





MEASUREMENT 41

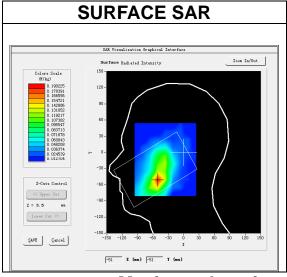
Date of measurement: 6/12/2024

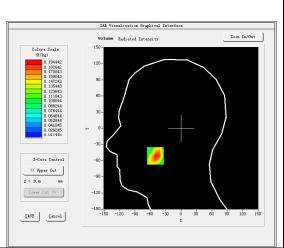
A. Experimental conditions.

	<u>-</u>
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	<u>Left head</u>
Device Position	<u>Cheek</u>
<u>Band</u>	FDDBand66
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	(Crest factor: 1.0)
ConvF	<u>2.51</u>

B. SAR Measurement Results

1745.000000
39.365982
13.682247
1.326418
3.240000





VOLUME SAR

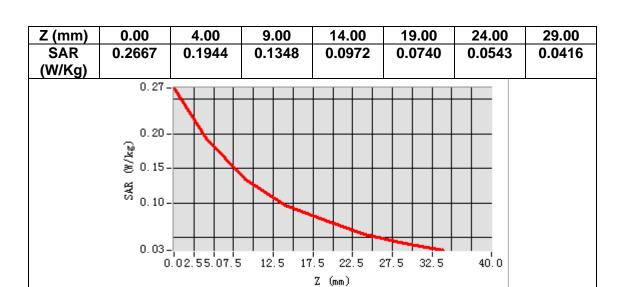
Maximum location: X=-50.00, Y=-51.00

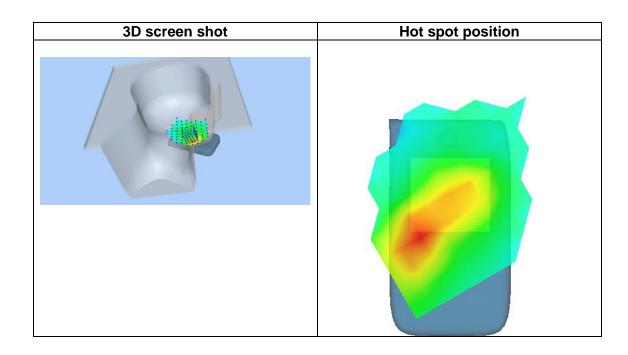
SAR Peak: 0.28 W/kg

SAR 10g (W/Kg)	0.116900
SAR 1g (W/Kg)	0.189360













MEASUREMENT 42

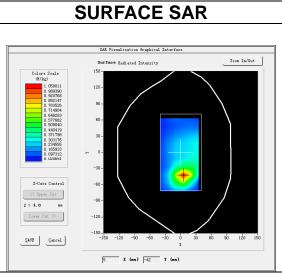
Date of measurement: 6/12/2024

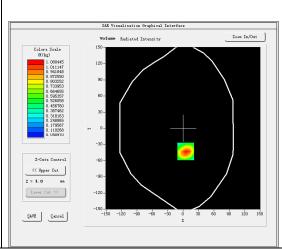
A. Experimental conditions.

<u> </u>	21
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	FDDBand66
<u>Channels</u>	<u>High</u>
Signal	(Crest factor: 1.0)
ConvF	2.51

B. SAR Measurement Results

Frequency (MHz)	1770.000000
Relative permittivity (real part)	39.204384
Relative permittivity	13.654547
(imaginary part) Conductivity (S/m)	1.342697
Variation (%)	-0.390000





VOLUME SAR

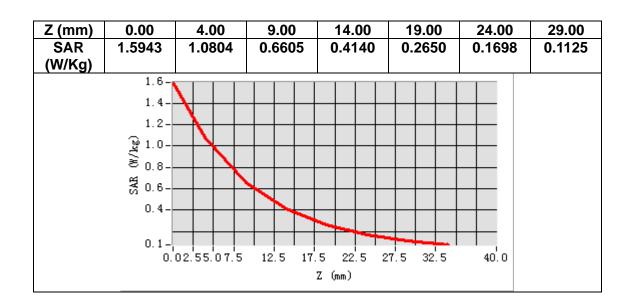
Maximum location: X=5.00, Y=-43.00 SAR Peak: 1.61 W/kg

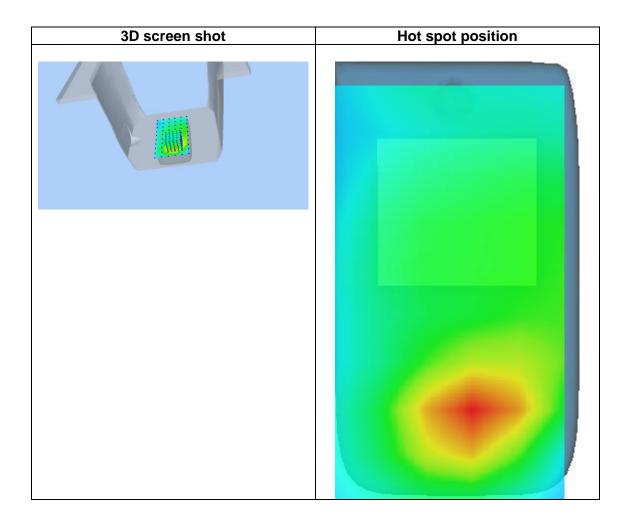
SAR 10g (W/Kg)	0.573491
SAR 1g (W/Kg)	1.022577















MEASUREMENT 43

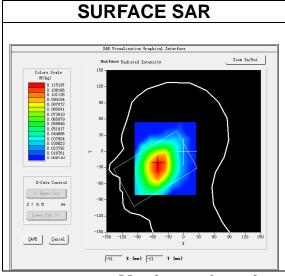
Date of measurement: 13/12/2024

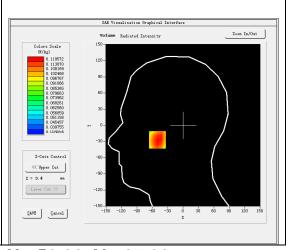
A. Experimental conditions.

<u>Area Scan</u> $dx=15mm dy=15mm, h= 5.00 mm$	
ZoomScan 5x5x7,dx=8mm dy=8mm dz=5mm	
Phantom Left head	
<u>Device Position</u> <u>Cheek</u>	
Band FDDBand71	
<u>Channels</u> <u>Middle</u>	
Signal (Crest factor: 39.4)	
<u>ConvF</u> 2.42	

B. SAR Measurement Results

Frequency (MHz)	683.000000
Relative permittivity (real part)	41.612701
Relative permittivity (imaginary part)	22.603046
Conductivity (S/m)	0.857660
Variation (%)	0.910000





VOLUME SAR

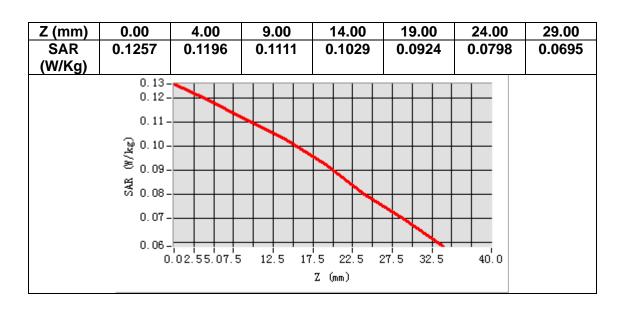
Maximum location: X=-50.00, Y=-27.00

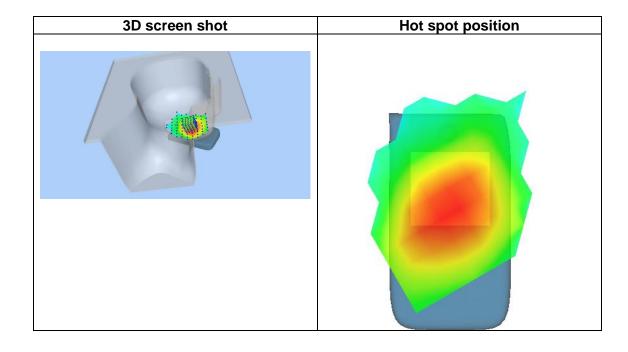
SAR Peak: 0.13 W/kg

SAR 10g (W/Kg)	0.101838
SAR 1g (W/Kg)	0.118494



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MEASUREMENT 44

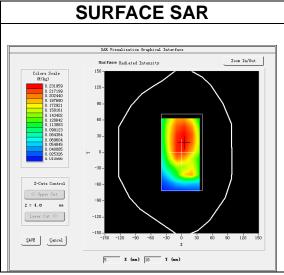
Date of measurement: 13/12/2024

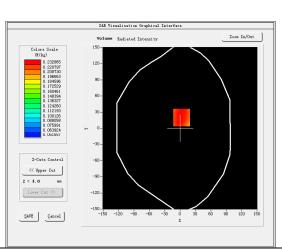
A. Experimental conditions.

<u> </u>	<u> </u>
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
<u>Band</u>	FDDBand71
Channels	<u>Middle</u>
Signal	(Crest factor: 39.4)
ConvF	2.42

B. SAR Measurement Results

tit mododiomont itoodito	
Frequency (MHz)	683.000000
Relative permittivity (real part)	41.612701
Relative permittivity (imaginary part)	22.603046
Conductivity (S/m)	0.857660
Variation (%)	-0.540000





VOLUME SAR

Maximum location: X=3.00, Y=20.00 SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)	0.189053
SAR 1g (W/Kg)	0.228698

22.5 27.5

32.5

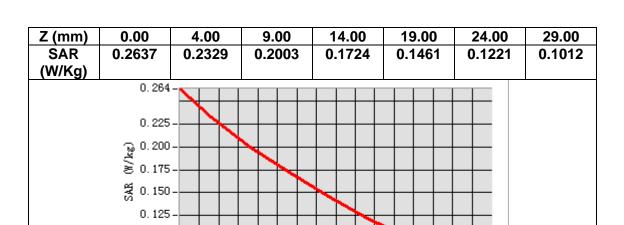
40.0



0.085 -

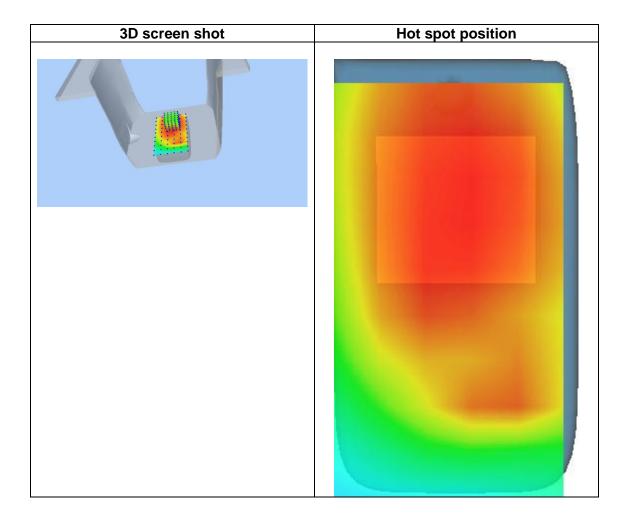
0.02.55.07.5





12.5 17.5

Z (mm)









MEASUREMENT 45

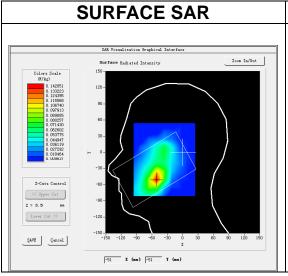
Date of measurement: 6/12/2024

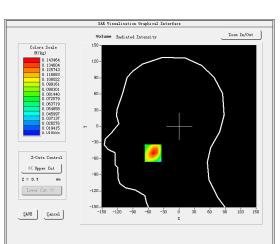
A. Experimental conditions.

<u> </u>	<u></u>
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
<u>Band</u>	<u>SA_n66</u>
<u>Channels</u>	<u>Middle</u>
Signal	(Crest factor: 1.0)
ConvF	2.51

B. SAR Measurement Results

111 111 0 11 0 11 1 1 1 0 0 1 1 1 1 1 1		
Frequency (MHz)	1745.000000	
Relative permittivity (real part)	39.365982	
Relative permittivity (imaginary part)	13.682247	
Conductivity (S/m)	1.326418	
Variation (%)	-0.580000	





VOLUME SAR

Maximum location: X=-51.00, Y=-50.00

SAR Peak: 0.21 W/kg

SAR 10g (W/Kg)	0.085152
SAR 1g (W/Kg)	0.137389

27.5 32.5

40.0

Report No.: S24111904706001

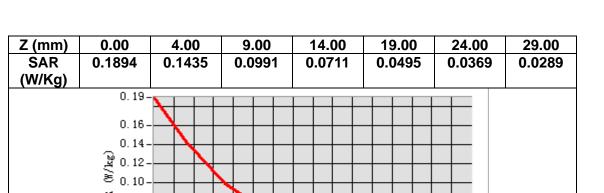


0.08-0.06-0.04-0.02-

0.02.55.07.5

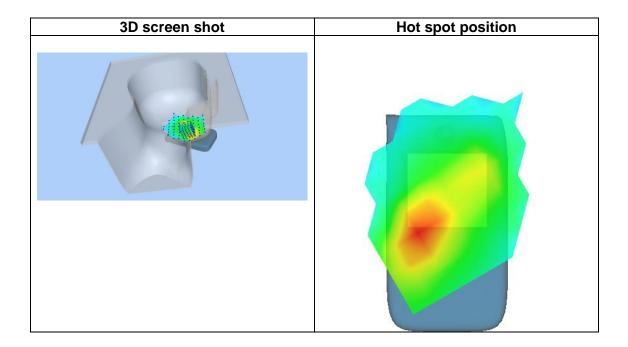
12.5





17.5 22.5

Z (mm)







MEASUREMENT 46

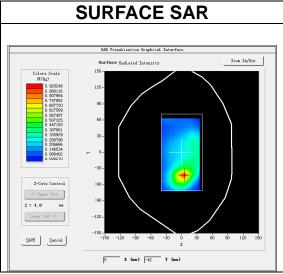
Date of measurement: 6/12/2024

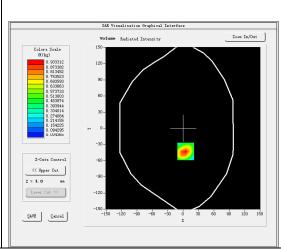
A. Experimental conditions.

<u> </u>	21		
Area Scan	dx=15mm dy=15mm, h= 5.00 mm		
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm		
Phantom	Validation plane		
Device Position	<u>Body</u>		
<u>Band</u>	<u>SA_n66</u>		
<u>Channels</u>	<u>Middle</u>		
Signal	(Crest factor: 1.0)		
ConvF	2.51		

B. SAR Measurement Results

Wit Mededicinent iteedite		
Frequency (MHz)	1745.000000	
Relative permittivity (real part)	39.365982	
Relative permittivity (imaginary part)	13.682247	
Conductivity (S/m)	1.326418	
Variation (%)	-0.830000	





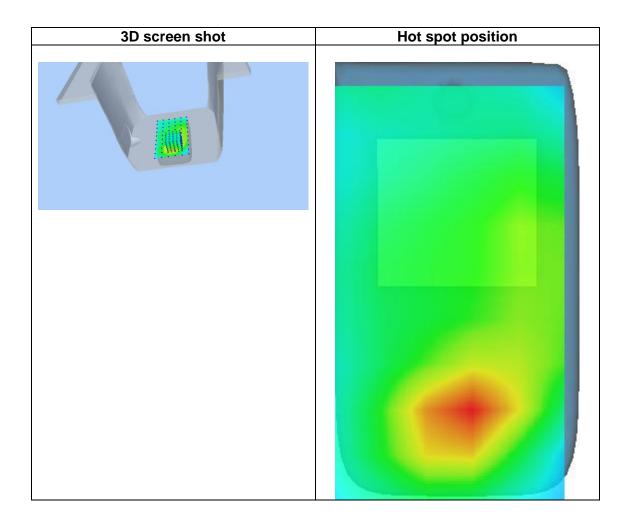
VOLUME SAR

Maximum location: X=5.00, Y=-43.00 SAR Peak: 1.39 W/kg

SAR 10g (W/Kg)	0.491124
SAR 1g (W/Kg)	0.883193



Z (mm) SAR	0.00 1.3857	4.00 0.9333	9.00 0.5633	14.00 0.3494	19.00 0.2184	24.00 0.1383	29.00 0.0903
(W/Kg)							
	1.4- 1.2- 1.0 (a) 0.8- (b) 0.8- (c) 0.4- (c) 2- (c) 1- (c) 0.1-	02.55.07.5	12.5 17.5 Z		27.5 32.5	40.0	







MEASUREMENT 47

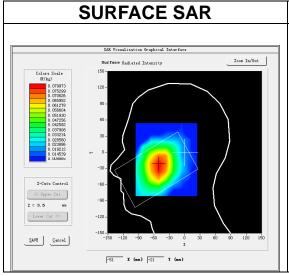
Date of measurement: 13/12/2024

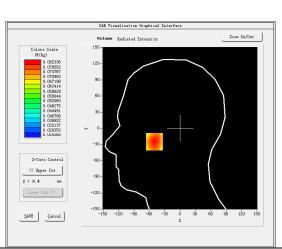
A. Experimental conditions.

<u>/ (: = /(0 1 1 1 1 1 1 1 1 1</u>	2.		
<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm		
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm		
<u>Phantom</u>	<u>Left head</u>		
Device Position	<u>Cheek</u>		
<u>Band</u>	<u>SA_n71</u>		
<u>Channels</u>	<u>Middle</u>		
Signal	(Crest factor: 40.0)		
ConvF	2.42		

B. SAR Measurement Results

111 11104041 01110111 11004110		
Frequency (MHz)	680.500000	
Relative permittivity (real part)	41.656803	
Relative permittivity (imaginary part)	22.597197	
Conductivity (S/m)	0.854300	
Variation (%)	-0.660000	





VOLUME SAR

Maximum location: X=-50.00, Y=-25.00

SAR Peak: 0.09 W/kg

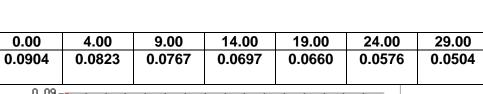
SAR 10g (W/Kg)	0.070658
SAR 1g (W/Kg)	0.081572

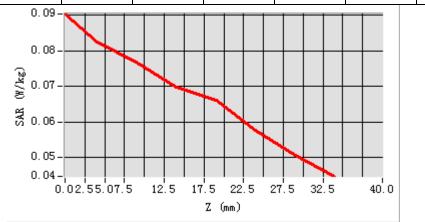
Z (mm)

SAR

(W/Kg)













MEASUREMENT 48

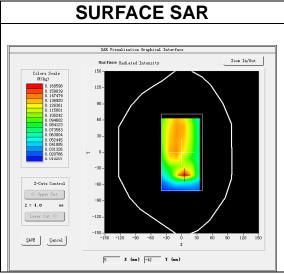
Date of measurement: 13/12/2024

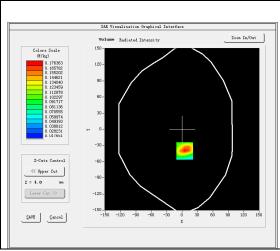
A. Experimental conditions.

A. Experimental conditions.	
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
<u>Band</u>	<u>SA_n71</u>
<u>Channels</u>	<u>Middle</u>
Signal	(Crest factor: 40.0)
ConvF	2.42

B. SAR Measurement Results

THE INCOME.	
Frequency (MHz)	680.500000
Relative permittivity (real part)	41.656803
Relative permittivity (imaginary part)	22.597197
Conductivity (S/m)	0.854300
Variation (%)	-2.460000





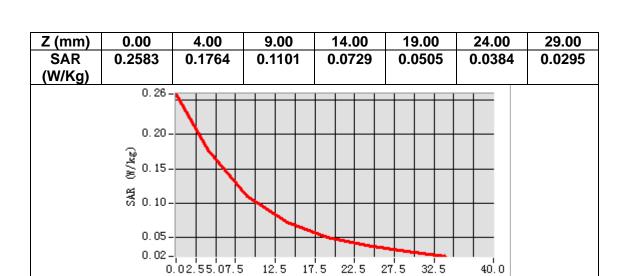
VOLUME SAR

Maximum location: X=5.00, Y=-40.00 SAR Peak: 0.27 W/kg

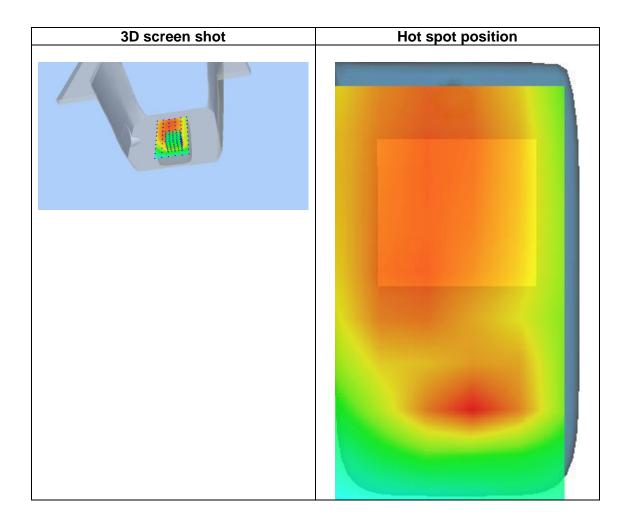
SAR 10g (W/Kg)	0.098421
SAR 1g (W/Kg)	0.168282







Z (mm)









MEASUREMENT 49

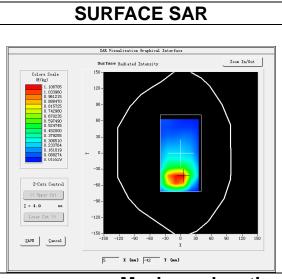
Date of measurement: 26/12/2024

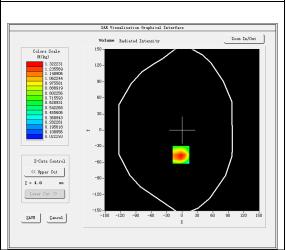
A. Experimental conditions.

7 ti Expormioritai comantioni	<u> </u>
<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	Band2_WCDMA1900
<u>Channels</u>	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)
ConvF	2.57

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.611801
Relative permittivity (imaginary part)	13.870998
Conductivity (S/m)	1.448749
Variation (%)	-1.480000





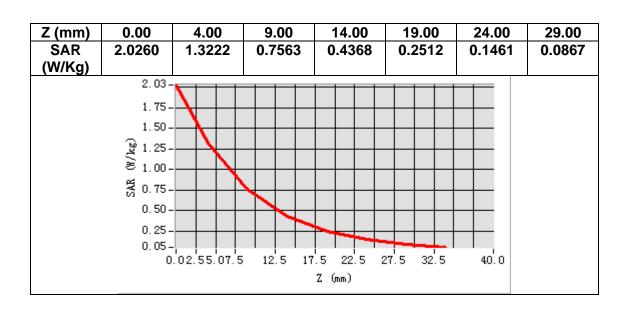
VOLUME SAR

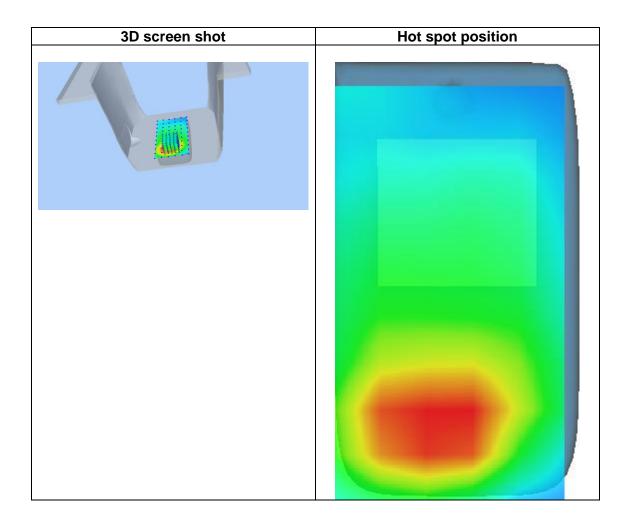
Maximum location: X=-2.00, Y=-46.00 SAR Peak: 2.15 W/kg

SAR 10g (W/Kg)	0.811775
SAR 1g (W/Kg)	1.684155













Date of measurement: 25/12/2024

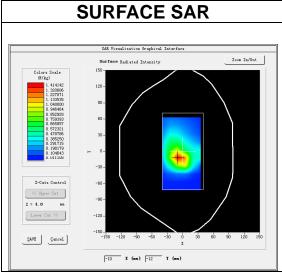
A. Experimental conditions.

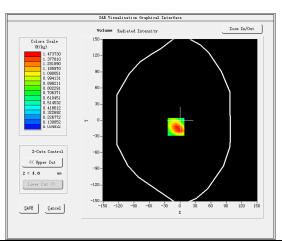
<u>dx=15mm dy=15mm, h= 5.00 mm</u>
5x5x7,dx=8mm dy=8mm dz=5mm
<u>Validation plane</u>
<u>Body</u>
Band4 WCDMA1700
<u>Middle</u>
WCDMA (Crest factor: 1.0)
<u>2.51</u>

MEASUREMENT 50

B. SAR Measurement Results

Frequency (MHz)	1732.600000
- 5 ,	
Relative permittivity (real part)	39.299583
Relative permittivity	13.710547
(imaginary part)	
Conductivity (S/m)	1.334493
, , ,	
Variation (%)	1.630000



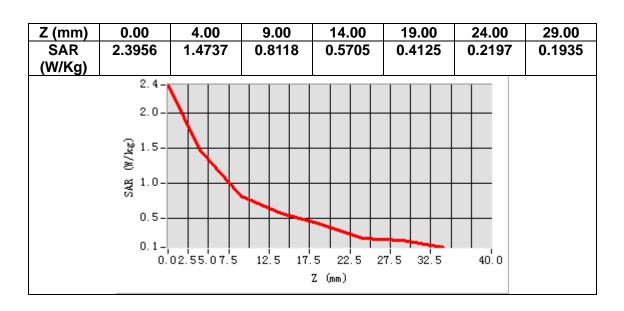


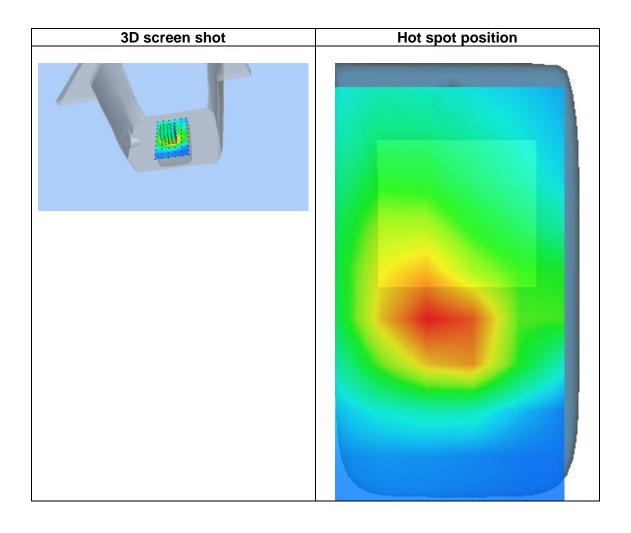
VOLUME SAR

Maximum location: X=-8.00, Y=-12.00 SAR Peak: 2.24 W/kg

SAR 10g (W/Kg)	0.858225
SAR 1g (W/Kg)	1.726230













MEASUREMENT 51

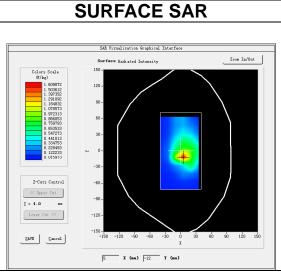
Date of measurement: 9/12/2024

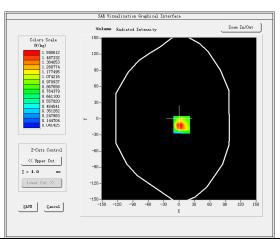
A. Experimental conditions.

7 ti =22,5011111011101 0011011101101	
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	<u>Body</u>
Band	LTE band 2
<u>Channels</u>	<u>Middle</u>
Signal	LTE (Crest factor: 1.0)
ConvF	2.57

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.543578
Relative permittivity (imaginary part)	13.809931
Conductivity (S/m)	1.442371
Variation (%)	-0.330000





VOLUME SAR

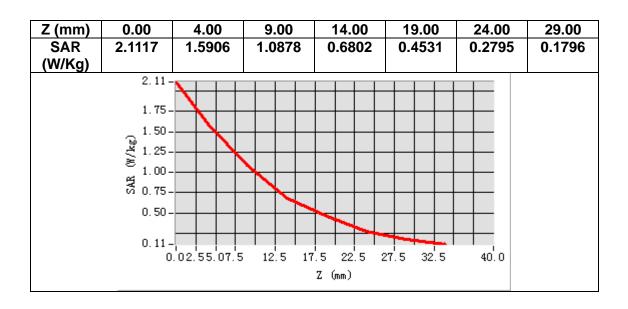
Maximum location: X=5.00, Y=-11.00

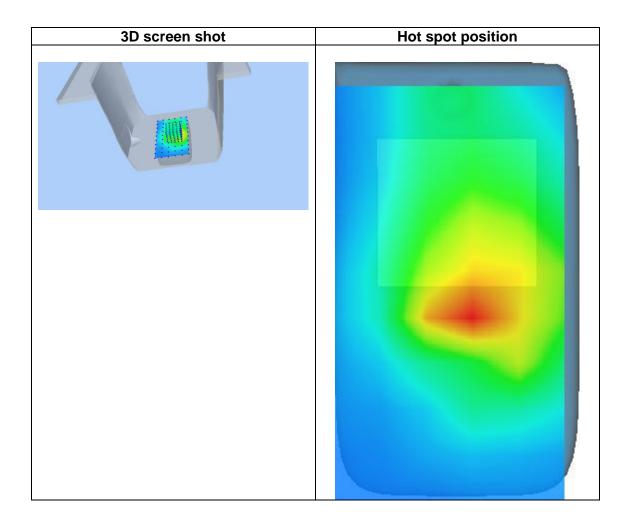
SAR Peak: 2.59 W/kg

SAR 10g (W/Kg)	0.714487
SAR 1g (W/Kg)	1.595472















MEASUREMENT 52

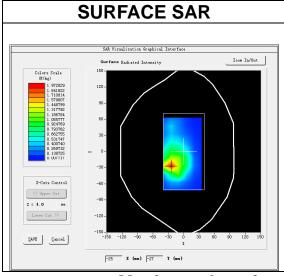
Date of measurement: 6/12/2024

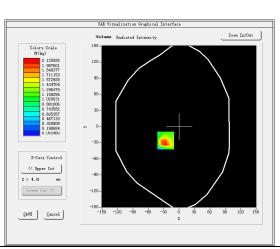
A. Experimental conditions.

<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
Band	LTE band 4
Channels	<u>Middle</u>
Signal	LTE (Crest factor: 1.0)
ConvF	2.51

B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.437782
Relative permittivity (imaginary part)	13.684697
Conductivity (S/m)	1.317152
Variation (%)	-0.440000





VOLUME SAR

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

SAR Peak: 3.53 W/kg

SAR 10g (W/Kg)	0.994260
SAR 1g (W/Kg)	1.981033



Z (mm)

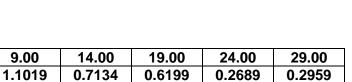
SAR

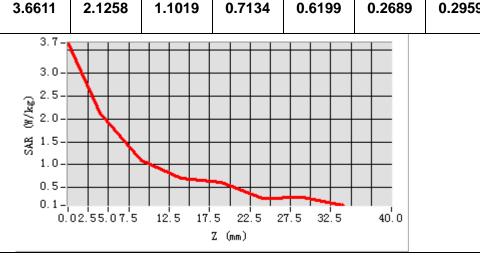
(W/Kg)

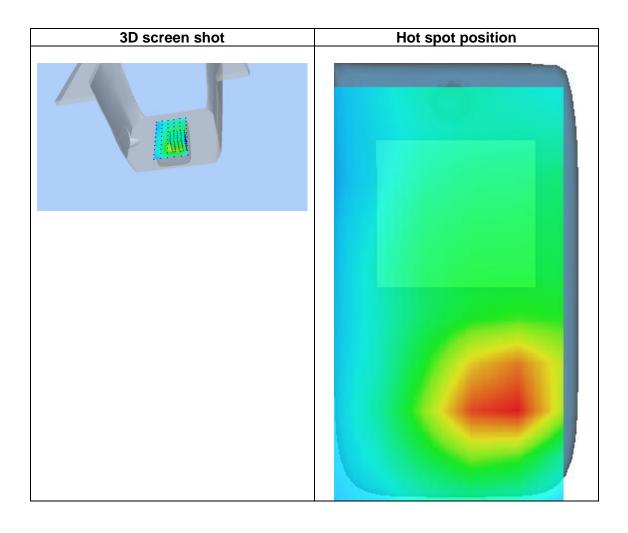
0.00



4.00











MEASUREMENT 53

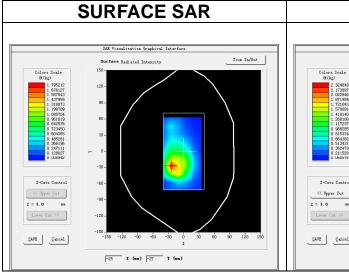
Date of measurement: 6/12/2024

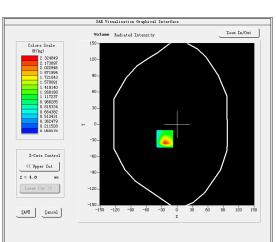
A. Experimental conditions.

<u> </u>	<u></u>
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	Body
<u>Band</u>	FDDBand66
<u>Channels</u>	<u>High</u>
<u>Signal</u>	(Crest factor: 1.0)
ConvF	<u>2.51</u>

B. SAR Measurement Results

Frequency (MHz)	1770.000000
Relative permittivity (real part)	39.204384
Relative permittivity (imaginary part)	13.654547
Conductivity (S/m)	1.342697
Variation (%)	-0.390000





VOLUME SAR

Maximum location: X=-24.00, Y=-27.00

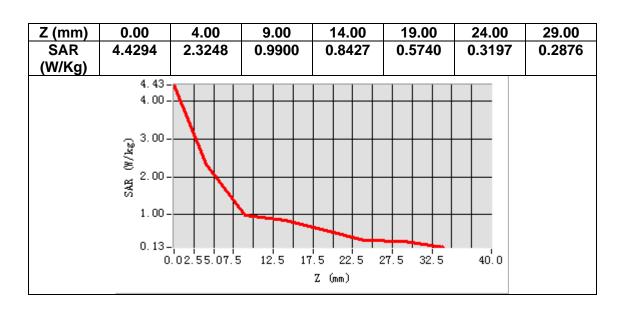
SAR Peak: 3.54 W/kg

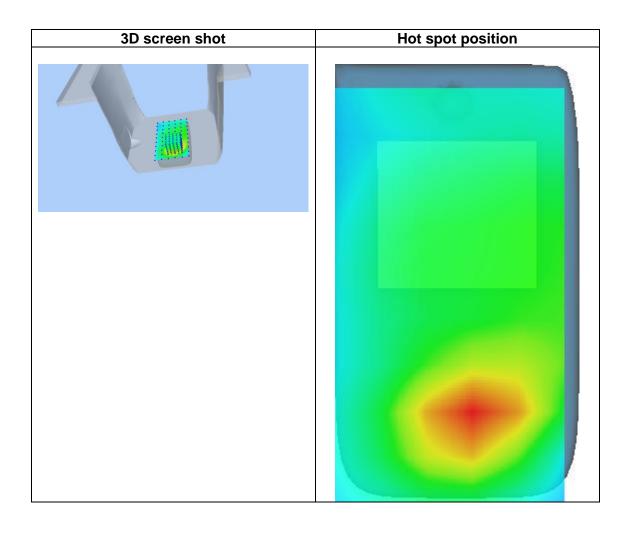
SAR 10g (W/Kg)	0.842165
SAR 1g (W/Kg)	1.782096















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MEASUREMENT 54

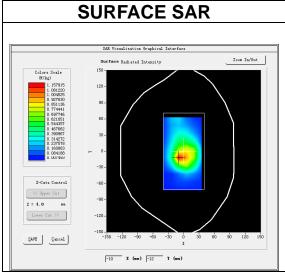
Date of measurement: 6/12/2024

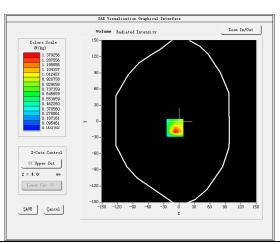
A. Experimental conditions.

7 ti =xpoimiomai comantiom	<u> </u>
<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	Body
Band	SA n66
<u>Channels</u>	<u>Middle</u>
Signal	(Crest factor: 1.0)
ConvF	<u>2.51</u>

B. SAR Measurement Results

Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.365982
Relative permittivity (imaginary part)	13.682247
Conductivity (S/m)	1.326418
Variation (%)	-2.580000





VOLUME SAR

Maximum location: X=-8.00, Y=-12.00 SAR Peak: 3.41 W/kg

SAR 10g (W/Kg)	0.724426
SAR 1g (W/Kg)	1.581245

22.5 27.5 32.5

40.0

0.0-

0.02.55.07.5

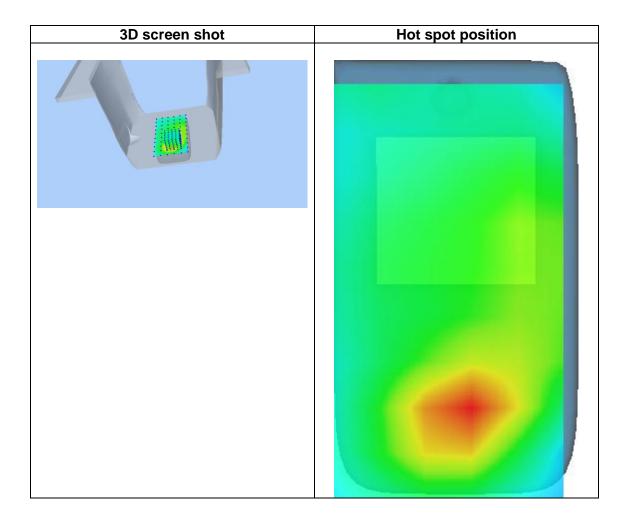
12.5





17.5

Z (mm)







MEASUREMENT 55

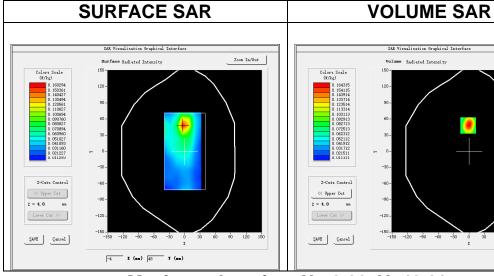
Date of measurement: 12/12/2024

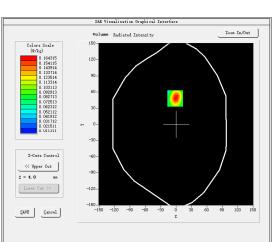
A. Experimental conditions.

7 t. = 21 p 0 : ::::0 : : tai: 0 0 : : tai:	
Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
<u>Signal</u>	IEEE802.11b (Crest factor: 1.0)
ConvF	2.74

B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	37.866589
Relative permittivity (imaginary part)	13.006529
Conductivity (S/m)	1.760940
Variation (%)	1.110000





Maximum location: X=-2.00, Y=48.00

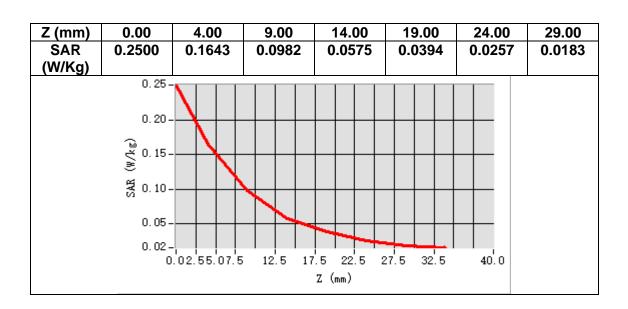
SAR Peak: 0.26 W/kg

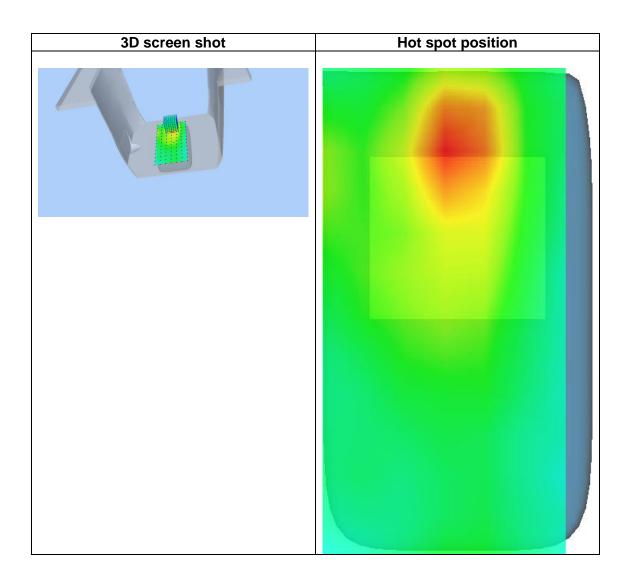
SAR 10g (W/Kg)	0.084917
SAR 1g (W/Kg)	0.156358















Date of measurement: 11/12/2024

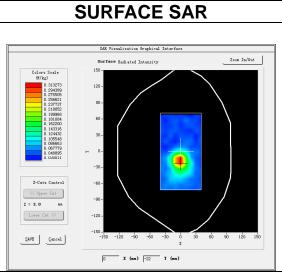
A. Experimental conditions.

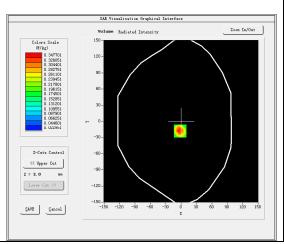
At Experimental conditions	
Area Scan	dx=10mm dy=10mm, h= 2.00 mm
<u>ZoomScan</u>	7x7x12,dx=4mm dy=4mm dz=2mm
<u>Phantom</u>	<u>Validation plane</u>
Device Position	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
Signal	IEEE802.11ax (Crest factor: 1.0)
ConvF	<u>1.89</u>

MEASUREMENT 56

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.652485
Relative permittivity (imaginary part)	15.561054
Conductivity (S/m)	4.495416
Variation (%)	-1.140000





VOLUME SAR

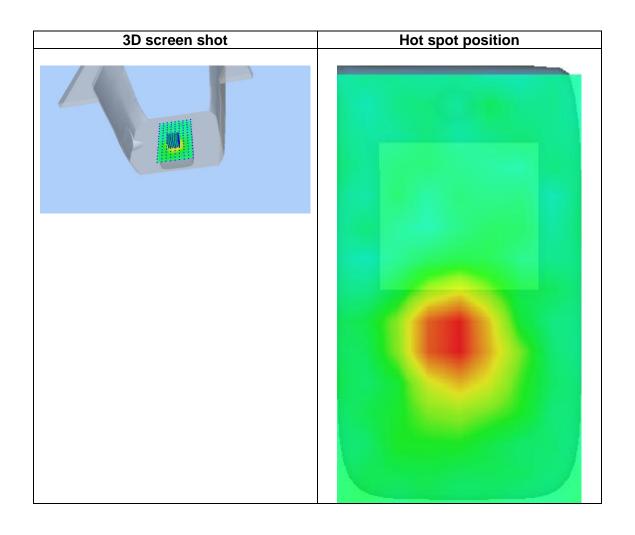
Maximum location: X=-7.00, Y=23.00 SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.102438
SAR 1g (W/Kg)	0.258174





Z 0.00 (m m)	2.00	4.00	6.00	8.00	10.0	12.0 0	14.0 0	16.0 0	18.0 0	20.0	22.0
SA 0.47		0.14	0.07	0.04	0.02	0.02	0.02	0.01	0.02	0.01	0.01
R 06 (W/	81	17	59	91	69	34	75	53	30	93	63
Kg)											
	2.0 2.0 2.0 1.0 0.0	2-	4 6	8 1	0 12 Z (n	14 16	18 20	22 2	4 26		







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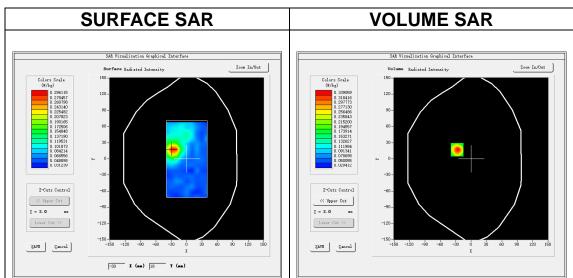
MEASUREMENT 57

Date of measurement: 11/12/2024

A. Experimental conditions.

dx=10mm dy=10mm, h= 2.00 mm
7x7x12,dx=4mm dy=4mm dz=2mm
Validation plane
<u>Body</u>
<u>IEEE 802.11a U-NII</u>
<u>Middle</u>
IEEE802.11ax (Crest factor: 1.0)
<u>1.89</u>

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.652485
Relative permittivity (imaginary part)	15.561054
Conductivity (S/m)	4.495416
Variation (%)	15.340000



Maximum location: X=0.00, Y=39.00 SAR Peak: 1.41 W/kg

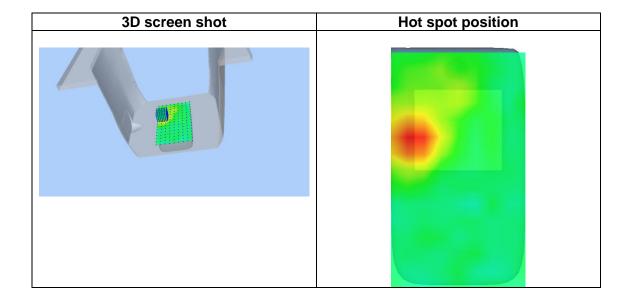
SAR 10g (W/Kg)	0.145162
SAR 1g (W/Kg)	0.412308







Z (m m) SA R (W/ Kg)	0.00 1.26 32	2.00 0.71 39	4.00 0.30 73	6.00 0.15 24	8.00 0.07 82	10.0 0 0.04 88	12.0 0 0.03 35	14.0 0 0.03 13	16.0 0 0.03 35	18.0 0 0.03 13	20.0 0 0.03 13	22.0 0 0.03 03
		1.3 1.0 2.8 0.6 0.4 0.2		4 6	8 1	0 12 Z (r	14 16	18 20	22 2	4 26		









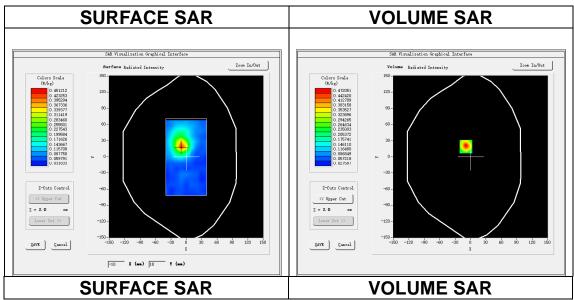
MEASUREMENT 58

ate of measurement: 11/12/2024

A. Experimental conditions.

7 ti =22 p 0 i i i i i i i i i i i i i i i i i i	
Area Scan	dx=10mm dy=10mm, h= 2.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	<u>Body</u>
Band	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
Signal	IEEE802.11ax (Crest factor: 1.0)
ConvF	1.89

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.652485
Relative permittivity (imaginary part)	15.561054
Conductivity (S/m)	4.495416
Variation (%)	2.800000



Maximum location: X=10.00, Y=47.00 SAR Peak: 1.92 W/kg

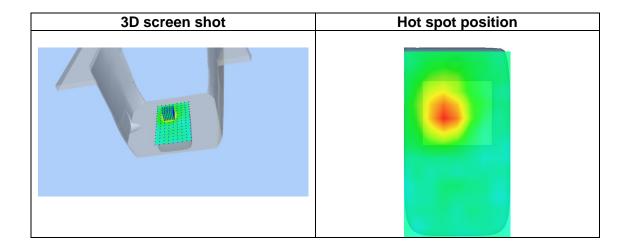
SAR 10g (W/Kg)	0.172334
SAR 1g (W/Kg)	0.487428





Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0	22.0 0
SA R	1.83 27	1.03 20	0.35 97	0.23 90	0.09 94	0.07 00	0.04 40	0.03 34	0.03 17	0.02 14	0.03 03	0.02 05
(W/ Kg)	21	20	31	30	34		40	34	''	14		05
		1.8	3-			1						
		1.5	0-1									
		1 0	1									
		(%) 1.0	l 🚺									
		왕 0.75 0.5		$\sqrt{}$								
		0.3										

Z (mm)







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MEASUREMENT 59

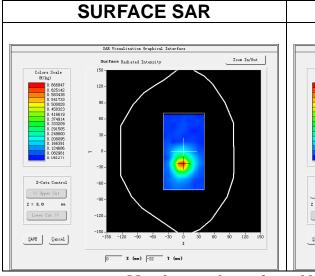
Date of measurement: 17/12/2024

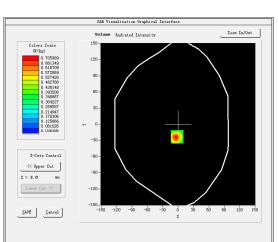
A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>						
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm						
<u>Phantom</u>	Validation plane						
Device Position	Body						
Band	<u>IEEE 802.11a U-NII</u>						
Channels	<u>Middle</u>						
Signal	IEEE802.11ax (Crest factor: 1.0)						
ConvF	1.90						

B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	33.979572
Relative permittivity (imaginary part)	15.795672
Conductivity (S/m)	5.076553
Variation (%)	-0.560000





VOLUME SAR

Maximum location: X=-1.00, Y=23.00

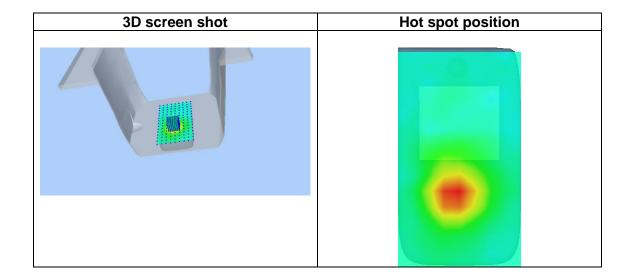
SAR Peak: 1.11 W/kg

SAR 10g (W/Kg)	0.195741
SAR 1g (W/Kg)	0.509294





Ζ 0.00 2.00 4.00 6.00 8.00 10.0 12.0 14.0 16.0 18.0 20.0 22.0 (m 0 0 0 0 0 0 0 m) 0.38 0.21 SA 1.28 0.68 0.06 0.04 0.03 0.02 0.02 0.02 0.01 0.01 R **77** 10 40 82 93 96 33 96 27 10 61 16 (W/ Kg) 1.2-1.0-0.8 0.8 ∂.0 (∦/kg) 0.6 왕 0.4. 0.2-0.0-12 14 16 18 20 22 24 26 10 Z (mm)







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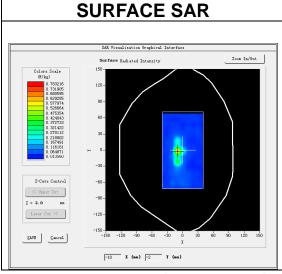
MEASUREMENT 60

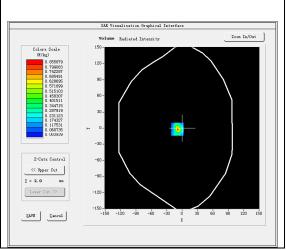
Date of measurement: 17/12/2024

A. Experimental conditions.

<u> </u>	<u> </u>
Area Scan	dx=10mm dy=10mm, h= 2.00 mm
<u>ZoomScan</u>	7x7x12,dx=4mm dy=4mm dz=2mm
<u>Phantom</u>	Validation plane
Device Position	Body
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	IEEE802.11ax (Crest factor: 1.0)
ConvF	<u>1.90</u>

Frequency (MHz)	5785.000000
Relative permittivity (real part)	33.979572
Relative permittivity (imaginary part)	15.795672
Conductivity (S/m)	5.076553
Variation (%)	-3.1400000





VOLUME SAR

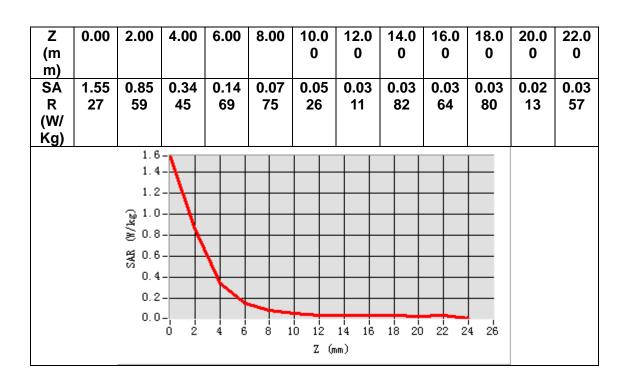
Maximum location: X=-9.00, Y=-2.00

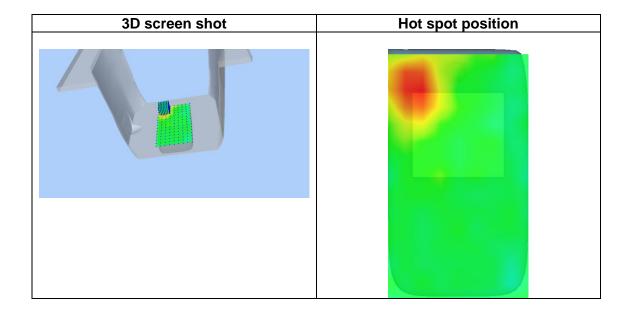
SAR Peak: 1.65 W/kg

SAR 10g (W/Kg)	0.135204
SAR 1g (W/Kg)	0.302235













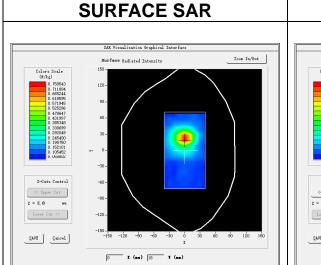
MEASUREMENT 61

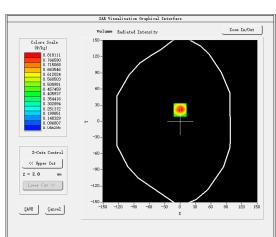
Date of measurement: 17/12/2024

A. Experimental conditions.

7 tr = 21 0 1 1 1 1 1 1 1 1	5.
Area Scan	dx=10mm dy=10mm, h= 2.00 mm
<u>ZoomScan</u>	7x7x12,dx=4mm dy=4mm dz=2mm
<u>Phantom</u>	<u>Validation plane</u>
Device Position	Body
Band	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
Signal	IEEE802.11ax (Crest factor: 1.0)
ConvF	1.90

Frequency (MHz)	5785.000000
Relative permittivity (real part)	33.979572
Relative permittivity (imaginary part)	15.795672
Conductivity (S/m)	5.076553
Variation (%)	-0.840000





VOLUME SAR

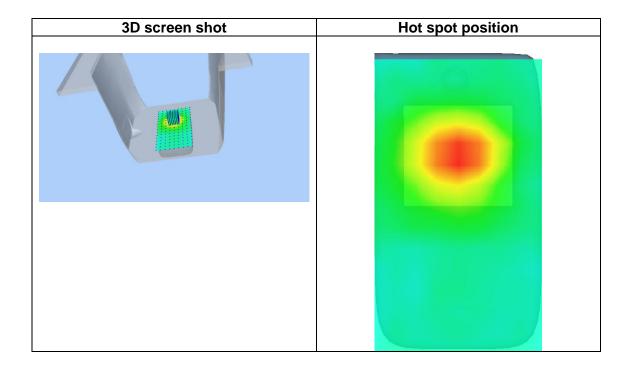
Maximum location: X=-11.00, Y=-51.00 SAR Peak: 1.39 W/kg

	-
SAR 10g (W/Kg)	0.139026
SAR 1g (W/Kg)	0.341362





Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0	22.0 0
SA R (W/ Kg)	1.31 19	0.72 10	0.30 51	0.12 89	0.04 60	0.02 76	0.02 28	0.01 85	0.01	0.01 13	0.01 75	0.01
		1.3 1.2 1.0 0.8 0.6 0.4 0.2		4 6	8 1	0 12 Z (n	14 16 mm)	18 20) 22 2	4 26		







14. Appendix D. Calibration Certificate

Table of contents							
E Field Probe - 4024-EPGO-442							
835 MHz Dipole - SN 03/15 DIP 0G835-347							
1800 MHz Dipole - SN 03/15 DIP 1G800-349							
1900 MHz Dipole - SN 03/15 DIP 1G900-350							
2450 MHz Dipole - SN 03/15 DIP 2G450-352							
2600 MHz Dipole - SN 03/15 DIP 2G600-356							





Docusign Envelope ID: 223C1A7C-4751-4B95-8502-1618DC0951E3



COMOSAR E-Field Probe Calibration Report

Ref: ACR.278.12.24.BES.A

Report No.: S24111904706001

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI COMMUNITY, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: 4024-EPGO-442

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

Calibration date: 10/04/2024



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).



Docusign Envelope ID: 223C1A7C-4751-4B95-8502-1618DC0951E3



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.278.12.24.BES.A

\$	Name	Function	Date	Signature
Prepared by :	Cyrille ONNEE	Measurement Responsible	10/4/2024	28
Checked & approved by:	Pedro Ruiz	Technical Manager	10/4/2024	fedurfling
Authorized by:	Pedro Ruiz	Laboratory Director	10/4/2024	nado por:

Pedro RUIZ -29093B31C46F428...

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

Issue	Name	Date	Modifications
A	Cyrille ONNEE	10/4/2024	Initial release

2			

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Report No.: S24111904706001

Docusign Envelope ID: 223C1A7C-4751-4B95-8502-1618DC0951E3



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref. ACR.278.12.24.BES.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.278.12.24.BES.A

1 DEVICE UNDER TEST

Device Under Test			
Device Type COMOSAR DOSIMETRIC E FIELD PR			
Manufacturer	MVG		
Model	SSE2		
Serial Number	4024-EPGO-442		
Product Condition (new / used)	New		
Frequency Range of Probe	0.15 GHz-7.5GHz		
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.206 MΩ		
	Dipole 2: R2=0.223 MΩ		
	Dipole 3: R3=0.235 MΩ		

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

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



Figure 1 – MVG COMOSAR Dosimetric E field Probe

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

3 MEASUREMENT METHOD

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

3.1 <u>SENSITIVITY</u>

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.



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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.278.12.24.BES.A.

3.2 LINEARITY

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

3.3 ISOTROPY

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

3.4 BOUNDARY EFFECT

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

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

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

where

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

dbe 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;

△SAR_{be} in percent of SAR is the deviation between the measured SAR value, at the

distance d_{be} from the boundary, and the analytical SAR value.

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

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR 278 12 24 BES A

3.5 PROBE MODULATION RESPONSE

MVG's probe were evaluated experimentally with various modulated signal and the deviation from CW response were found neglectable in the used power range of the probe. So the correction to taking into account the linearization parameters for different modulation is null, therefore the CW factor given in this report can be used whatever the measured modulation

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty associated with a SAR probe calibration using the waveguide or calorimetric cell technique depending on the frequency.

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

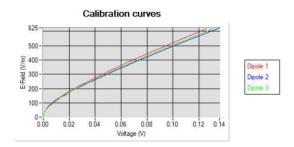
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is $\pm 14\%$ for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

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

5.1 <u>CALIBRATION IN AIR</u>

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



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

$$E^{2} = \sum_{i=1}^{3} \frac{V_{i} \left(1 + \frac{V_{i}}{DCP_{i}}\right)}{Norm_{i}}$$

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR 278 12 24 BES A

where

Vi=voltage readings on the 3 channels of the probe DCPi=diode compression point given below for the 3 channels of the probe

Normi=dipole sensitivity given below for the 3 channels of the probe

Normx dipole	Normy dipole	Normz dipole
$1 (\mu V/(V/m)^2)$	$2 (\mu V/(V/m)^2)$	$3 (\mu V/(V/m)^2)$
0.73	0.79	0.78

DCP dipole 1	DCP dipole 2	DCP dipole 3
(mV)	(mV)	(mV)
105	109	103

5.2 CALIBRATION IN LIQUID

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

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

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

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

where

σ=the conductivity of the liquid ρ=the volumetric density of the liquid

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

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

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

where

c=the specific heat for the liquid dT/dt=the temperature rises over the time

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

$$SAR = \frac{4P_W}{ah^{\frac{c}{\delta}}}e^{\frac{-2z}{\delta}}$$

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.278.12.24.BES.A

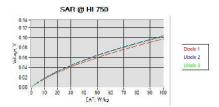
where

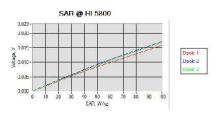
a=the larger cross-sectional of the waveguide b=the smaller cross-sectional of the waveguide δ=the skin depth for the liquid in the waveguide Pw=the power delivered to the liquid

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

<u>Liquid</u>	Frequency (MHz*)	ConvF
HL750	750	2.42
HL850	835	2.34
HL900	900	2.24
HL1800	1800	2.51
HL1900	1900	2.57
HL2000	2000	2.64
HL2300	2300	2.73
HL2450	2450	2.74
HL2600	2600	2.51
HL3300	3300	2.11
HL3500	3500	2.15
HL3700	3700	2.08
HL3900	3900	2.27
HL4200	4200	2.39
HL4600	4600	2.30
HL4900	4900	2.13
HL5200	5200	1.89
HL5400	5400	1.97
HL5600	5600	1.88
HL5800	5800	1.90

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





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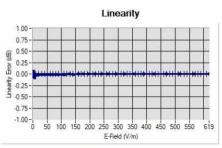


COMOSAR E-FIELD PROBE CALIBRATION REPORT

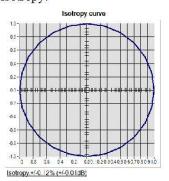
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6 VERIFICATION RESULTS

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



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



7 LIST OF EQUIPMENT

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

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Ref. ACR. 278.12.24.BES.A

1		1	AND DO NO BY BY DO ADMIND ***	Per section we for Section 19
Wa∨eguide	MVG	SN 32/16 WG2_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G600_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_5G000_1	Validated. No cal required.	Validated. No cal required.
Wa∨eguide	MVG	SN 32/16 WG14_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_7G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44235403	02/2024	02/2027









SAR Reference Dipole Calibration Report

Ref: ACR.53.24.24.BES.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

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

FREQUENCY: 835 MHZ

SERIAL NO.: SN 03/15DIP0G835-347

Calibrated at MVG

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

Calibration date: 02/21/2024



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Summary:

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



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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR. 53.24.24.BES.A

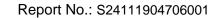
	Name	Function	Date	Signature
Prepared by:	Pedro Ruiz	Measurement Responsible	2/22/2024	feduraling
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	J35
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	Yann TOUTAAN

Signature numérique de Yann Toutain ID Yann Toutain ID Date: 2024.02.27 08:55:11 +01'00'

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

Name	Date	Modifications
Pedro Ruiz	2/22/2024	Initial release

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SAR REFERENCE DIPOLE CALIBRATION REPORT

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR 53.24.24.BES.A

Report No.: S24111904706001

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards for reference dipoles used for SAR measurement system validations and the measurements that were performed to verify that the product complies with the fore mentioned standards.

2 DEVICE UNDER TEST

Device Under Test		
Device Type	COMOSAR 835 MHz REFERENCE DIPOLE	
Manufacturer	MVG	
Model	SID835	
Serial Number	SN 03/15DIP0G835-347	
Product Condition (new / used)	Used	

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR 53 24 24 BES A

MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards specify the mechanical components and dimensions of the validation dipoles, with the dimension's frequency and phantom shell thickness dependent. The COMOSAR test bench employs a 2 mm phantom shell thickness therefore the dipoles sold for use with the COMOSAR test bench comply with the requirements set forth for a 2 mm phantom shell thickness. A direct method is used with a ISO17025 calibrated caliper.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 measurement shall be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. A direct method is used with a network analyser and its calibration kit, both with a valid ISO17025 calibration.

SAR REQUIREMENTS 4.3

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards provide requirements for reference dipoles used for system validation measurements. The following measurements were performed to verify that the product complies with the fore-mentioned standards.

MEASUREMENT UNCERTAINTY

MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty (k=2) in calibration for the dimension measurement in mm is +/-0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty (k=2) in calibration for the dimension measurement in mm is +/-0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty (k=2) in calibration for the S11 parameter in linear is +/-0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty (k=2) in calibration for the 1g and 10g SAR measurement in W/kg is +/-19% with respect to measurement conditions.

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