13. Simultaneous Transmission Analysis

Simultaneous TX SAR Considerations

No.	Applicable Simultaneous Transmission
1.	LTE+WIFI
2.	LTE+BT

Note:

1. EUT will choose either LTE according to the network signal condition; therefore, LTE cannot transmit simultaneously.
2. Because the Bluetooth SAR is exclusion, so the simultaneous SAR is not evaluate.
3. Bluetooth stand-alone SAR tests are not required and are considered zero in the SAR summation.

Evaluation of Simultaneous SAR

Simultaneous-Head

<LTE+WiFi >

Test Position	WiFi 2.4GHz SAR 1-g (W/Kg)	WiFi 5.2GHz SAR 1-g (W/Kg)	WiFi 5.8GHz SAR 1-g (W/Kg)	LTE BAND 2 1-g (W/Kg)	LTE BAND 4 1-g (W/Kg)	LTE BAND 5 1-g (W/Kg)	LTE BAND 7 1-g (W/Kg)	LTE BAND 17 1-g (W/Kg)	LTE BAND 38 1-g (W/Kg)	LTE BAND 41 1-g (W/Kg)	MAX. ΣSAR 1-g (W/Kg)	SAR 1-g Limit (W/Kg)	Simut. Meas. Required
Left Cheek	**0.278**	**0.371**	**0.374**	**0.572**	**0.649**	**0.920**	**0.566**	**0.750**	**0.615**	**0.572**	**1.167**	1.6	N/A
Left Tilt	0.237	0.305	0.301	0.236	0.303	0.448	0.237	0.364	0.278	0.240	0.749	1.6	N/A
Right Cheek	0.269	0.362	0.355	0.553	0.628	0.906	0.327	0.740	0.595	0.562	1.261	1.6	N/A
Right Tilt	0.225	0.293	0.295	0.226	0.289	0.429	0.202	0.322	0.260	0.221	0.724	1.6	N/A

Simultaneous- Body

<LTE+WiFi >

Test Position	WiFi 2.4GHz SAR 1-g (W/Kg)	WiFi 5.2GHz SAR 1-g (W/Kg)	WiFi 5.8GHz SAR 1-g (W/Kg)	LTE BAND 2_{1-g} (W/Kg)	LTE BAND 4_{1-g} (W/Kg)	LTE BAND 5_{1-g} (W/Kg)	LTE BAND 7_{1-g} (W/Kg)	LTE BAND 17_{1-g} (W/Kg)	LTE BAND 38_{1-g} (W/Kg)	LTE BAND 41_{1-g} (W/Kg)	MAX. ΣSAR_{1-g} (W/Kg)	SAR 1-g Limit (W/Kg)	Simut. Meas. Required
Back	**0.256**	**0.305**	**0.308**	**0.341**	**0.444**	**0.698**	**0.322**	**0.576**	**0.377**	**0.324**	**1.006**	1.6	N/A
Front	0.206	0.258	0.261	0.294	0.394	0.627	0.269	0.514	0.312	0.254	0.888	1.6	N/A
Left Side	N/A	N/A	N/A	0.279	0.378	0.611	0.258	0.51	0.298	0.249	0.611	1.6	N/A
Right Side	0.193	0.242	0.251	NA	NA	NA	NA	NA	NA	NA	0.251	1.6	N/A
Top side	0.185	0.234	0.241	NA	NA	NA	NA	NA	NA	NA	0.241	1.6	N/A
Bottom Side	N/A	N/A	N/A	0.327	0.423	0.444	0.31	0.507	0.361	0.311	0.444	1.6	N/A

14. Measurement Uncertainty

NO	Source	Uncert. ai（%）	Prob. Dist.	Div. k	ci (1g)	ci (10g)	Stand.Uncert. ui (1g)	Stand.Uncert. ui (10g)	*Veff*
1	Repeat	0. 4	N	1	1	1	0. 4	0. 4	9
Instrument									
2	Probe calibration	7	N	2	1	1	3.5	3.5	∞
3	Axial isotropy	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
4	Hemispherical isotropy	9.4	R	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
5	Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
7	Detection limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
8	Readout electronics	0.3	N	1	1	1	0.3	0.3	∞
9	Response time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
11	Ambient noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	Ambient reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioner mech. restrictions	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Max.SAR evaluation	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞

Test sample related									
16	Device positioning	3.8	N	1	1	1	3.8	3.8	99
17	Device holder	5.1	N	1	1	1	5.1	5.1	5
18	Drift of output power	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up									
19	Phantom uncertainty	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
20	Liquid conductivity (target)	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas)	2.5	N	1	0.64	0.43	1.6	1.2	∞
22	Liquid Permittivity (target)	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.5	∞
23	Liquid Permittivity (meas)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined standard			RSS	$U_c = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			11.4%	11.3%	236
Expanded uncertainty(P=95%)		$U_c = k\,U$,k=2					**22.8%**	**22.6%**	

Appendix A. EUT Photos and Test Setup Photos

Please refer to separated files Appendix I -- Test Setup Photograph_SAR

Appendix B. Plots of SAR System Check

750MHz Head System Check Date:07/15/2024

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1163

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.91 S/m; εr = 41.73; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN7396; ConvF(9.82, 9.82, 9.82); Calibrated: May,06.2024;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn387; Calibrated: Sep.06.2023

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.10 (7164)

Configuration/Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.328 W/kg

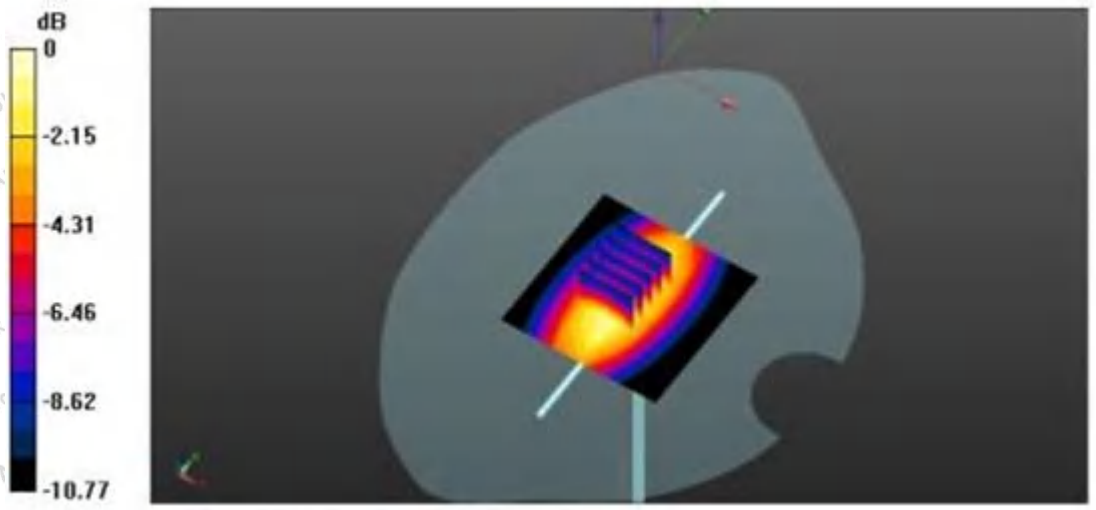
Configuration/Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 57.538V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.78 W/kg

SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.39 W/kg

Maximum value of SAR (measured) = 3.11 W/kg



835MHz Head System Check Date:07/15/2024

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d154

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 835 MHz; σ = 0.92 S/m; ε_r = 41.62; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

•Probe: EX3DV4 - SN7396; ConvF(9.71, 9.71, 9.71); Calibrated: May 06, 2024;

•Sensor-Surface: 4mm (Mechanical Surface Detection)

•Electronics: DAE4 Sn387; Calibrated: Sep.06,2023;

•Phantom: SAM 1; Type: SAM;

•Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 2.875 W/kg

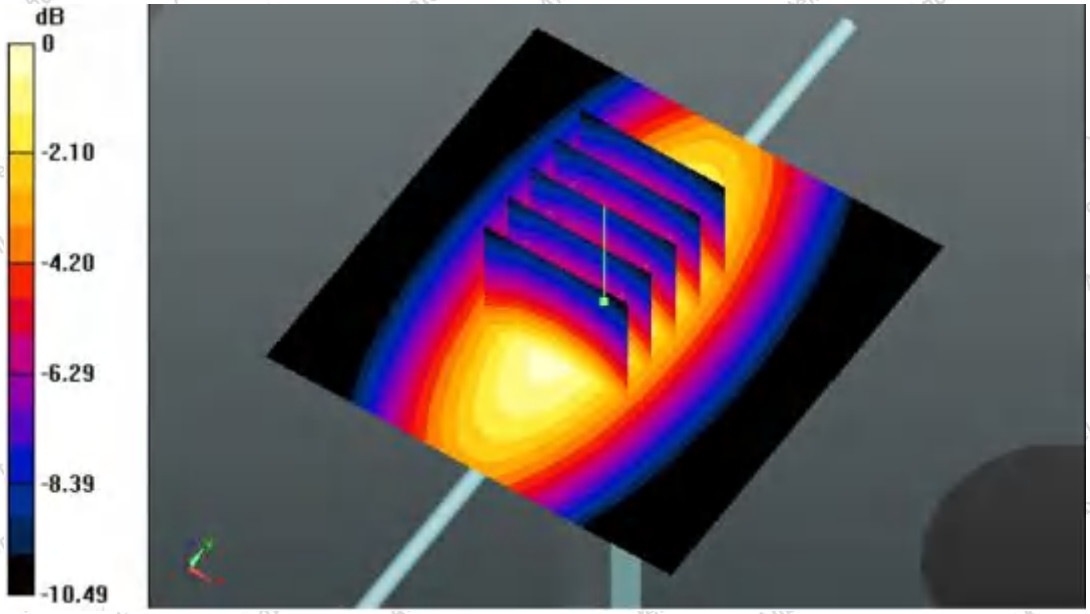
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50.286 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 3.175 W/kg

SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 2.574 W/kg



1750MHz Head System Check Date:07/16/2024

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2

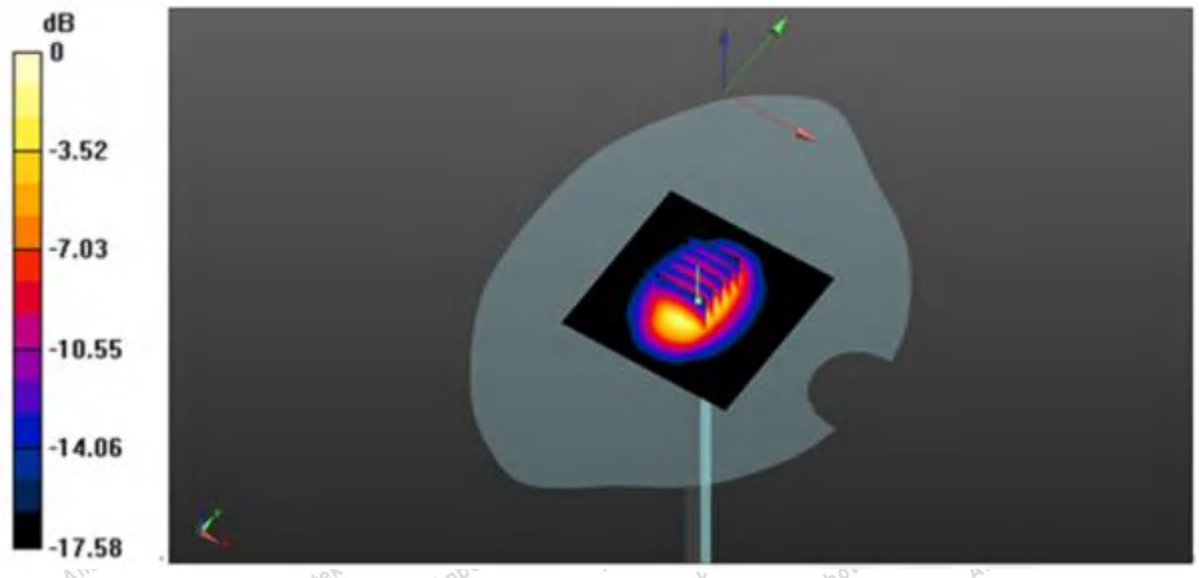
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f =1750 MHz; σ =1.41 S/m; εr =40.25; ρ =1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7396; ConvF(8.61, 8.61, 8.61); Calibrated: May,06.2024;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn387; Calibrated: Sep.06.2023;
- Phantom: SAM 1 ; Type: QD 000 P40 CD; Serial: TP - 1802
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.122 W/kg

Configuration/Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 92.35 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 16.353 W/kg
SAR(1 g) =9.57 W/kg; SAR(10 g) = 5.03 W/kg
Maximum value of SAR (measured) = 12.142 W/kg



1900MHz Head System Check Date:07/17/2024

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d175

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 1900 MHz; σ = 1.46S/m; εr = 40.12; ρ = 1000 kg/m3

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN7396; ConvF(8.13, 8.13, 8.13); Calibrated: May 06, 2024;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn387; Calibrated: Sep.06,2023;

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 16.895 W/kg

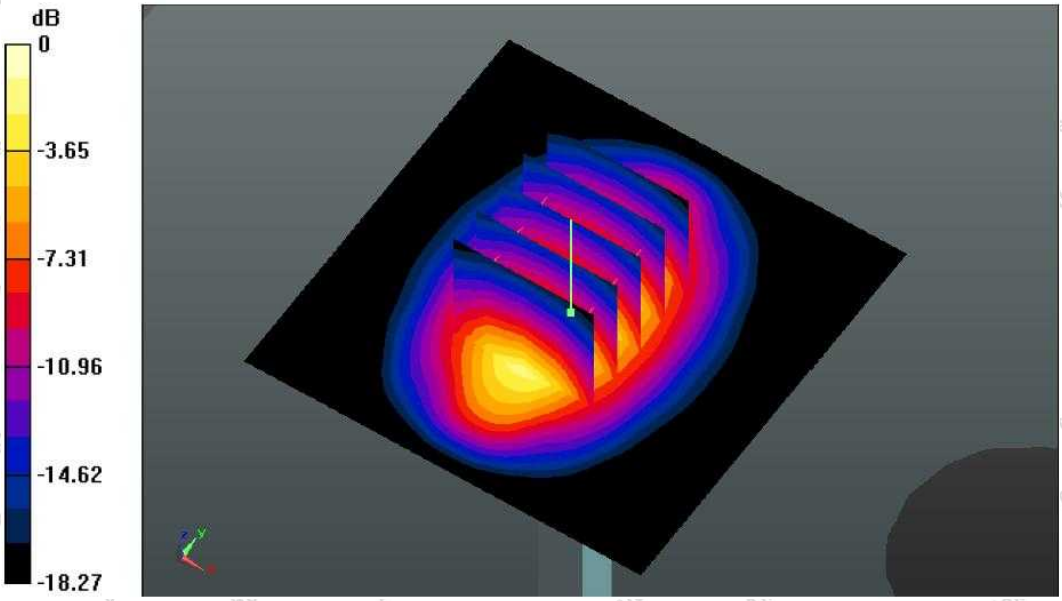
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 87.671 V/m; Power Drift = 0.08dB

Peak SAR (extrapolated) = 19.868 W/kg

SAR(1 g) = 10.18 W/kg; SAR(10 g) = 5.37 W/kg

Maximum value of SAR (measured) = 15.332 W/kg



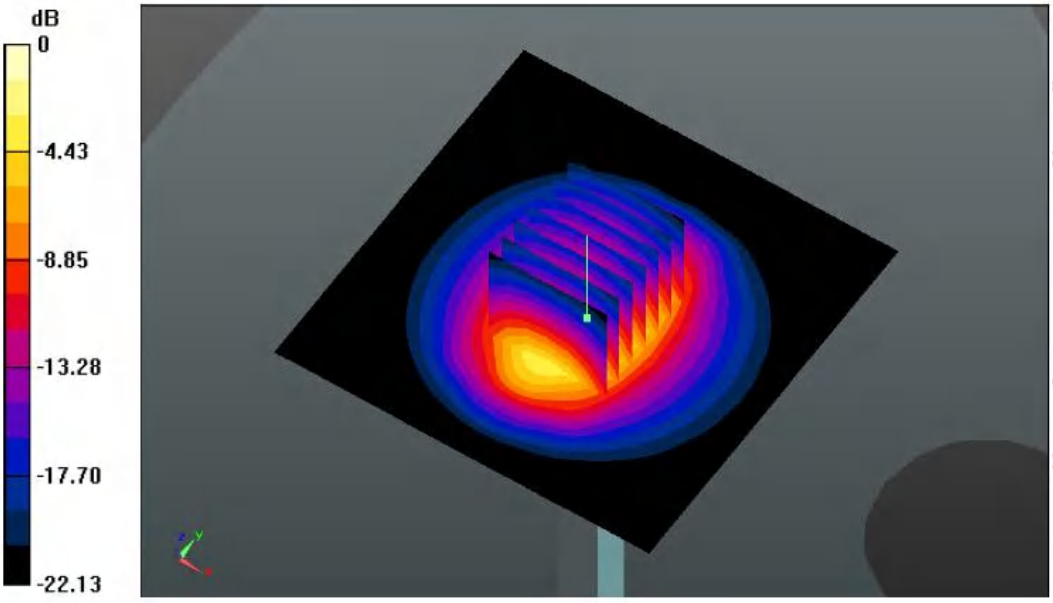
2450MHz Head System Check Date:07/18/2024

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 910

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2450 MHz; σ = 1.85S/m; εr = 39.08; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY5 Configuration:
Probe: EX3DV4 - SN7396; ConvF(7.57, 7.57, 7.57); Calibrated: May 06, 2024;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06.2023;
Phantom: SAM 1; Type: SAM;
Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Area Scan (61x91x1): Measurement grid: dx=10.00 mm, dy=10.00 mm
Maximum value of SAR (interpolated) = 19.664 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.571 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 26.125 W/kg
SAR(1 g) = 12.95 W/kg; SAR(10 g) = 5.92 W/kg
Maximum value of SAR (measured) = 19.47W/kg



2600MHz Head System Check Date:07/19/2024

DUT: Dipole 2600 MHz; Type: D2600V2;

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2600 MHz; σ = 2.03 S/m; εr = 39.35; ρ = 1000 kg/m3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38, 7.38); Calibrated: May 06, 2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn387; Calibrated: Sep.06.2023
- Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Configuration/Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 24.576 W/kg

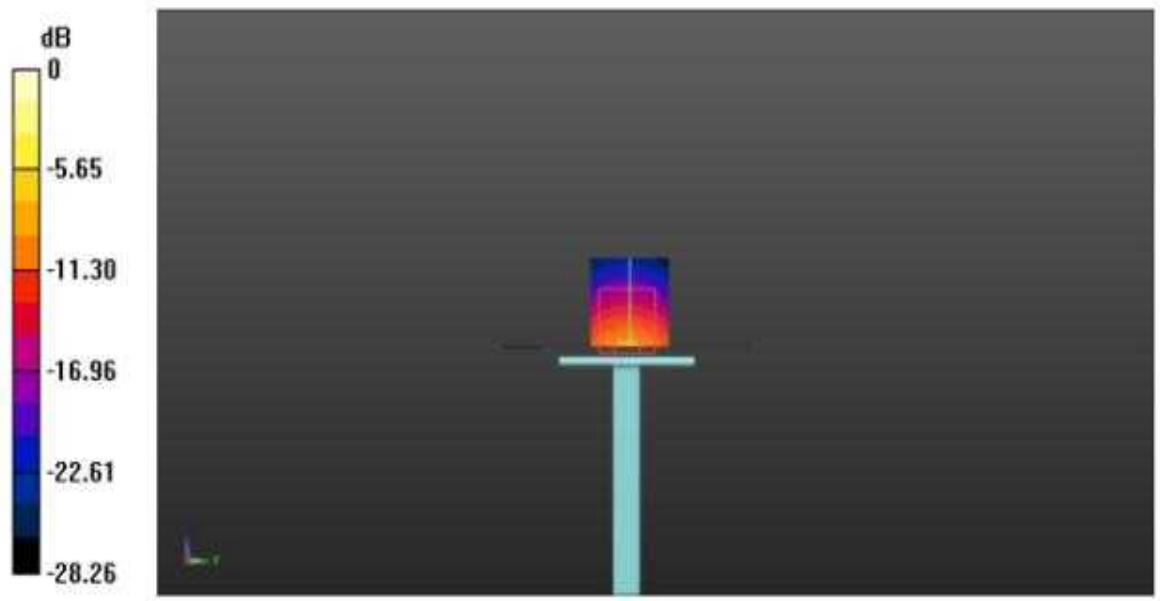
Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.147 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 33.245 W/kg

SAR(1 g) = 13.91 W/kg; SAR(10 g) = 6.43 W/kg

Maximum value of SAR (measured) = 25.668 W/kg



5200MHz Head System Check Date:07/22/2024

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1160

Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; σ = 5.20 S/m; ε_r = 48.23; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 – SN7396; ConvF(5.33, 5.33, 5.33); Calibrated: May 06, 2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn387; Calibrated: Sep. 06, 2023
- Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Configuration/Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 20.9 W/kg

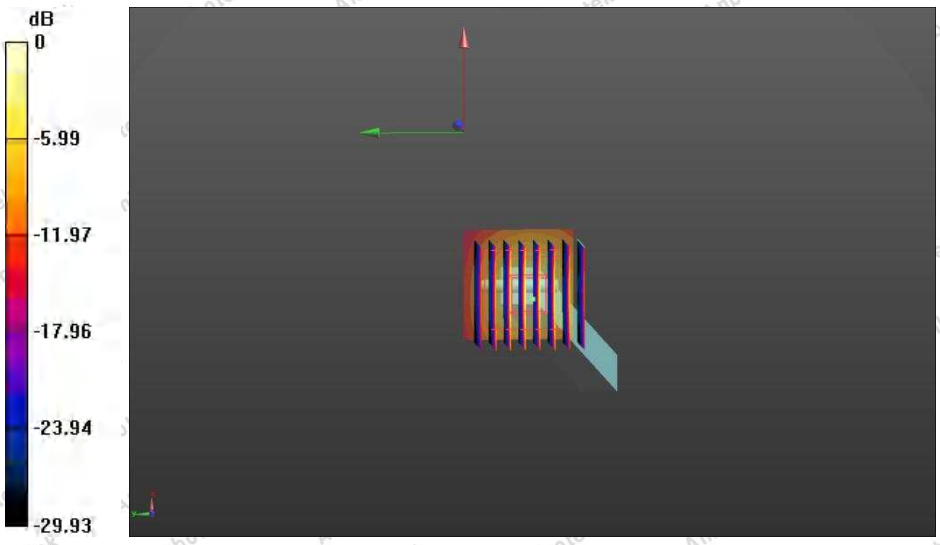
Configuration/Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 59.857 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 34.58 W/kg

SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.21 W/kg

Maximum value of SAR (measured) = 20.8 W/kg



5800MHz Head System Check Date:07/23/2024

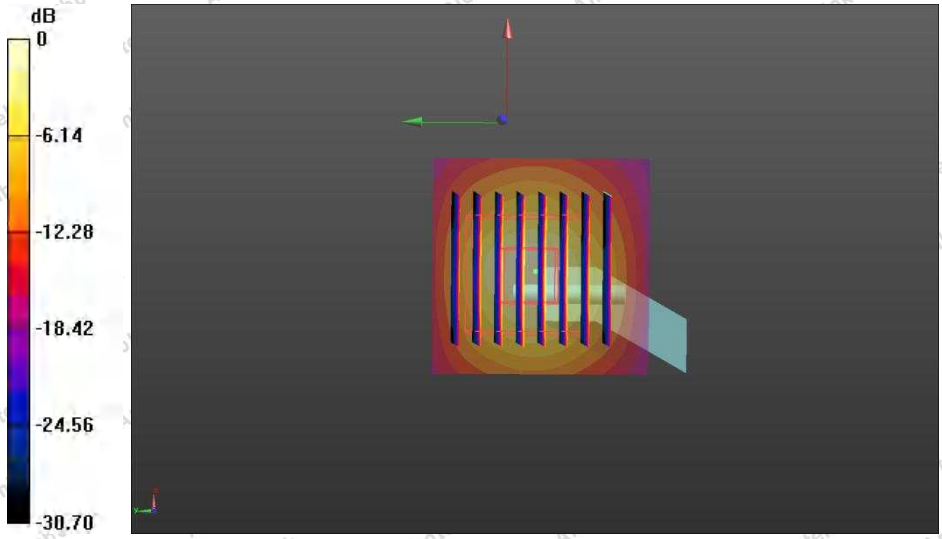
DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1160
Communication System: UID 0, CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.85 S/m; ε_r = 48.45; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 – SN7396; ConvF(4.92, 4.92, 4.92); Calibrated: May 06, 2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn387; Calibrated: Sep. 06, 2023
- Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Configuration/Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.8 W/kg

Configuration/Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 56.773 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.95 W/kg; SAR(10 g) = 2.23 W/kg
Maximum value of SAR (measured) = 19.8 W/kg



Appendix C. Plots of SAR Test Data

#1 Date: 07/17/2024

LTE Band 2_ Left Cheek Touch _1RB_Ch18900

Communication System: UID 0, Generic LTE (0); Frequency: 1880MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1880 MHz; = 1.46 S/m; εr= 40.12; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(8.13, 8.13,8.13); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

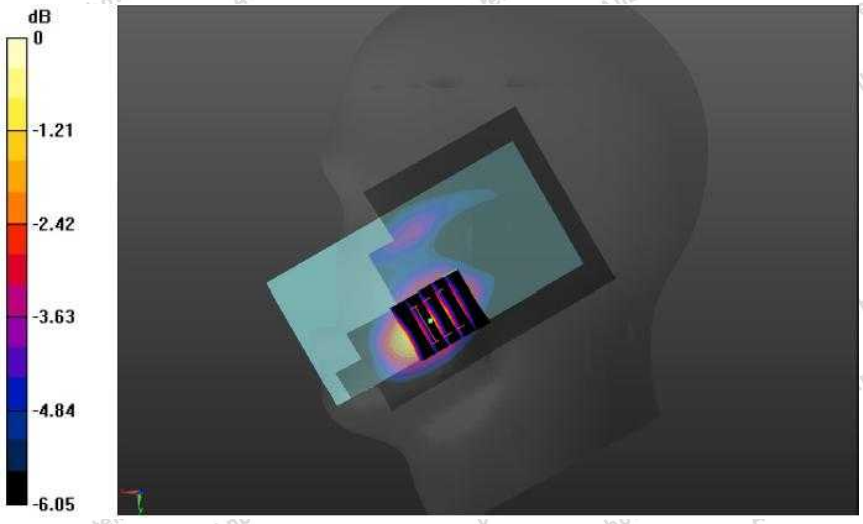
Maximum value of SAR (interpolated) =0.621 W/kg

Left Cheek Touch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.542 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.685 W/kg

SAR(1 g) = 0.539 W/kg; SAR(10 g) = 0.277 W/kg

Maximum value of SAR (measured) = 0.663 W/kg



#2 Date: 07/16/2024

LTE Band 4_ Left Cheek Touch _1RB_Ch20175

Communication System: UID 0, Generic LTE (0); Frequency: 1732.5MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; = 1.41 S/m; εr= 40.25; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(8.61, 8.61,8.61); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

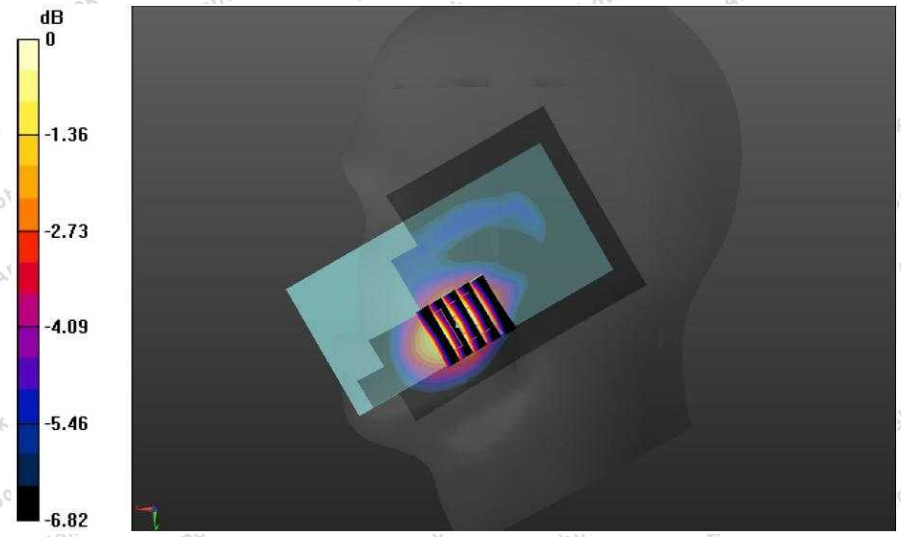
Maximum value of SAR (interpolated) =0.805 W/kg

Left Cheek Touch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.664 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.855 W/kg

SAR(1 g) = 0.637 W/kg; SAR(10 g) = 0.312 W/kg

Maximum value of SAR (measured) = 0.765 W/kg



#3 Date: 07/15/2024

LTE Band 5_ Left Cheek Touch _1RB_Ch20450

Communication System: UID 0, Generic LTE (0); Frequency: 829MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 829 MHz; = 0.92 S/m; εr= 41.62; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(9.71, 9.71,9.71); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

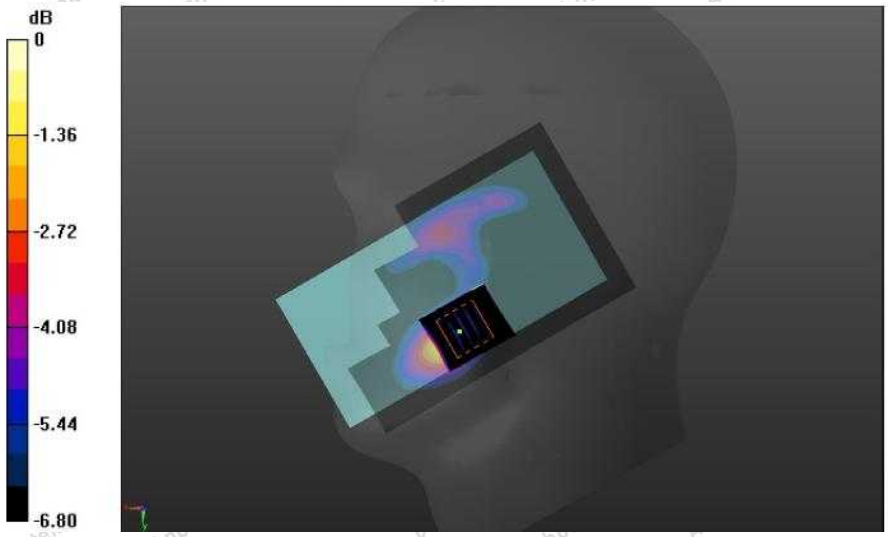
Maximum value of SAR (interpolated) =0.711 W/kg

Left Cheek Touch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.654 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.757 W/kg

SAR(1 g) = 0.715 W/kg; SAR(10 g) = 0.362 W/kg

Maximum value of SAR (measured) = 0.862 W/kg



#4 Date: 07/19/2024

LTE Band 7_ Left Cheek Touch _1RB_ Ch21100

Communication System: UID 0, Generic LTE (0); Frequency: 2535 MHz;
Medium parameters used (interpolated): f=2535 MHz; σ=2.03 S/m; εr=39.35; ρ=1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38, 7.38); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

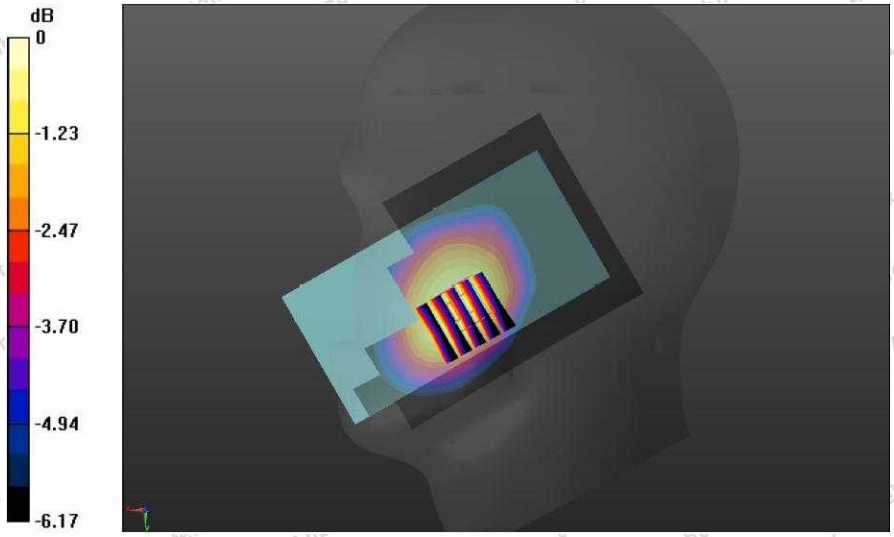
Maximum value of SAR (interpolated) = 0.647 W/kg

Left Cheek Touch /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.584 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.663 W/kg

SAR(1 g) = 0.546 W/kg; SAR(10 g) = 0.279 W/kg

Maximum value of SAR (measured) =0.635 W/kg



#5 Date: 07/15/2024

LTE Band 17_ Left Cheek Touch _1RB_ Ch23780

Communication System: UID 0, Generic LTE (0); Frequency: 709 MHz;
Medium parameters used (interpolated): f=709 MHz; σ=0.91 S/m; εr=41.73; ρ=1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(9.82, 9.82, 9.82); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.963 W/kg

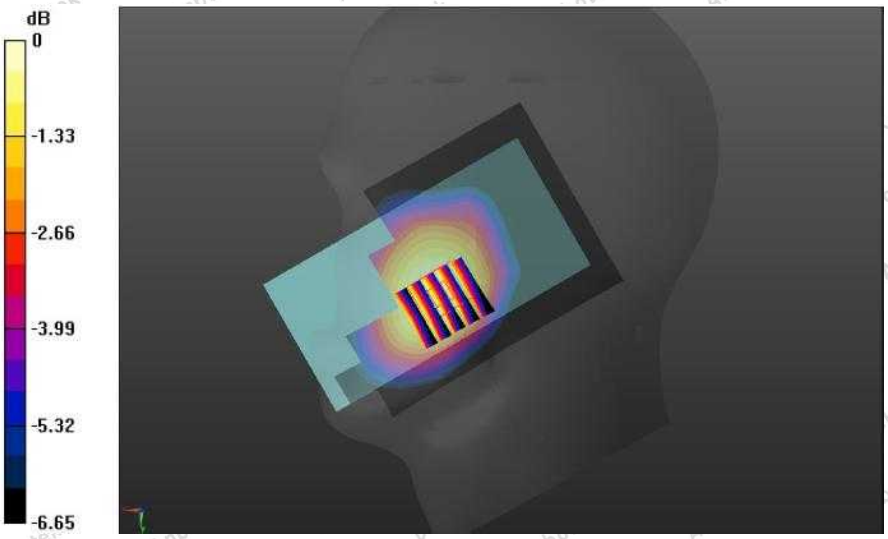
Left Cheek Touch /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.528 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.879 W/kg

SAR(1 g) = 0.733 W/kg; SAR(10 g) = 0.368 W/kg

Maximum value of SAR (measured) =0.968 W/kg



#6 Date: 07/19/2024

LTE Band 38_ Left Cheek Touch _1RB_ Ch38000

Communication System: UID 0, Generic LTE (0); Frequency: 2595 MHz;
Medium parameters used (interpolated): f=2595 MHz; σ=2.03 S/m; εr=39.35; ρ=1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38, 7.38); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.667 W/kg

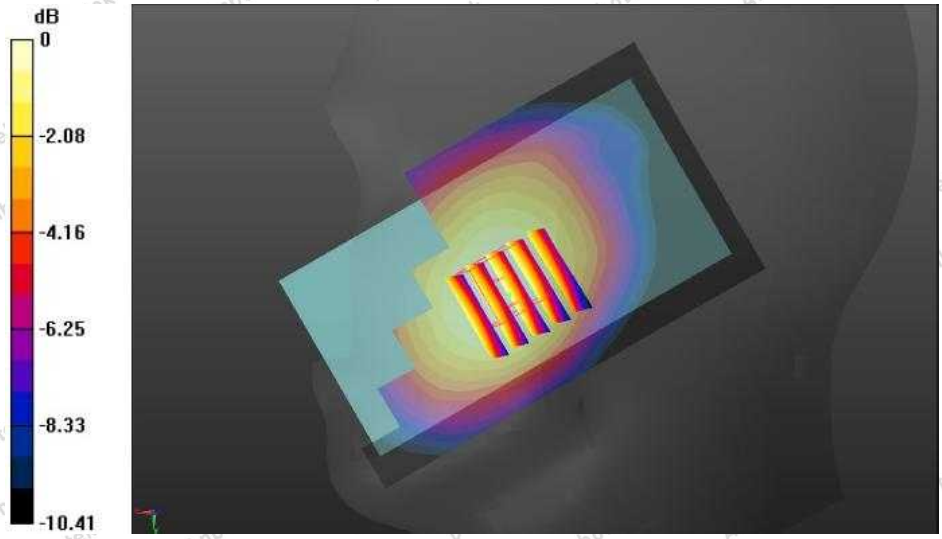
Left Cheek Touch /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.596 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.683 W/kg

SAR(1 g) = 0.566 W/kg; SAR(10 g) = 0.269 W/kg

Maximum value of SAR (measured) =0.733 W/kg



#7 Date: 07/19/2024

LTE Band 41_ Left Cheek Touch _1RB_Ch41140

Communication System: UID 0, Generic LTE (0); Frequency: 2645 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2645 MHz; σ = 2.03 S/m; εr = 39.35; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38, 7.38); Calibrated: May 06.2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

Maximum value of SAR (interpolated) = 0.684 W/kg

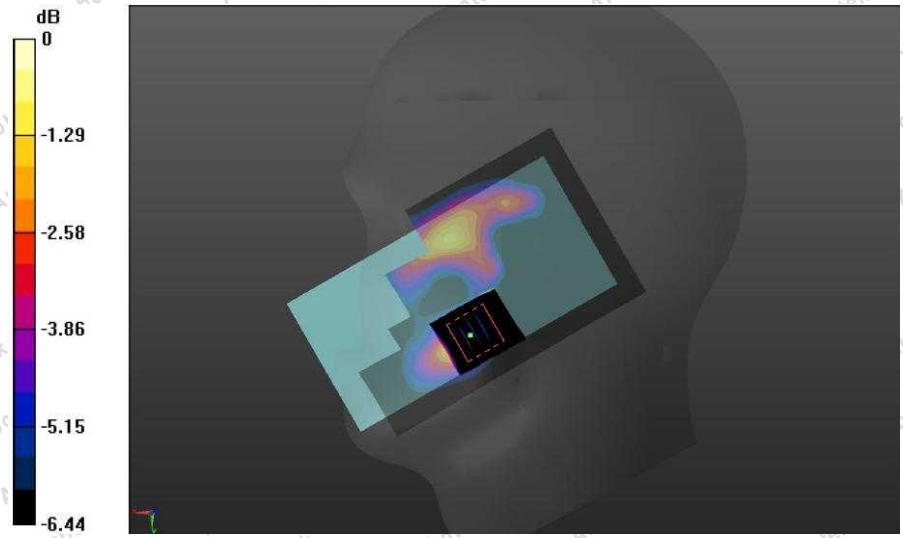
Left Cheek Touch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.056 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.712 W/kg

SAR(1 g) = 0.523 W/kg; SAR(10 g) = 0.255 W/kg

Maximum value of SAR (measured) = 0.771 W/kg



#8 Date: 07/18/2024

WIFI 2.4G_802.11g_ Left Cheek Touch _Ch6

Communication System: UID 0, wifi (fcc) (0); Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.85 S/m; ε_r = 39.08; ρ = 1000 kg/m^3

Phantom section: Flat Section

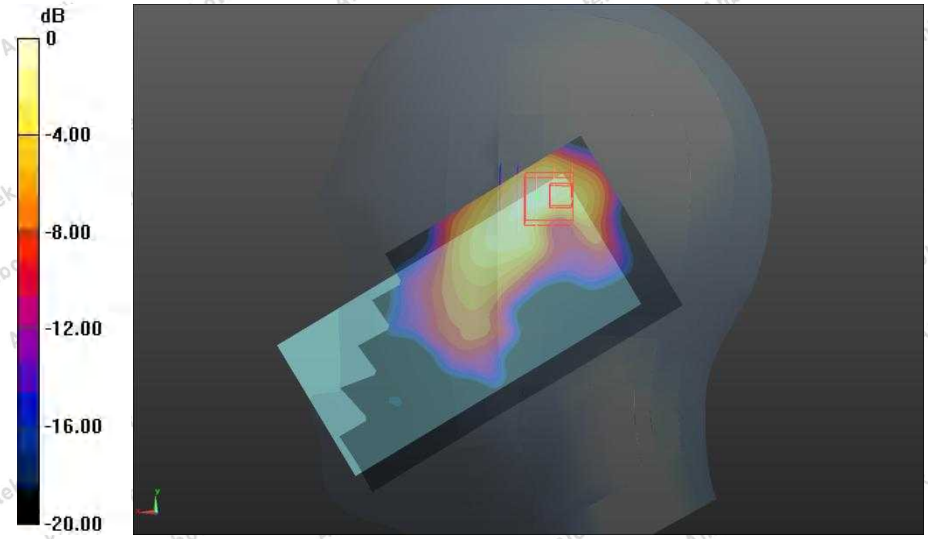
DASY5 Configuration:

•Probe: EX3DV4 - SN7396; ConvF(7.57, 7.57, 7.57); Calibrated: May 06.2024;
•Sensor-Surface: 4mm (Mechanical Surface Detection)
•Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
•Phantom: SAM 1; Type: SAM;
•Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (91x161x1): Measurement grid: dx=1.200mm, dy=1.200mm
Maximum value of SAR (measured) = 0.352 W/kg

Left Cheek Touch /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.463 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.474 W/kg
SAR(1 g) = 0.275 W/kg; SAR(10 g) = 0.133 W/kg

Maximum value of SAR (measured) = 0.332 W/kg



#9 Date: 07/22/2024

WIFI 5.2G_802.11ac(VHT80)_ Left Cheek Touch _Ch42

Communication System: UID 0, 802.11 (0); Frequency: 5210MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5210 MHz; σ = 5.20 S/m; ε_r= 48.23; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(5.33, 5.33, 5.33); Calibrated: May 06.2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM2; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (91x161x1): Measurement grid: dx=1.000mm, dy=1.000mm

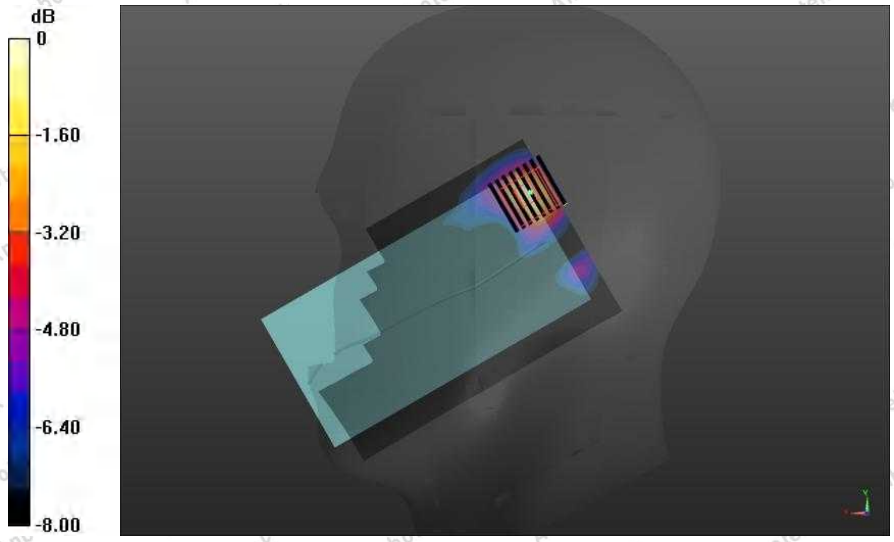
Maximum value of SAR (measured) = 0.223 W/kg

Left Cheek Touch /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 4.159 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.248 W/kg

SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.170 W/kg

Maximum value of SAR (measured) = 0.305 W/kg



#10 Date: 07/23/2024

WIFI 5.8G_802.11ac(VHT80)_ Left Cheek Touch _Ch155

Communication System: UID 0, wifi (fcc) (0); Frequency: 5775MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 5775 MHz; σ = 5.85 S/m; εr = 48.45; ρ = 1000 kg/m3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 – SN7396; ConvF(4.92, 4.92, 4.92); Calibrated: May 06, 2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn387; Calibrated: Sep. 06, 2023
- Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

Left Cheek Touch /Area Scan (91x161x1): Measurement grid: dx=1.000mm, dy=1.000mm

Maximum value of SAR (measured) = 0.442 W/kg

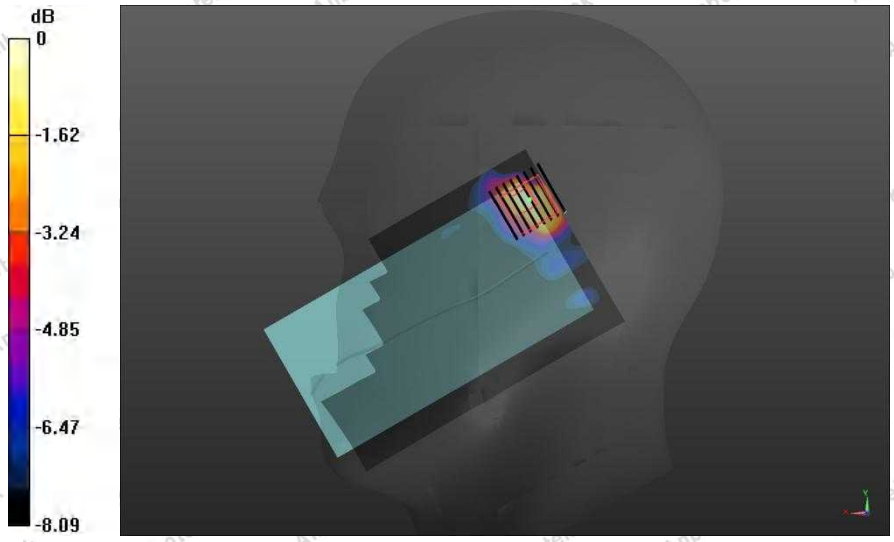
Left Cheek Touch /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 5.358 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.586 W/kg

SAR(1 g) = 0.365 W/kg; SAR(10 g) = 0.187 W/kg

Maximum value of SAR (measured) = 0.462 W/kg



#11 Date: 07/17/2024

LTE Band 2_ Body Back_1RB_Ch18900

Communication System: UID 0, Generic LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.46 S/m; εr= 40.12; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(8.13, 8.13,8.13); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

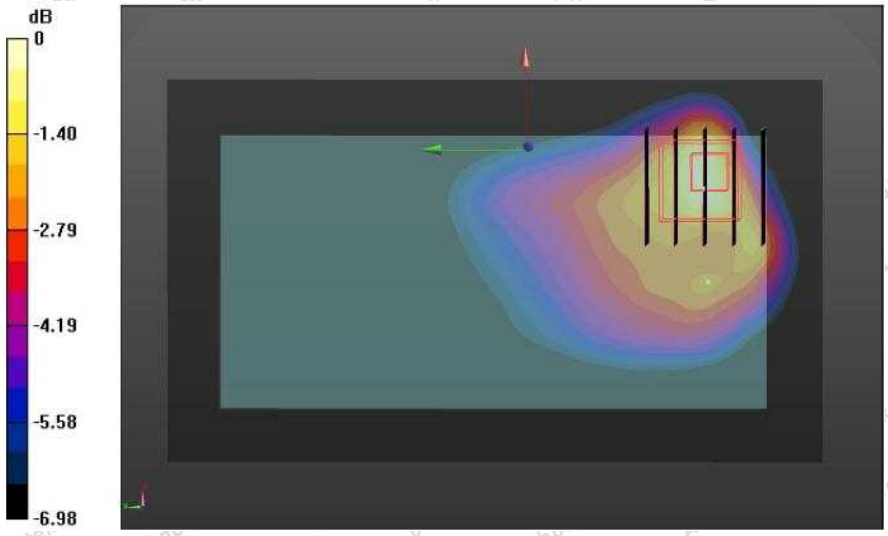
Maximum value of SAR (interpolated) = 1.157 W/kg

BODY/ BACK /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.413 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.153 W/kg

SAR(1 g) = 0.321 W/kg; SAR(10 g) = 0.168W/kg

Maximum value of SAR (measured) = 0.356 W/kg



#12 Date: 07/16/2024

LTE Band 4_ Body Back_1RB_Ch20175

Communication System: UID 0, Generic LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.41 S/m; εr= 40.25; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(8.61, 8.61,8.61); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

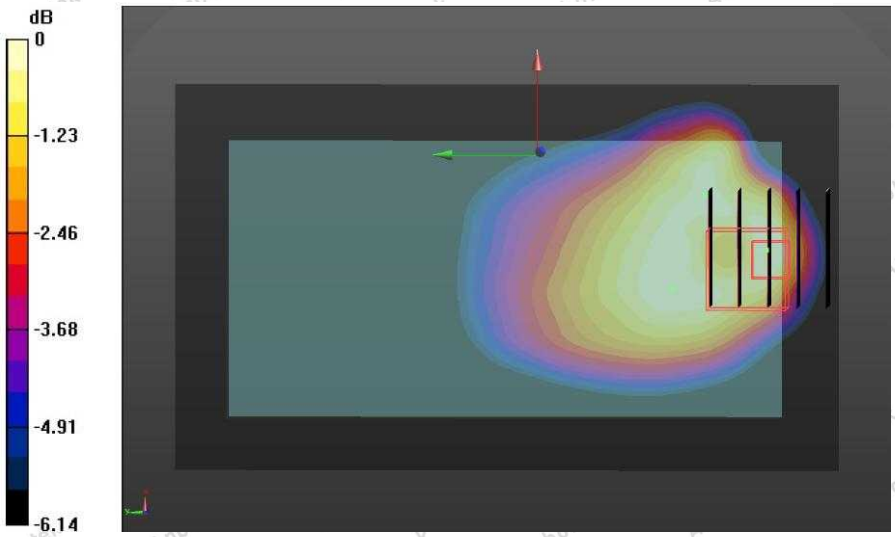
Maximum value of SAR (interpolated) = 1.573 W/kg

BODY/ BACK /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.582 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.471 W/kg

SAR(1 g) = 0.436 W/kg; SAR(10 g) = 0.221W/kg

Maximum value of SAR (measured) = 0.458 W/kg



#13 Date: 07/15/2024

LTE Band 5_ Body Back_1RB_Ch20450

Communication System: UID 0, Generic LTE (0); Frequency: 829 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 829 MHz; σ = 0.92 S/m; εr= 41.62; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(9.71, 9.71,9.71); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

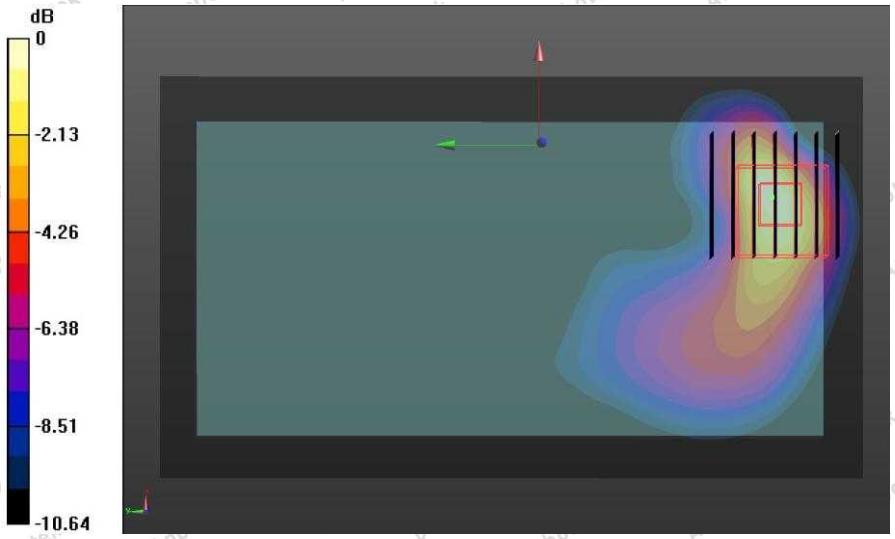
Maximum value of SAR (interpolated) = 1.426 W/kg

BODY/ BACK /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.425 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.564 W/kg

SAR(1 g) = 0.629 W/kg; SAR(10 g) = 0.310W/kg

Maximum value of SAR (measured) = 0.634 W/kg



#14 Date: 07/19/2024

LTE Band 7_ Body Back_1RB_ Ch21100

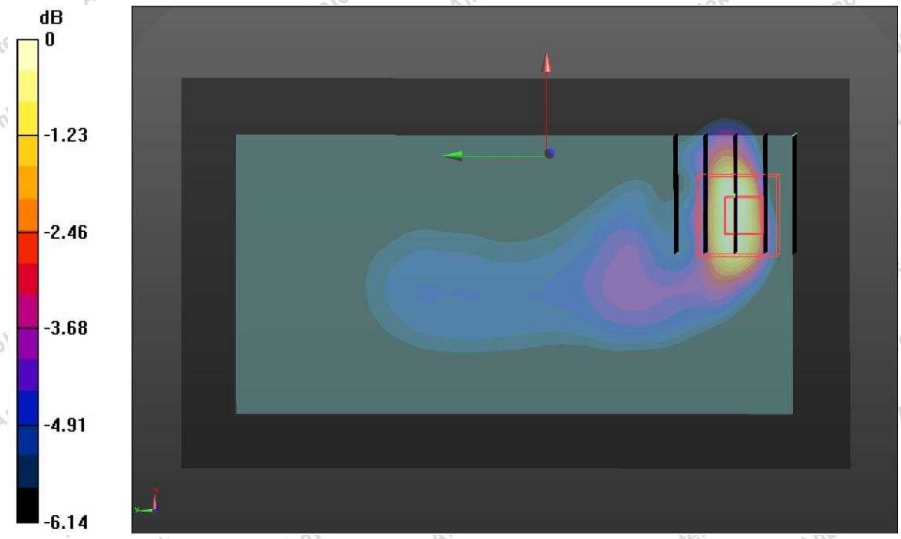
Communication System: UID 0, Generic LTE (0); Frequency: 2535 MHz;
Medium parameters used (interpolated): f=2535 MHz; σ=2.03,S/m; εr=39.35; ρ=1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:

Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38, 7.38); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) =0.558 W/kg

BODY/ BACK /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.275 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.987 W/kg
SAR(1 g) = 0.310 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) =0.465 W/kg



#15 Date: 07/15/2024

LTE Band 7_ Body Back_1RB_ Ch23780

Communication System: UID 0, Generic LTE (0); Frequency: 709 MHz;

Medium parameters used (interpolated): f=709 MHz; σ=0.91,S/m; εr=41.73; ρ=1000 kg/m3

Phantom section: Left Section

DASY5 Configuration:

Probe: EX3DV4 – SN7396; ConvF(9.82, 9.82, 9.82); Calibrated: May 06, 2024;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn387; Calibrated: Sep.06,2023

Phantom: SAM; Type: QD000P40CD; Serial: TP:1670

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) =1.158 W/kg

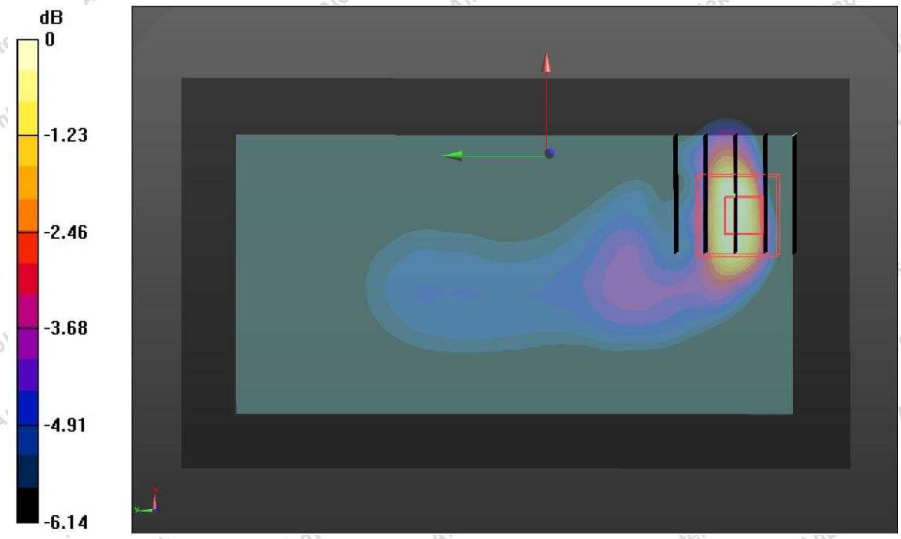
BODY/ BACK /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.284 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.174 W/kg

SAR(1 g) = 0.563 W/kg; SAR(10 g) = 0.285 W/kg

Maximum value of SAR (measured) =0.574 W/kg



#16 Date: 07/19/2024

LTE Band 38_ Body Back_1RB_Ch38000

Communication System: UID 0, Generic LTE (0); Frequency: 2595 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2595 MHz; σ = 2.03 S/m; εr= 39.35; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38,7.38); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

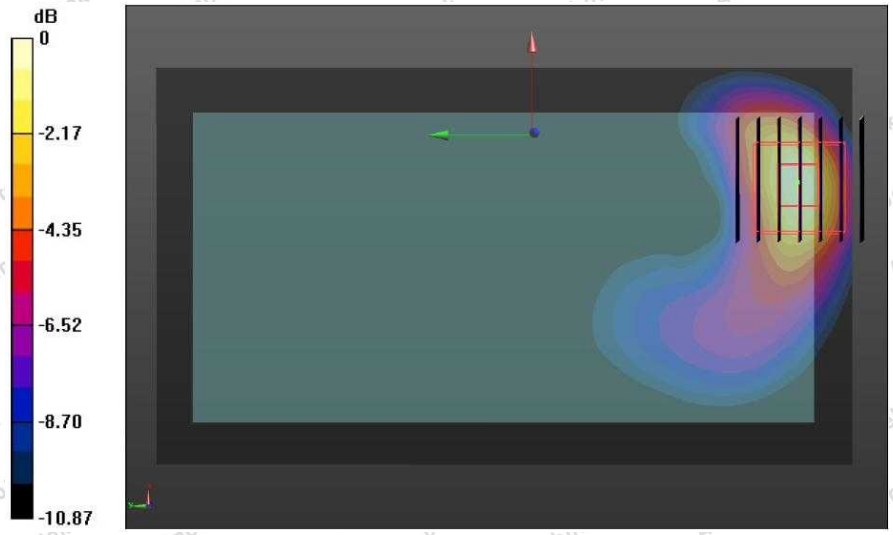
Maximum value of SAR (interpolated) = 1.101 W/kg

BODY/ BACK /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.335 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.121 W/kg

SAR(1 g) = 0.347 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.435 W/kg



#17 Date: 07/19/2024

LTE Band 41_ Body Back_1RB_Ch41140

Communication System: UID 0, Generic LTE (0); Frequency: 2645 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2645 MHz; = 2.03 S/m; εr= 39.35; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(7.38, 7.38,7.38); Calibrated: May 06, 2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/BACK /Area Scan (71x131x1): Measurement grid: dx=1.500mm, dy=1.500mm

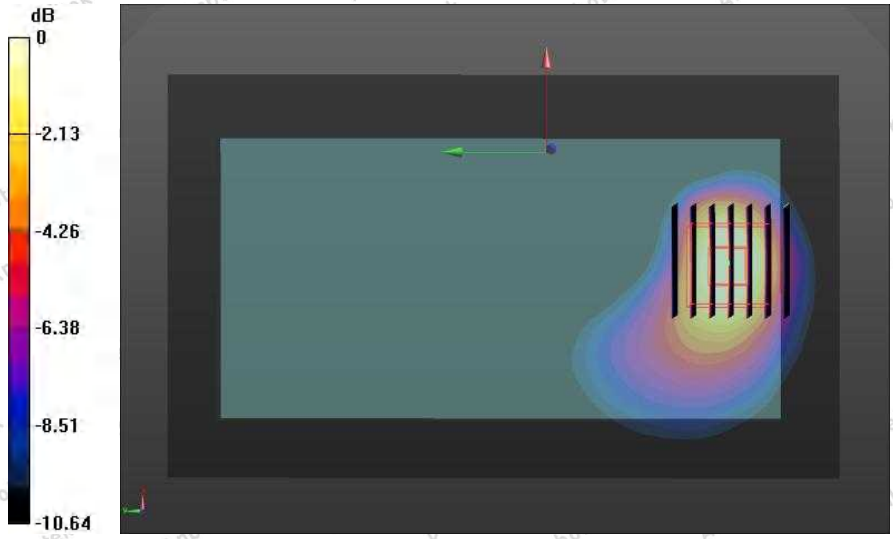
Maximum value of SAR (interpolated) = 1.323 W/kg

BODY/BACK/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.832 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.256 W/kg

SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.158 W/kg

Maximum value of SAR (measured) = 0.396 W/kg



#18 Date: 07/18/2024

WIFI 2.4G_802.11g_Body Back _Ch6

Communication System: UID 0, wifi (fcc) (0); Frequency: 2437 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.85 S/m; ε_r = 39.08; ρ = 1000 kg/m^3

Phantom section: Flat Section

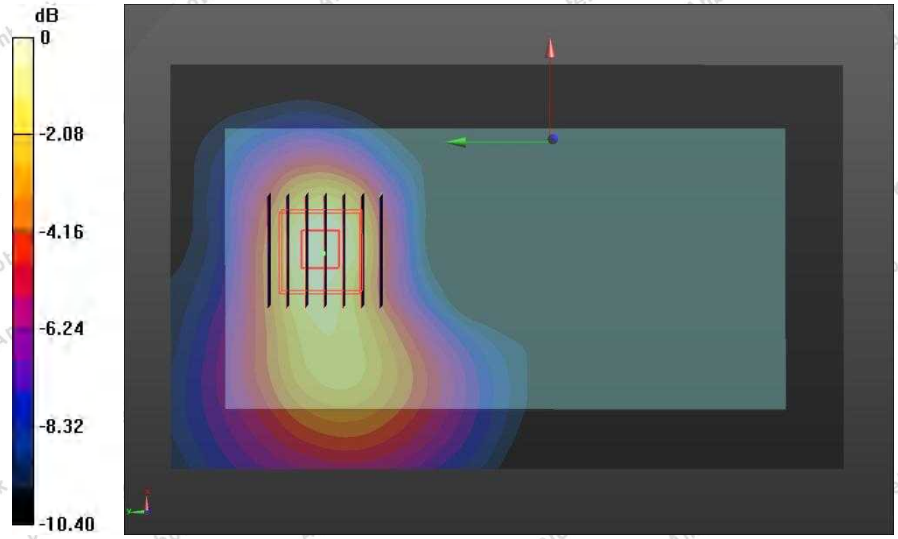
DASY5 Configuration:

•Probe: EX3DV4 - SN7396; ConvF(7.57, 7.57, 7.57); Calibrated: May 06.2024;
•Sensor-Surface: 4mm (Mechanical Surface Detection)
•Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
•Phantom: SAM 1; Type: SAM;
•Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.10 (7164)

BODY/BACK/Area Scan (91x161x1): Measurement grid: dx=1.200mm, dy=1.200mm
Maximum value of SAR (measured) = 1.676 W/kg

BODY/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.586 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.676 W/kg
SAR(1 g) = 0.253 W/kg; SAR(10 g) = 0.119 W/kg

Maximum value of SAR (measured) = 0.357 W/kg



#19 Date: 07/22/2024

WIFI 5.2G_802.11ac(VHT80)_Body back_Ch42

Communication System: UID 0, 802.11 (0); Frequency: 5210MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5210 MHz; σ = 5.20 S/m; ε_r= 48.23; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:

Probe: EX3DV4 – SN7396; ConvF(5.33, 5.33, 5.33); Calibrated: May 06.2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM2; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

BODY/BACK/Area Scan (91x161x1): Measurement grid: dx=1.000mm, dy=1.000mm

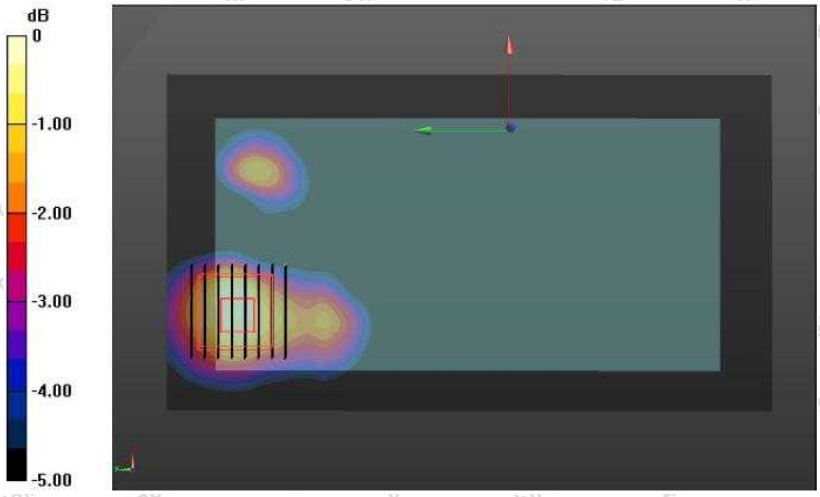
Maximum value of SAR (measured) = 0.632W/kg

BODY/BACK/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 6.166 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.644 W/kg

SAR(1 g) = 0.285 W/kg; SAR(10 g) = 0.144 W/kg

Maximum value of SAR (measured) = 0.524 W/kg



#20 Date: 07/23/2024

WIFI 5.8G_802.11ac(VHT80)_Body back _Ch155

Communication System: UID 0, 802.11 (0); Frequency: 5775MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5775 MHz; σ = 5.85 S/m; ε_r= 48.45; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 – SN7396; ConvF(4.92, 4.92, 4.92); Calibrated: May 05,2024;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn387; Calibrated: Sep.06,2023
Phantom: SAM2; Type: QD000P40CD; Serial: TP:1670
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

BODY/ BACK /Area Scan (91x161x1): Measurement grid: dx=1.500mm, dy=1.500mm

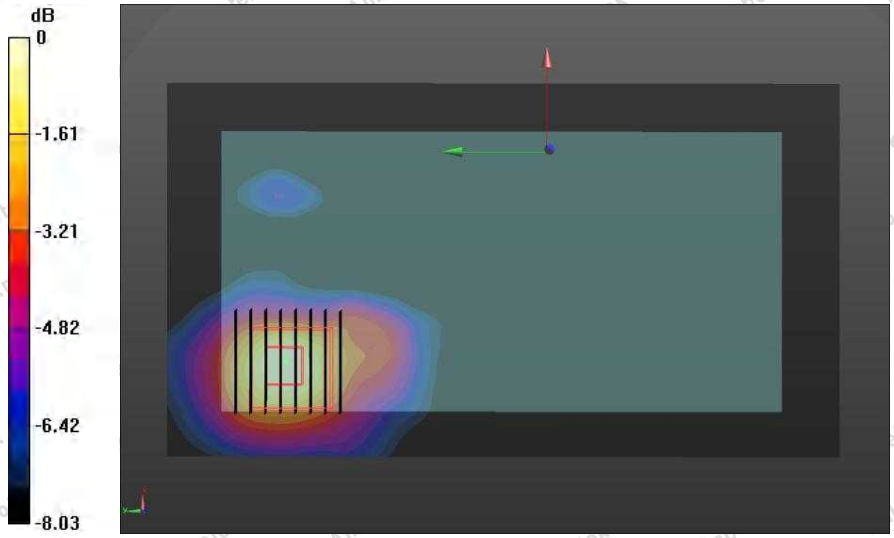
Maximum value of SAR (measured) =0.335 W/kg

BODY/ BACK /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 5.123 V/m; Power Drift =0.06 dB
Peak SAR (extrapolated) = 0.447 W/kg

SAR(1 g) = 0.301 W/kg; SAR(10 g) = 0.150 W/kg

Maximum value of SAR (measured) = 0.433 W/kg



Appendix D. DASY System Calibration Certificate

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client **Anbotek (Auden)** **Certificate No: Z24-98671**

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:7396

Calibration Procedure(s) FF-Z12-006-08
Calibration Procedures for Dosimetric E-field Probes

Calibration date: May 06, 2024

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	20-Jun-23 (CTTL, No.J23X07447)	Jun-23
Power sensor NRP-Z91	101547	20-Jun-23 (CTTL, No.J23X07447)	Jun-23
Power sensor NRP-Z91	101548	20-Jun-23 (CTTL, No.J23X07447)	Jun-23
Reference10dBAttenuator	18N50W-10dB	13-Mar-24(CTTL,No.J24X01547)	Mar-24
Reference20dBAttenuator	18N50W-20dB	13-Mar-24(CTTL, No.J24X01548)	Mar-24
Reference Probe EX3DV4	SN 7433	26-Sep-23(SPEAG,No.EX3-7433_Sep22)	Sep-23
DAE4	SN 549	13-Dec-23(SPEAG, No.DAE4-549_Dec22)	Dec-23
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	27-Jun-23 (CTTL, No.J23X04776)	Jun-23
Network Analyzer E5071C	MY46110673	13-Jan-24 (CTTL, No.J24X00285)	Jan-24

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: May 06, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z24-98671 Page 1 of 11

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Probe EX3DV4

SN: 7396

Calibrated: May 06, 2024

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7396

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)^A	0.54	0.53	0.50	±10.0%
DCP(mV)^B	97.8	104.5	102.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	199.9	±2.4%
		Y	0.0	0.0	1.0		203.3	
		Z	0.0	0.0	1.0		195.0	

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

^{A} The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and Page 6).
^{B} Numerical linearization parameter: uncertainty not required.
^{E} Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7396

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	9.82	9.82	9.82	0.30	0.85	±12.1%
835	41.5	0.90	9.71	9.71	9.71	0.15	1.36	±12.1%
900	41.5	0.97	9.87	9.87	9.87	0.16	1.37	±12.1%
1750	40.1	1.37	8.61	8.61	8.61	0.25	1.04	±12.1%
1900	40.0	1.40	8.13	8.13	8.13	0.24	1.01	±12.1%
2100	39.8	1.49	8.14	8.14	8.14	0.24	1.04	±12.1%
2300	39.5	1.67	7.85	7.85	7.85	0.40	0.75	±12.1%
2450	39.2	1.80	7.57	7.57	7.57	0.50	0.75	±12.1%
2600	39.0	1.96	7.38	7.38	7.38	0.64	0.68	±12.1%
5250	35.9	4.71	5.33	5.33	5.33	0.45	1.30	±13.3%
5600	35.5	5.07	4.89	4.89	4.89	0.45	1.35	±13.3%
5750	35.4	5.22	4.92	4.92	4.92	0.45	1.45	±13.3%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7396

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	55.5	0.96	10.09	10.09	10.09	0.30	0.90	±12.1%
835	55.2	0.97	9.88	9.88	9.88	0.19	1.32	±12.1%
900	55.0	1.05	9.82	9.82	9.82	0.23	1.15	±12.1%
1750	53.4	1.49	8.24	8.24	8.24	0.24	1.06	±12.1%
1900	53.3	1.52	7.97	7.97	7.97	0.19	1.24	±12.1%
2100	53.2	1.62	8.18	8.18	8.18	0.19	1.39	±12.1%
2300	52.9	1.81	7.88	7.88	7.88	0.55	0.80	±12.1%
2450	52.7	1.95	7.53	7.53	7.53	0.46	0.89	±12.1%
2600	52.5	2.16	7.38	7.38	7.38	0.52	0.80	±12.1%
5250	48.9	5.36	4.93	4.93	4.93	0.45	1.80	±13.3%
5600	48.5	5.77	4.19	4.19	4.19	0.48	1.90	±13.3%
5750	48.3	5.94	4.52	4.52	4.52	0.48	1.95	±13.3%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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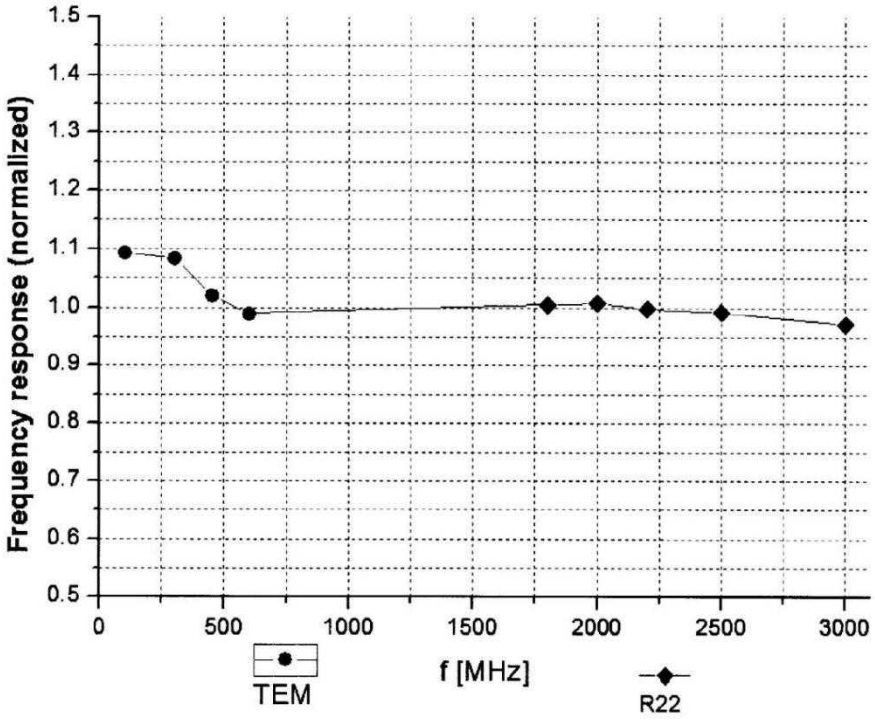
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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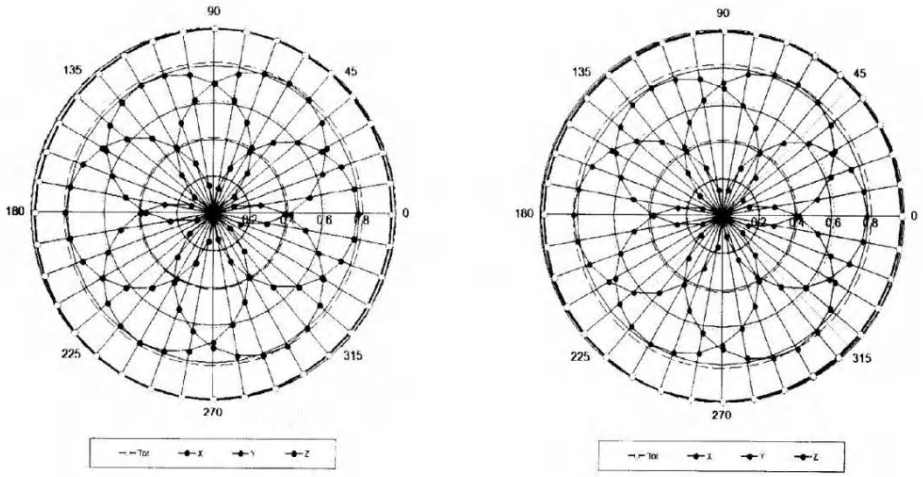
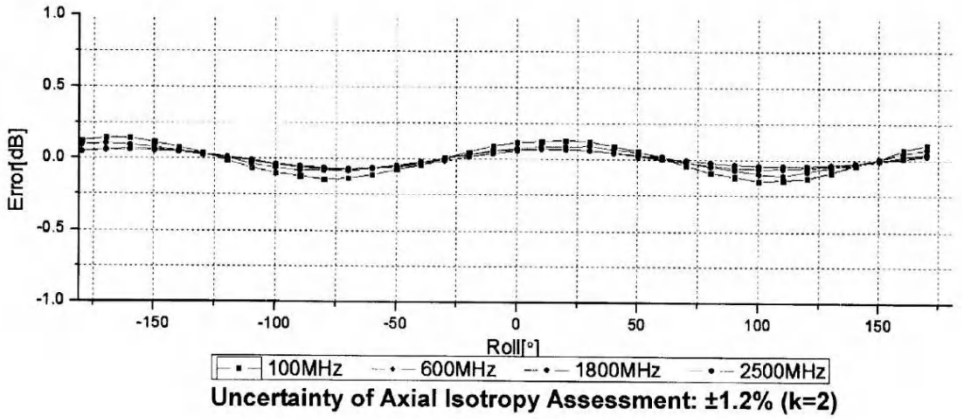
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM **f=1800 MHz, R22**





Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

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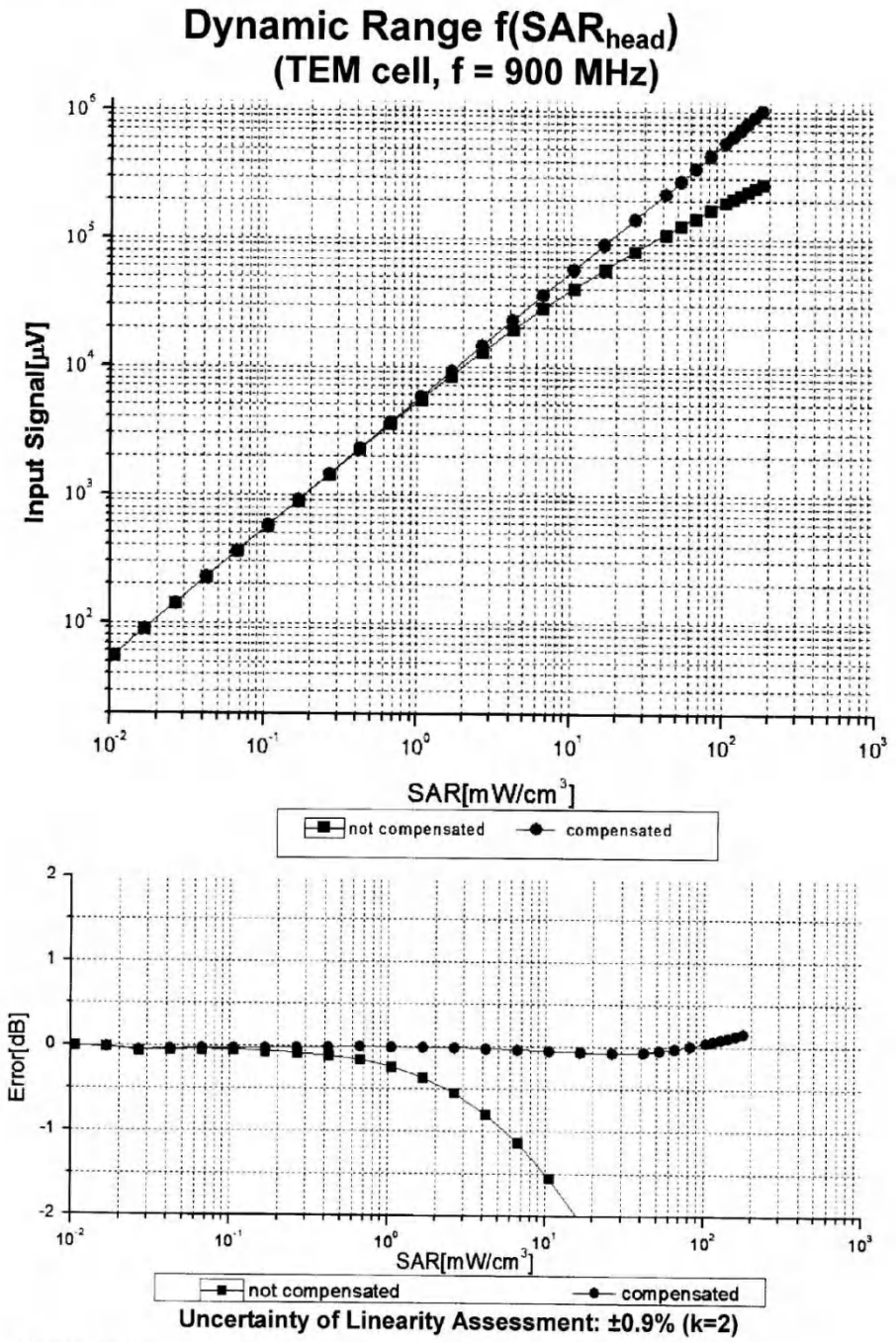

Uncertainty of Linearity Assessment: ±0.9% (k=2)

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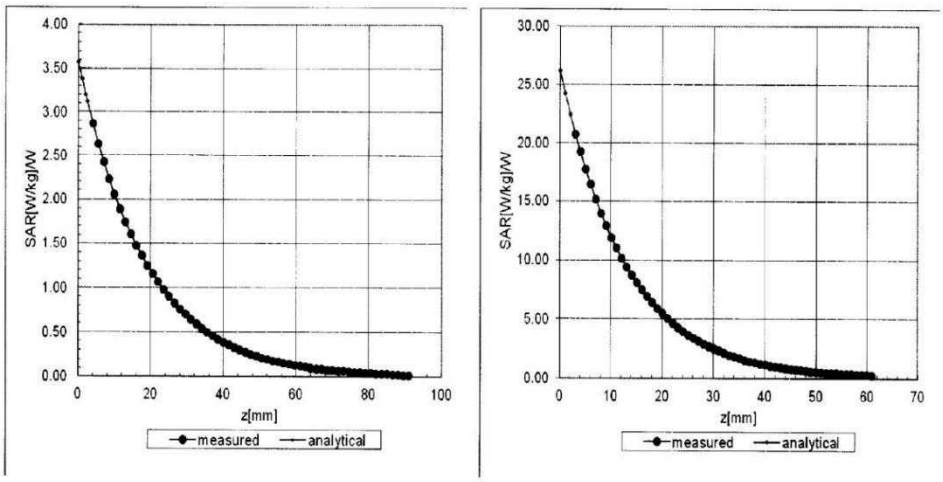
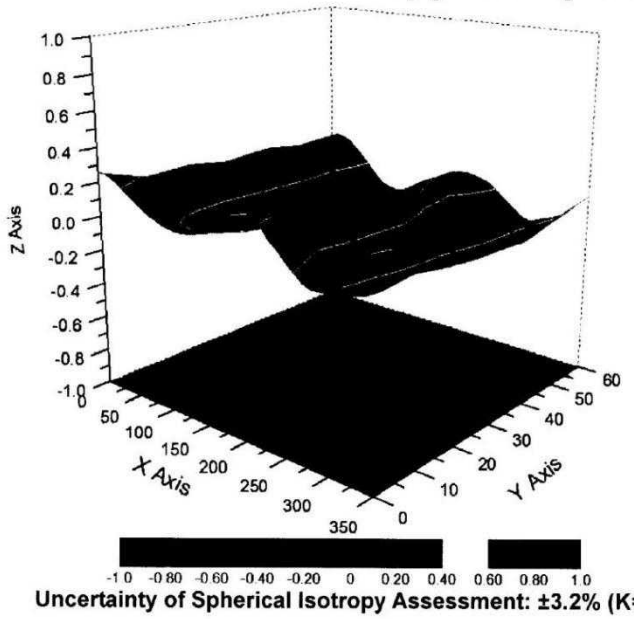
Conversion Factor Assessment

f=900 MHz, WGLS R9(H_convF) **f=1750 MHz, WGLS R22(H_convF)**



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (K=2)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7396

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	156.9
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

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s p e a g

IMPORTANT NOTICE

USAGE OF THE DAE 4

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE4 unit is closed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:
Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:
Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:
To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.

Schmid & Partner Engineering

TN_BR040315AD DAE4.doc 11.12.2009

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client Anbotek (Auden) **Certificate No: DAE4-387_Sep10**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BM - SN: 387
Calibration procedure(s)	QA CAL-06.v29 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	September 06, 2023

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	15-Aug-23 (No:22092)	Aug-22
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	05-Jan-23 (in house check)	In house check: Jan-23
Calibrator Box V2.1	SE UMS 006 AA 1002	05-Jan-23 (in house check)	In house check: Jan-23

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Laboratory Technician	
Approved by:	Sven Kühn	Deputy Manager	

Issued: September 06, 2023

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Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.489 ± 0.02% (k=2)	404.852 ± 0.02% (k=2)	404.862 ± 0.02% (k=2)
Low Range	3.97827 ± 1.50% (k=2)	3.95875 ± 1.50% (k=2)	3.97982 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	53.0 ° ± 1 °

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200032.85	-3.31	-0.00
Channel X	+ Input	20007.64	1.88	0.01
Channel X	- Input	-20003.48	1.18	-0.01
Channel Y	+ Input	200034.23	-1.43	-0.00
Channel Y	+ Input	20006.60	0.91	0.00
Channel Y	- Input	-20004.04	0.72	-0.00
Channel Z	+ Input	200035.38	-0.83	-0.00
Channel Z	+ Input	20003.69	-2.11	-0.01
Channel Z	- Input	-20006.38	-1.59	0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2001.63	0.08	0.00
Channel X	+ Input	202.29	0.70	0.35
Channel X	- Input	-197.90	0.60	-0.30
Channel Y	+ Input	2001.33	-0.07	-0.00
Channel Y	+ Input	200.86	-0.60	-0.30
Channel Y	- Input	-199.87	-1.23	0.62
Channel Z	+ Input	2001.61	0.27	0.01
Channel Z	+ Input	200.60	-0.70	-0.35
Channel Z	- Input	-199.51	-0.85	0.43

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	13.50	11.56
	- 200	-8.64	-11.18
Channel Y	200	-0.81	-1.28
	- 200	1.05	0.09
Channel Z	200	7.17	6.91
	- 200	-9.46	-9.01

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	-1.70	0.33
Channel Y	200	10.70	-	-0.38
Channel Z	200	7.11	7.89	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15969	17466
Channel Y	15661	16162
Channel Z	15990	16190

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.73	-2.58	3.29	0.62
Channel Y	0.41	-0.49	1.23	0.40
Channel Z	-0.80	-1.88	0.30	0.42

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

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Client: Anbotek (Auden) Certificate No: Z24-97076

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1118
Calibration Procedure(s)	FD-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	June 04, 2024

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-23 (CTTL, No.J27X04256)	Jun-21
Power sensor NRP-Z91	101547	01-Jul-23 (CTTL, No.J27X04256)	Jun-21
Reference Probe EX3DV4	SN 7307	19-Feb-24(SPEAG,No.EX3-7307_Feb18)	Feb-22
DAE4	SN 771	02-Feb-24(CTTL-SPEAG,No.Z24-97011)	Feb-22
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	01-Feb-21 (CTTL, No.J18X00893)	Jan-22
Network Analyzer E5071C	MY46110673	26-Jan-21 (CTTL, No.J18X00894)	Jan-22

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: June 07, 2024

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.0.1442
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.06 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.31 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.37 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.52 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.7 ± 6 %	0.97 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.21 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.76 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.48 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.88 mW /g ±18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.3Ω- 4.83jΩ
Return Loss	- 24.9dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.5Ω- 6.11jΩ
Return Loss	- 23.9dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.135 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 06.04.2024

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1118

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.882 S/m; ε_r = 42.14; ρ = 1000 kg/m^3

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(10.05, 10.05, 10.05); Calibrated: 2/19/2024;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2024-02-02
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7372)

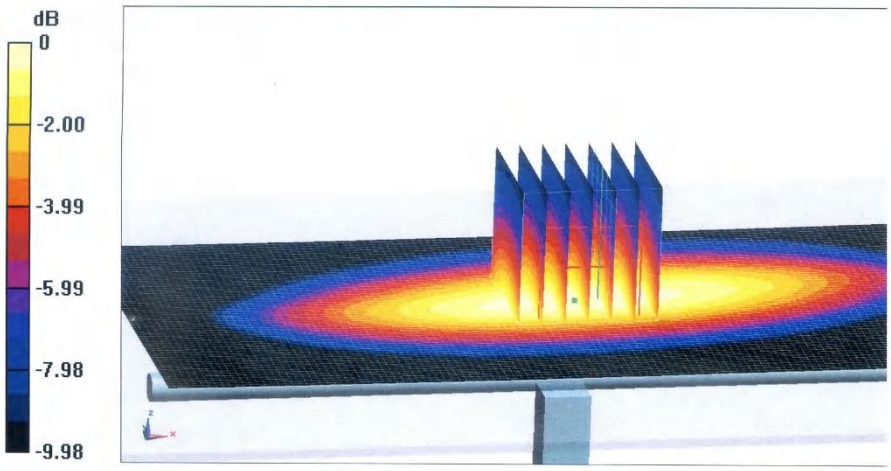
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.45 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.14 W/kg

SAR(1 g) = 2.06 W/kg; SAR(10 g) = 1.37 W/kg

Maximum value of SAR (measured) = 2.75 W/kg



0 dB = 2.75 W/kg = 4.39 dBW/kg

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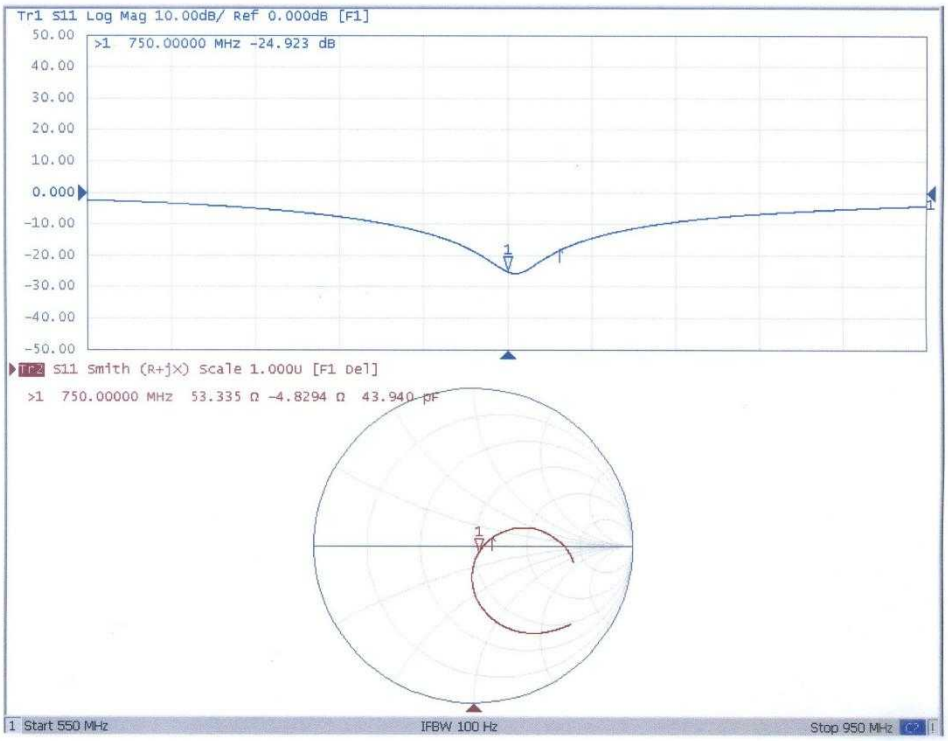
Impedance Measurement Plot for Head TSL



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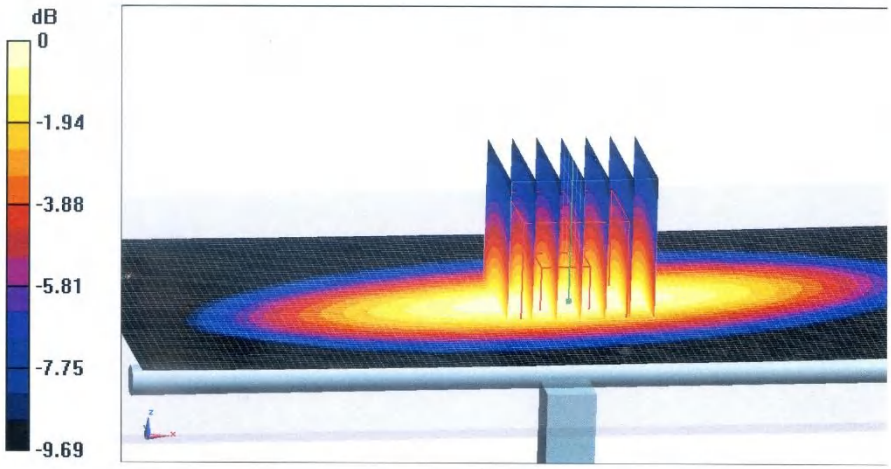
DASY5 Validation Report for Body TSL Date: 06.04.2024
Test Laboratory: CTTL, Beijing, China
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1118
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.972 S/m; ε_r = 55.73; ρ = 1000 kg/m^3
Phantom section: Center Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(9.8, 9.8, 9.8); Calibrated: 2/19/2024;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2024-02-02
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7372)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.05 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.48 W/kg
Maximum value of SAR (measured) = 2.95 W/kg



0 dB = 2.95 W/kg = 4.70 dBW/kg

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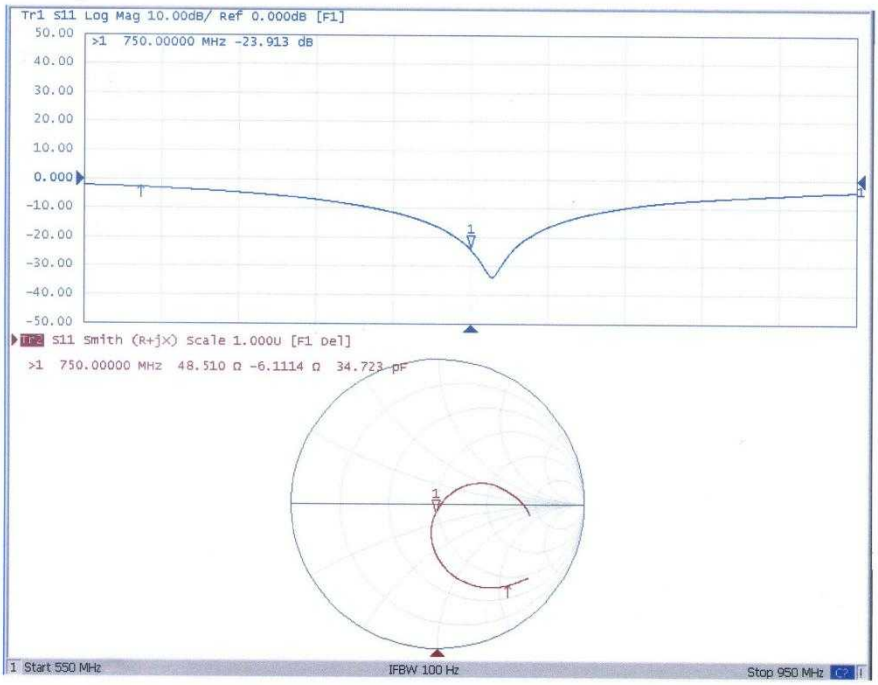
Impedance Measurement Plot for Body TSL



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Client Anbotek (Auden) Certificate No: Z24 -97089

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d154
Calibration Procedure(s)	FD-Z11-2-003-01 Calibration Procedures for dipole validation kits
Calibration date:	Jun 11, 2024

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	1-Jul-23 (CTTL, No.J23X04256)	Jun-24
Power sensor NRP-Z91	101547	1-Jul-23 (CTTL, No.J23X04256)	Jun-24
Reference Probe EX3DV4	SN 7307	19-Feb-24(SPEAG,No.EX3-7307_Feb24)	Feb-25
DAE4	SN 771	02-Feb-24(CTTL-SPEAG,No.Z24-97011)	Feb-25
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	01-Feb-24 (CTTL, No.J24X00893)	Jan-25
Network Analyzer E5071C	MY46110673	26-Jan-24 (CTTL, No.J24X00894)	Jan-25

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: Jun 12, 2024

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010

d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.8.8.1258
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.30 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.24 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.50 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.02 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.4 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.57 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.61 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.36 mW /g ± 20.4 % (k=2)**