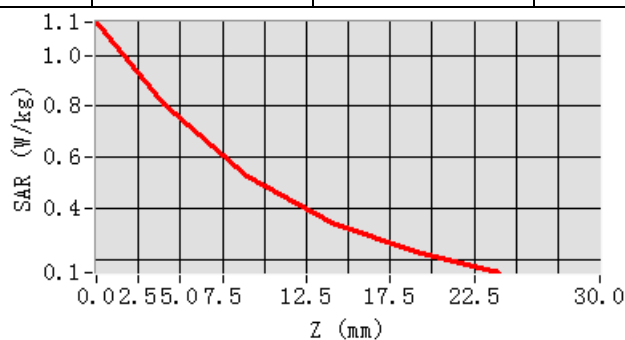
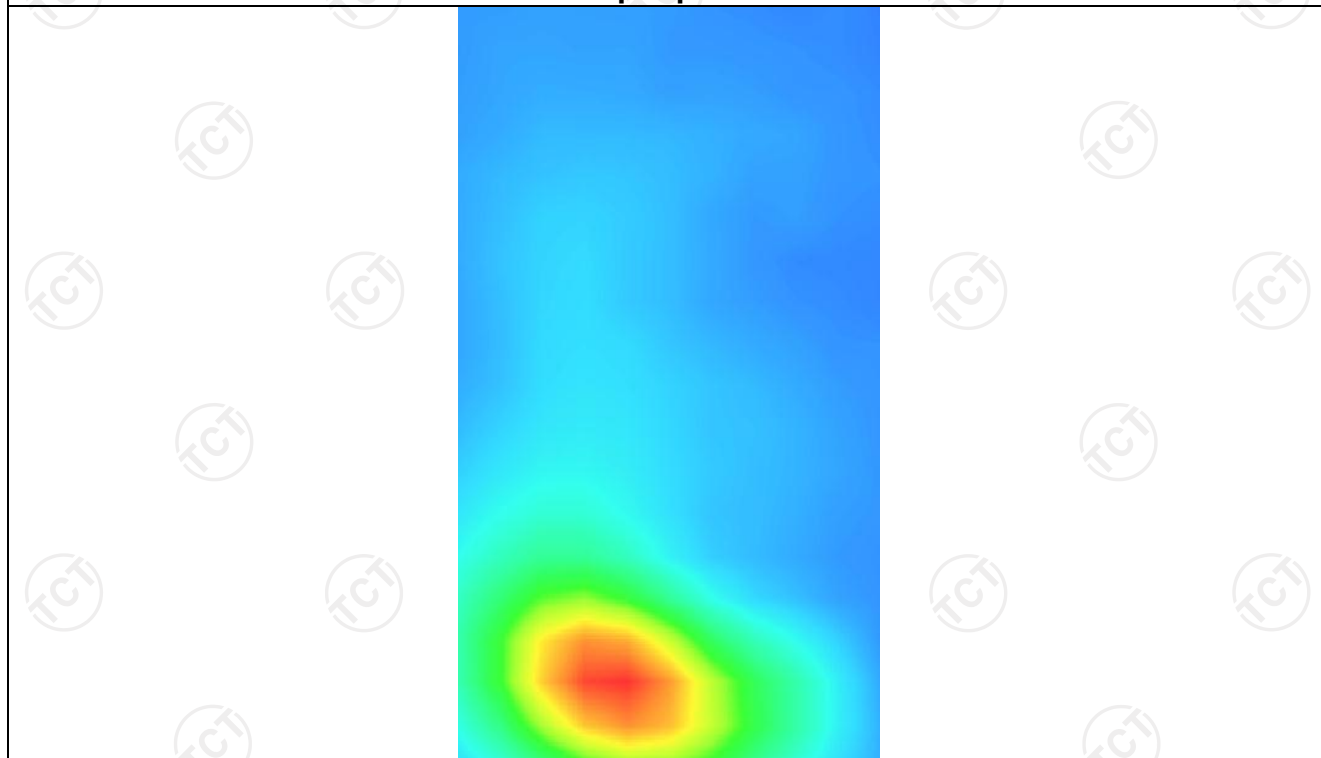


Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1304	0.8059	0.5228	0.3412	0.2264



Hot spot position



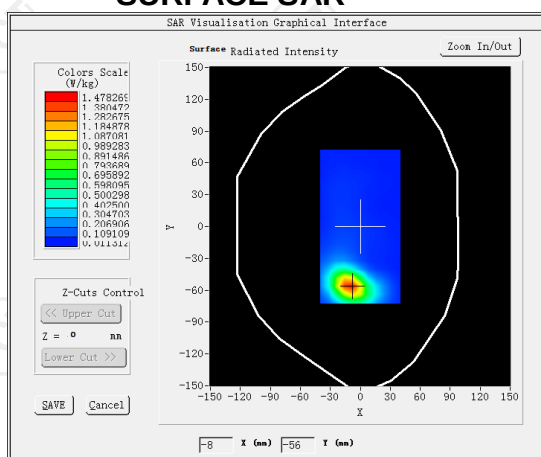
MEASUREMENT 3

Middle Band SAR (Channel 21100):

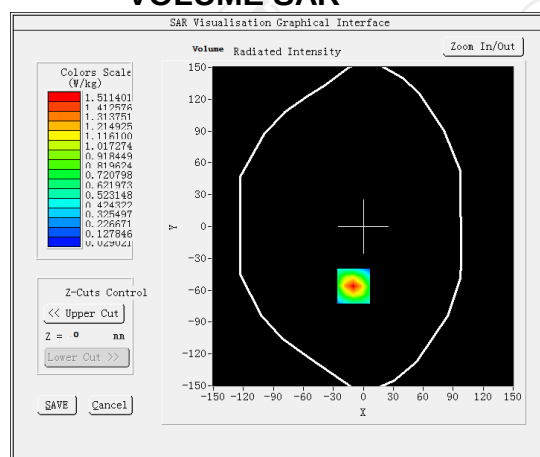
Date: 01/26/2024

Frequency (MHz)	2535.000000
Relative permittivity (real part)	37.432823
Relative permittivity (imaginary part)	13.671675
Conductivity (S/m)	1.925428
Variation (%)	0.420000
Crest Factor	1.0
Probe Conversion factor	4.36
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	5x5x7,dx=5mm dy=5mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 10mm)
Band	LTE band 7(1 RB#0)

SURFACE SAR

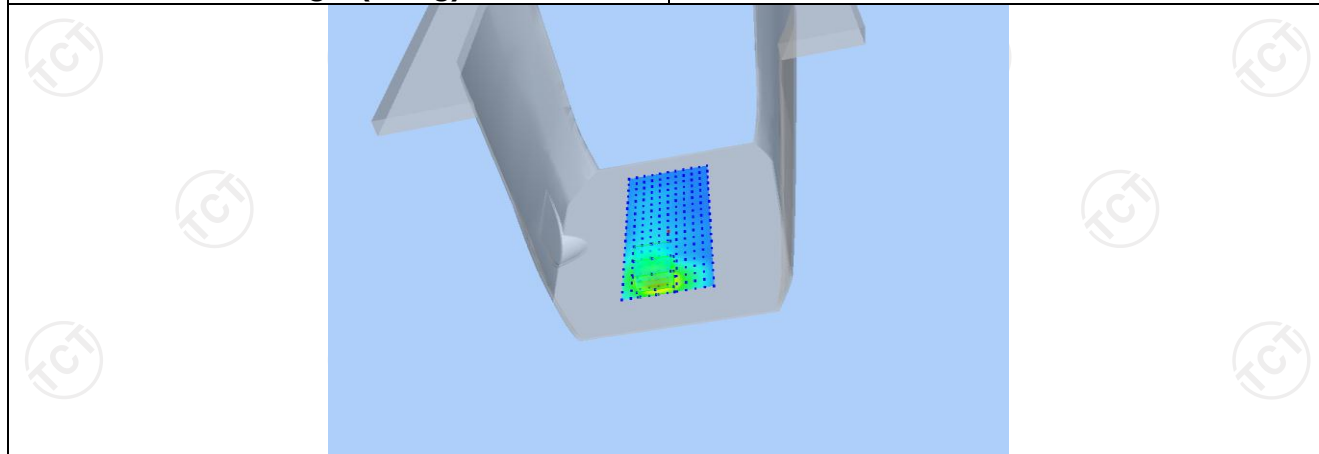


VOLUME SAR

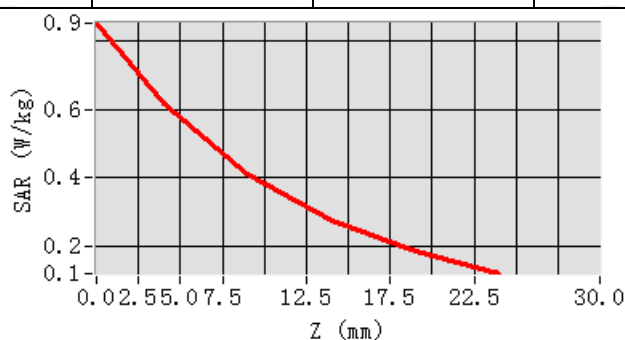


Maximum location: X=-10.00, Y=-56.00 SAR Peak: 0.85 W/kg

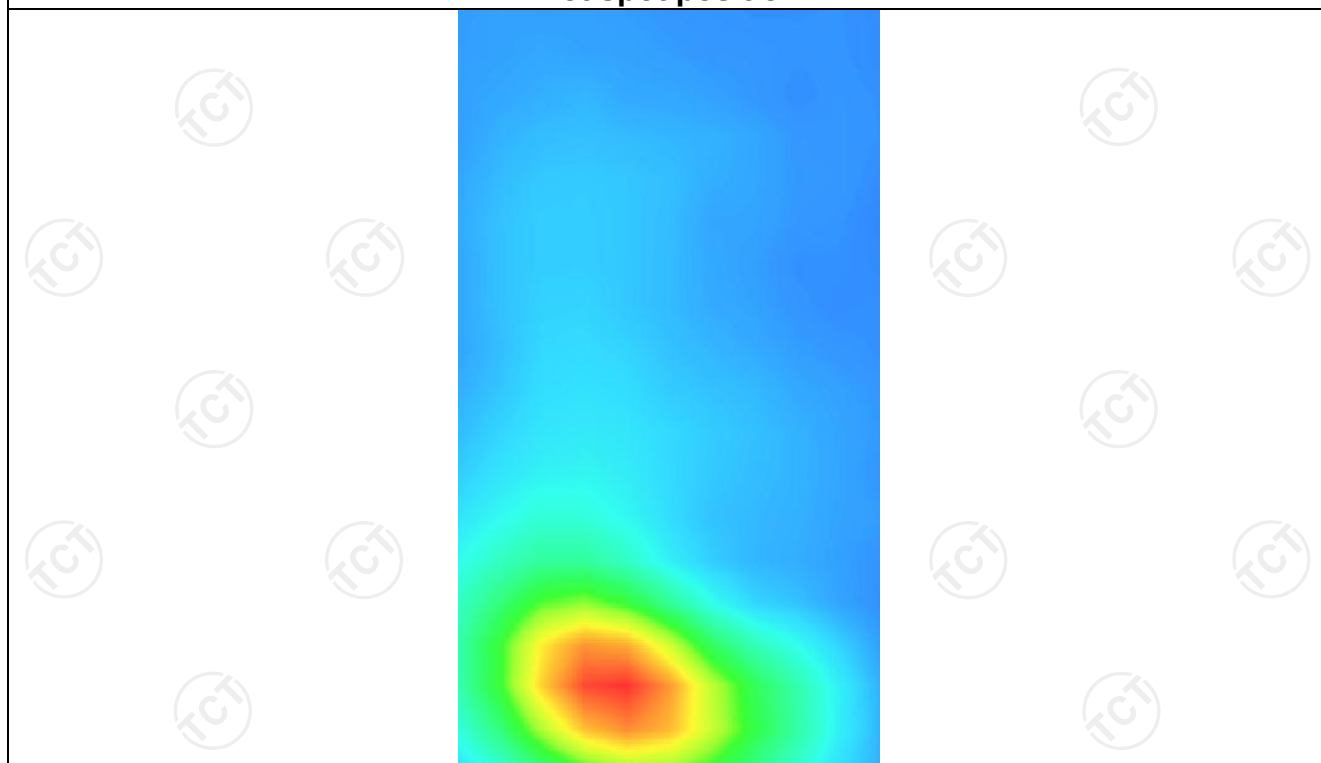
SAR 10g (W/Kg)	0.376188
SAR 1g (W/Kg)	0.479512



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8517	0.6173	0.4088	0.2712	0.1815



Hot spot position

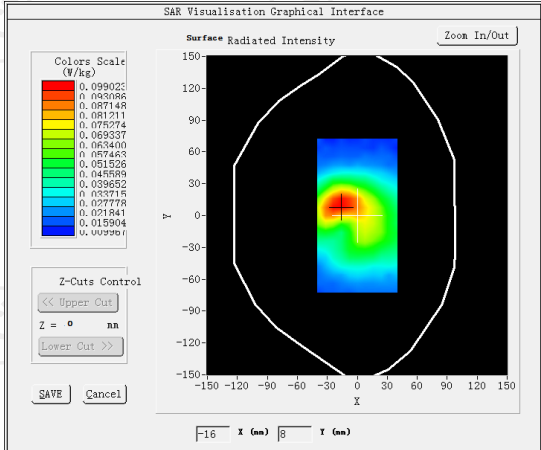
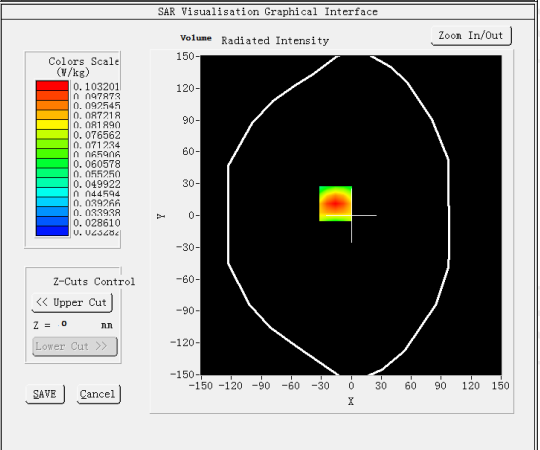


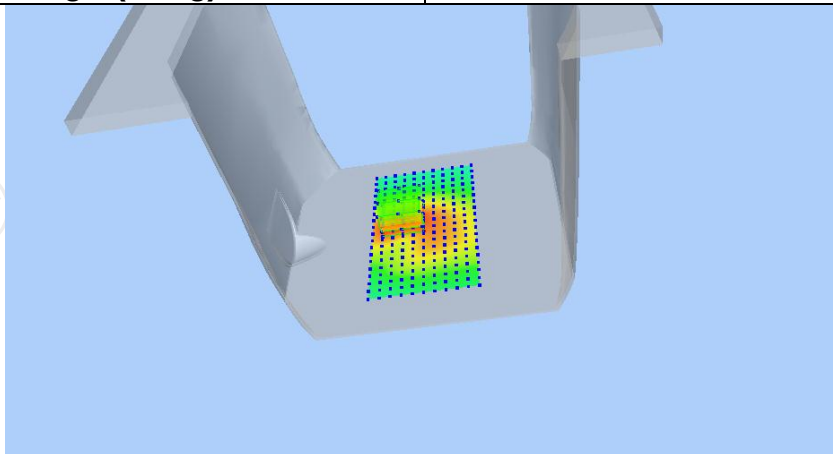
LTE Band 12

MEASUREMENT 1

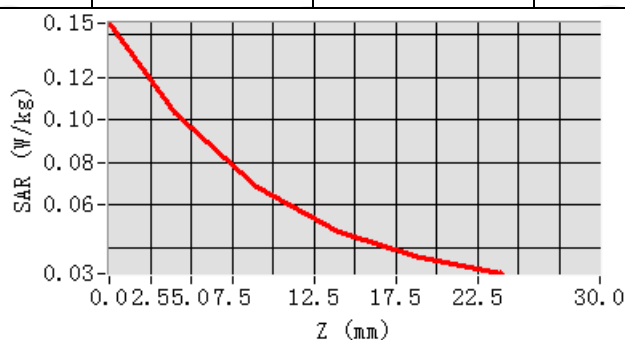
High Band SAR (Channel 23130):

Date: 01/15/2024

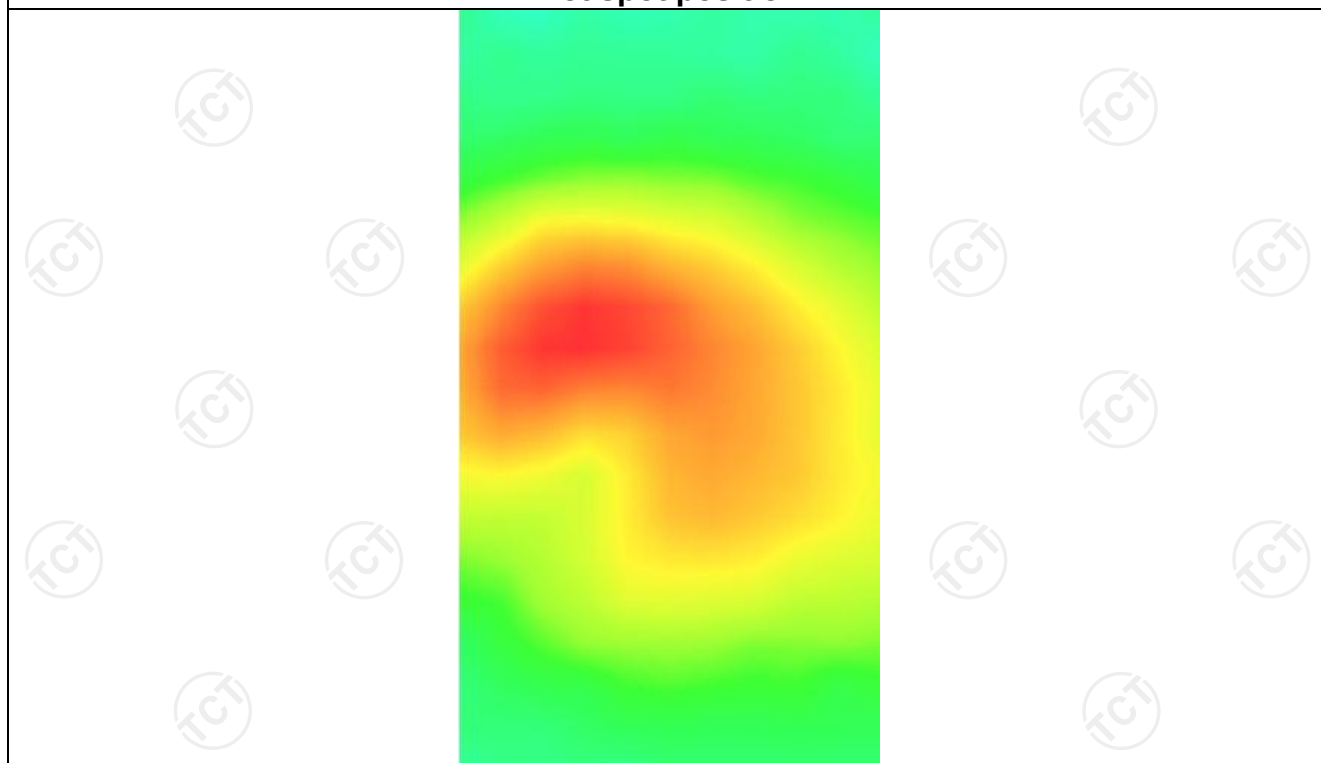
Frequency (MHz)	711.000000
Relative permittivity (real part)	42.126667
Relative permittivity (imaginary part)	23.264000
Conductivity (S/m)	0.914404
Variation (%)	1.520000
Crest Factor	1.0
Probe Conversion factor	
E-Field Probe:	
Area Scan	
ZoomScan	
Phantom	
Device Position	
Band	LTE band 12(1 RB#0)
SURFACE SAR	VOLUME SAR
	
Maximum location: X=-16.00, Y=11.00 SAR Peak: 0.15 W/kg	
SAR 10g (W/Kg)	0.064314
SAR 1g (W/Kg)	0.091085



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1454	0.1032	0.0681	0.0473	0.0355



Hot spot position



MEASUREMENT 2

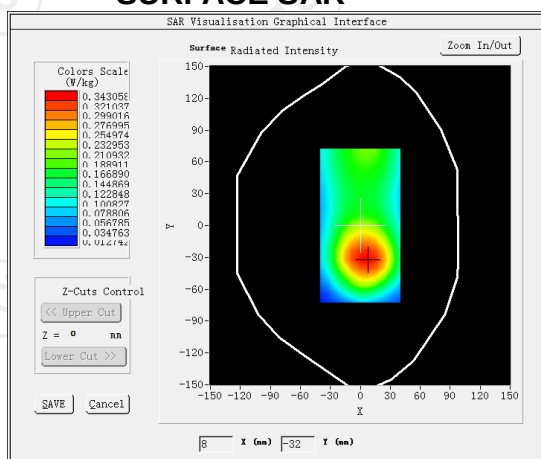
High Band SAR (Channel 23130):

Date: 01/15/2024

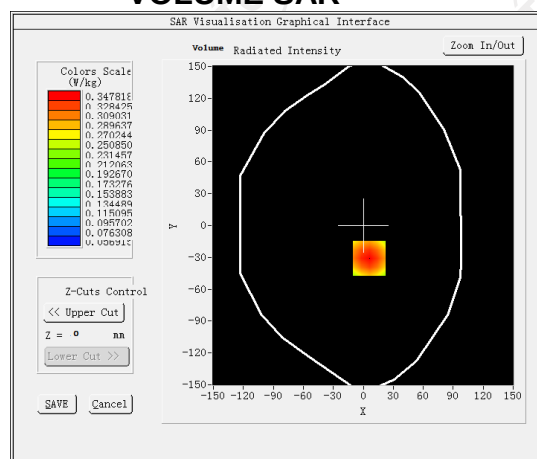
Frequency (MHz)	711.000000
Relative permittivity (real part)	42.126667
Relative permittivity (imaginary part)	23.264000
Conductivity (S/m)	0.914404
Variation (%)	2.100000
Crest Factor	1.0
Probe Conversion factor	1.71
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=8mm dy=8mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	LTE band 12(1 RB#0)

SURFACE SAR

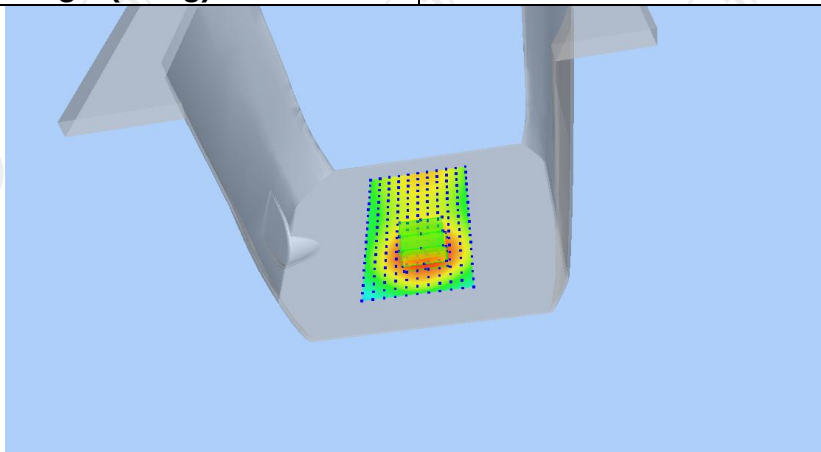


VOLUME SAR

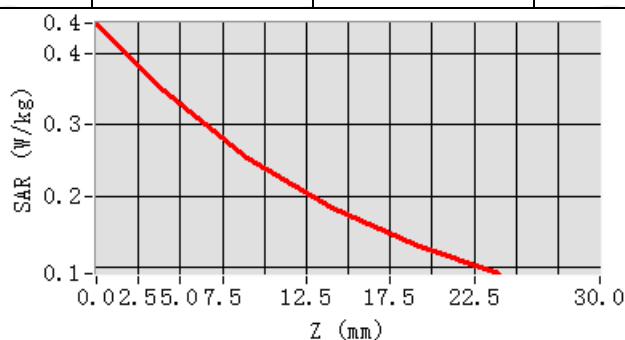


Maximum location: X=6.00, Y=-31.00 SAR Peak: 0.44 W/kg

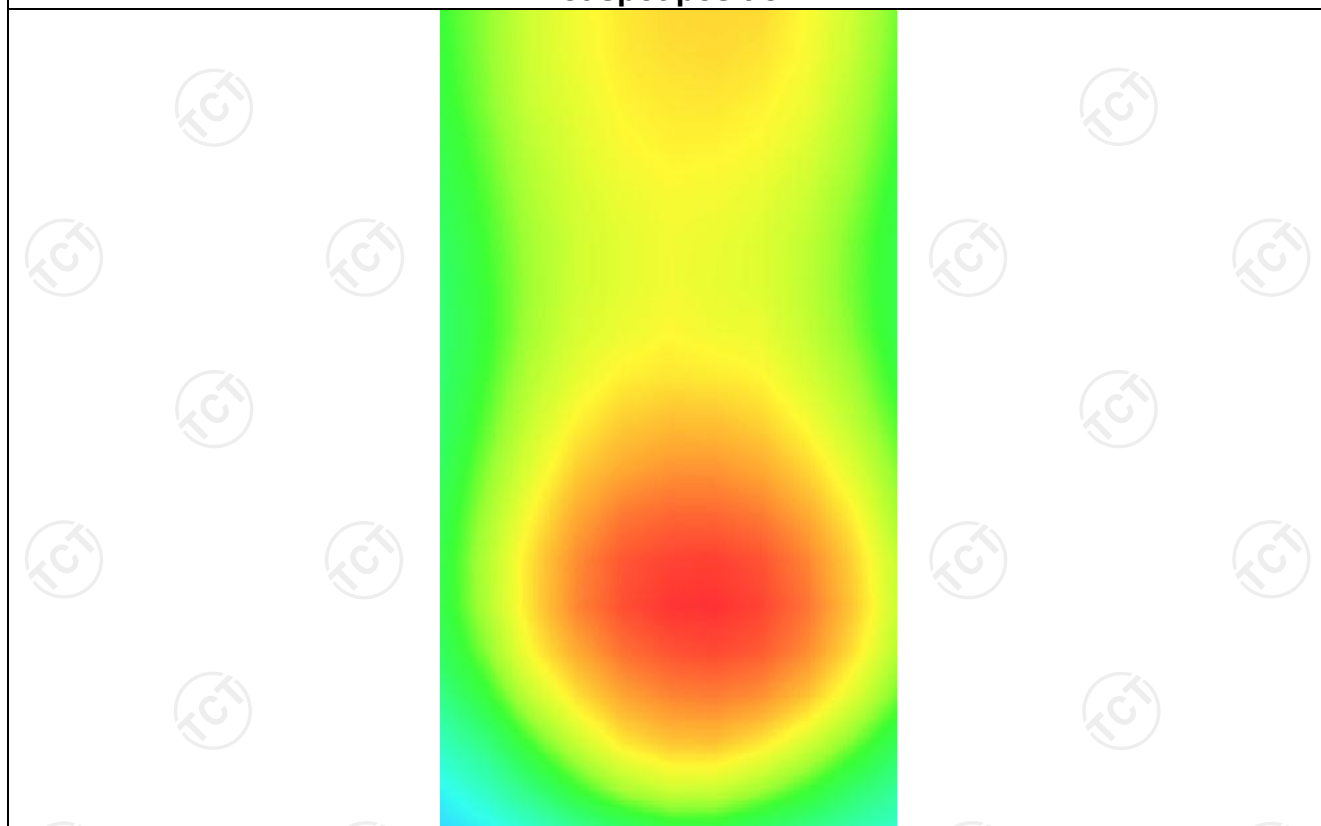
SAR 10g (W/Kg)	0.172311
SAR 1g (W/Kg)	0.289128



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4434	0.3478	0.2541	0.1841	0.1318



Hot spot position



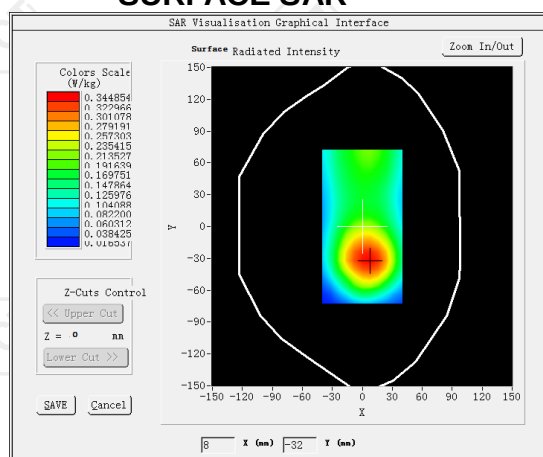
MEASUREMENT 3

High Band SAR (Channel 23130):

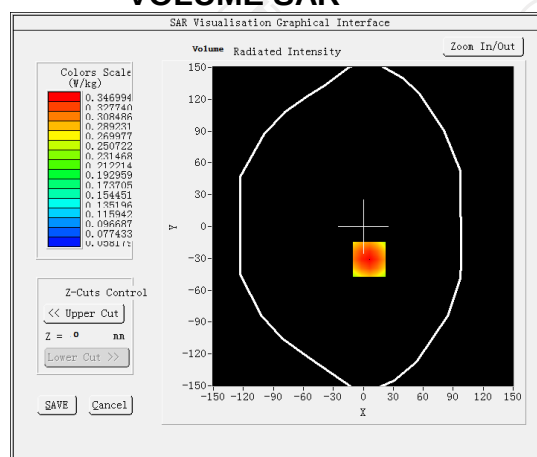
Date: 01/15/2024

Frequency (MHz)	711.000000
Relative permittivity (real part)	42.126667
Relative permittivity (imaginary part)	23.264000
Conductivity (S/m)	0.914404
Variation (%)	0.410000
Crest Factor	1.0
Probe Conversion factor	1.71
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=8mm dy=8mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 12(1 RB#0)</u>

SURFACE SAR

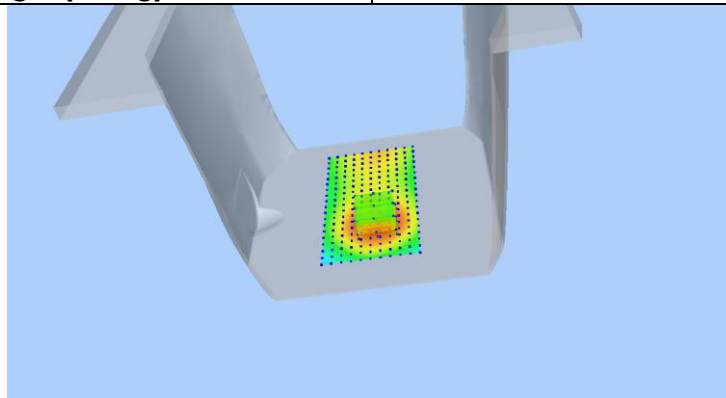


VOLUME SAR

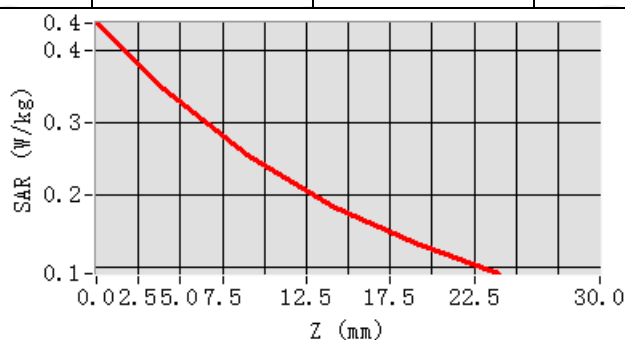


Maximum location: X=6.00, Y=-31.00 SAR Peak: 0.44 W/kg

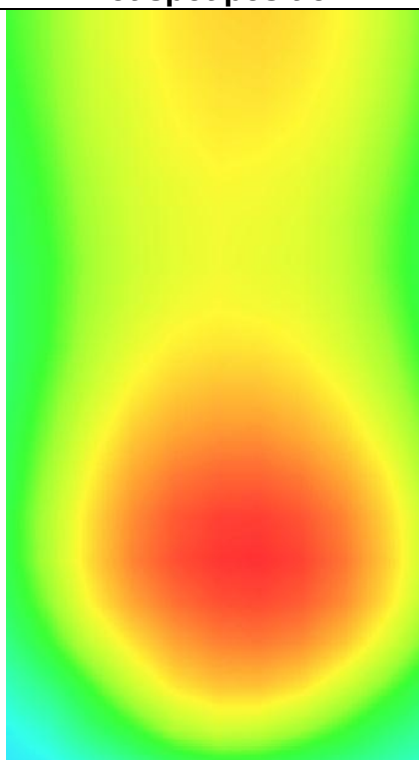
SAR 10g (W/Kg)	0.216037
SAR 1g (W/Kg)	0.306055



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4387	0.3470	0.2557	0.1862	0.1333



Hot spot position

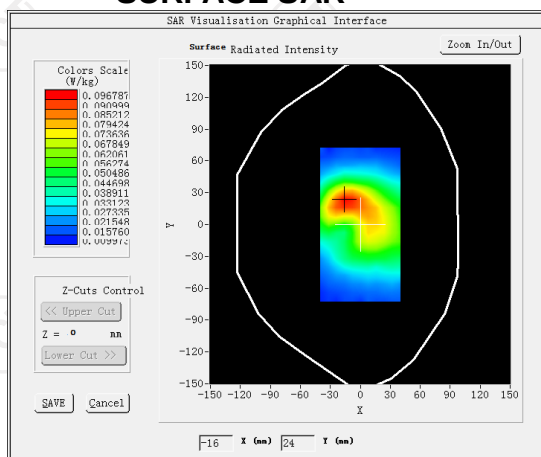


LTE Band 17

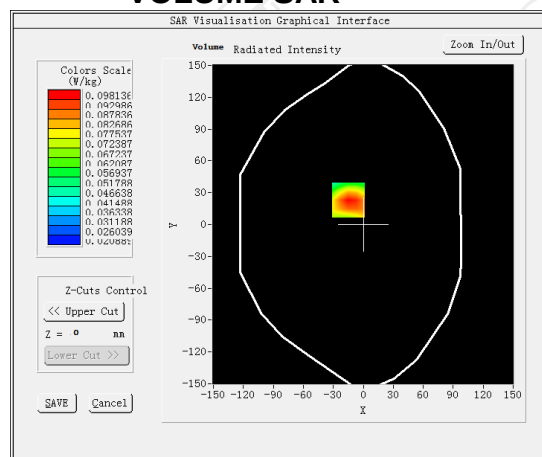
MEASUREMENT 1

High Band SAR (Channel 23800):		Date: 01/15/2024
Frequency (MHz)	711.000000	
Relative permittivity (real part)	42.113335	
Relative permittivity (imaginary part)	23.152000	
Conductivity (S/m)	0.913218	
Variation (%)	-0.410000	
Crest Factor	1.0	
Probe Conversion factor	1.71	
E-Field Probe:	SSE2 (SN 25/22 EPG0375)	
Area Scan	dx=8mm dy=8mm, h= 5.00 mm	
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm	
Phantom	Validation plane	
Device Position	Body front(10mm)	
Band	LTE band 17(1 RB#0)	

SURFACE SAR



VOLUME SAR



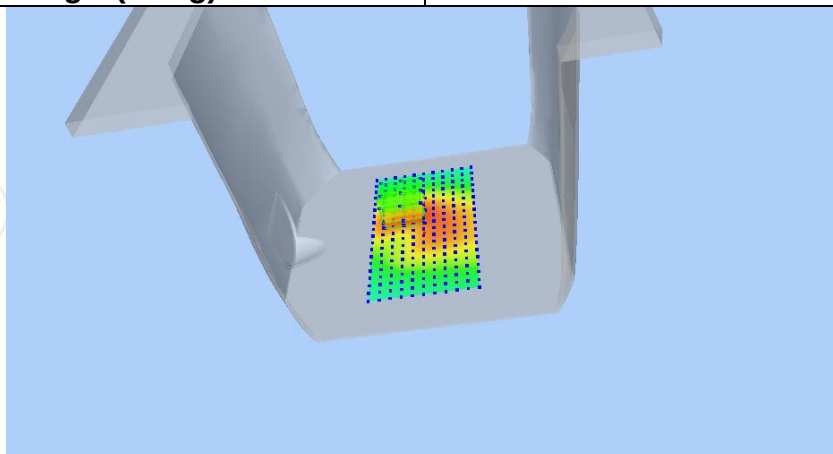
Maximum location: X=-15.00, Y=23.00 SAR Peak: 0.14 W/kg

SAR 10g (W/Kg)

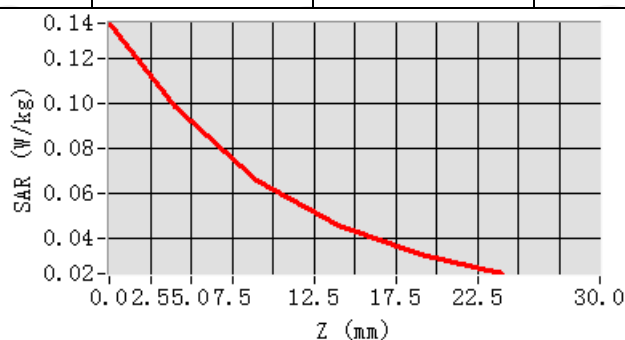
0.063050

SAR 1g (W/Kg)

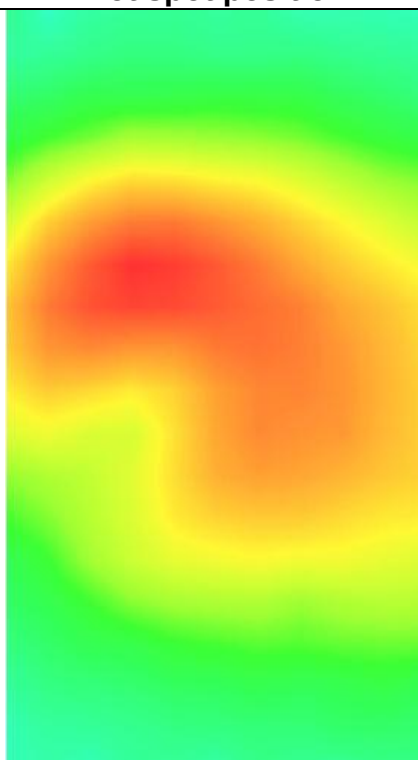
0.093277



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1355	0.0981	0.0658	0.0455	0.0330



Hot spot position



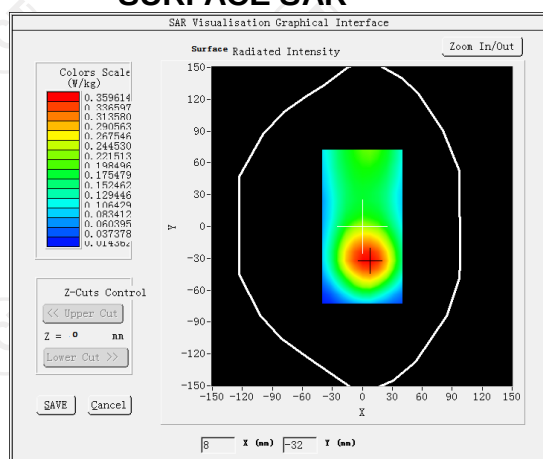
MEASUREMENT 2

High Band SAR (Channel 23800):

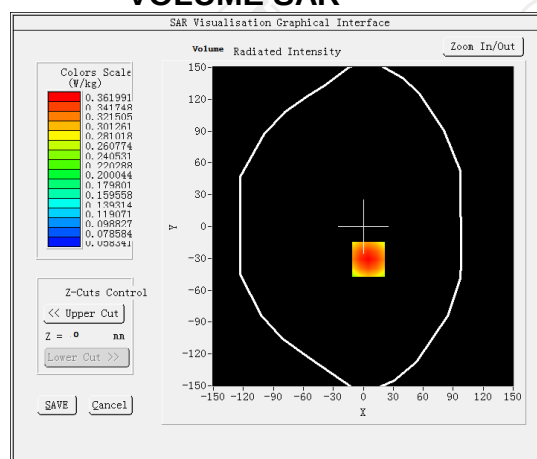
Date: 01/15/2024

Frequency (MHz)	711.000000
Relative permittivity (real part)	42.113335
Relative permittivity (imaginary part)	23.152000
Conductivity (S/m)	0.913218
Variation (%)	1.590000
Crest Factor	1.0
Probe Conversion factor	1.71
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=8mm dy=8mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body back(10mm)
Band	LTE band 17(1 RB#0)

SURFACE SAR

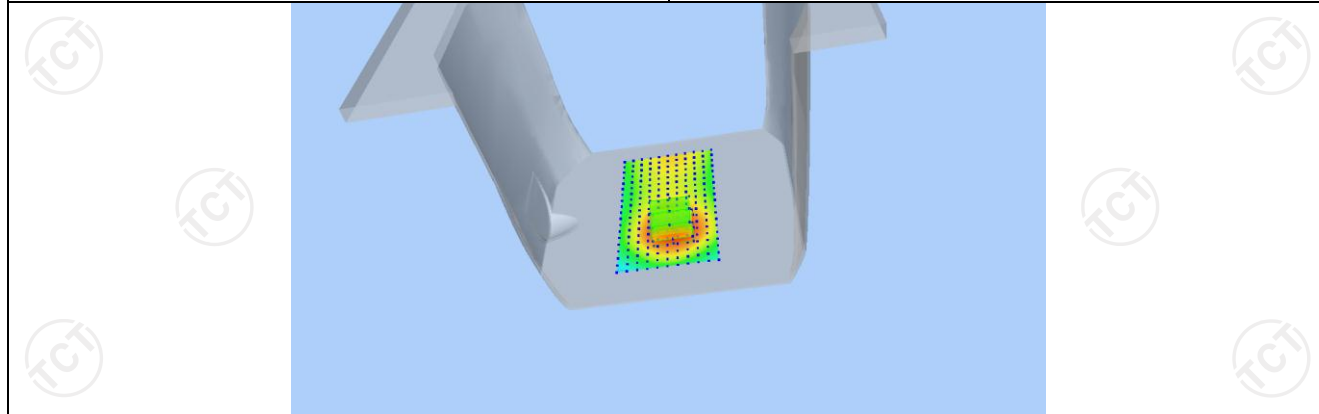


VOLUME SAR

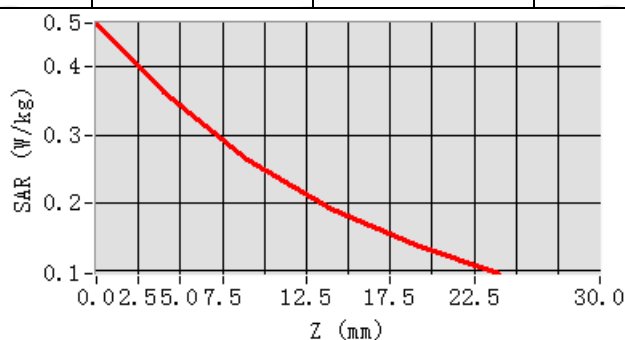


Maximum location: X=5.00, Y=-31.00 SAR Peak: 0.46 W/kg

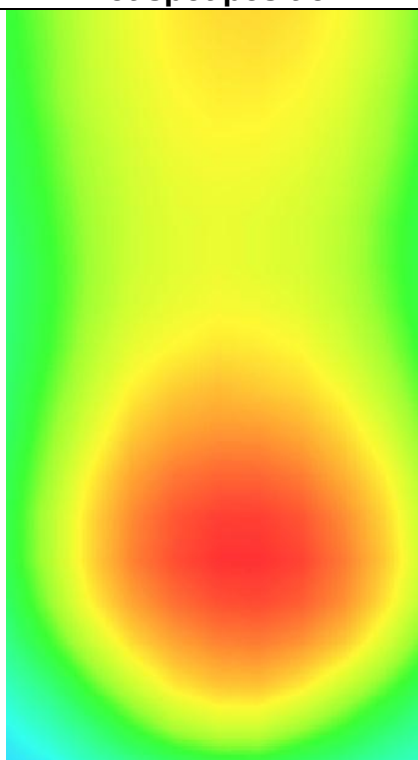
SAR 10g (W/Kg)	0.264158
SAR 1g (W/Kg)	0.327177



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4643	0.3620	0.2631	0.1905	0.1372



Hot spot position



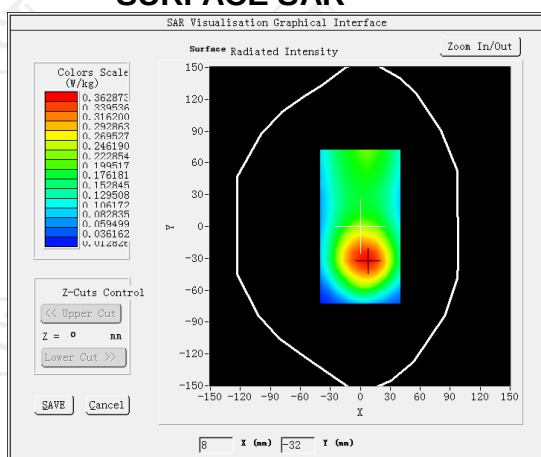
MEASUREMENT 3

High Band SAR (Channel 23800):

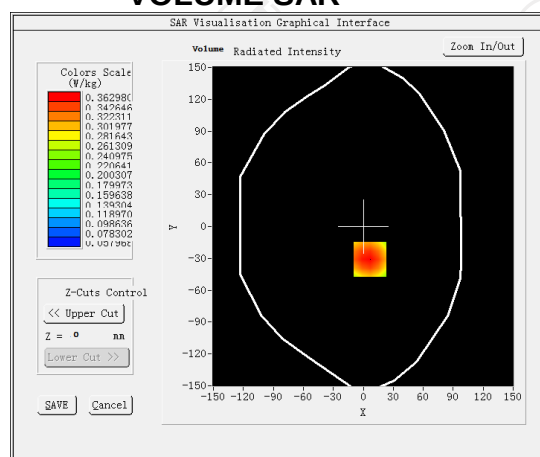
Date: 01/15/2024

Frequency (MHz)	711.000000
Relative permittivity (real part)	42.113335
Relative permittivity (imaginary part)	23.152000
Conductivity (S/m)	0.913218
Variation (%)	1.550000
Crest Factor	1.0
Probe Conversion factor	1.71
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=8mm dy=8mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 17(1 RB#0)</u>

SURFACE SAR

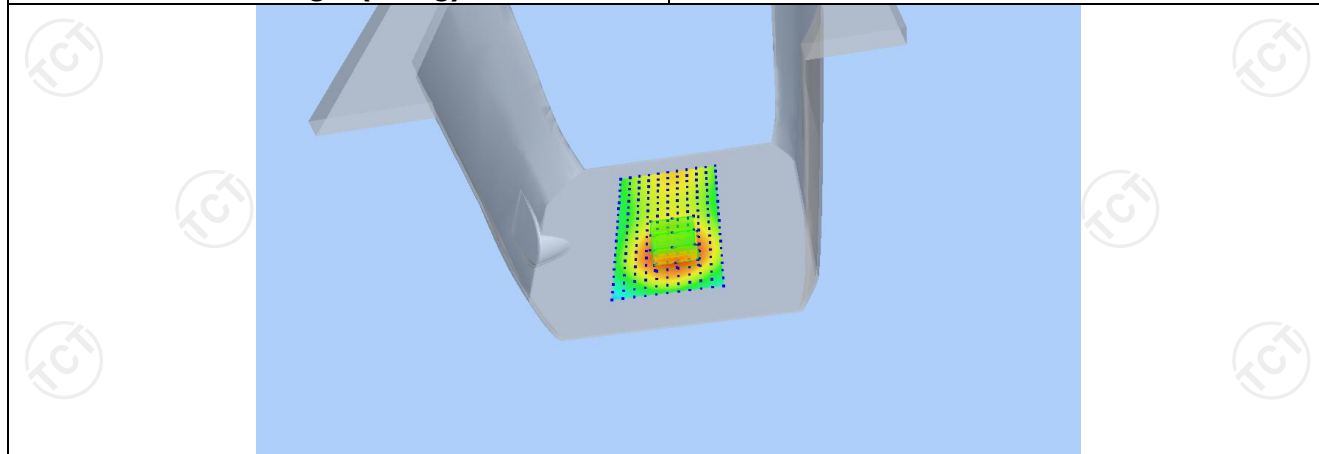


VOLUME SAR

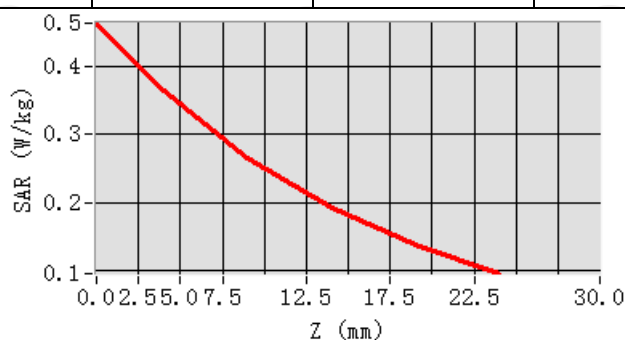


Maximum location: X=7.00, Y=-31.00 SAR Peak: 0.46 W/kg

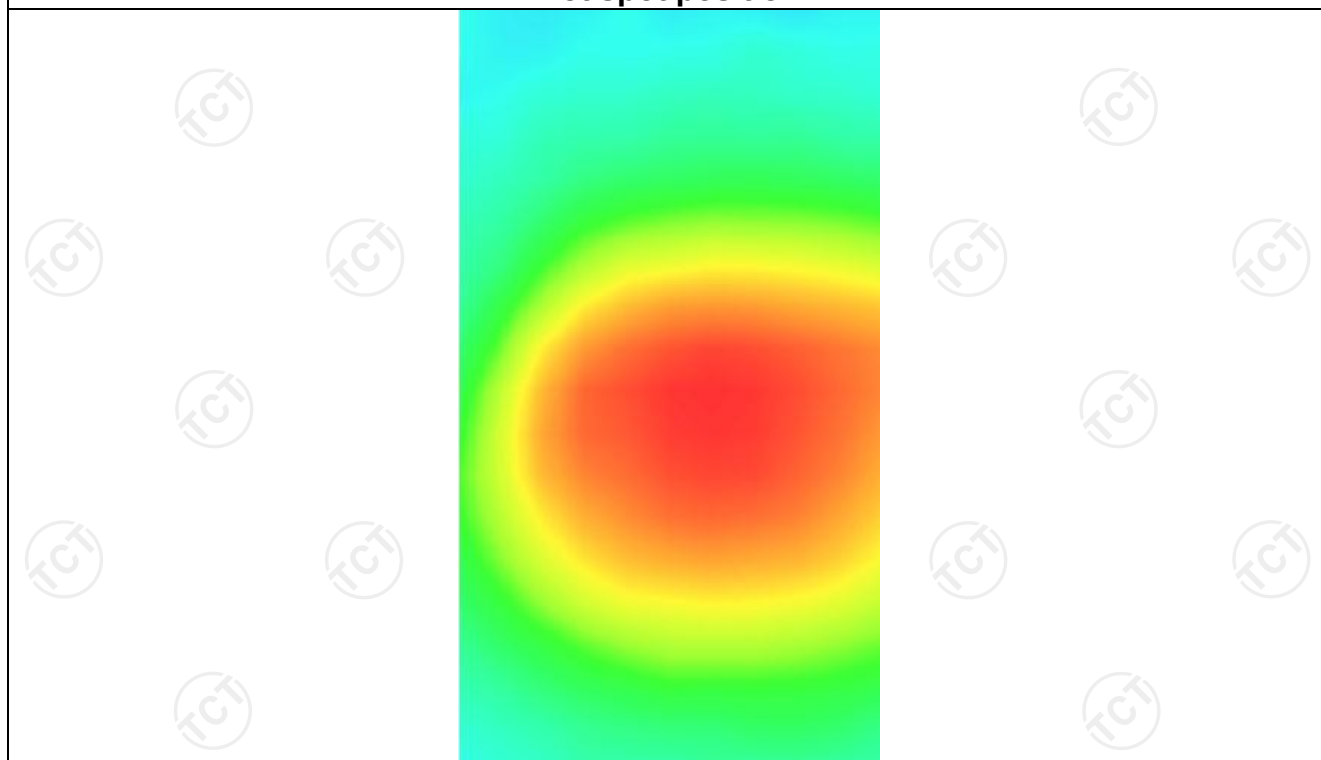
SAR 10g (W/Kg)	0.221087
SAR 1g (W/Kg)	0.331581



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4625	0.3630	0.2654	0.1924	0.1379



Hot spot position



LTE Band 41

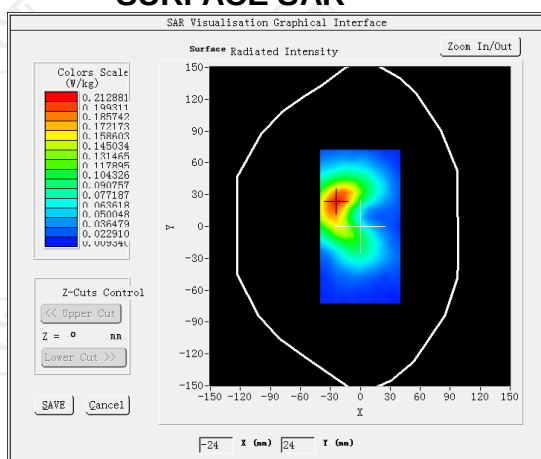
MEASUREMENT 1

Low Band SAR (Channel 39750):

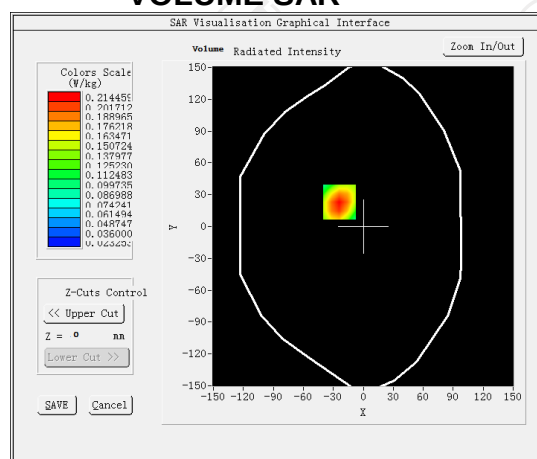
Date: 01/26/2024

Frequency (MHz)	2506.000000
Relative permittivity (real part)	39.009335
Relative permittivity (imaginary part)	13.553667
Conductivity (S/m)	1.952481
Variation (%)	-1.630000
Crest Factor	1.0
Probe Conversion factor	4.36
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body Front(10mm)
Band	<u>LTE band 41(1 RB#0)</u>

SURFACE SAR

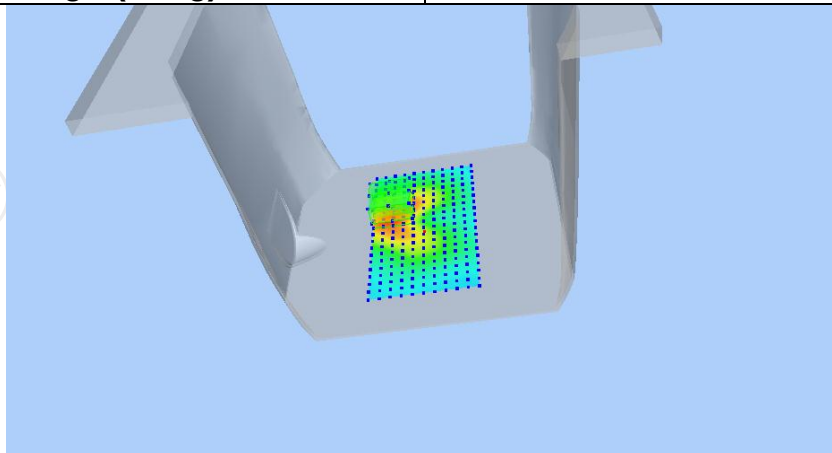


VOLUME SAR

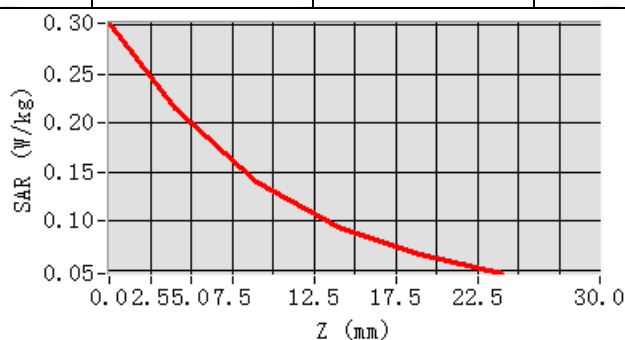


Maximum location: X=-24.00, Y=23.00 SAR Peak: 0.30 W/kg

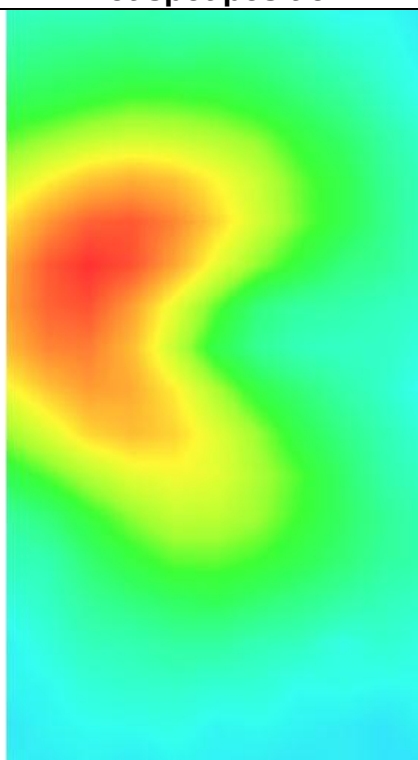
SAR 10g (W/Kg)	0.076087
SAR 1g (W/Kg)	0.142087



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3017	0.2145	0.1399	0.0936	0.0655



Hot spot position



MEASUREMENT 2

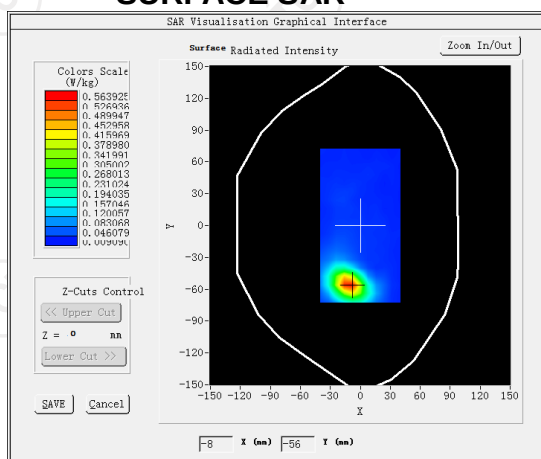
Low Band SAR (Channel 39750):

Date: 01/26/2024

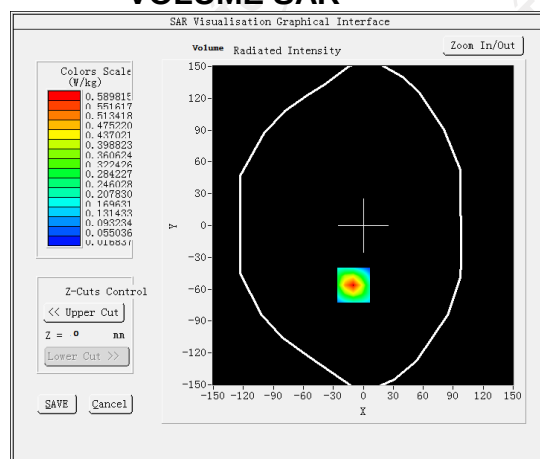
Frequency (MHz)	2506.000000
Relative permittivity (real part)	39.009335
Relative permittivity (imaginary part)	13.553667
Conductivity (S/m)	1.952481
Variation (%)	1.300000
Crest Factor	1.0
Probe Conversion factor	4.36
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>LTE band 41(1 RB#0)</u>

SURFACE SAR

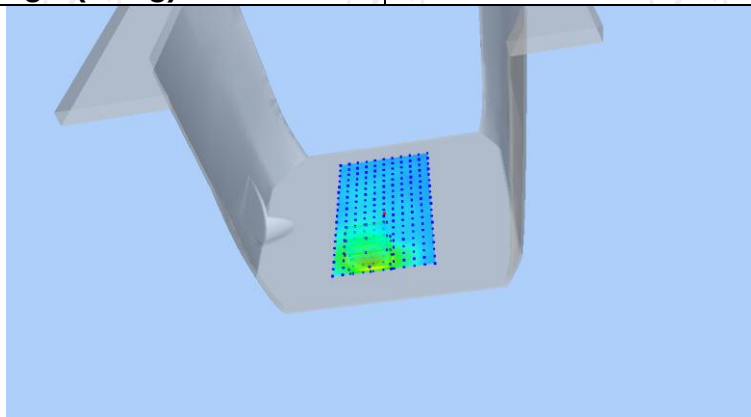


VOLUME SAR

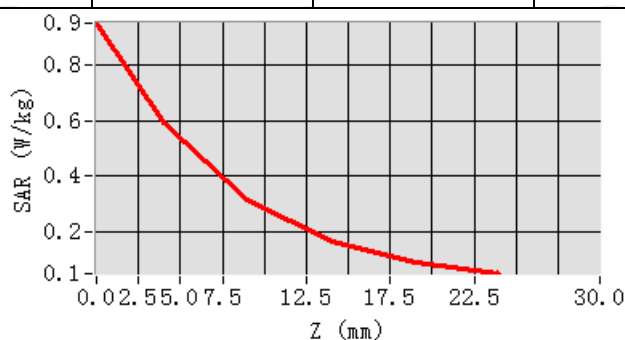


Maximum location: X=-10.00, Y=-56.00 SAR Peak: 0.95 W/kg

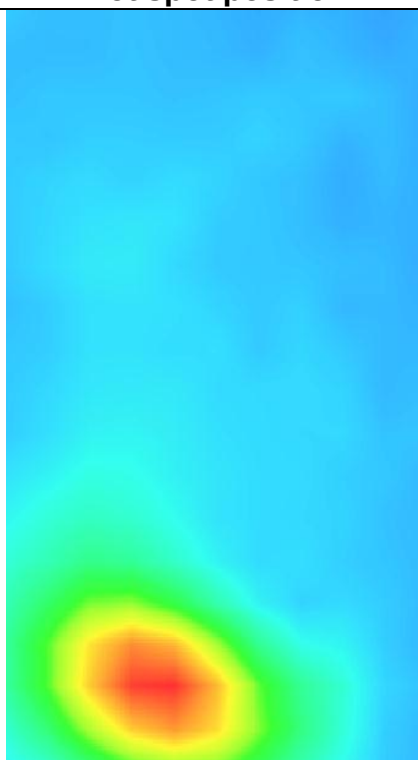
SAR 10g (W/Kg)	0.261084
SAR 1g (W/Kg)	0.436379



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.9465	0.5898	0.3162	0.1700	0.0961



Hot spot position



MEASUREMENT 3

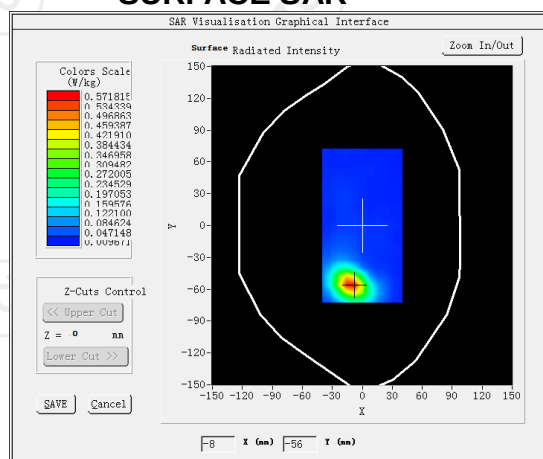
Low Band SAR (Channel 39750):

Date: 01/26/2024

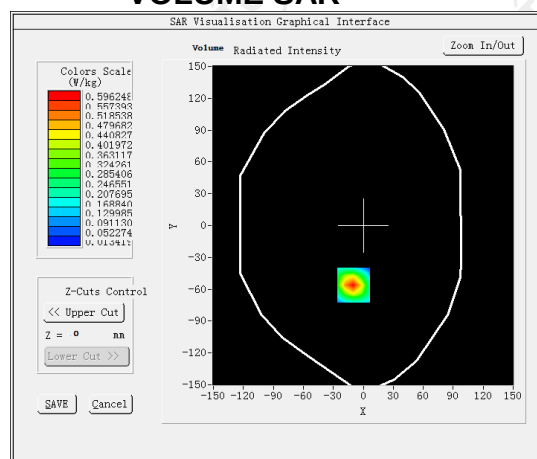
Frequency (MHz)	2506.000000
Relative permittivity (real part)	39.009335
Relative permittivity (imaginary part)	13.553667
Conductivity (S/m)	1.952481
Variation (%)	0.910000
Crest Factor	1.0
Probe Conversion factor	4.36
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(hotspot 10mm)
Band	<u>LTE band 41(1 RB#0)</u>

SURFACE SAR

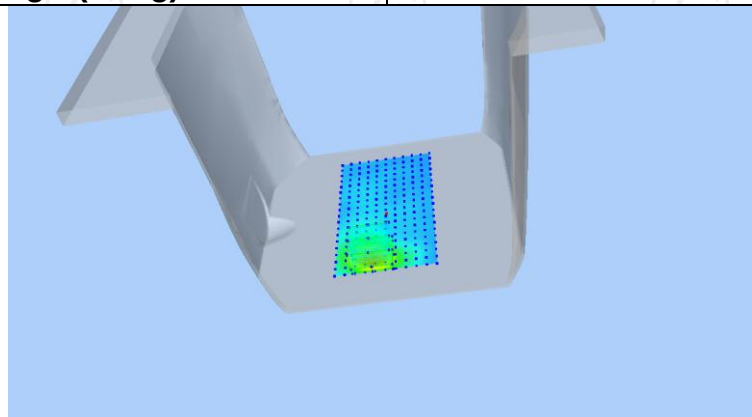


VOLUME SAR

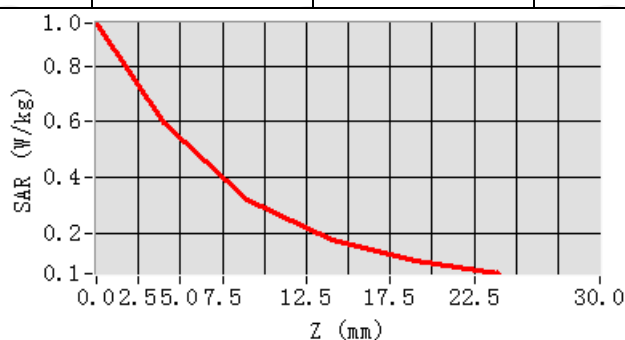


Maximum location: X=-10.00, Y=-56.00 SAR Peak: 0.96 W/kg

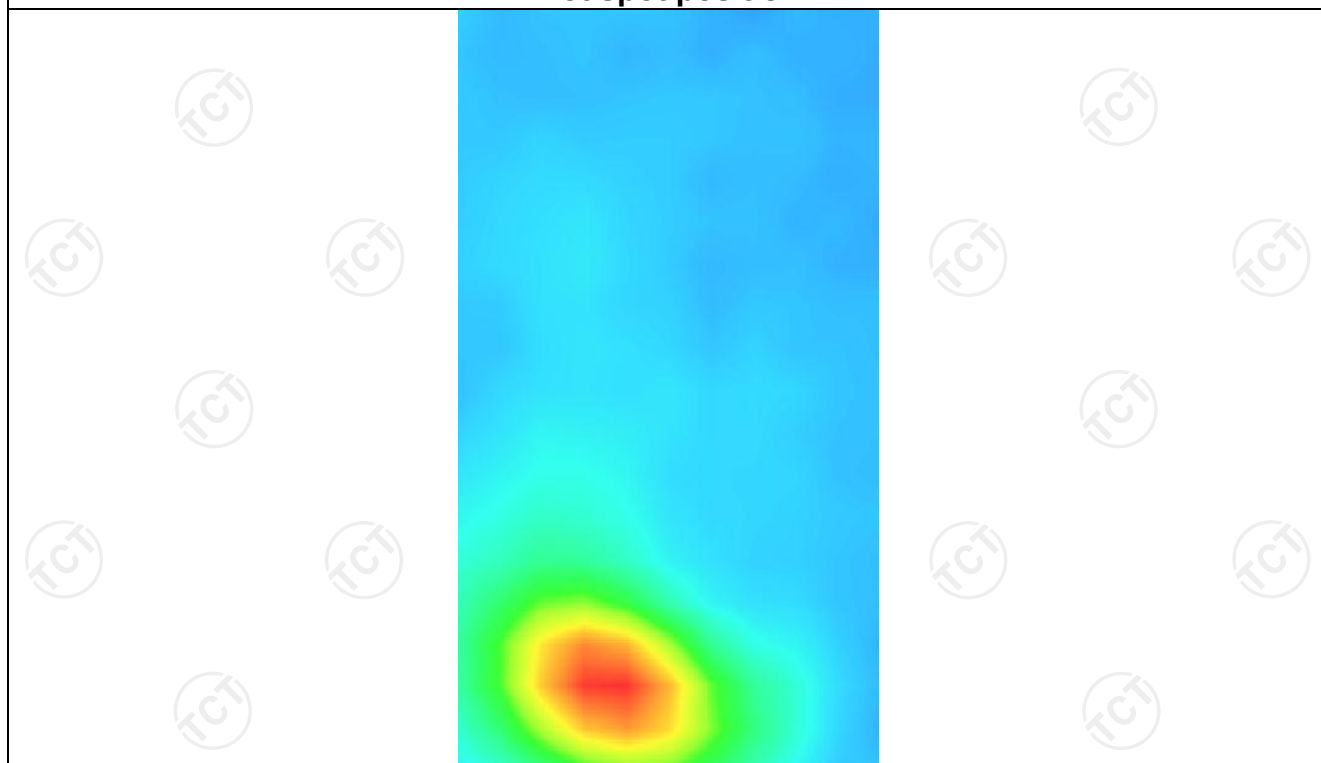
SAR 10g (W/Kg)	0.206715
SAR 1g (W/Kg)	0.476081



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.9537	0.5962	0.3212	0.1735	0.0984



Hot spot position



WLAN 2.4G

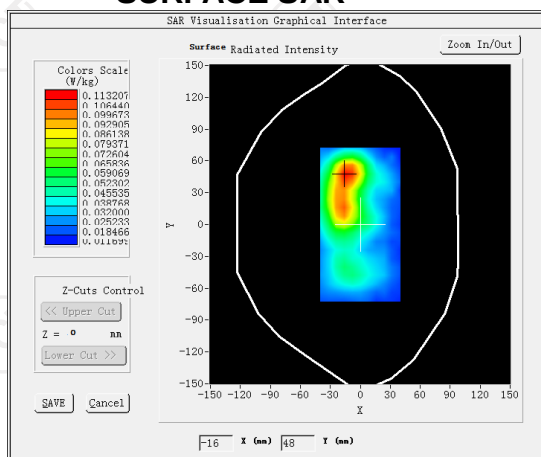
MEASUREMENT 1

High Band SAR (Channel 9):

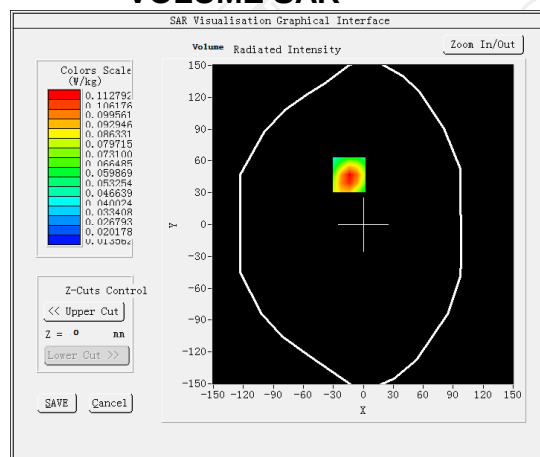
Date: 01/25/2024

Frequency (MHz)	2452.000000
Relative permittivity (real part)	37.821613
Relative permittivity (imaginary part)	13.546980
Conductivity (S/m)	1.834111
Variation (%)	1.830000
Crest Factor	1.0
Probe Conversion factor	2.31
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body front(10mm)
Band	<u>IEEE 802.11n HT40 ISM</u>

SURFACE SAR

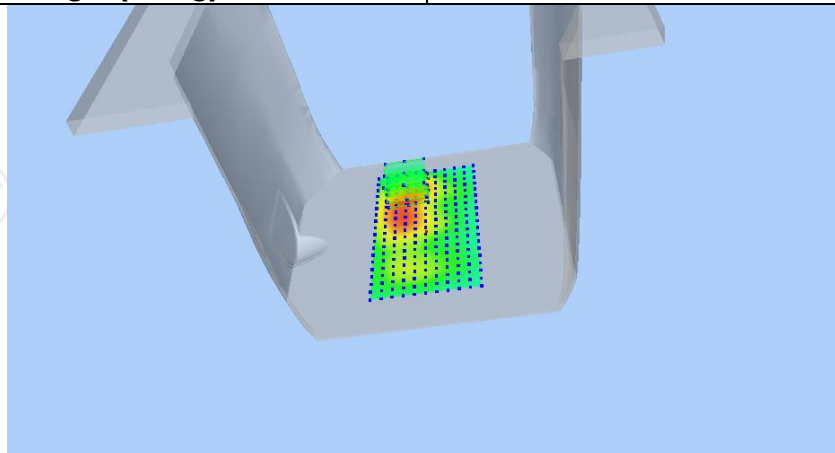


VOLUME SAR

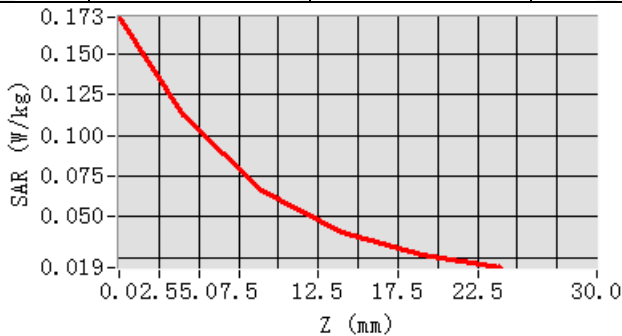


Maximum location: X=-14.00, Y=47.00 SAR Peak: 0.17 W/kg

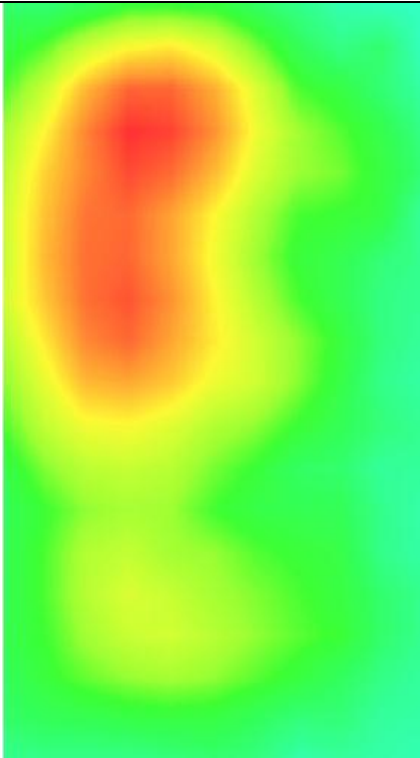
SAR 10g (W/Kg)	0.072100
SAR 1g (W/Kg)	0.107602



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1726	0.1128	0.0659	0.0401	0.0268



Hot spot position



MEASUREMENT 2

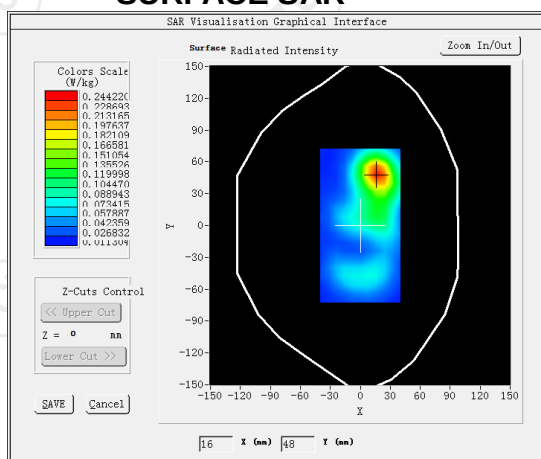
High Band SAR (Channel 9):

Date: 01/25/2024

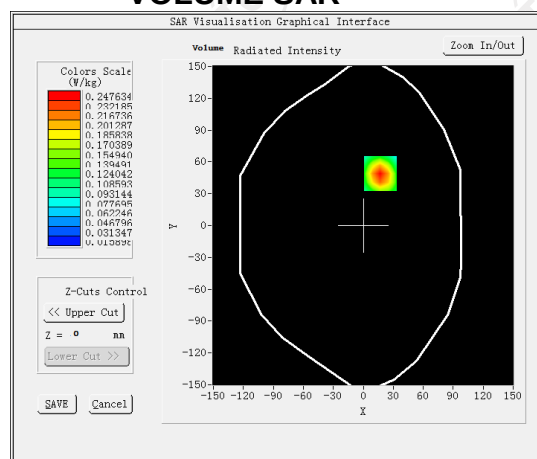
Frequency (MHz)	2452.000000
Relative permittivity (real part)	37.821613
Relative permittivity (imaginary part)	13.546980
Conductivity (S/m)	1.834111
Variation (%)	3.180000
Crest Factor	1.0
Probe Conversion factor	2.31
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=5mm dy=5mm</u> <u>dz=5mm, Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>IEEE 802.11n HT40 ISM</u>

SURFACE SAR

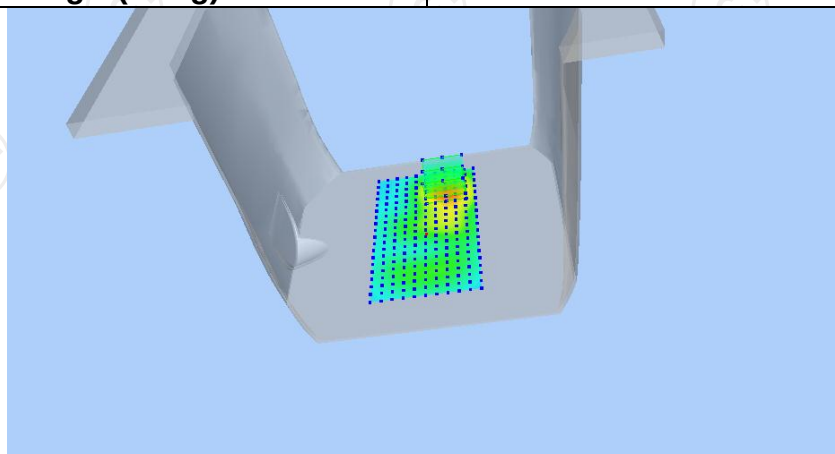


VOLUME SAR

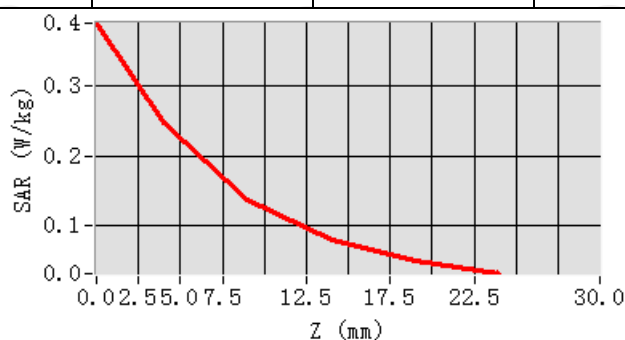


Maximum location: X=17.00, Y=49.00 SAR Peak: 0.39 W/kg

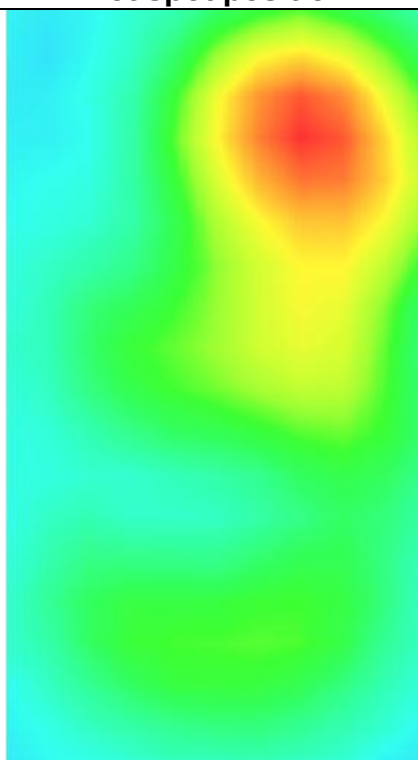
SAR 10g (W/Kg)	0.157130
SAR 1g (W/Kg)	0.304836



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3901	0.2476	0.1376	0.0785	0.0484



Hot spot position



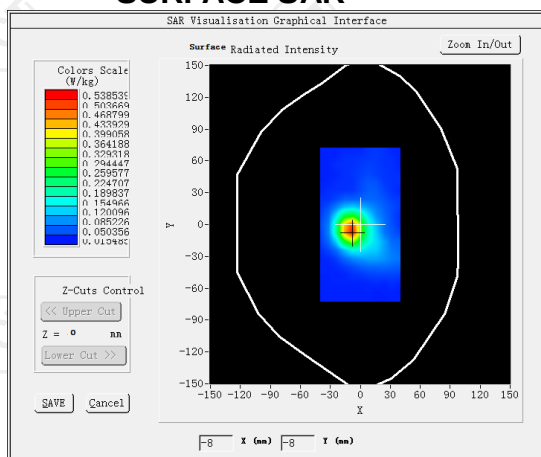
MEASUREMENT 3

High Band SAR (Channel 9):

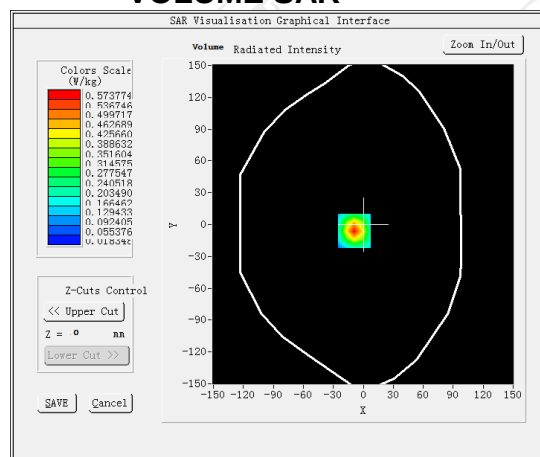
Date: 01/25/2024

Frequency (MHz)	2452.000000
Relative permittivity (real part)	37.821613
Relative permittivity (imaginary part)	13.546980
Conductivity (S/m)	1.834111
Variation (%)	0.570000
Crest Factor	1.0
Probe Conversion factor	2.31
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>IEEE 802.11b ISM(hotspot)</u>

SURFACE SAR

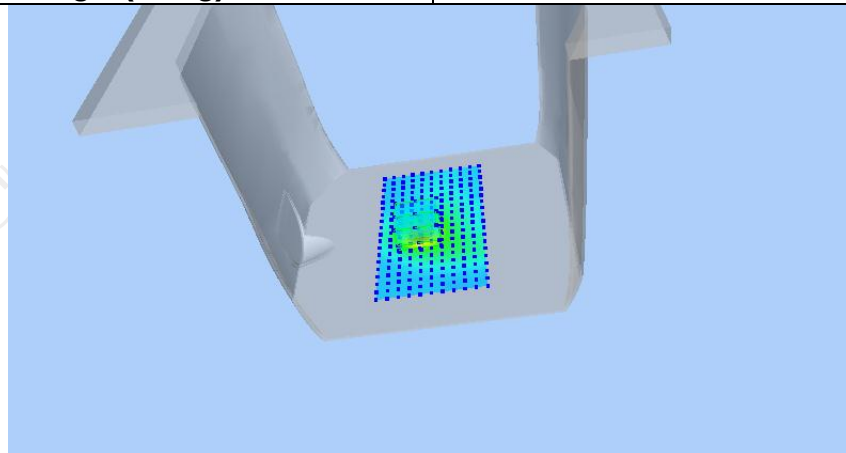


VOLUME SAR

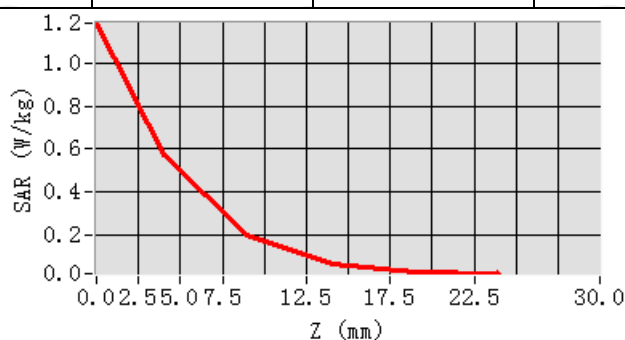


Maximum location: X=-14.00, Y=55.00 SAR Peak: 0.44 W/kg

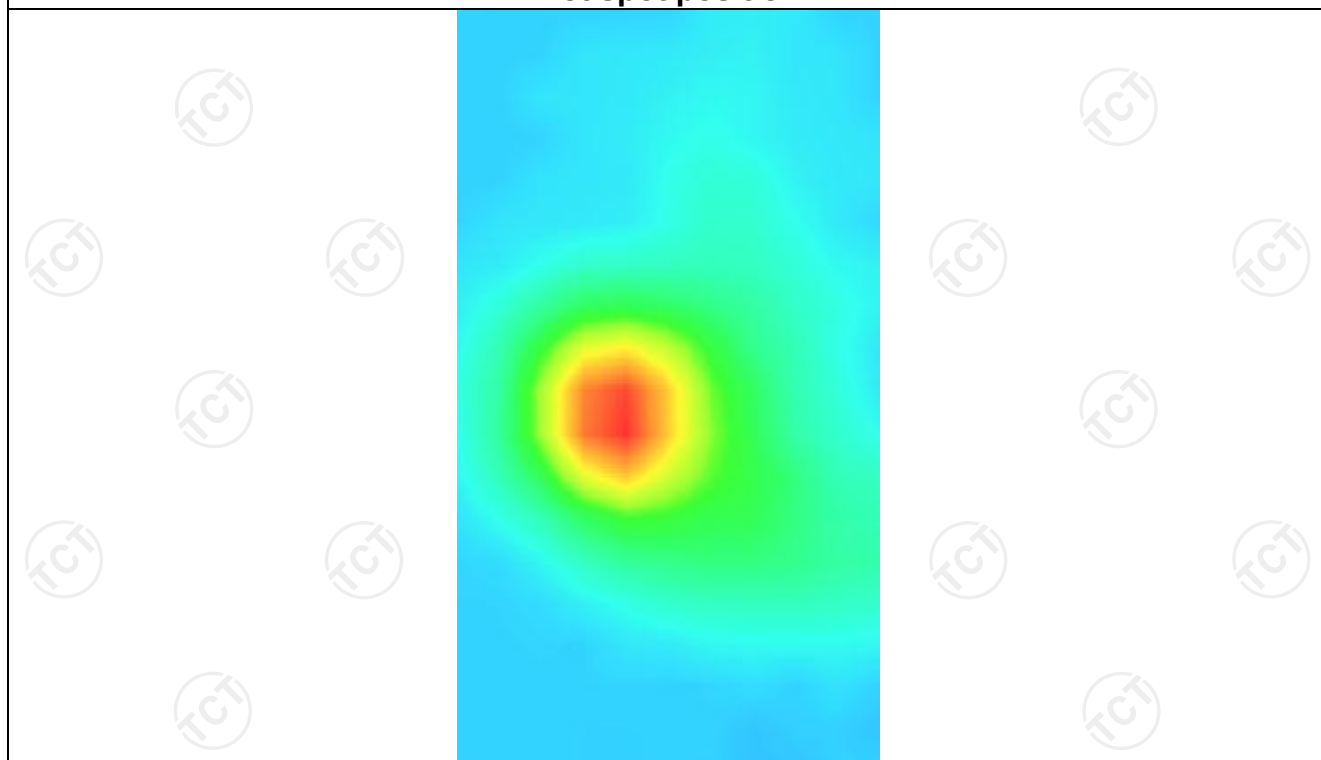
SAR 10g (W/Kg)	0.126740
SAR 1g (W/Kg)	0.329154



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1857	0.5738	0.2014	0.0679	0.0308



Hot spot position



WLAN 5.2G

MEASUREMENT 1

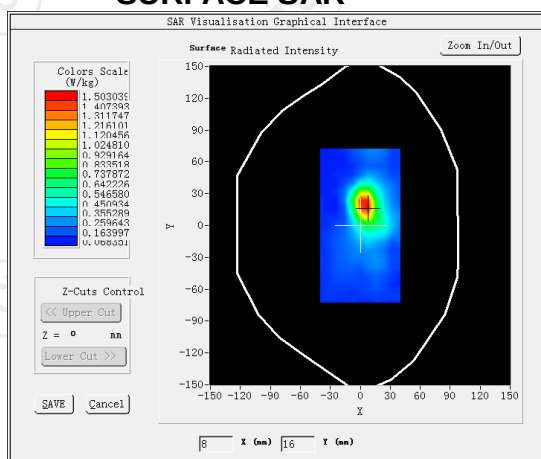
SAR (Channel 36):

Date: 02/01/2024

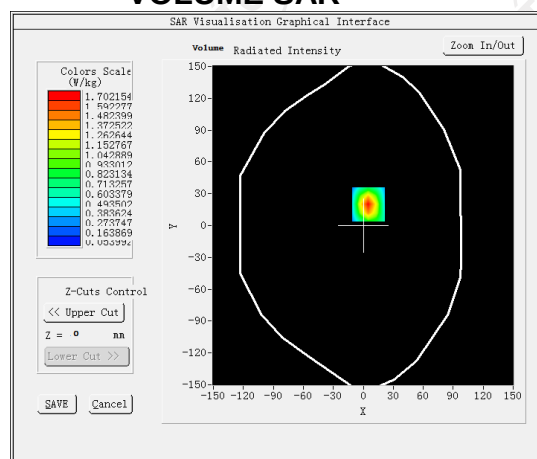
Frequency (MHz)	5180.000000
Relative permittivity (real part)	35.068832
Relative permittivity (imaginary part)	13.679428
Conductivity (S/m)	5.220788
Variation (%)	-0.480000
Crest Factor	1.0
Probe Conversion factor	2.01
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=4mm dy=4mm</u> <u>dz=2mm, Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body front(10mm)
Band	IEEE 802.11a ISM

SURFACE SAR

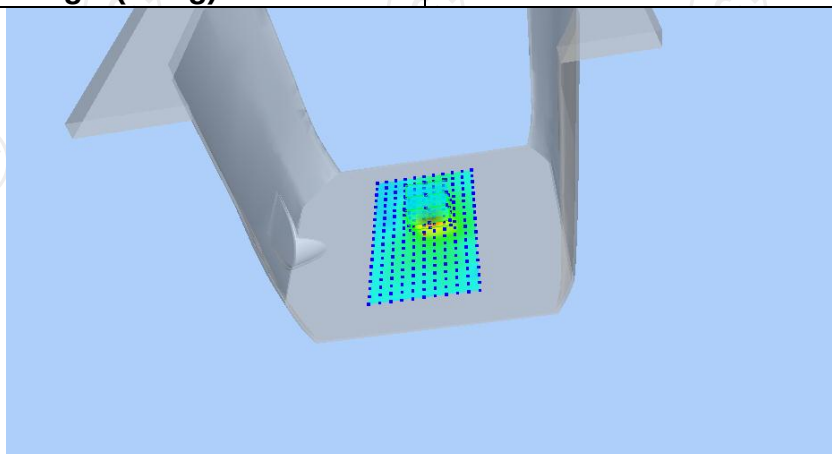


VOLUME SAR

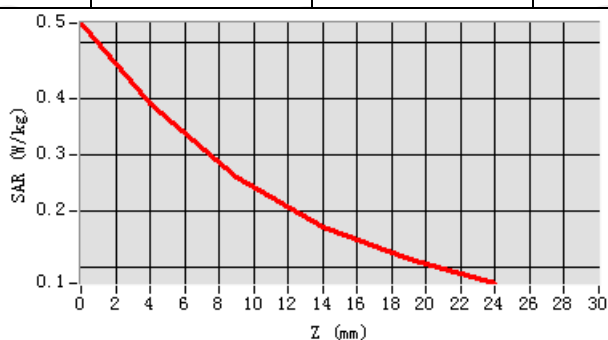


Maximum location: X=15.00, Y=21.00 SAR Peak: 0.56 W/kg

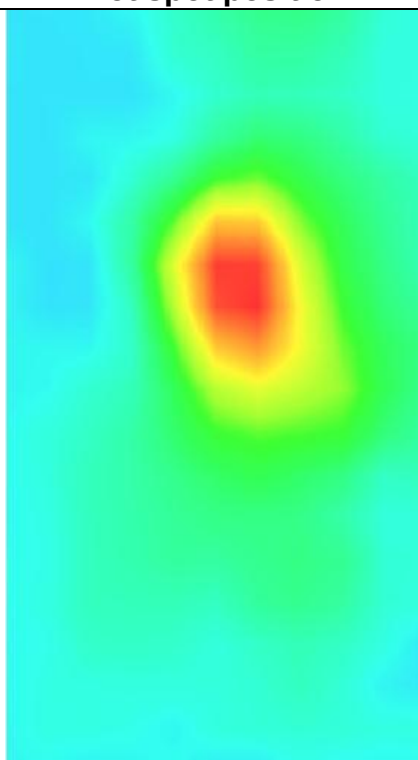
SAR 10g (W/Kg)	0.140821
SAR 1g (W/Kg)	0.301250



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.5344	0.3907	0.2608	0.1730	0.1144



Hot spot position



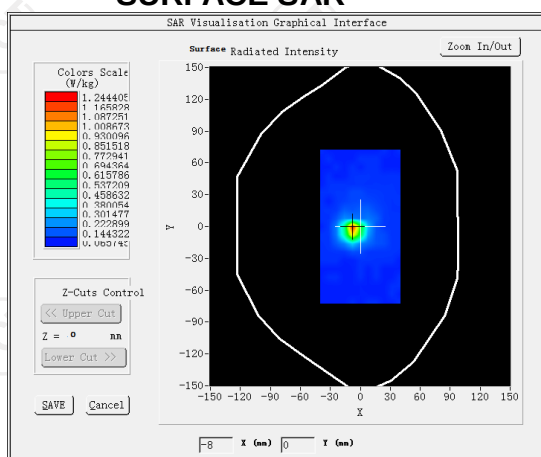
MEASUREMENT 2

SAR (Channel 36):

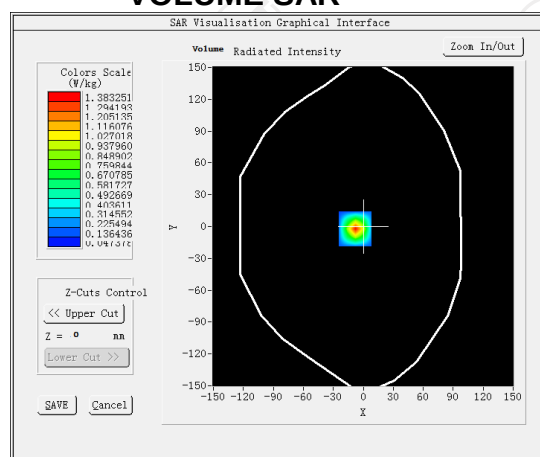
Date: 02/01/2024

Frequency (MHz)	5180.000000
Relative permittivity (real part)	35.068832
Relative permittivity (imaginary part)	13.679428
Conductivity (S/m)	5.220788
Variation (%)	3.640000
Crest Factor	1.0
Probe Conversion factor	2.01
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body back(10mm)
Band	IEEE 802.11a ISM

SURFACE SAR

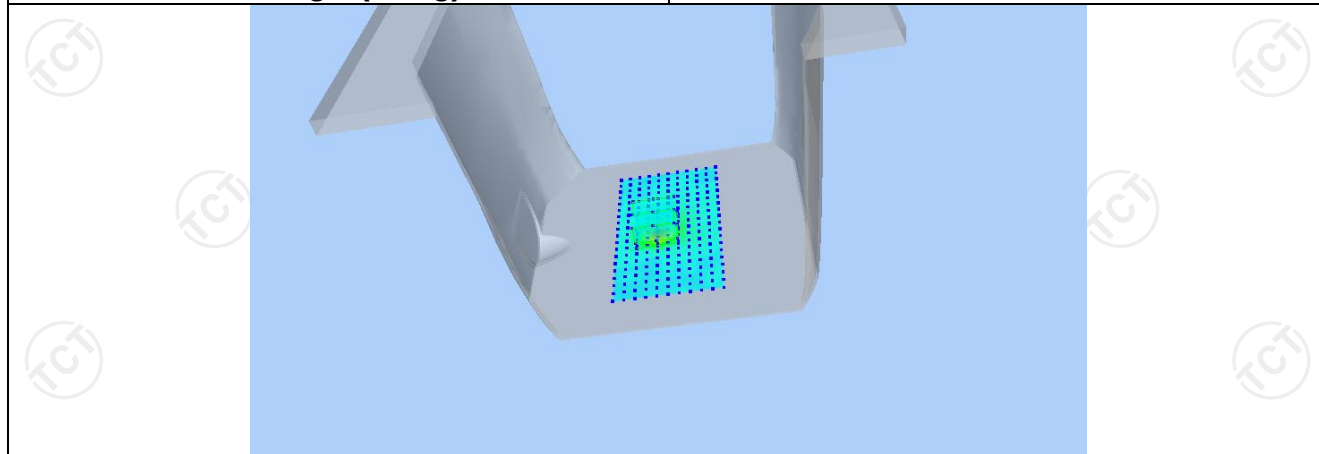


VOLUME SAR

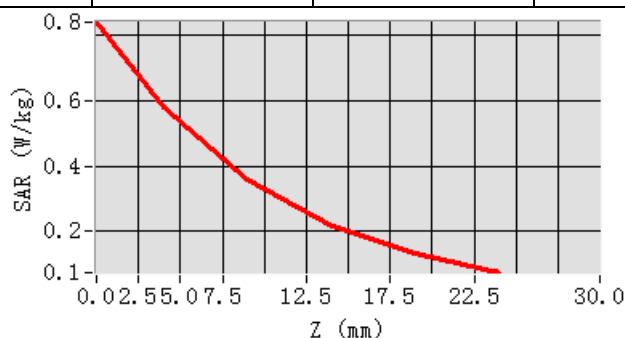


Maximum location: X=-8.00, Y=-2.00 SAR Peak: 0.84 W/kg

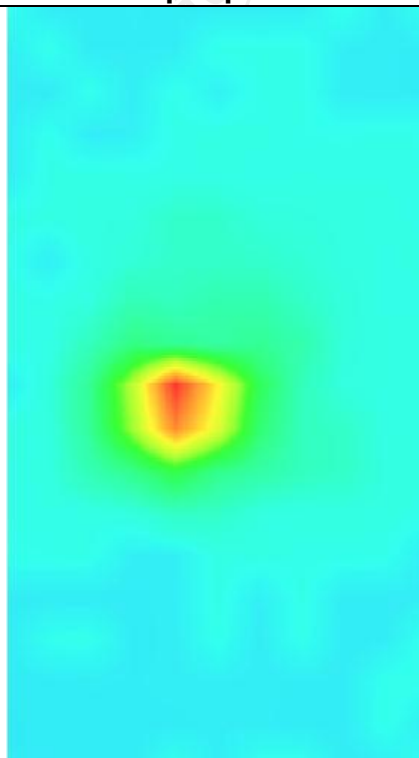
SAR 10g (W/Kg)	0.241305
SAR 1g (W/Kg)	0.415747



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.8414	0.5805	0.3567	0.2159	0.1294



Hot spot position



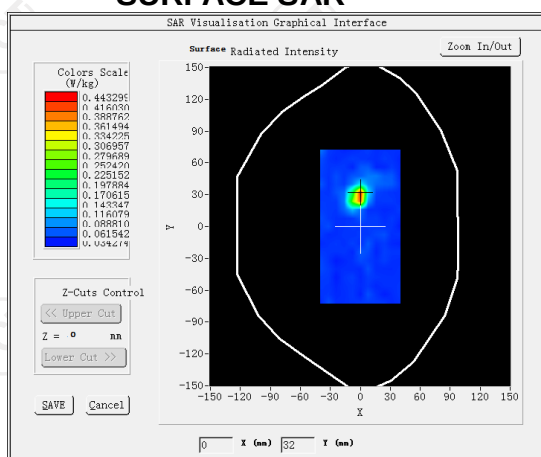
MEASUREMENT 3

SAR (Channel 36):

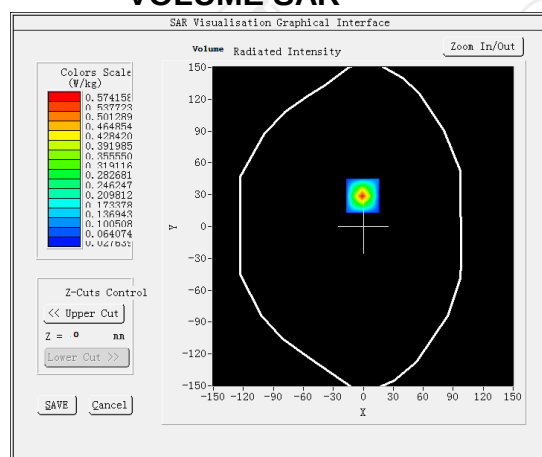
Date: 02/01/2024

Frequency (MHz)	5180.000000
Relative permittivity (real part)	35.068832
Relative permittivity (imaginary part)	13.679428
Conductivity (S/m)	5.220788
Variation (%)	2.610000
Crest Factor	1.0
Probe Conversion factor	2.01
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>IEEE 802.11a ISM(hotspot)</u>

SURFACE SAR

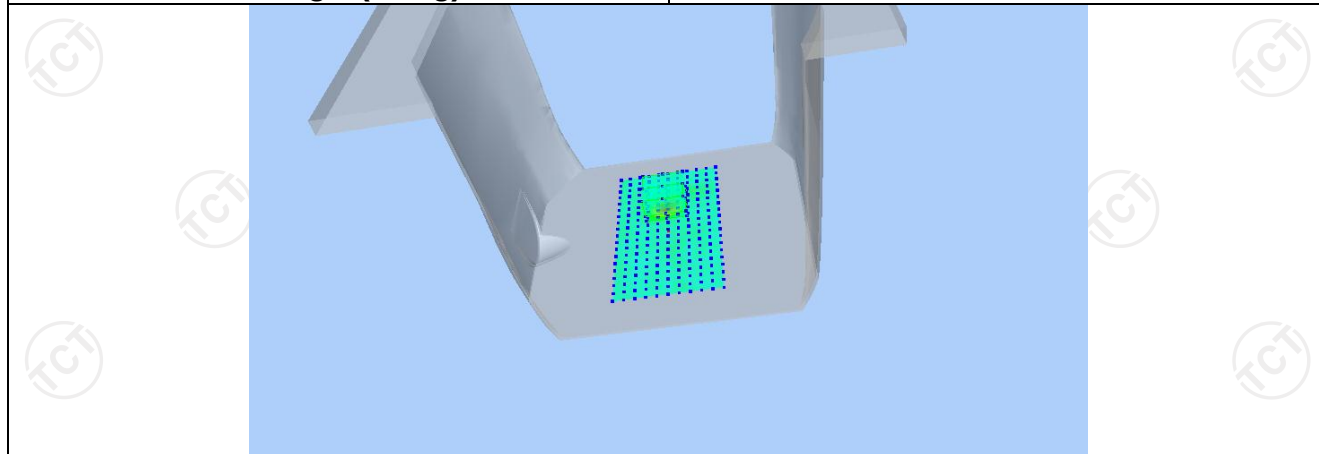


VOLUME SAR

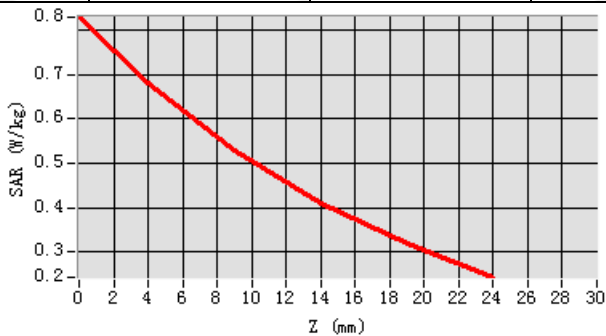


Maximum location: X=-1.00, Y=29.00 SAR Peak: 0.84 W/kg

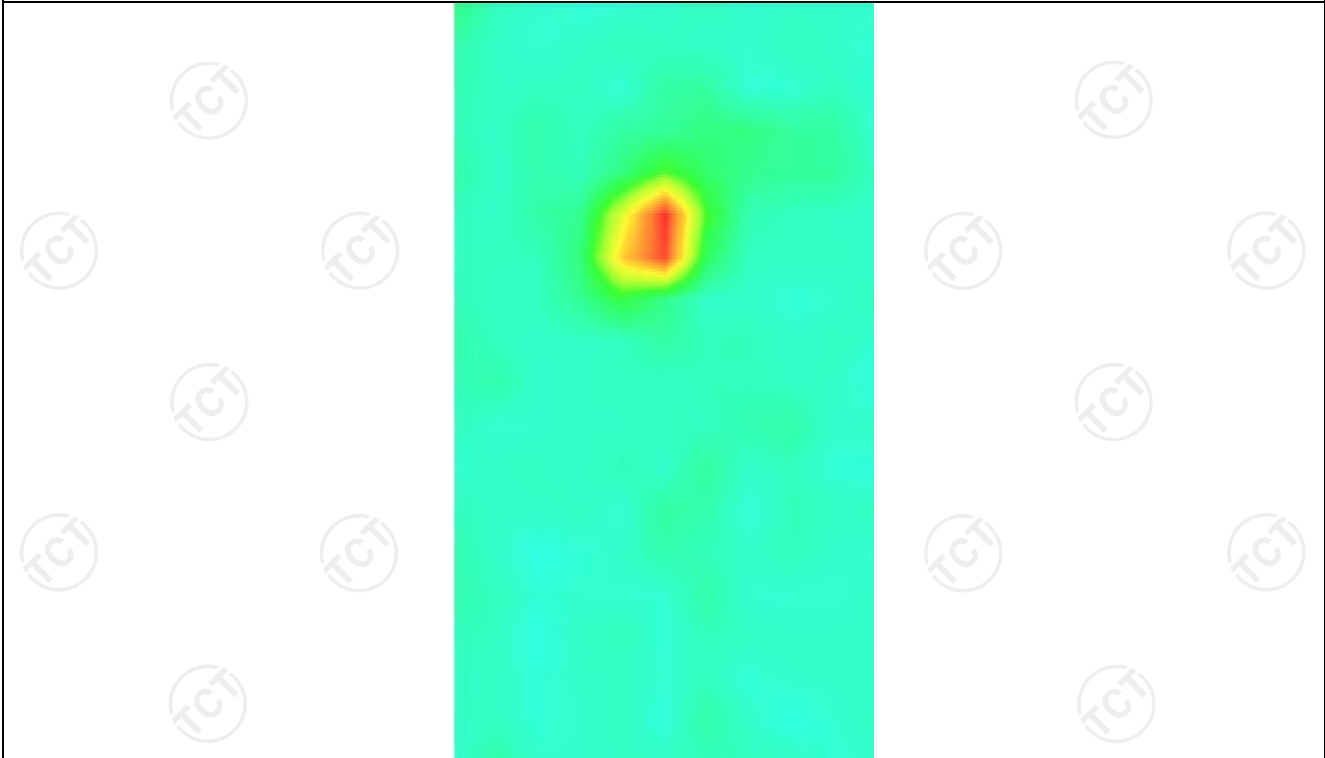
SAR 10g (W/Kg)	0.261871
SAR 1g (W/Kg)	0.448410



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.8297	0.6798	0.5281	0.4101	0.3180



Hot spot position



WLAN 5.3G

MEASUREMENT 1

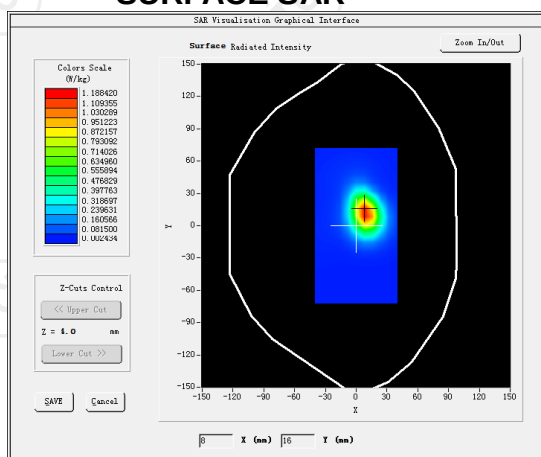
SAR (Channel 52):

Date: 02/02/2024

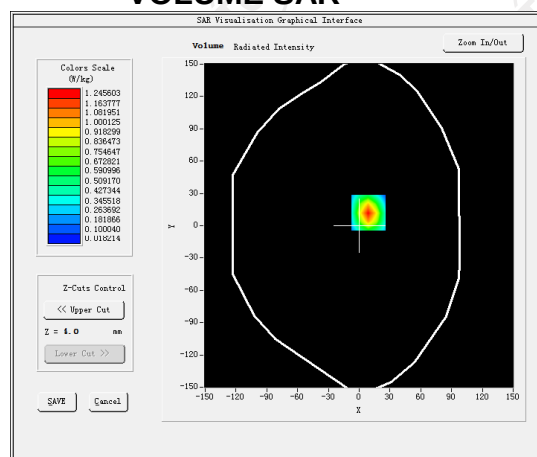
Frequency (MHz)	5280.000000
Relative permittivity (real part)	36.068832
Relative permittivity (imaginary part)	13.680430
Conductivity (S/m)	4.690788
Variation (%)	2.490000
Crest Factor	1.0
Probe Conversion factor	1.94
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body front(10mm)
Band	IEEE 802.11a ISM

SURFACE SAR

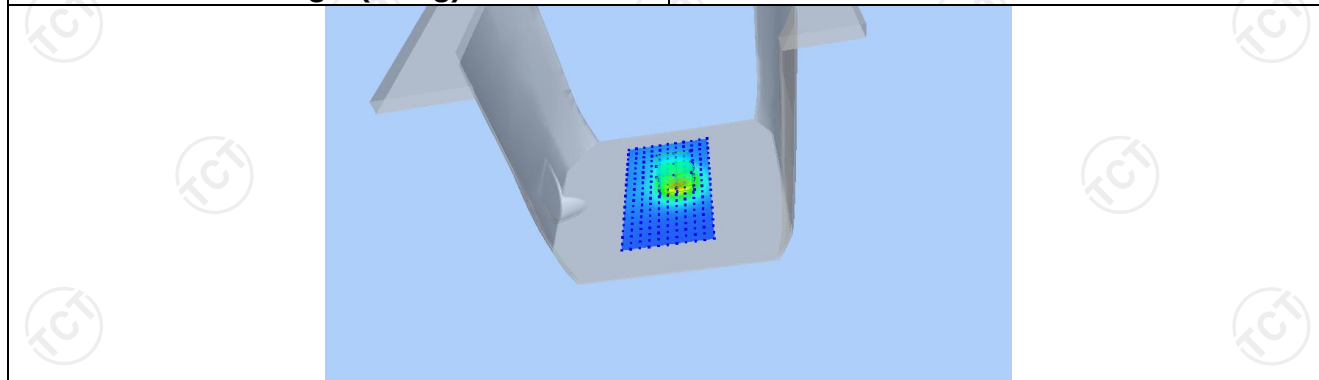


VOLUME SAR

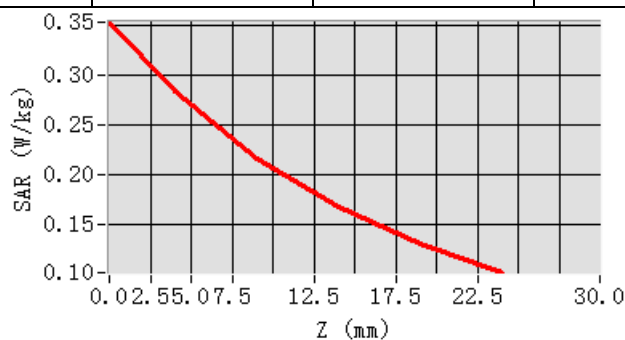


Maximum location: X=18.00, Y=35.00 SAR Peak: 0.36 W/kg

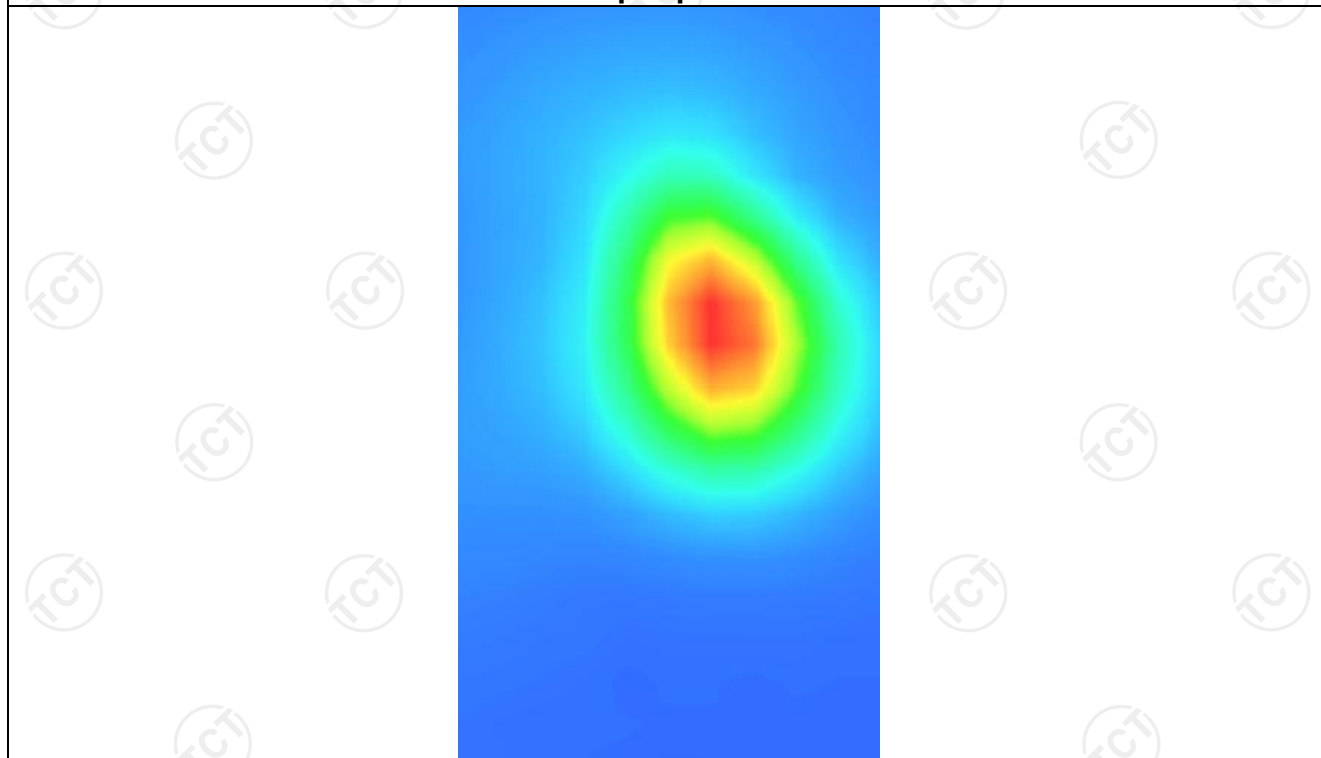
SAR 10g (W/Kg)	0.127955
SAR 1g (W/Kg)	0.206047



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3521	0.2840	0.2161	0.1657	0.1324



Hot spot position



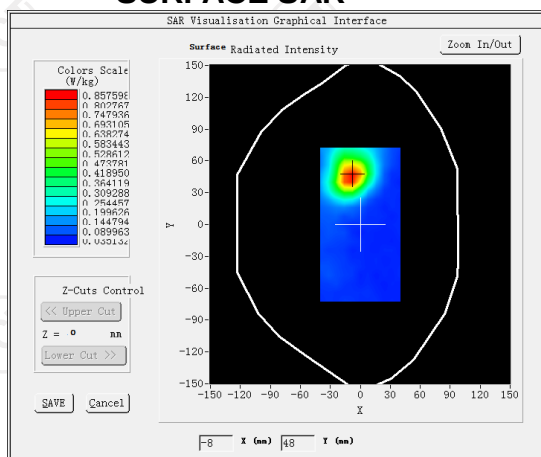
MEASUREMENT 2

SAR (Channel 52):

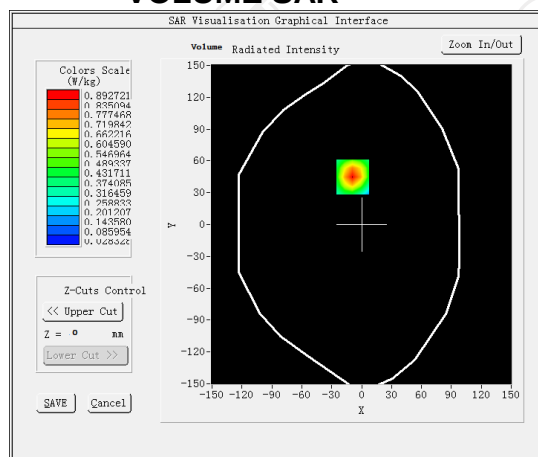
Date: 02/02/2024

Frequency (MHz)	5280.000000
Relative permittivity (real part)	36.068832
Relative permittivity (imaginary part)	13.680430
Conductivity (S/m)	4.690788
Variation (%)	-2.470000
Crest Factor	1.0
Probe Conversion factor	1.94
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>IEEE 802.11a ISM</u>

SURFACE SAR

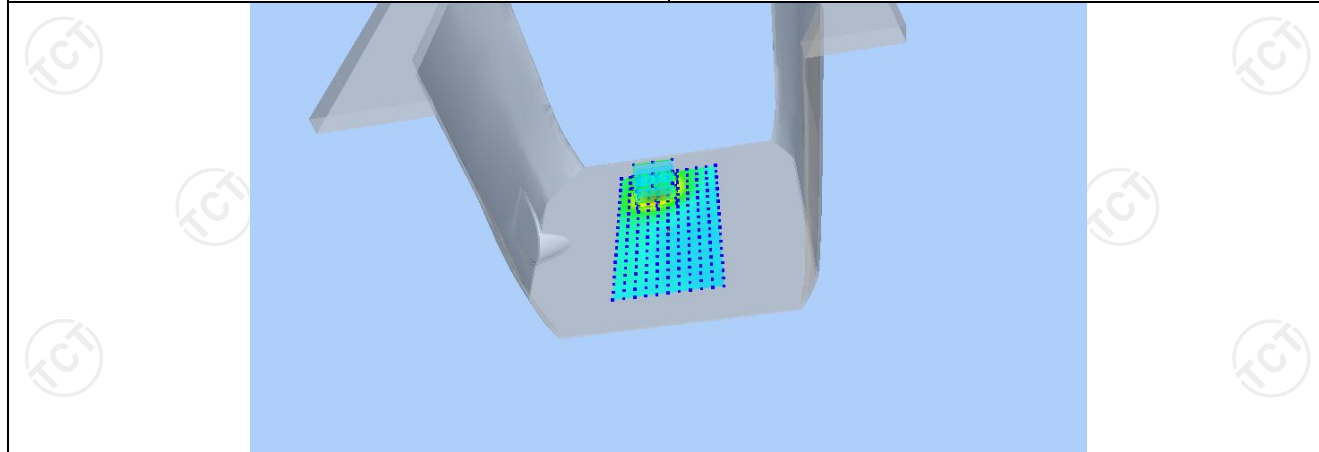


VOLUME SAR

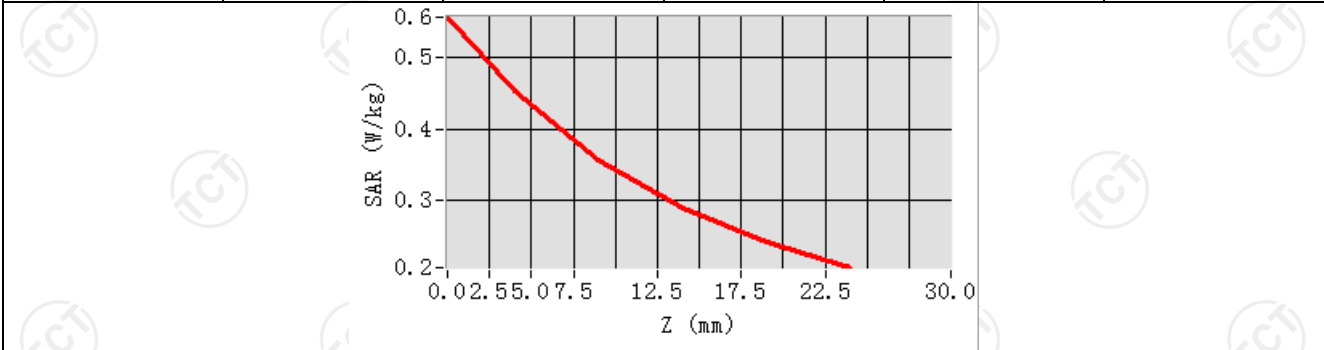


Maximum location: X=-9.00, Y=45.00 SAR Peak: 0.56 W/kg

SAR 10g (W/Kg)	0.171681
SAR 1g (W/Kg)	0.330128



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.5562	0.4528	0.3556	0.2881	0.2417



Hot spot position



MEASUREMENT 3

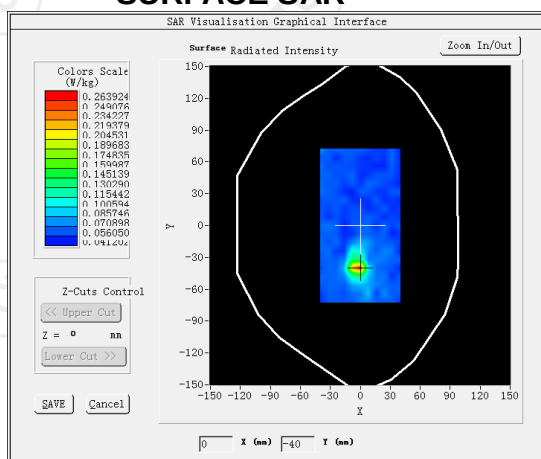
SAR (Channel 52):

Date: 02/02/2024

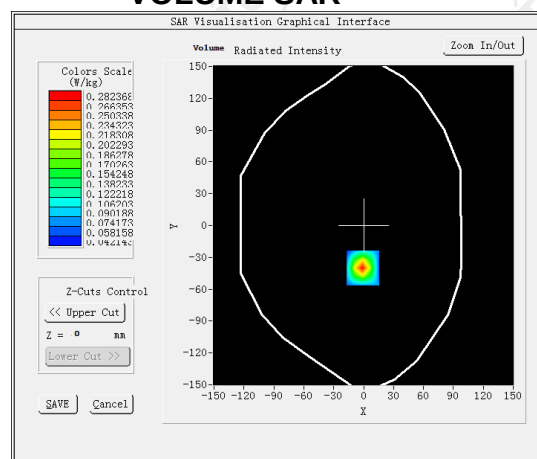
Frequency (MHz)	5280.000000
Relative permittivity (real part)	36.068832
Relative permittivity (imaginary part)	13.680430
Conductivity (S/m)	4.690788
Variation (%)	1.520000
Crest Factor	1.0
Probe Conversion factor	1.94
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>IEEE 802.11a ISM(hotspot)</u>

SURFACE SAR

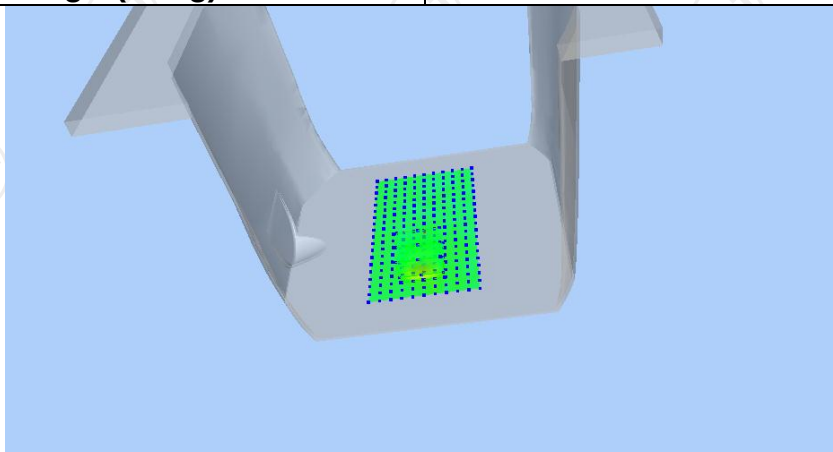


VOLUME SAR

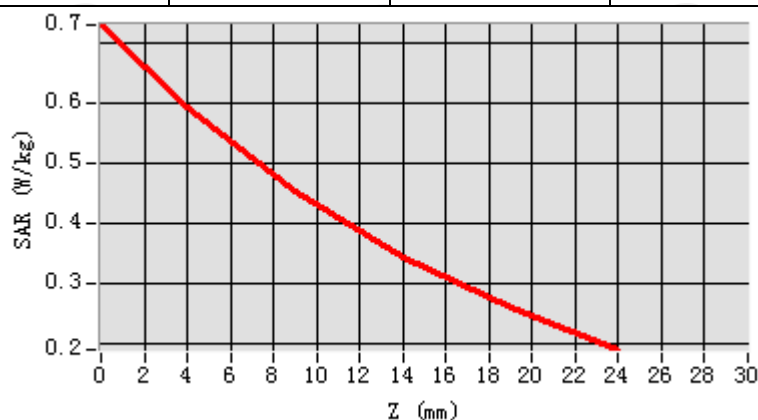


Maximum location: X=-1.00, Y=-40.00 SAR Peak: 0.70 W/kg

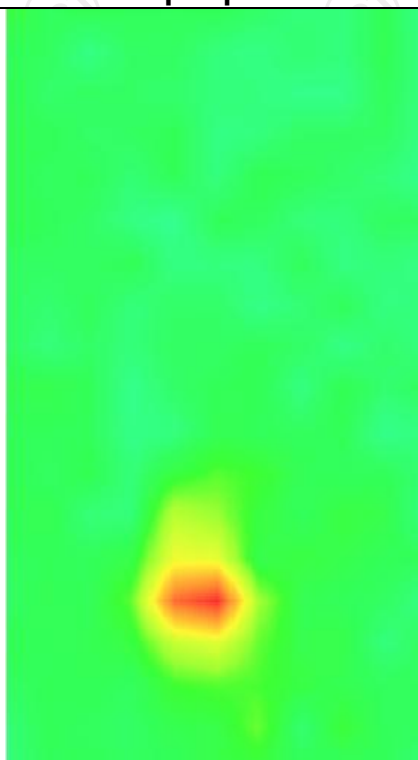
SAR 10g (W/Kg)	0.208043
SAR 1g (W/Kg)	0.352257



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.7311	0.5944	0.4521	0.3422	0.2562



Hot spot position



WLAN 5.6G

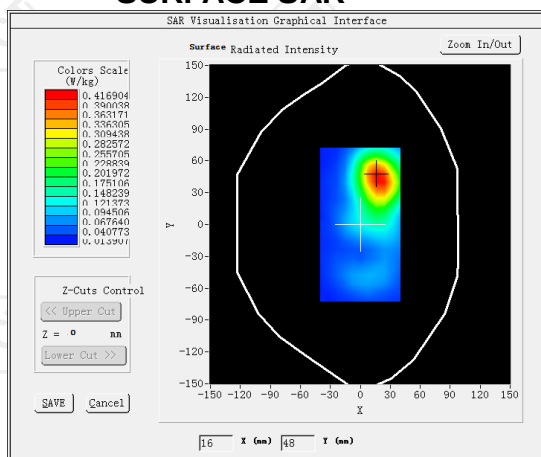
MEASUREMENT 1

SAR (Channel 134):

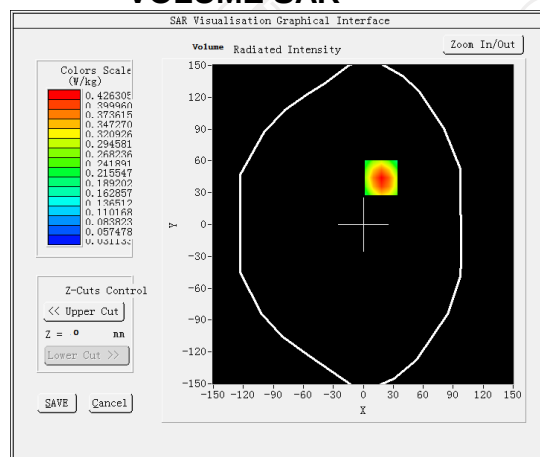
Date: 02/05/2024

Frequency (MHz)	5670.000000
Relative permittivity (real part)	49.759999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.970354
Variation (%)	1.720000
Crest Factor	1.0
Probe Conversion factor	2.12
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body front(10mm)
Band	IEEE 802.11n ISM

SURFACE SAR

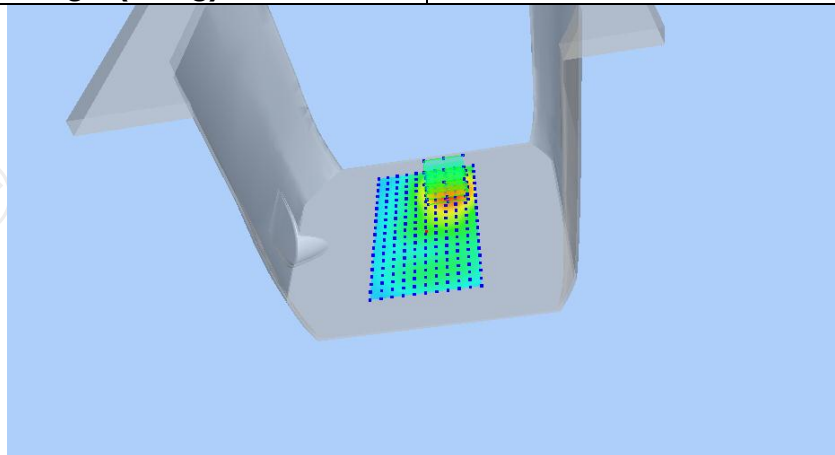


VOLUME SAR

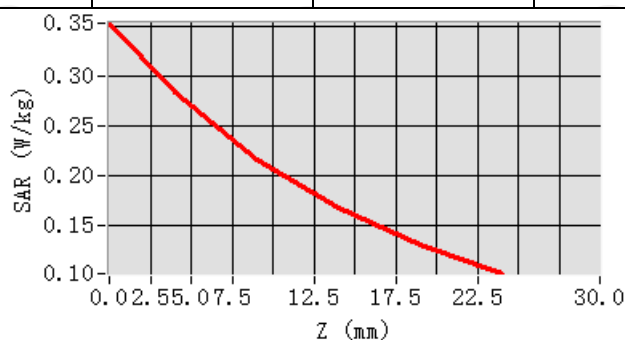


Maximum location: X=18.00, Y=44.00 SAR Peak: 0.36 W/kg

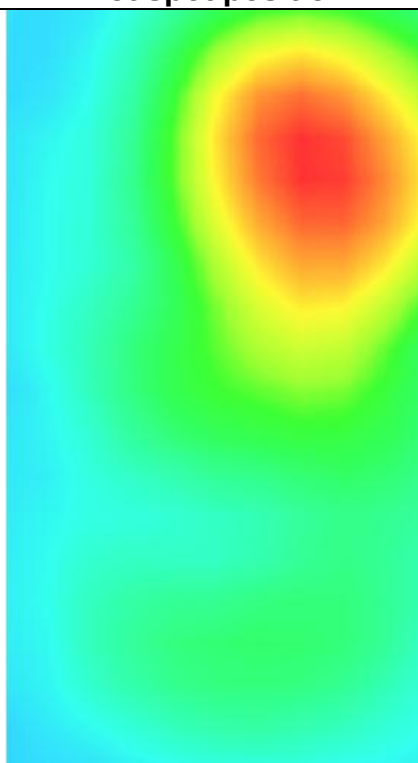
SAR 10g (W/Kg)	0.129908
SAR 1g (W/Kg)	0.233524



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3541	0.2841	0.2163	0.1664	0.1297



Hot spot position



MEASUREMENT 2

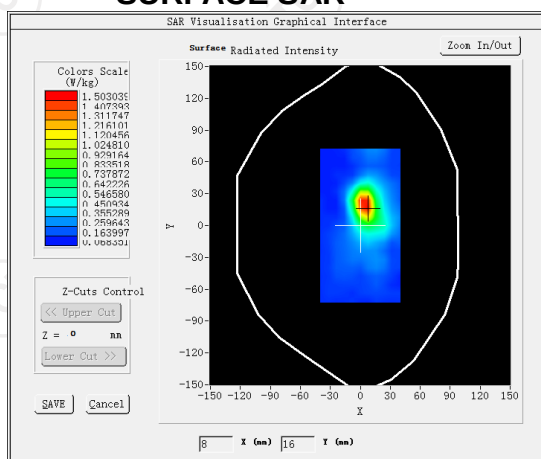
SAR (Channel 134):

Date: 02/05/2024

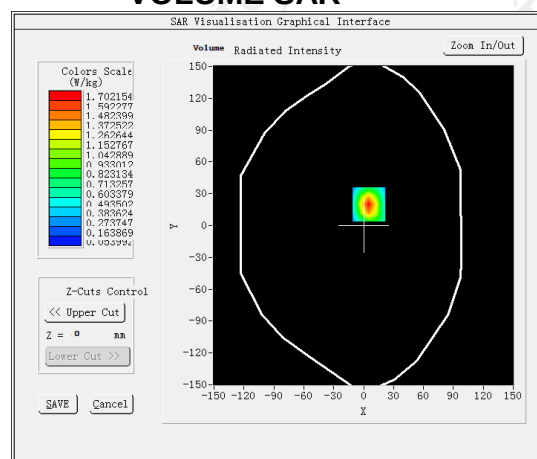
Frequency (MHz)	5670.000000
Relative permittivity (real part)	49.759999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.970354
Variation (%)	-0.710000
Crest Factor	1.0
Probe Conversion factor	2.12
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=4mm dy=4mm</u> <u>dz=2mm, Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	IEEE 802.11n ISM

SURFACE SAR

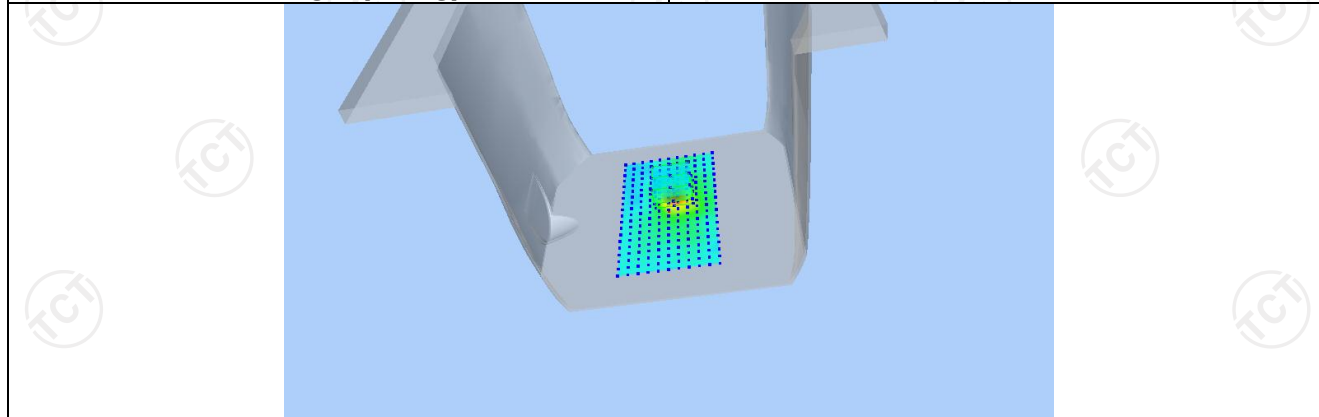


VOLUME SAR

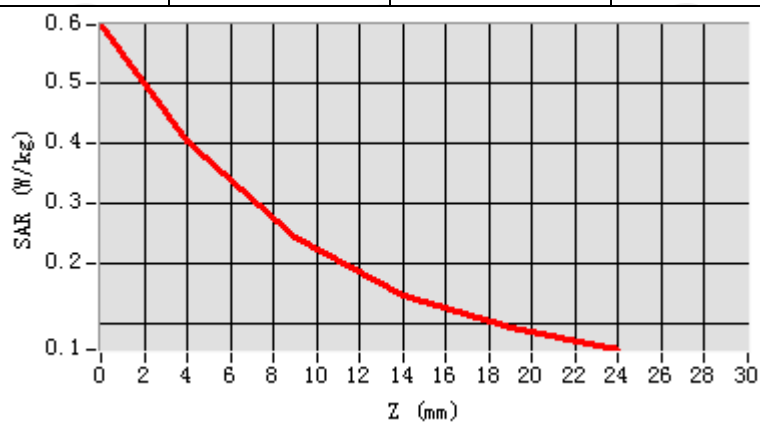


Maximum location: X=19.00, Y=5.00 SAR Peak: 0.60 W/kg

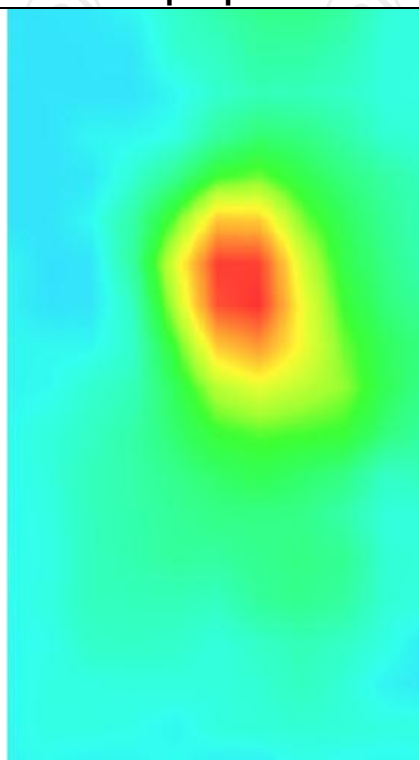
SAR 10g (W/Kg)	0.168895
SAR 1g (W/Kg)	0.329565



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.5985	0.4037	0.2429	0.1473	0.0922



Hot spot position



MEASUREMENT 3

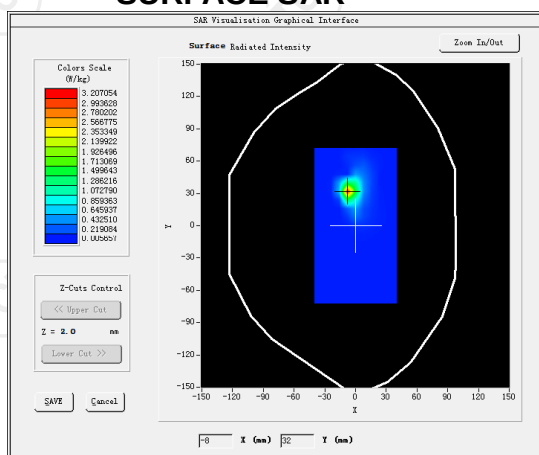
SAR (Channel 134):

Date: 02/05/2024

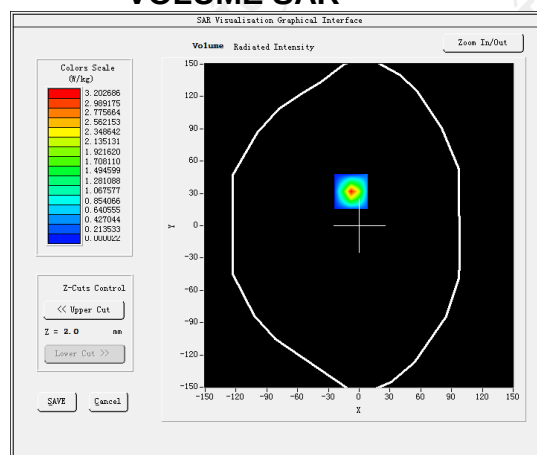
Frequency (MHz)	5670.000000
Relative permittivity (real part)	49.759999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.970354
Variation (%)	-2.390000
Crest Factor	1.0
Probe Conversion factor	2.12
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body Back(hotspot 10mm)
Band	IEEE 802.11n ISM

SURFACE SAR

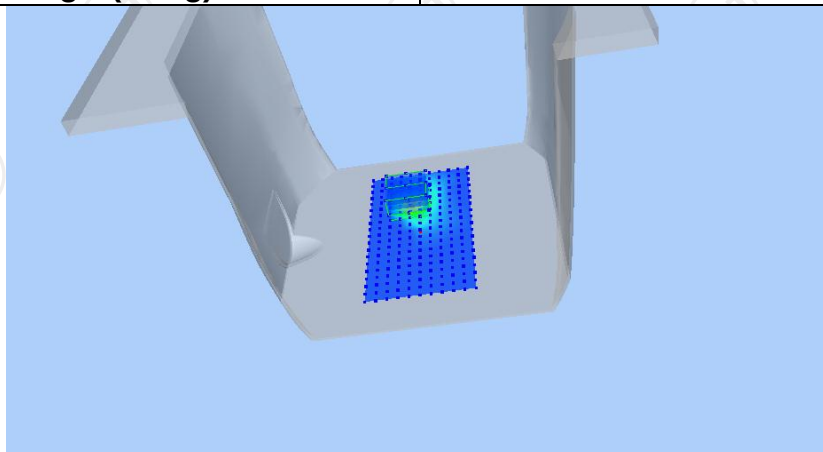


VOLUME SAR

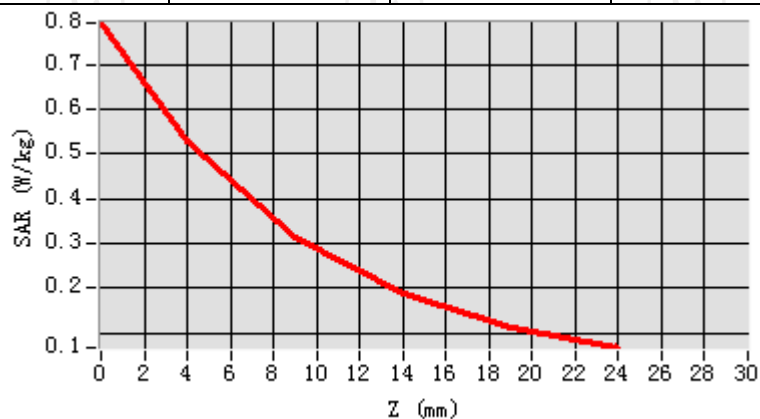


Maximum location: X=18.00, Y=-37.00 SAR Peak: 0.79 W/kg

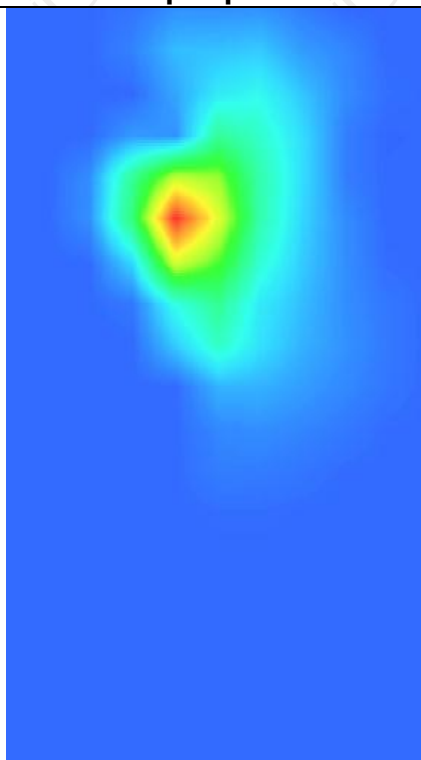
SAR 10g (W/Kg)	0.282176
SAR 1g (W/Kg)	0.377017



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.7921	0.5295	0.3141	0.1871	0.1145



Hot spot position



WLAN 5.8G

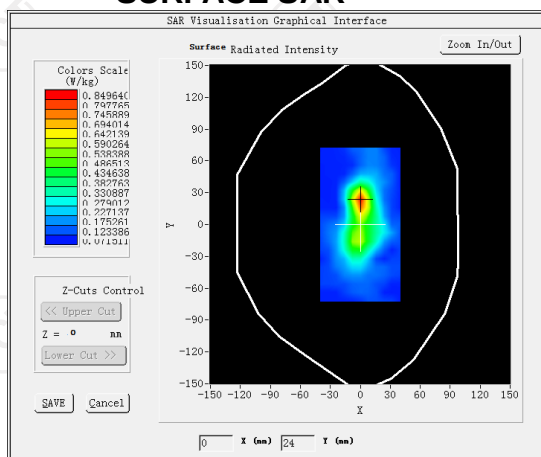
MEASUREMENT 1

SAR (Channel 165):

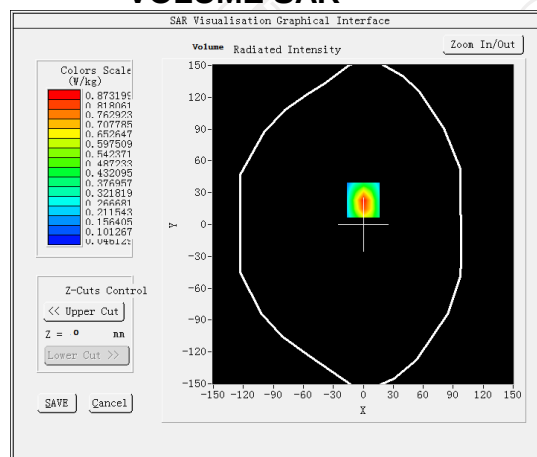
Date: 02/05/2024

Frequency (MHz)	5825.000000
Relative permittivity (real part)	38.352823
Relative permittivity (imaginary part)	13.671675
Conductivity (S/m)	5.430828
Variation (%)	1.300000
Crest Factor	1.0
Probe Conversion factor	2.06
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body front(10mm)
Band	IEEE 802.11n ISM

SURFACE SAR

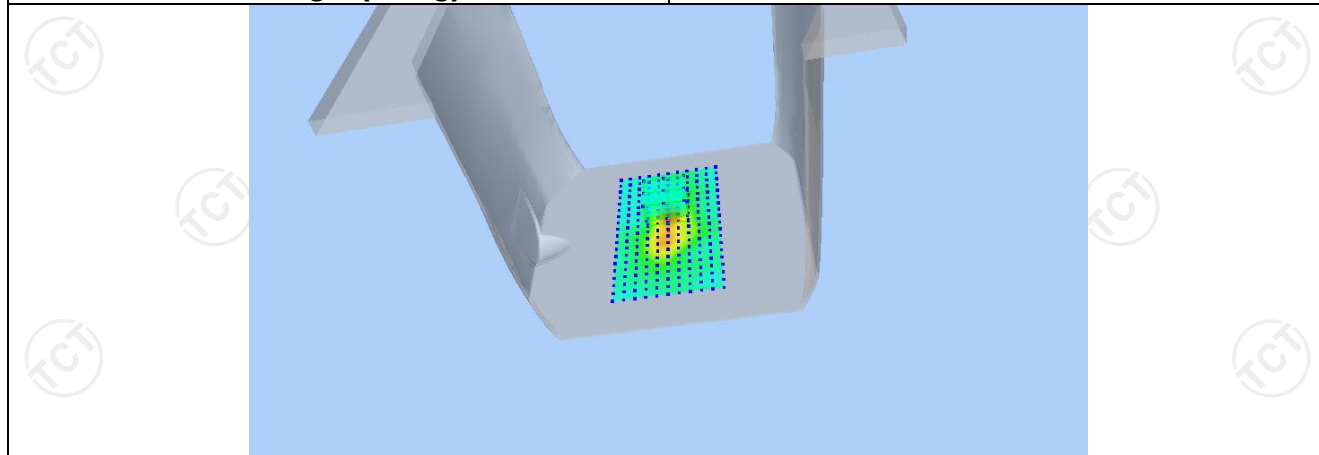


VOLUME SAR

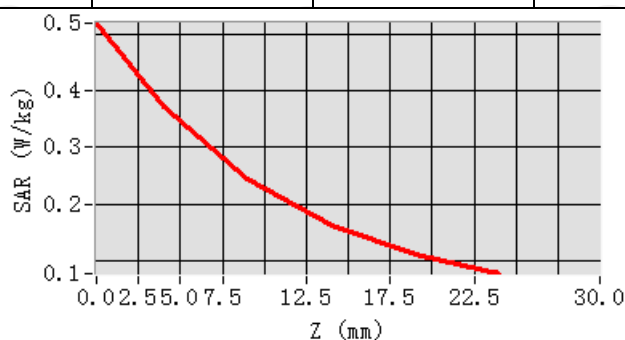


Maximum location: X=0.00, Y=23.00 SAR Peak: 0.52 W/kg

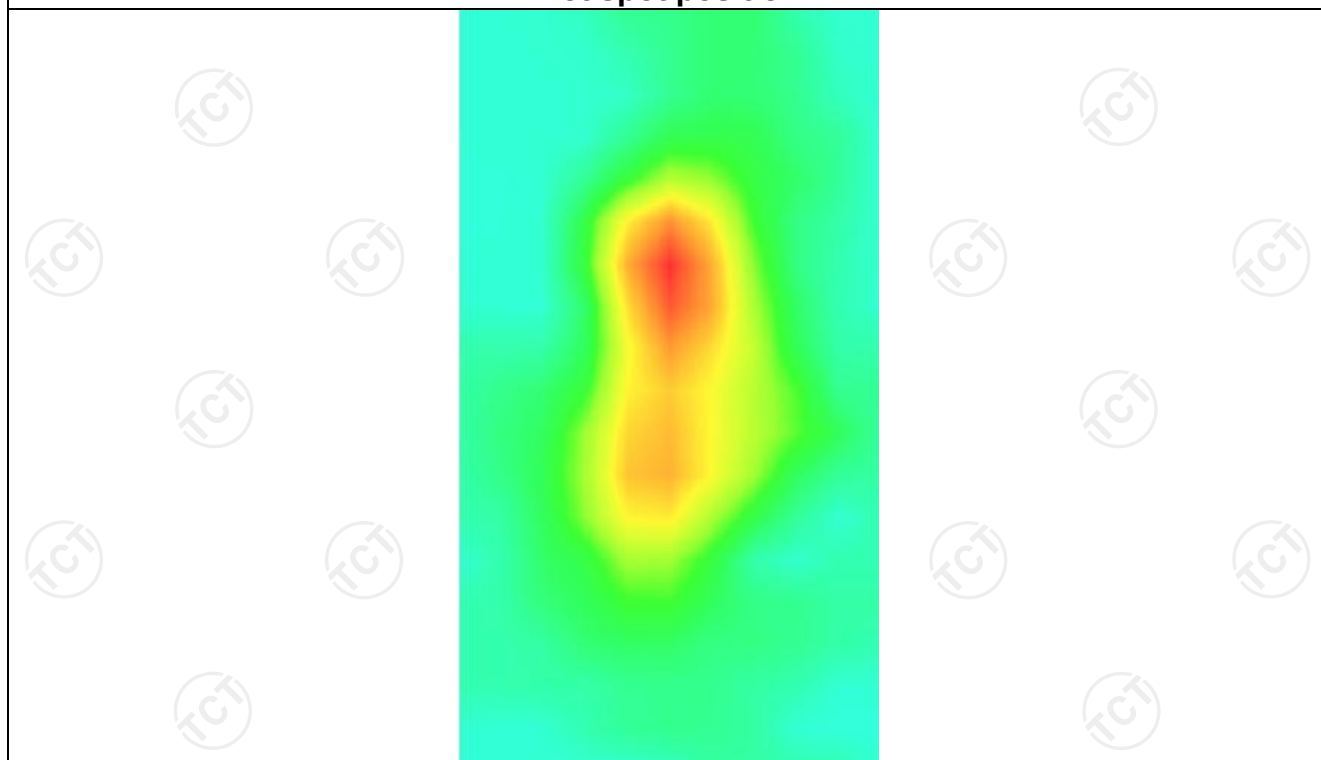
SAR 10g (W/Kg)	0.103810
SAR 1g (W/Kg)	0.293110



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.5206	0.3717	0.2431	0.1618	0.1112



Hot spot position



MEASUREMENT 2

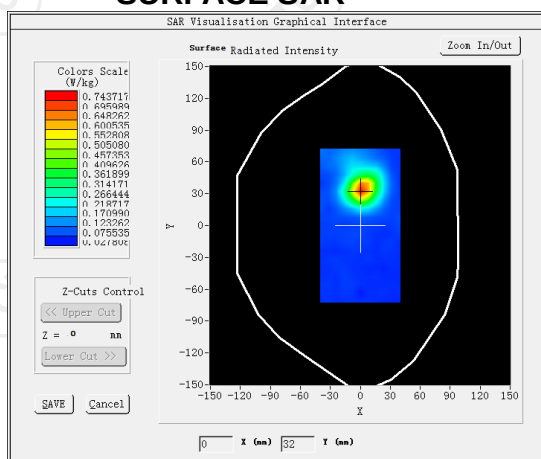
SAR (Channel 165):

Date: 02/05/2024

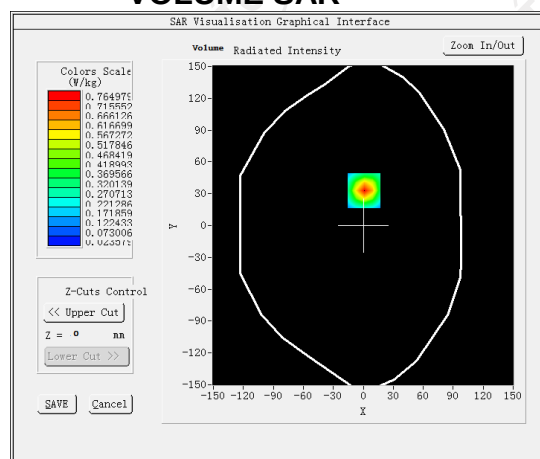
Frequency (MHz)	5825.000000
Relative permittivity (real part)	38.352823
Relative permittivity (imaginary part)	13.671675
Conductivity (S/m)	5.430828
Variation (%)	-1.300000
Crest Factor	1.0
Probe Conversion factor	2.06
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>IEEE 802.11n ISM</u>

SURFACE SAR

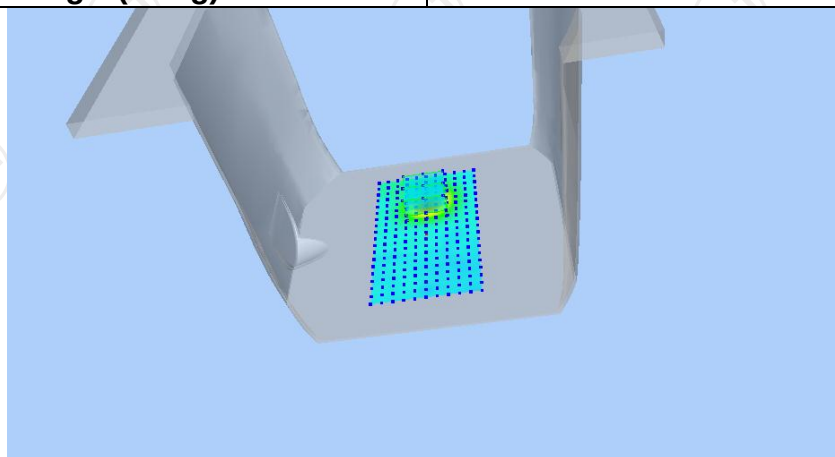


VOLUME SAR

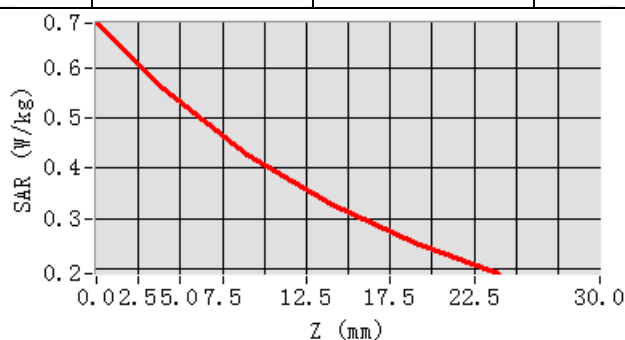


Maximum location: X=1.00, Y=33.00 SAR Peak: 0.69 W/kg

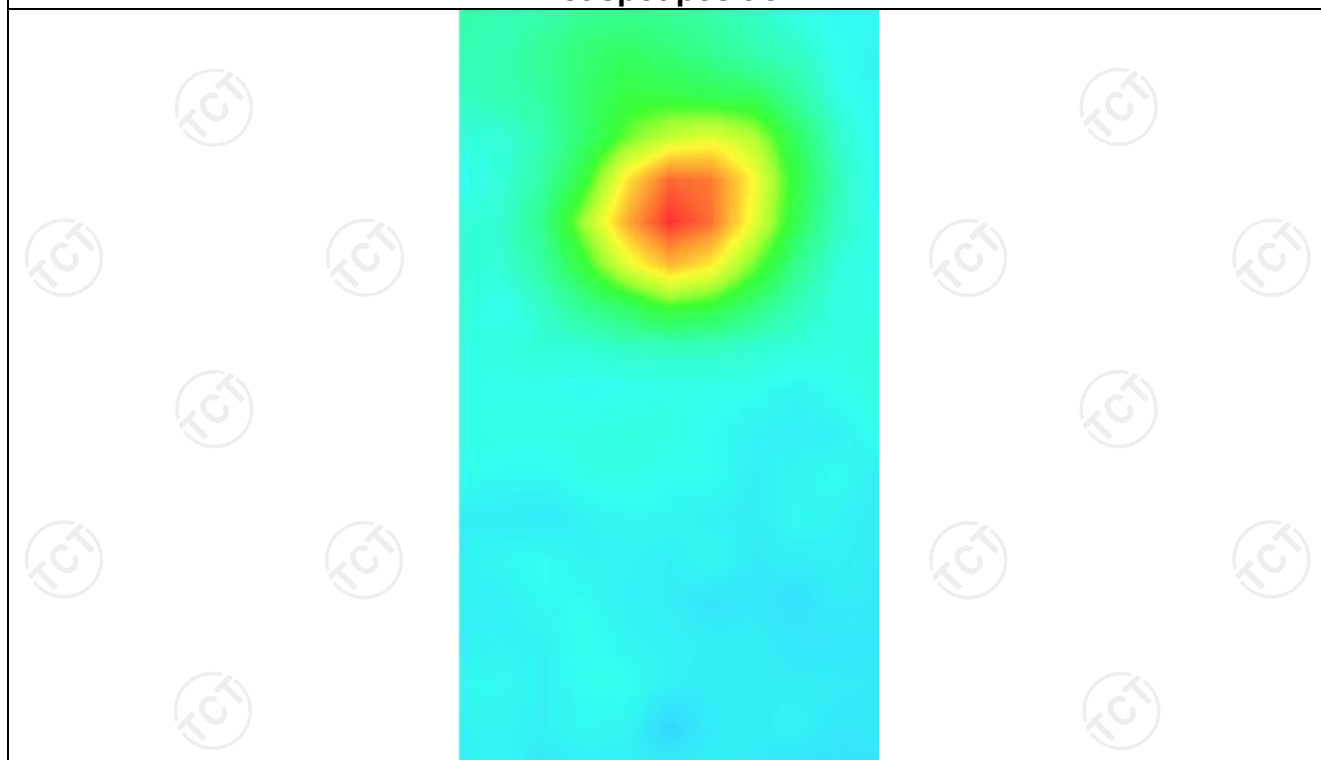
SAR 10g (W/Kg)	0.201791
SAR 1g (W/Kg)	0.380120



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.6892	0.5586	0.4282	0.3285	0.2522



Hot spot position



MEASUREMENT 3

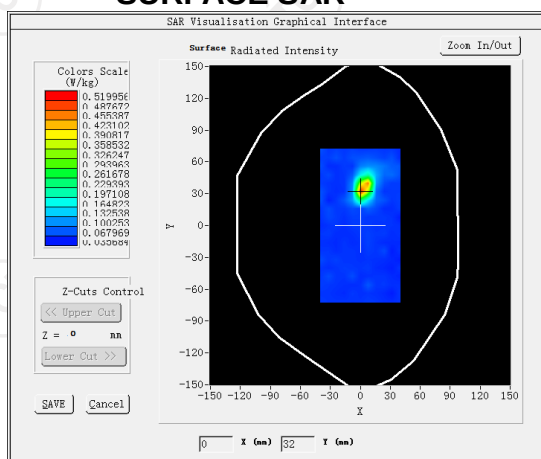
SAR (Channel 165):

Date: 02/05/2024

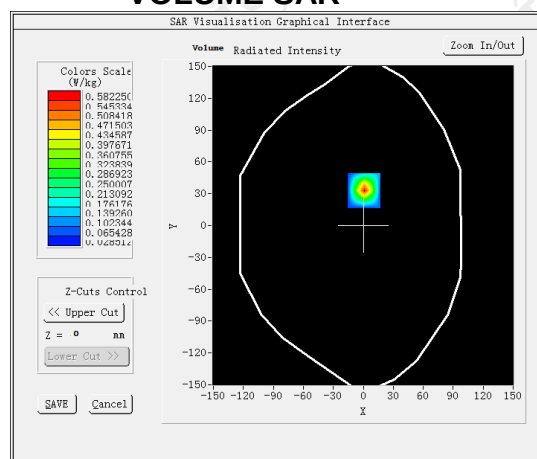
Frequency (MHz)	5825.000000
Relative permittivity (real part)	38.352823
Relative permittivity (imaginary part)	13.671675
Conductivity (S/m)	5.430828
Variation (%)	2.840000
Crest Factor	1.0
Probe Conversion factor	2.06
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=10mm dy=10mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=4mm dy=4mm</u> <u>dz=2mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

Phantom	Validation plane
Device Position	Body back(10mm)
Band	<u>IEEE 802.11n ISM(hotspot)</u>

SURFACE SAR

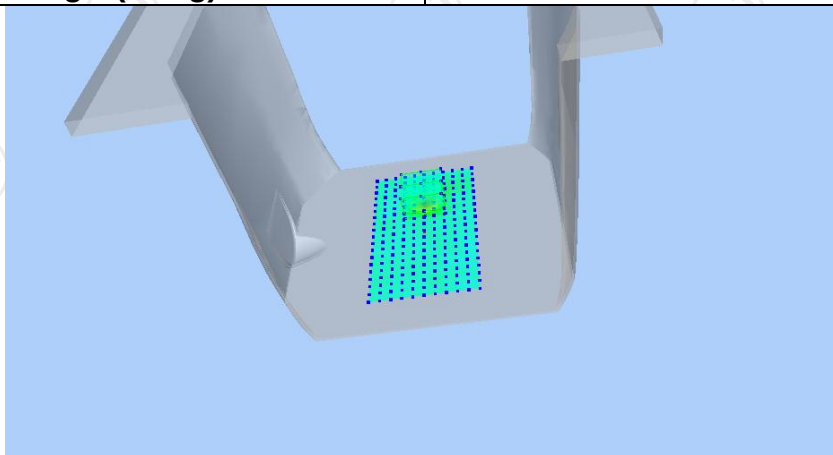


VOLUME SAR

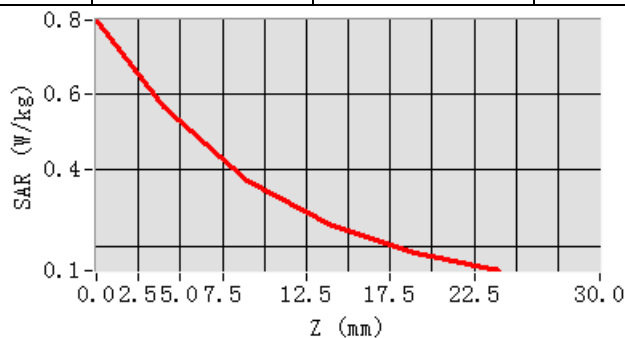


Maximum location: X=1.00, Y=33.00 SAR Peak: 0.80 W/kg

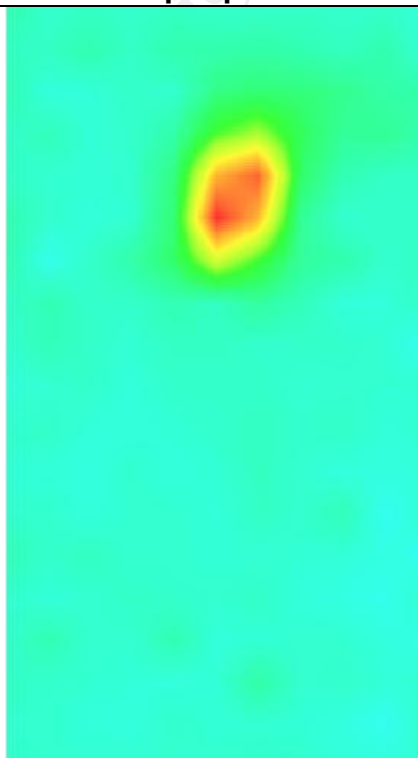
SAR 10g (W/Kg)	0.236442
SAR 1g (W/Kg)	0.381691



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.7933	0.5642	0.3707	0.2530	0.1834



Hot spot position



BT

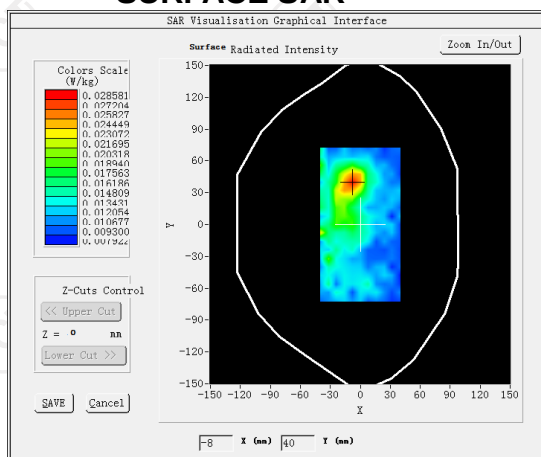
MEASUREMENT 1

Low Band SAR (Channel 0):

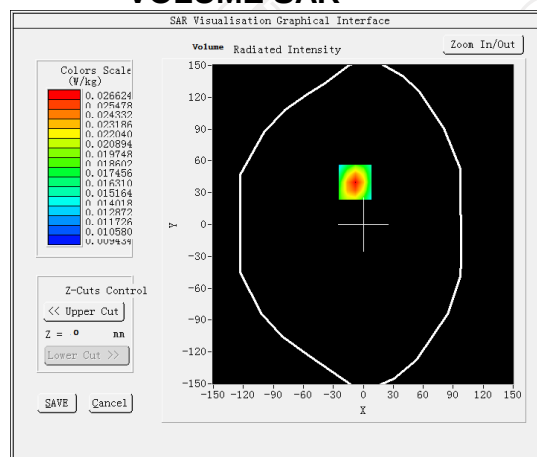
Date: 01/25/2024

Frequency (MHz)	2402.000000
Relative permittivity (real part)	37.821613
Relative permittivity (imaginary part)	13.546980
Conductivity (S/m)	1.834111
Variation (%)	-0.240000
Crest Factor	1.0
Probe Conversion factor	2.31
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>
Phantom	Validation plane
Device Position	Body front(10mm)
Band	<u>GFSK</u>

SURFACE SAR

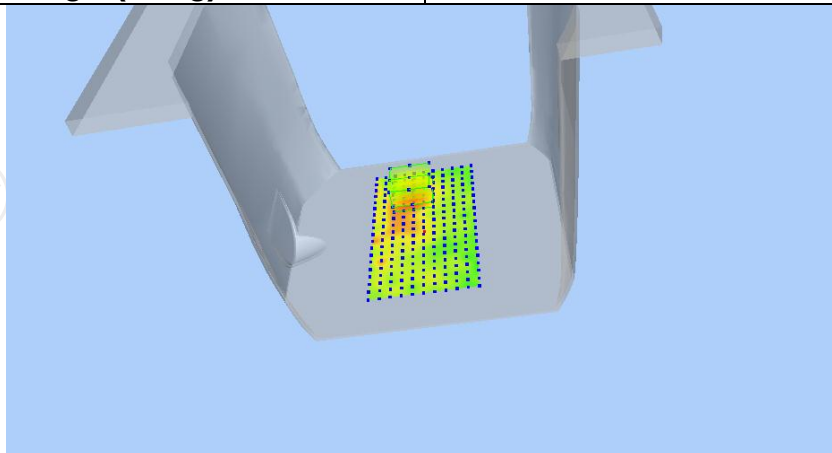


VOLUME SAR

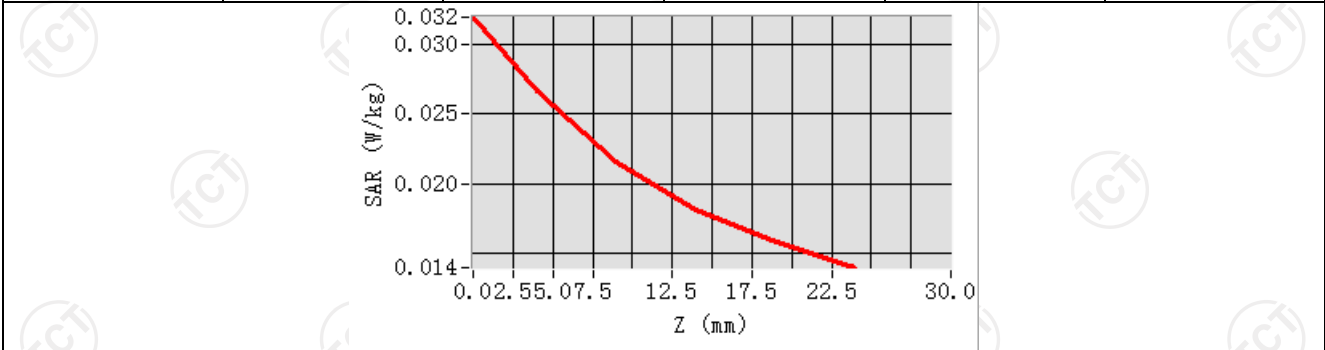


Maximum location: X=-8.00, Y=40.00 SAR Peak: 0.03 W/kg

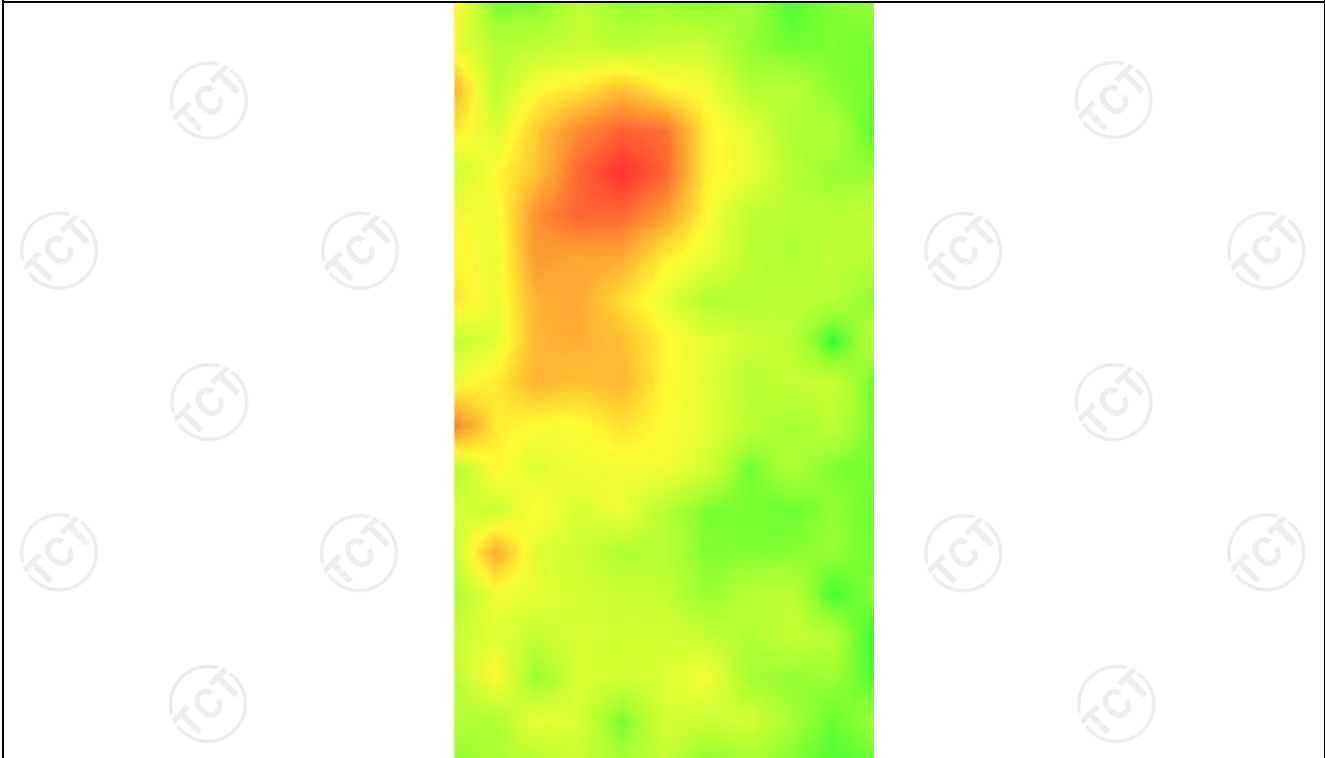
SAR 10g (W/Kg)	0.019369
SAR 1g (W/Kg)	0.025577



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0319	0.0266	0.0216	0.0182	0.0158



Hot spot position



MEASUREMENT 2

Low Band SAR (Channel 0):

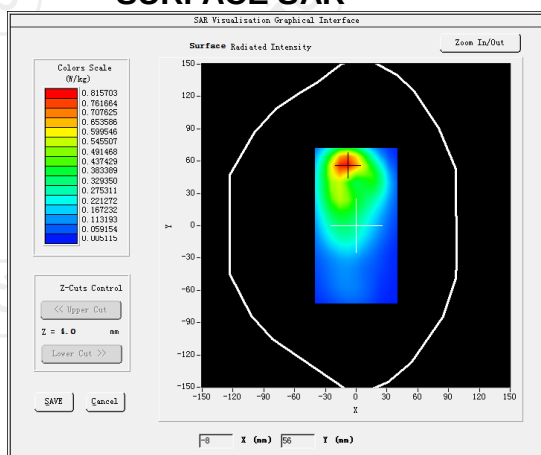
Date: 01/25/2024

Frequency (MHz)	2402.000000
Relative permittivity (real part)	37.821613
Relative permittivity (imaginary part)	13.546980
Conductivity (S/m)	1.834111
Variation (%)	-1.570000
Crest Factor	1.0
Probe Conversion factor	2.37
E-Field Probe:	SSE2 (SN 25/22 EPG0375)
Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=5mm dy=5mm</u> <u>dz=5mm,Complete/ndx=8mm dy=8mm, h=</u> <u>5.00 mm</u>

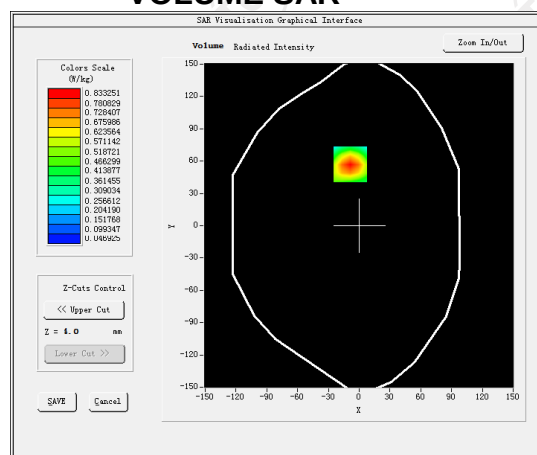
Phantom	Validation plane
Device Position	Body back(10mm)

Band	GFSK
------	------

SURFACE SAR

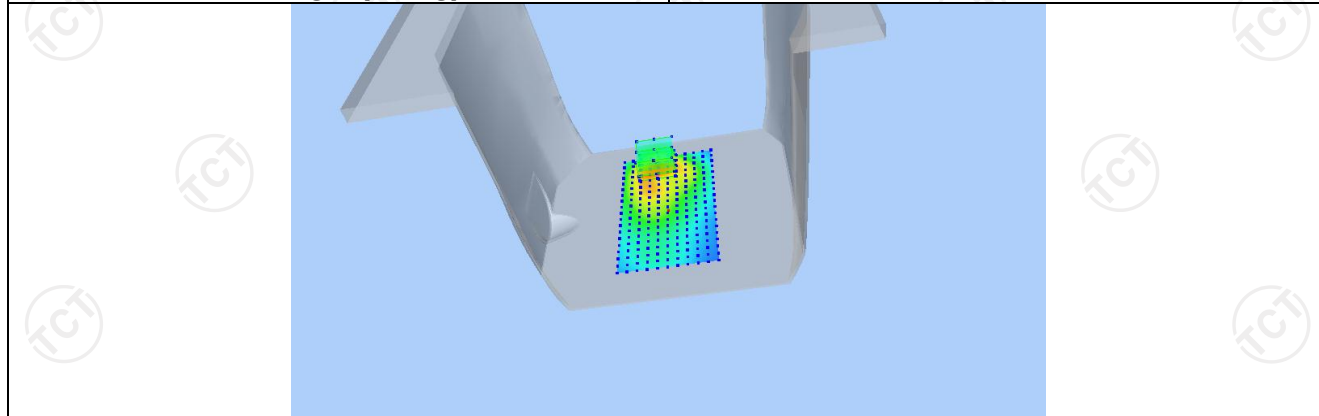


VOLUME SAR

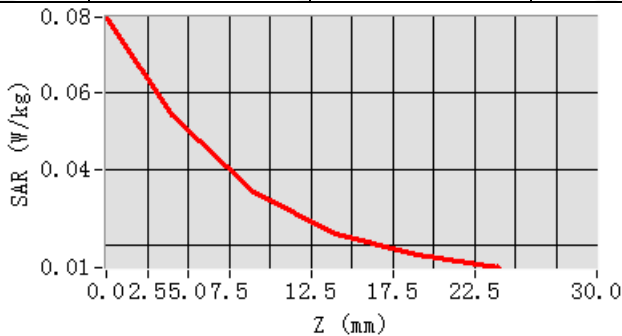


Maximum location: X=8.00, Y=-7.00 SAR Peak: 0.08 W/kg

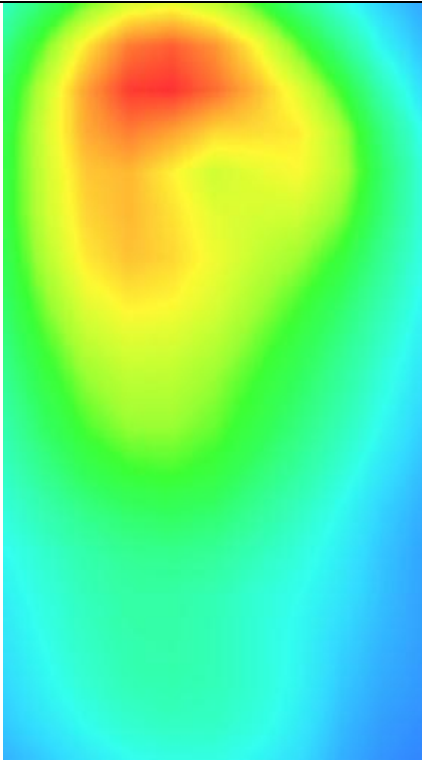
SAR 10g (W/Kg)	0.053679
SAR 1g (W/Kg)	0.080945



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0800	0.0545	0.0342	0.0231	0.0175



Hot spot position



Appendix A: EUT Photos



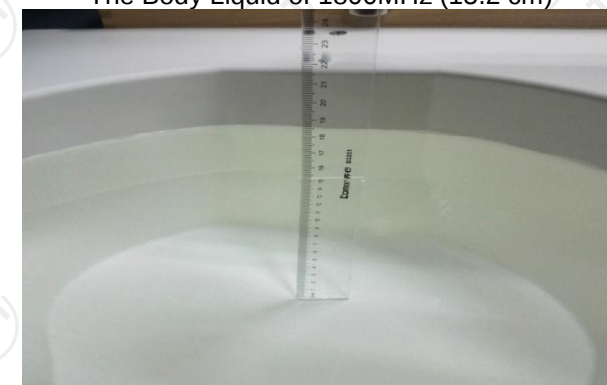
Liquid depth



The Body Liquid of 835MHz (15.4cm)



The Body Liquid of 1800MHz (15.2 cm)



The Body Liquid of 1900MHz (16.4 cm)



The Body Liquid of 2450MHz (15.3cm)



The Body Liquid of 2600MHz (16.5cm)

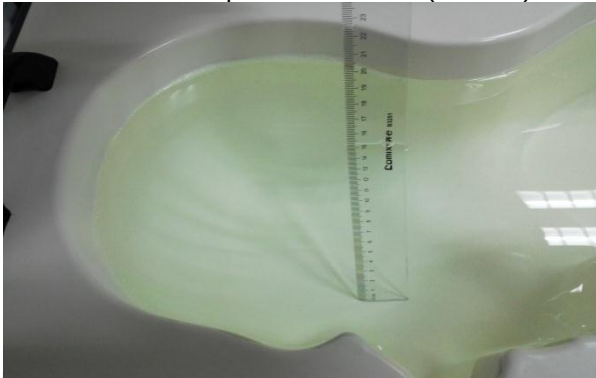
The Body Liquid of 5000-6000MHz (16.5cm)



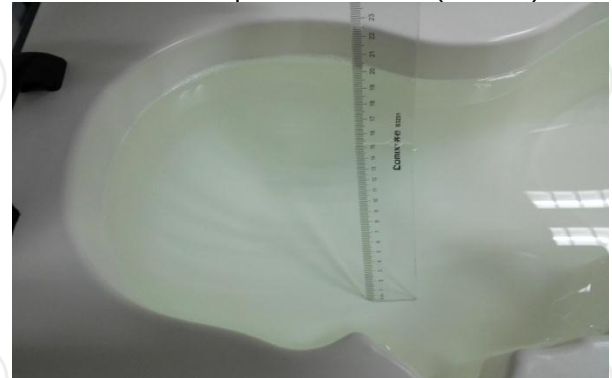
The Head Liquid of 1900MHz (15.5cm)



The Head Liquid of 2450MHz (15.6cm)



The Head Liquid of 835MHz (15.3cm)



The Head Liquid of 1800MHz (15.2cm)

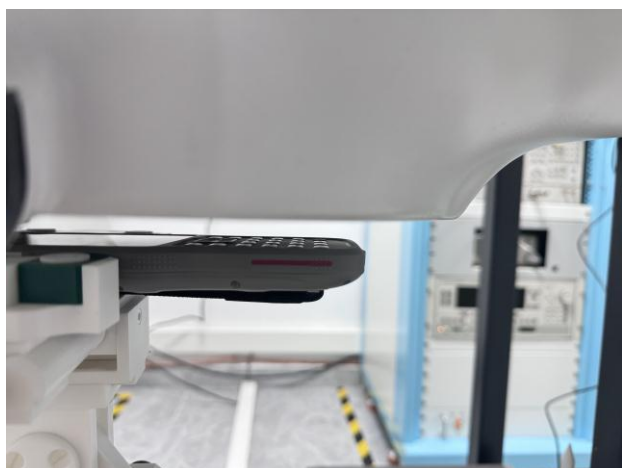


The Head Liquid of 2600MHz (15.1cm)



The Body Liquid of 5000-6000MHz (15.8cm)

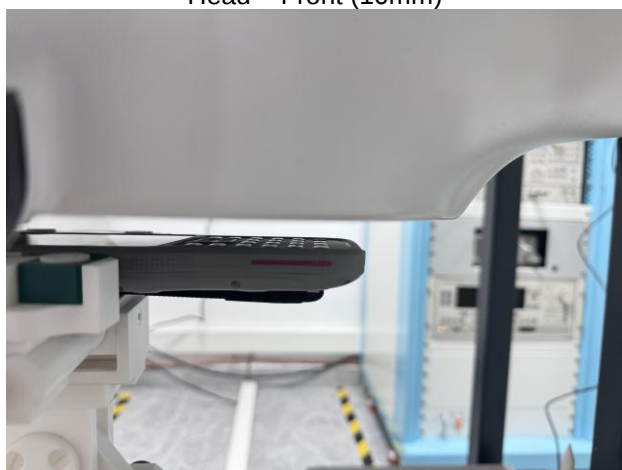
Appendix B: Test Setup Photos



Head – Front (10mm)



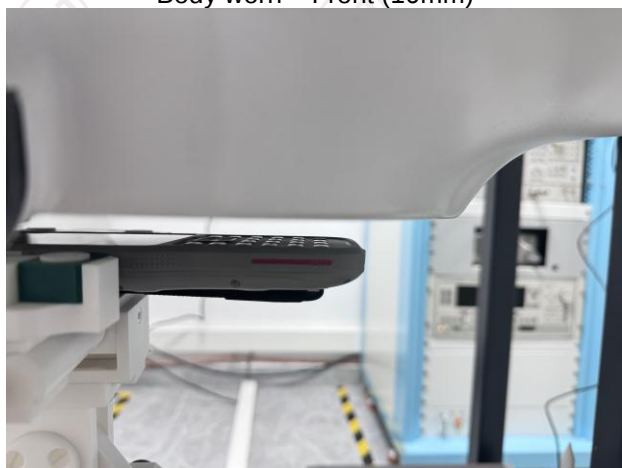
Head –Bottom (10mm)



Body worn – Front (10mm)



Body worn – Back (10mm)



Hotspo Front (10mm)



Hotspo Back (10mm)



Hotspot Top (10mm)



Hotspot Right (10mm)



Hotspot Bottom (10mm)



Hotspot Left (10mm)

Appendix C: Probe Calibration Certificate

COMOSAR E-FIELD Probe



COMOSAR E-Field Probe Calibration Report

Ref : ACR.180.7.22.BES.B

SHENZHEN TONGCE TESTING LAB

2101 & 2201, ZHENCHANG FACTORY RENSHAN INDUSTRIAL
ZONE, FUHAI SUBDISTRICT, BAO'AN DISTRICT SHENZHEN,
GUANGDONG, 518103, PEOPLE'S REPUBLIC OF CHINA

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 25/22 EPG0375

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 06/29/2023



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

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Summary:

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.180.7.22.BES.B

	Name	Function	Date	Signature
Prepared by :	Jérôme Le Gall	Measurement Responsible	6/30/2023	
Checked & approved by:	Jérôme Luc	Technical Manager	6/30/2023	
Authorized by:	Yann Toutain	Laboratory Director	7/05/2023	

	Customer Name
Distribution :	Shenzhen Tongce Testing Lab

Issue	Name	Date	Modifications
A	Jérôme Le Gall	6/30/2023	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.180.7.22.BES.B

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.180.7.22.BES.B

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 25/22 EPGO375
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.197 MΩ Dipole 2: R2=0.230 MΩ Dipole 3: R3=0.208 MΩ

2 PRODUCT DESCRIPTION**2.1 GENERAL INFORMATION**

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

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

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

3 MEASUREMENT METHOD

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

3.1 LINEARITY

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

3.2 SENSITIVITY

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

Page: 4/11

Template_ACR.DDD.N.YY.MVGB.ISSUE_COMOSAR Probe vK

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3.3 LOWER DETECTION LIMIT

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

3.4 ISOTROPY

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

3.1 BOUNDARY EFFECT

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

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

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

where

$SAR_{uncertainty}$ is the uncertainty in percent of the probe boundary effect

d_{be} is the distance between the surface and the closest *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;

ΔSAR_{be} in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

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



4 MEASUREMENT UNCERTAINTY

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

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

5 CALIBRATION MEASUREMENT RESULTS

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

5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normy dipole 2 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normz dipole 3 ($\mu\text{V}/(\text{V}/\text{m})^2$)
0.64	0.53	0.44

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
106	108	109

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

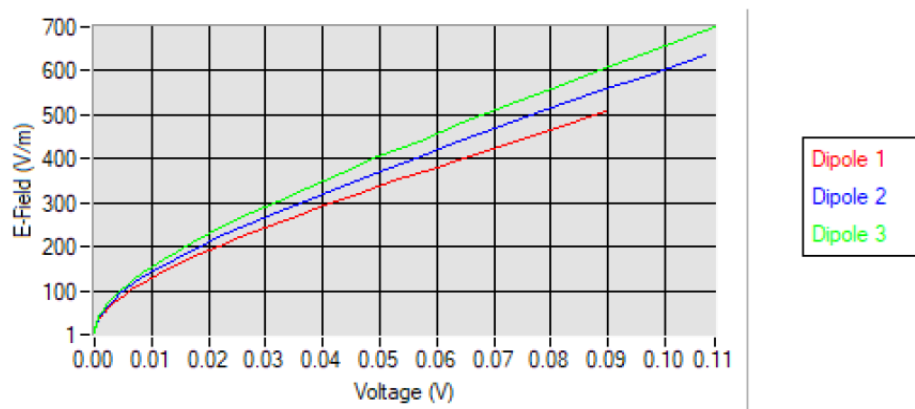
$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

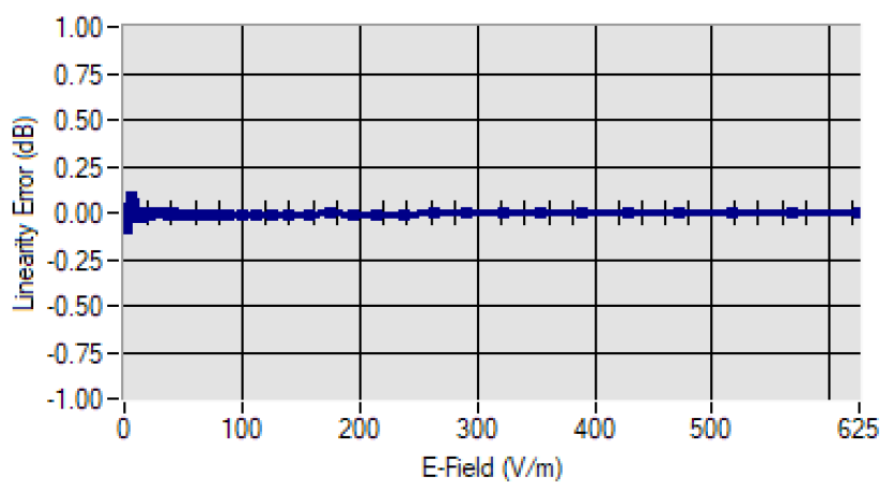
Ref: ACR.180.7.22.BES.B

Calibration curves



5.2 LINEARITY

Linearity



Linearity: $\pm 1.94\%$ ($\pm 0.09\text{dB}$)



5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL750	750	1.71
BL750	750	1.78
HL900	900	1.91
BL900	900	1.96
HL1800	1800	2.08
BL1800	1800	2.16
HL2000	2000	2.03
BL2000	2000	2.10
HL2450	2450	2.31
BL2450	2450	2.37
HL2600	2600	2.16
BL2600	2600	2.23
HL3500	3500	2.21
BL3500	3500	2.28
HL3700	3700	3.45
BL3700	3700	3.15
HL4600	4600	3.30
BL4600	4600	3.70
HL5200	5200	2.01
BL5200	5200	2.08
HL5600	5600	2.07
BL5600	5600	2.12
HL5800	5800	2.06
BL5800	5800	2.13

LOWER DETECTION LIMIT: 7mW/kg



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.180.7.22.BES.B

5.4 ISOTROPY

HL1800 MHz

