

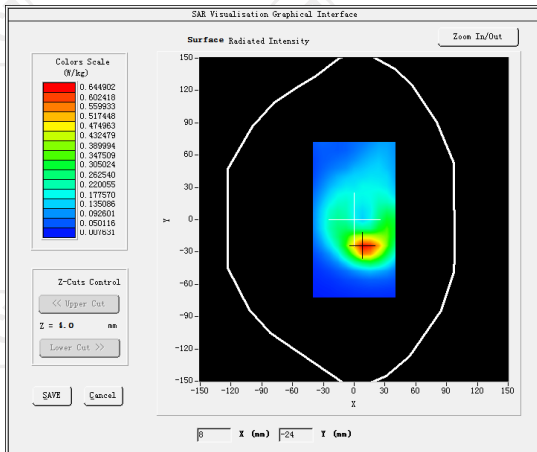
MEASUREMENT 4

Lower Band SAR (Channel 512):

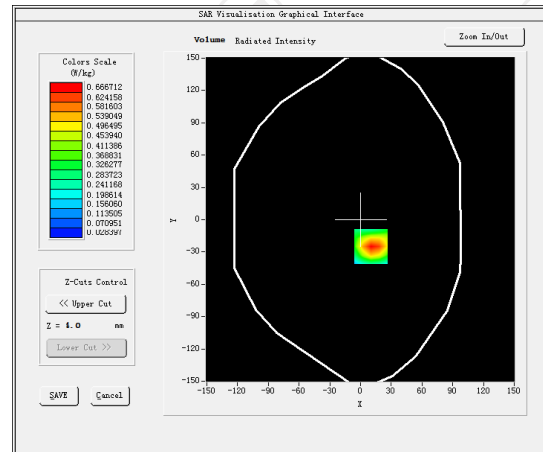
Date: 06/17/2021

Frequency (MHz)	1850.199951
Relative permittivity (real part)	53.341337
Relative permittivity (imaginary part)	14.232400
Conductivity (S/m)	1.491736
Variation (%)	-1.940000
Crest Factor	2.0
Probe Conversion factor	5.01
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>GSM1900(GPRS 4slot hotspot)</u>

SURFACE SAR

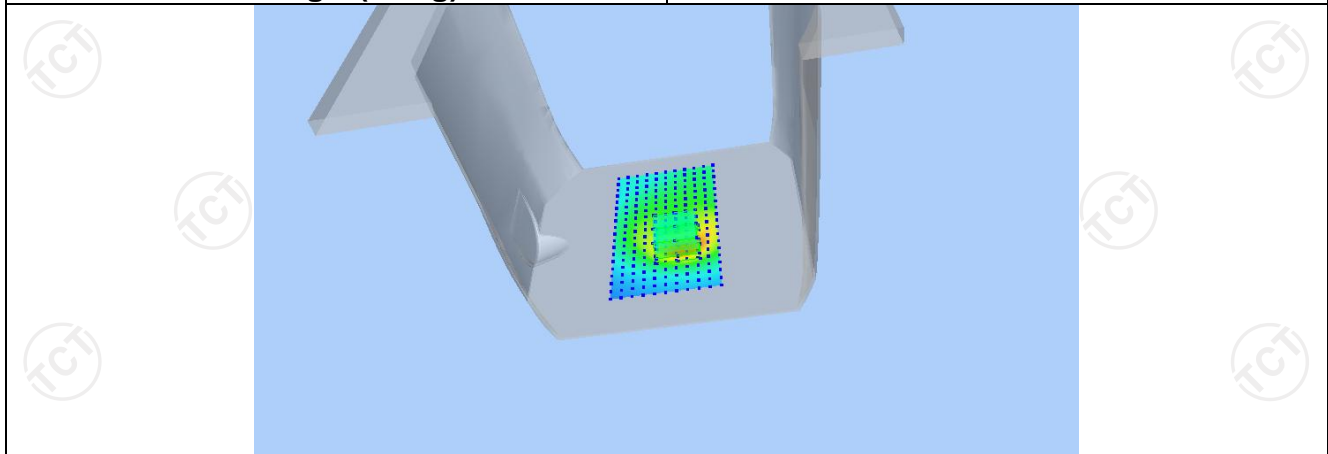


VOLUME SAR

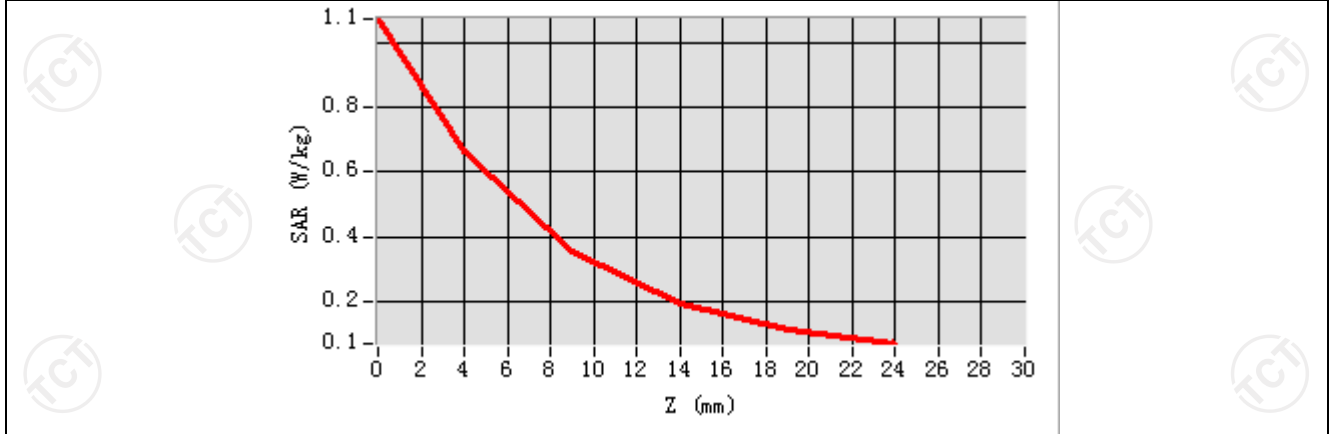


Maximum location: X=10.00, Y=-25.00 SAR Peak: 1.08 W/kg

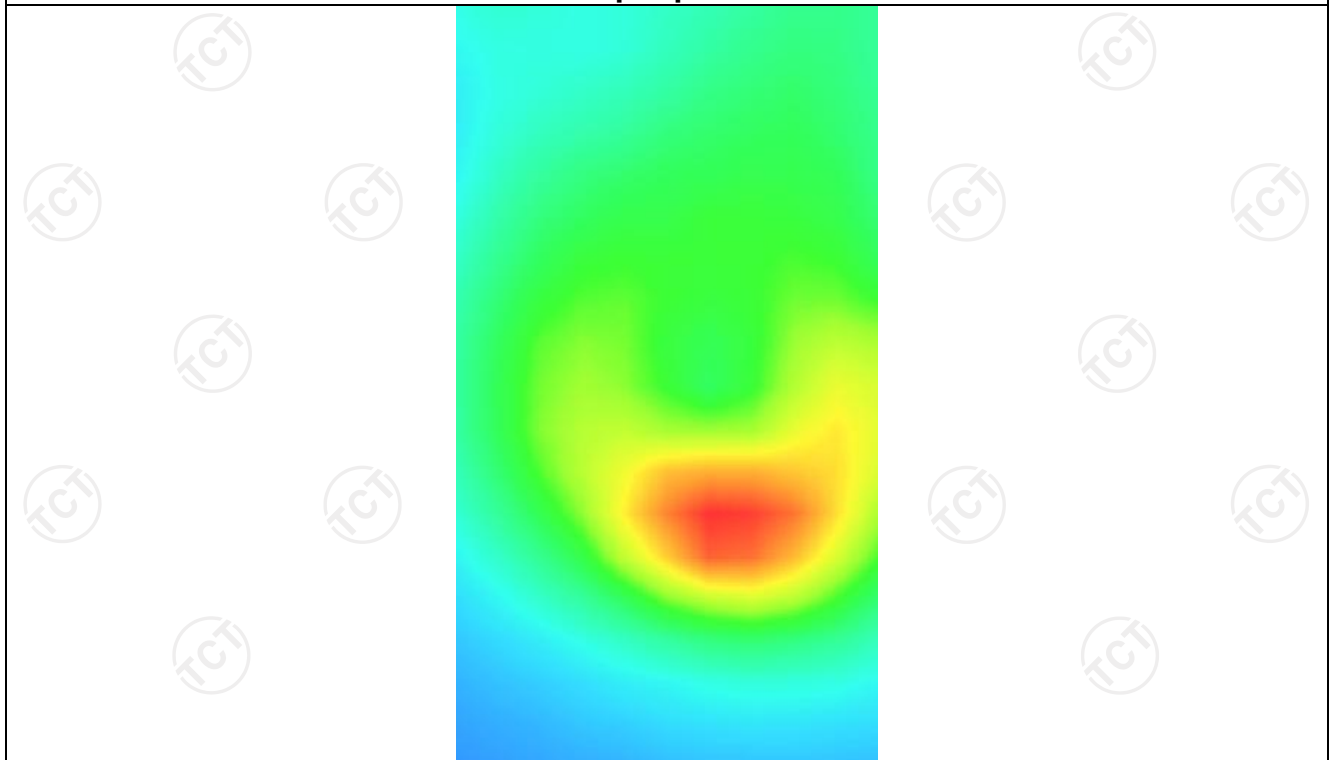
SAR 10g (W/Kg)	0.324630
SAR 1g (W/Kg)	0.731660



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0759	0.6667	0.3563	0.1934	0.1131



Hot spot position



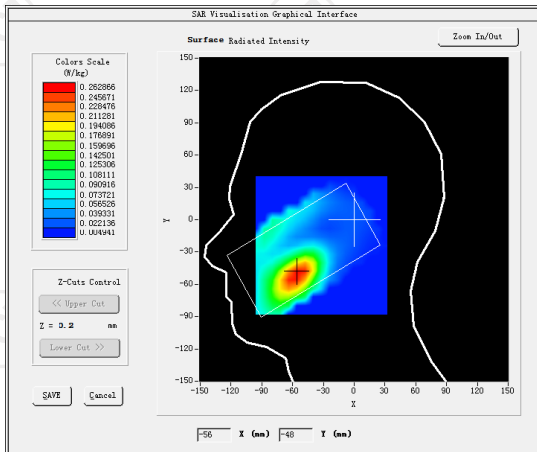
WCDMA Band II
MEASUREMENT 1

Higher Band SAR (Channel 9538):

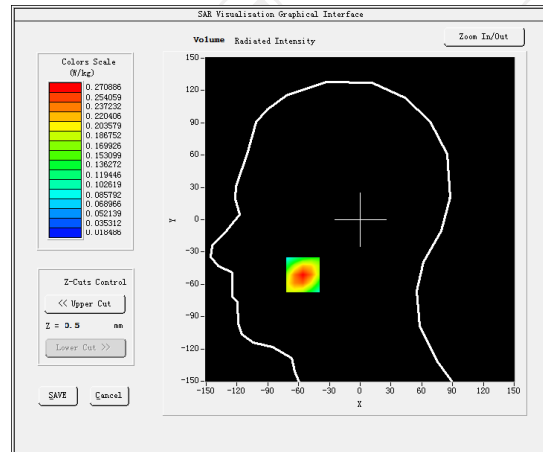
Date: 06/23/2021

Frequency (MHz)	1907.600000
Relative permittivity (real part)	39.072741
Relative permittivity (imaginary part)	12.607061
Conductivity (S/m)	1.377304
Variation (%)	-2.340000
Crest Factor	1.0
Probe Conversion factor	4.85
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>BAND1_WCDMA2100</u>

SURFACE SAR



VOLUME SAR



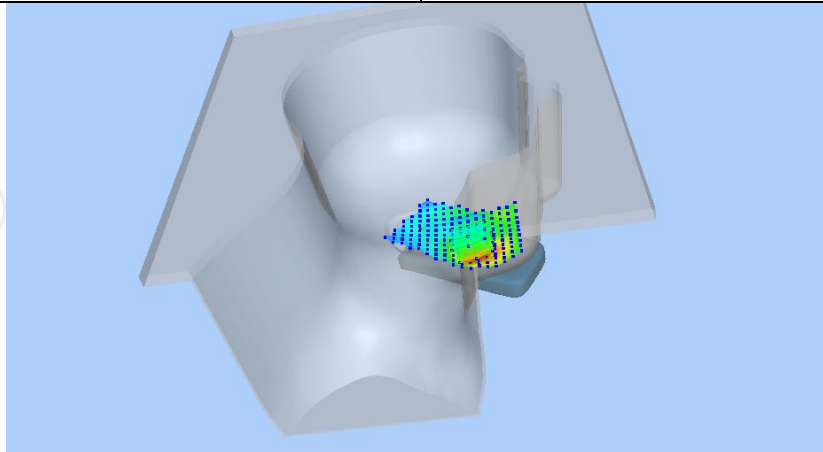
Maximum location: X=-56.00, Y=-51.00 SAR Peak: 0.39 W/kg

SAR 10g (W/Kg)

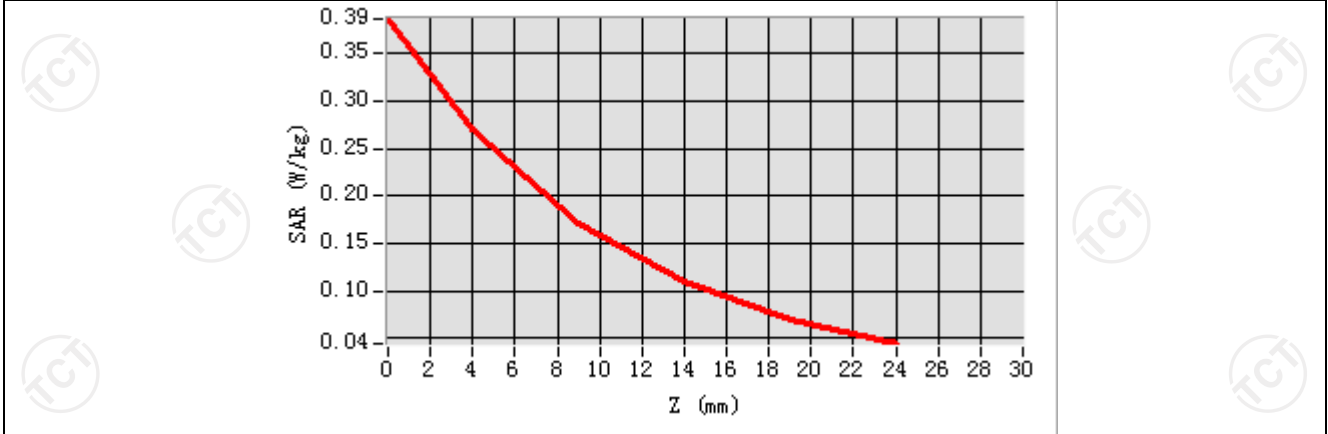
0.150717

SAR 1g (W/Kg)

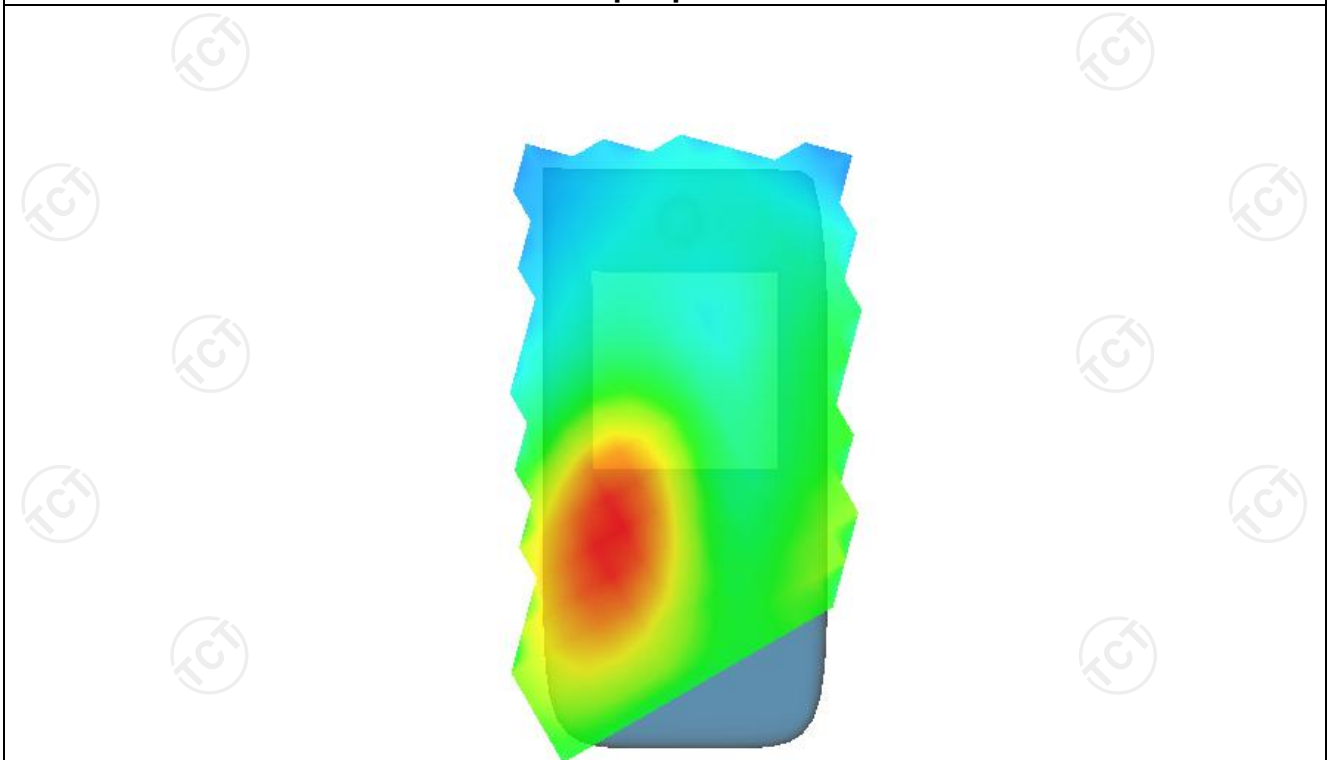
0.254739



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3864	0.2709	0.1716	0.1092	0.0706



Hot spot position



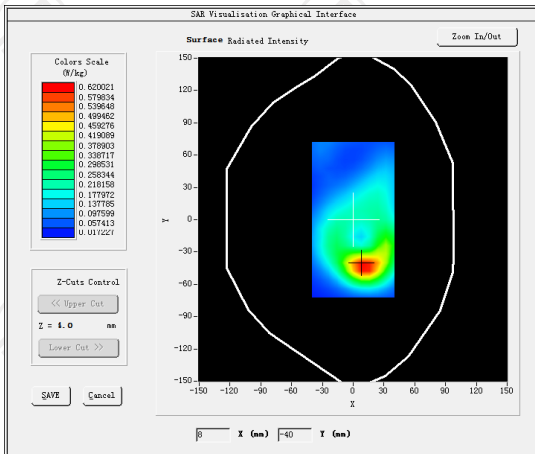
MEASUREMENT 2

Higher Band SAR (Channel 9538):

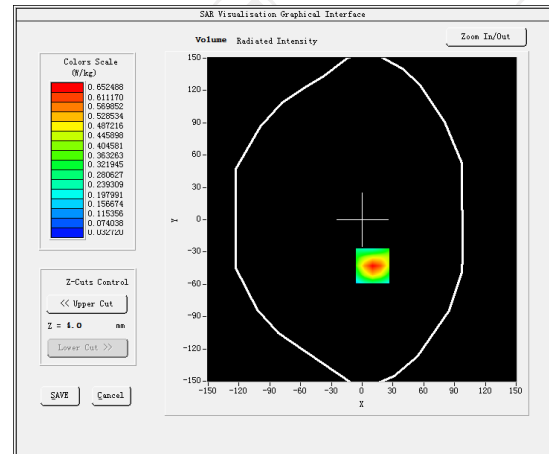
Date: 06/23/2021

Frequency (MHz)	1907.600000
Relative permittivity (real part)	53.293554
Relative permittivity (imaginary part)	14.225424
Conductivity (S/m)	1.532961
Variation (%)	-1.880000
Crest Factor	1.0
Probe Conversion factor	5.01
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>BAND1_WCDMA2100</u>

SURFACE SAR



VOLUME SAR



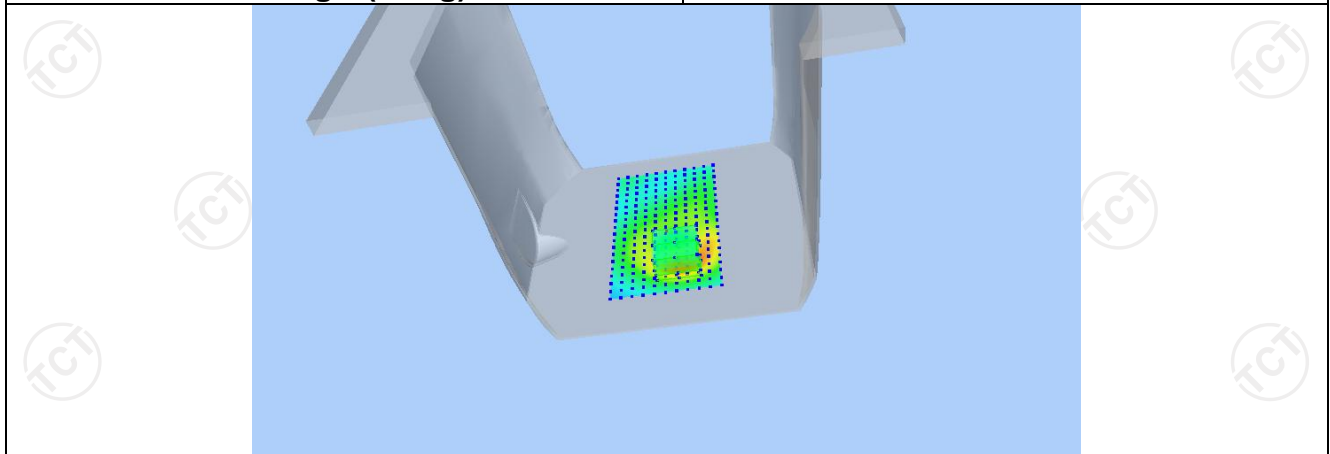
Maximum location: X=10.00, Y=-43.00 SAR Peak: 1.07 W/kg

SAR 10g (W/Kg)

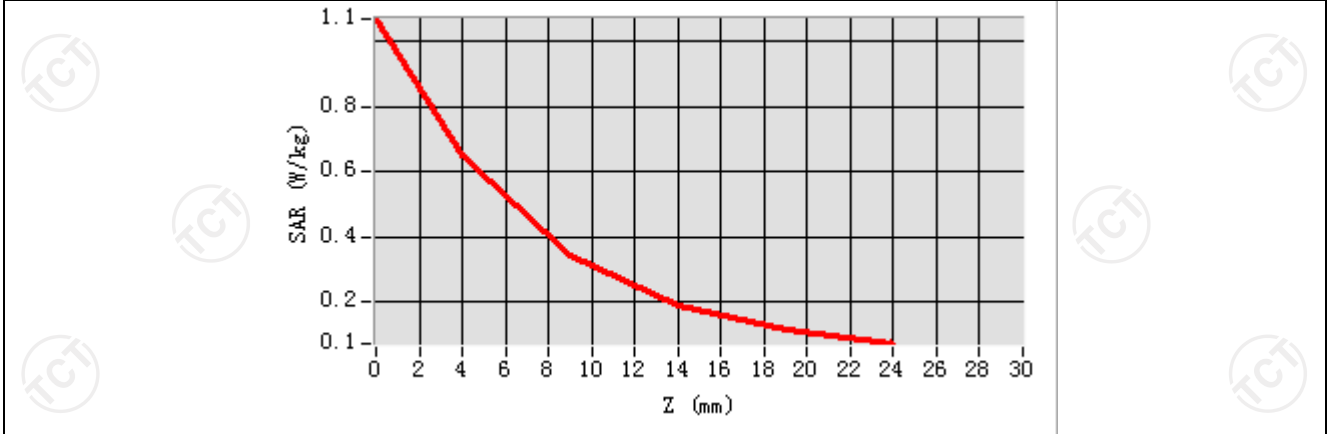
0.316117

SAR 1g (W/Kg)

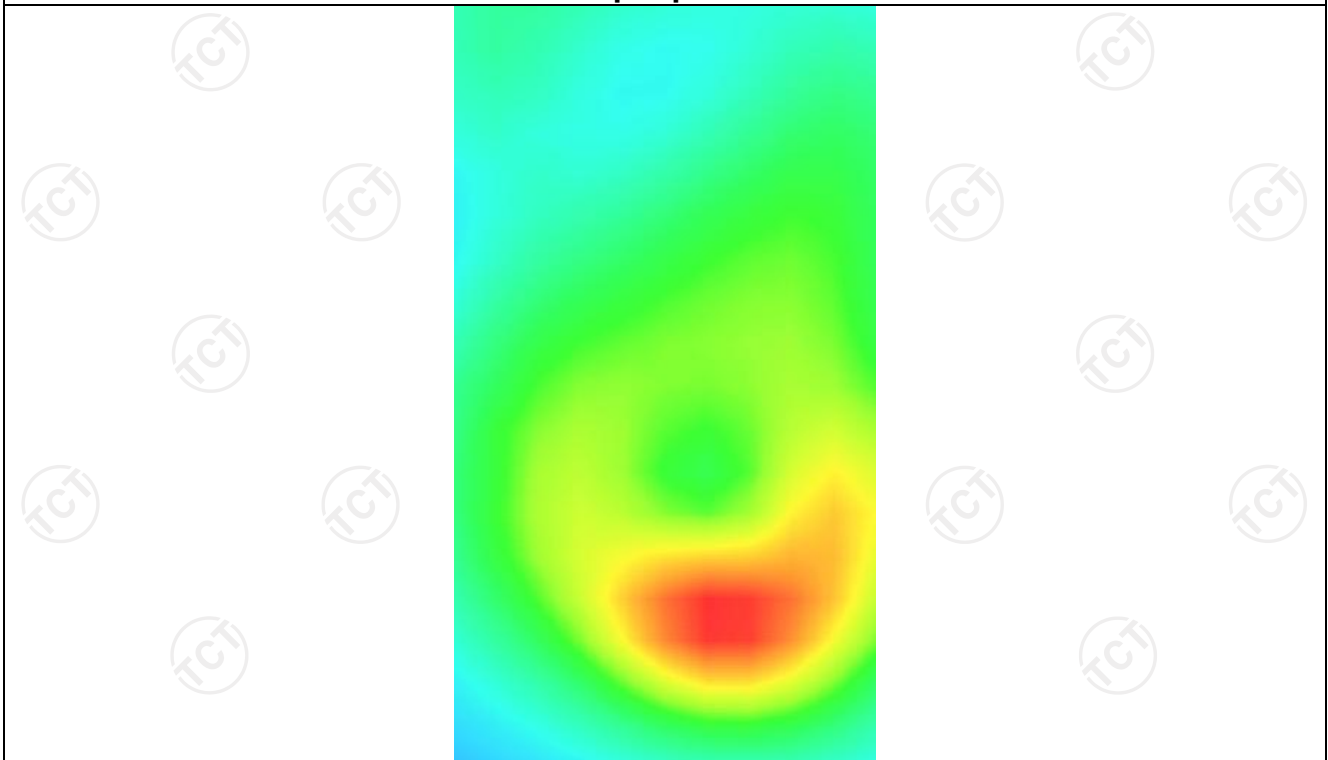
0.607284



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0672	0.6525	0.3439	0.1870	0.1131



Hot spot position



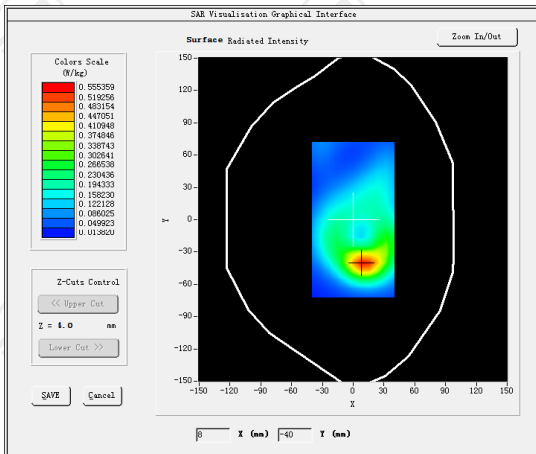
MEASUREMENT 3

Higher Band SAR (Channel 9538):

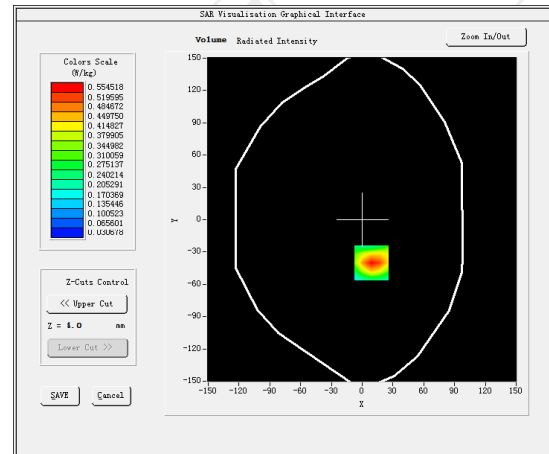
Date: 06/23/2021

Frequency (MHz)	1907.600000
Relative permittivity (real part)	53.293554
Relative permittivity (imaginary part)	14.225424
Conductivity (S/m)	1.532961
Variation (%)	-2.040000
Crest Factor	1.0
Probe Conversion factor	5.01
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body bottom(10mm)</u>
Band	<u>BAND1_WCDMA2100(hotspot)</u>

SURFACE SAR



VOLUME SAR



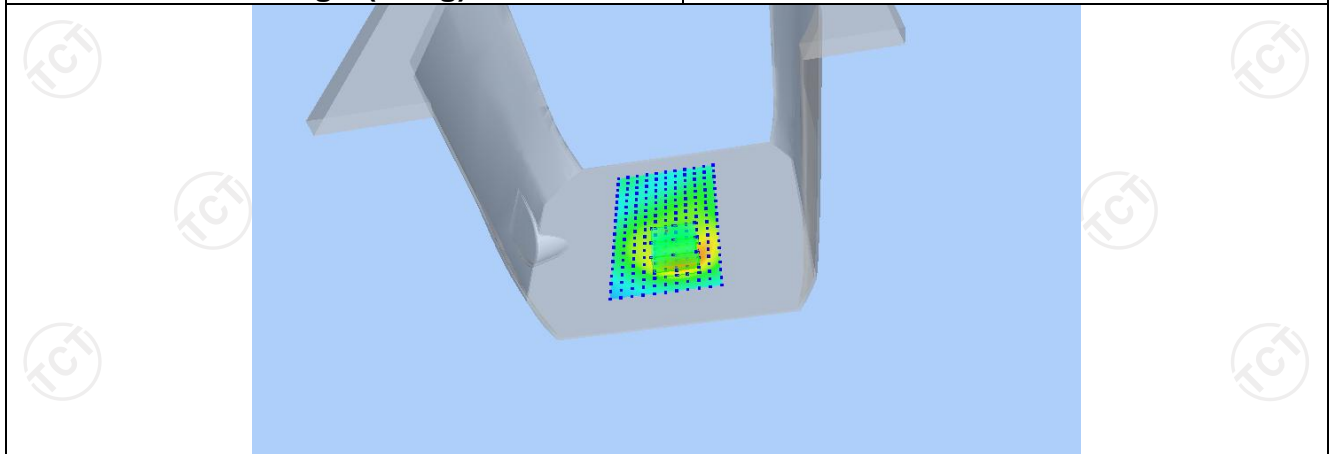
Maximum location: X=9.00, Y=-40.00 SAR Peak: 0.83 W/kg

SAR 10g (W/Kg)

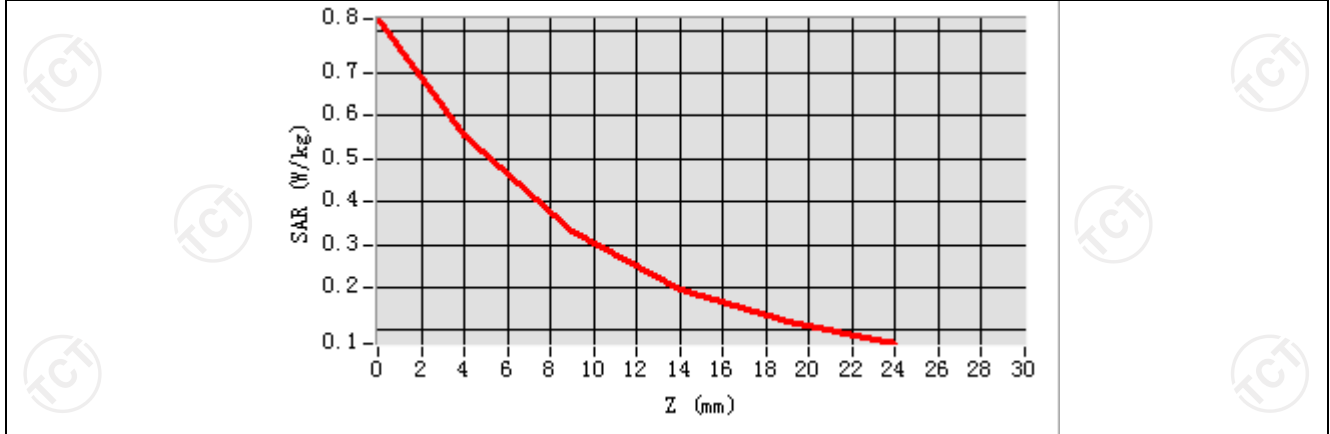
0.287102

SAR 1g (W/Kg)

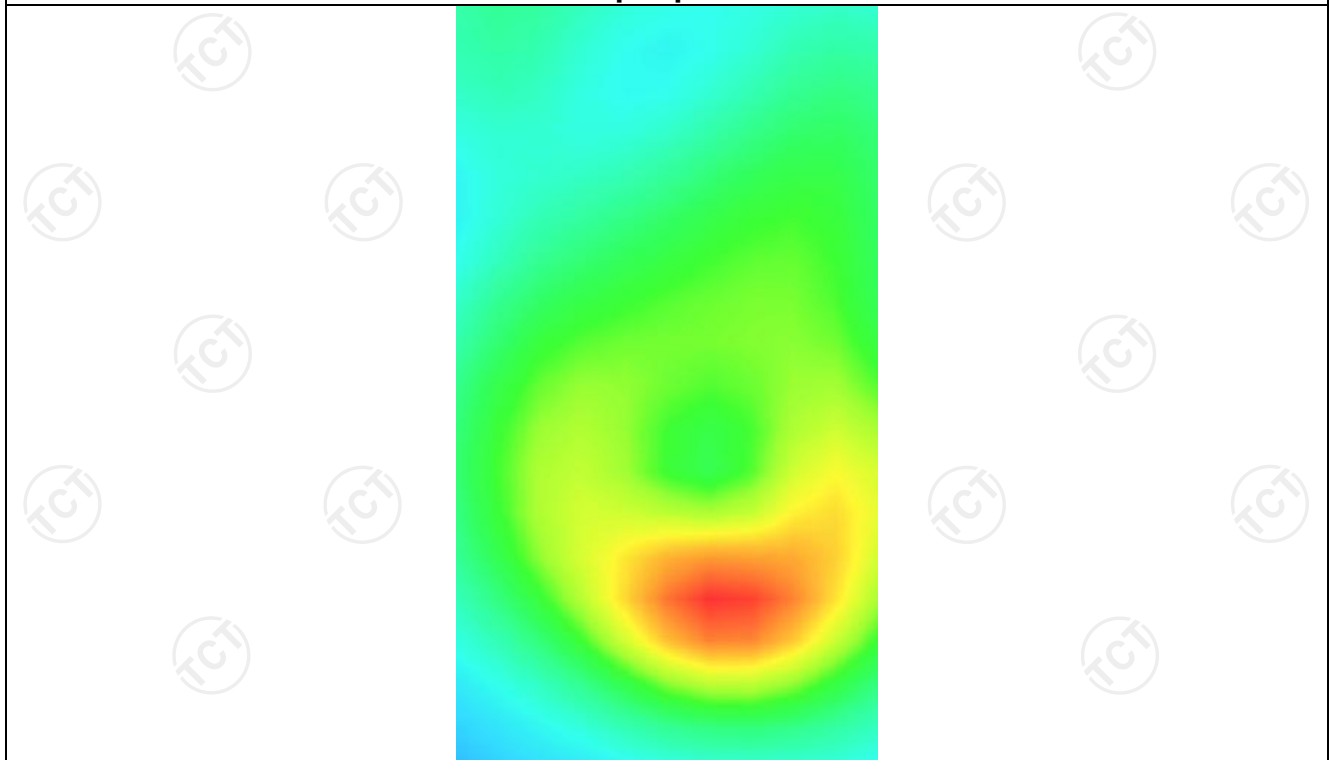
0.625924



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8261	0.5545	0.3302	0.1965	0.1191



Hot spot position



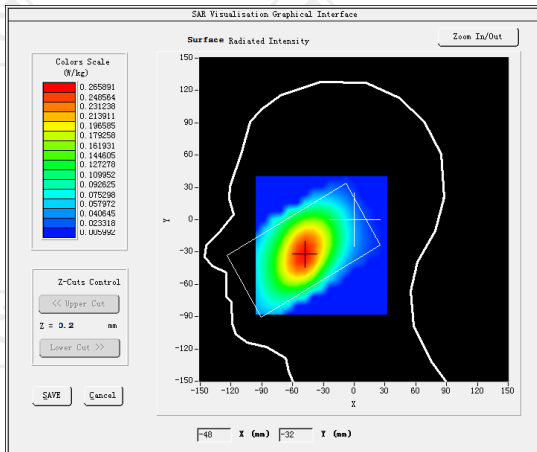
WCDMA Band V
MEASUREMENT 1

Hight Band SAR (Channel 4182):

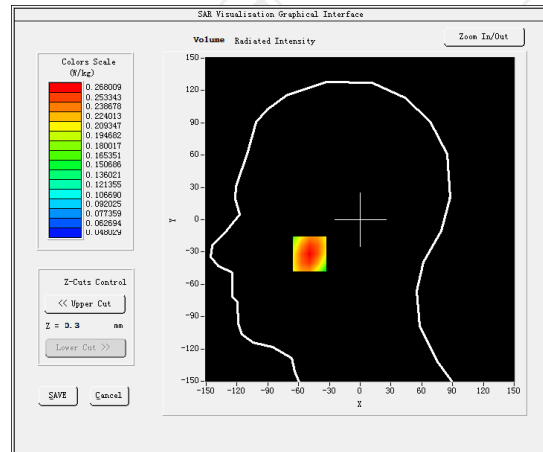
Date: 06/15/2021

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.432883
Relative permittivity (imaginary part)	18.129634
Conductivity (S/m)	0.857241
Variation (%)	-0.530000
Crest Factor:	1.0
Probe Conversion factor	5.50
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Right head</u>
Device Position	<u>Cheek</u>
Band	<u>BAND5 WCDMA850</u>

SURFACE SAR



VOLUME SAR



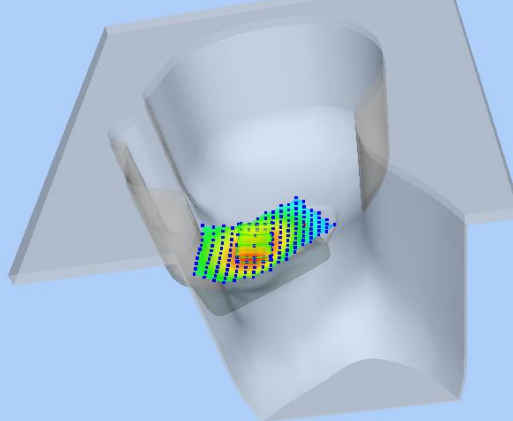
Maximum location: X=-49.00, Y=-32.00 SAR Peak: 0.32 W/kg

SAR 10g (W/Kg)

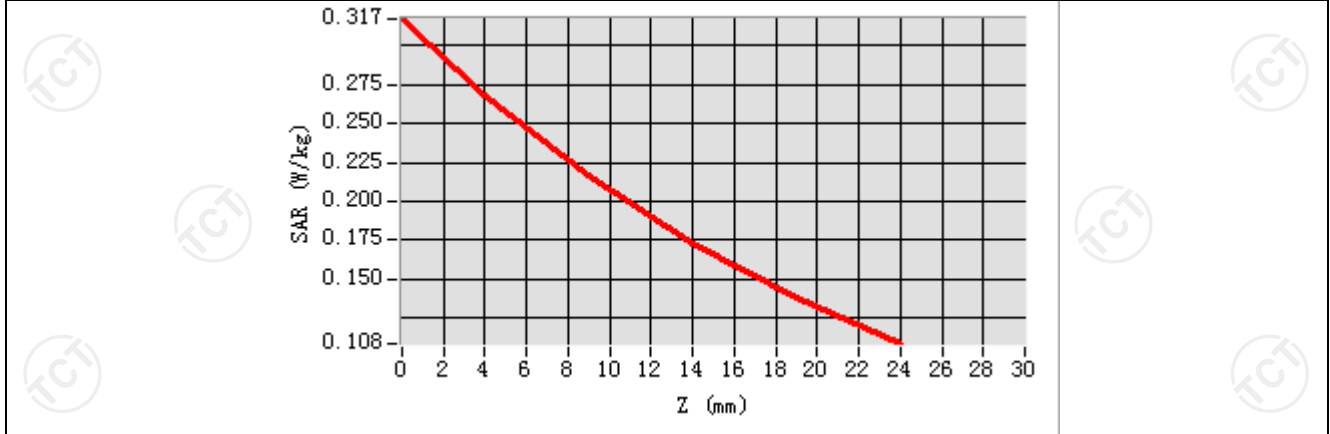
0.193816

SAR 1g (W/Kg)

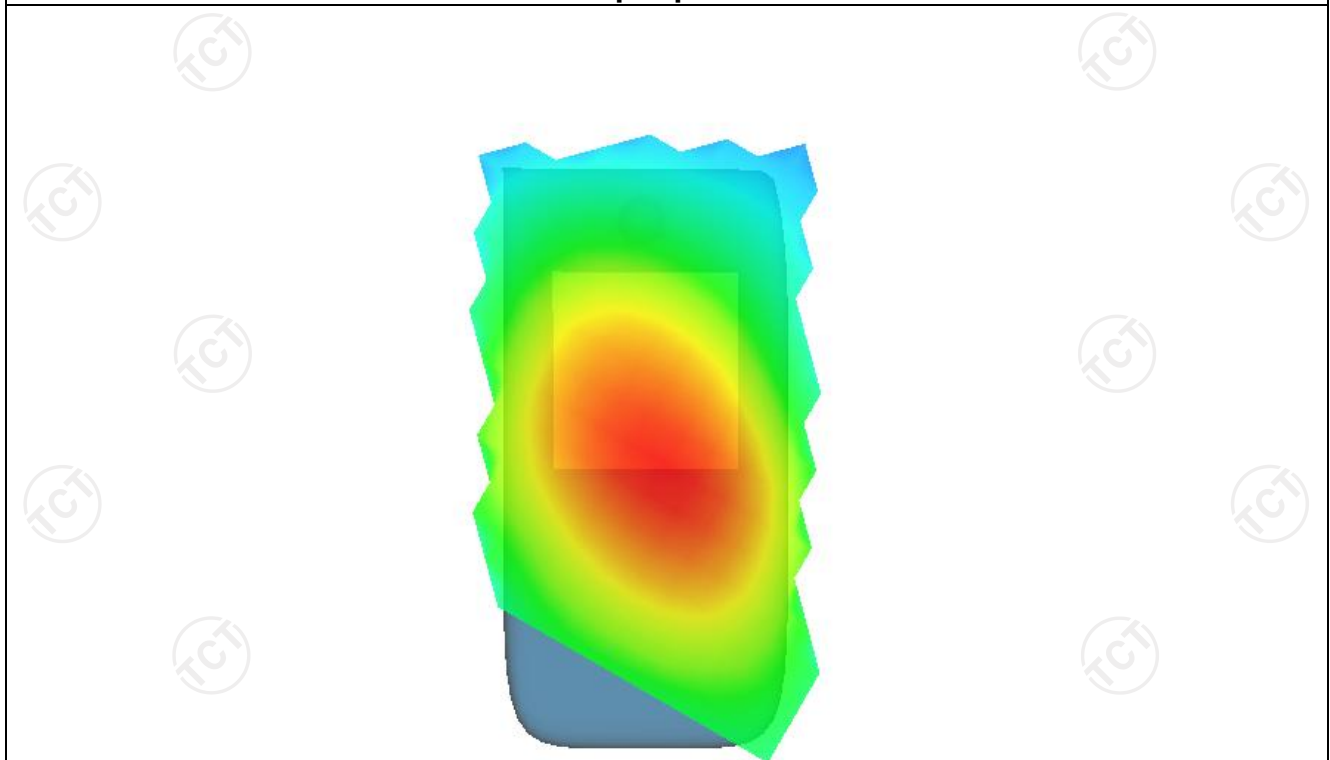
0.258048



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3172	0.2680	0.2160	0.1733	0.1382



Hot spot position



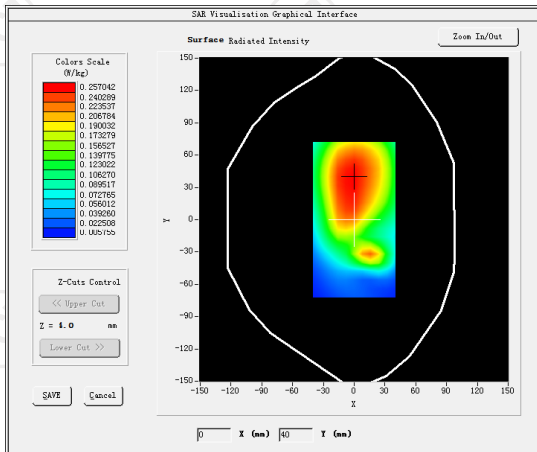
MEASUREMENT 2

Hight Band SAR (Channel 4182):

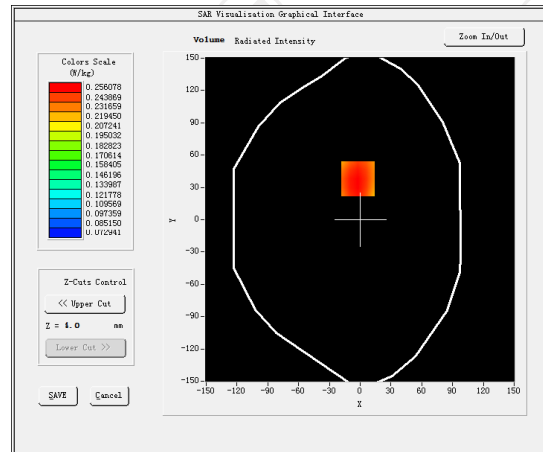
Date: 06/15/2021

Frequency (MHz)	836.400000
Relative permittivity (real part)	55.262457
Relative permittivity (imaginary part)	18.128360
Conductivity (S/m)	0.932668
Variation (%)	0.390000
Crest Factor:	1.0
Probe Conversion factor	5.65
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>BAND5 WCDMA850</u>

SURFACE SAR



VOLUME SAR



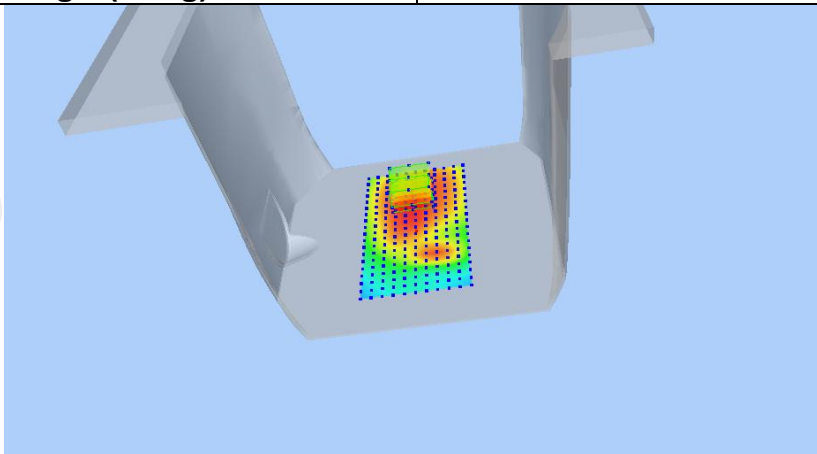
Maximum location: X=-2.00, Y=38.00 SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)

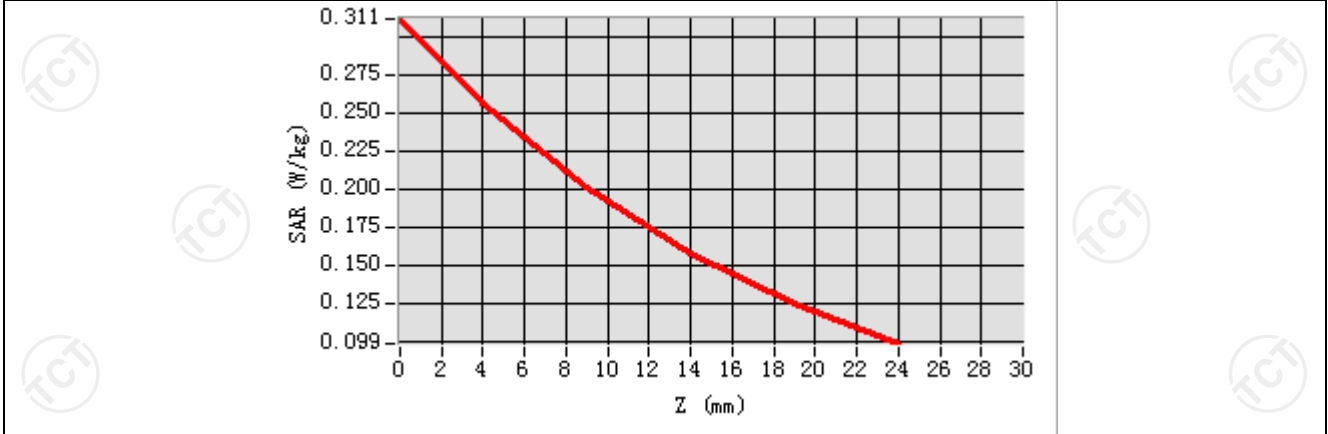
0.192483

SAR 1g (W/Kg)

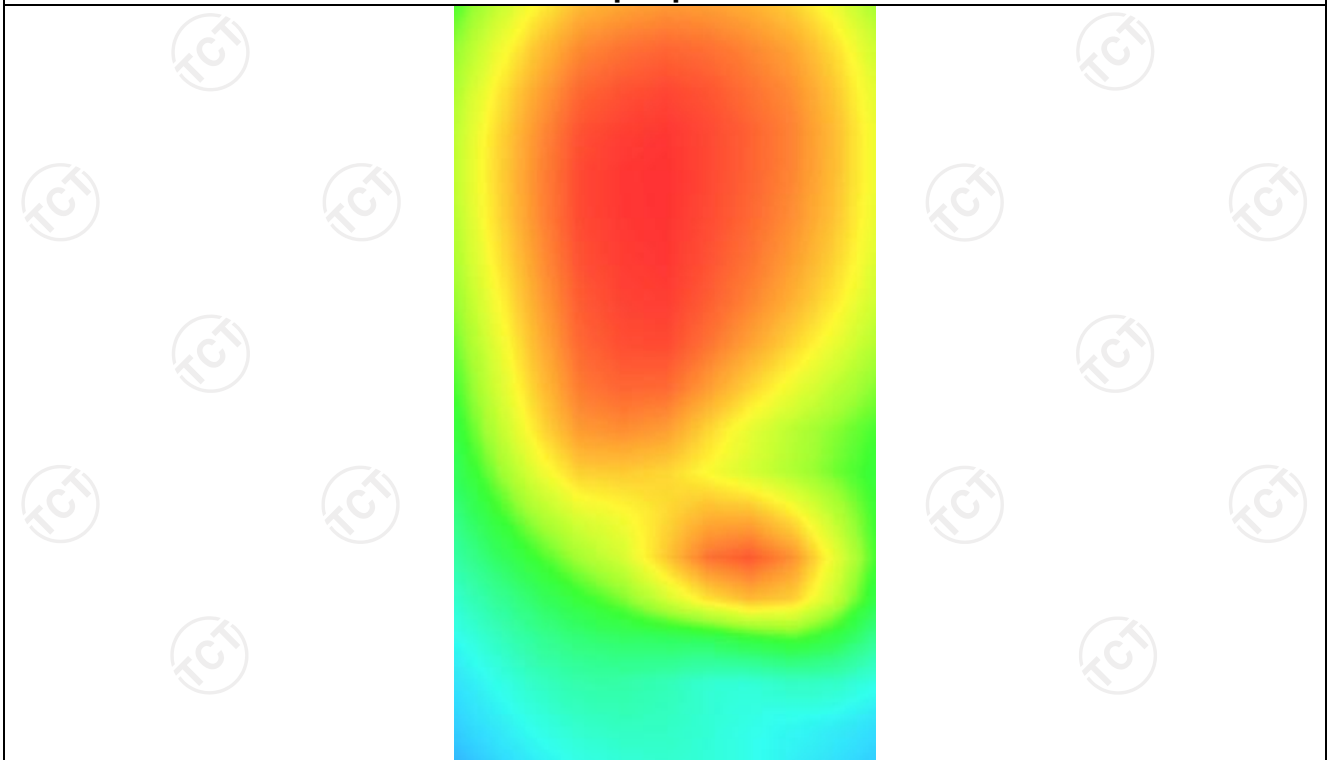
0.243751



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3113	0.2561	0.2008	0.1584	0.1258



Hot spot position



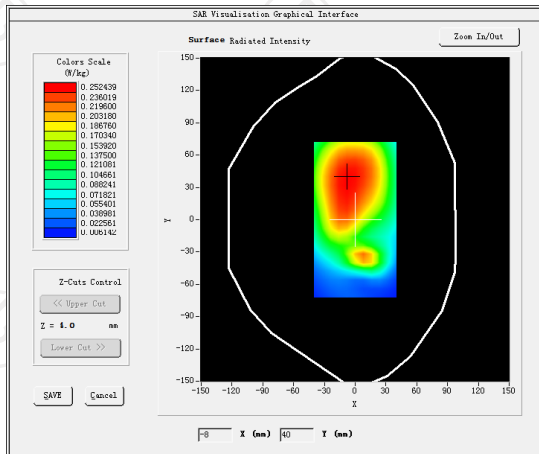
MEASUREMENT 3

Hight Band SAR (Channel 4182):

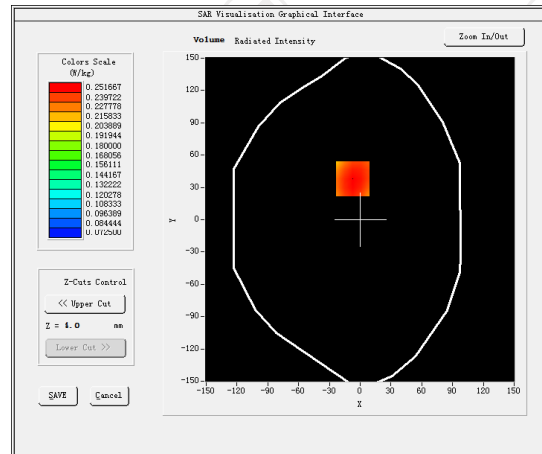
Date: 06/15/2021

Frequency (MHz)	836.400000
Relative permittivity (real part)	55.262457
Relative permittivity (imaginary part)	18.128360
Conductivity (S/m)	0.932668
Variation (%)	-0.590000
Crest Factor:	1.0
Probe Conversion factor	5.65
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>BAND5_WCDMA850(hotspot)</u>

SURFACE SAR



VOLUME SAR



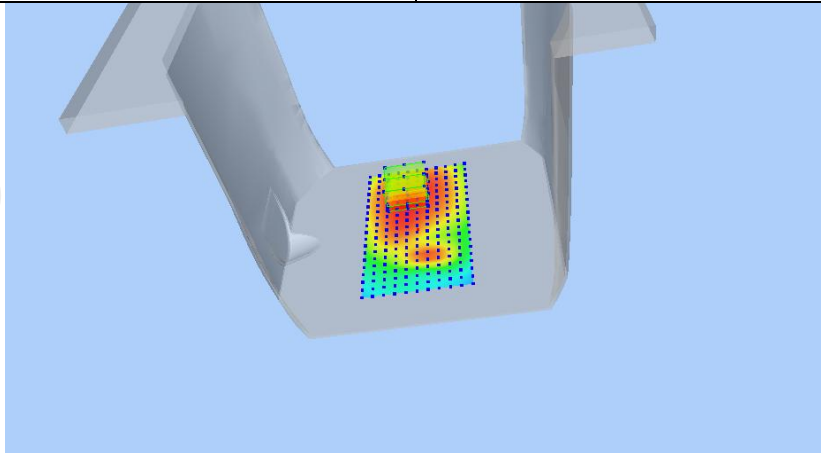
Maximum location: X=-7.00, Y=38.00 SAR Peak: 0.30 W/kg

SAR 10g (W/Kg)

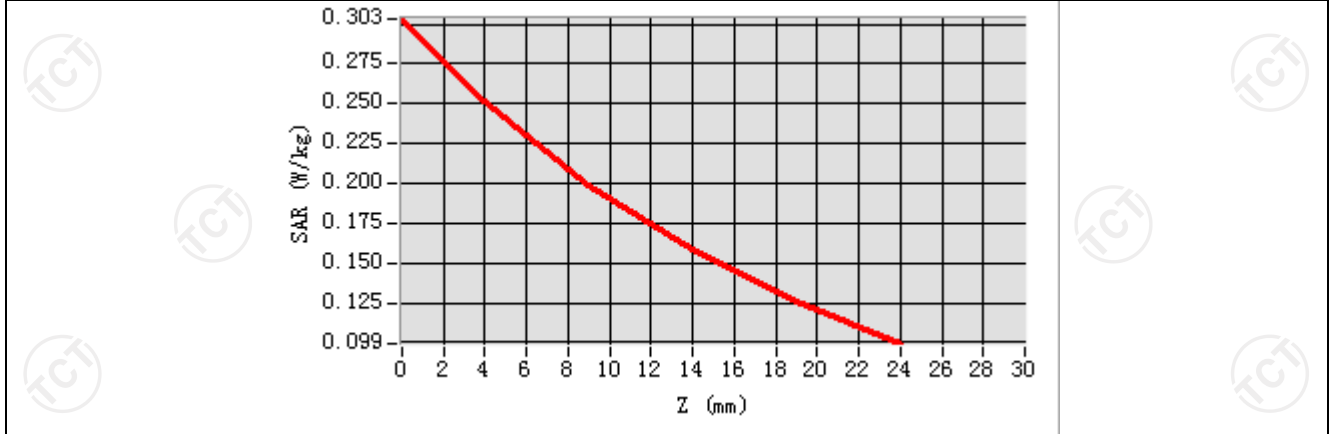
0.191228

SAR 1g (W/Kg)

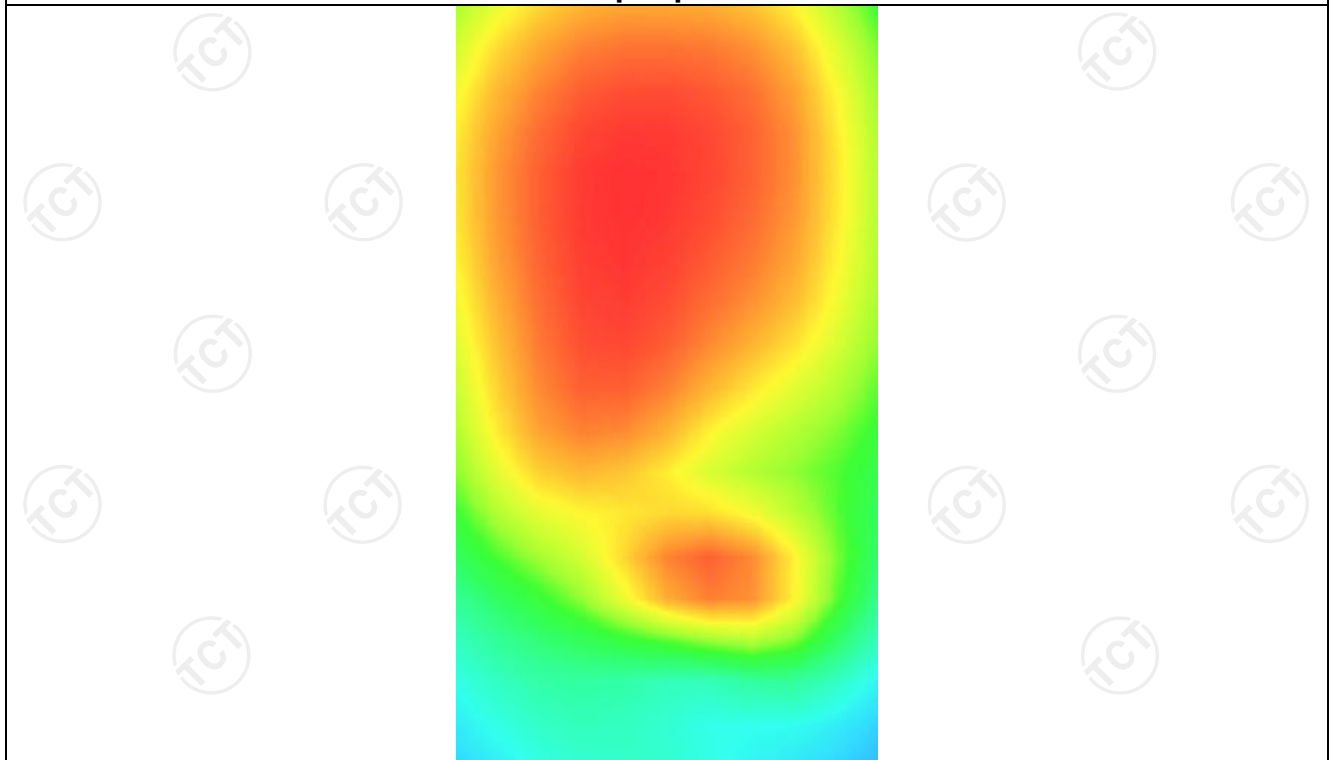
0.259442



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3032	0.2517	0.1993	0.1583	0.1261



Hot spot position



LTE Band 2

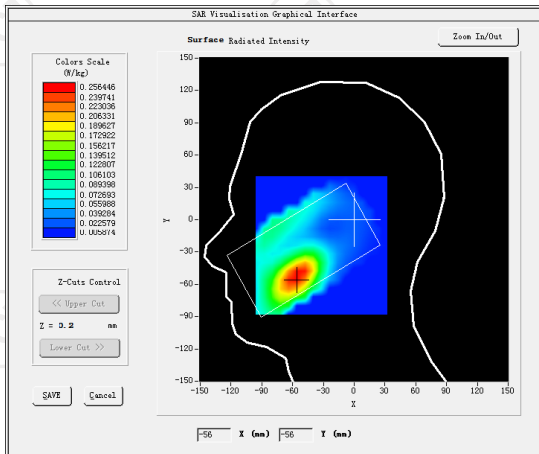
MEASUREMENT 1

Lower Band SAR (Channel 18700):

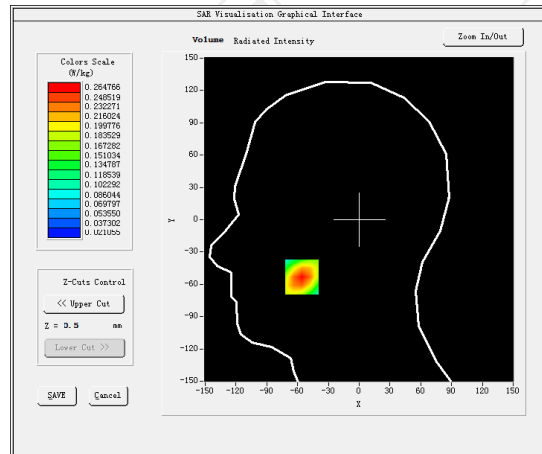
Date: 06/17/2021

Frequency (MHz)	1860.000000
Relative permittivity (real part)	39.082162
Relative permittivity (imaginary part)	12.607130
Conductivity (S/m)	1.375228
Variation (%)	-0.720000
Crest Factor	1.0
Probe Conversion factor	4.85
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 2 (1 RB#49)</u>

SURFACE SAR



VOLUME SAR



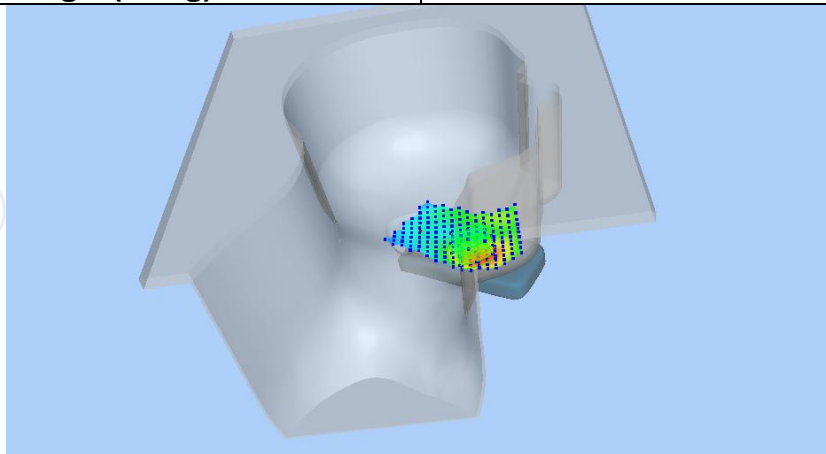
Maximum location: X=-56.00, Y=-53.00 SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)

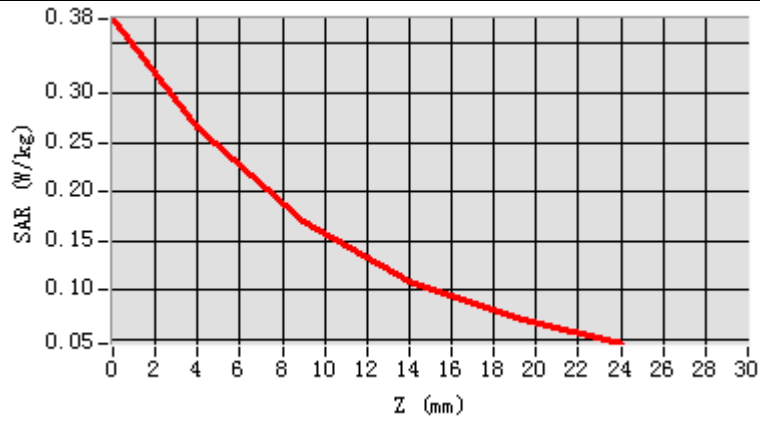
0.150219

SAR 1g (W/Kg)

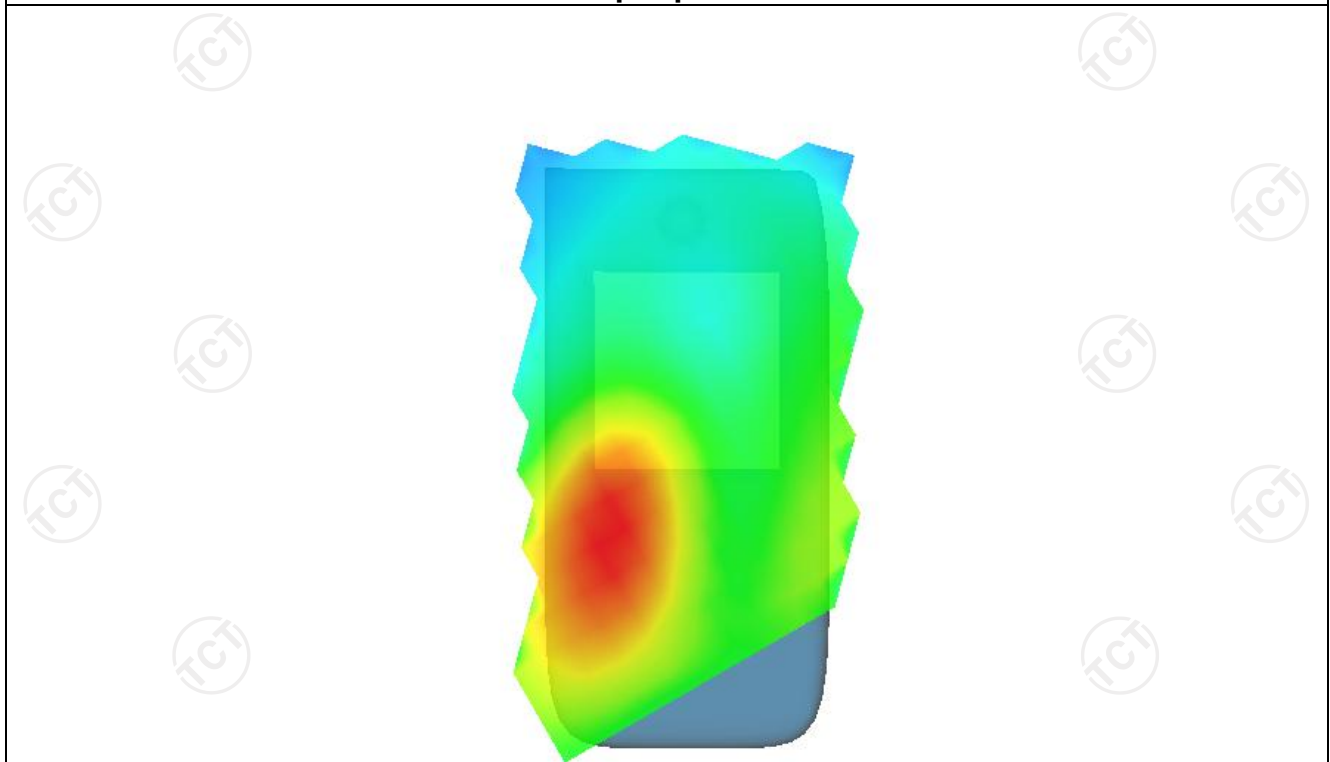
0.249376



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3755	0.2648	0.1692	0.1088	0.0711



Hot spot position



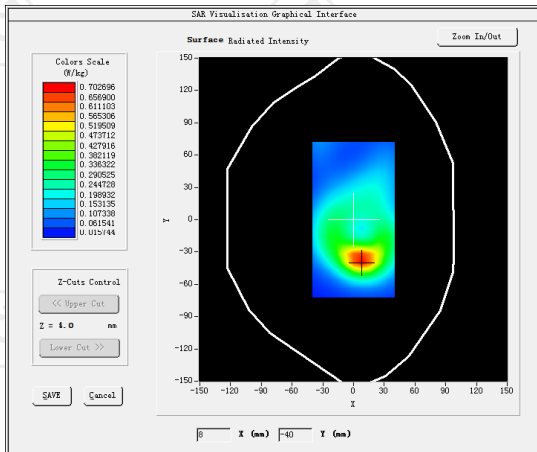
MEASUREMENT 2

Lower Band SAR (Channel 18700):

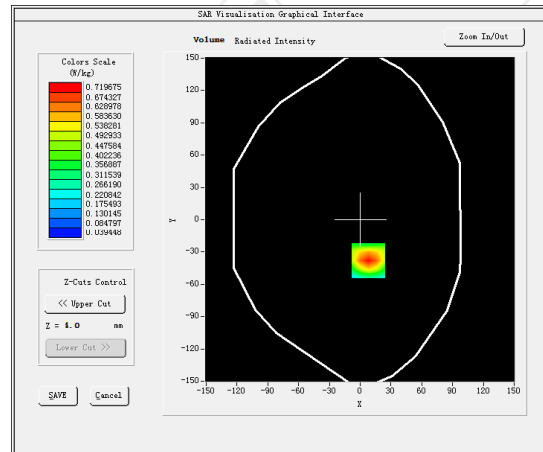
Date: 06/17/2021

Frequency (MHz)	1860.000000
Relative permittivity (real part)	53.312133
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	1.511983
Variation (%)	1.120000
Crest Factor	1.0
Probe Conversion factor	5.01
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 2 (1 RB#49)</u>

SURFACE SAR



VOLUME SAR



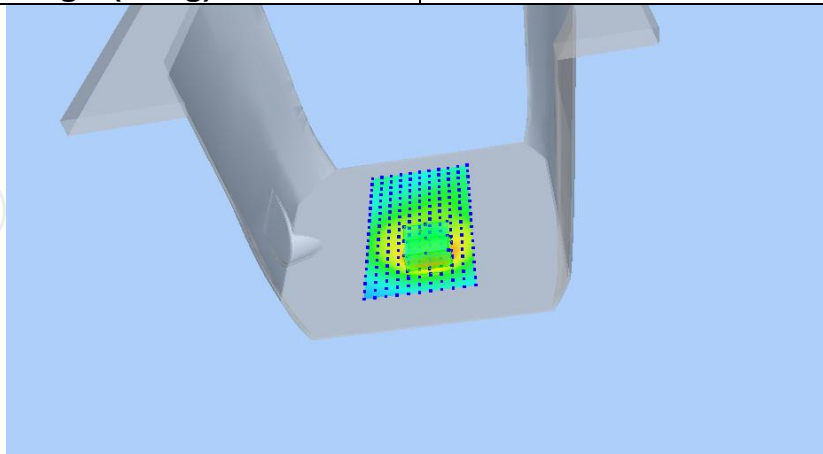
Maximum location: X=8.00, Y=-38.00 SAR Peak: 1.07 W/kg

SAR 10g (W/Kg)

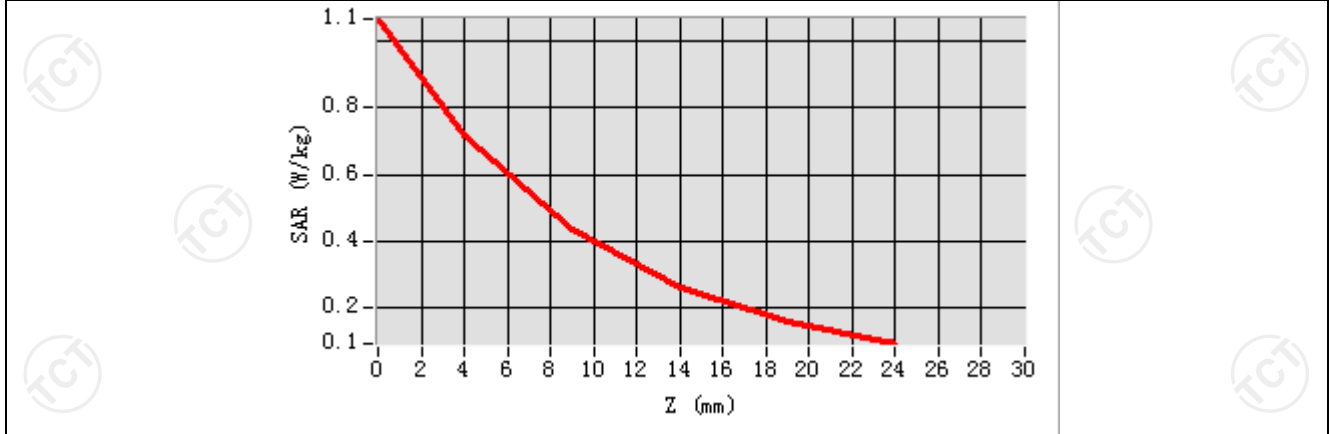
0.374037

SAR 1g (W/Kg)

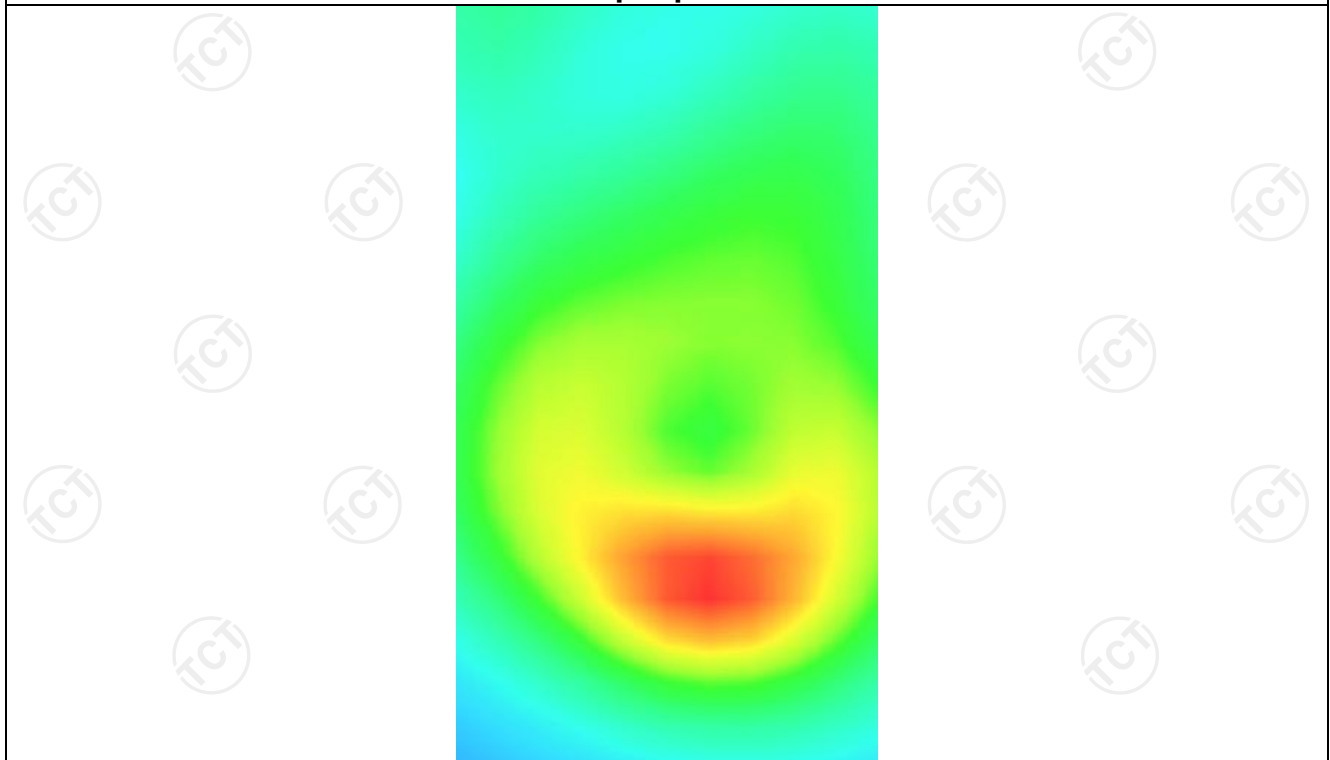
0.668230



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0654	0.7197	0.4321	0.2592	0.1581



Hot spot position



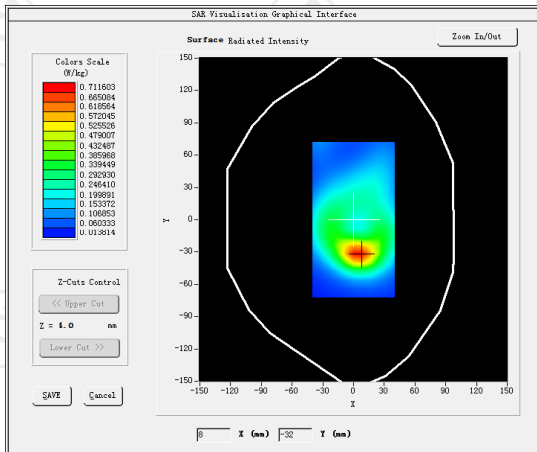
MEASUREMENT 3

Lower Band SAR (Channel 18700):

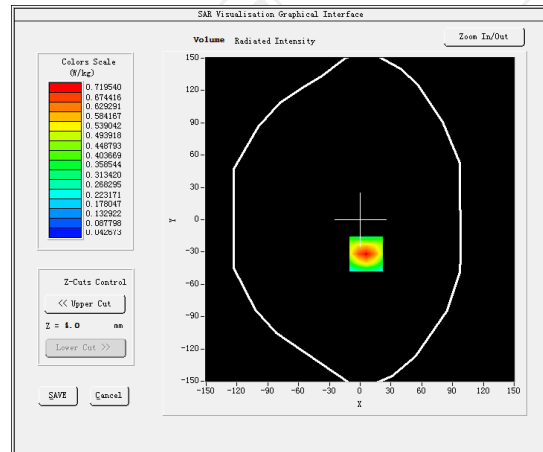
Date: 06/17/2021

Frequency (MHz)	1860.000000
Relative permittivity (real part)	53.312133
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	1.511983
Variation (%)	0.210000
Crest Factor	1.0
Probe Conversion factor	5.01
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 2 (1 RB#49)</u>

SURFACE SAR



VOLUME SAR



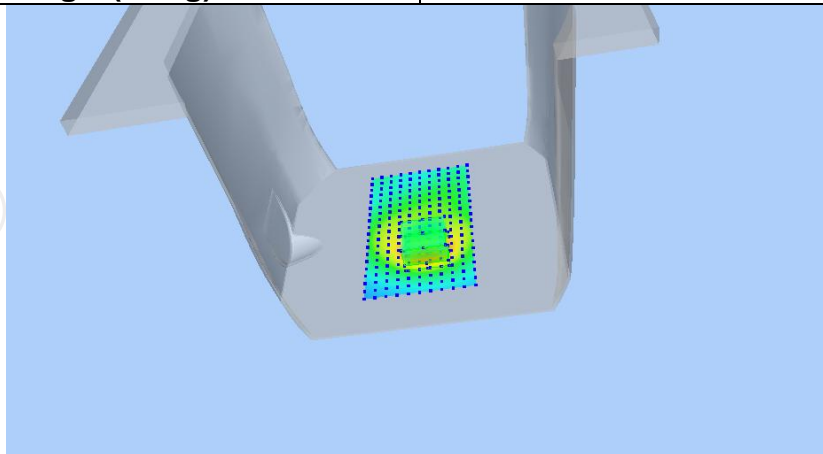
Maximum location: X=6.00, Y=-32.00 SAR Peak: 1.07 W/kg

SAR 10g (W/Kg)

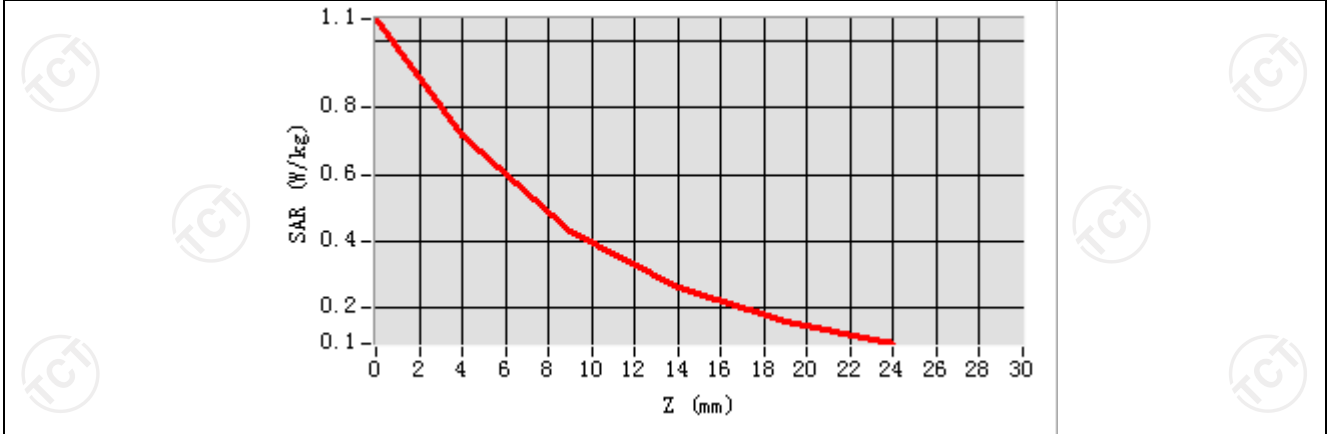
0.373822

SAR 1g (W/Kg)

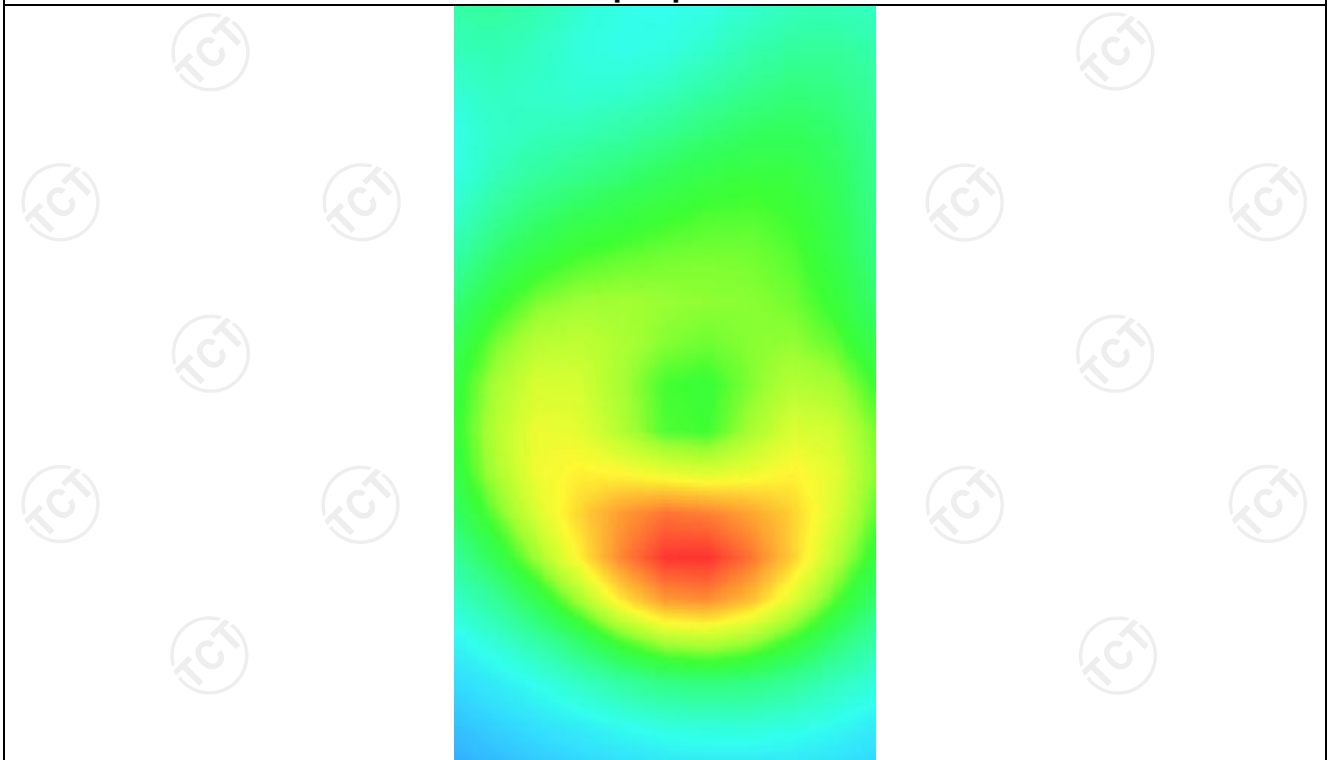
0.679586



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0661	0.7195	0.4316	0.2587	0.1576



Hot spot position



LTE Band 4

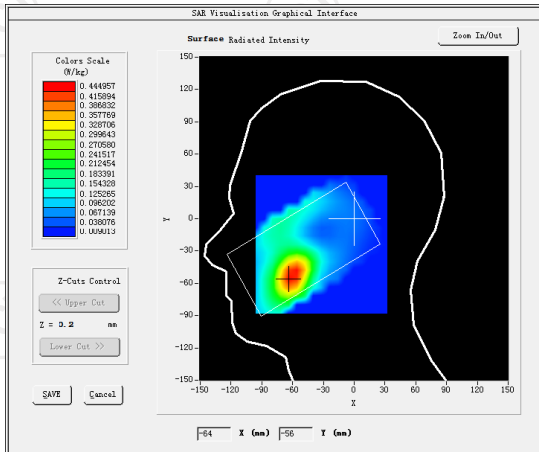
MEASUREMENT 1

Hight Band SAR (Channel 20300):

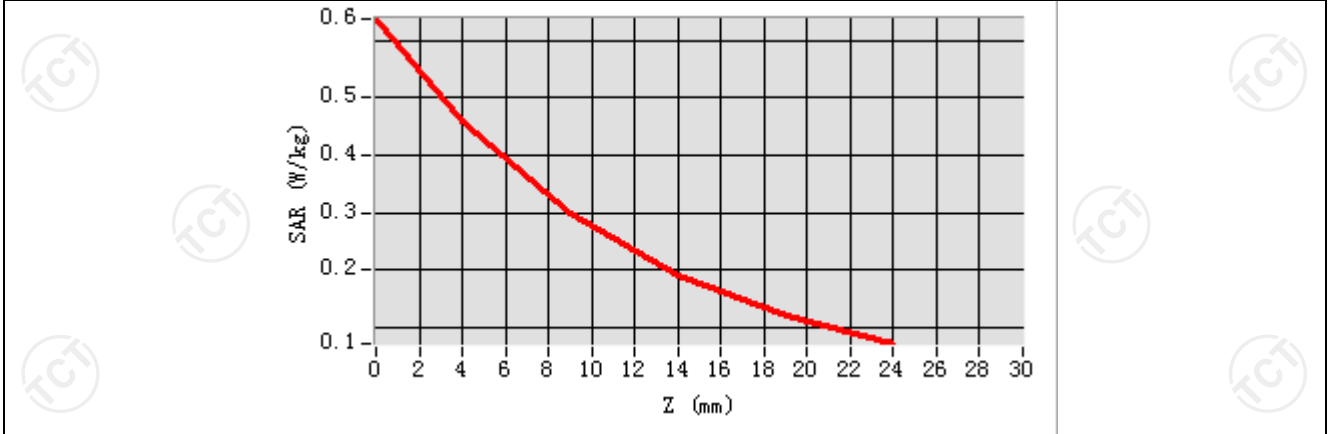
Date: 06/17/2021

Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.082249
Relative permittivity (imaginary part)	12.468101
Conductivity (S/m)	1.365332
Variation (%)	-0.790000
Crest Factor	1.0
Probe Conversion factor	4.38
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 4(1 RB#49)</u>

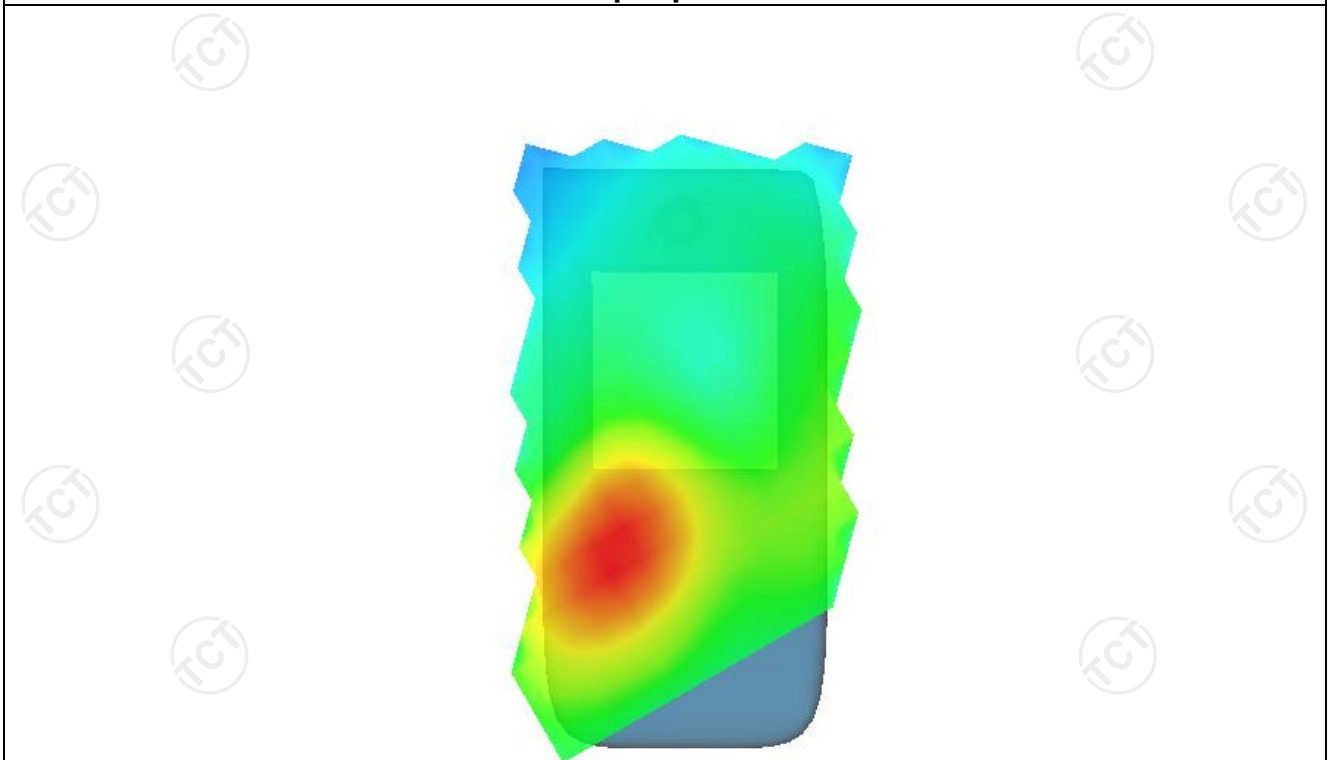
SURFACE SAR



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.6376	0.4579	0.2973	0.1907	0.1209



Hot spot position



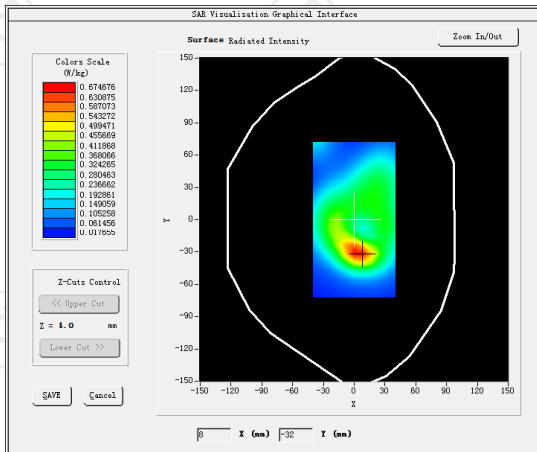
MEASUREMENT 2

Hight Band SAR (Channel 20300):

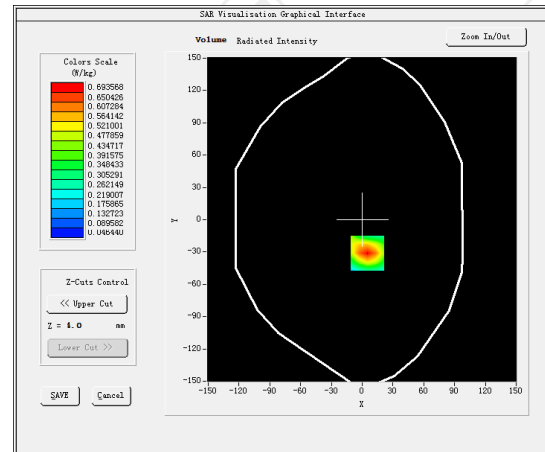
Date: 06/17/2021

Frequency (MHz)	1745.000000
Relative permittivity (real part)	53.310663
Relative permittivity (imaginary part)	12.468721
Conductivity (S/m)	1.512592
Variation (%)	-1.120000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 4(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



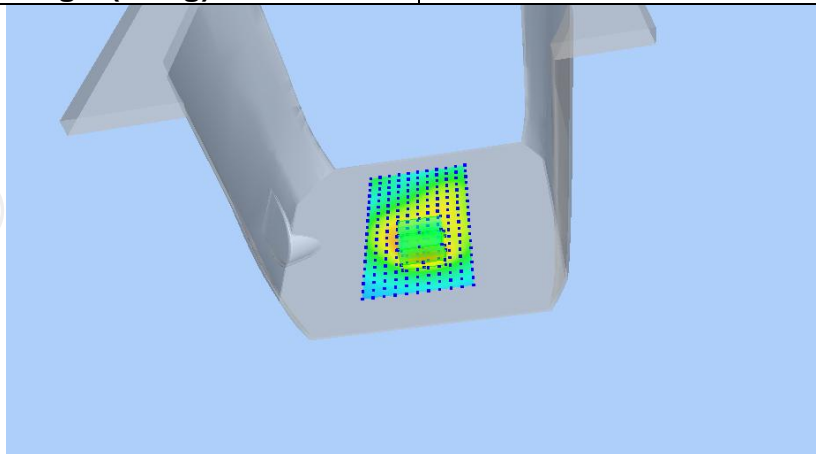
Maximum location: X=5.00, Y=-31.00 SAR Peak: 1.02 W/kg

SAR 10g (W/Kg)

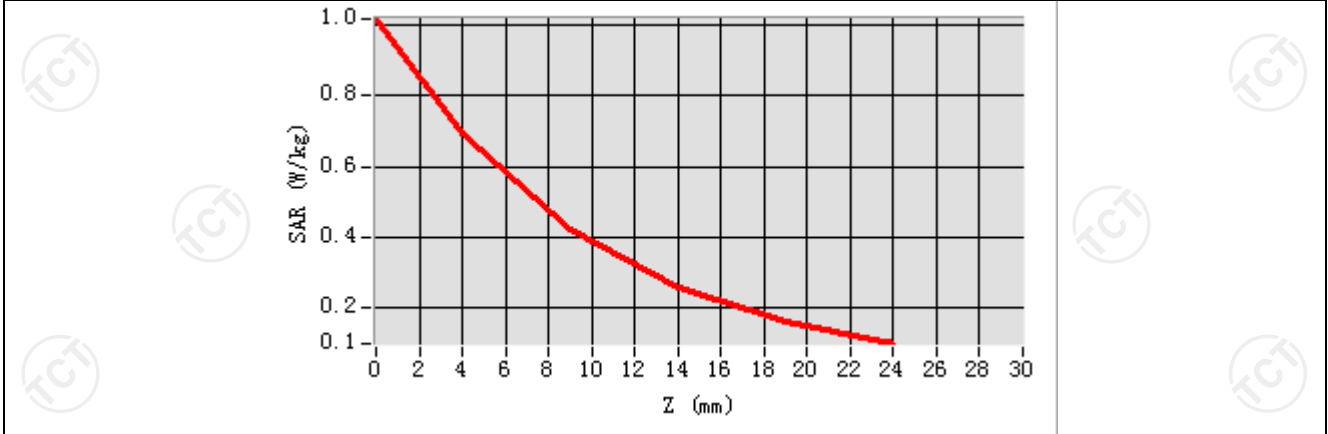
0.362784

SAR 1g (W/Kg)

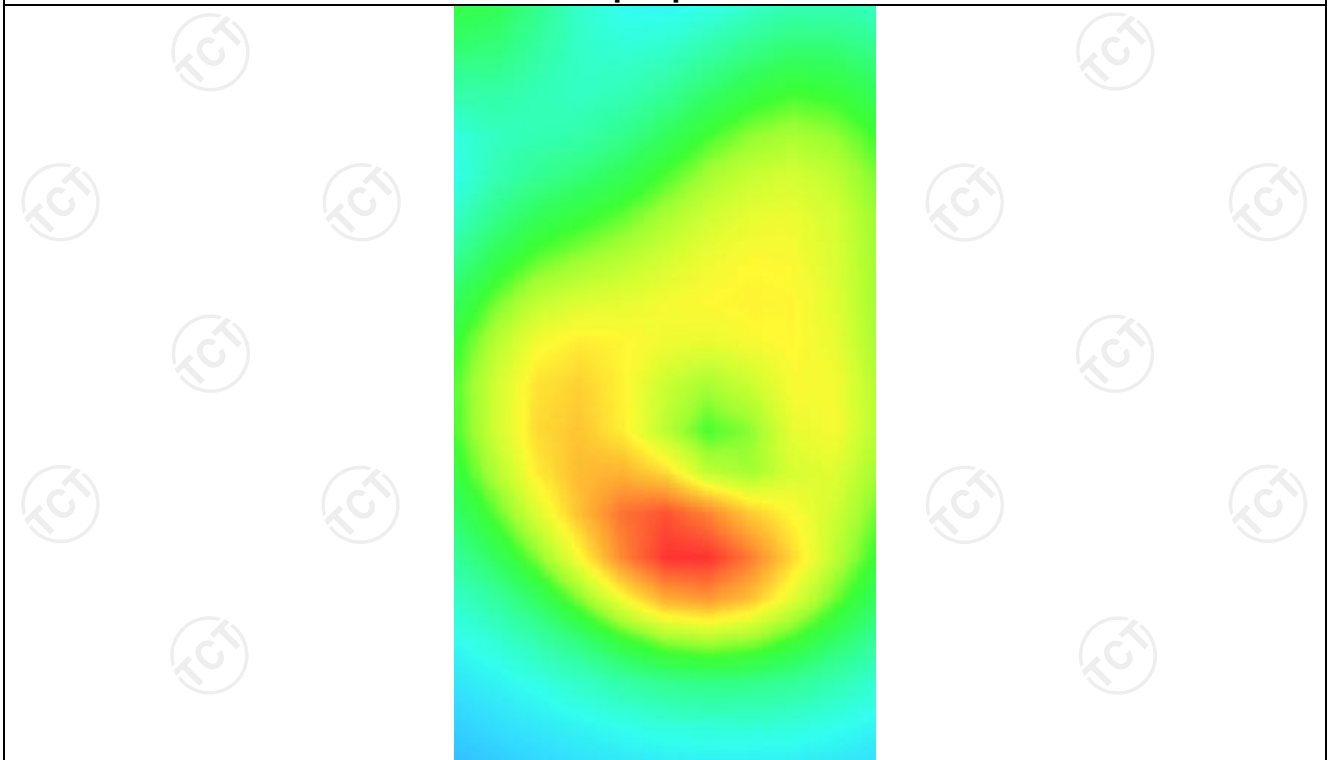
0.643788



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0187	0.6936	0.4218	0.2573	0.1601



Hot spot position



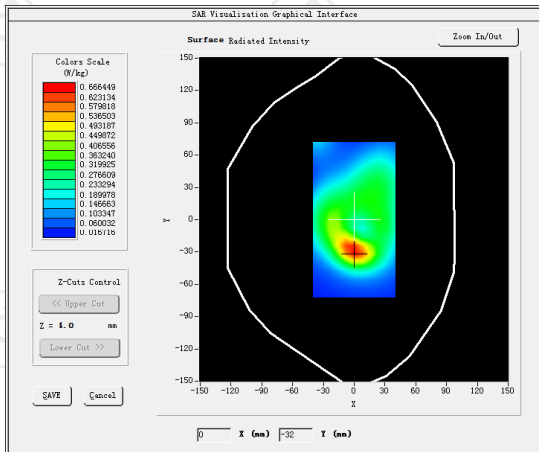
MEASUREMENT 3

Hight Band SAR (Channel 20300):

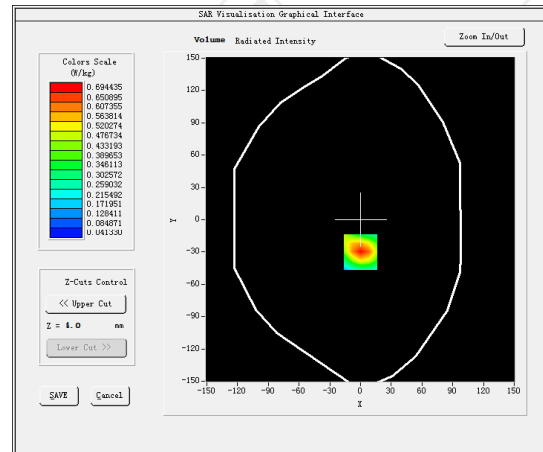
Date: 06/17/2021

Frequency (MHz)	1745.000000
Relative permittivity (real part)	53.310663
Relative permittivity (imaginary part)	12.468721
Conductivity (S/m)	1.512592
Variation (%)	0.170000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 4(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



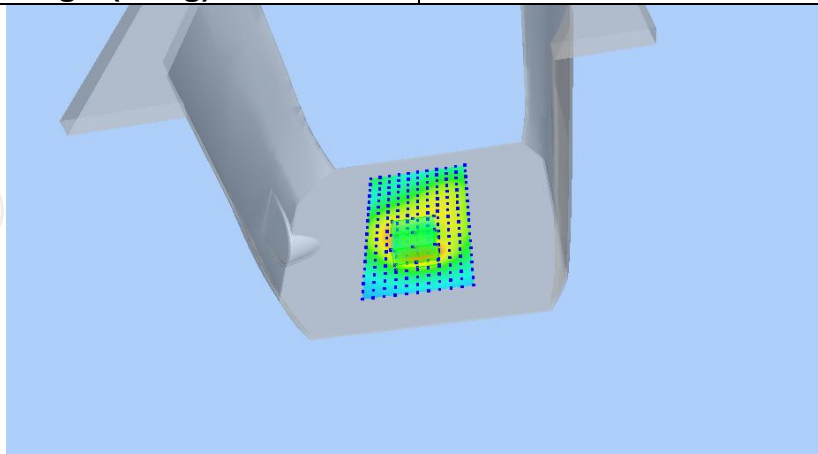
Maximum location: X=0.00, Y=-30.00 SAR Peak: 1.02 W/kg

SAR 10g (W/Kg)

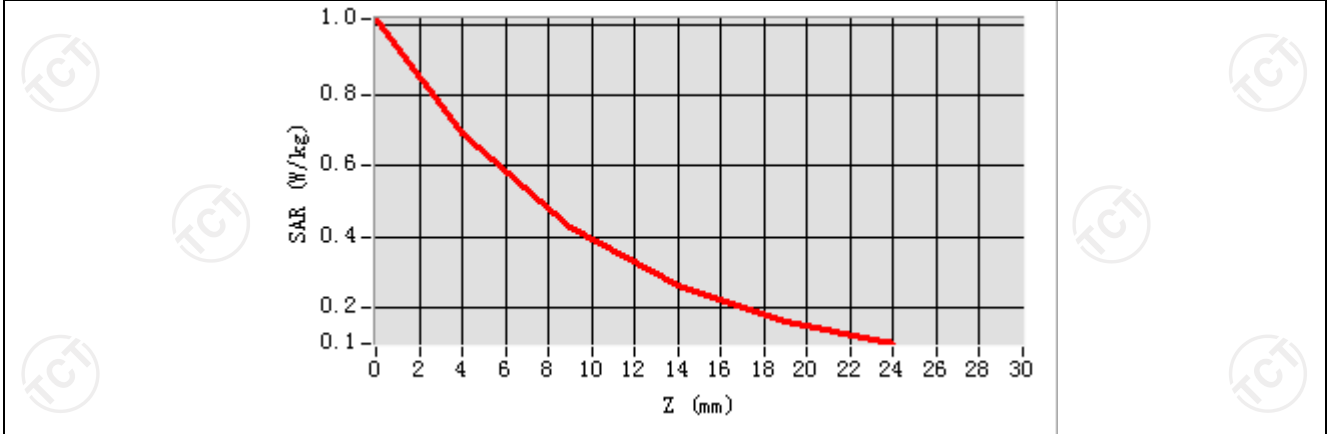
0.365005

SAR 1g (W/Kg)

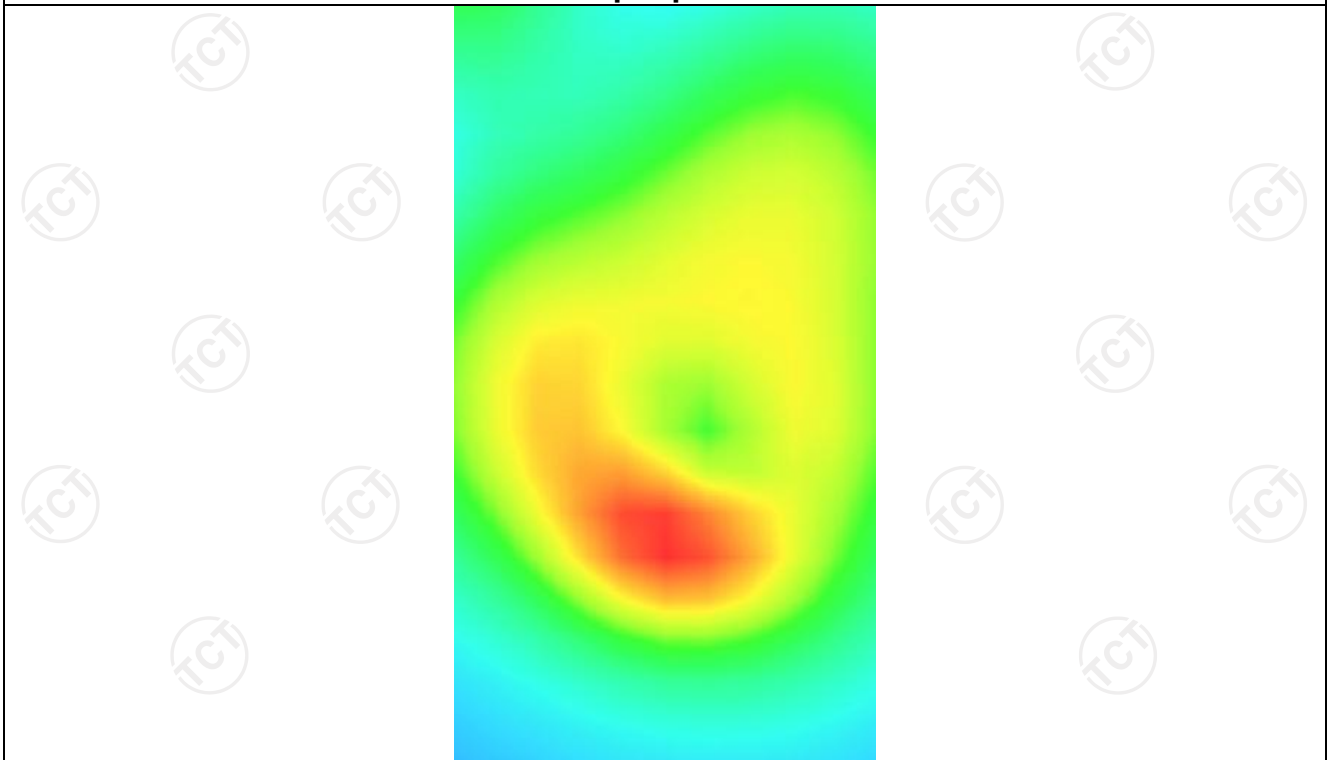
0.665521



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0144	0.6944	0.4253	0.2608	0.1628



Hot spot position



LTE Band 5

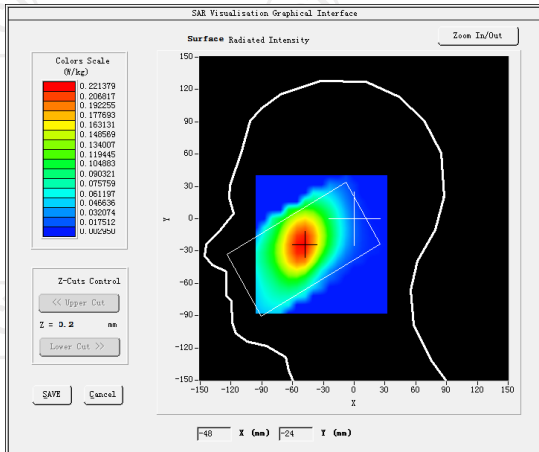
MEASUREMENT 1

Lower Band SAR (Channel 20450):

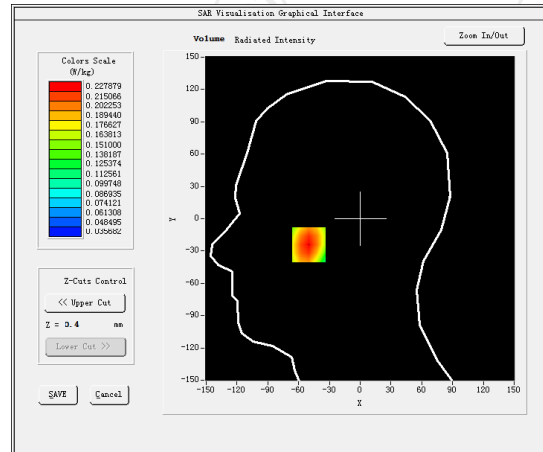
Date: 06/11/2021

Frequency (MHz)	829.000000
Relative permittivity (real part)	41.422375
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	0.873352
Variation (%)	0.490000
Crest Factor	1.0
Probe Conversion factor	4.38
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 5(1 RB#0)</u>

SURFACE SAR



VOLUME SAR



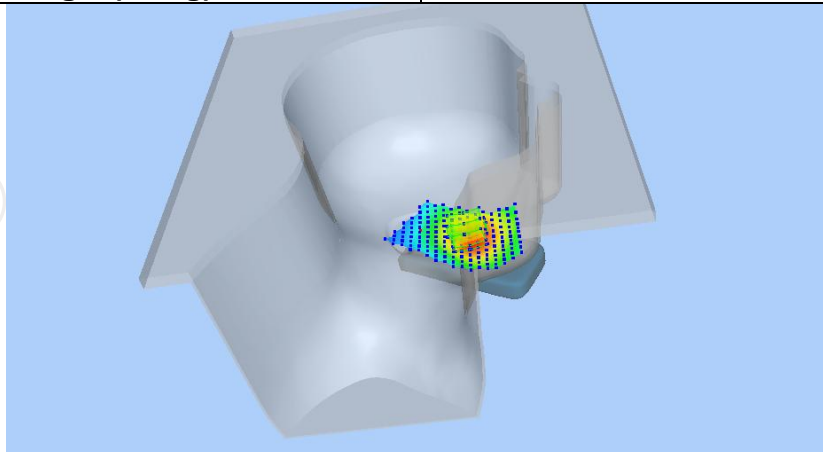
Maximum location: X=-50.00, Y=-24.00 SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)

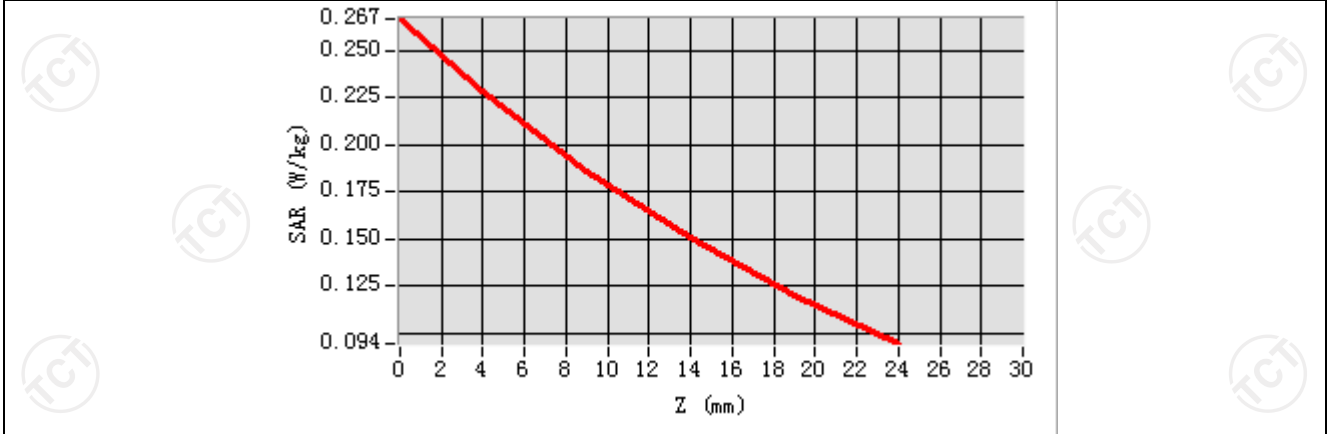
0.165191

SAR 1g (W/Kg)

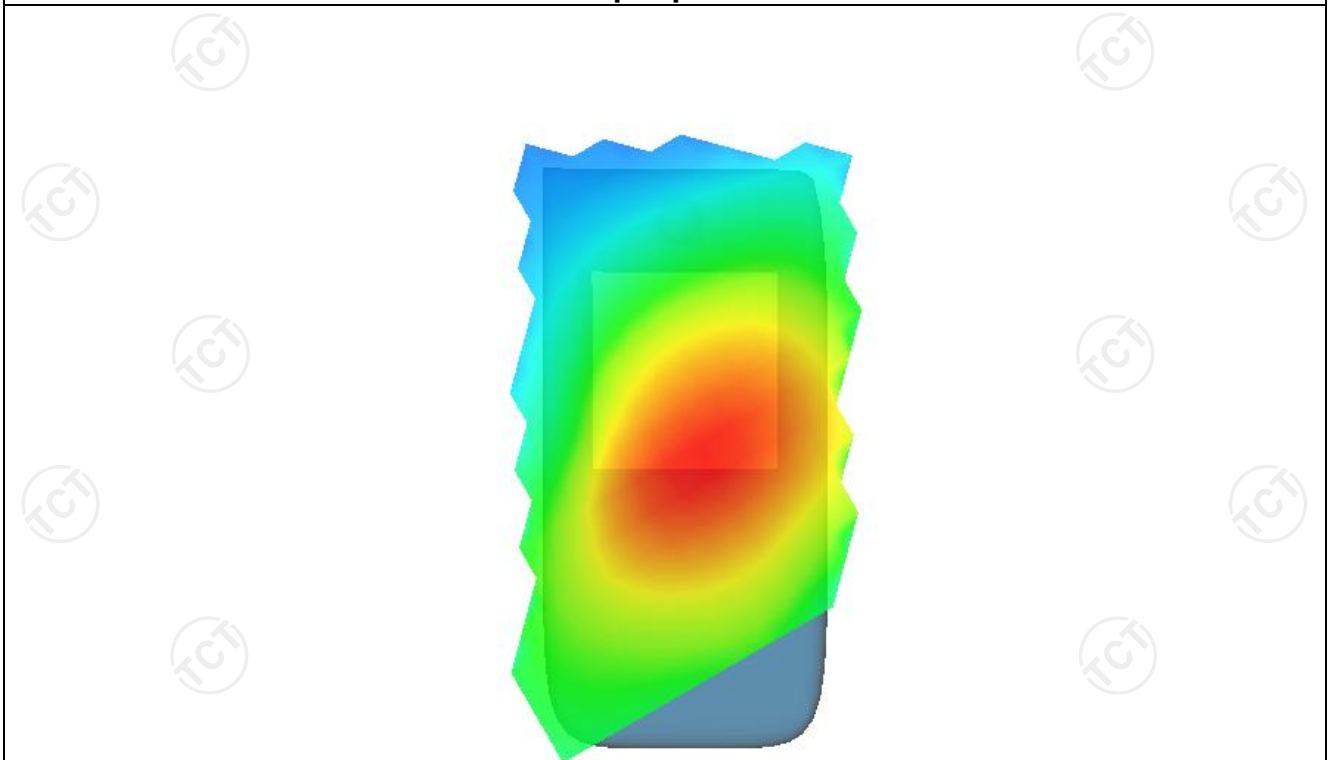
0.219502



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2666	0.2279	0.1859	0.1504	0.1204



Hot spot position



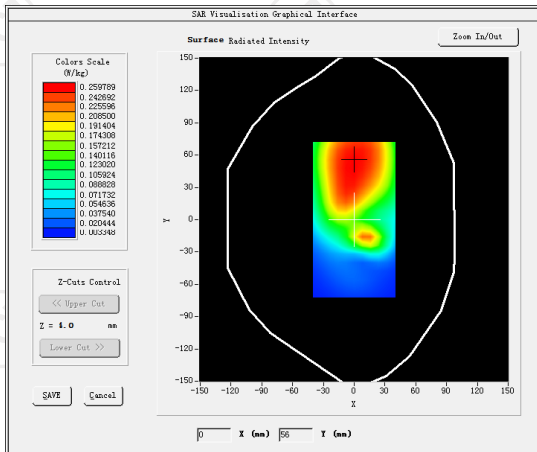
MEASUREMENT 2

Lower Band SAR (Channel 20450):

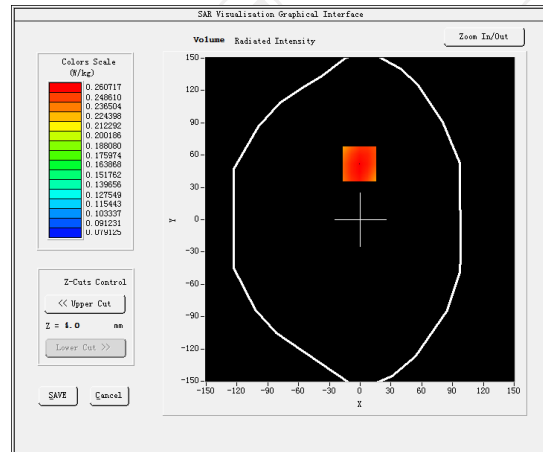
Date: 06/11/2021

Frequency (MHz)	829.000000
Relative permittivity (real part)	53.242028
Relative permittivity (imaginary part)	12.468234
Conductivity (S/m)	0.941322
Variation (%)	0.170000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 5(1 RB#0)</u>

SURFACE SAR



VOLUME SAR



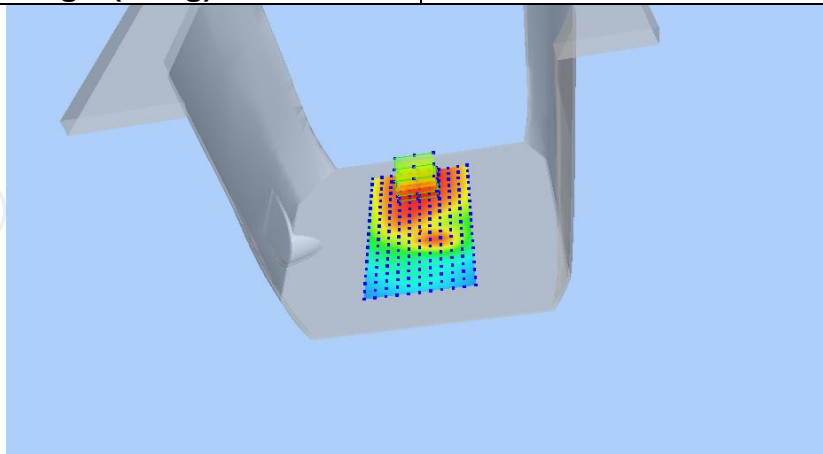
Maximum location: X=-1.00, Y=52.00 SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)

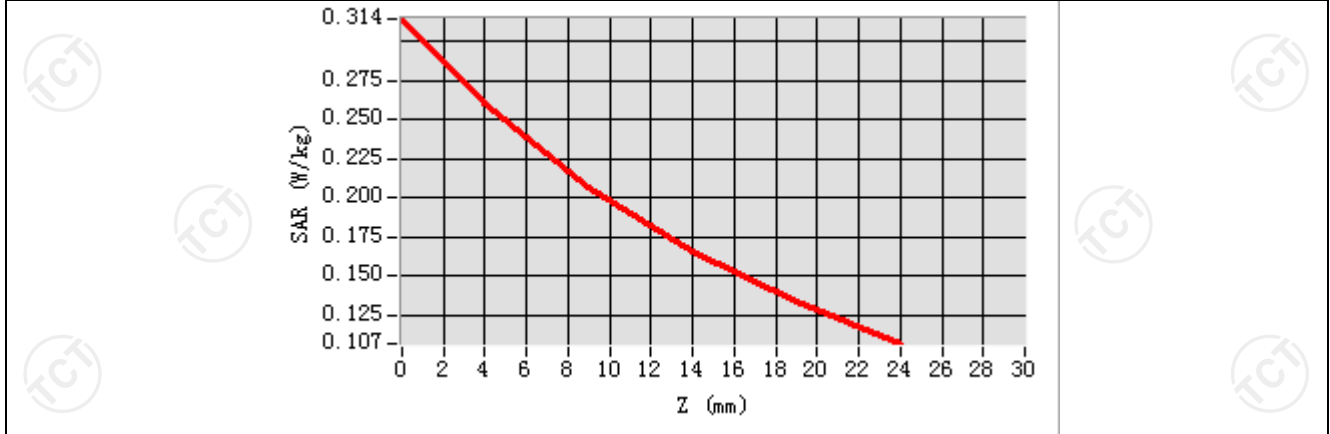
0.197049

SAR 1g (W/Kg)

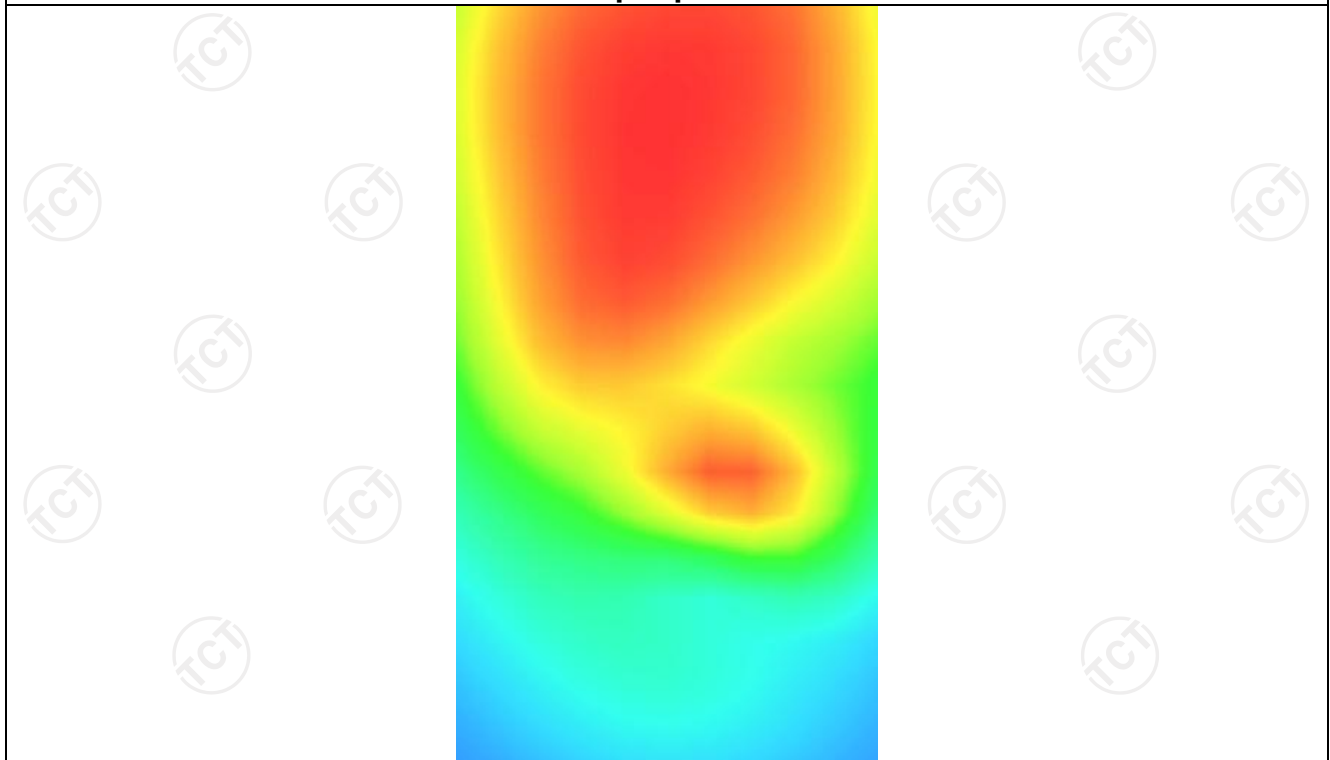
0.244874



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3141	0.2607	0.2069	0.1654	0.1332



Hot spot position



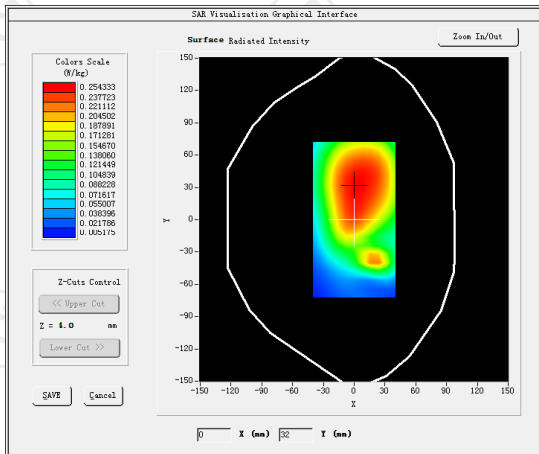
MEASUREMENT 3

Lower Band SAR (Channel 20450):

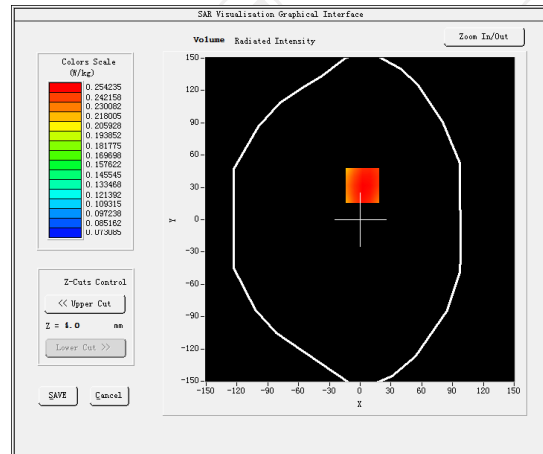
Date: 06/11/2021

Frequency (MHz)	829.000000
Relative permittivity (real part)	53.242028
Relative permittivity (imaginary part)	12.468234
Conductivity (S/m)	0.941322
Variation (%)	-0.660000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 5(1 RB#0)</u>

SURFACE SAR

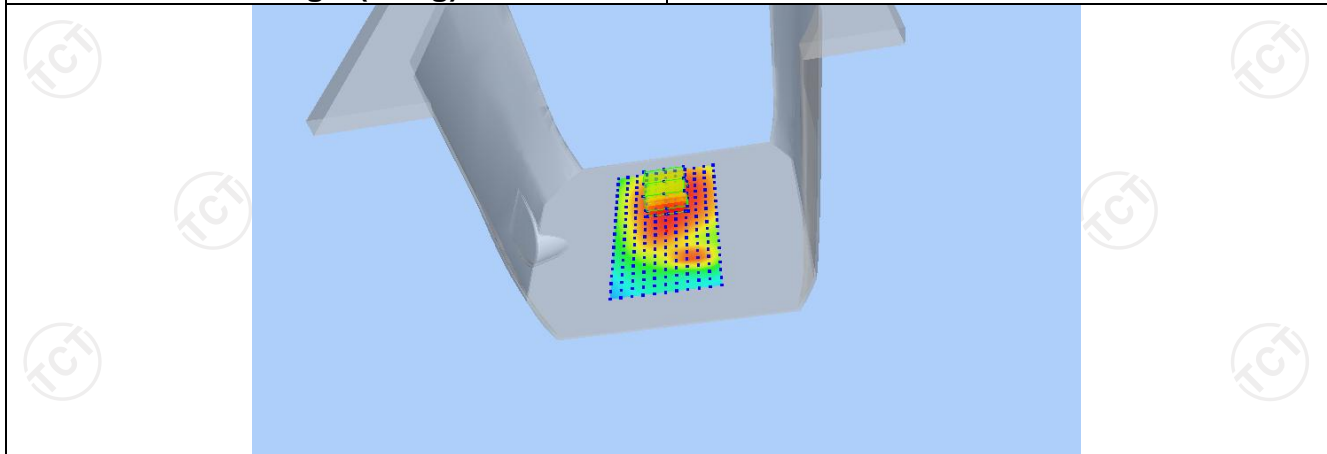


VOLUME SAR

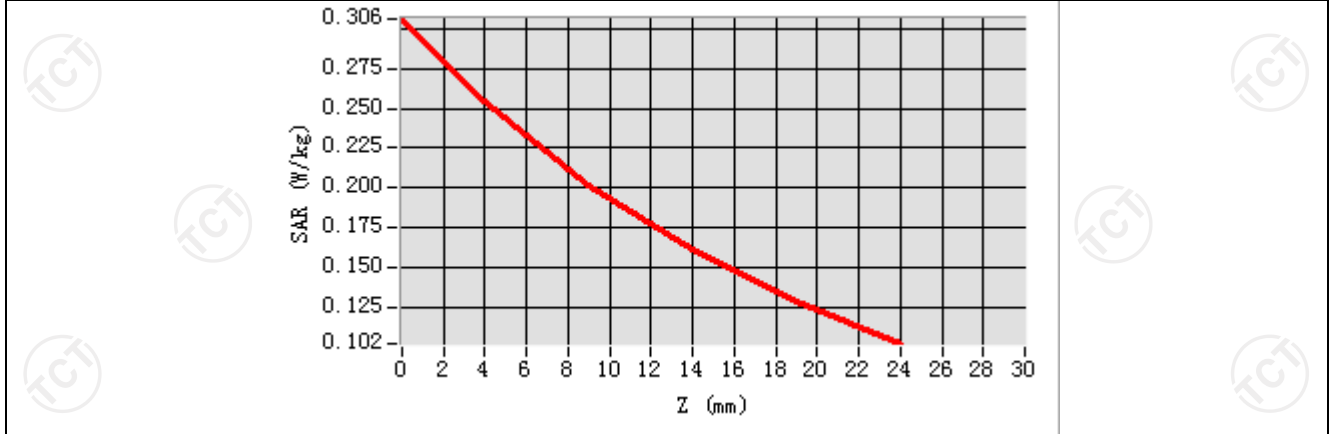


Maximum location: X=2.00, Y=32.00 SAR Peak: 0.31 W/kg

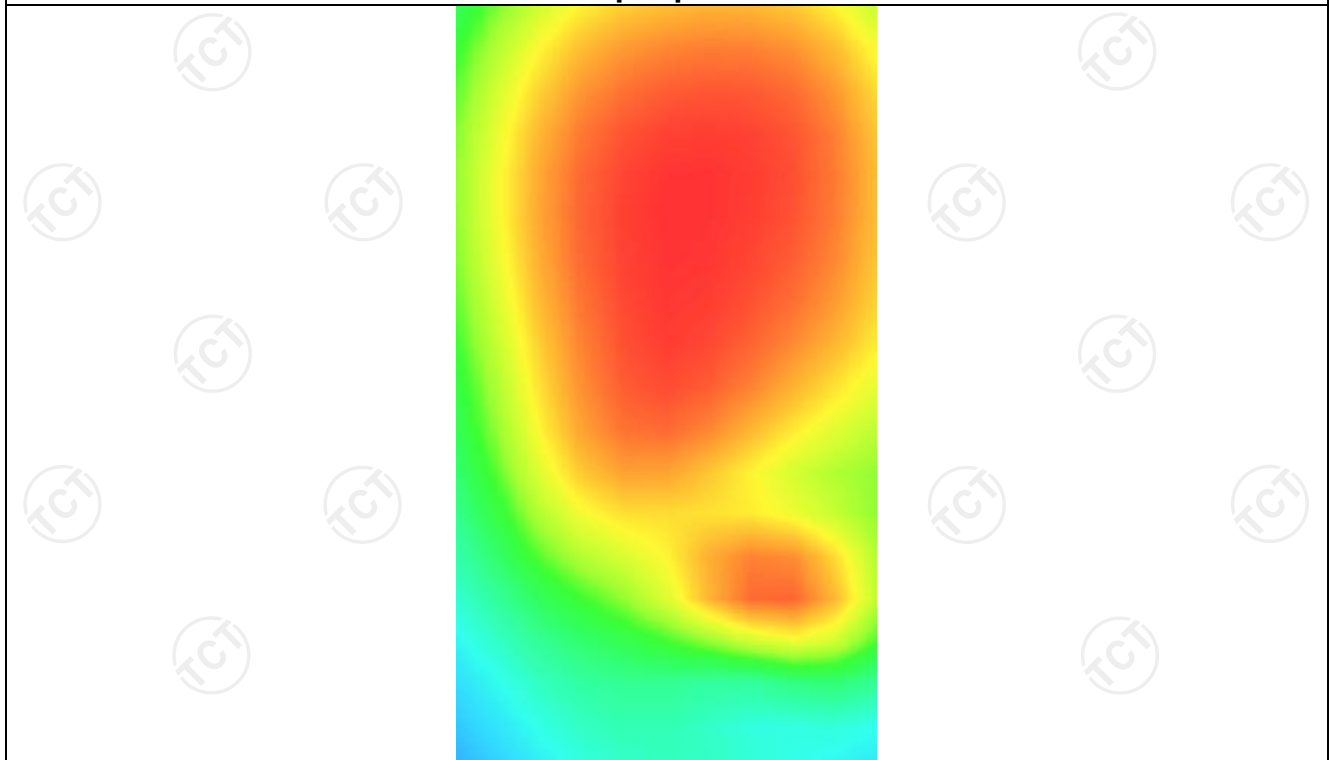
SAR 10g (W/Kg)	0.192746
SAR 1g (W/Kg)	0.258934



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3059	0.2542	0.2018	0.1610	0.1290



Hot spot position



LTE Band 7

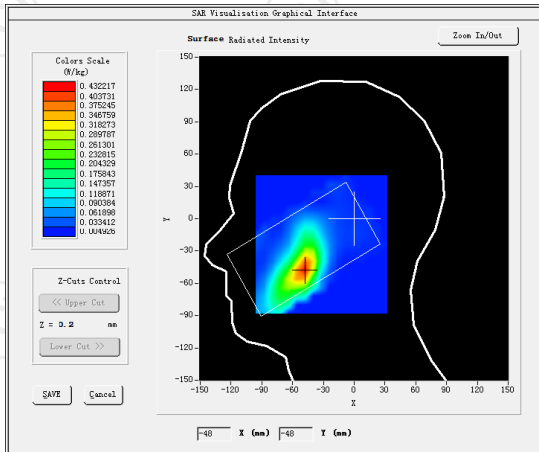
MEASUREMENT 1

Lower Band SAR (Channel 20850):

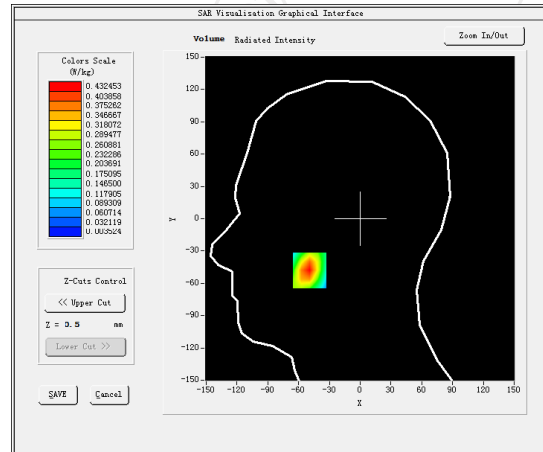
Date: 06/29/2021

Frequency (MHz)	2510.000000
Relative permittivity (real part)	38.854836
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.920731
Variation (%)	-0.390000
Crest Factor	1.0
Probe Conversion factor	4.38
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 7(1 RB#0)</u>

SURFACE SAR



VOLUME SAR



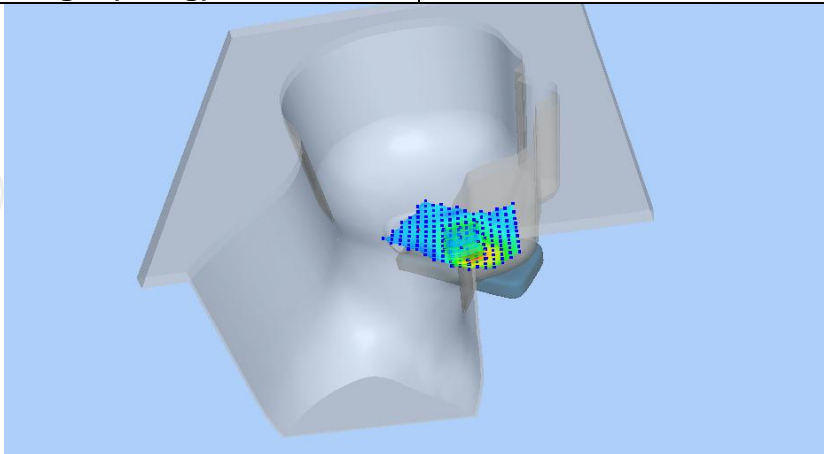
Maximum location: X=-49.00, Y=-48.00 SAR Peak: 0.88 W/kg

SAR 10g (W/Kg)

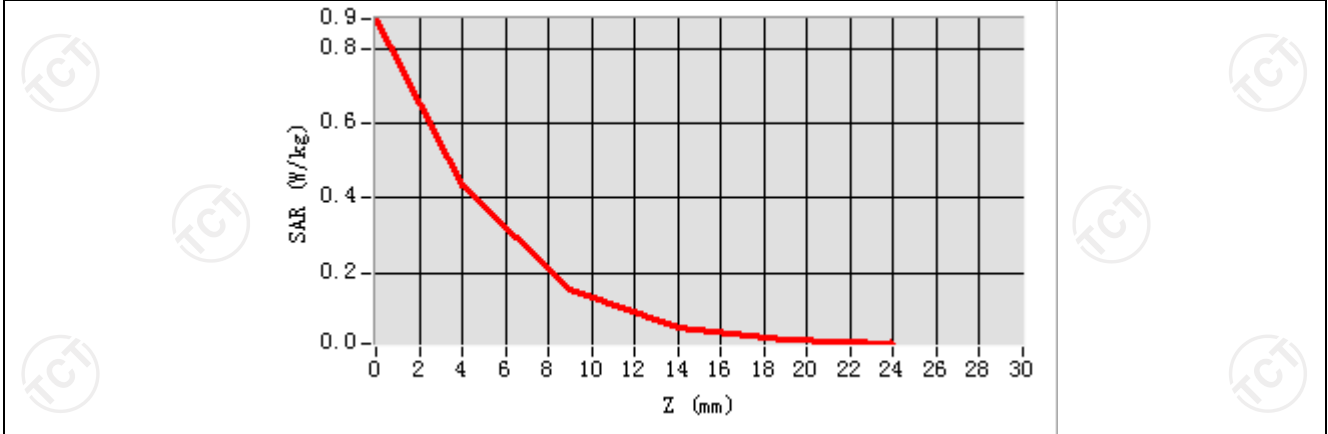
0.184588

SAR 1g (W/Kg)

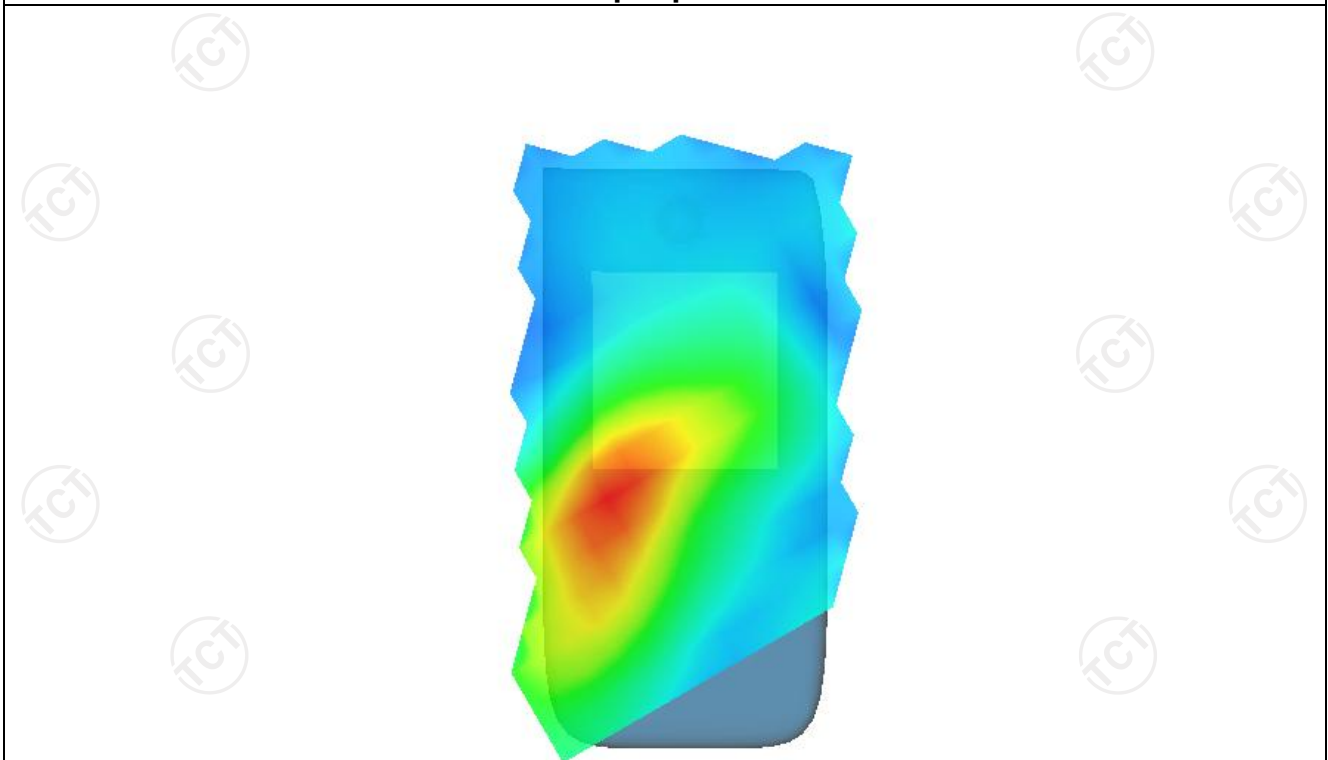
0.420219



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8804	0.4325	0.1545	0.0508	0.0199



Hot spot position



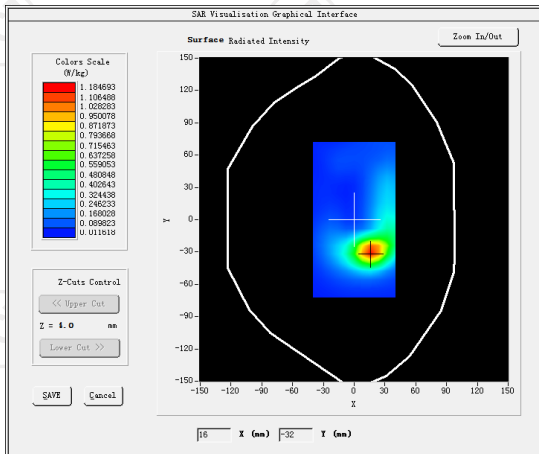
MEASUREMENT 2

Lower Band SAR (Channel 20850):

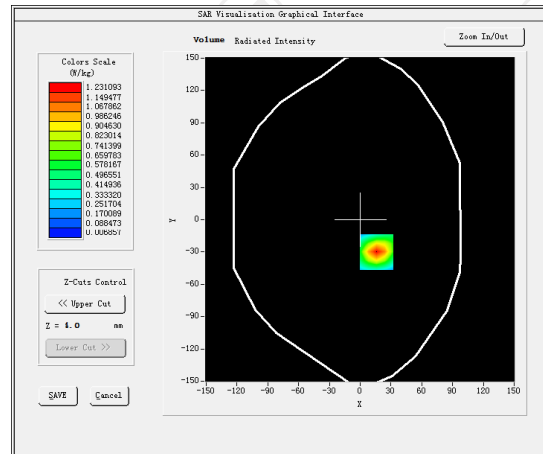
Date: 06/29/2021

Frequency (MHz)	2510.000000
Relative permittivity (real part)	51.963582
Relative permittivity (imaginary part)	12.468820
Conductivity (S/m)	2.102337
Variation (%)	-0.230000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 7(1 RB#0)</u>

SURFACE SAR



VOLUME SAR



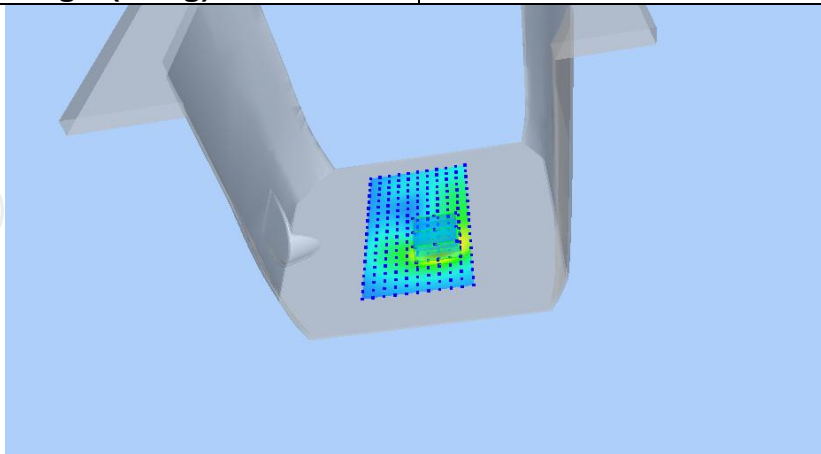
Maximum location: X=16.00, Y=-30.00 SAR Peak: 2.49 W/kg

SAR 10g (W/Kg)

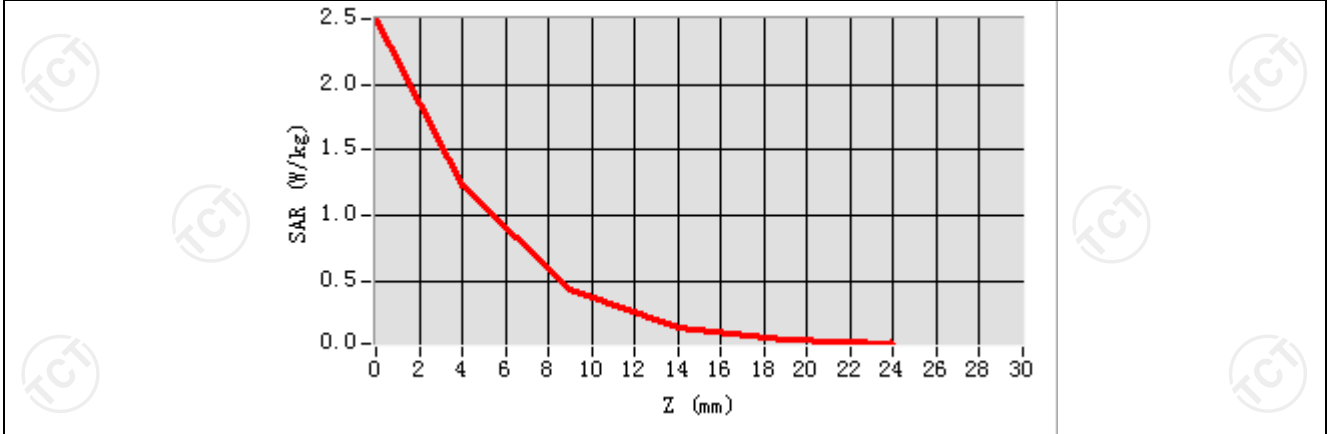
0.985495

SAR 1g (W/Kg)

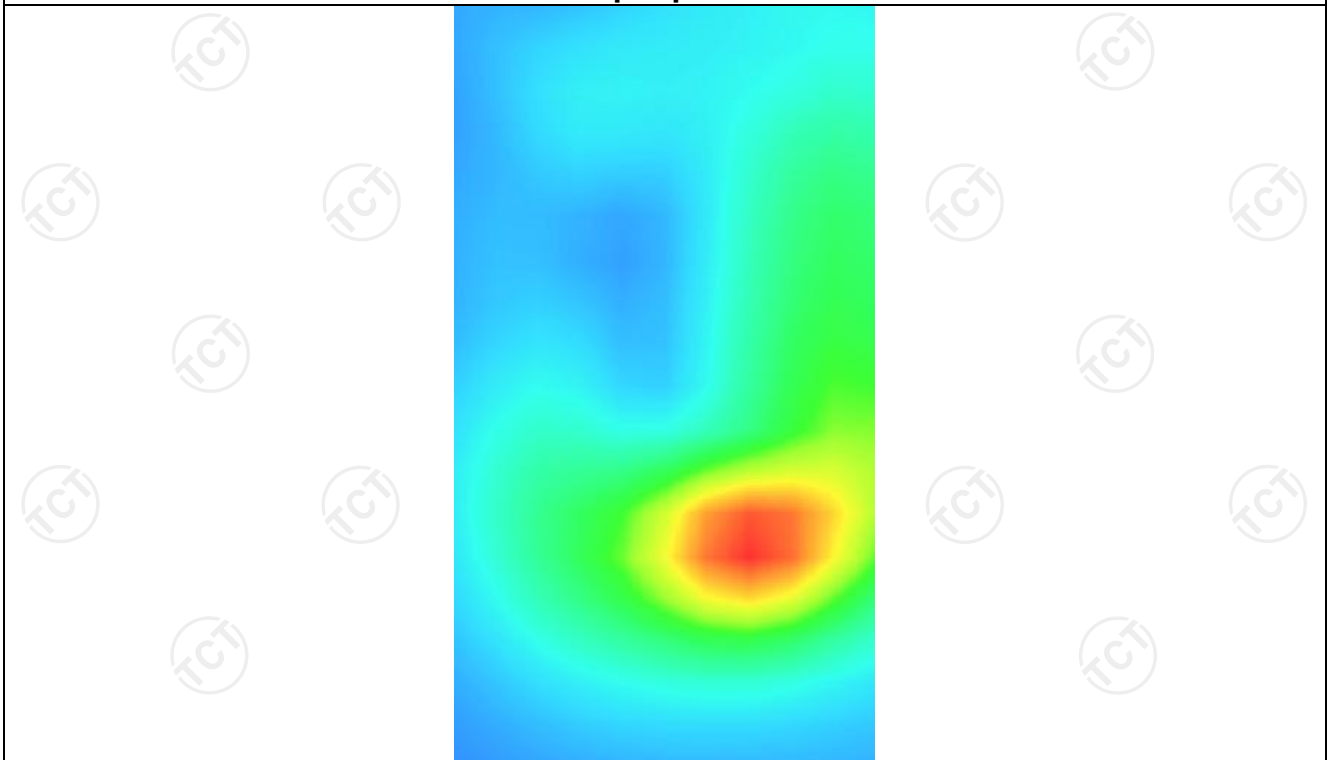
0.449891



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.4978	1.2311	0.4399	0.1414	0.0507



Hot spot position



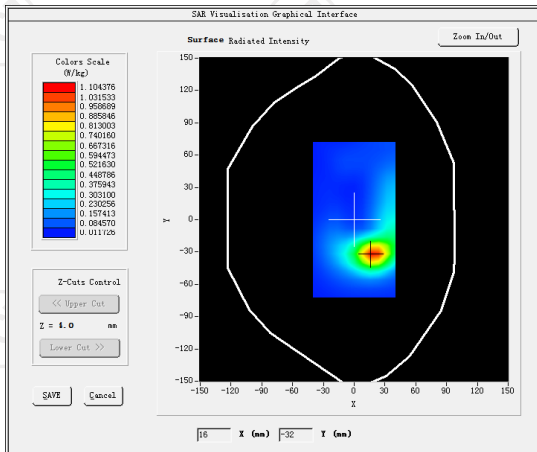
MEASUREMENT 3

Lower Band SAR (Channel 20850):

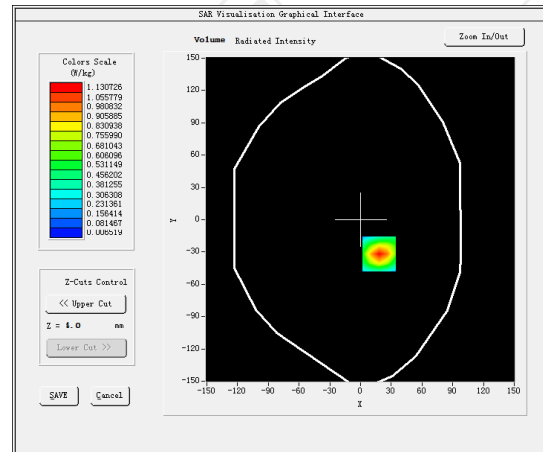
Date: 06/29/2021

Frequency (MHz)	2510.000000
Relative permittivity (real part)	51.963582
Relative permittivity (imaginary part)	12.468820
Conductivity (S/m)	2.102337
Variation (%)	-0.070000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 7(1 RB#0)</u>

SURFACE SAR



VOLUME SAR



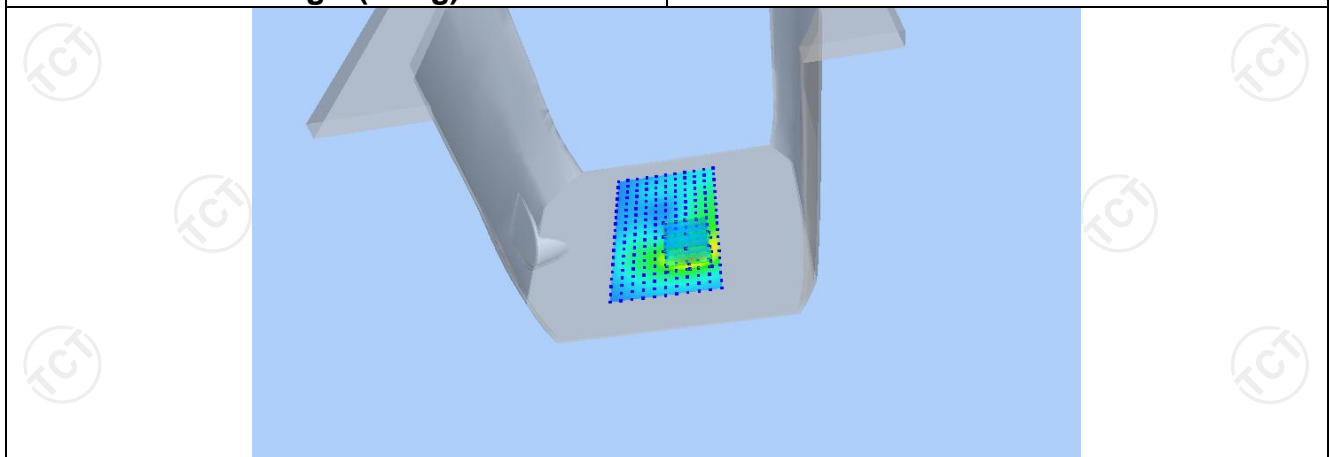
Maximum location: X=18.00, Y=-32.00 SAR Peak: 2.29 W/kg

SAR 10g (W/Kg)

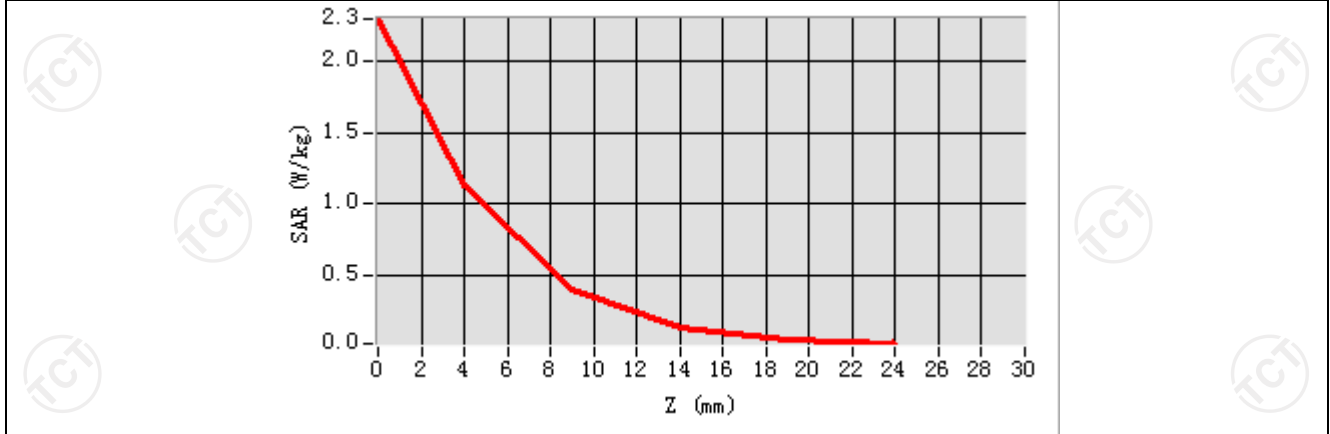
0.970208

SAR 1g (W/Kg)

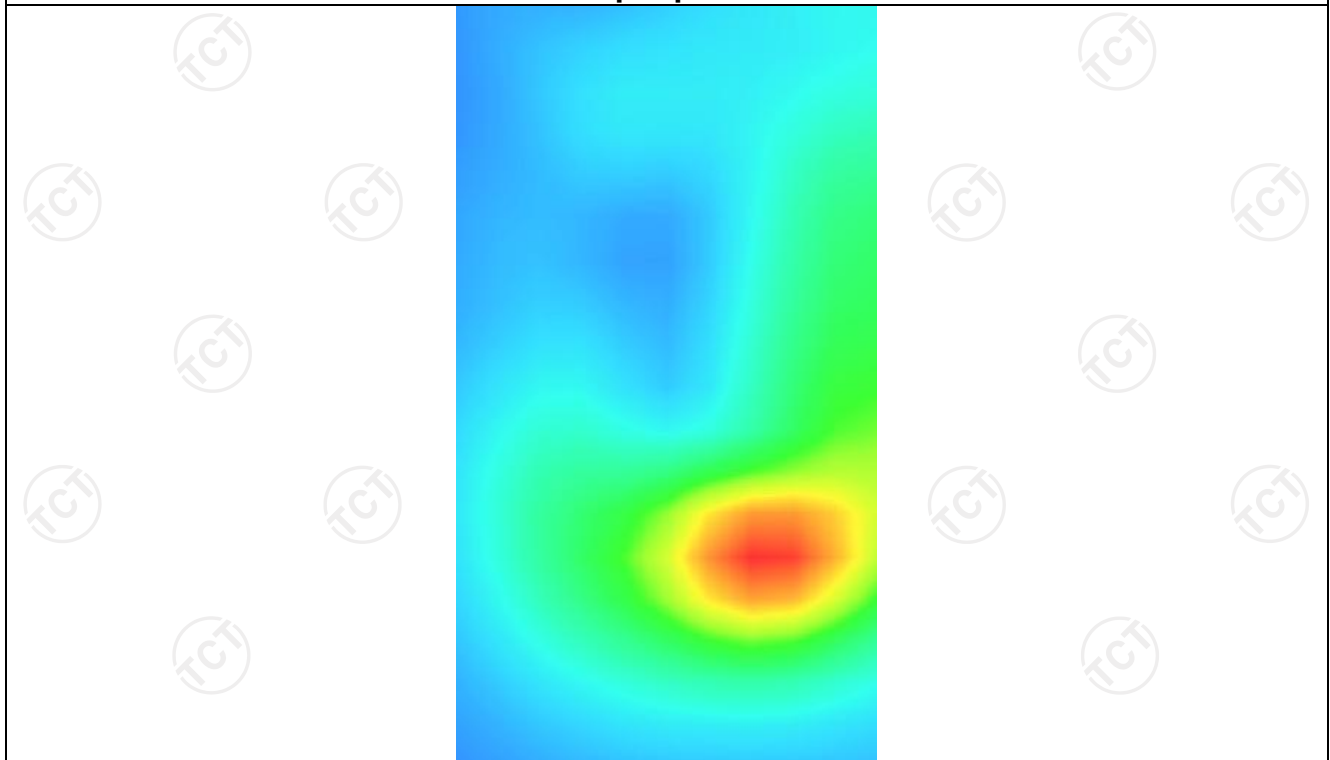
0.459411



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.2975	1.1307	0.4031	0.1294	0.0466



Hot spot position



LTE Band 12

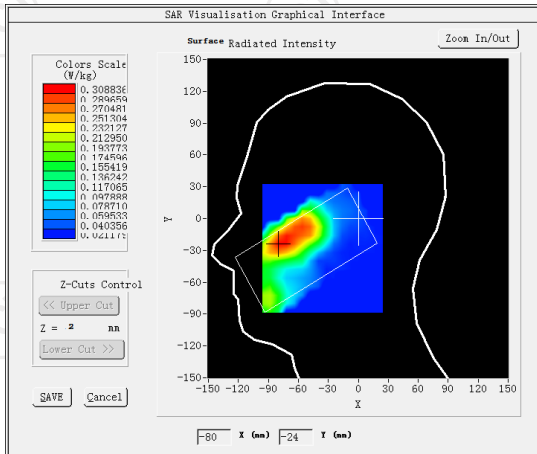
MEASUREMENT 1

Middle Band SAR (Channel 23095):

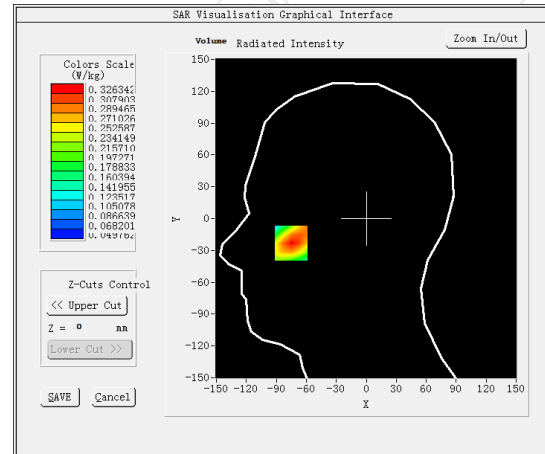
Date: 06/11/2021

Frequency (MHz)	707.500000
Relative permittivity (real part)	40.392517
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	0.881392
Variation (%)	-0.240000
Crest Factor	1.0
Probe Conversion factor	4.38
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 12(1 RB#24)</u>

SURFACE SAR



VOLUME SAR



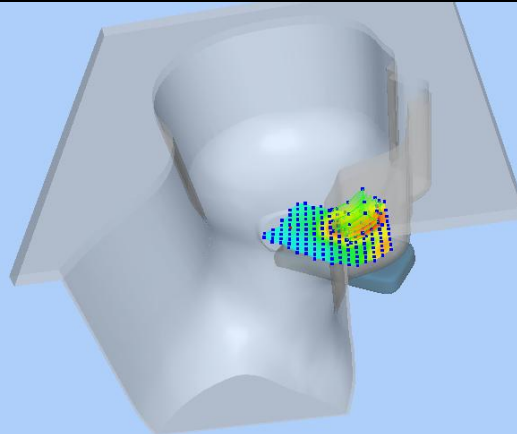
Maximum location: X=-75.00, Y=-22.00 SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)

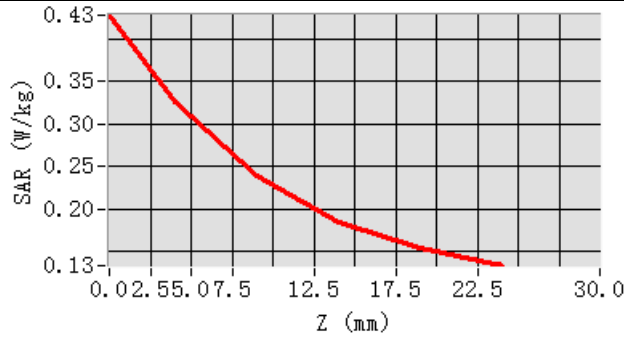
0.219558

SAR 1g (W/Kg)

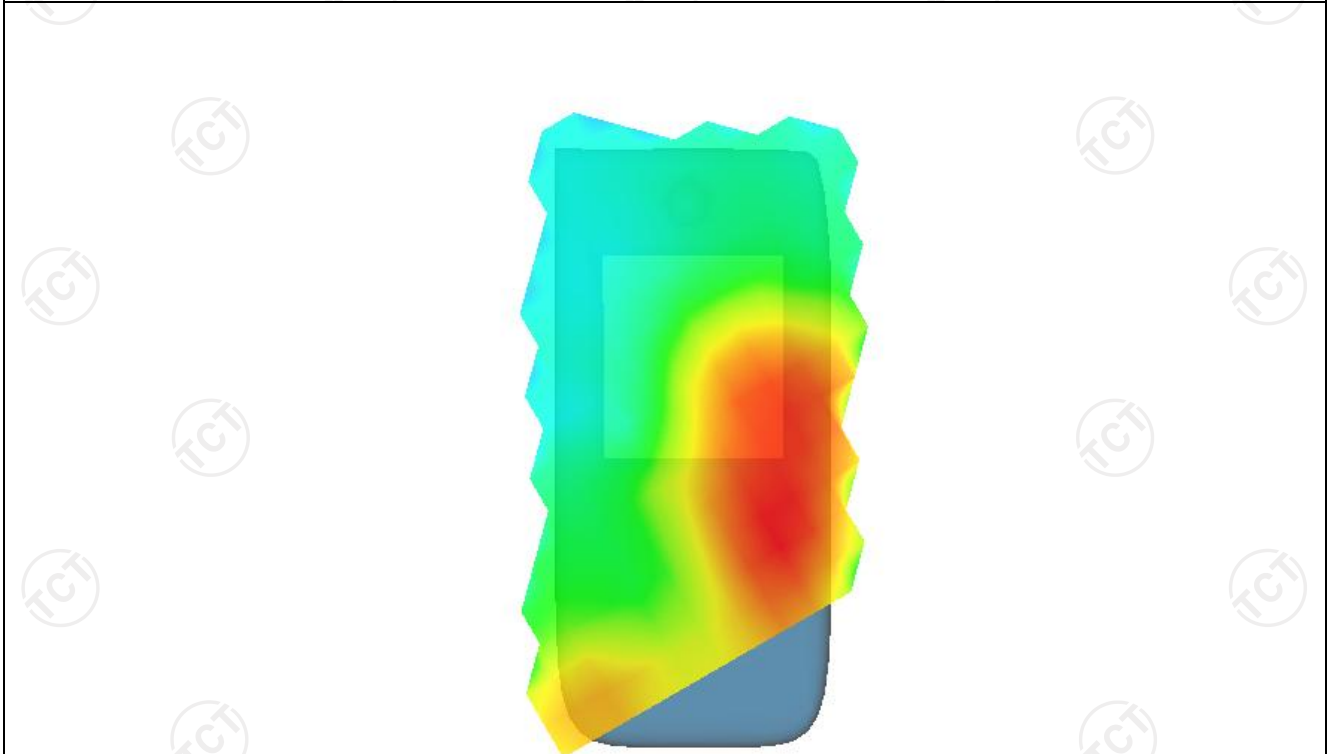
0.317572



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4281	0.3263	0.2385	0.1848	0.1540



Hot spot position



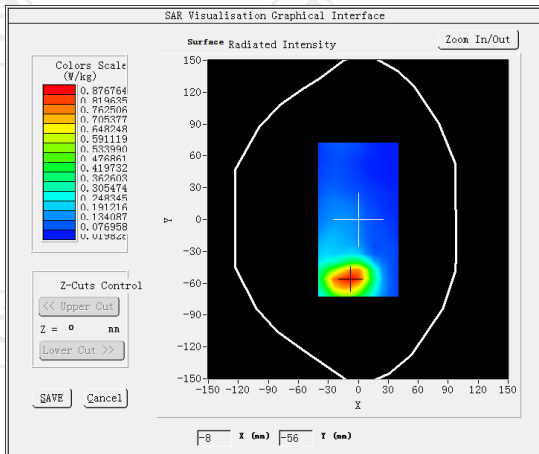
MEASUREMENT 2

Middle Band SAR (Channel 23095):

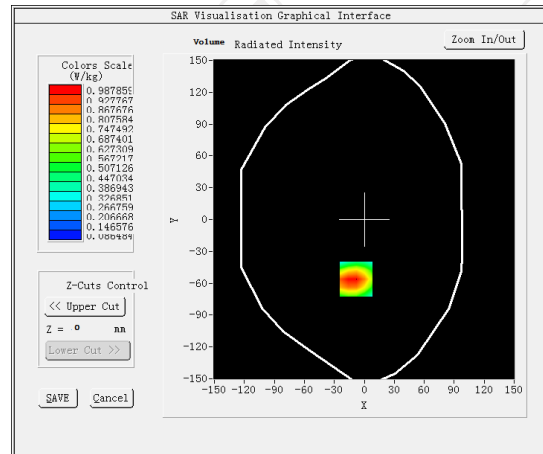
Date: 06/11/2021

Frequency (MHz)	707.500000
Relative permittivity (real part)	40.392517
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	0.881392
Variation (%)	1.220000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 12(1 RB#24)</u>

SURFACE SAR

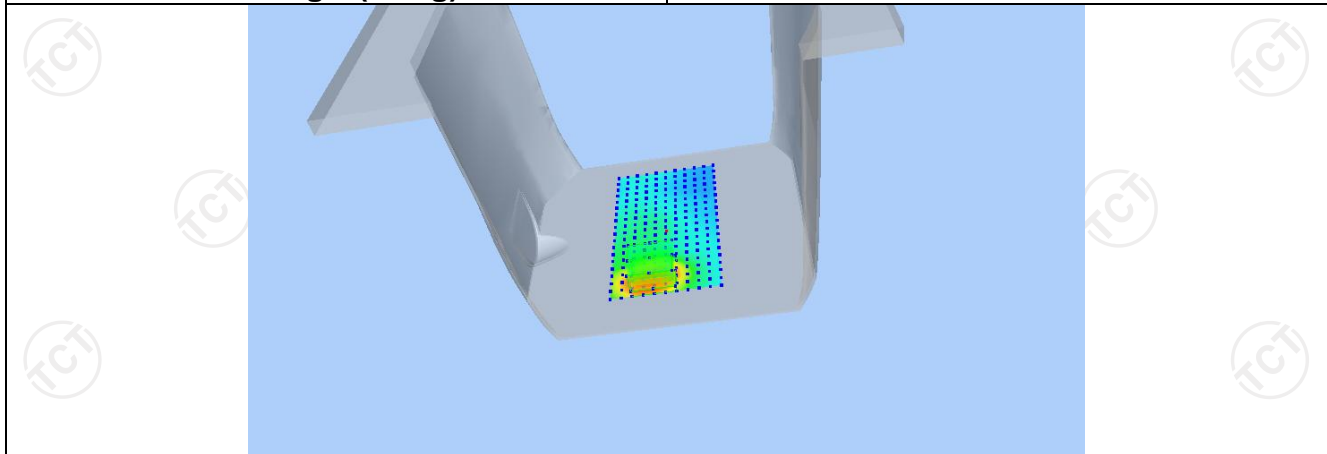


VOLUME SAR

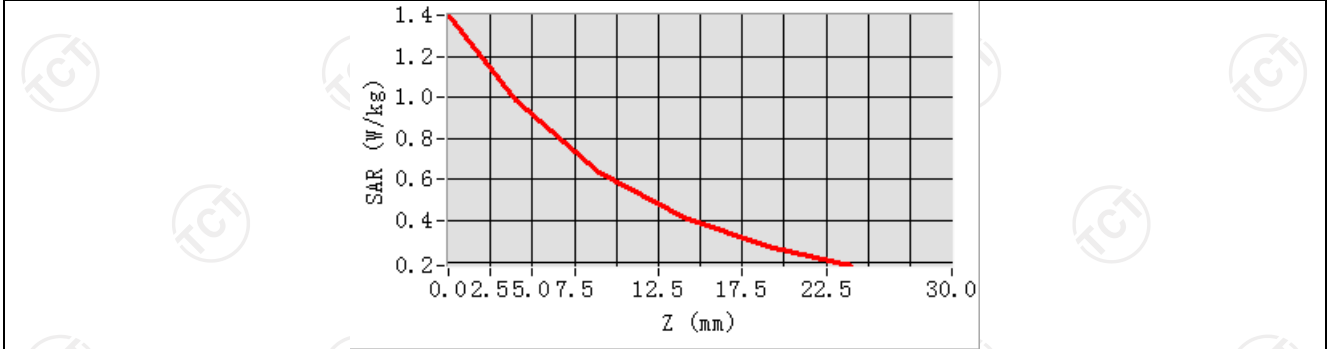


Maximum location: X=-8.00, Y=-56.00 SAR Peak: 1.44 W/kg

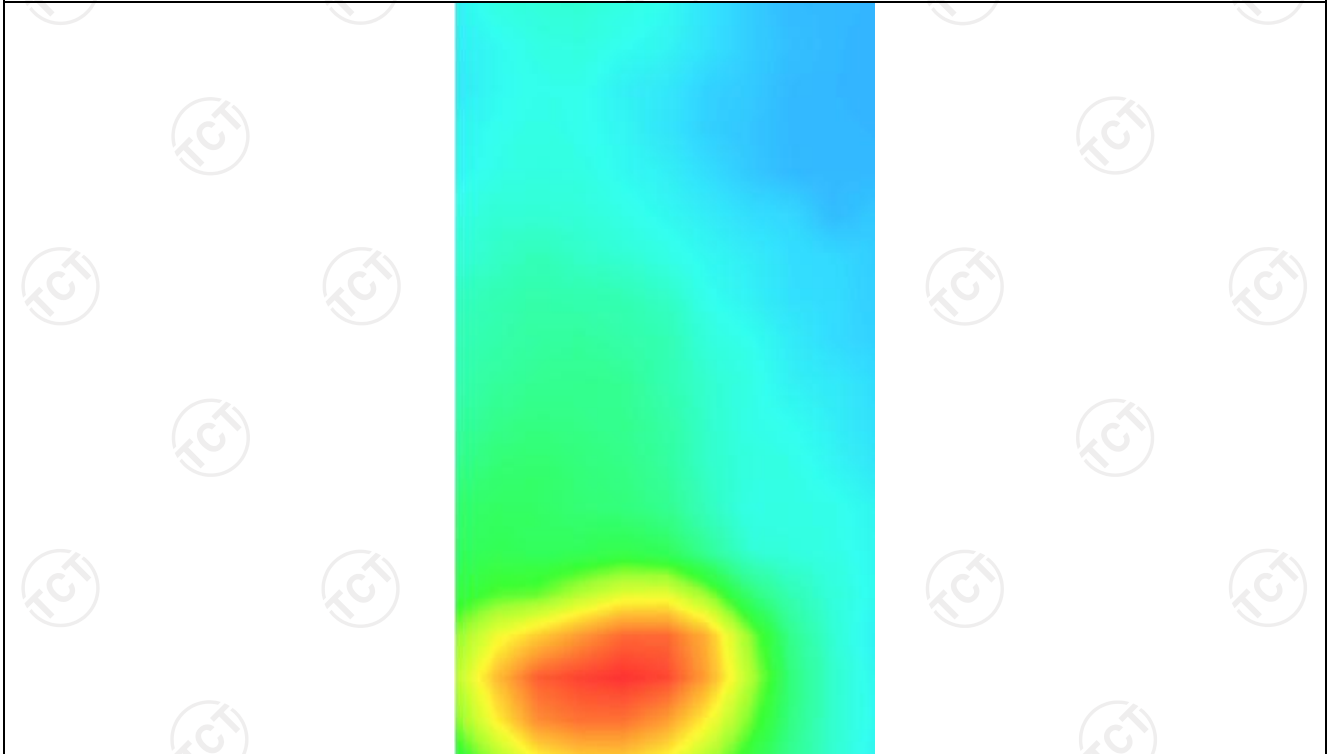
SAR 10g (W/Kg)	0.971257
SAR 1g (W/Kg)	0.565259



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.3998	0.9879	0.6339	0.4117	0.2746



Hot spot position



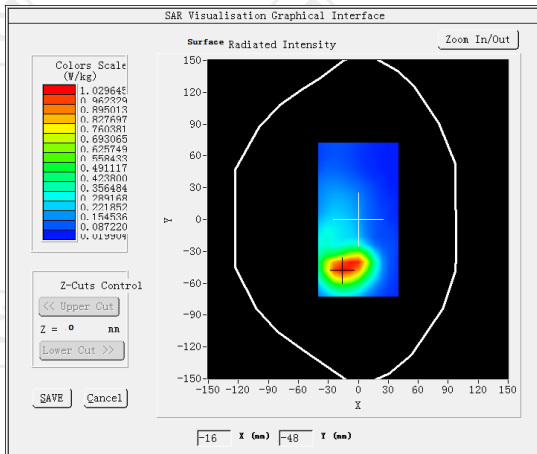
MEASUREMENT 3

Middle Band SAR (Channel 23095):

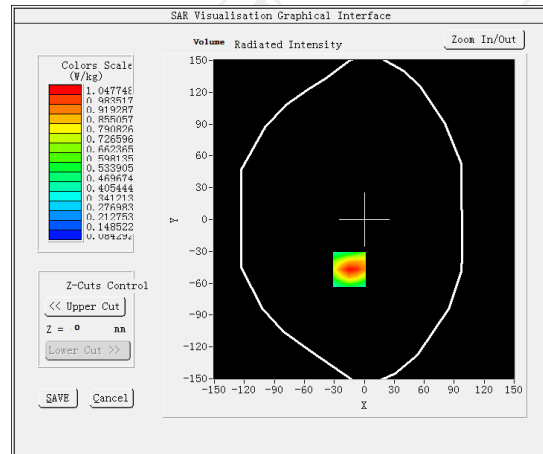
Date: 06/11/2021

Frequency (MHz)	707.500000
Relative permittivity (real part)	40.392517
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	0.881392
Variation (%)	-0.460000
Crest Factor	1.0
Probe Conversion factor	4.52
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 12(1 RB#24)</u>

SURFACE SAR



VOLUME SAR



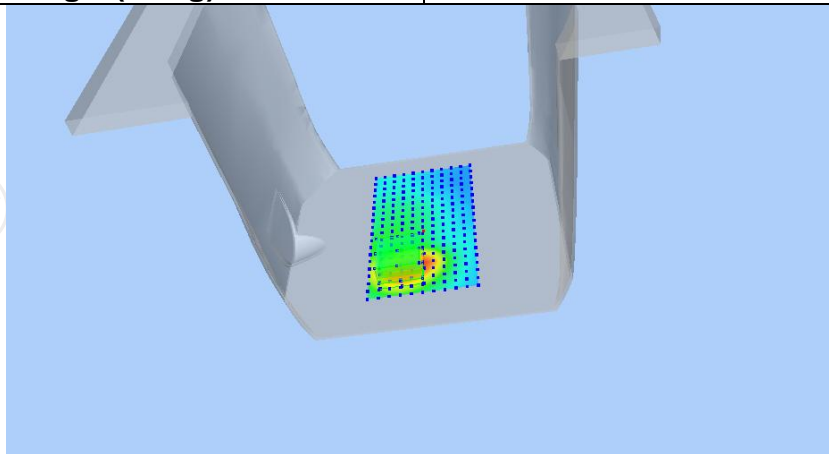
Maximum location: X=-15.00, Y=-47.00 SAR Peak: 1.49 W/kg

SAR 10g (W/Kg)

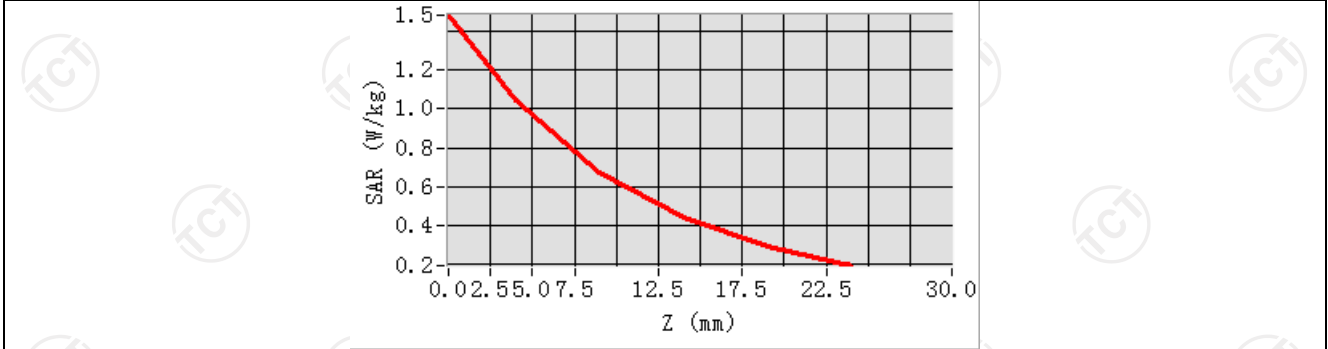
0.984461

SAR 1g (W/Kg)

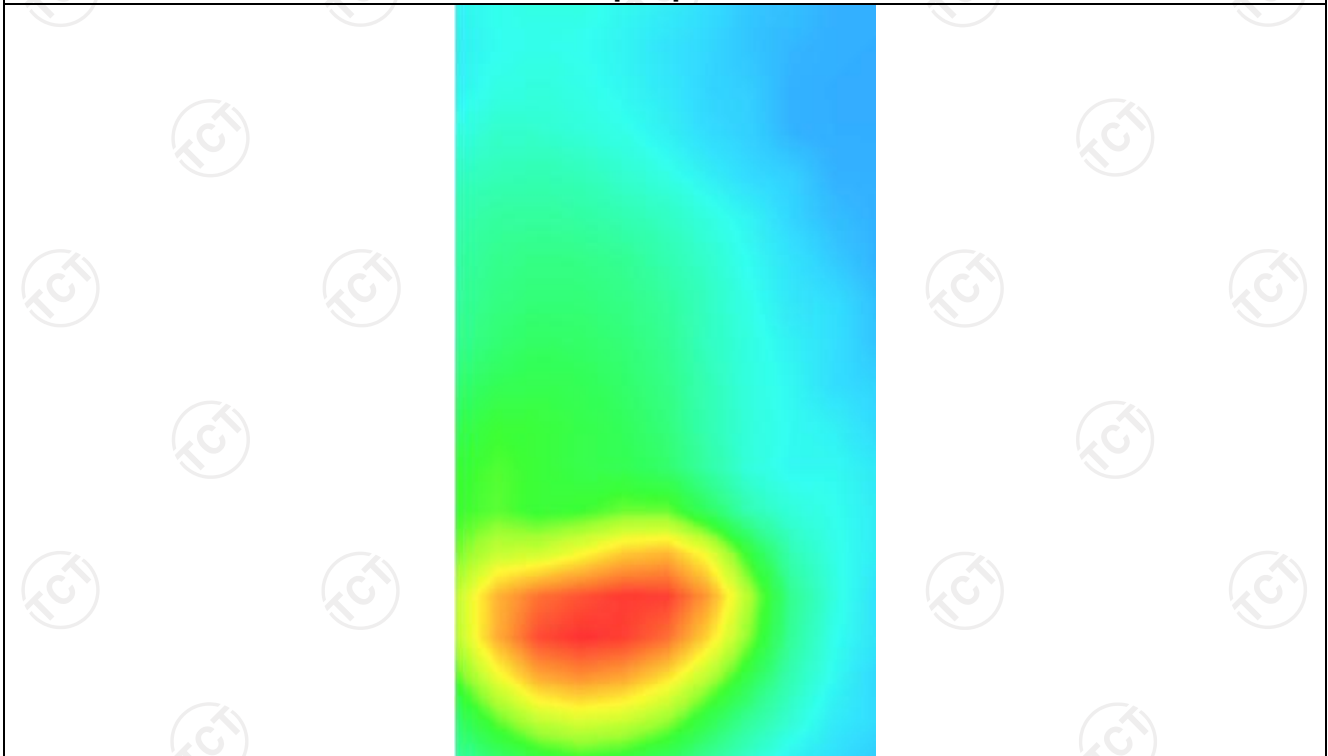
0.595948



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.4868	1.0477	0.6707	0.4341	0.2882



Hot spot position



LTE Band 66_

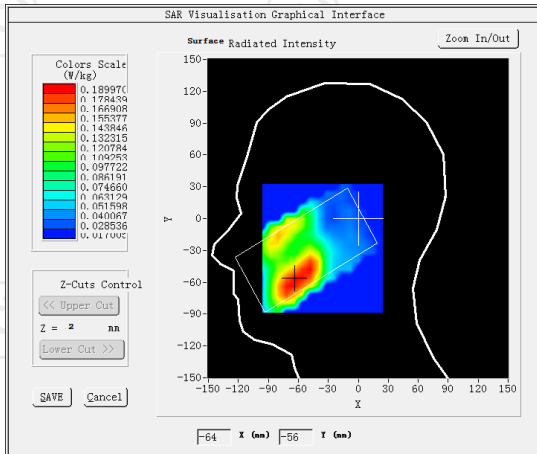
MEASUREMENT 1

Hight Band SAR (Channel 132572):

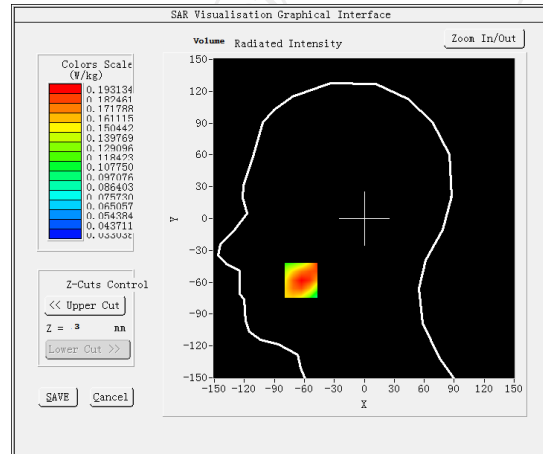
Date: 06/17/2021

Frequency (MHz)	1770.000000
Relative permittivity (real part)	39.111249
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.340792
Variation (%)	1.010000
Crest Factor	1.0
Probe Conversion factor	2.08
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 66(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



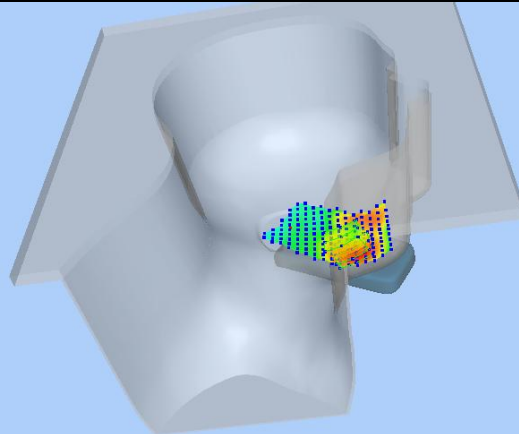
Maximum location: X=-63.00, Y=-58.00 SAR Peak: 0.23 W/kg

SAR 10g (W/Kg)

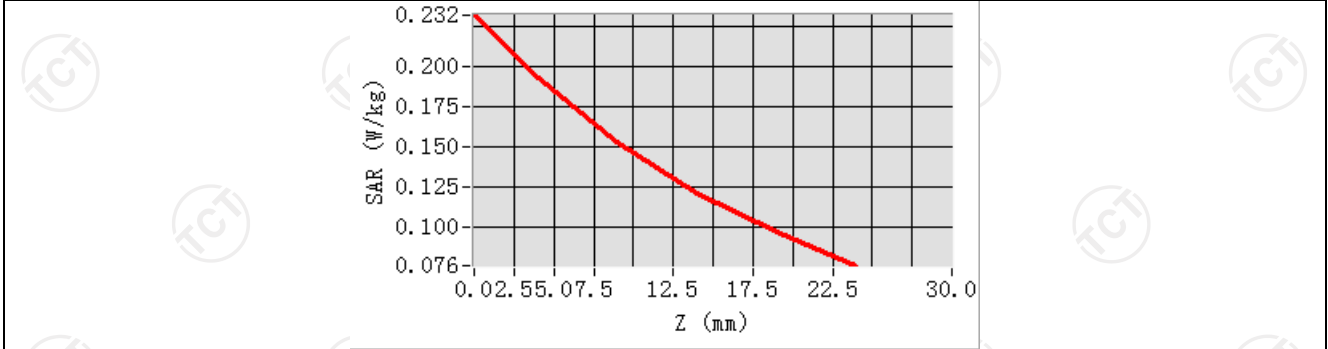
0.141073

SAR 1g (W/Kg)

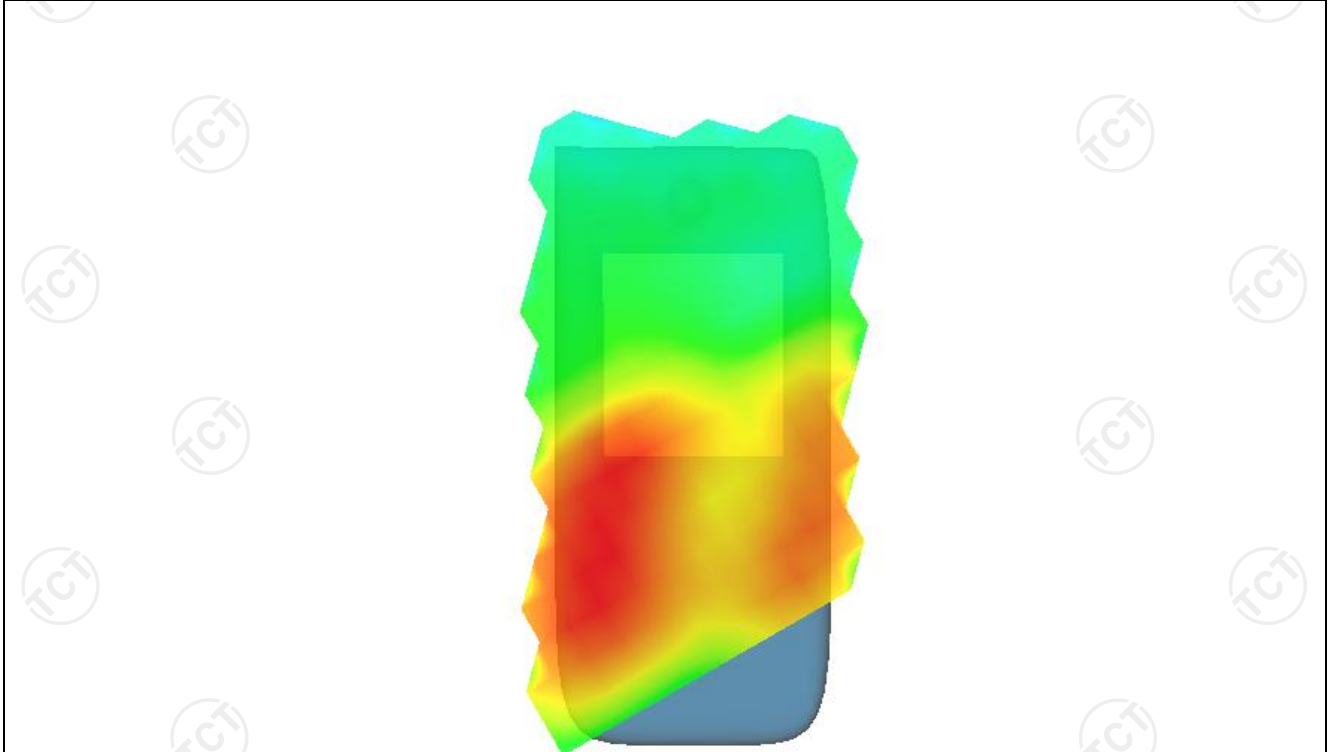
0.185764



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2323	0.1931	0.1532	0.1218	0.0970



Hot spot position



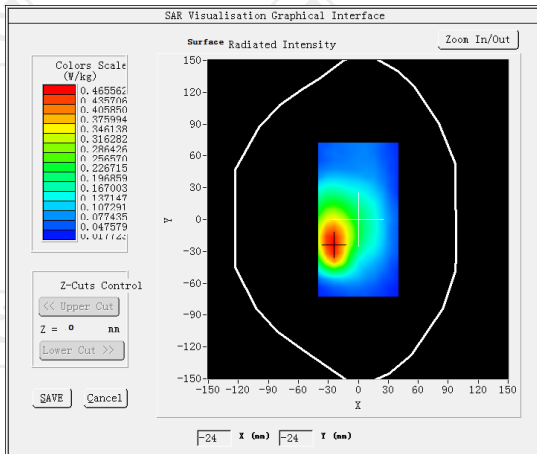
MEASUREMENT 2

Hight Band SAR (Channel 132572):

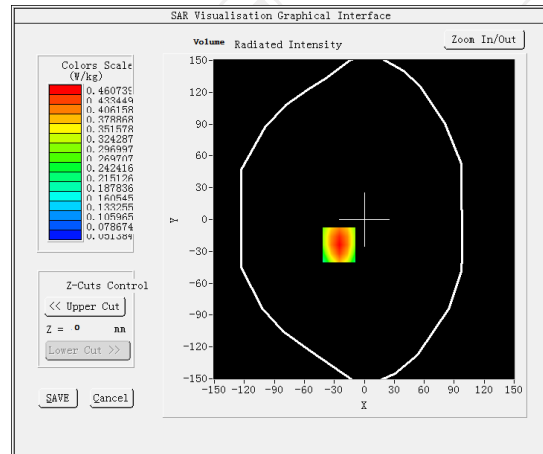
Date: 06/17/2021

Frequency (MHz)	1770.000000
Relative permittivity (real part)	53.341249
Relative permittivity (imaginary part)	15.168850
Conductivity (S/m)	1.492592
Variation (%)	-1.930000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 66(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



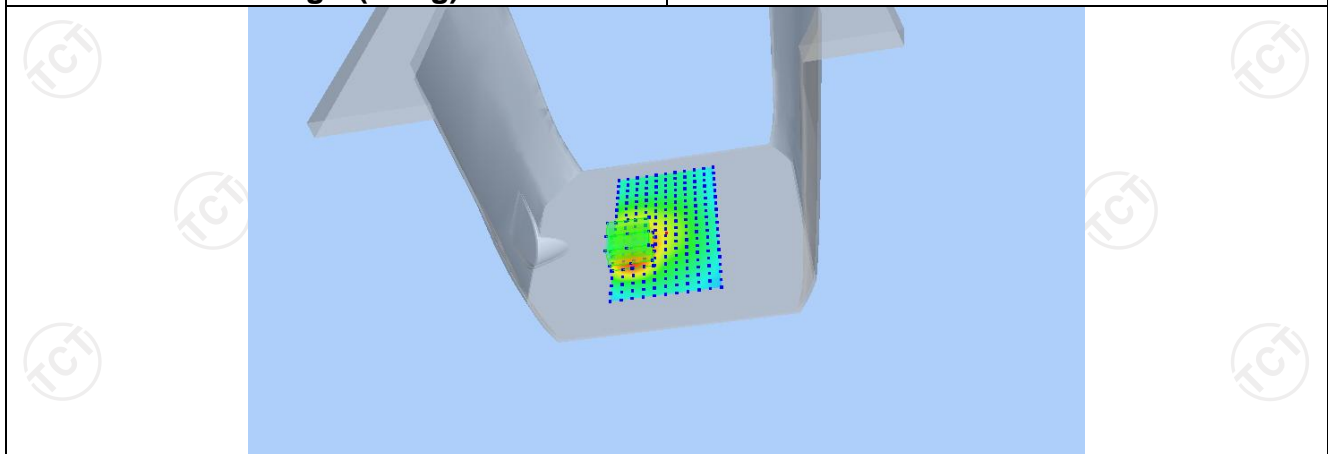
Maximum location: X=-25.00, Y=-24.00 SAR Peak: 0.66 W/kg

SAR 10g (W/Kg)

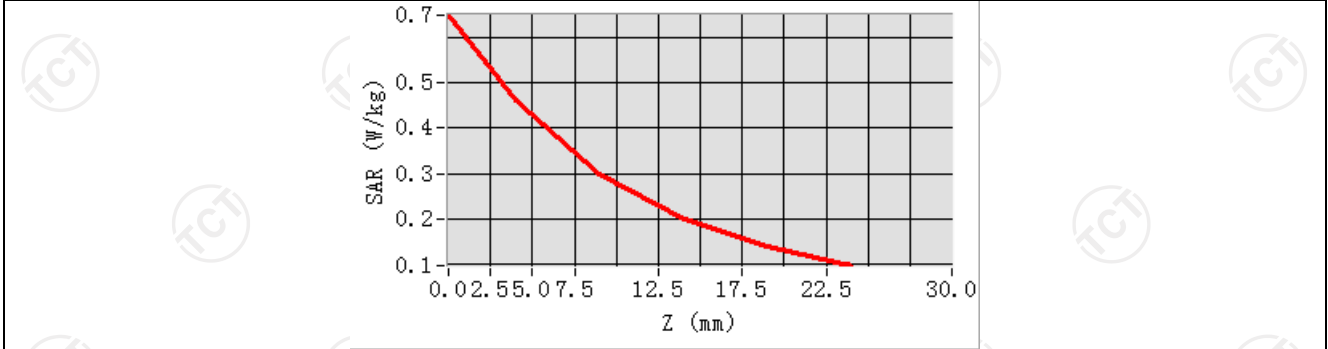
0.285578

SAR 1g (W/Kg)

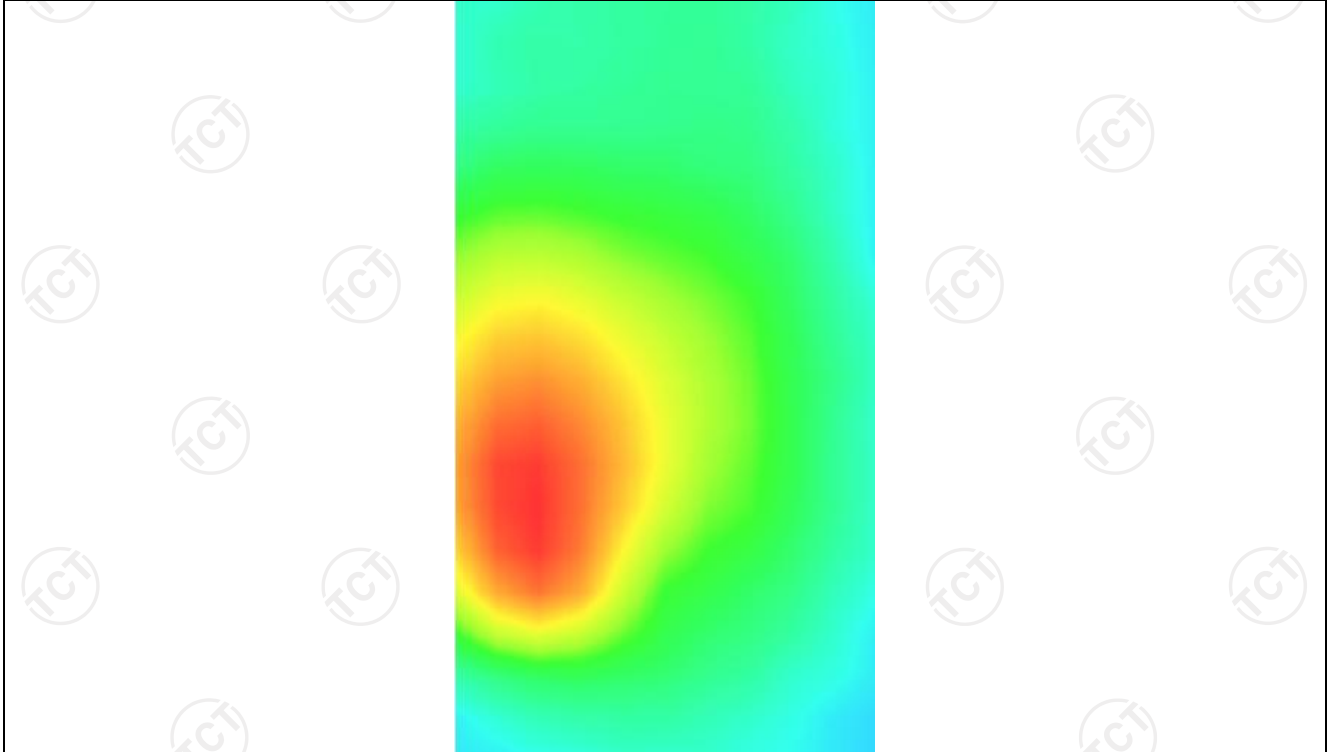
0.441372



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.6508	0.4607	0.2987	0.1983	0.1374



Hot spot position



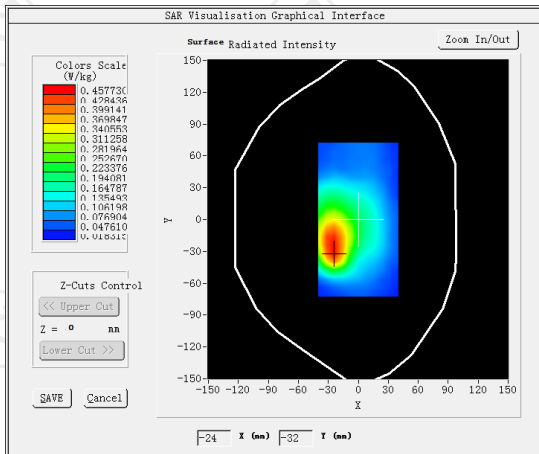
MEASUREMENT 3

Hight Band SAR (Channel 132572):

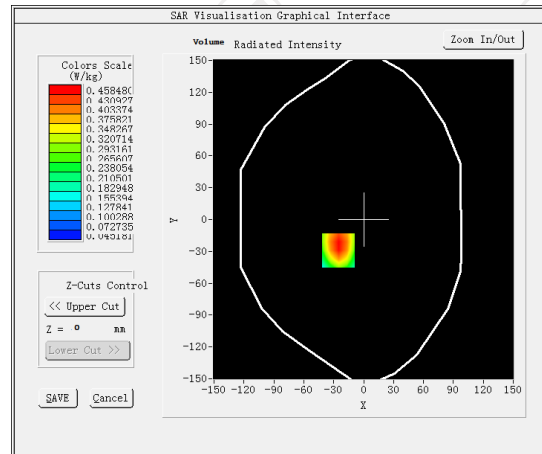
Date: 06/17/2021

Frequency (MHz)	1770.000000
Relative permittivity (real part)	53.341249
Relative permittivity (imaginary part)	15.168850
Conductivity (S/m)	1.492592
Variation (%)	-0.550000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 66(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



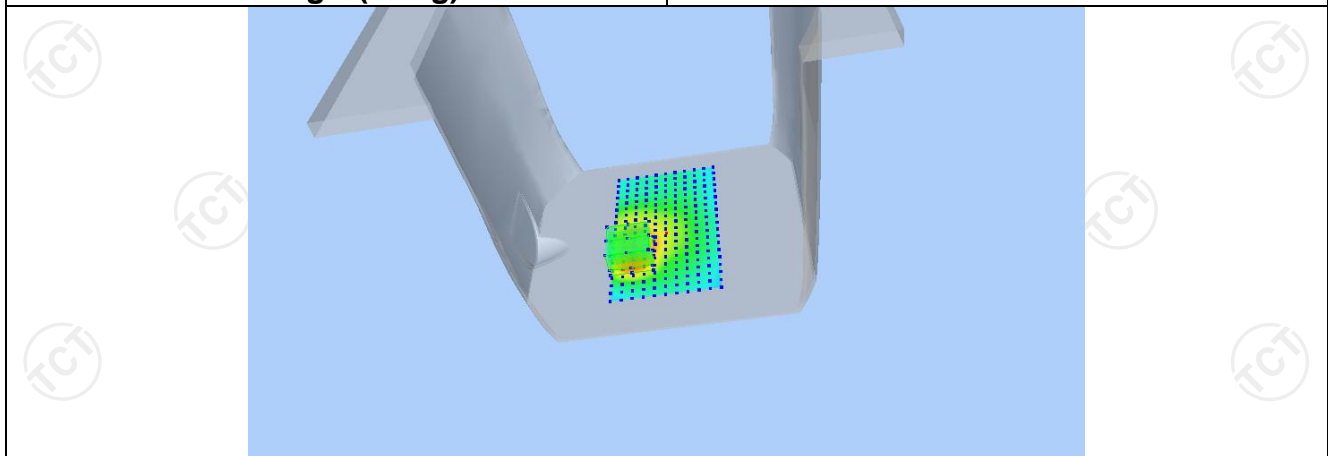
Maximum location: X=-25.00, Y=-29.00 SAR Peak: 0.67 W/kg

SAR 10g (W/Kg)

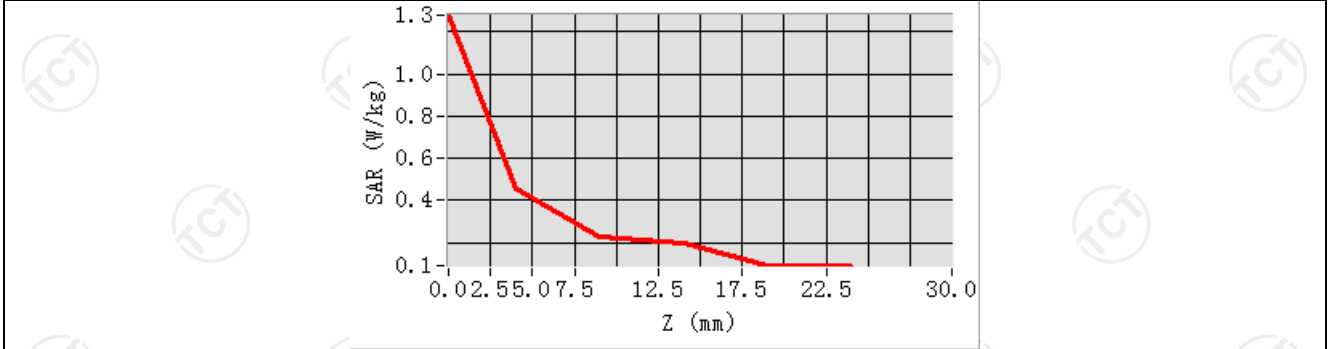
0.275212

SAR 1g (W/Kg)

0.462445



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.2790	0.4585	0.2276	0.1998	0.0922



Hot spot position



LTE Band 71

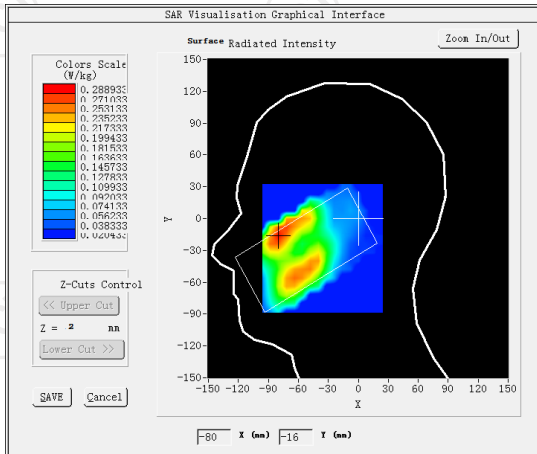
MEASUREMENT 1

Middle Band SAR (Channel 133322):

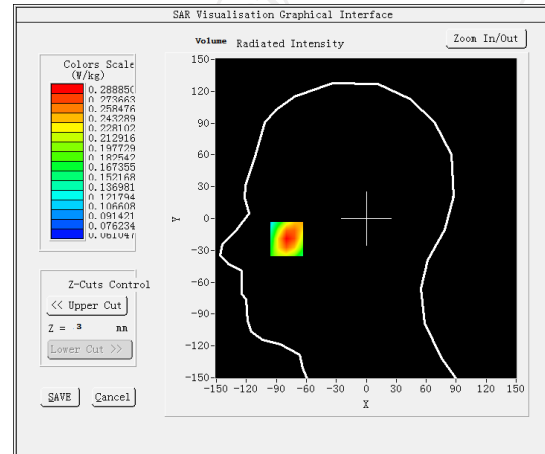
Date: 06/11/2021

Frequency (MHz)	683.000000
Relative permittivity (real part)	41.432976
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.862835
Variation (%)	3.170000
Crest Factor	1.0
Probe Conversion factor	1.80
E-Field Probe:	SSE2 (SN 36/20 EPGO346)
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	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 71(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



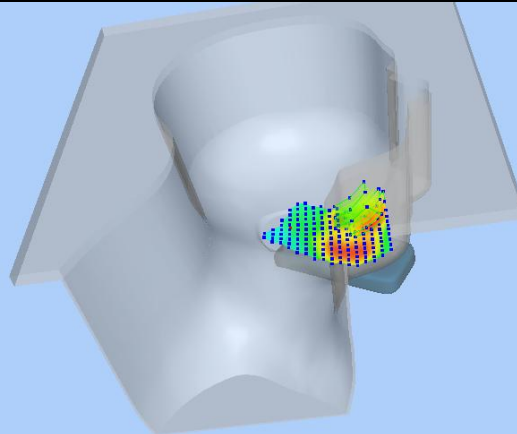
Maximum location: X=-80.00, Y=-16.00 SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)

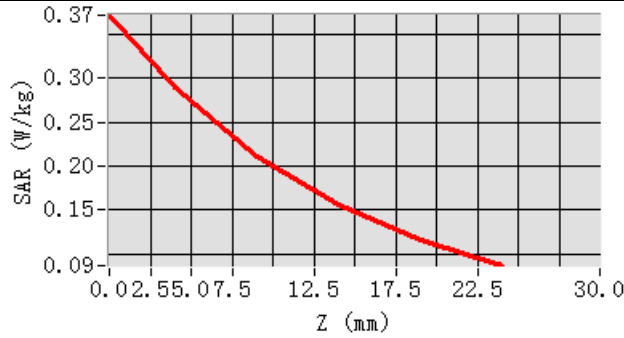
0.191091

SAR 1g (W/Kg)

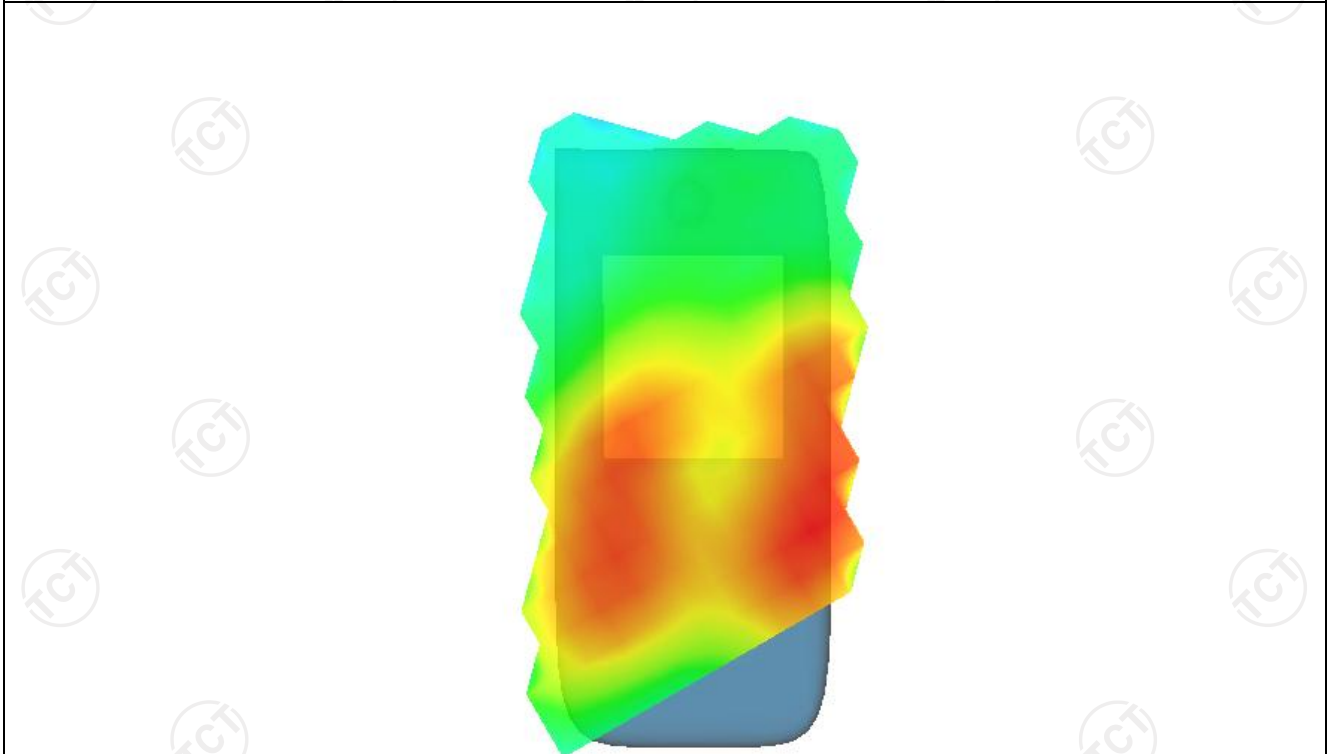
0.276323



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3720	0.2888	0.2107	0.1555	0.1167



Hot spot position



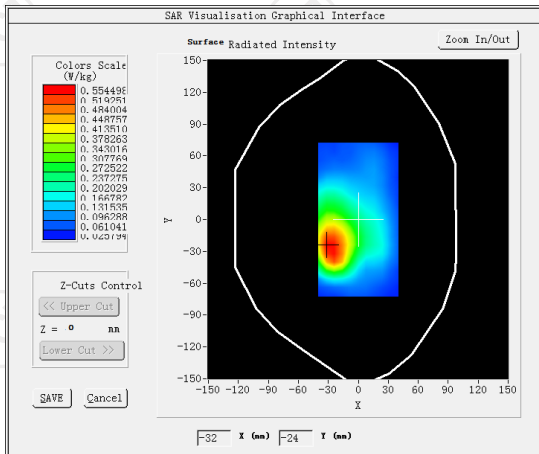
MEASUREMENT 2

Middle Band SAR (Channel 133322):

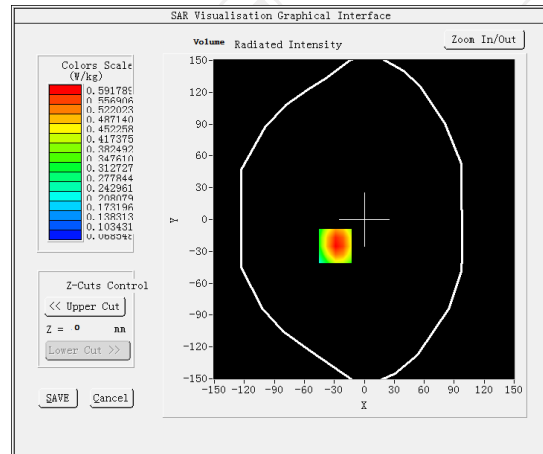
Date: 06/11/2021

Frequency (MHz)	673.000000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	-1.830000
Crest Factor	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(10mm)</u>
Band	<u>LTE band 71 (1 RB#49)</u>

SURFACE SAR



VOLUME SAR



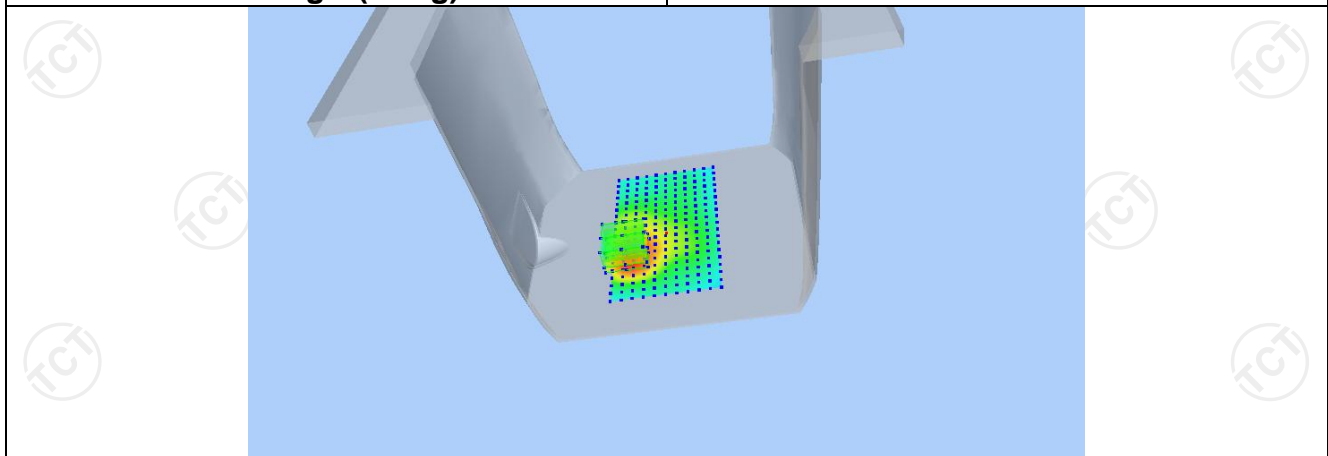
Maximum location: X=-29.00, Y=-25.00 SAR Peak: 0.84 W/kg

SAR 10g (W/Kg)

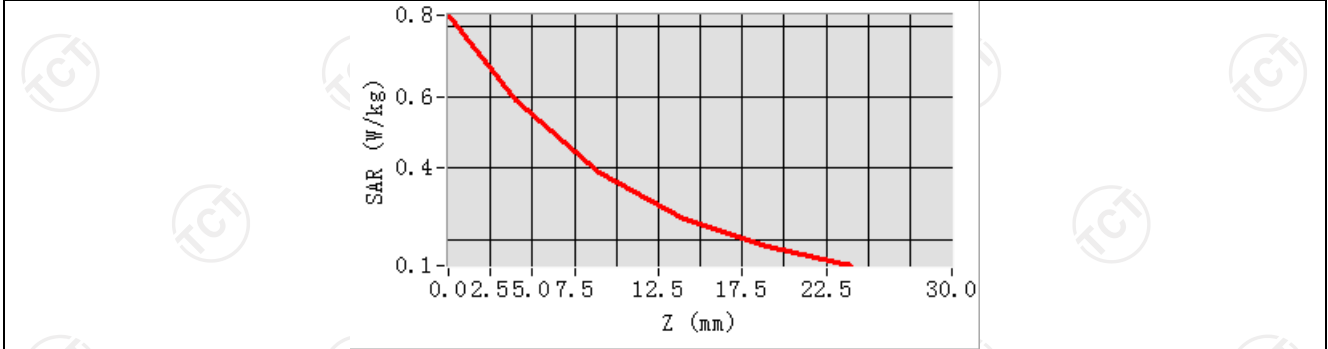
0.366701

SAR 1g (W/Kg)

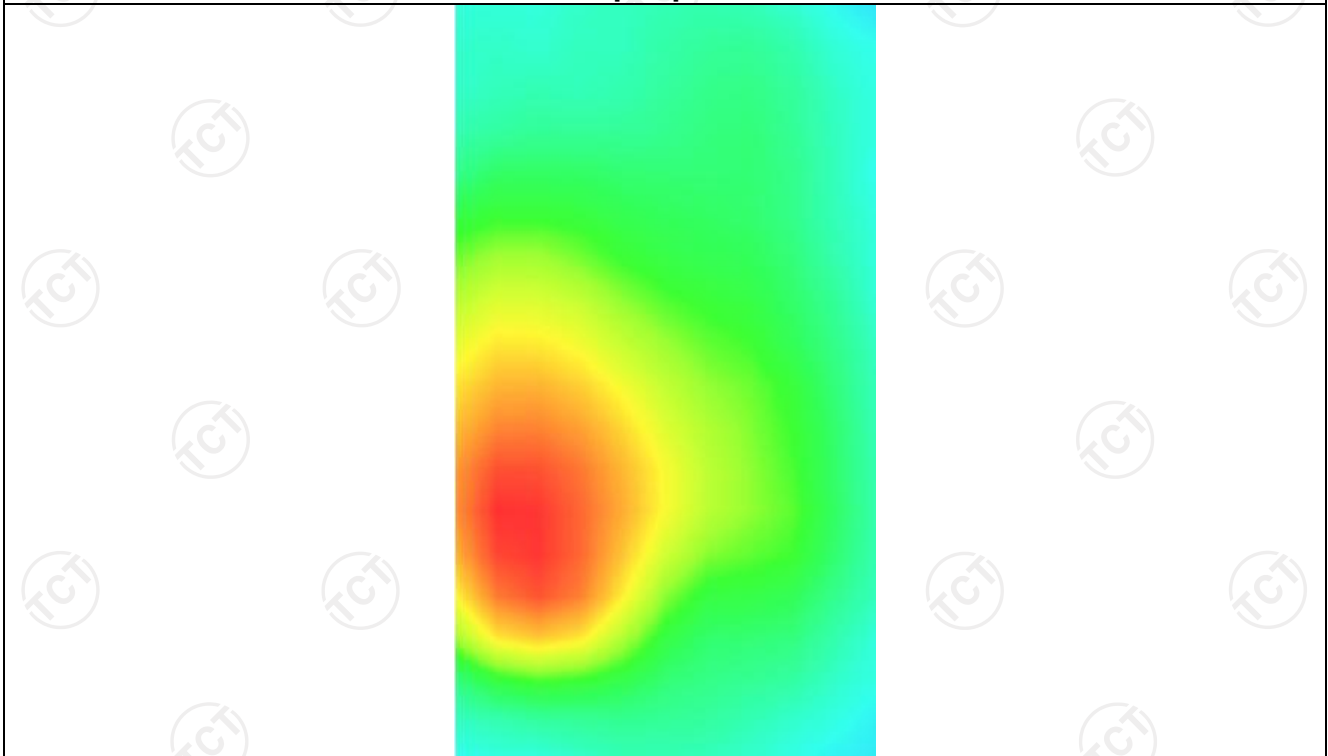
0.567436



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8293	0.5918	0.3879	0.2603	0.1821



Hot spot position



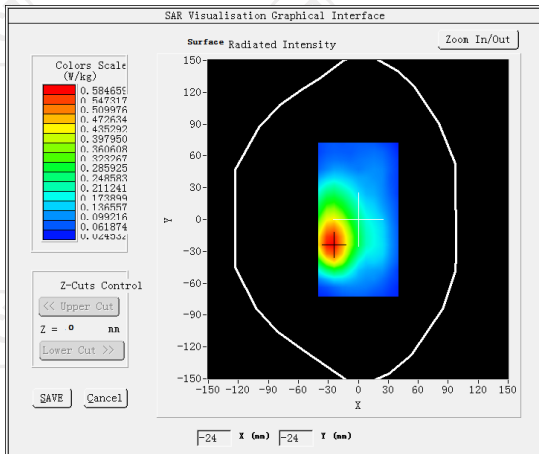
MEASUREMENT 3

Middle Band SAR (Channel 133322):

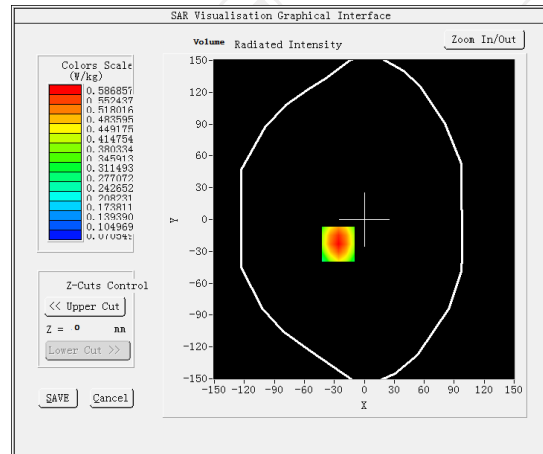
Date: 06/11/2021

Frequency (MHz)	683.000000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	-0.130000
Crest Factor	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Validation plane</u>
Device Position	<u>Body back(hotspot 10mm)</u>
Band	<u>LTE band 71(1 RB#49)</u>

SURFACE SAR



VOLUME SAR



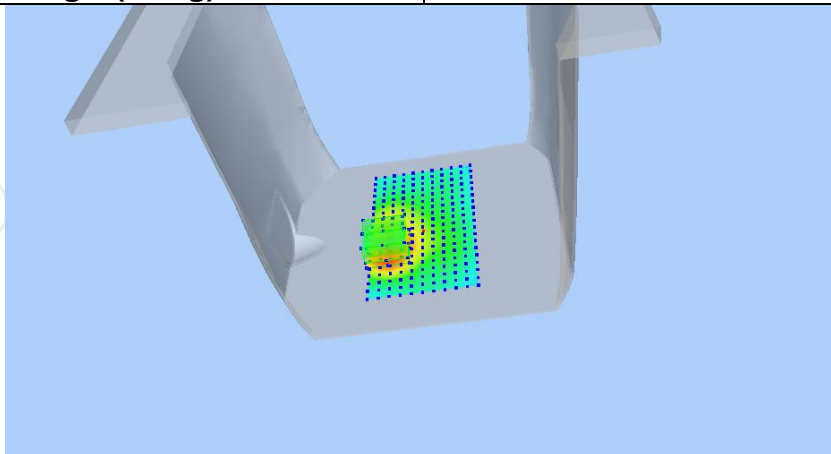
Maximum location: X=-26.00, Y=-23.00 SAR Peak: 0.80 W/kg

SAR 10g (W/Kg)

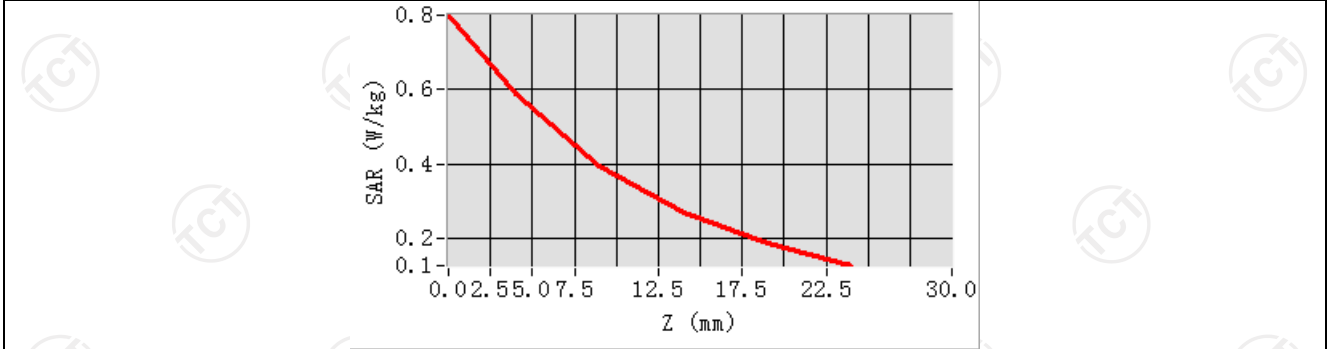
0.365667

SAR 1g (W/Kg)

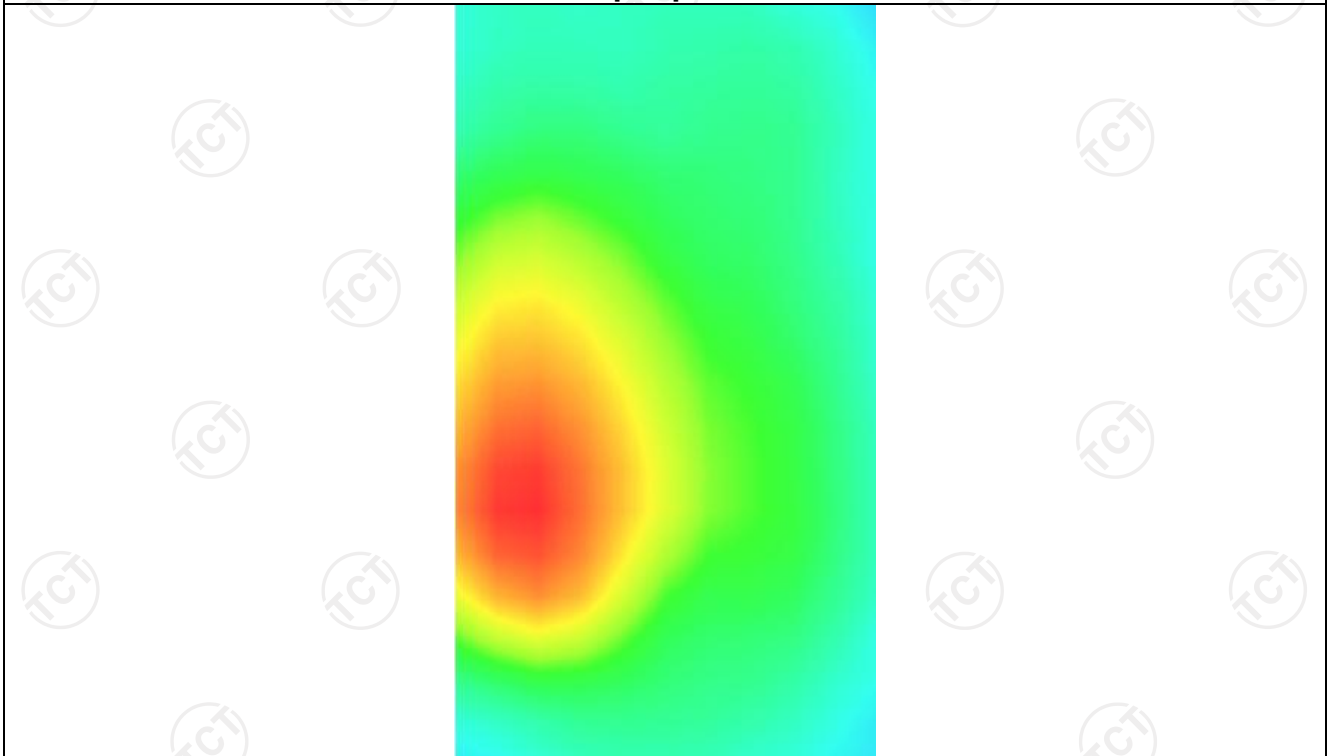
0.559380



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8009	0.5869	0.3955	0.2685	0.1852



Hot spot position



WLAN 2.4G

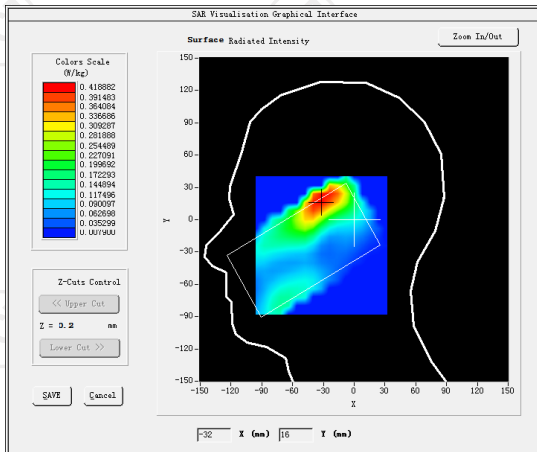
MEASUREMENT 1

Middle Band SAR (Channel 06):

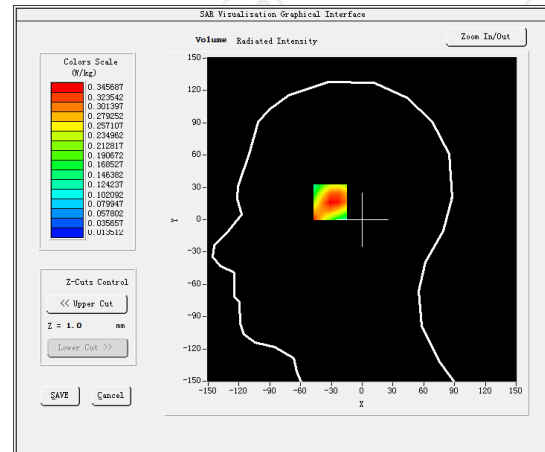
Date: 06/25/2021

Frequency (MHz)	2437.000000
Relative permittivity (real part)	57.801322
Relative permittivity (imaginary part)	14.318172
Conductivity (S/m)	1.843241
Variation (%)	-1.900000
Crest Factor	1.0
Probe Conversion factor	4.58
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>Right head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11b ISM</u>

SURFACE SAR



VOLUME SAR



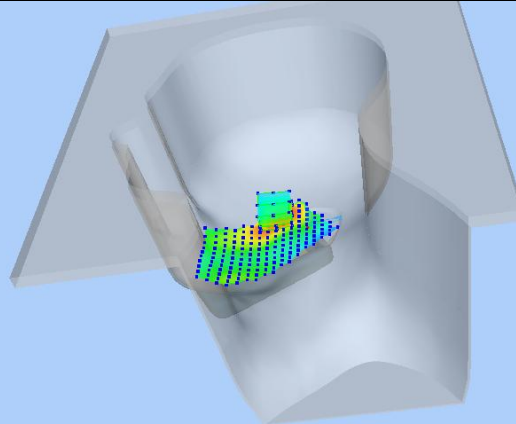
Maximum location: X=-31.00, Y=19.00 SAR Peak: 0.68 W/kg

SAR 10g (W/Kg)

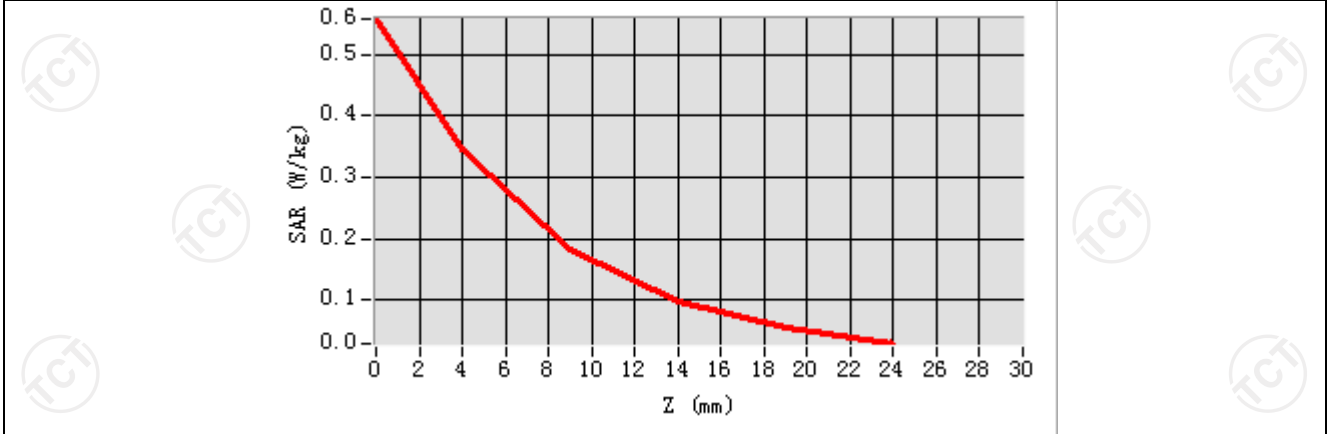
0.177353

SAR 1g (W/Kg)

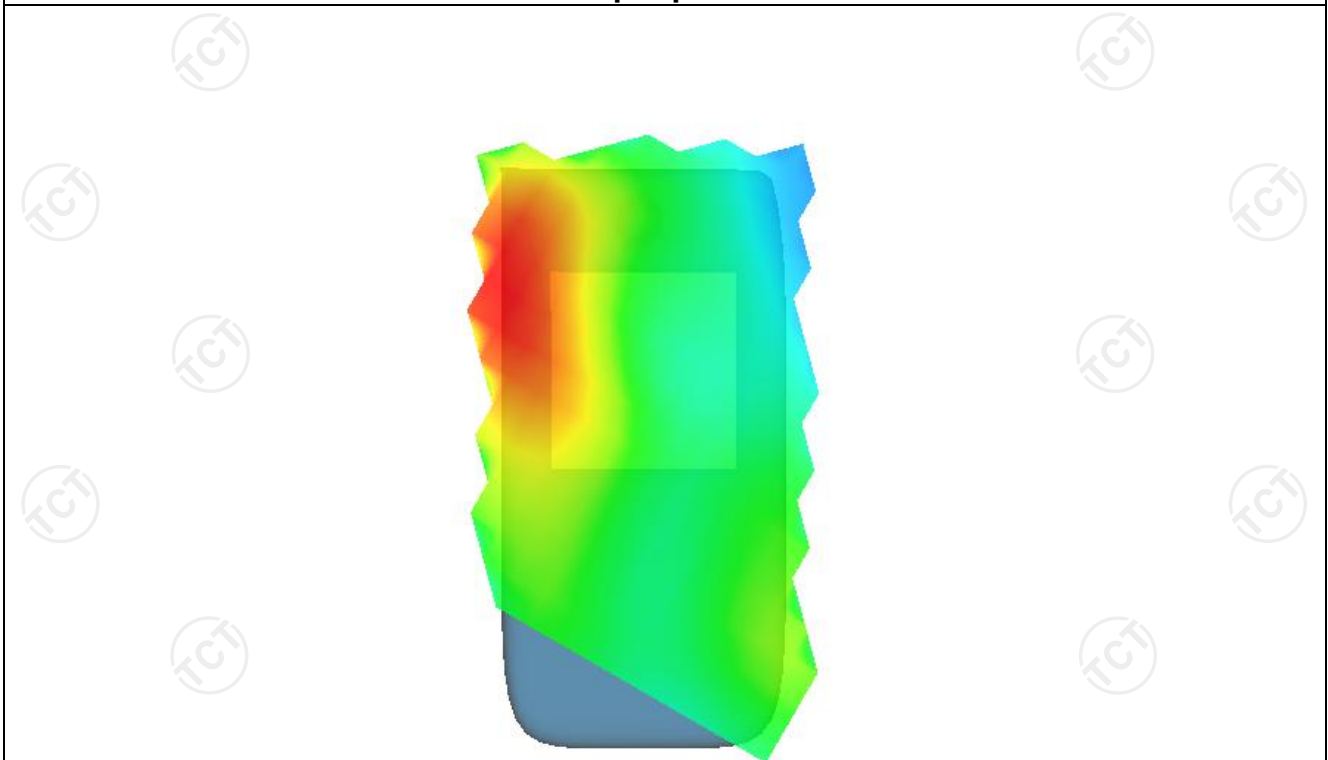
0.219501



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.5576	0.3457	0.1838	0.0977	0.0546



Hot spot position



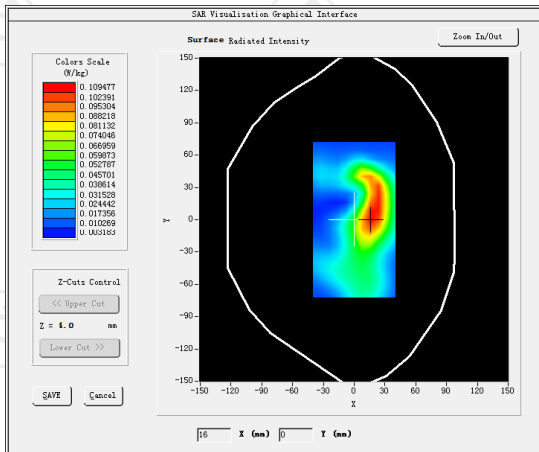
MEASUREMENT 2

Middle Band SAR (Channel 06):

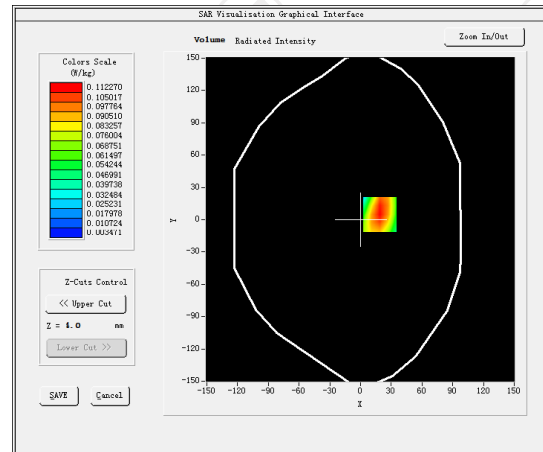
Date: 06/25/2021

Frequency (MHz)	2437.00000
Relative permittivity (real part)	54.592146
Relative permittivity (imaginary part)	14.318285
Conductivity (S/m)	2.033842
Variation (%)	-0.710000
Crest Factor	1.0
Probe Conversion factor	4.70
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>IEEE 802.11b ISM</u>

SURFACE SAR



VOLUME SAR



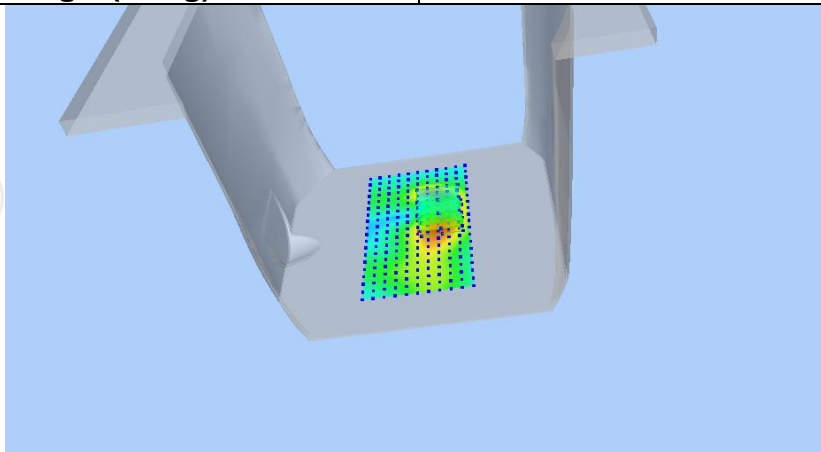
Maximum location: X=19.00, Y=5.00 SAR Peak: 0.39 W/kg

SAR 10g (W/Kg)

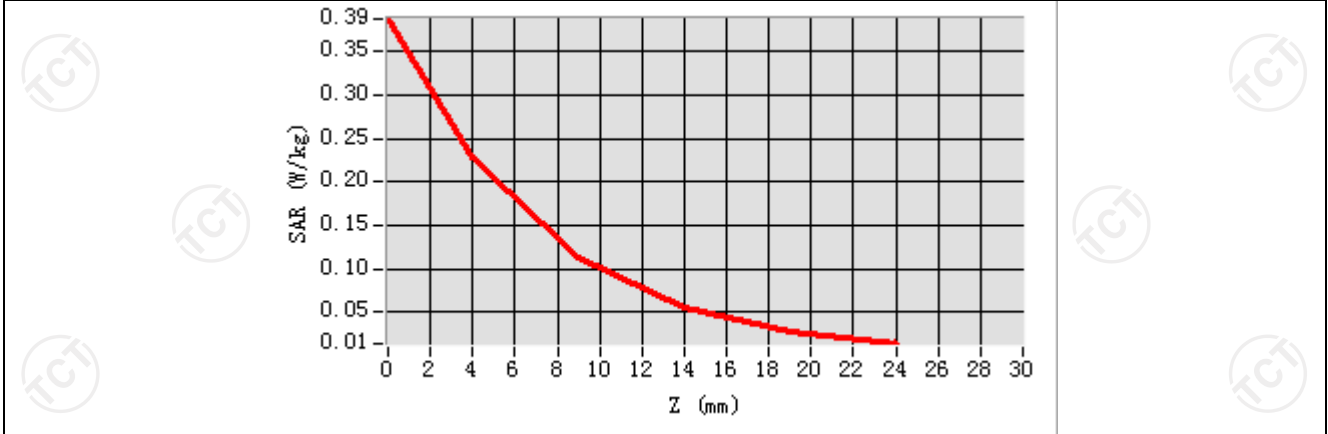
0.068895

SAR 1g (W/Kg)

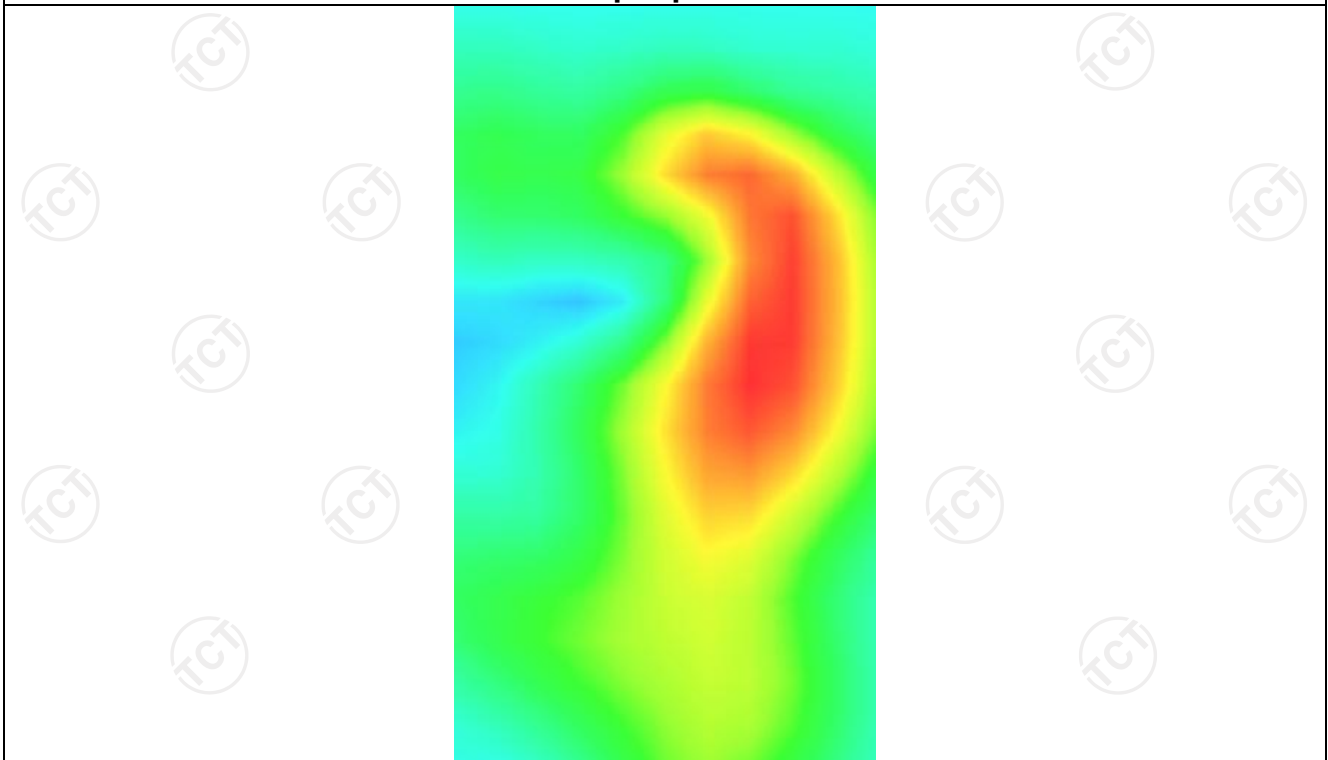
0.229565



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3880	0.2293	0.1129	0.0549	0.0281



Hot spot position



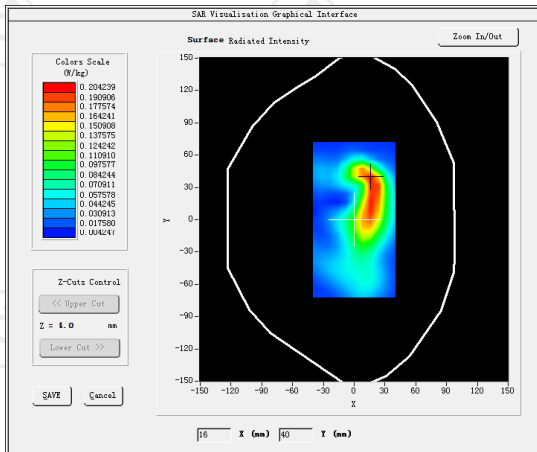
MEASUREMENT 3

Middle Band SAR (Channel 06):

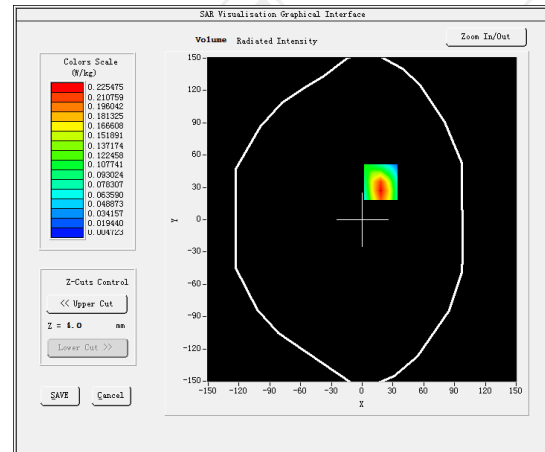
Date: 06/25/2021

Frequency (MHz)	2437.00000
Relative permittivity (real part)	54.592146
Relative permittivity (imaginary part)	14.318285
Conductivity (S/m)	2.033842
Variation (%)	-1.450000
Crest Factor	1.0
Probe Conversion factor	4.70
E-Field Probe:	SSE2 (SN 36/20 EPG0346)
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	<u>IEEE 802.11b ISM(hotspot)</u>

SURFACE SAR



VOLUME SAR



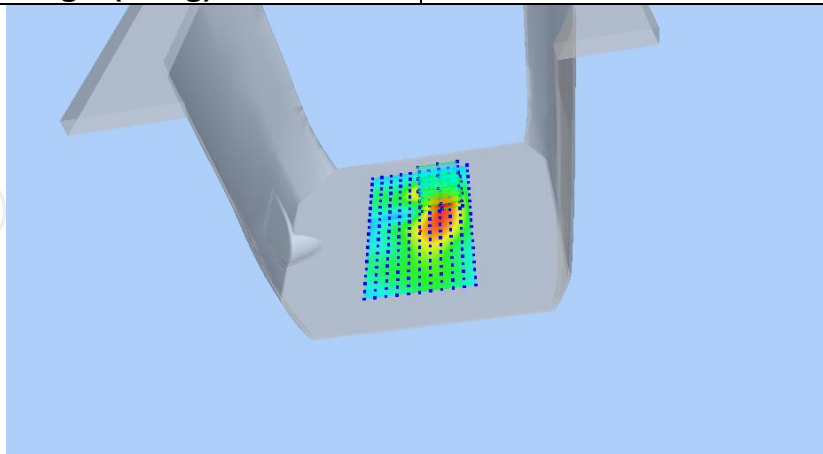
Maximum location: X=18.00, Y=35.00 SAR Peak: 0.39 W/kg

SAR 10g (W/Kg)

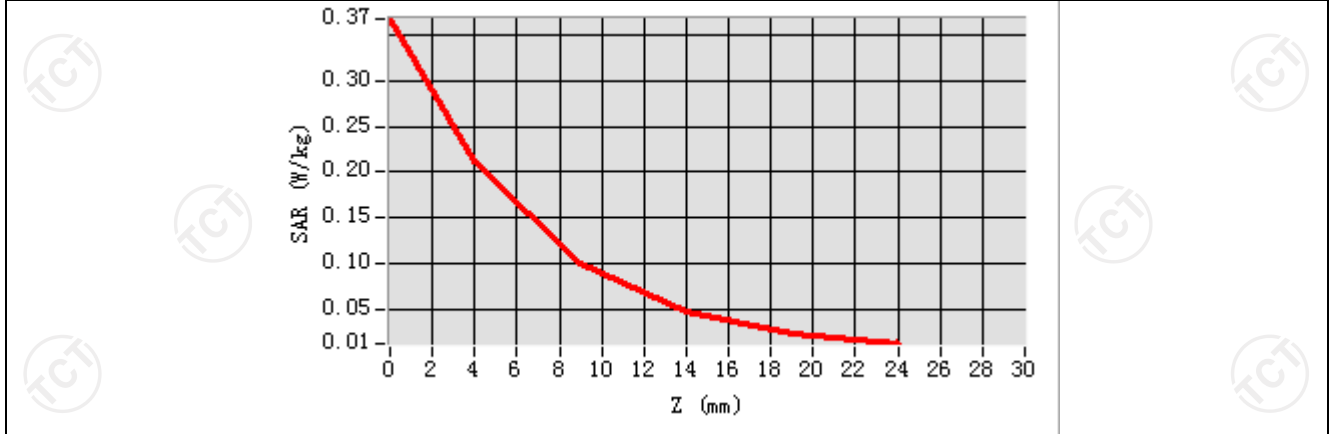
0.098645

SAR 1g (W/Kg)

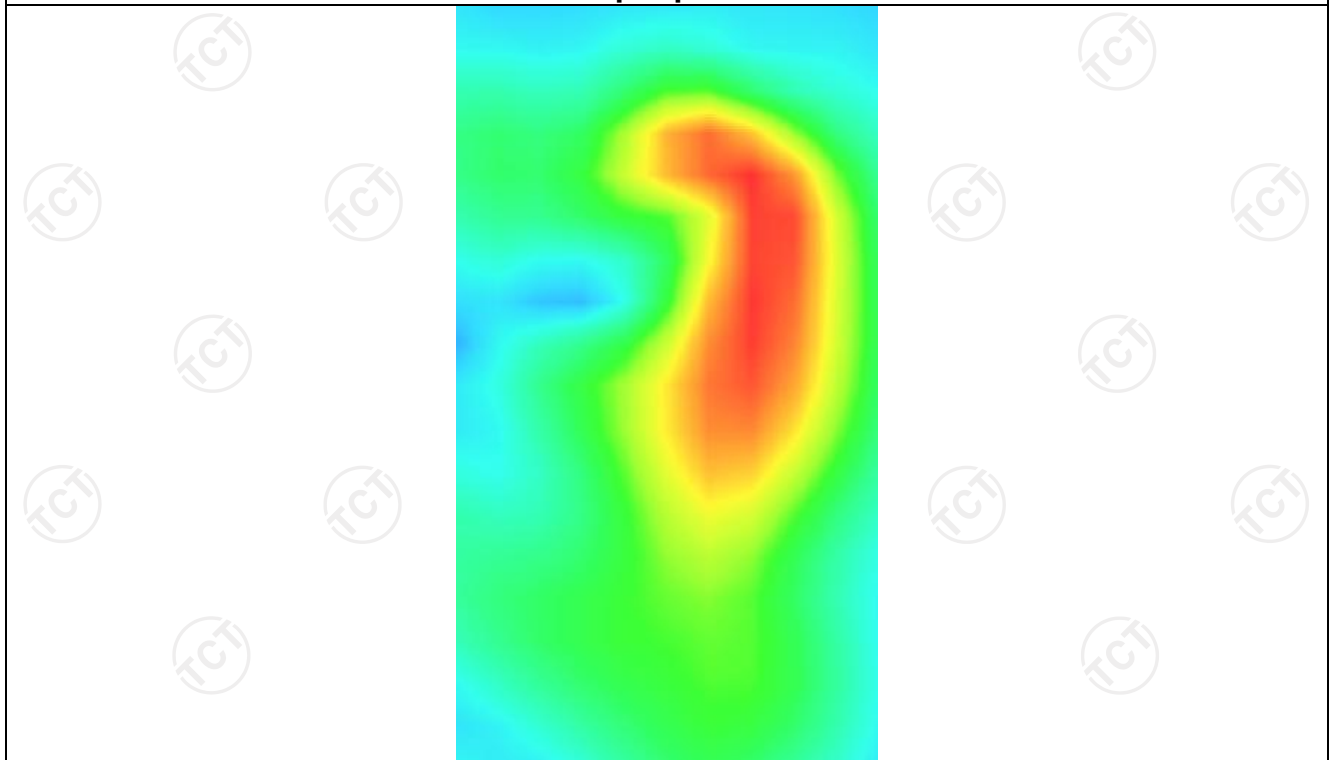
0.244300



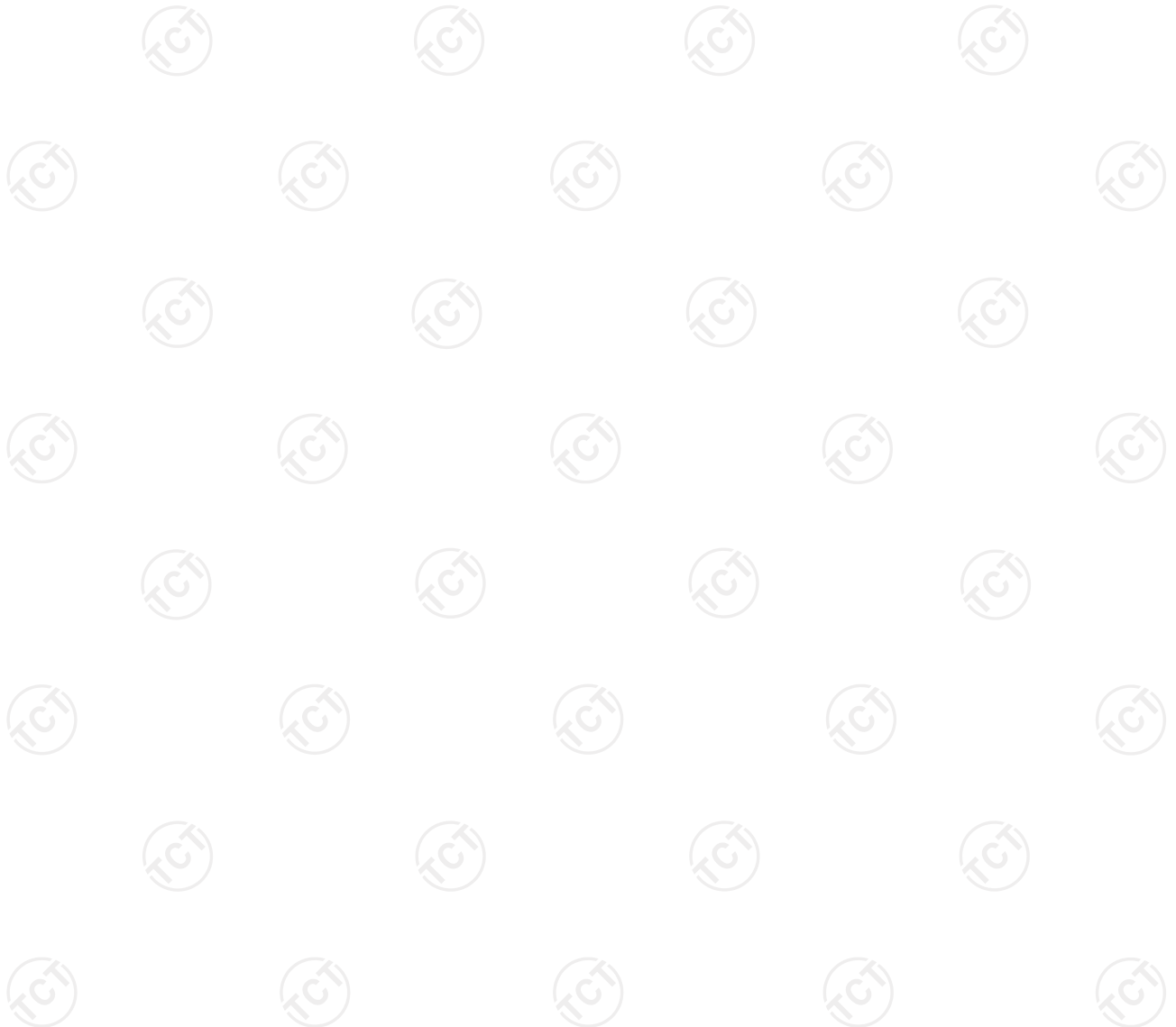
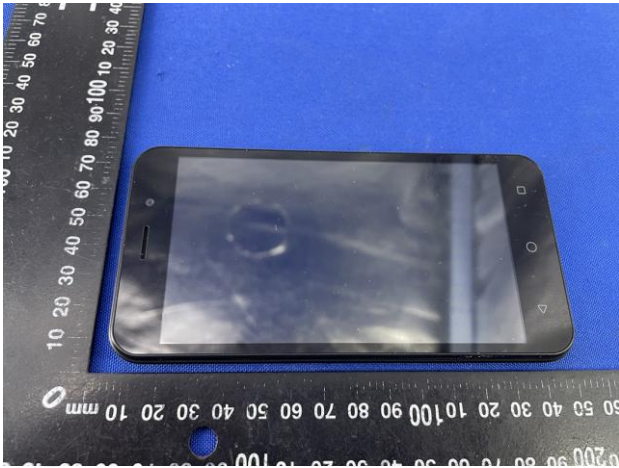
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3683	0.2119	0.1003	0.0468	0.0235



Hot spot position



13. Appendix A: EUT Photos



Liquid depth



The Body Liquid of 835MHz (15.4cm)



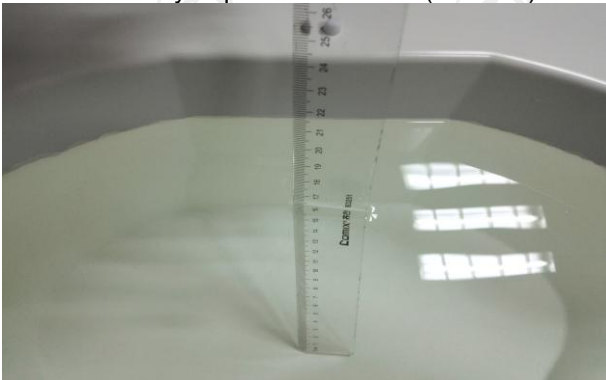
The Body Liquid of 1800MHz (15.2 cm)



The Body Liquid of 1900MHz (16.4 cm)



The Body Liquid of 2450MHz (15.3cm)



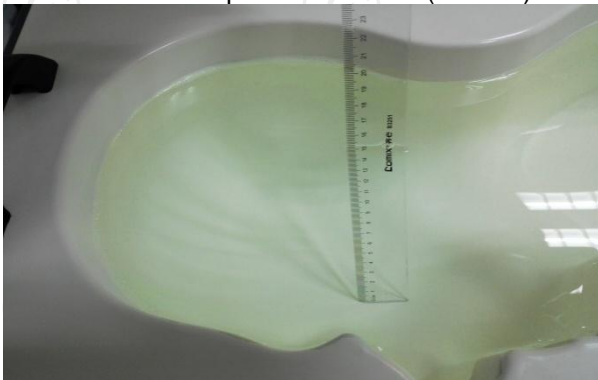
The Body Liquid of 2600MHz (16.5cm)



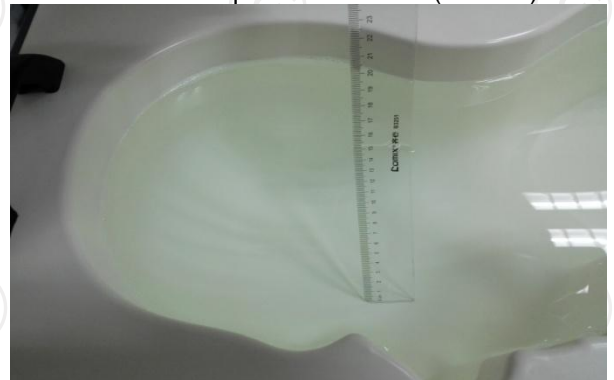
The Head Liquid of 1900MHz (15.5cm)



The Head Liquid of 2450MHz (15.6cm)



The Head Liquid of 835MHz (15.3cm)

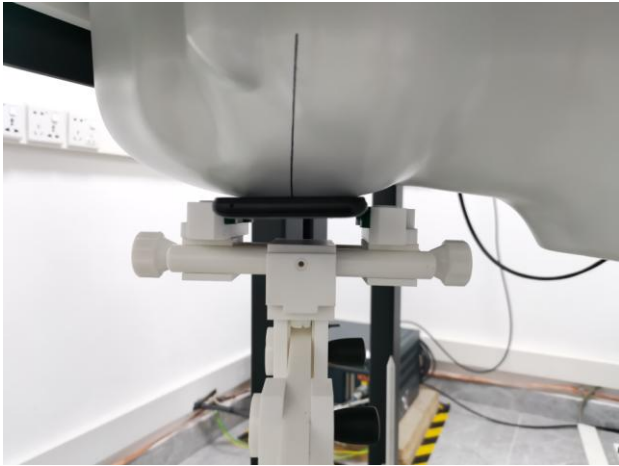


The Head Liquid of 1800MHz (15.2cm)

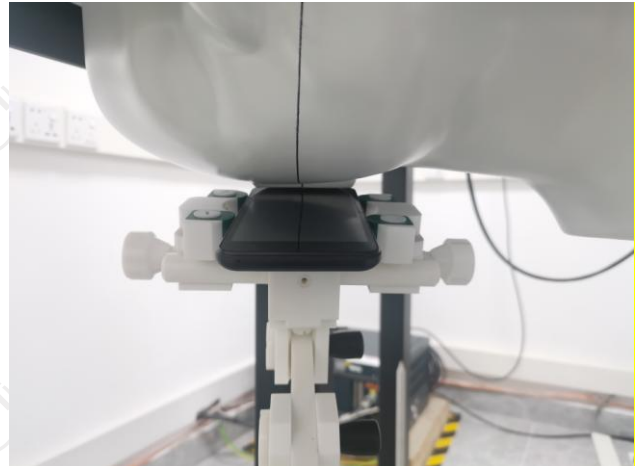


The Head Liquid of 1800MHz (15.2cm)

Appendix B: Test Setup Photos



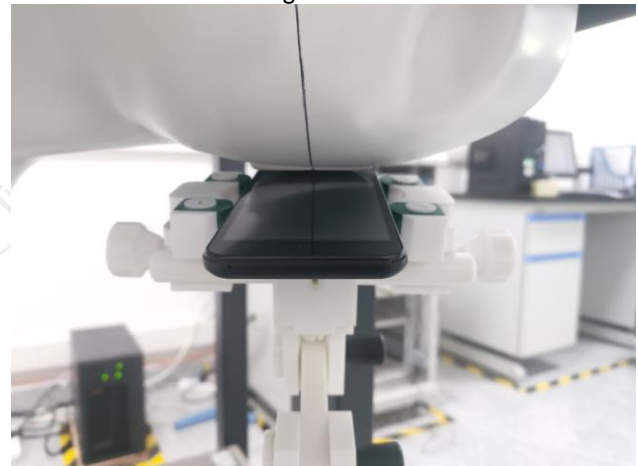
Right Cheek



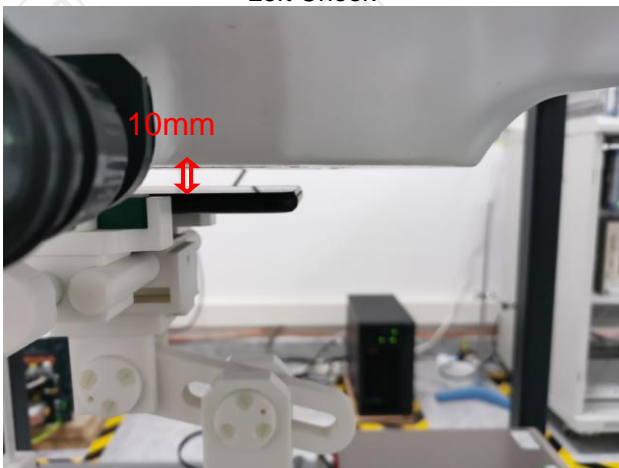
Right Tilted



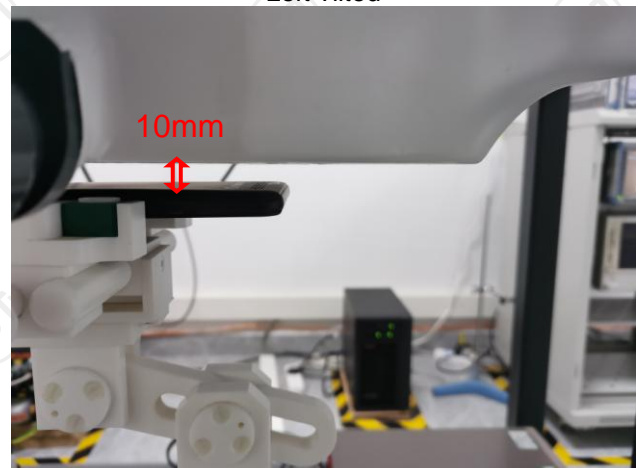
Left Cheek



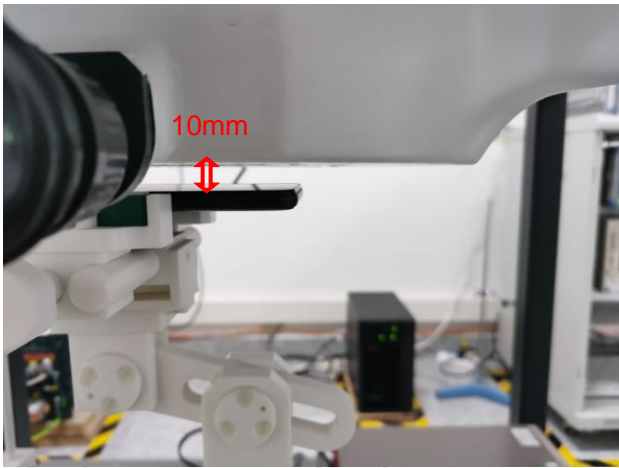
Left Tilted



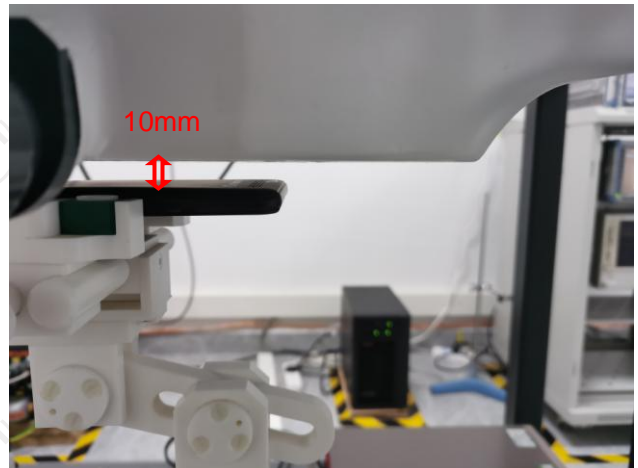
Body worn – Front (10mm)



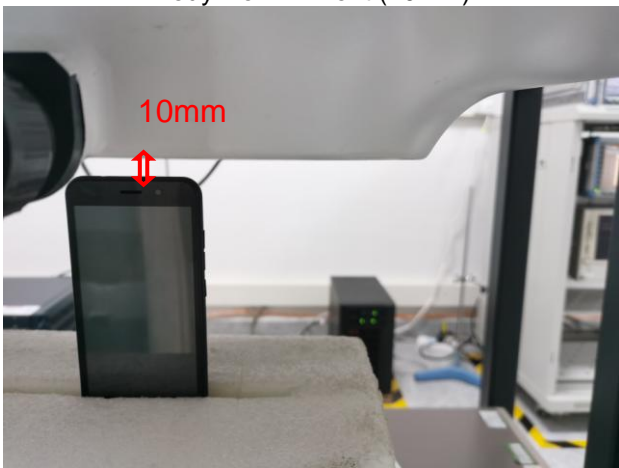
Body worn – Back (10mm)



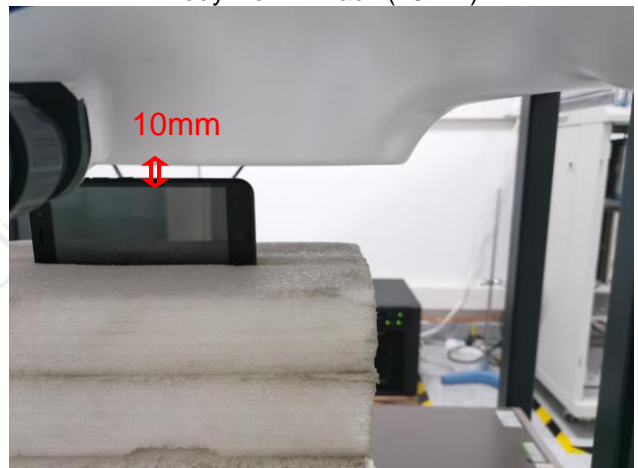
Body worn – Front (10mm)



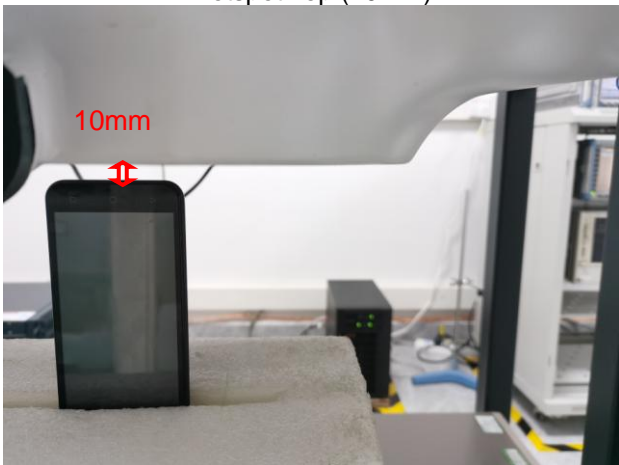
Body worn – Back (10mm)



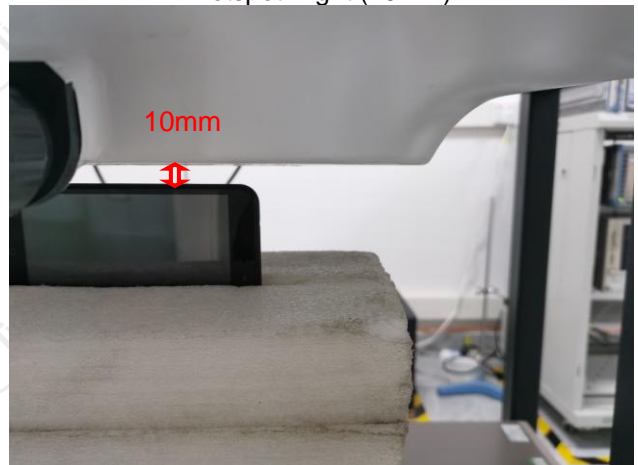
Hotspot Top (10mm)



Hotspot Right (10mm)



Hotspot Bottom (0mm)



Hotspot Left (10mm)

Appendix C: Probe Calibration Certificate

COMOSAR E-FIELD Probe



COMOSAR E-Field Probe Calibration Report

Ref : ACR.297.1.20.MVGB.A

SHENZHEN TONGCE TESTING LAB.
TCT TESTING INDUSTRIAL PARK, FUQIAO 5TH
INDUSTRIAL ZONE, FUHAI STREET,
BAOAN DISTRICT, SHENZHEN, GUANGDONG ,
518103, PEOPLES REPUBLIC OF CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 36/20 EPG0346

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

Calibration date: 10/23/2020



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.297.1.20.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Technical Manager	10/23/2020	<i>JLS</i>
Checked by :	Jérôme LUC	Technical Manager	10/23/2020	<i>JLS</i>
Approved by :	Yann Toutain	Laboratory Director	10/26/2020	<i>Yann Toutain</i>

2020.10.2
6 09:25:59
+01'00'

	Customer Name
Distribution :	SHENHEN TONGCE TESTING LAB.

Issue	Name	Date	Modifications
A	Jérôme LUC	10/23/2020	Initial release



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1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 36/20 EPGO346
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.217 MΩ Dipole 2: R2=0.245 MΩ Dipole 3: R3=0.219 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:

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

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 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	30-80 %

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)
0.81	0.71	0.80

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
115	112	112

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

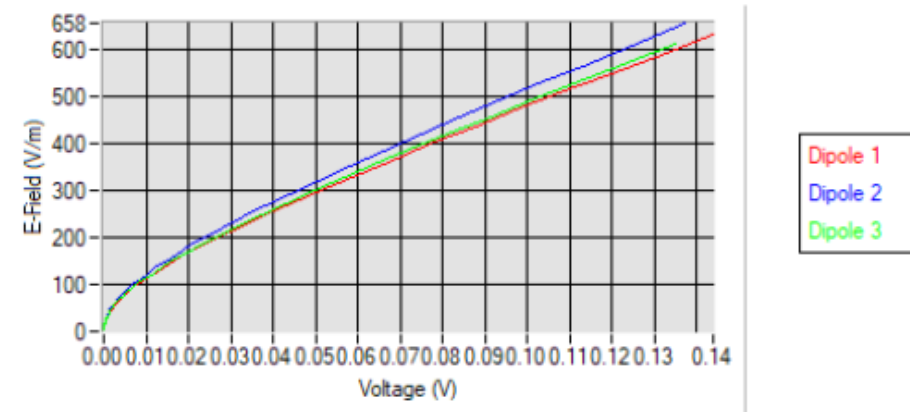
$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

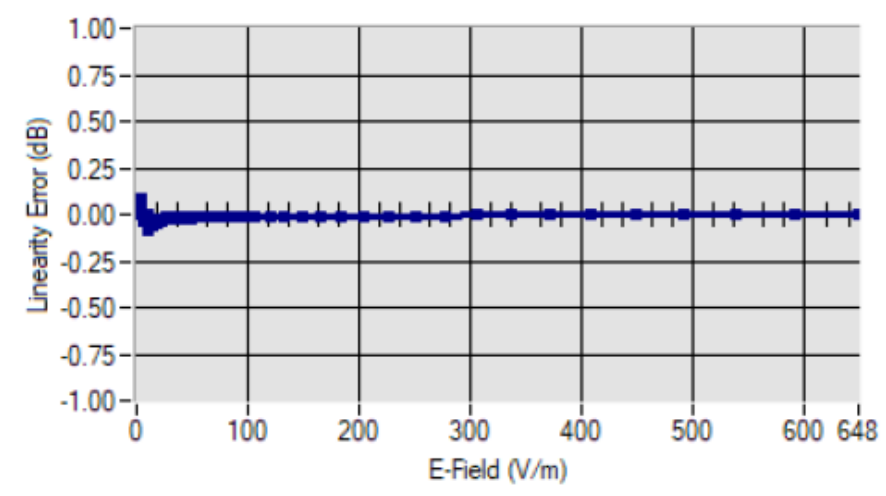
Ref: ACR.297.1.20.MVGB.A

Calibration curves



5.2 LINEARITY

Linearity



Linearity: +/- 1.97% (+/- 0.09dB)