

Test Laboratory: Verkotan Oy

DUT: CLA-13 - SN1012; Type: CLA-13; Serial: SN1012

Communication System: UID 0, CW (0); Communication System Band: CLA13 (13.0MHz); Frequency: 13 MHz; Communication System
PAR: 0 dB; PMF: 1

Medium parameters used: $f = 13 \text{ MHz}$; $\sigma = 0.714 \text{ S/m}$; $\epsilon_r = 52.949$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(15.43, 15.43, 15.43) @ 13 MHz; Calibrated: 28.02.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.02.2022
- Phantom: SAR1_Phantom1_EL1; Type: QD OVA 002 AA;
- DASYS2 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/system check/Area Scan (151x151x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.205 W/kg

Configuration/system check/Zoom Scan (7x7x5)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.98 V/m ; Power Drift = -0.12 dB

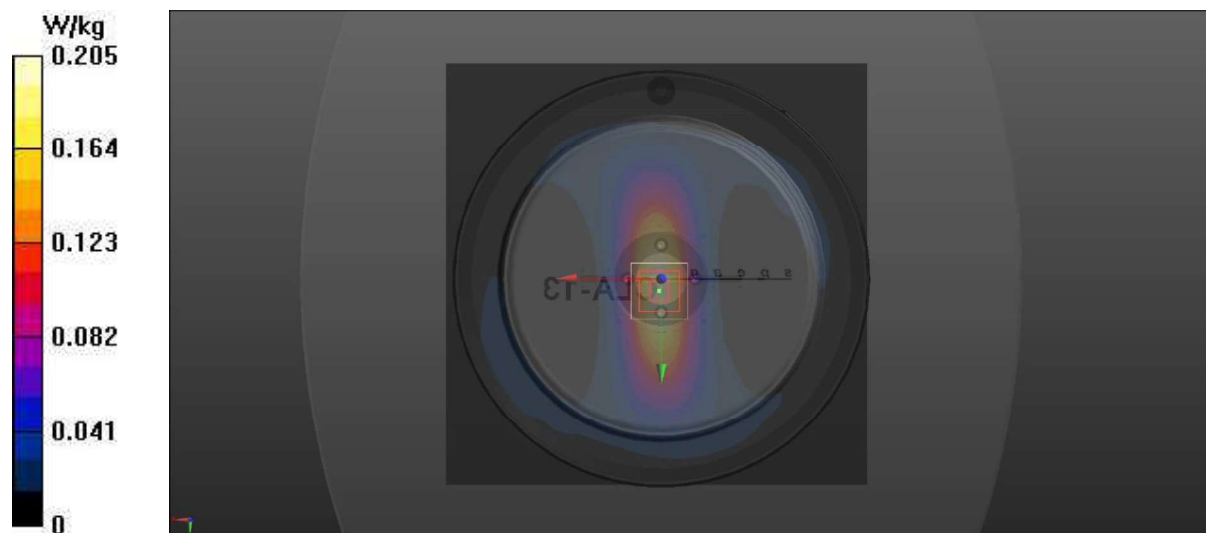
Peak SAR (extrapolated) = 0.251 W/kg

SAR(1 g) = 0.144 W/kg ; SAR(10 g) = 0.090 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 15 mm

Ratio of SAR at M2 to SAR at M1 = 55.4%

Maximum value of SAR (measured) = 0.205 W/kg



APPENDIX C: MEASUREMENT SCAN

Plot 8

Date/Time: 31.3.2022 12:33:54

Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, WCDMA (0); Communication System Band: Band 2; Frequency: 1852.4 MHz; Communication System PAR: 0 dB; PMF: 1.12202e-005

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.405$ S/m; $\epsilon_r = 40.245$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.13, 8.13, 8.13) @ 1852.4 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx
- DASYS2 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm WCDMA 2 Low/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.02 W/kg

Back/Back 5mm WCDMA 2 Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 13.33 V/m; Power Drift = 0.04 dB

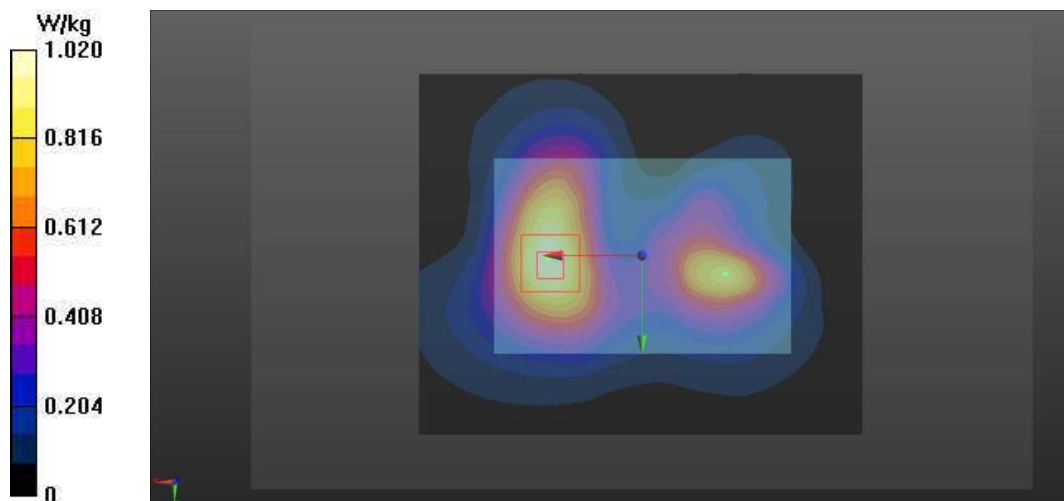
Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.730 W/kg; SAR(10 g) = 0.444 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 18.3 mm

Ratio of SAR at M2 to SAR at M1 = 63.9%

Maximum value of SAR (measured) = 0.994 W/kg



Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, WCDMA (0); Communication System Band: Band 4; Frequency: 1732.6 MHz; Communication System PAR: 0 dB; PMF: 1.12202e-005

Medium parameters used: $f = 1733 \text{ MHz}$; $\sigma = 1.273 \text{ S/m}$; $\epsilon_r = 38.404$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.42, 8.42, 8.42) @ 1732.6 MHz; Calibrated: 28.2.2022
 - Modulation Compensation:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration 2/Back 5mm WCDMA 4 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 24.34 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.984 W/kg; SAR(10 g) = 0.605 W/kg (SAR corrected for target medium)

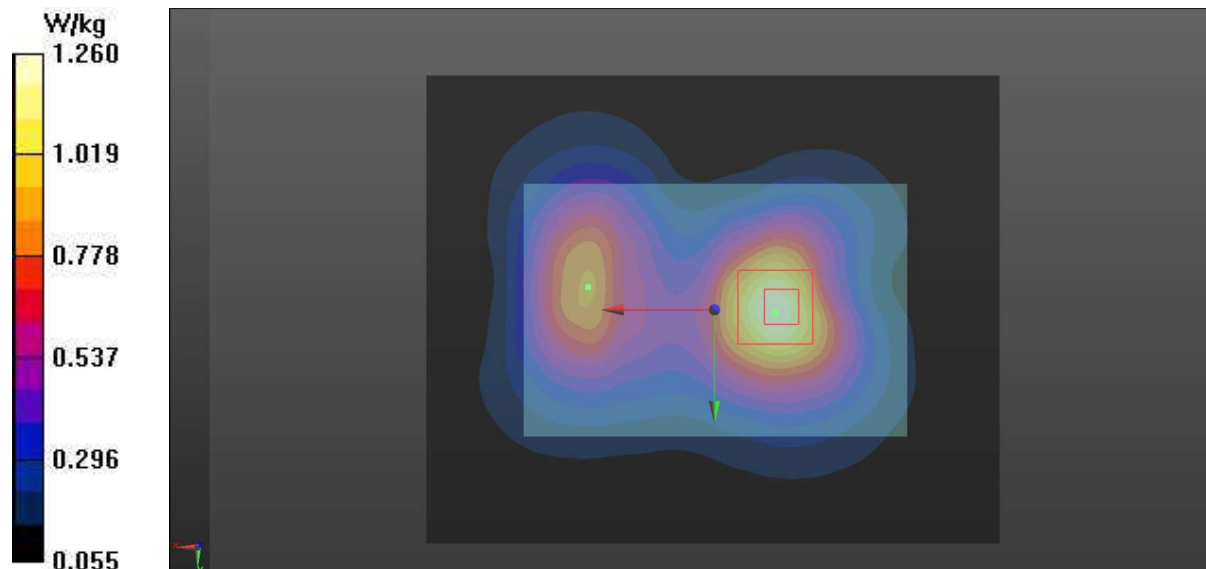
Smallest distance from peaks to all points 3 dB below = 13.8 mm

Ratio of SAR at M2 to SAR at M1 = 66.7%

Maximum value of SAR (measured) = 1.26 W/kg

Configuration 2/Back 5mm WCDMA 4 2/Area Scan (111x91x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.30 W/kg



Test Laboratory: Verkotan Oy

31032022_LTE2 WCDMA2

DUT: AINA Wireless Kepler

Communication System: UID 0, WCDMA (0); Communication System Band: Band 5; Frequency: 836.6 MHz; Communication System PAR: 0 dB; PMF: 1.12202e-005

Medium parameters used: $f = 837$ MHz; $\sigma = 0.915$ S/m; $\epsilon_r = 42.978$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(9.9, 9.9, 9.9) @ 836.6 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx;
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm WCDMA 5 MID/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.596 W/kg

Back/Back 5mm WCDMA 5 MID/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 22.56 V/m; Power Drift = -0.05 dB

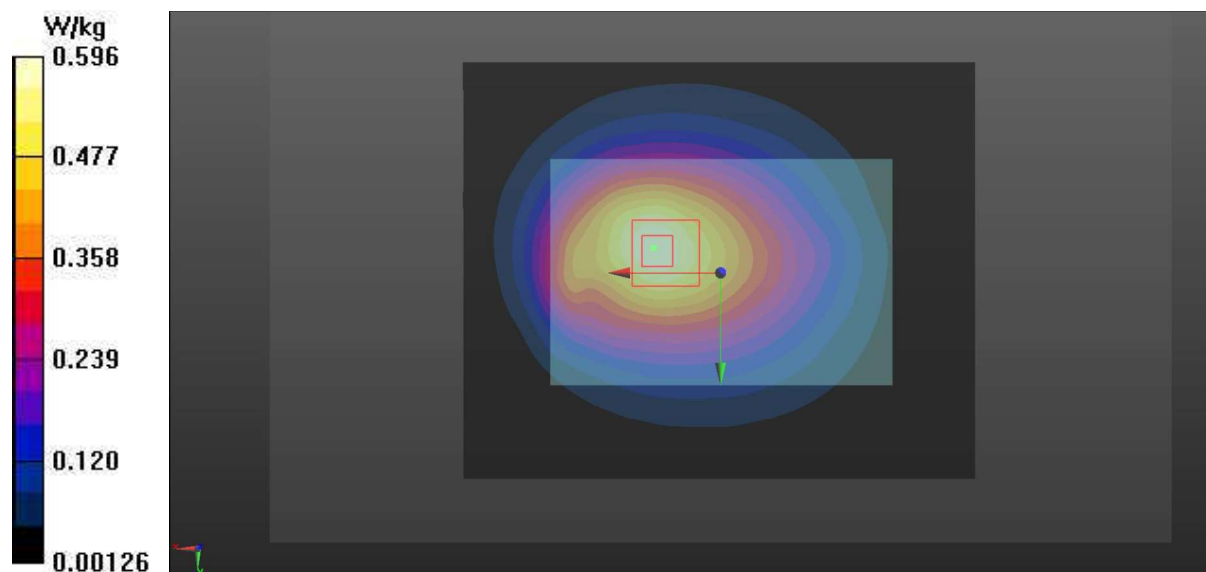
Peak SAR (extrapolated) = 0.642 W/kg

SAR(1 g) = 0.458 W/kg; SAR(10 g) = 0.322 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 71.2%

Maximum value of SAR (measured) = 0.582 W/kg



Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 2, E-UTRA/FDD (1850.0 - 1910.0 MHz); Frequency: 1880 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ S/m; $\epsilon_r = 40.19$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.13, 8.13, 8.13) @ 1880 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx;
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm LTE 2 MID QPSK BW 20, RB 1 Offset 0/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.977 W/kg

Back/Back 5mm LTE 2 MID QPSK BW 20, RB 1 Offset 0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 13.00 V/m; Power Drift = -0.02 dB

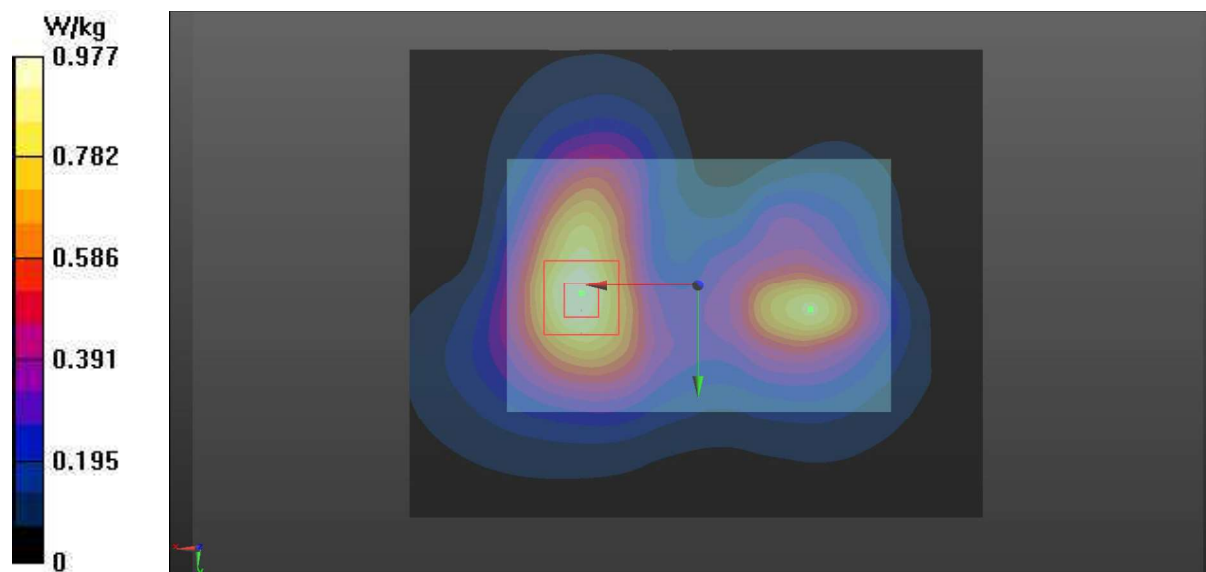
Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.421 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 19.2 mm

Ratio of SAR at M2 to SAR at M1 = 63.9%

Maximum value of SAR (measured) = 0.945 W/kg



Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 5, E-UTRA/FDD (824.0 - 849.0 MHz); Frequency: 844 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $f = 844$ MHz; $\sigma = 0.918$ S/m; $\epsilon_r = 42.949$; $\rho = 1000$ kg/m³
Phantom section: Center Section
Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(9.9, 9.9, 9.9) @ 844 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm LTE 5 HIGH QPSK BW10, RB 1, Offset 24/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

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

Back/Back 5mm LTE 5 HIGH QPSK BW10, RB 1, Offset 24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 24.04 V/m; Power Drift = -0.07 dB

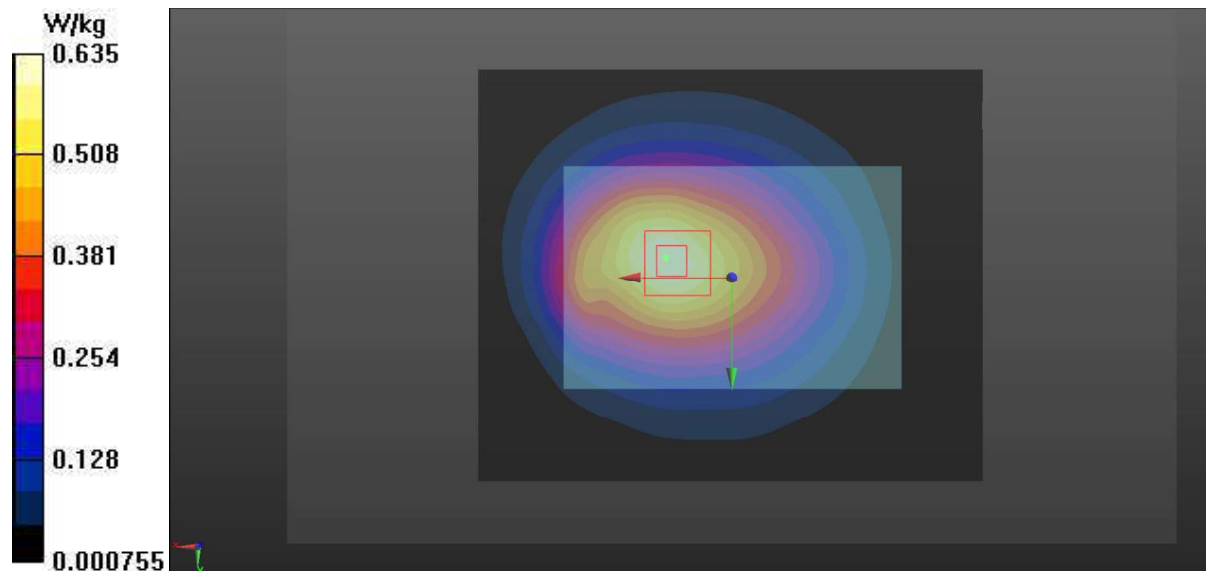
Peak SAR (extrapolated) = 0.688 W/kg

SAR(1 g) = 0.502 W/kg; SAR(10 g) = 0.354 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 72.9%

Maximum value of SAR (measured) = 0.629 W/kg



Plot 13

Date/Time: 4.4.2022 12:22:23

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 12, E-UTRA/FDD (698.0 - 716.0 MHz); Frequency: 711 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $f = 711$ MHz; $\sigma = 0.821$ S/m; $\epsilon_r = 43.335$; $\rho = 1000$ kg/m³
Phantom section: Center Section
Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(10.39, 10.39, 10.39) @ 711 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/Back5mm LTE 12, HIGH, BW 10 RB 1 Offset 24/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.814 W/kg

Configuration/Back5mm LTE 12, HIGH, BW 10 RB 1 Offset 24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 29.09 V/m; Power Drift = -0.38 dB

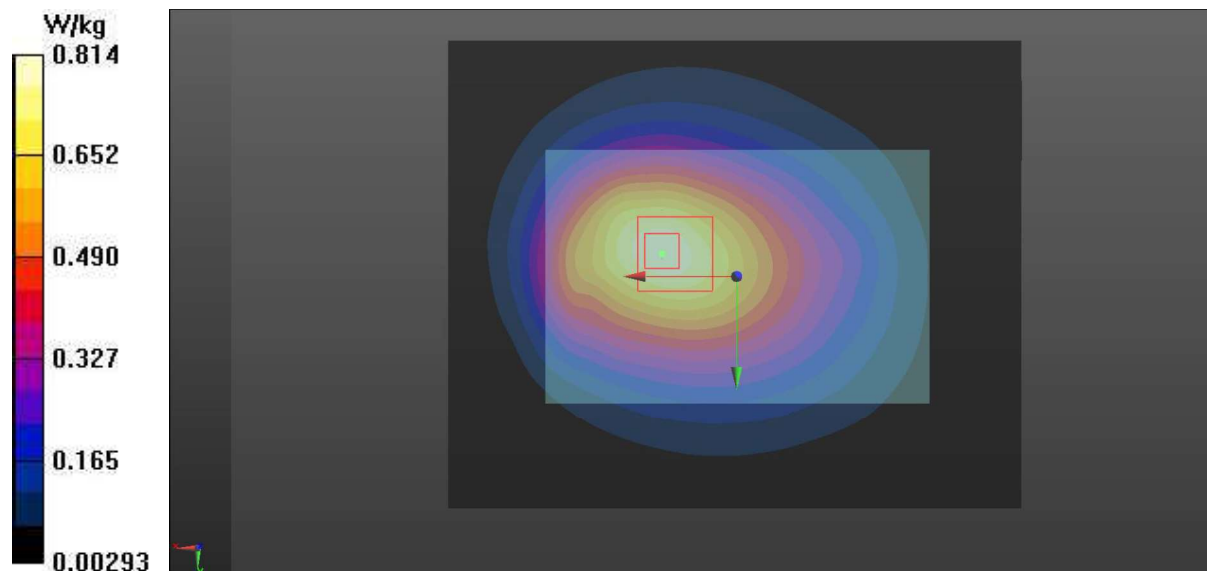
Peak SAR (extrapolated) = 0.876 W/kg

SAR(1 g) = 0.659 W/kg; SAR(10 g) = 0.457 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 70.7%

Maximum value of SAR (measured) = 0.790 W/kg



Plot 14

Date/Time: 31.3.2022 16:48:28

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 13, E-UTRA/FDD (777.0 - 787.0 MHz); Frequency: 784.5 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used (interpolated): $f = 784.5$ MHz; $\sigma = 0.895$ S/m; $\epsilon_r = 43.217$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(10.39, 10.39, 10.39) @ 784.5 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm LTE 13 HIGH QPSK BW5, RB 1, Offset 24/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.584 W/kg

Back/Back 5mm LTE 13 HIGH QPSK BW5, RB 1, Offset 24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 22.77 V/m; Power Drift = -0.38 dB

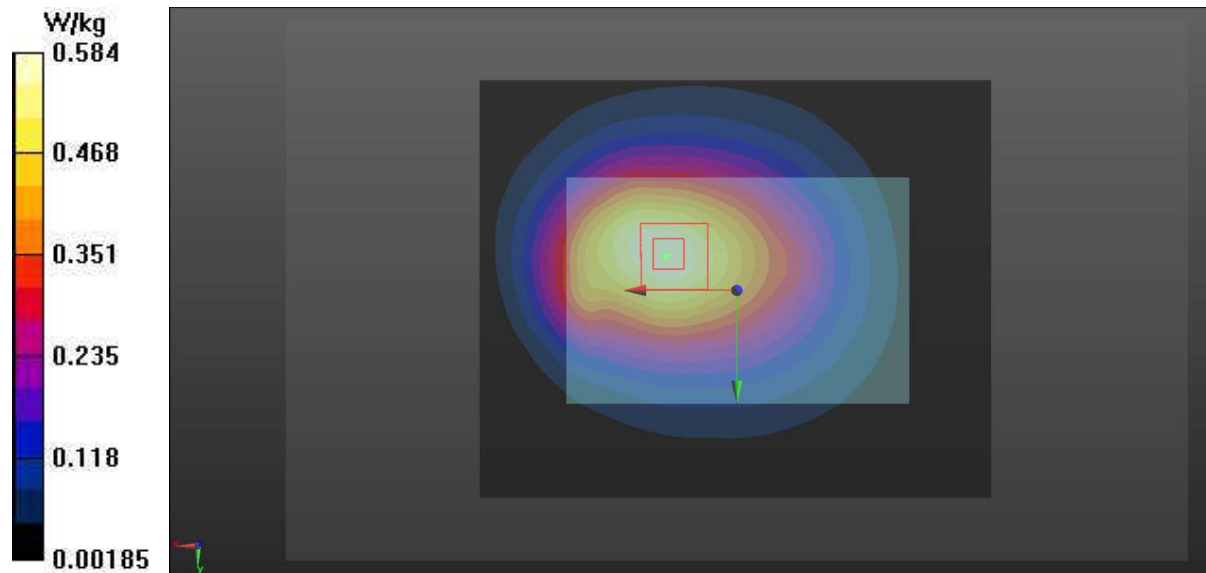
Peak SAR (extrapolated) = 0.669 W/kg

SAR(1 g) = 0.480 W/kg; SAR(10 g) = 0.340 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 68.3%

Maximum value of SAR (measured) = 0.585 W/kg



Plot 15

Date/Time: 31.3.2022 18:15:49

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 14, E-UTRA/FDD (788.0 - 798.0 MHz); Frequency: 793 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $f = 793$ MHz; $\sigma = 0.898$ S/m; $\epsilon_r = 43.174$; $\rho = 1000$ kg/m³
Phantom section: Center Section
Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(10.39, 10.39, 10.39) @ 793 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Back/Back 5mm LTE 14 MID QPSK BW510 RB 1, Offset 24/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 22.86 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.722 W/kg

SAR(1 g) = 0.526 W/kg; SAR(10 g) = 0.373 W/kg (SAR corrected for target medium)

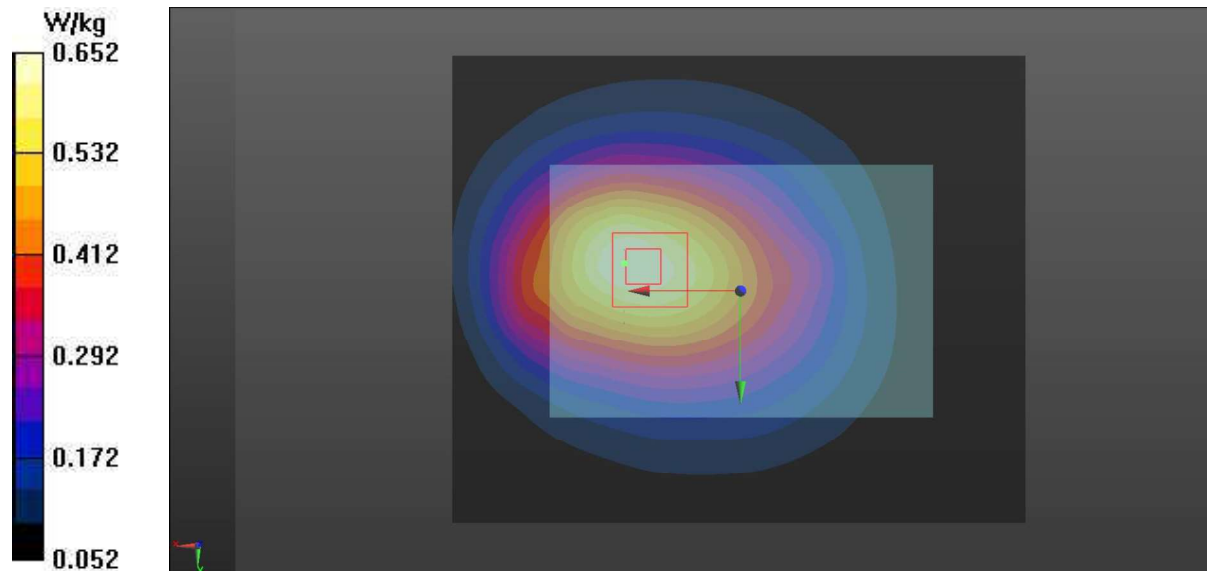
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 71.3%

Maximum value of SAR (measured) = 0.652 W/kg

Back/Back 5mm LTE 14 MID QPSK BW510 RB 1, Offset 24/Area Scan (111x91x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.648 W/kg



Plot 16

Date/Time: 4.4.2022 14:05:01

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 66; Frequency: 1745 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used (interpolated): $f = 1745 \text{ MHz}$; $\sigma = 1.272 \text{ S/m}$; $\epsilon_r = 40.394$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.42, 8.42, 8.42) @ 1745 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASYS2 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/Back 25mm LTE 66, MID, BW 20 RB Start 50 Offset 0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.41 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.745 W/kg; SAR(10 g) = 0.450 W/kg (SAR corrected for target medium)

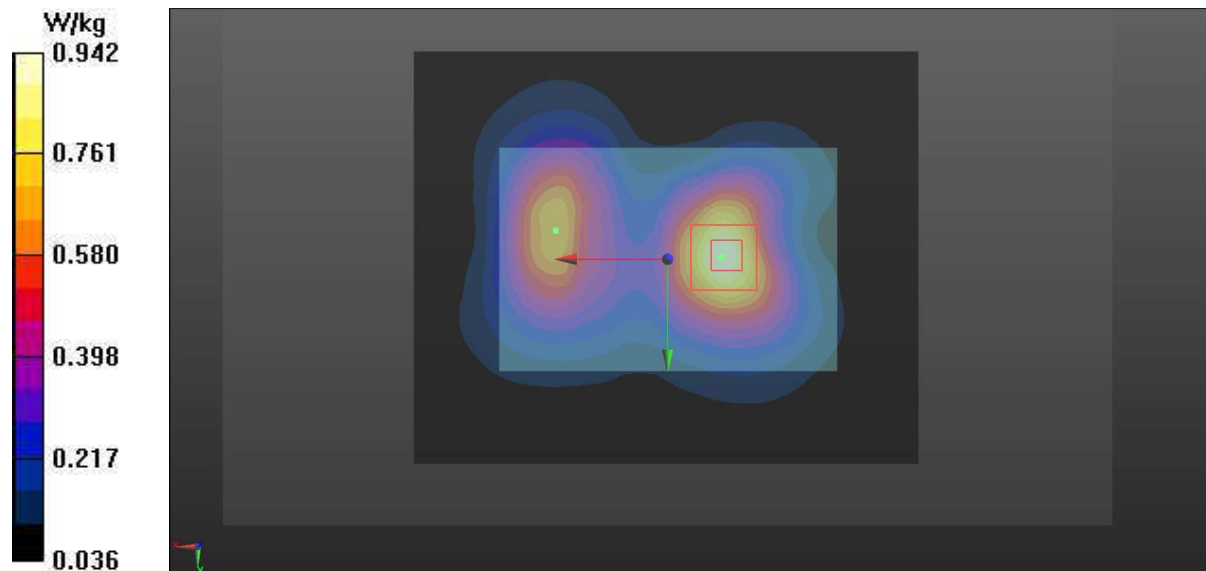
Smallest distance from peaks to all points 3 dB below = 13.9 mm

Ratio of SAR at M2 to SAR at M1 = 66.7%

Maximum value of SAR (measured) = 0.942 W/kg

Configuration/Back 25mm LTE 66, MID, BW 20 RB Start 50 Offset 0/Area Scan (111x91x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.899 W/kg



Plot 17

Date/Time: 4.4.2022 16:09:06

Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, Generic LTE (0); Communication System Band: Band 71; Frequency: 688 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 688 \text{ MHz}$; $\sigma = 0.813 \text{ S/m}$; $\epsilon_r = 43.469$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(10.39, 10.39, 10.39) @ 688 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/Back 25mm LTE 71, HIGH, BW 20 RB Start 50 Offset 0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.05 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.671 W/kg

SAR(1 g) = 0.511 W/kg; SAR(10 g) = 0.353 W/kg (SAR corrected for target medium)

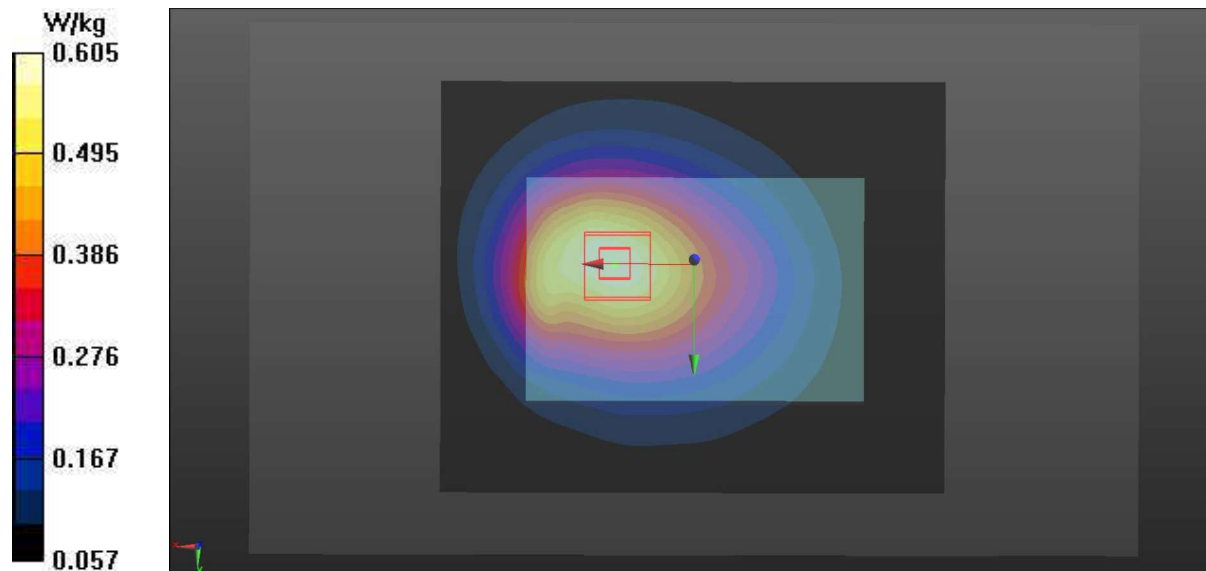
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 70.8%

Maximum value of SAR (measured) = 0.605 W/kg

Configuratio/Back 25mm LTE 71, HIGH, BW 20 RB Start 50 Offset 0/Area Scan (111x91x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.592 W/kg



Plot 18

Date/Time: 5.4.2022 13:03:54

Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, ISM (0); Communication System Band: ISM 2.4GHz; Frequency: 2413 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used (interpolated): $f = 2413 \text{ MHz}$; $\sigma = 1.674 \text{ S/m}$; $\epsilon_r = 39.309$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(7.77, 7.77, 7.77) @ 2413 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom 1_triple flat; Type: QD 000 P51 Cx; Serial: 28_March_2017
- DASYS2 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/Back 5mm ISM Low 2413MHz/Zoom Scan (7x6x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.036 V/m; Power Drift = -0.23 dB

Peak SAR (extrapolated) = 0.116 W/kg

SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.034 W/kg (SAR corrected for target medium)

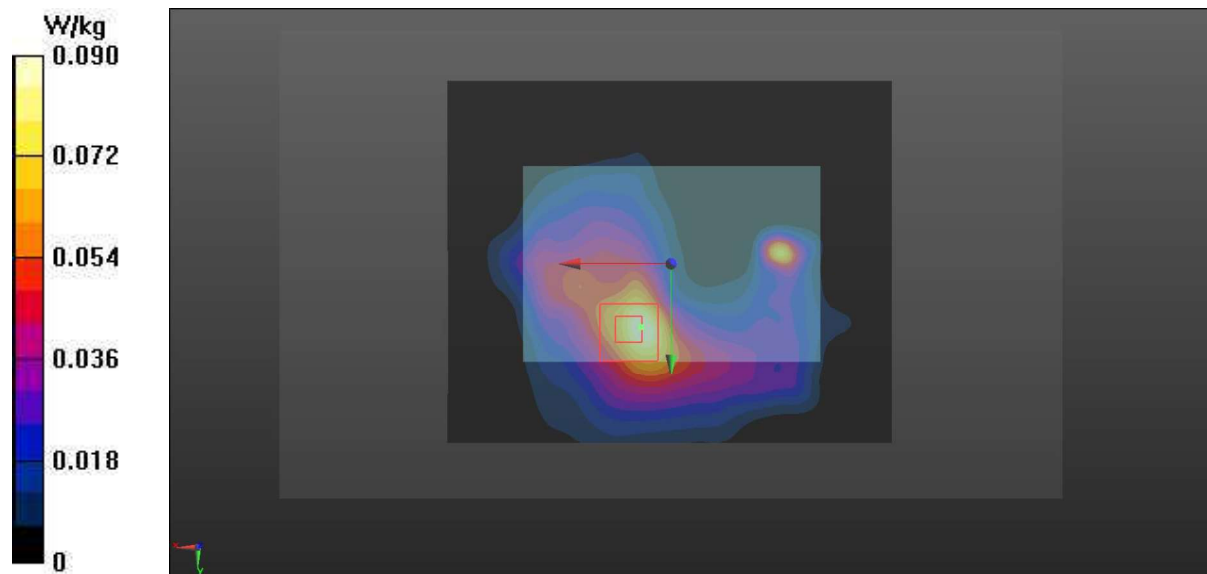
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 54.4%

Maximum value of SAR (measured) = 0.0898 W/kg

Configuration/Back 5mm ISM Low 2413MHz/Area Scan (111x91x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.0924 W/kg



Plot 19

Date/Time: 8.4.2022 15:34:44

Test Laboratory: Verkotan Oy

DUT: AINA Wireless Kepler

Communication System: UID 0, NFC 13.56MHz (0); Communication System Band: NFC; Frequency: 13.56 MHz; Communication System
PAR: 0 dB; PMF: 1
Medium parameters used: $f = 14 \text{ MHz}$; $\sigma = 0.714 \text{ S/m}$; $\epsilon_r = 52.848$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(15.43, 15.43, 15.43) @ 13.56 MHz; Calibrated: 28.2.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), $z = 31.0, -4.0$
- Electronics: DAE4 Sn1332; Calibrated: 23.2.2022
- Phantom: SAR1_Phantom1_EL1; Type: QD OVA 002 AA
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/Back 5mm NFC 13.56MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 0 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.00274 W/kg

SAR(1 g) = 0.000445 W/kg; SAR(10 g) = 0.000139 W/kg (SAR corrected for target medium)

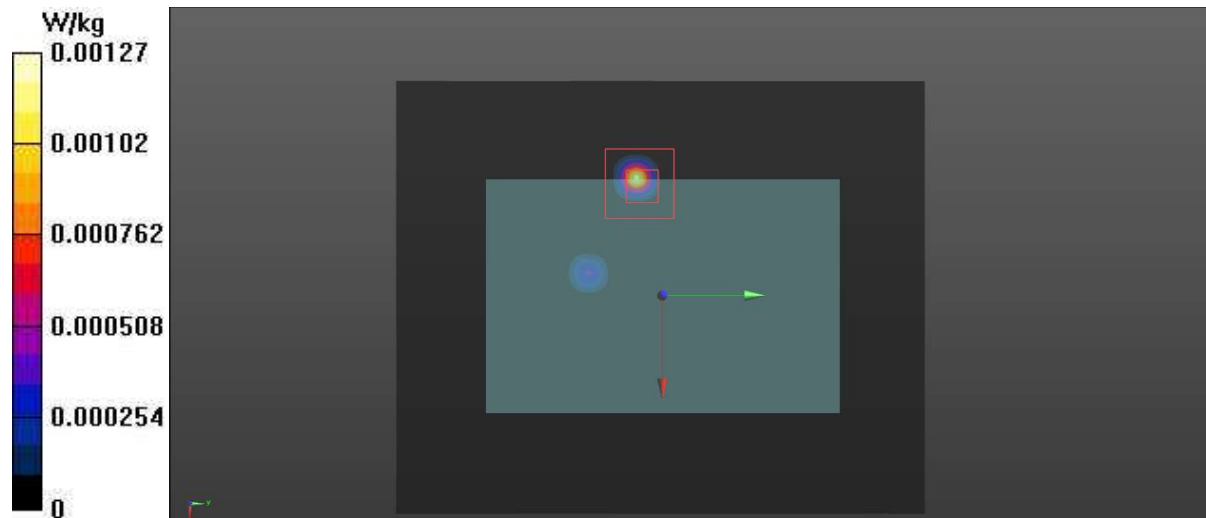
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 13.4%

Maximum value of SAR (measured) = 0.00127 W/kg

Configuration/Back 5mm NFC 13.56MHz/Area Scan (91x111x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.00194 W/kg



APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION

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



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Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **Verkotan**

Certificate No: **EX3-7447_Feb22**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7447**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5,
QA CAL-25.v7
Calibration procedure for dosimetric E-field probes**

Calibration date: **February 28, 2022**

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
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	09-Apr-21 (No. 217-03343)	Apr-22
DAE4	SN: 660	13-Oct-21 (No. DAE4-660_Oct21)	Oct-22
Reference Probe ES3DV2	SN: 3013	27-Dec-21 (No. ES3-3013_Dec21)	Dec-22
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

	Name	Function	Signature
Calibrated by:	Aidonia Georgiadou	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	
			Issued: March 1, 2022

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Certificate No: EX3-7447_Feb22

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EX3DV4 – SN:7447

February 28, 2022

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7447

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.40	0.43	0.44	$\pm 10.1 \%$
DCP (mV) ^B	93.5	95.0	96.2	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	155.9	$\pm 2.5 \%$	$\pm 4.7 \%$
		Y	0.0	0.0	1.0		167.3		
		Z	0.0	0.0	1.0		159.8		

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).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4- SN:7447

February 28, 2022

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7447

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)	Unc (k=2)
13	55.0	0.75	15.43	15.43	15.43	0.00	1.00	± 13.3 %
750	41.9	0.89	10.39	10.39	10.39	0.42	0.80	± 12.0 %
900	41.5	0.97	9.90	9.90	9.90	0.45	0.80	± 12.0 %
1750	40.1	1.37	8.42	8.42	8.42	0.28	0.85	± 12.0 %
1950	40.0	1.40	8.13	8.13	8.13	0.26	0.85	± 12.0 %
2150	39.7	1.53	8.14	8.14	8.14	0.25	0.85	± 12.0 %
2300	39.5	1.67	8.09	8.09	8.09	0.21	0.90	± 12.0 %
2450	39.2	1.80	7.77	7.77	7.77	0.15	0.90	± 12.0 %
2600	39.0	1.96	7.61	7.61	7.61	0.24	0.90	± 12.0 %
3300	38.2	2.71	6.85	6.85	6.85	0.30	1.30	± 13.1 %
5250	35.9	4.71	5.20	5.20	5.20	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.50	4.50	4.50	0.40	1.80	± 13.1 %
5750	35.4	5.22	4.60	4.60	4.60	0.40	1.80	± 13.1 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the 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, 160 and 220 MHz respectively. Validity of ConvF^F assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

APPENDIX E: RELEVANT PAGES FROM DIPOLE CALIBRATION REPORTS

Calibration Laboratory of
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **Verkotan**

Certificate No: **CLA13-1012_Mar21**

CALIBRATION CERTIFICATE

Object **CLA13 - SN: 1012**

Calibration procedure(s) **QA CAL-15.v9**
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: **March 11, 2021**

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
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
Type-N mismatch combination	SN: 310982 / 06327	31-Mar-20 (No. 217-03104)	Apr-21
Reference Probe EX3DV4	SN: 3877	30-Dec-20 (No. EX3-3877_Dec20)	Dec-21
DAE4	SN: 654	26-Jun-20 (No. DAE4-654_Jun20)	Jun-21

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

Calibrated by: **Michael Weber** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

M. Weber

K. Pokovic

Issued: March 12, 2021

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Certificate No: CLA13-1012_Mar21

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Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- 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
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- 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 source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss:** This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. 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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	$dx, dy = 4.0$ mm, $dz = 1.4$ mm	Graded Ratio = 1.4 (Z direction)
Frequency	13 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	55.0	0.75 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	0.72 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	1 W input power	0.540 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	0.555 W/kg ± 18.4 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	1 W input power	0.337 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	0.346 W/kg ± 18.0 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$54.5 \Omega + 5.4 j\Omega$
Return Loss	- 23.4 dB

Additional EUT Data

Manufactured by	SPEAG
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