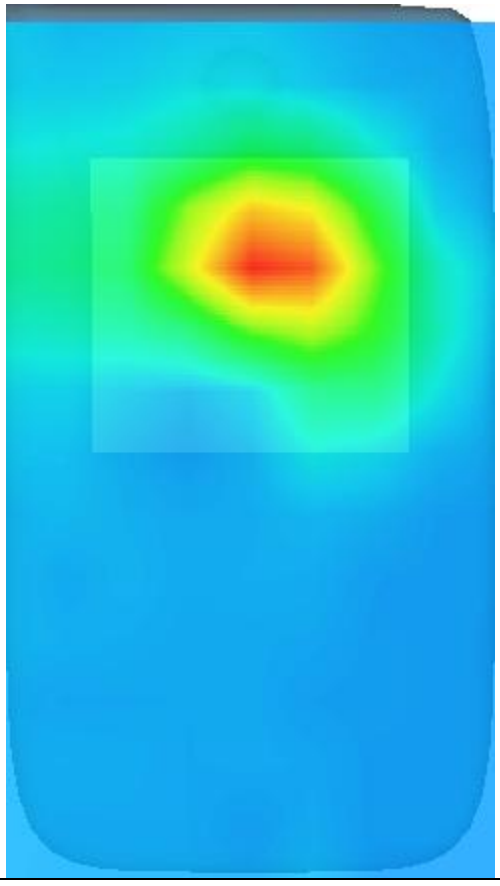
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=29.00
SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.009635
SAR 1g (W/Kg)	0.028723

Z (mm)	0.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
SAR (W/Kg)	0.0861	0.0277	0.0117	0.0048	0.0017	0.0009	0.0006	0.0006	0.0005	0.0006	0.0005	0.0004



3D screen shot	Hot spot position
	

MEASUREMENT 15

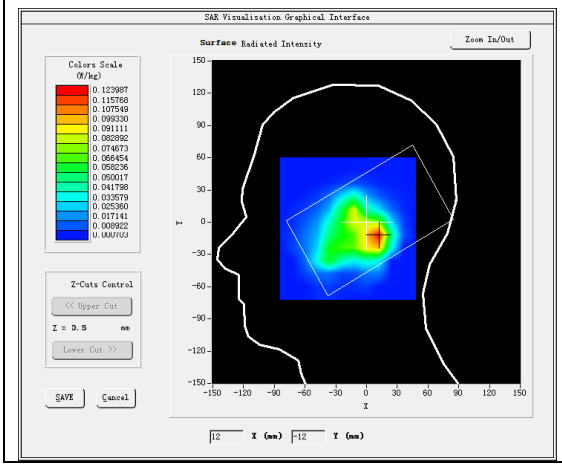
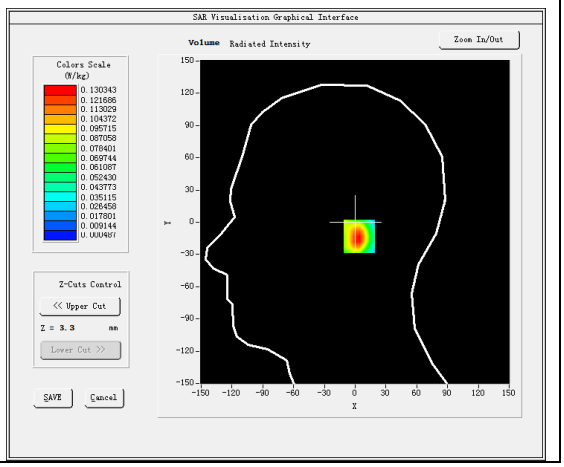
Date of measurement: 30/5/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11b ISM
Channels	High
Signal	IEEE802.11b (Crest factor: 1.0)
ConvF	1.98

B. SAR Measurement Results

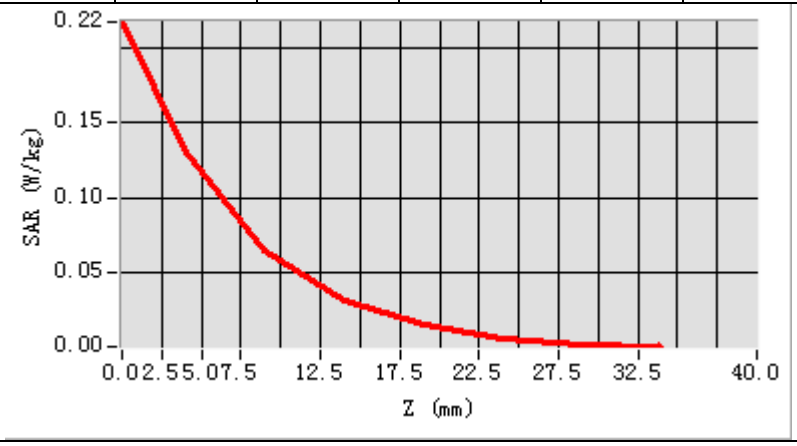
Frequency (MHz)	2462.000000
Relative permittivity (real part)	37.751371
Relative permittivity (imaginary part)	13.320421
Conductivity (S/m)	1.821936
Variation (%)	-1.090000

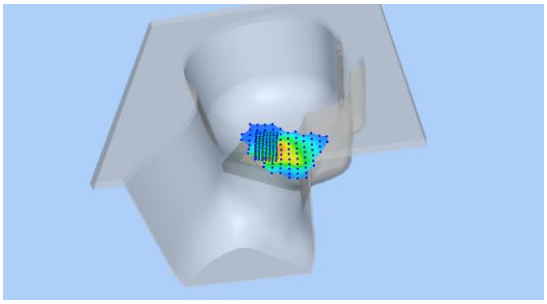
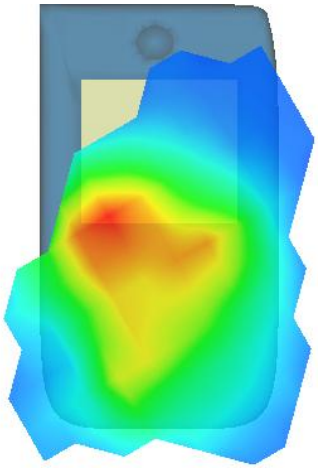
SURFACE SAR	VOLUME SAR
	

Maximum location: X=10.00, Y=-13.00
SAR Peak: 0.22 W/kg

SAR 10g (W/Kg)	0.059798
SAR 1g (W/Kg)	0.123173

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.2171	0.1303	0.0651	0.0316	0.0155	0.0071	0.0032



3D screen shot	Hot spot position
	

MEASUREMENT 16

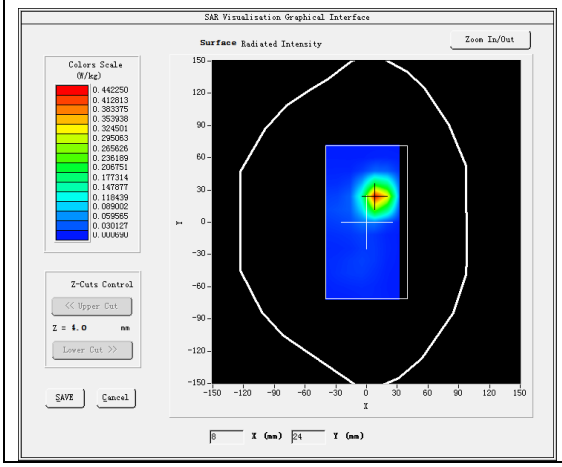
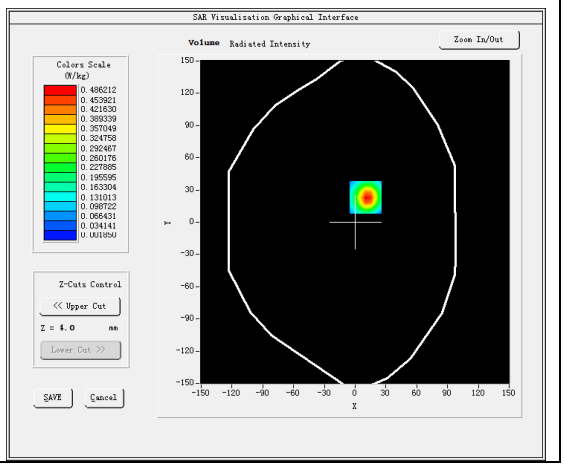
Date of measurement: 30/5/2023

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	High
Signal	IEEE802.11b (Crest factor: 1.0)
ConvF	1.98

B. SAR Measurement Results

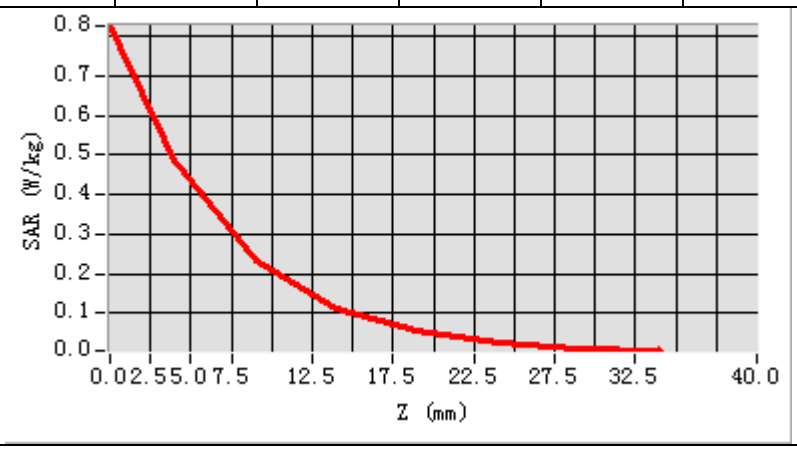
Frequency (MHz)	2462.000000
Relative permittivity (real part)	37.751371
Relative permittivity (imaginary part)	13.320421
Conductivity (S/m)	1.821936
Variation (%)	-1.850000

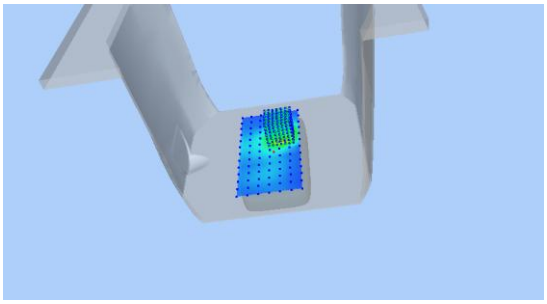
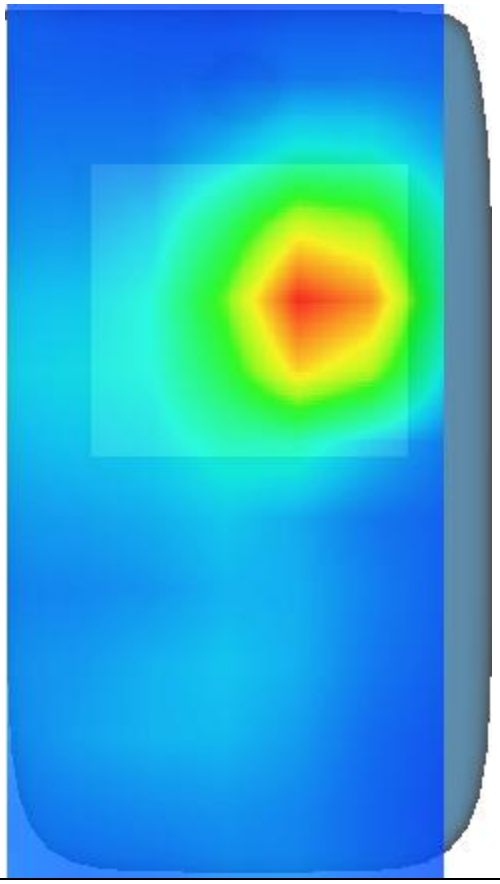
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=10.00, Y=23.00
SAR Peak: 0.83 W/kg

SAR 10g (W/Kg)	0.194024
SAR 1g (W/Kg)	0.254455

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8250	0.4860	0.2326	0.1121	0.0550	0.0274	0.0132



3D screen shot	Hot spot position
	

MEASUREMENT 17

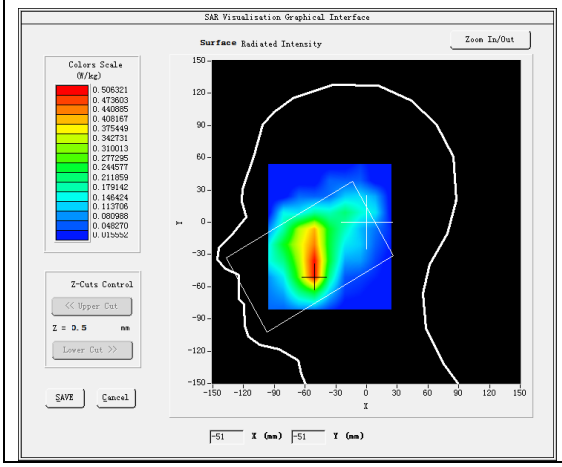
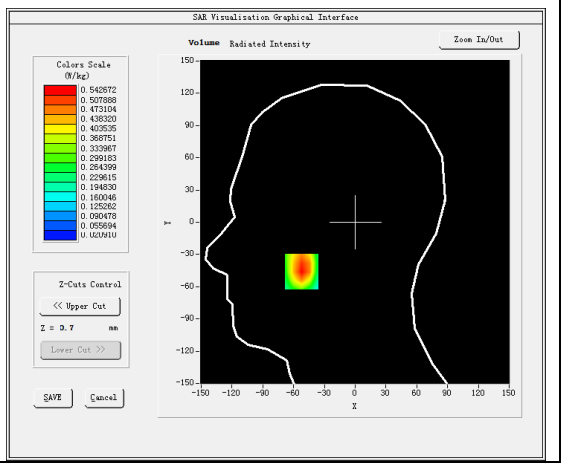
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 2
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.91

B. SAR Measurement Results

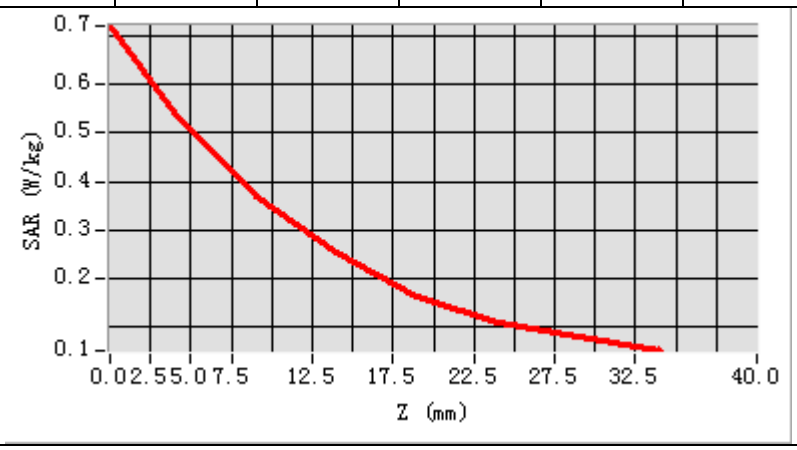
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.565529
Relative permittivity (imaginary part)	13.885053
Conductivity (S/m)	1.450217
Variation (%)	0.080000

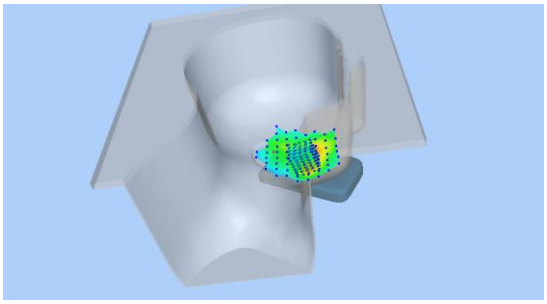
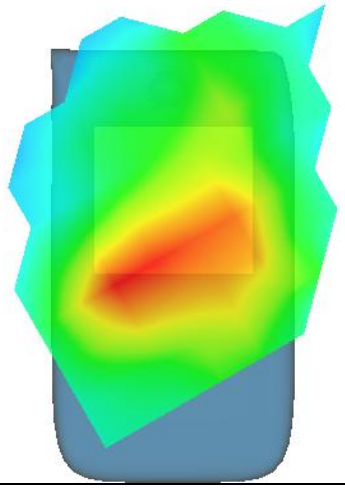
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-46.00
SAR Peak: 0.75 W/kg

SAR 10g (W/Kg)	0.319264
SAR 1g (W/Kg)	0.526743

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7199	0.5427	0.3681	0.2539	0.1647	0.1116	0.0809



3D screen shot	Hot spot position
	

MEASUREMENT 18

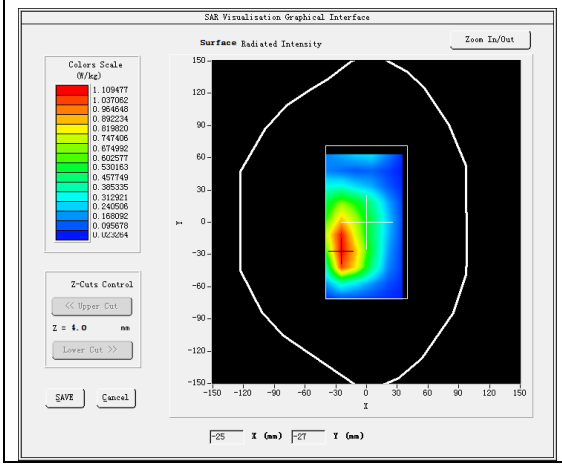
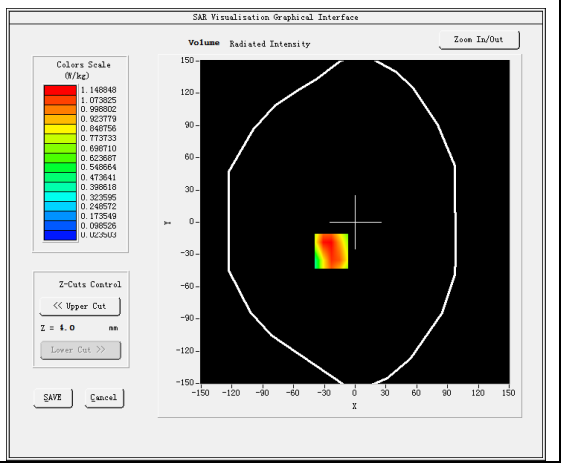
Date of measurement: 14/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.91

B. SAR Measurement Results

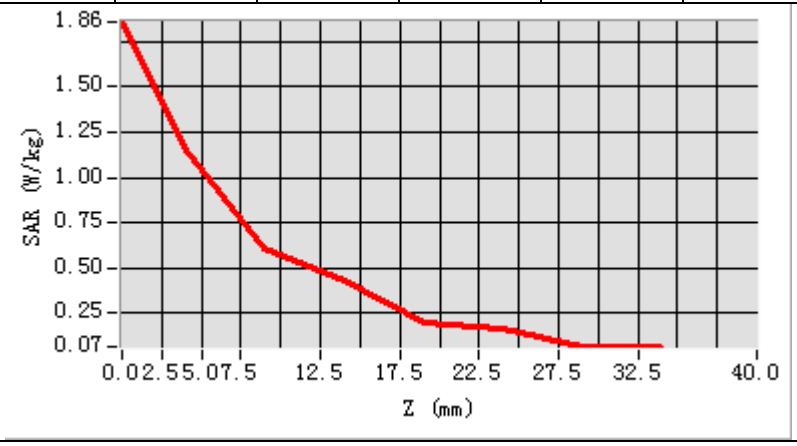
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.565529
Relative permittivity (imaginary part)	13.885053
Conductivity (S/m)	1.450217
Variation (%)	-2.480000

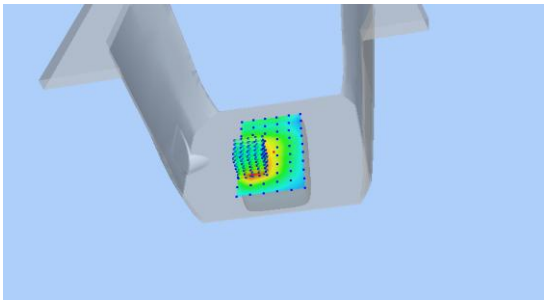
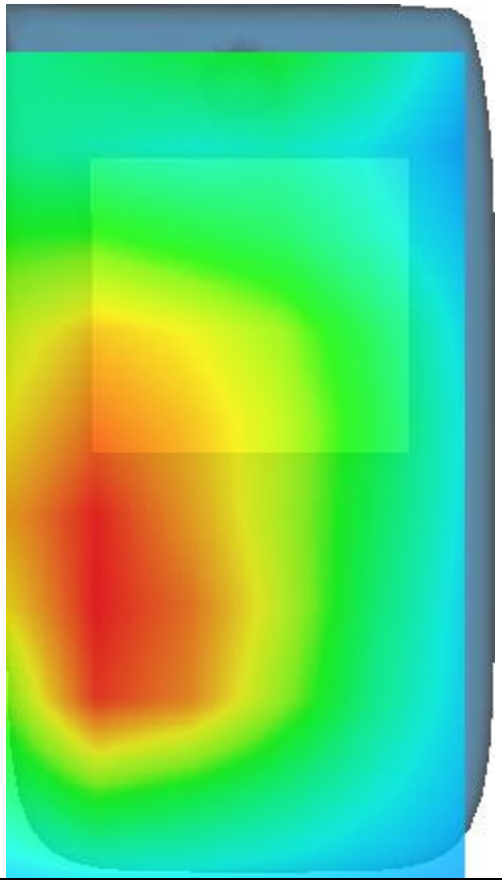
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-23.00, Y=-27.00
SAR Peak: 1.78 W/kg

SAR 10g (W/Kg)	0.647971
SAR 1g (W/Kg)	1.051606

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.8585	1.1488	0.6112	0.4308	0.1977	0.1636	0.0704



3D screen shot	Hot spot position
	

MEASUREMENT 19

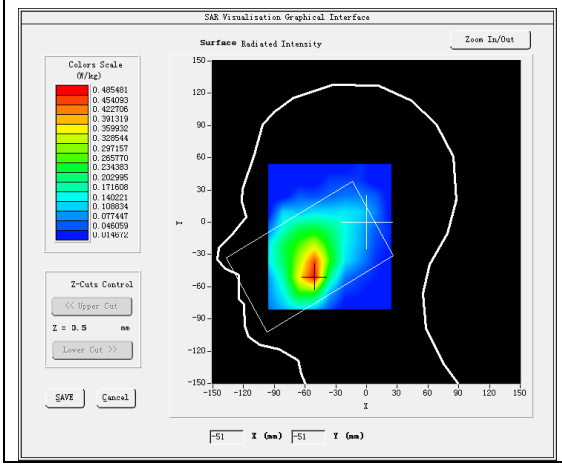
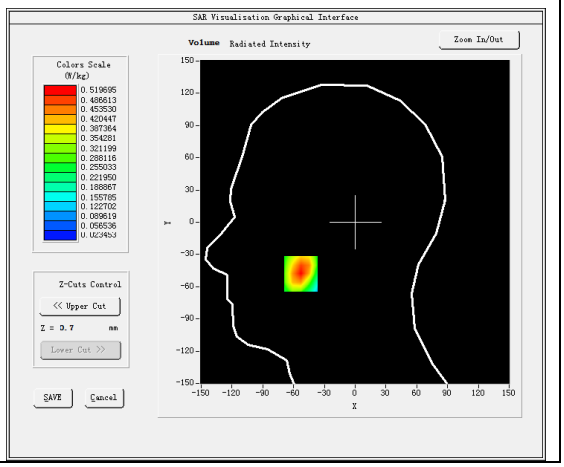
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 4
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

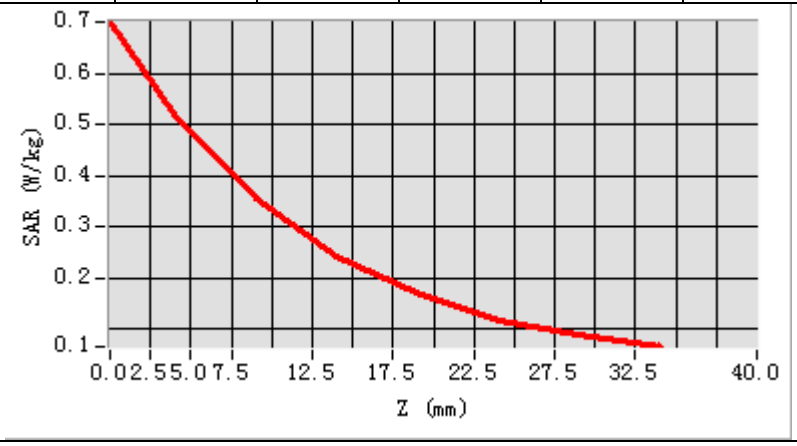
Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.144661
Relative permittivity (imaginary part)	13.784731
Conductivity (S/m)	1.326780
Variation (%)	0.260000

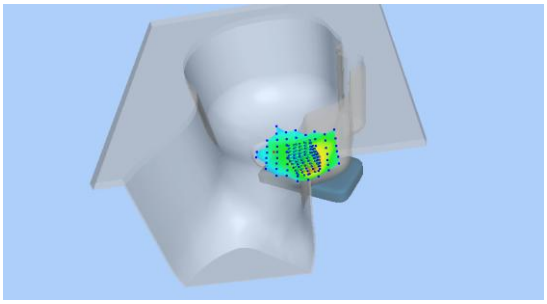
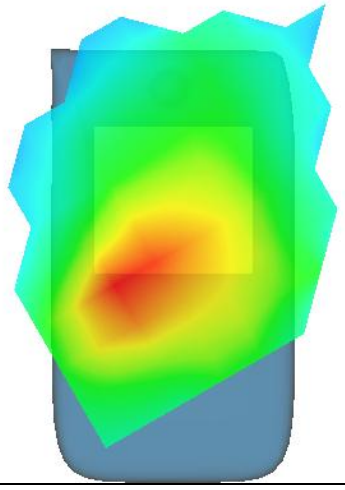
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-53.00, Y=-48.00
SAR Peak: 0.71 W/kg

SAR 10g (W/Kg)	0.308589
SAR 1g (W/Kg)	0.490977

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7016	0.5197	0.3556	0.2422	0.1726	0.1181	0.0900



3D screen shot	Hot spot position
	

MEASUREMENT 20

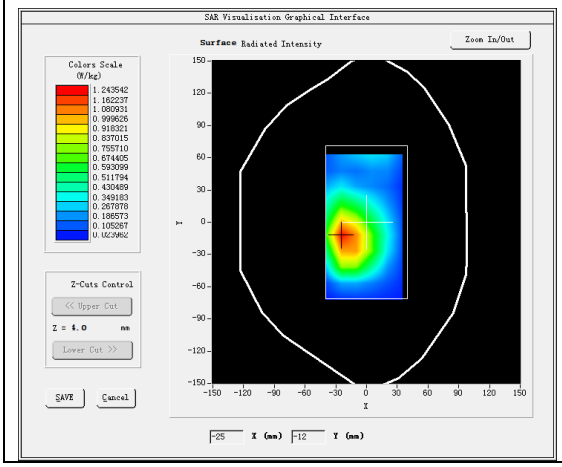
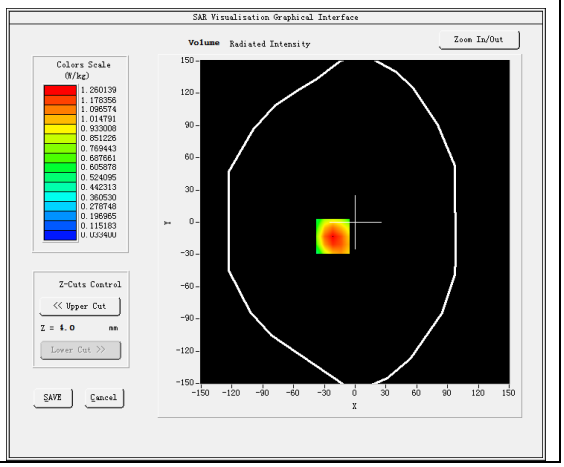
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	High
Signal	LTE (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

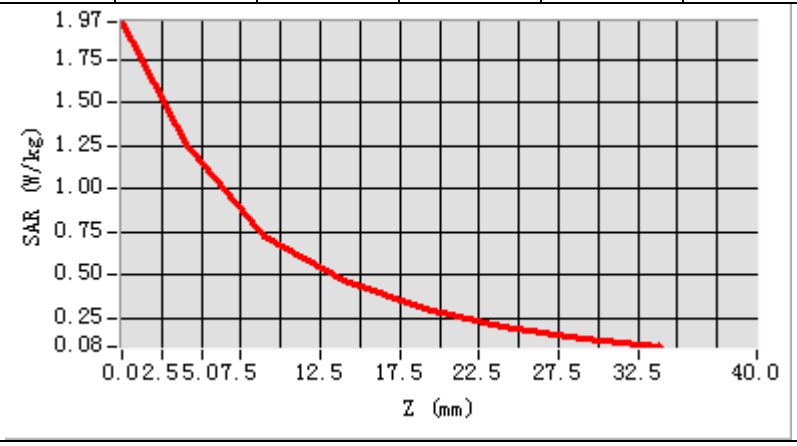
Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.072862
Relative permittivity (imaginary part)	13.782281
Conductivity (S/m)	1.336116
Variation (%)	-1.730000

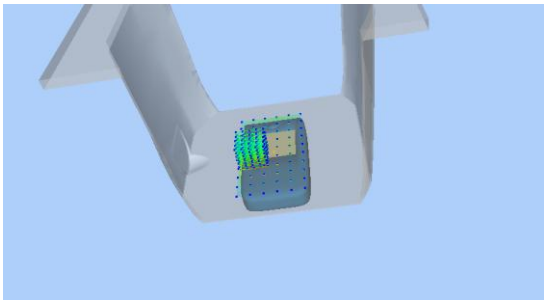
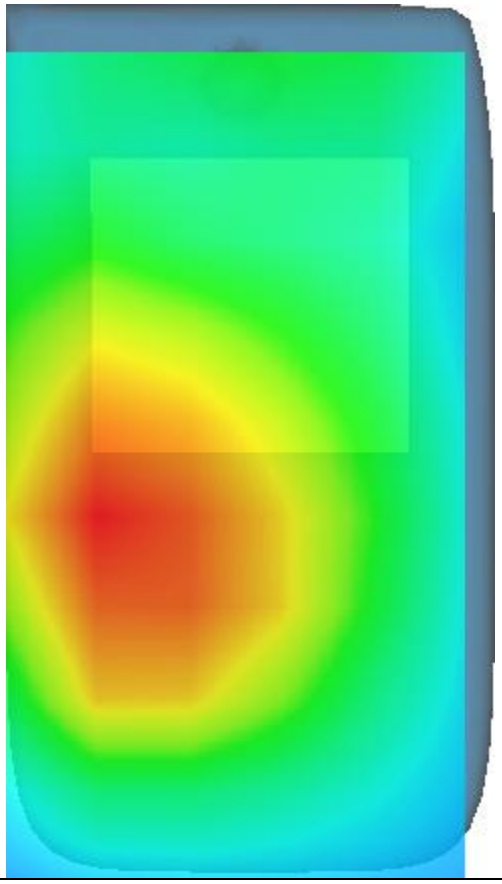
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-22.00, Y=-13.00
SAR Peak: 1.99 W/kg

SAR 10g (W/Kg)	0.718231
SAR 1g (W/Kg)	1.232013

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.9688	1.2601	0.7268	0.4701	0.3027	0.1953	0.1263



3D screen shot	Hot spot position
	

MEASUREMENT 21

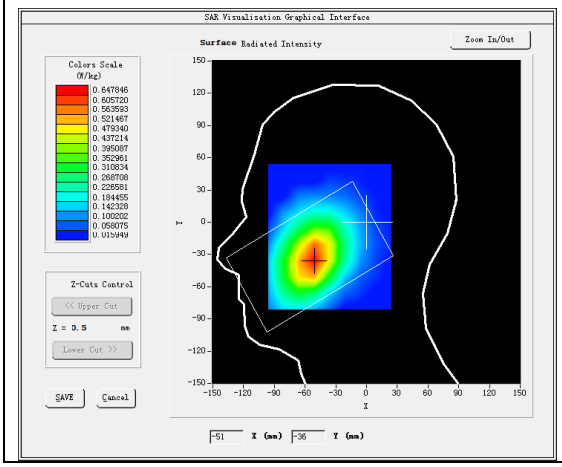
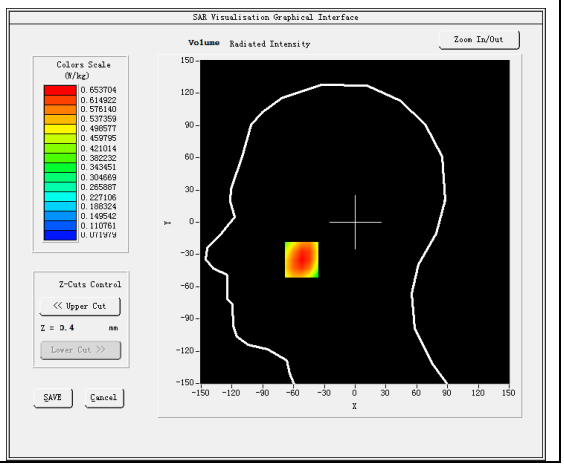
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 5
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.50

B. SAR Measurement Results

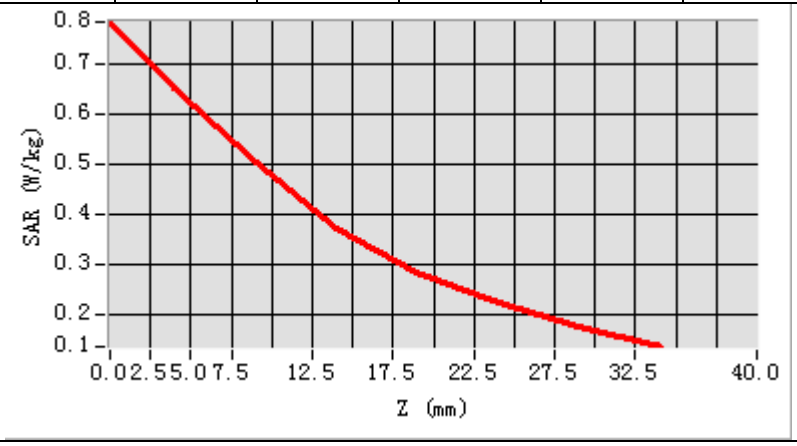
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.421921
Relative permittivity (imaginary part)	20.068506
Conductivity (S/m)	0.932628
Variation (%)	-4.140000

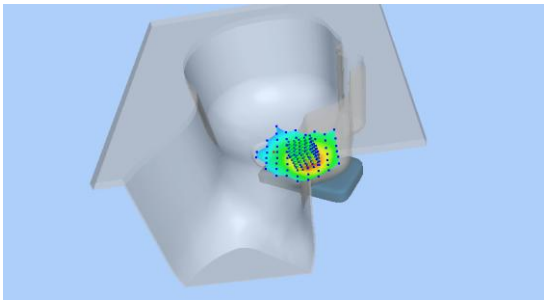
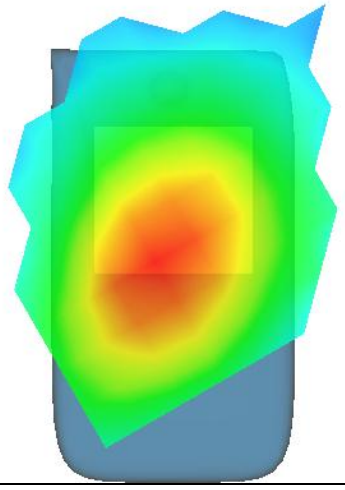
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-52.00, Y=-35.00
SAR Peak: 0.81 W/kg

SAR 10g (W/Kg)	0.457565
SAR 1g (W/Kg)	0.640375

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7861	0.6537	0.5054	0.3727	0.2852	0.2240	0.1761



3D screen shot	Hot spot position
	

MEASUREMENT 22

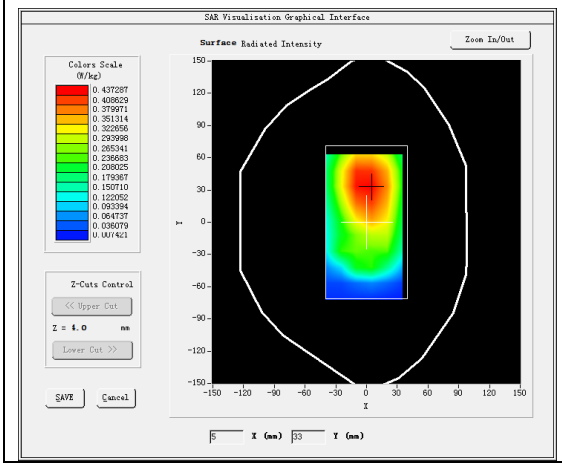
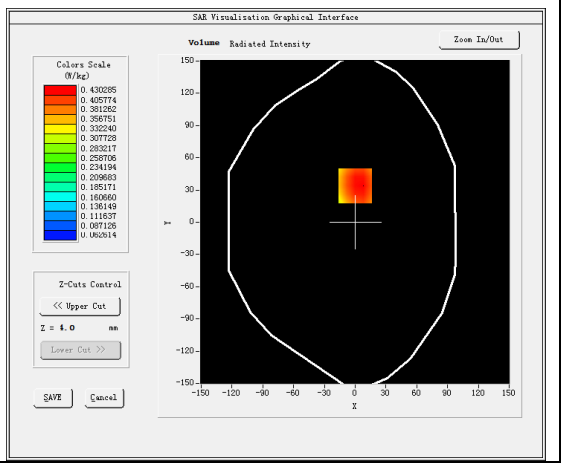
Date of measurement: 12/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.50

B. SAR Measurement Results

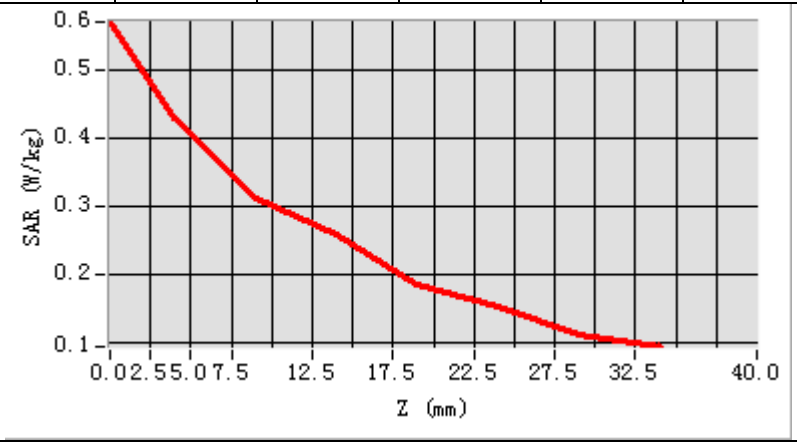
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.421921
Relative permittivity (imaginary part)	20.068506
Conductivity (S/m)	0.932628
Variation (%)	-1.380000

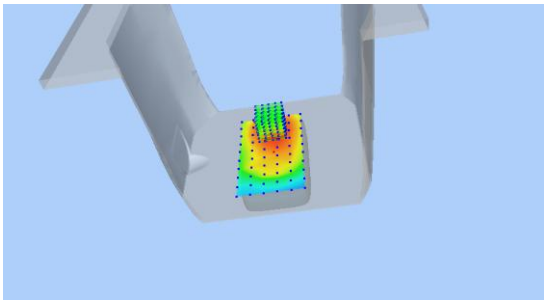
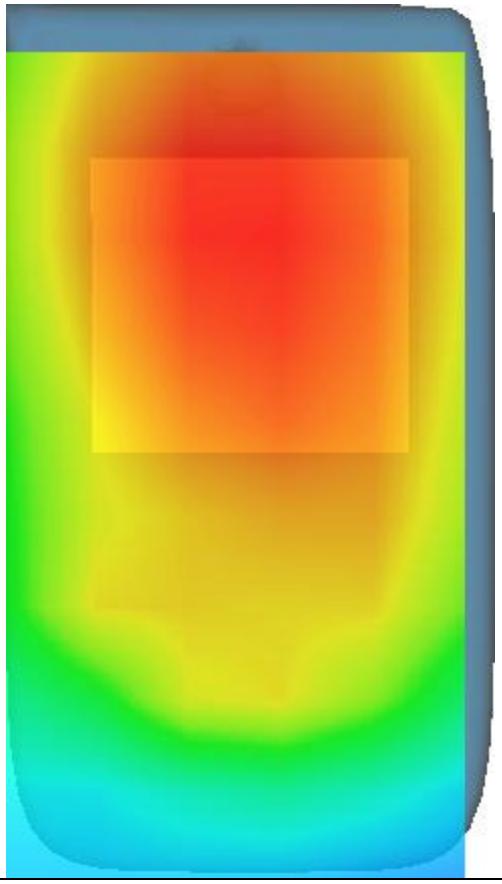
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=0.00, Y=34.00
SAR Peak: 0.53 W/kg

SAR 10g (W/Kg)	0.318338
SAR 1g (W/Kg)	0.429458

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5700	0.4303	0.3118	0.2574	0.1848	0.1526	0.1118



3D screen shot	Hot spot position
	

MEASUREMENT 23

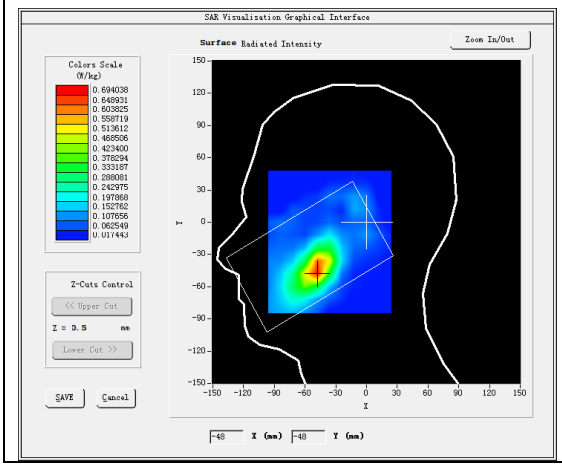
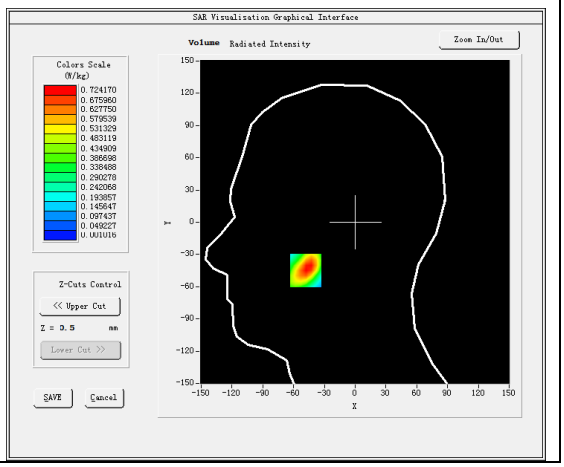
Date of measurement: 22/9/2022

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 7
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.87

B. SAR Measurement Results

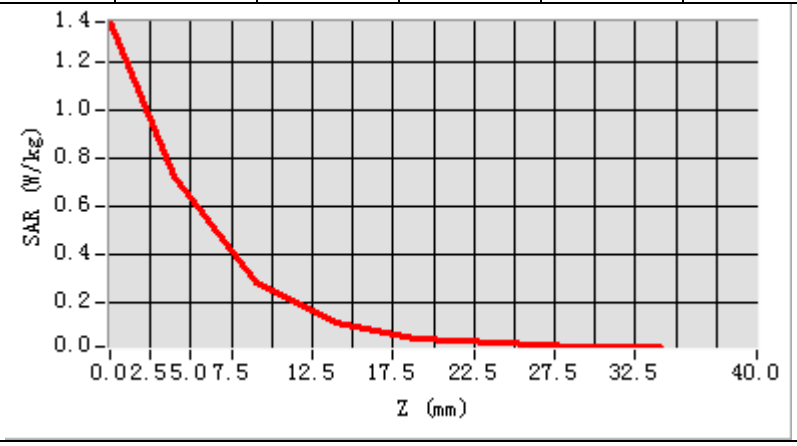
Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.021152
Relative permittivity (imaginary part)	13.111235
Conductivity (S/m)	1.846499
Variation (%)	-1.440000

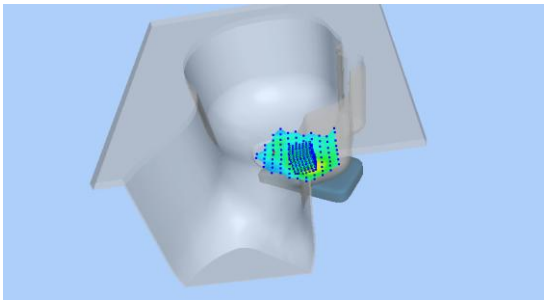
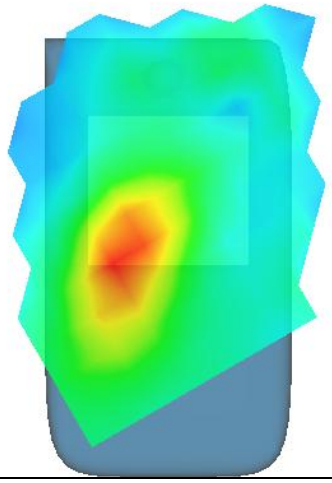
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-48.00, Y=-45.00
SAR Peak: 1.37 W/kg

SAR 10g (W/Kg)	0.304280
SAR 1g (W/Kg)	0.698930

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.3678	0.7242	0.2864	0.1155	0.0484	0.0302	0.0197



3D screen shot	Hot spot position
	

MEASUREMENT 24

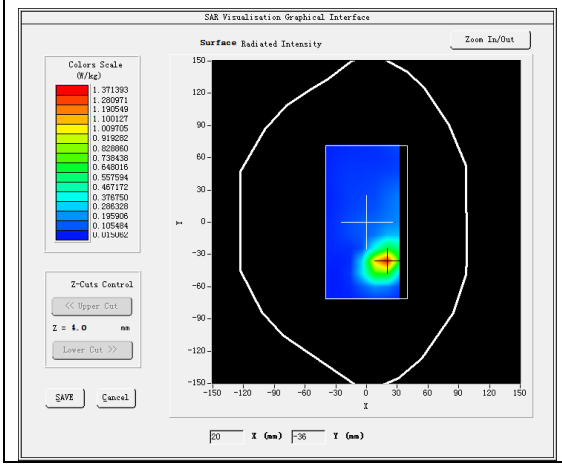
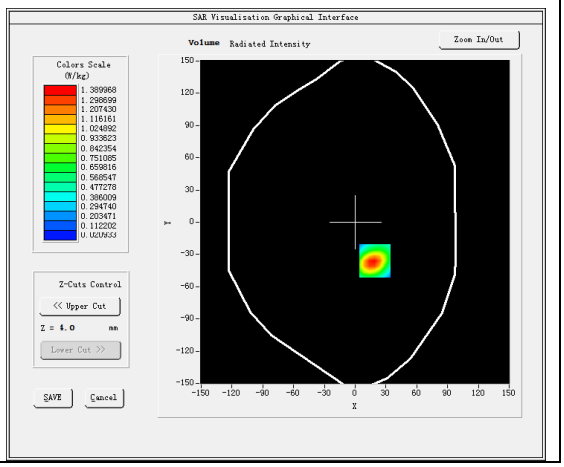
Date of measurement: 22/9/2022

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.87

B. SAR Measurement Results

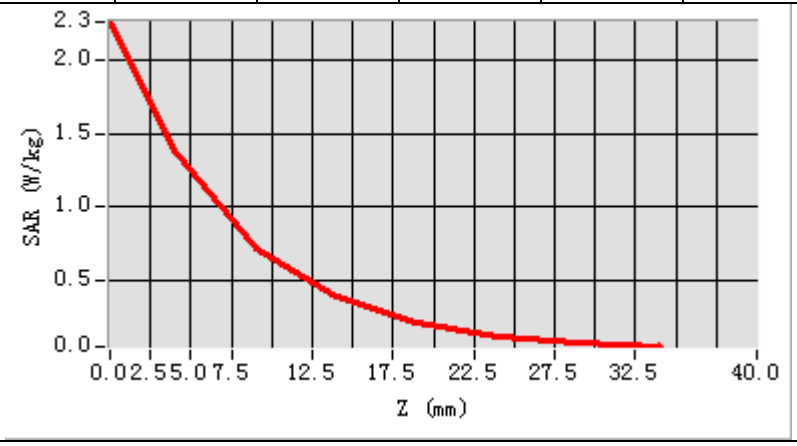
Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.021152
Relative permittivity (imaginary part)	13.111235
Conductivity (S/m)	1.846499
Variation (%)	-0.780000

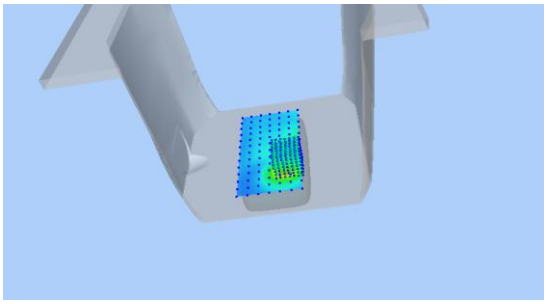
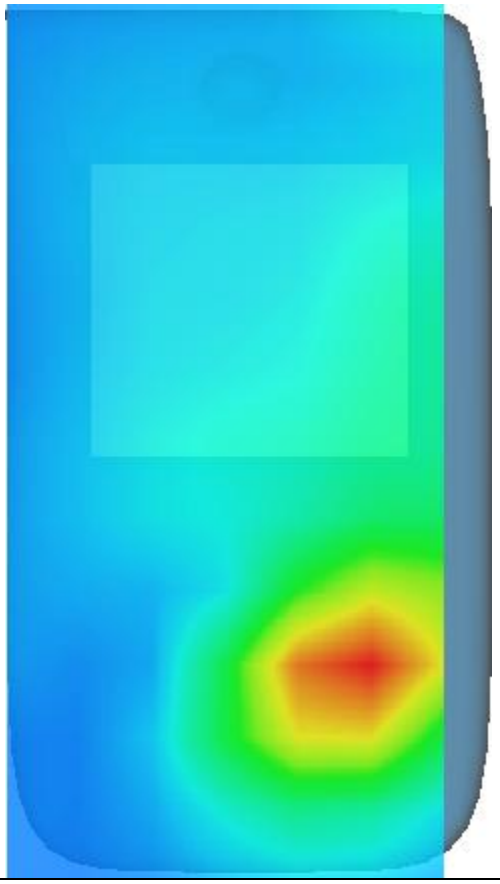
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=19.00, Y=-36.00
SAR Peak: 2.27 W/kg

SAR 10g (W/Kg)	0.620794
SAR 1g (W/Kg)	1.103786

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	2.2673	1.3900	0.7224	0.3803	0.2070	0.1122	0.0698



3D screen shot	Hot spot position
	

MEASUREMENT 25

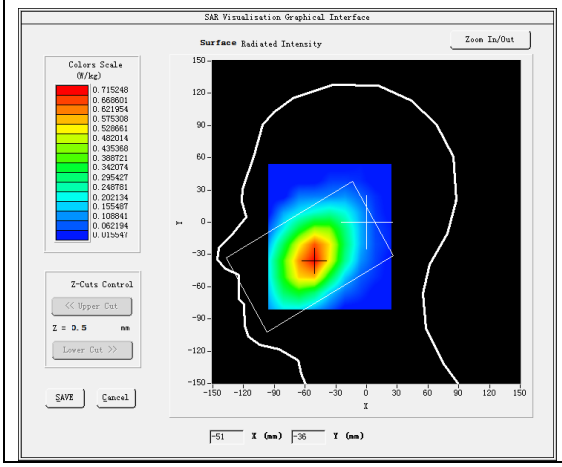
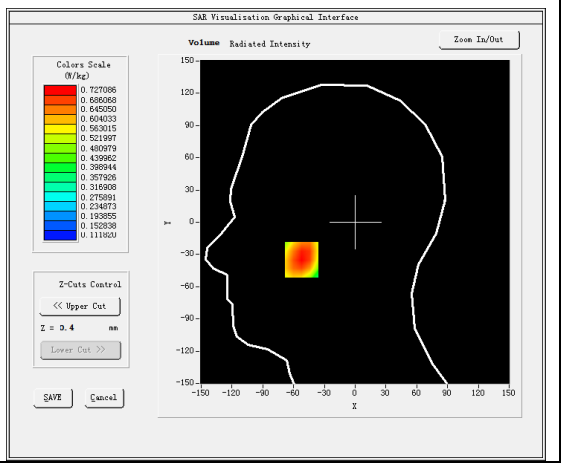
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 12
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

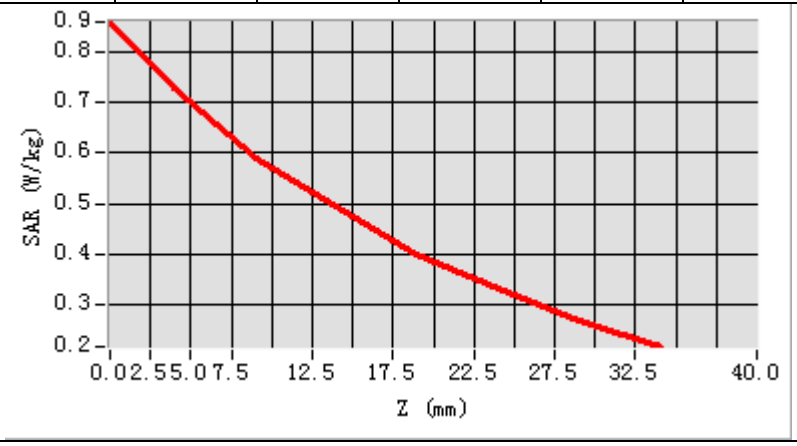
Frequency (MHz)	707.500000
Relative permittivity (real part)	40.672363
Relative permittivity (imaginary part)	21.707848
Conductivity (S/m)	0.853239
Variation (%)	0.310000

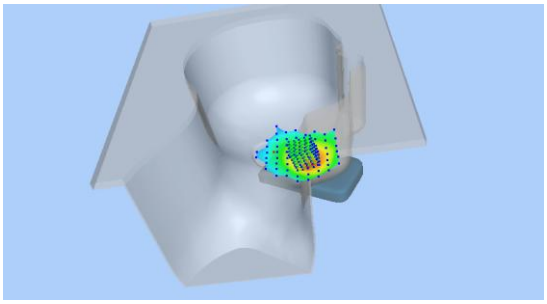
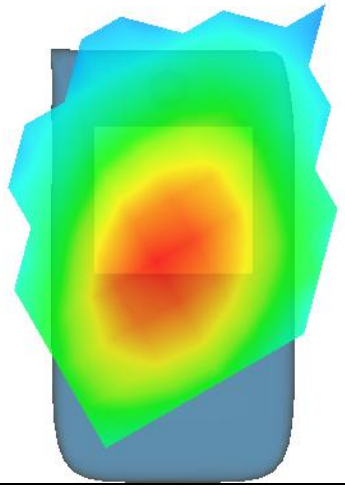
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-35.00
SAR Peak: 0.87 W/kg

SAR 10g (W/Kg)	0.543735
SAR 1g (W/Kg)	0.706204

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8584	0.7271	0.5914	0.4931	0.4003	0.3308	0.2710



3D screen shot	Hot spot position
	

MEASUREMENT 26

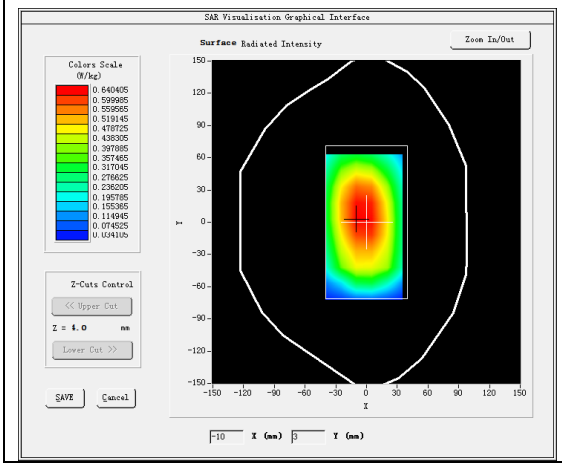
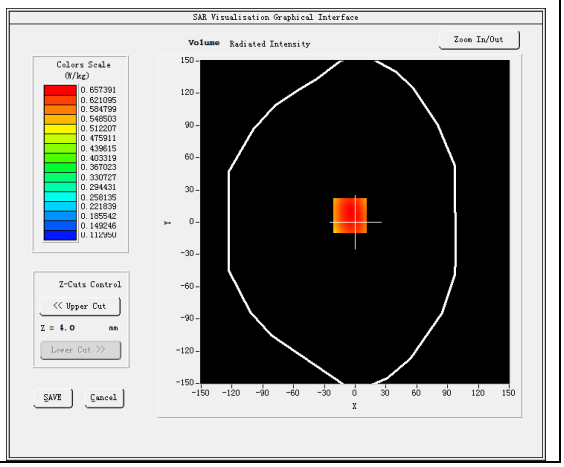
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 12
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

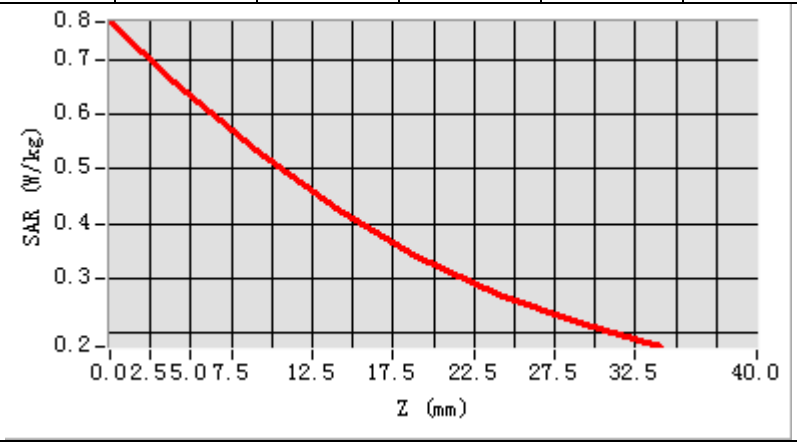
Frequency (MHz)	707.500000
Relative permittivity (real part)	40.672363
Relative permittivity (imaginary part)	21.707848
Conductivity (S/m)	0.853239
Variation (%)	-0.050000

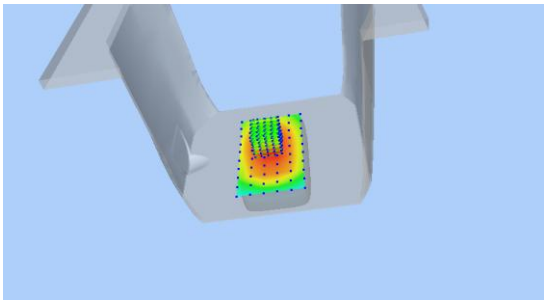
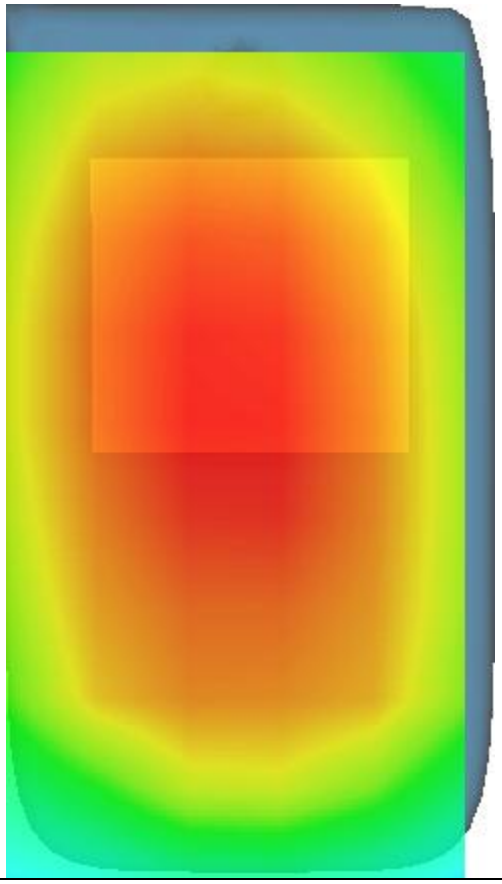
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-5.00, Y=6.00
SAR Peak: 0.78 W/kg

SAR 10g (W/Kg)	0.496491
SAR 1g (W/Kg)	0.639531

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7685	0.6574	0.5323	0.4275	0.3397	0.2692	0.2174



3D screen shot	Hot spot position
	

MEASUREMENT 27

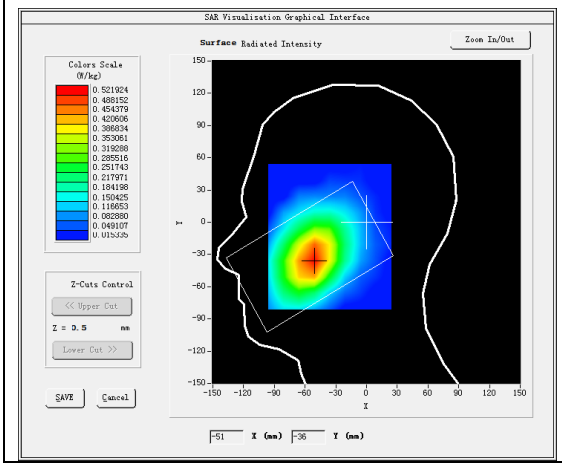
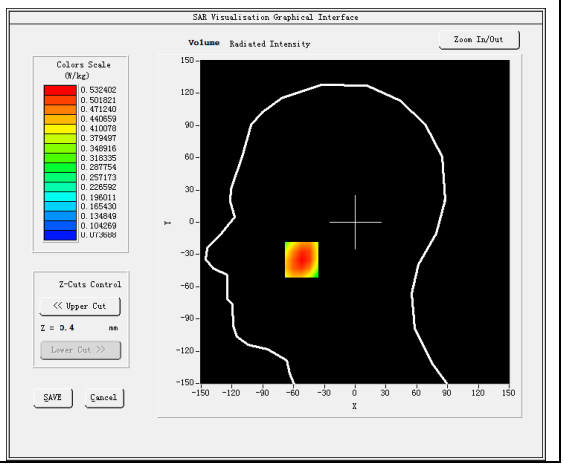
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 13
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

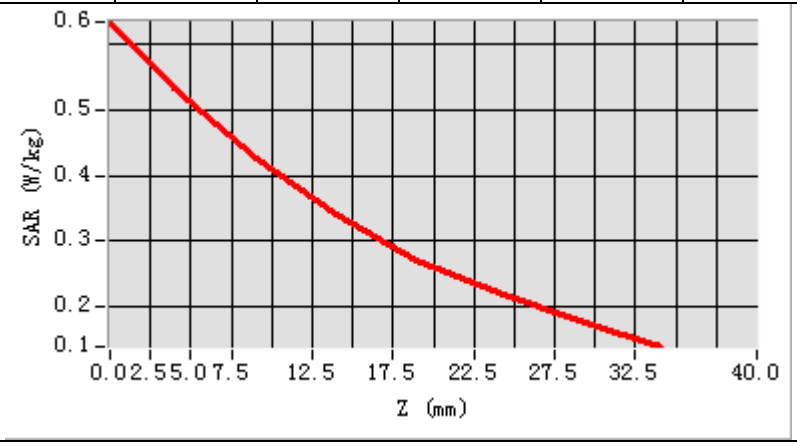
Frequency (MHz)	782.000000
Relative permittivity (real part)	39.784713
Relative permittivity (imaginary part)	20.965398
Conductivity (S/m)	0.910830
Variation (%)	-0.400000

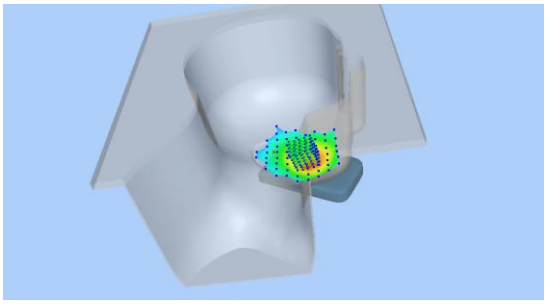
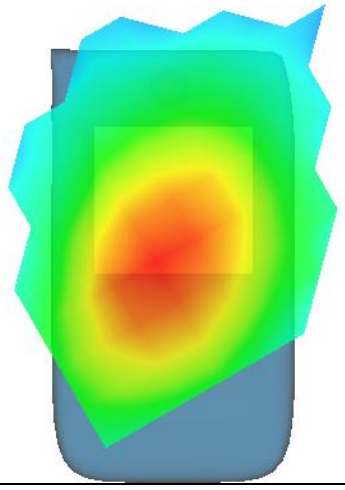
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-35.00
SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.387029
SAR 1g (W/Kg)	0.517489

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6337	0.5324	0.4250	0.3418	0.2718	0.2208	0.1777



3D screen shot	Hot spot position
	

MEASUREMENT 28

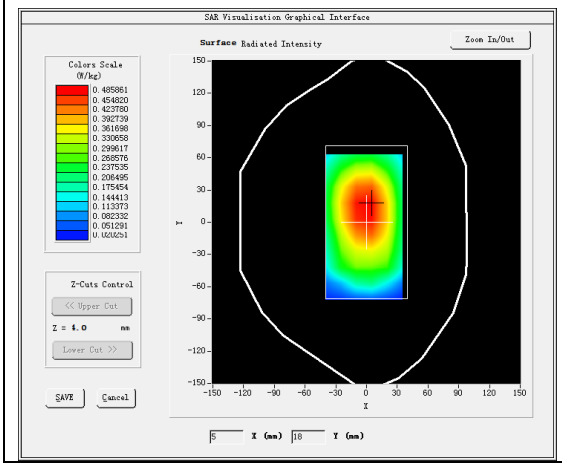
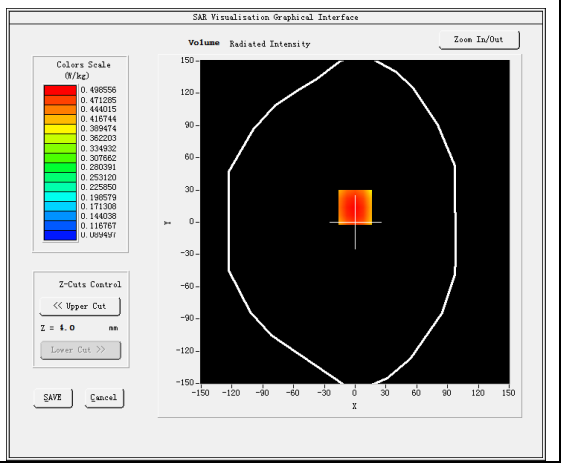
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 13
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

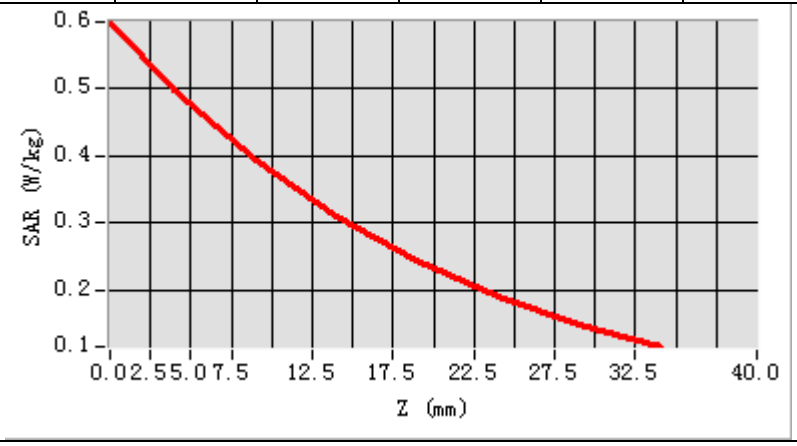
Frequency (MHz)	782.000000
Relative permittivity (real part)	39.784713
Relative permittivity (imaginary part)	20.965398
Conductivity (S/m)	0.910830
Variation (%)	0.120000

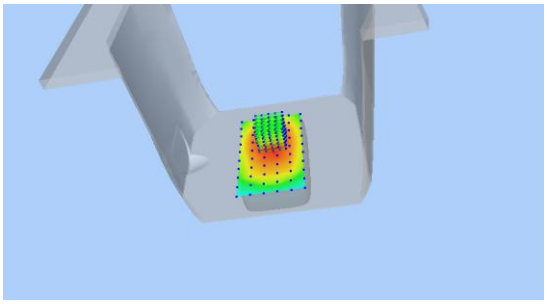
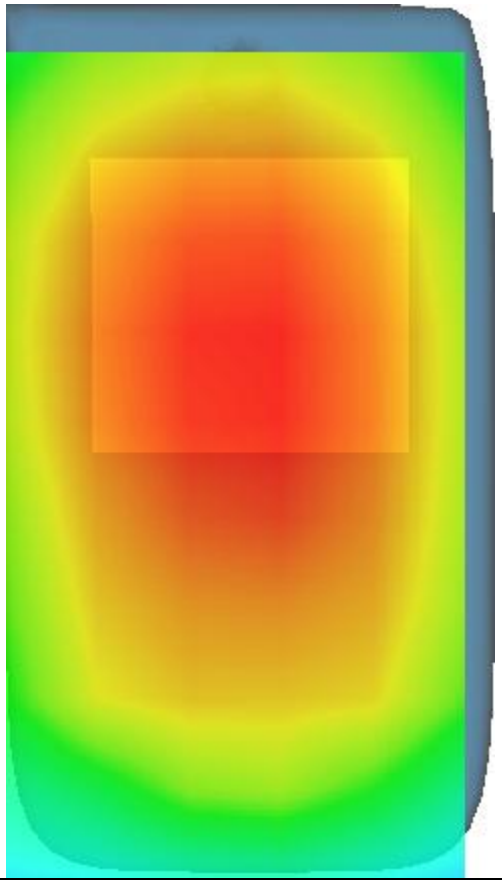
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=0.00, Y=14.00
SAR Peak: 0.60 W/kg

SAR 10g (W/Kg)	0.368414
SAR 1g (W/Kg)	0.487193

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5999	0.4986	0.3953	0.3098	0.2435	0.1924	0.1479



3D screen shot	Hot spot position
	

MEASUREMENT 29

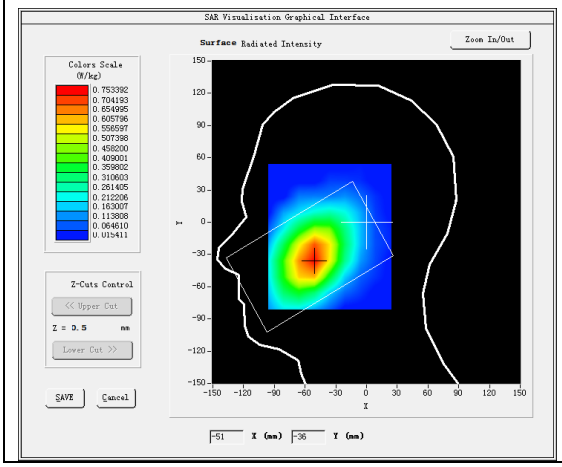
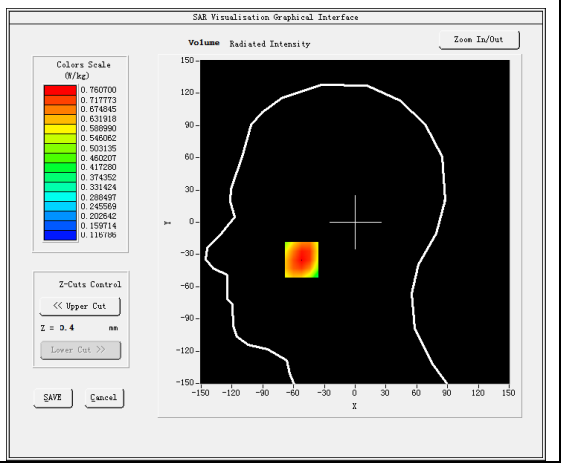
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 17
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

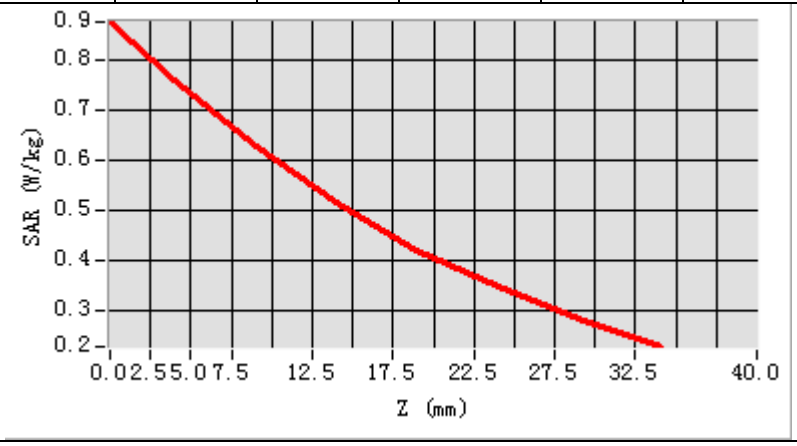
Frequency (MHz)	710.000000
Relative permittivity (real part)	40.657013
Relative permittivity (imaginary part)	21.648298
Conductivity (S/m)	0.853905
Variation (%)	0.070000

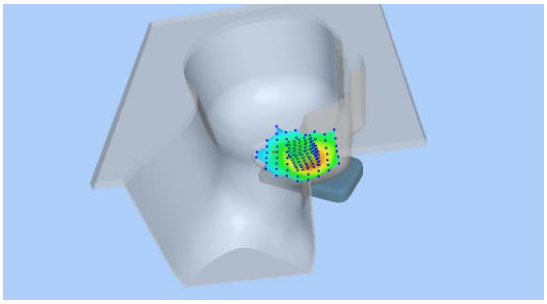
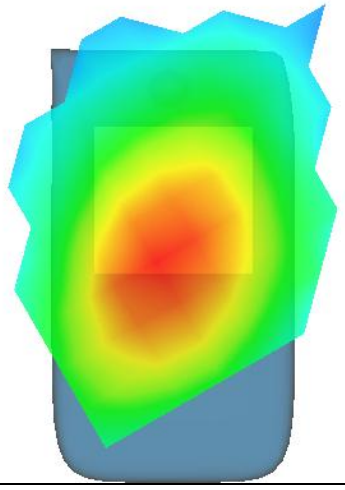
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-52.00, Y=-35.00
SAR Peak: 0.91 W/kg

SAR 10g (W/Kg)	0.569522
SAR 1g (W/Kg)	0.738453

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8781	0.7607	0.6275	0.5180	0.4206	0.3474	0.2836



3D screen shot	Hot spot position
	

MEASUREMENT 30

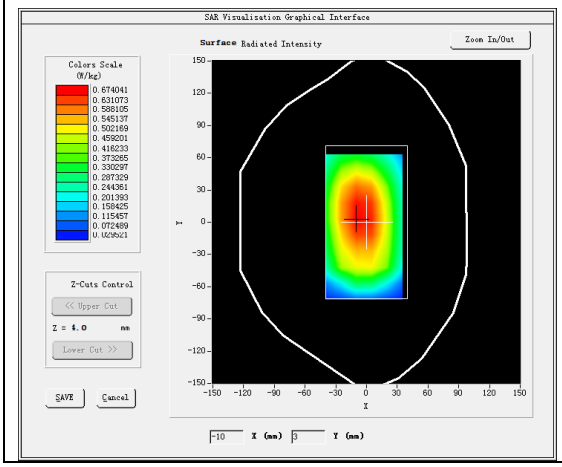
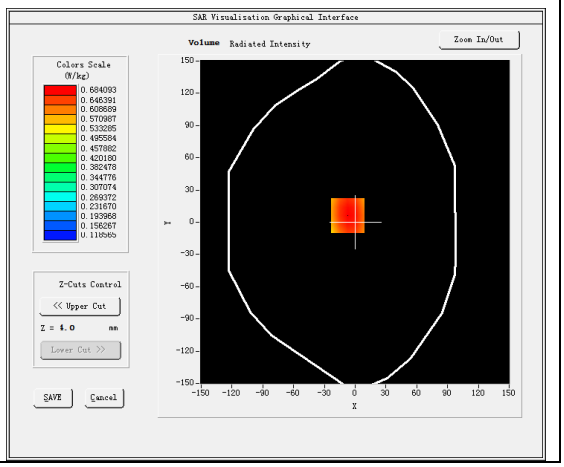
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 17
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

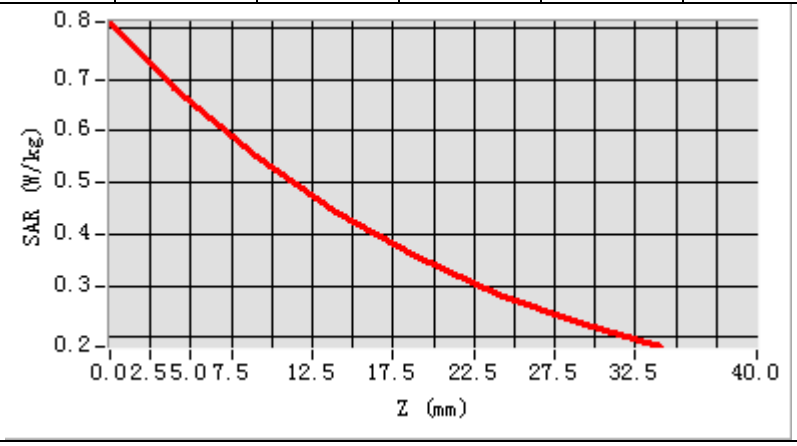
Frequency (MHz)	710.000000
Relative permittivity (real part)	40.657013
Relative permittivity (imaginary part)	21.648298
Conductivity (S/m)	0.853905
Variation (%)	-0.020000

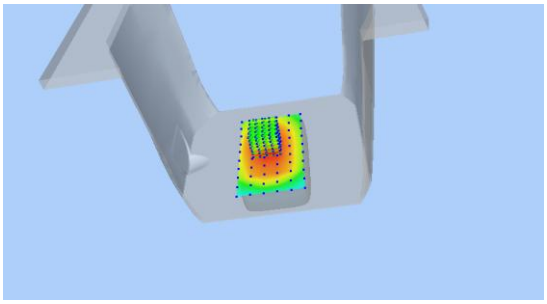
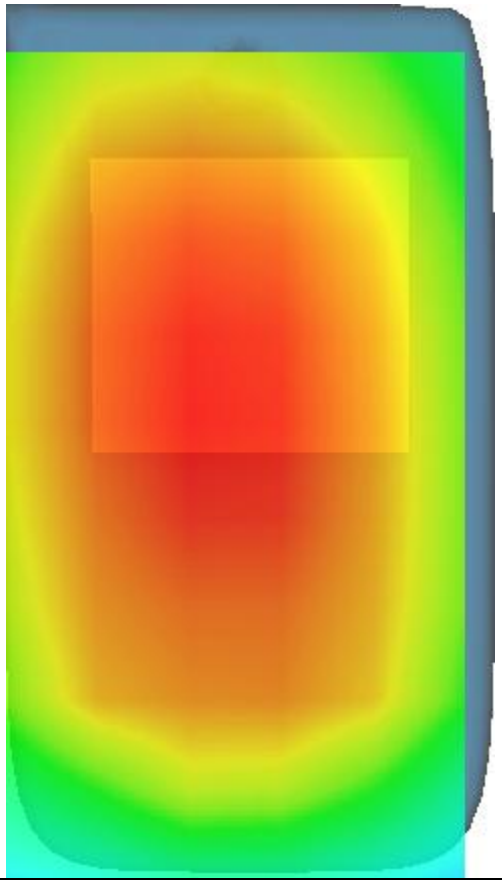
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-7.00, Y=6.00
SAR Peak: 0.81 W/kg

SAR 10g (W/Kg)	0.515925
SAR 1g (W/Kg)	0.665723

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8107	0.6841	0.5513	0.4433	0.3563	0.2815	0.2273



3D screen shot	Hot spot position
	

MEASUREMENT 31

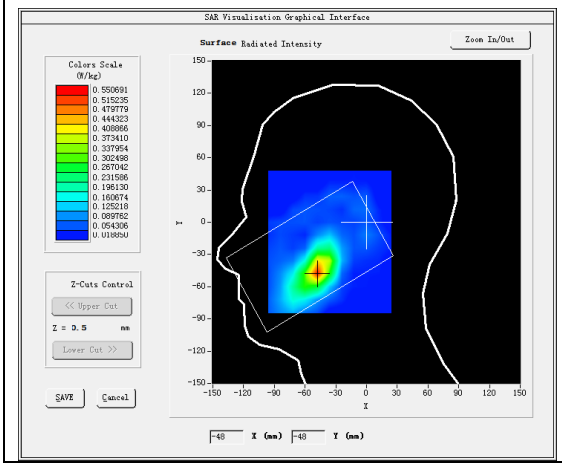
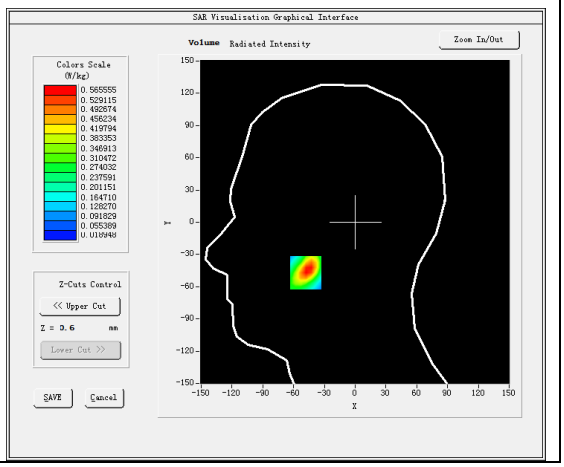
Date of measurement: 22/9/2022

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 41
Channels	Middle
Signal	LTE (Crest factor: 1.6)
ConvF	1.87

B. SAR Measurement Results

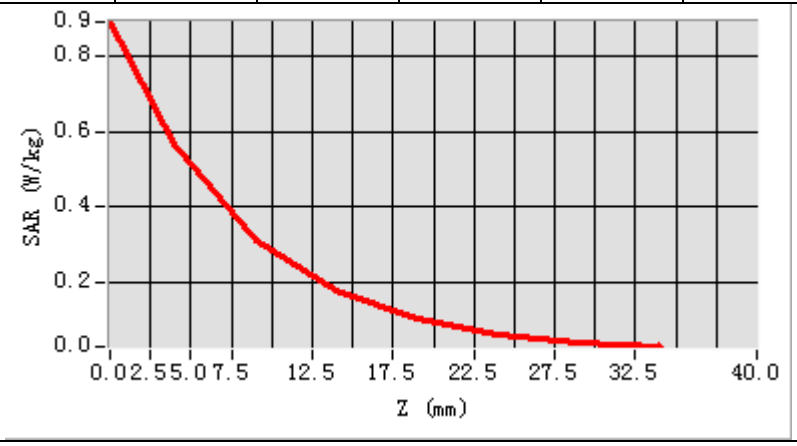
Frequency (MHz)	2593.000000
Relative permittivity (real part)	37.739651
Relative permittivity (imaginary part)	13.274835
Conductivity (S/m)	1.912314
Variation (%)	-2.370000

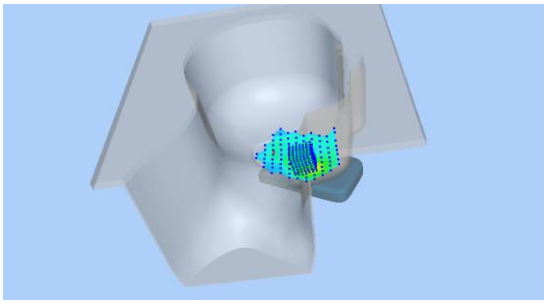
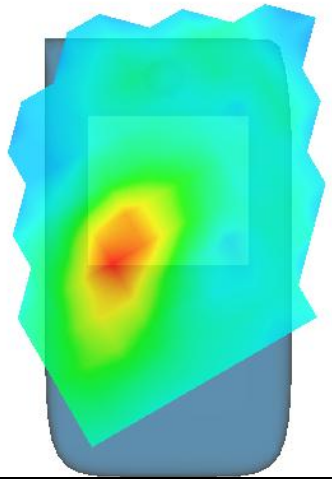
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-47.00
SAR Peak: 0.90 W/kg

SAR 10g (W/Kg)	0.264236
SAR 1g (W/Kg)	0.529680

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8880	0.5656	0.3140	0.1802	0.1062	0.0628	0.0431



3D screen shot	Hot spot position
	

MEASUREMENT 32

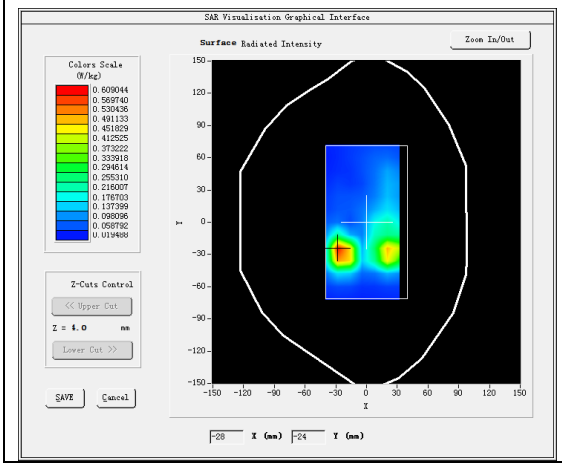
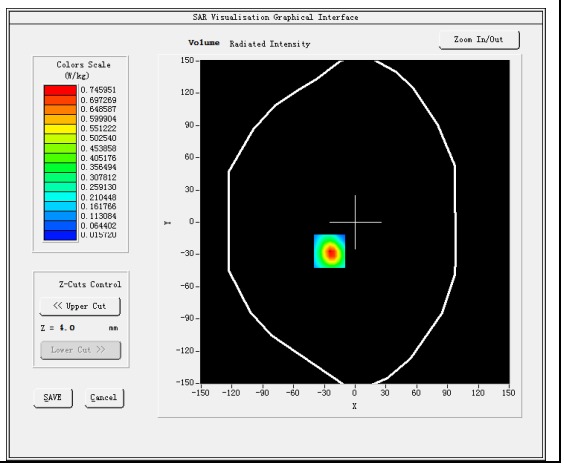
Date of measurement: 22/9/2022

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 41
Channels	Middle
Signal	LTE (Crest factor: 1.6)
ConvF	1.87

B. SAR Measurement Results

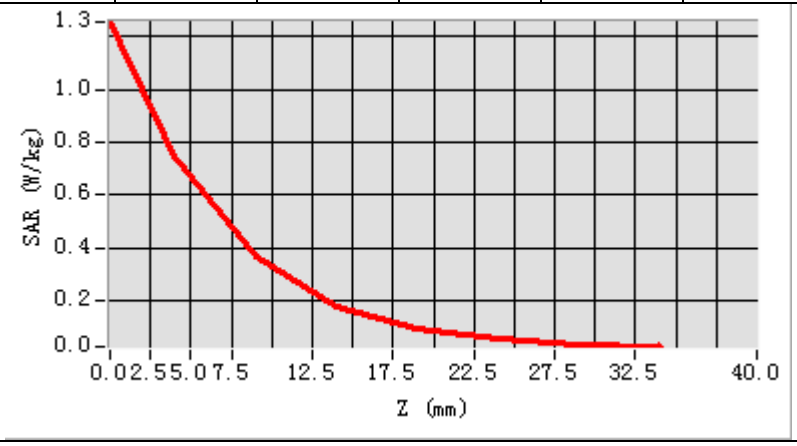
Frequency (MHz)	2593.000000
Relative permittivity (real part)	37.739651
Relative permittivity (imaginary part)	13.274835
Conductivity (S/m)	1.912314
Variation (%)	0.600000

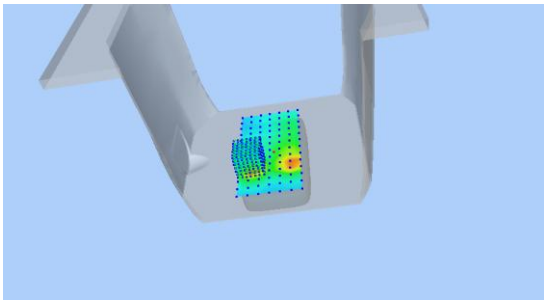
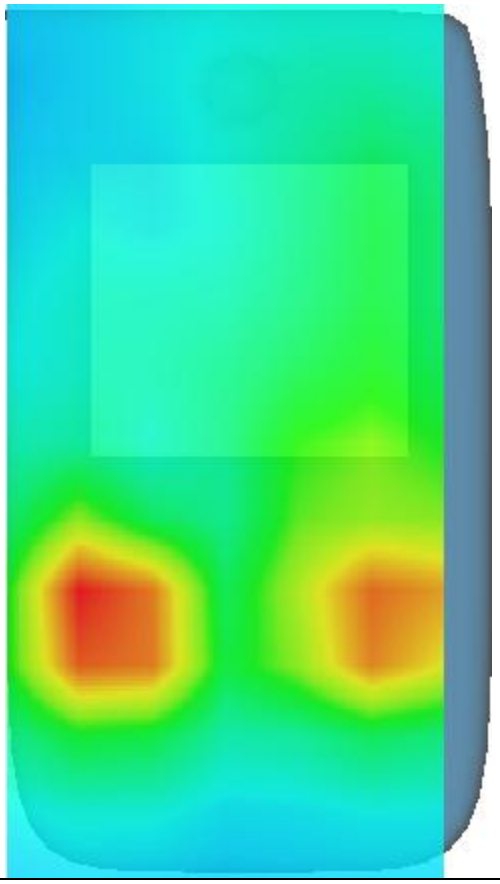
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-25.00, Y=-27.00
SAR Peak: 1.28 W/kg

SAR 10g (W/Kg)	0.300551
SAR 1g (W/Kg)	0.686287

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2542	0.7460	0.3690	0.1799	0.0953	0.0580	0.0378



3D screen shot	Hot spot position
	

MEASUREMENT 33

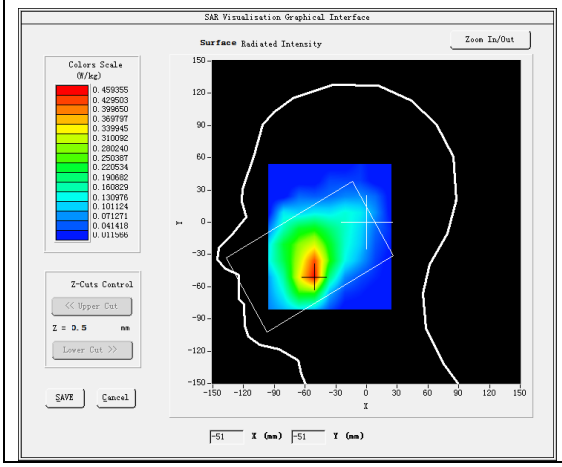
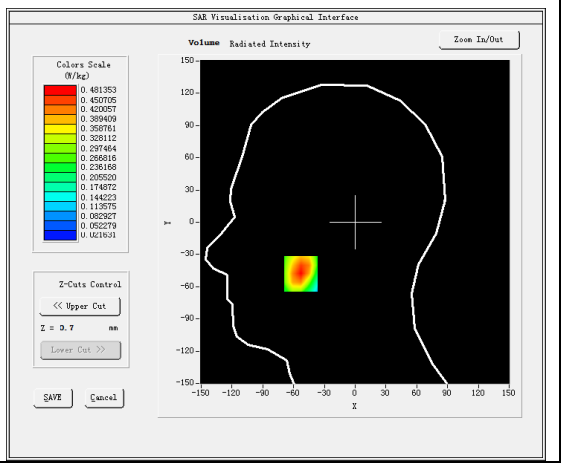
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 66
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

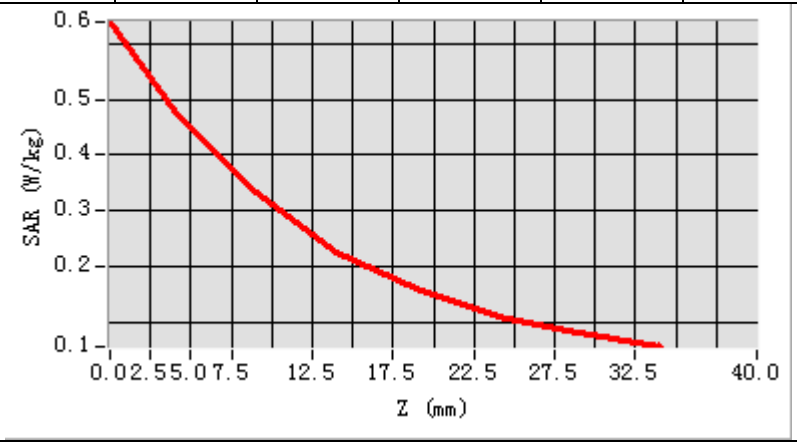
Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.072861
Relative permittivity (imaginary part)	13.782281
Conductivity (S/m)	1.336116
Variation (%)	-1.050000

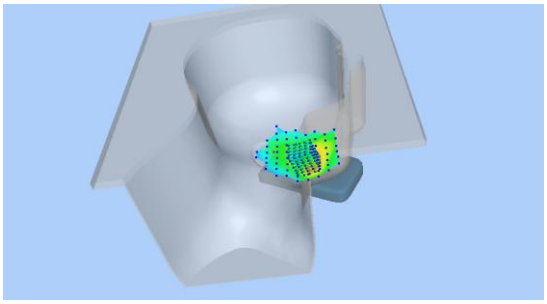
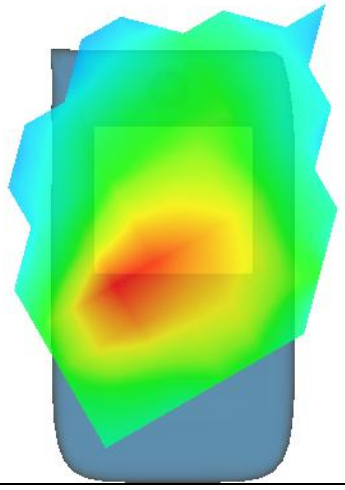
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-53.00, Y=-48.00
SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.287643
SAR 1g (W/Kg)	0.453504

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6390	0.4814	0.3328	0.2257	0.1587	0.1096	0.0814



3D screen shot	Hot spot position
	

MEASUREMENT 34

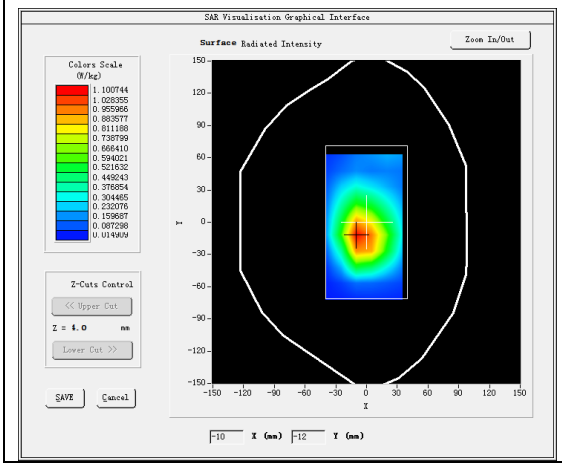
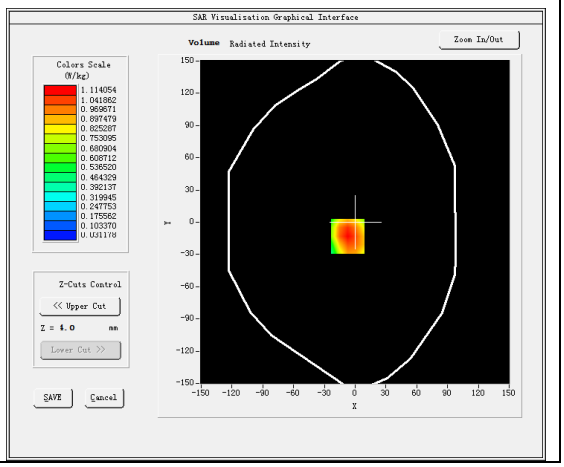
Date of measurement: 21/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 66
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.73

B. SAR Measurement Results

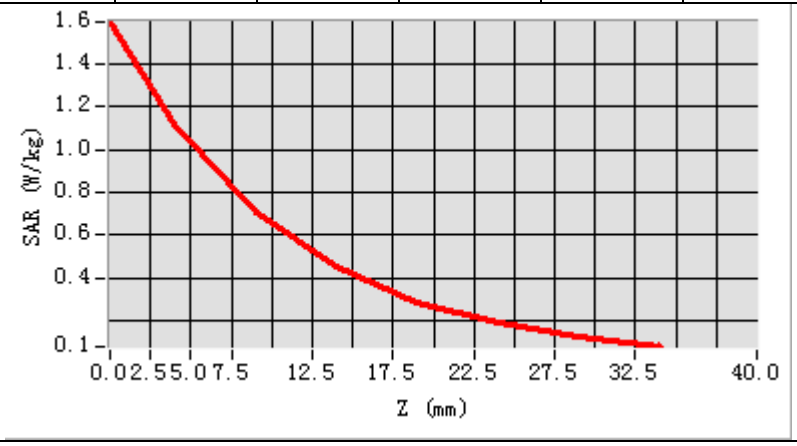
Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.072861
Relative permittivity (imaginary part)	13.782281
Conductivity (S/m)	1.336116
Variation (%)	-0.400000

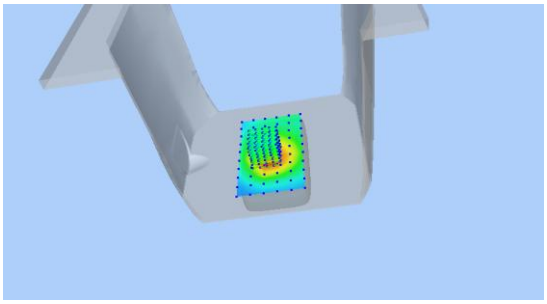
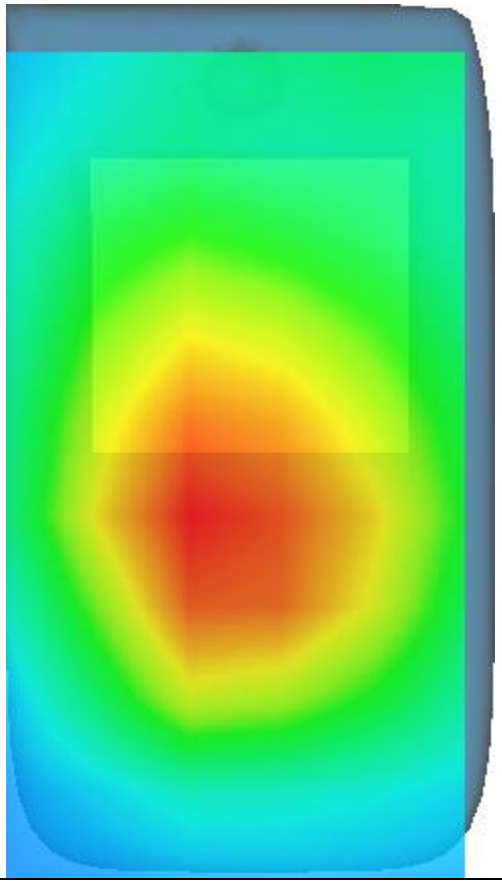
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-7.00, Y=-13.00
SAR Peak: 1.59 W/kg

SAR 10g (W/Kg)	0.647382
SAR 1g (W/Kg)	1.057869

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.5960	1.1141	0.7031	0.4492	0.2879	0.1864	0.1226



3D screen shot	Hot spot position
	

MEASUREMENT 35

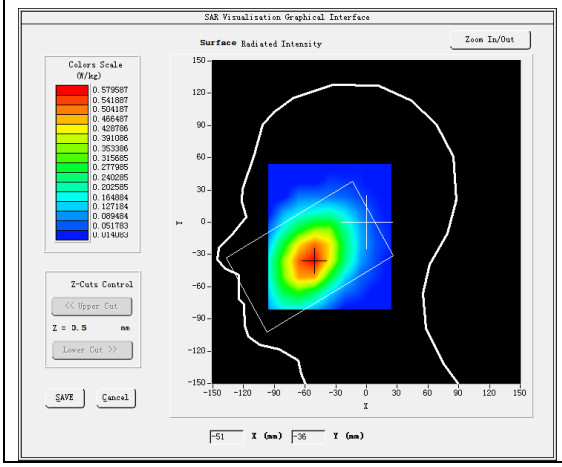
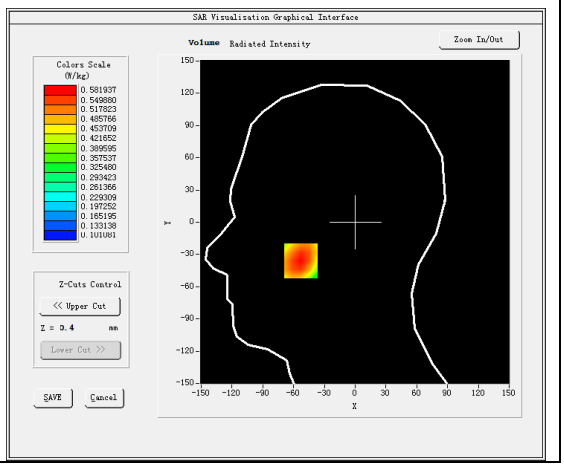
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	LTE band 71
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

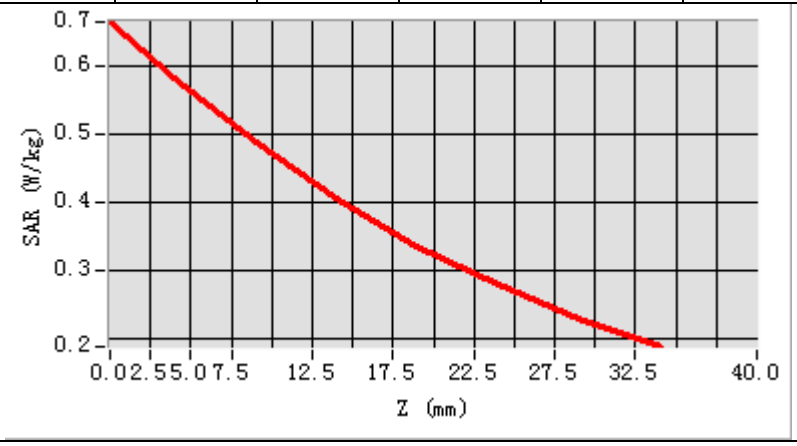
Frequency (MHz)	683.000000
Relative permittivity (real part)	40.970413
Relative permittivity (imaginary part)	22.450598
Conductivity (S/m)	0.851875
Variation (%)	0.510000

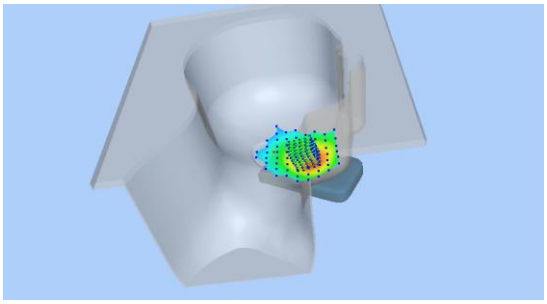
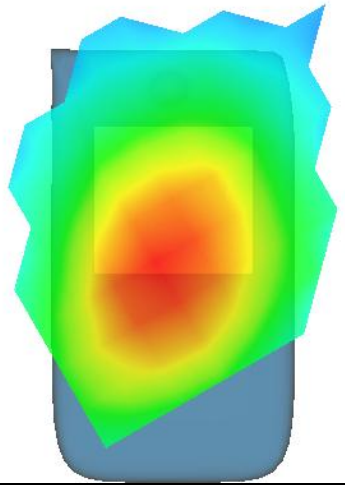
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-53.00, Y=-36.00
SAR Peak: 0.67 W/kg

SAR 10g (W/Kg)	0.443456
SAR 1g (W/Kg)	0.562841

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6641	0.5819	0.4875	0.4066	0.3342	0.2783	0.2288



3D screen shot	Hot spot position
	

MEASUREMENT 36

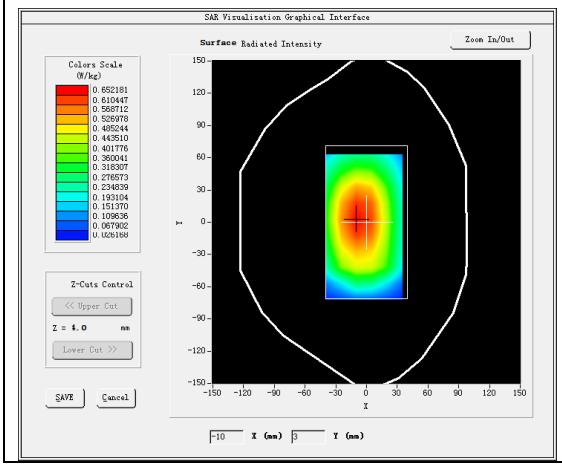
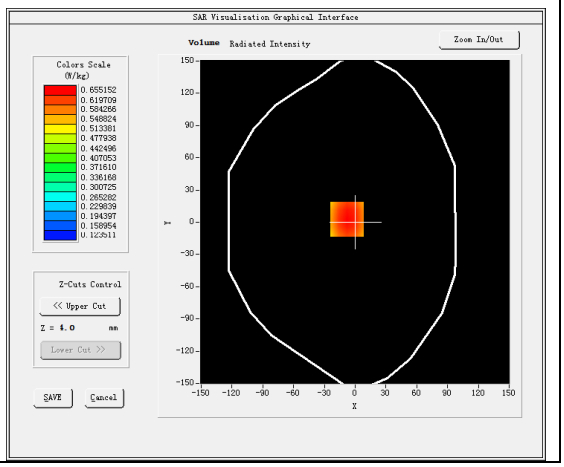
Date of measurement: 20/9/2022

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 71
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	1.49

B. SAR Measurement Results

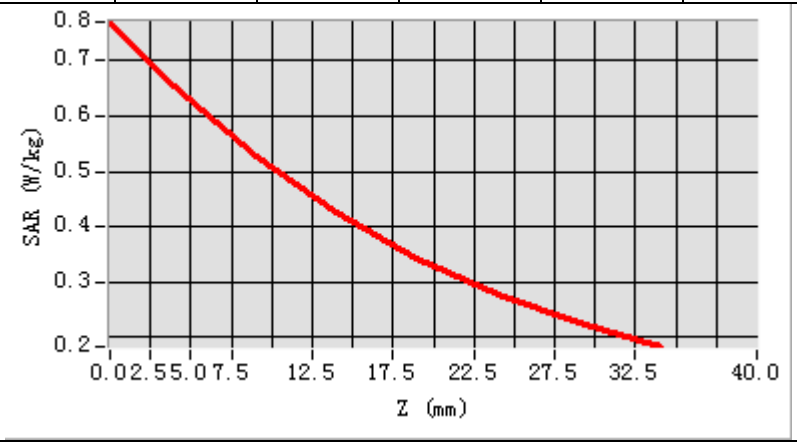
Frequency (MHz)	683.000000
Relative permittivity (real part)	40.970413
Relative permittivity (imaginary part)	22.450598
Conductivity (S/m)	0.851875
Variation (%)	0.260000

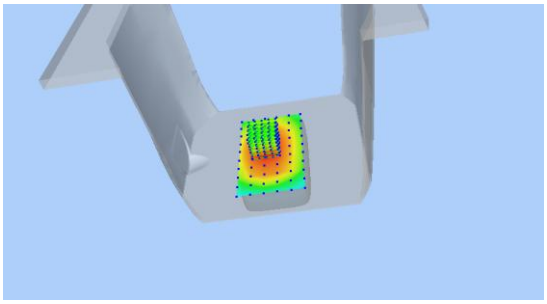
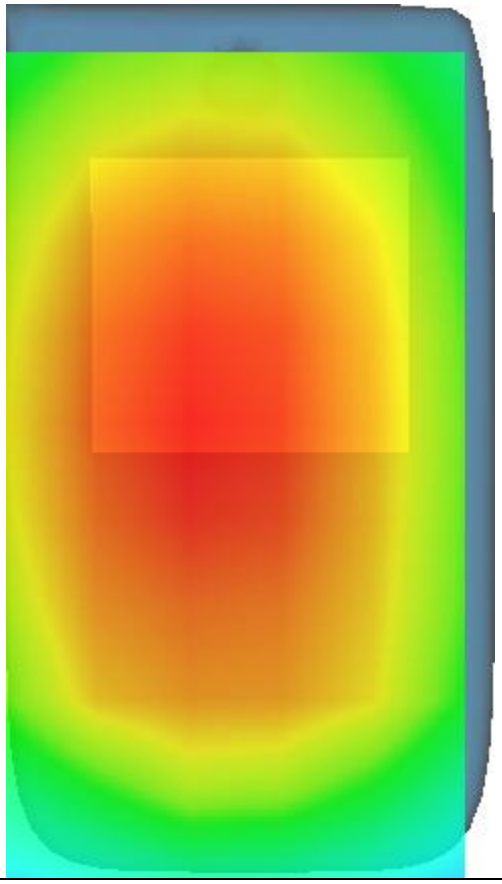
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-8.00, Y=3.00
SAR Peak: 0.77 W/kg

SAR 10g (W/Kg)	0.494084
SAR 1g (W/Kg)	0.635112

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7707	0.6552	0.5294	0.4279	0.3440	0.2762	0.2268



3D screen shot	Hot spot position
	

14. Appendix D. Calibration Certificate

Table of contents
E Field Probe - SN 08/16 EPGO287
E Field Probe - SN 08/16 EPGO287-2023
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
Extended Calibration Certificate

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 EPGO287

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 02/01/2022

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	2/1/2022	
Checked by :	Jérôme Luc	Technical Manager	2/1/2022	
Approved by :	Yann Toutain	Laboratory Director	2/1/2022	Yann Toutain 2022.02.01 10:07:13 +01'00'

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

Issue	Name	Date	Modifications
A	Jérôme Luc	2/1/2022	Initial release

TABLE OF CONTENTS

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.

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:

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

where

$\mathrm{SAR}_{\mathrm{uncertainty}}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest *zoom-scan* 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;
$\Delta\mathrm{SAR}_{be}$	in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

The measured worst case boundary effect SARuncertainty[%] 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 %

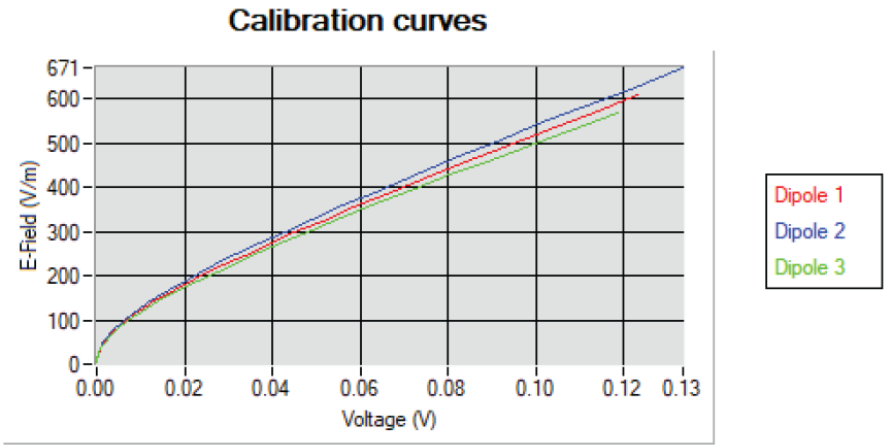
5.1 SENSITIVITY IN AIR

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

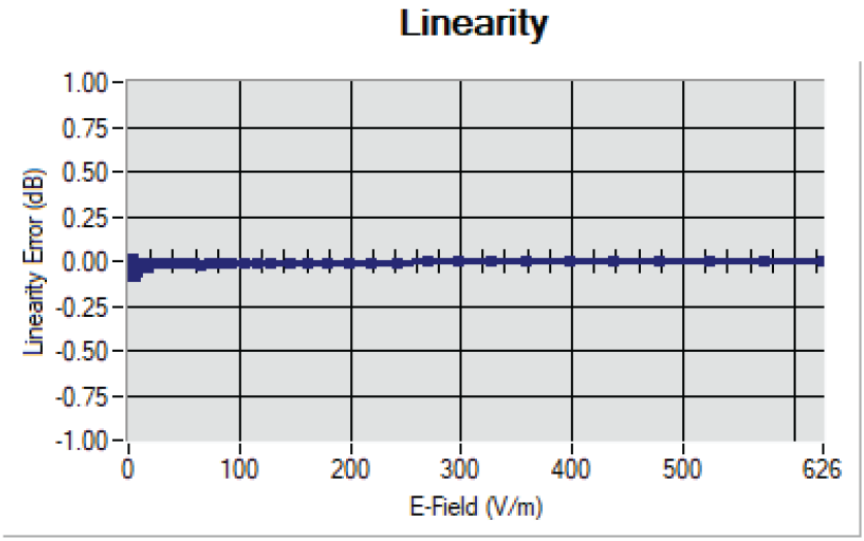
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
107	110	110

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

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



5.2 LINEARITY



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

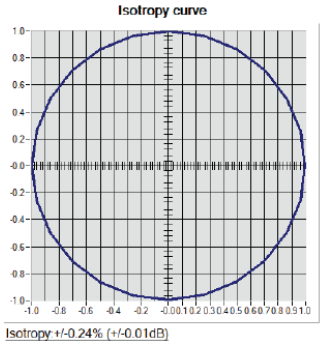
5.3 SENSITIVITY IN LIQUID

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

5.4 ISOTROPY

HL1800 MHz



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

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 EPGO287

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 01/10/2023

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).