Appendix F SAR Measurement data

F.1 Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm, 12 mm x 12 mm or 10 mm x 10 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan), a volume of 30 mm x 30 mm x 30 mm or more was assessed by measuring 7 x 7 x 7 points at least for below 3 GHz and a volume of 28 mm x 28 mm x 22.5 mm or more was assessed by measuring 8 x 8 x 6(ratio step method (*1)) points at least for 5 GHz band.

And for any secondary peaks found in the Step2 which are within 2 dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm(EX3DV4) away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes.
This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

(3). All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

*1. Ratio step method parameters used;
The first measurement point: 2 mm from the phantom surface, the initial grid separation: 2 mm, subsequent graded grid ratio: 1.5
These parameters comply with the requirement of the KDB 865664D01.

Step 4: Re-measurement of the E-field at the same location as in Step 1.
Confirmation after SAR testing
It was checked that the power drift [W] is within +/-5 %.The verification of power drift during the SAR test is that DASY5 system calculates the power drift by measuring the e-filed at the same location at beginning and the end of the scan measurement for each test position.

DASY5 system calculation Power drift value[dB] =20log(Ea)/(Eb)
Before SAR testing : Eb[V/m]
After SAR testing : Ea[V/m]

Limit of power drift[W] =+/-5 %
X[dB]=10log[P]=10log(1.05/1)=10log(1.05)-10log(1)=0.212 dB

from E-filed relations with power.
p=E^2/η=E^2/
Therefore, The correlation of power and the E-filed
XdB=10log(P)=10log(E)^2=20log(E)

Therefore,
The calculated power drift of DASY5 System must be the less than +/-0.212 dB.

F.2 Plot No. G850

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-15, 17:03
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	GSM 850	GSM, 10024-DAC	848.8, 251	9.7	0.944	42.1

Hardware Setup

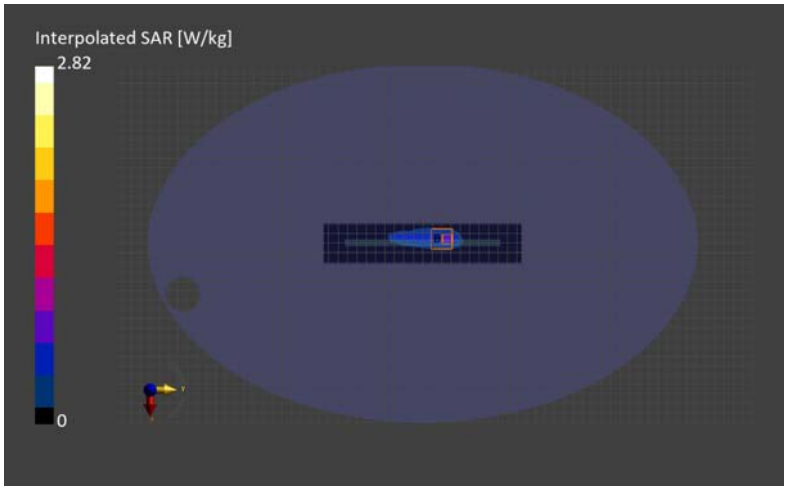
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000, 2023-Jun-13	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn509, 2022-07-13

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	4.9 x 4.9 x 1.4
Sensor Surface [mm]	4.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.647	0.724
psSAR10g [W/Kg]	0.337	0.324
Power Drift [dB]	-0.01	0.00
M2/M1 [%]		57.9
Dist 3dB Peak [mm]		4.9



F.3 Plot No. G1900

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/ Time:2023-06-19, 13:34
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	PCS 1900	GSM, 10028-DAC	1880.0, 661	8.21	1.39	39.8

Hardware Setup

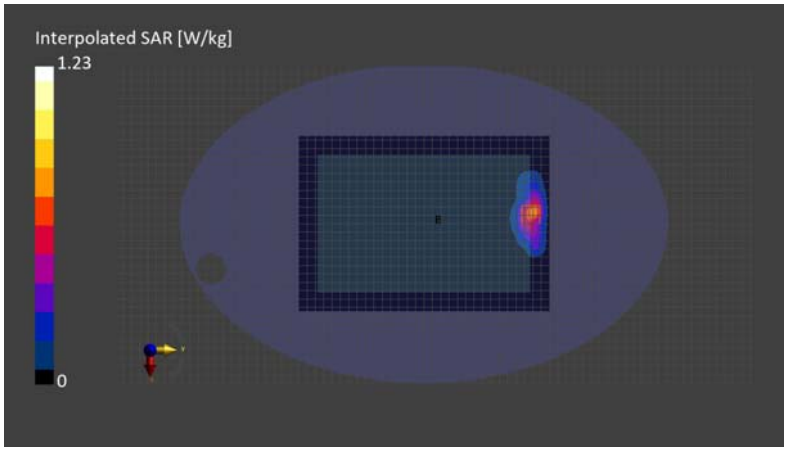
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000, 2023-Jun-19	EX3DV4 - SN3917, 2023-05-23	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	210.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	4.6 x 4.6 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.634	0.922
psSAR10g [W/Kg]	0.347	0.372
Power Drift [dB]	-0.03	-0.03
M2/M1 [%]		72.6
Dist 3dB Peak [mm]		5.6



F.4 Plot No. W2

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-06-14, 14:04
Room Temp_23.5 deg.C._Liquid Temp_23.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 0.00	Band 2	WCDMA, 10011-CAC	1880.0, 9400	8.21	1.35	40.4

Hardware Setup

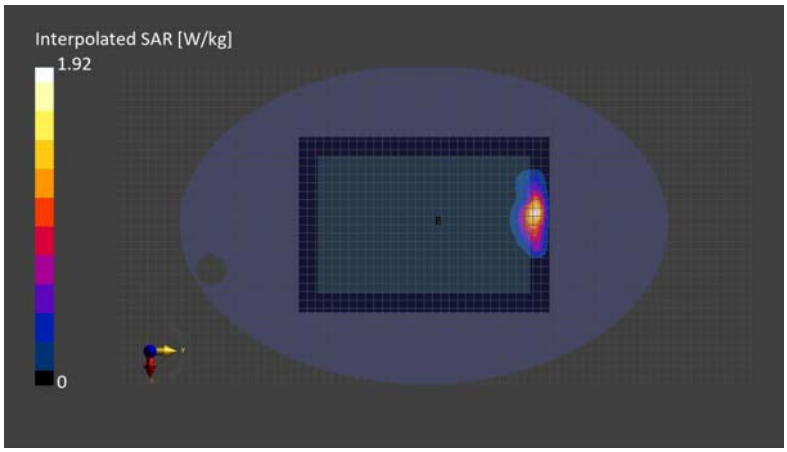
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000, 2023-Jun-13	EX3DV4 - SN3917, 2023-05-23	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	210.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	4.6 x 4.6 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.504	0.626
psSAR10g [W/Kg]	0.261	0.257
Power Drift [dB]	0.03	-0.01
M2/M1 [%]		70.4
Dist 3dB Peak [mm]		5.6



F.5 Plot No. W4

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-13, 08:09
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 0.00	Band 4	WCDMA, 10011-CAC	1732.6, 1413	8.8	1.34	39.5

Hardware Setup

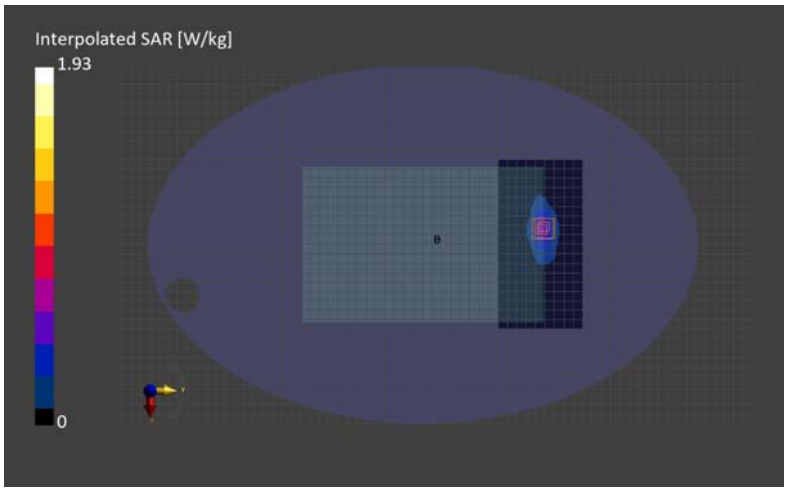
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-12	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn509, 2022-07-13

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	180.0 x 90.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	4.9 x 4.9 x 1.4
Sensor Surface [mm]	4.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.537	0.654
psSAR10g [W/Kg]	0.286	0.278
Power Drift [dB]	-0.00	-0.07
M2/M1 [%]		69.6
Dist 3dB Peak [mm]		5.9



F.6 Plot No. W5

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-22, 14:46
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	Band 5	WCDMA, 10011-CAC	836.6, 4183	9.7	0.943	40.2

Hardware Setup

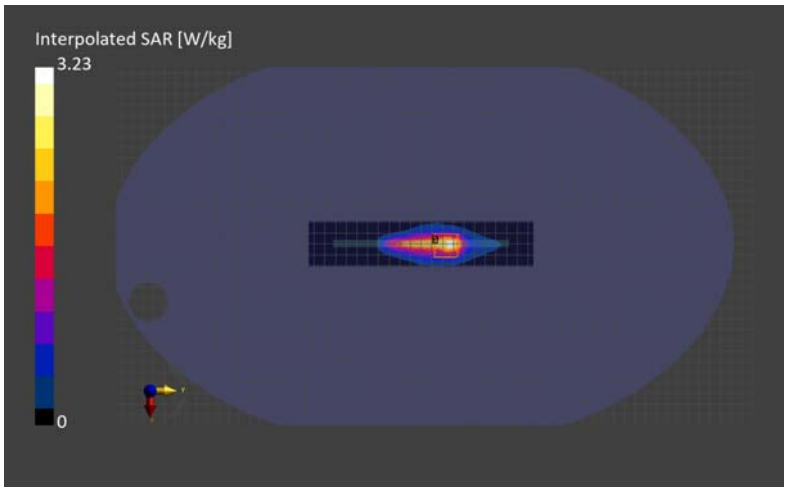
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-20	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	4.2 x 4.2 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.913	0.861
psSAR10g [W/Kg]	0.471	0.376
Power Drift [dB]	0.01	0.03
M2/M1 [%]		60.3
Dist 3dB Peak [mm]		5.7



F.7 Plot No. L2-1

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-06-22, 11:12
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	Band 2	LTE-FDD, 10169-CAF	1860.0, 18700	8.21	1.38	39.9

Hardware Setup

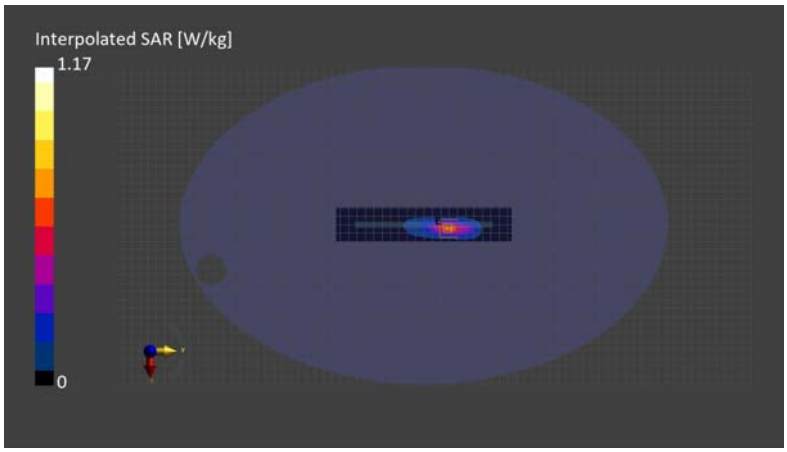
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000 , 2023-Jun-21	EX3DV4 - SN3917, 2023-05-23	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.538	0.593
psSAR10g [W/Kg]	0.245	0.220
Power Drift [dB]	-0.03	-0.04
M2/M1 [%]		65.8
Dist 3dB Peak [mm]		5.0



F.8 Plot No. L2-2

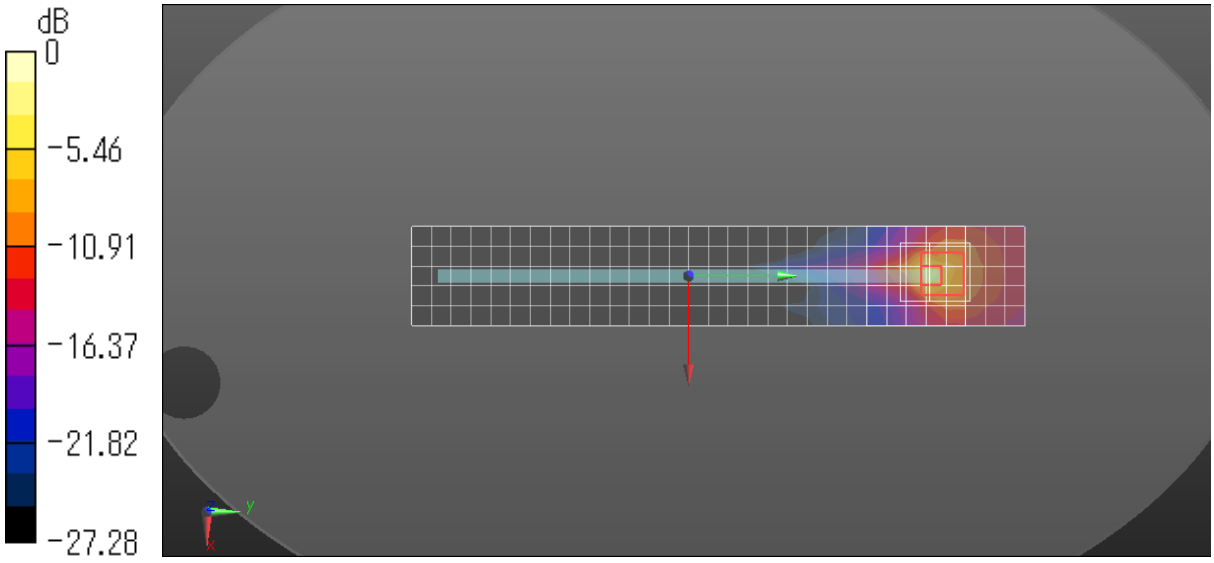
UL Japan,Inc. Ise EMC Lab. SAR#2
Date/Time: 2023/07/11 15:21:12
Room Temp_24.0 deg.C._Liquid Temp_23.5 deg.C

Frequency: 1860 MHz; Communication System Channel Number: 18700; Duty Cycle: 1:1
Medium parameters used: f = 1860 MHz; σ = 1.396 S/m; ε_r = 38.406; ρ = 1000 kg/m^3

DASY5 Configuration:
- Electronics: DAE4 Sn1372; Calibrated: 2023/03/16
- Probe: EX3DV4 - SN7652; ConvF(8.35, 8.13, 8.46) @ 1860 MHz; Calibrated: 2023/04/24
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 TP1207 (30 deg probe tilt); Phantom section: Flat Section ; Type: QDOVA001BB
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Red/LTE B2 ch18700 1860 MHz QPSK N/A Right 0 mm 20 MHz RBn1 RBp99/Area Scan (6x29x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (measured) = 0.674 W/kg

Red/LTE B2 ch18700 1860 MHz QPSK N/A Right 0 mm 20 MHz RBn1 RBp99/Zoom Scan normal (7x8x7)/Cube 0:
Measurement grid: dx=5 mm, dy=5 mm, dz=5 mm
Reference Value = 16.8 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.07 W/kg
SAR(1 g) = 0.464 W/kg; SAR(10 g) = 0.149 W/kg
Smallest distance from peaks to all points 3 dB below = 3.6 mm
Ratio of SAR at M2 to SAR at M1 = 15.1 %
Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kg = 2.17 dBW/kg

F.9 Plot No. L5

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-19, 09:54
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 19.00	Band 5	LTE-FDD, 10175-CAH	836.5, 20525	9.7	0.943	40.9

Hardware Setup

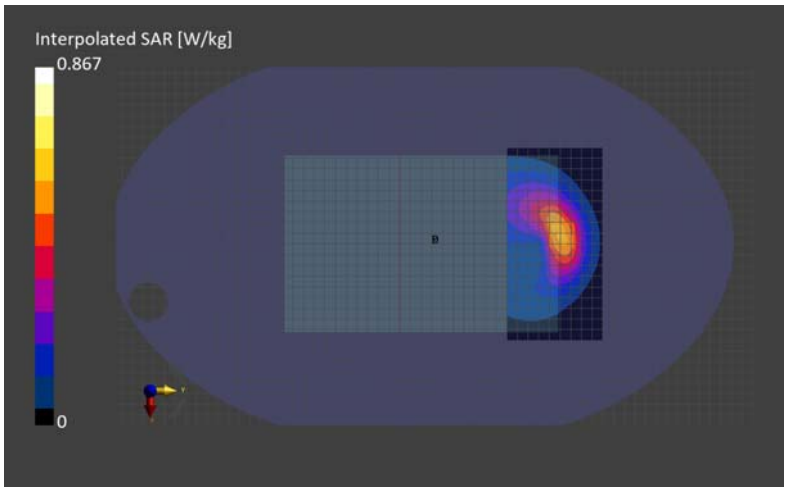
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-19	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	180.0 x 90.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	6.0 x 6.0 x 1.5
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.542	0.565
psSAR10g [W/Kg]	0.362	0.366
Power Drift [dB]	-0.01	-0.02
M2/M1 [%]		87.8
Dist 3dB Peak [mm]		14.1



F.10 Plot No. L12

UL Japan, Inc. Ise EMC Lab. SAR#3
Date/Time: 2023/06/26 9:31:35
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C

Frequency: 707.5 MHz; Communication System Channel Number: 23095; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 707.5 MHz; σ = 0.88 S/m; ε_r = 40.831; ρ = 1000 kg/m^3

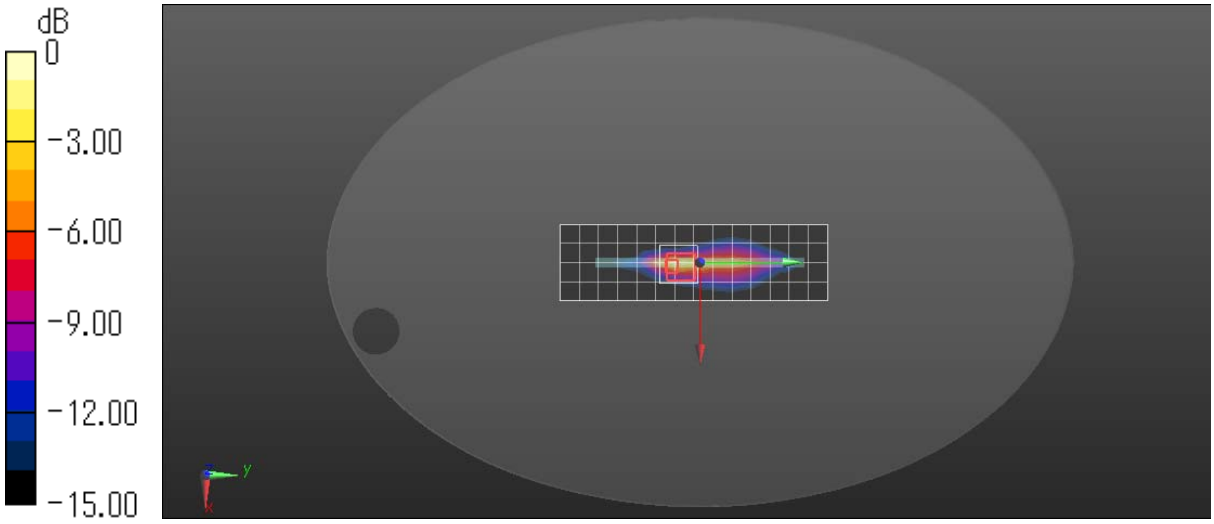
DASY5 Configuration:
- Electronics: DAE4 Sn554; Calibrated: 2023/04/14
- Probe: EX3DV4 - SN3745; ConvF(9.4, 9.4, 9.4) @ 707.5 MHz; Calibrated: 2023/04/18
- Sensor-Surface: 1.4 mm (Mechanical Surface Detection)
- Phantom: ELI v4.0 (20 deg probe tilt); Phantom section: Flat Section ; Type: QDOVA001BB
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Red/LTE B12 ch23095 707.5 MHz QPSK N/A Top 0 mm 10 MHz RBn1 RBp0/Area Scan (5x15x1): Measurement grid: dx=15 mm, dy=15 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.925 W/kg

Red/LTE B12 ch23095 707.5 MHz QPSK N/A Top 0 mm 10 MHz RBn1 RBp0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5 mm, dy=5 mm, dz=5 mm
Reference Value = 38.01 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 2.58 W/kg
SAR(1 g) = 0.508 W/kg; SAR(10 g) = 0.187 W/kg
Smallest distance from peaks to all points 3 dB below = 4 mm
Ratio of SAR at M2 to SAR at M1 = 20.3 %

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.26 W/kg



0 dB = 1.26 W/kg = 1.00 dBW/kg

F.11 Plot No. L13

UL Japan, Inc. Ise EMC Lab. SAR#3
Date/Time: 2023/06/26 14:22:32
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C

Frequency: 782 MHz; Communication System Channel Number: 23230; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 0.907 S/m; ε_r = 40.572; ρ = 1000 kg/m^3

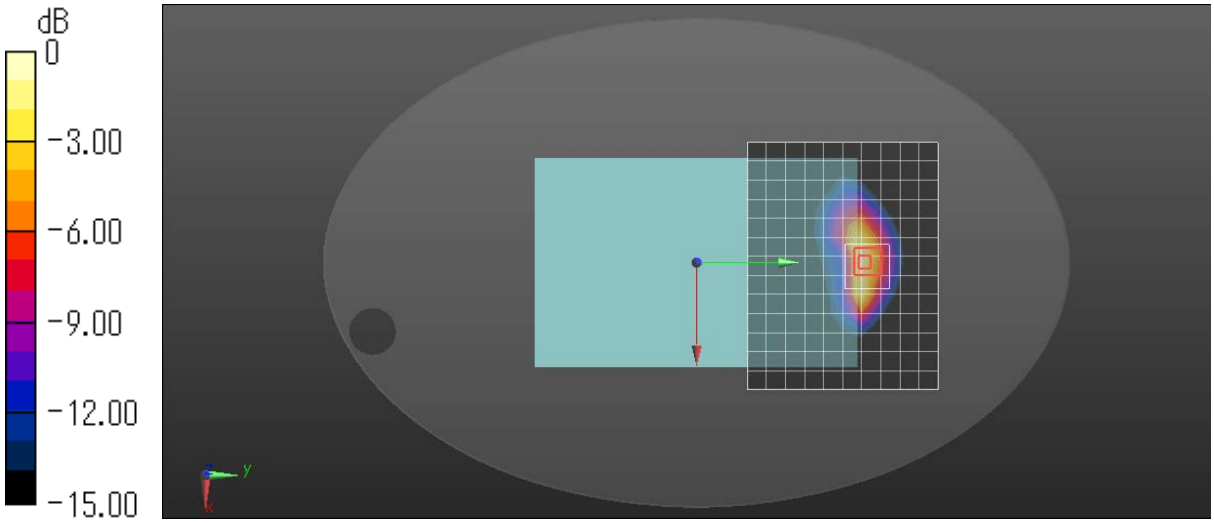
DASY5 Configuration:
- Electronics: DAE4 Sn554; Calibrated: 2023/04/14
- Probe: EX3DV4 - SN3745; ConvF(9.4, 9.4, 9.4) @ 782 MHz; Calibrated: 2023/04/18
- Sensor-Surface: 1.4 mm (Mechanical Surface Detection)
- Phantom: ELI v4.0 (20 deg probe tilt); Phantom section: Flat Section ; Type: QDOVA001BB
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Red/LTE B13 ch23230 782.0 MHz QPSK N/A Rear 0 mm 10 MHz RBn 25 RBp 0/Area Scan (14x11x1): Measurement grid: dx=15 mm, dy=15 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.18 W/kg

Red/LTE B13 ch23230 782.0 MHz QPSK N/A Rear 0 mm 10 MHz RBn 25 RBp 0/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5 mm, dy=5 mm, dz=5 mm
Reference Value = 37.44 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.67 W/kg
SAR(1 g) = 0.650 W/kg; SAR(10 g) = 0.317 W/kg
Smallest distance from peaks to all points 3 dB below = 6 mm
Ratio of SAR at M2 to SAR at M1 = 40.6 %

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.20 W/kg



0 dB = 1.20 W/kg = 0.79 dBW/kg

F.12 Plot No. L26

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-26, 12:56
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	Band 26	LTE-FDD, 10160-CAF	831.5, 26865	9.7	0.939	39.9

Hardware Setup

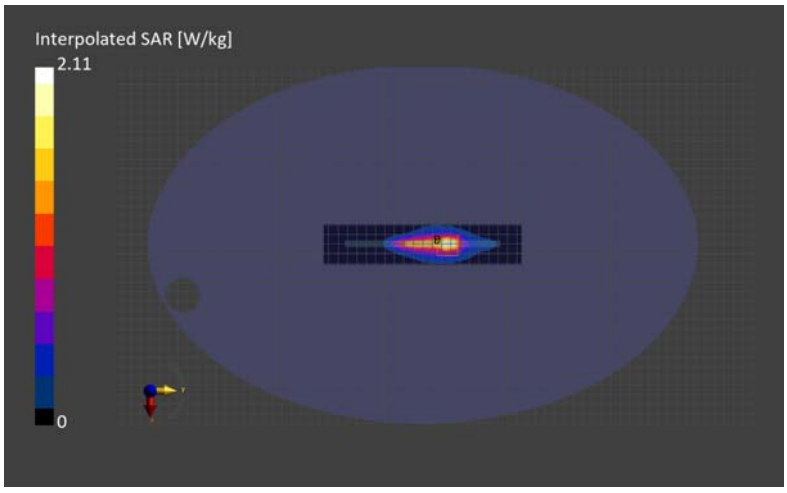
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-26	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	4.5 x 4.5 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.534	0.526
psSAR10g [W/Kg]	0.277	0.227
Power Drift [dB]	0.02	0.01
M2/M1 [%]		58.4
Dist 3dB Peak [mm]		4.5



F.13 Plot No. L41

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-06-22, 15:10
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 0.00	Band 41	LTE-TDD, 10494-AAG	2593.0, 40620	7.47	1.93	39.4

Hardware Setup

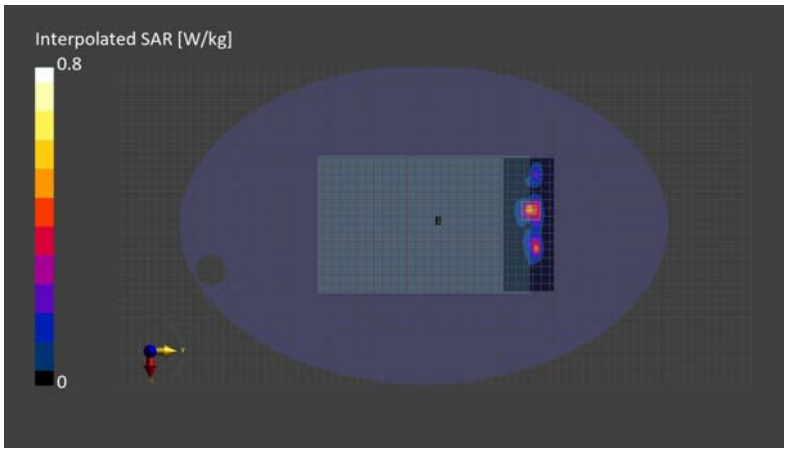
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000 , 2023-Jun-22	EX3DV4 - SN3917, 2023-05-23	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	160.0 x 60.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 10.0	4.6 x 4.6 x 1.5
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.412	0.458
psSAR10g [W/Kg]	0.173	0.167
Power Drift [dB]	-0.03	-0.02
M2/M1 [%]		66.8
Dist 3dB Peak [mm]		6.5



F.14 Plot No. L66

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-13, 23:36
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 0.00	Band 66	LTE-FDD, 10297-AAE	1745.0, 132322	8.8	1.36	40.2

Hardware Setup

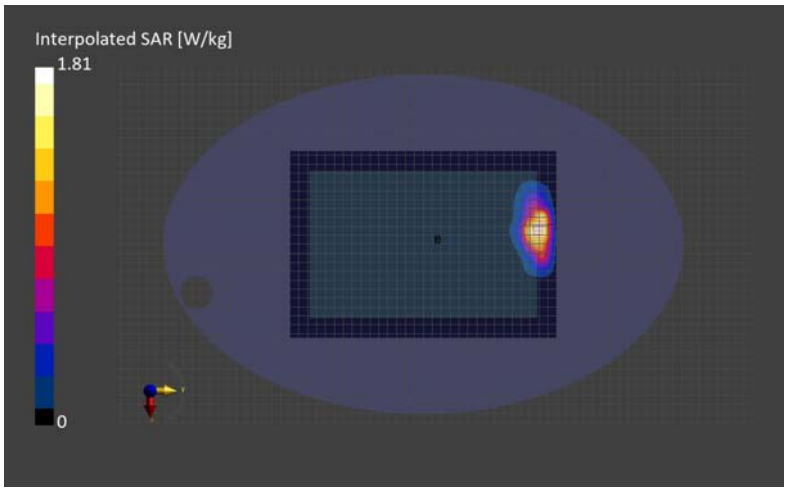
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-13	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn509, 2022-07-13

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	210.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	5.5 x 5.5 x 1.5
Sensor Surface [mm]	4.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.422	0.638
psSAR10g [W/Kg]	0.242	0.269
Power Drift [dB]	0.01	-0.01
M2/M1 [%]		69.2
Dist 3dB Peak [mm]		6.6



F.15 Plot No. n5

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-06, 17:34
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 19.00	Band n5	5G NR FR1 FDD, 10939-AAC	836.5, 167300	9.7	0.923	43.9

Hardware Setup

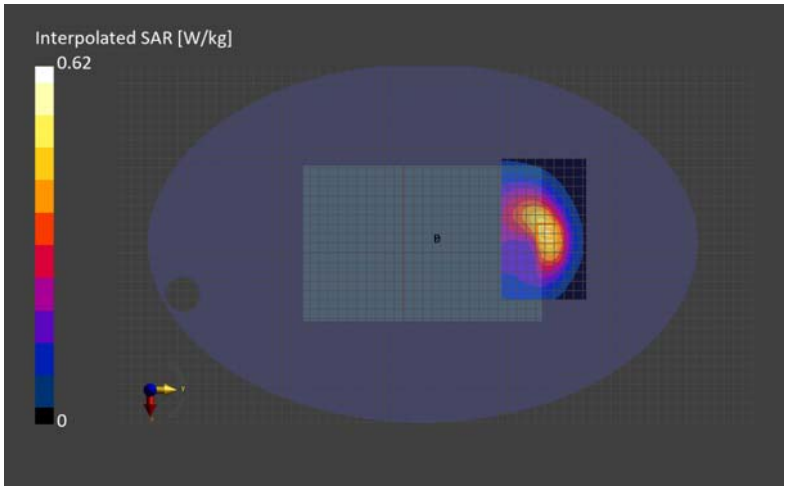
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000, 2023-Jun-05	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn509, 2022-07-13

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	150.0 x 90.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	6.0 x 6.0 x 1.5
Sensor Surface [mm]	4.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.390	0.415
psSAR10g [W/Kg]	0.262	0.278
Power Drift [dB]	-0.01	-0.01
M2/M1 [%]		87.6
Dist 3dB Peak [mm]		16.7



F.16 Plot No. n66

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-16, 09:28
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	Band n66	5G NR FR1 FDD, 10931-AAC	1745.0, 349000	8.8	1.36	40.2

Hardware Setup

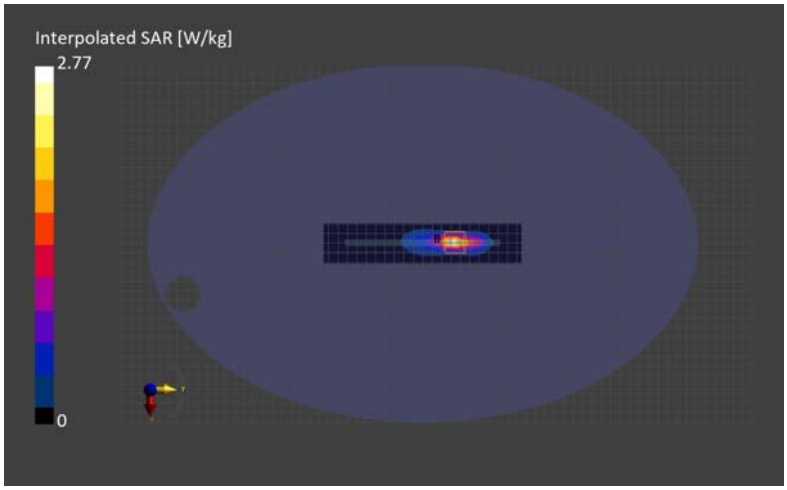
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 , 2023-Jun-13	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn509, 2022-07-13

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	3.8 x 3.8 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.676	0.669
psSAR10g [W/Kg]	0.285	0.235
Power Drift [dB]	0.03	0.07
M2/M1 [%]		61.9
Dist 3dB Peak [mm]		4.7



F.17 Plot No. RP1

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-06-23, 15:01
Room Temp_22.5 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	REAR, 0.00	PCS 1900	GSM, 10028-DAC	1880.0, 661	8.21	1.39	38.9

Hardware Setup

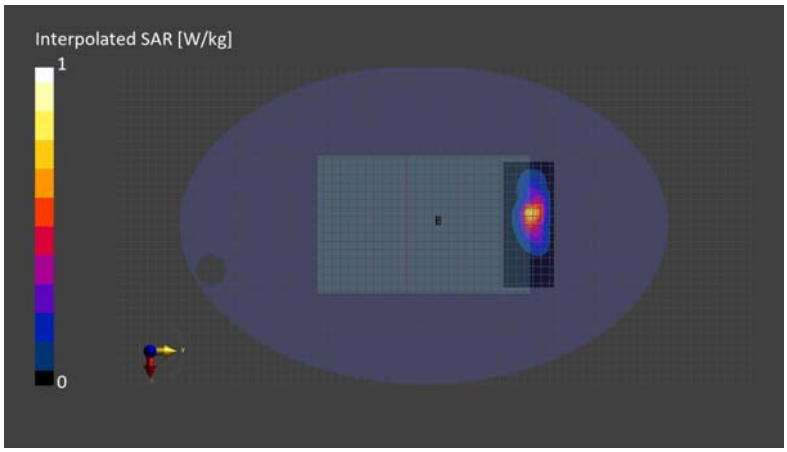
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000 , 2023-Jun-23	EX3DV4 - SN3917, 2023-05-23	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	150.0 x 60.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	15.0 x 15.0	3.8 x 3.8 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.613	0.902
psSAR10g [W/Kg]	0.328	0.361
Power Drift [dB]	-0.02	-0.04
M2/M1 [%]		68.8
Dist 3dB Peak [mm]		5.5



F.18 Plot No. RP2

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-06-22, 16:42
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE TOP, 0.00	Band 5	WCDMA, 10011-CAC	826.4, 4132	9.7	0.939	40.2

Hardware Setup

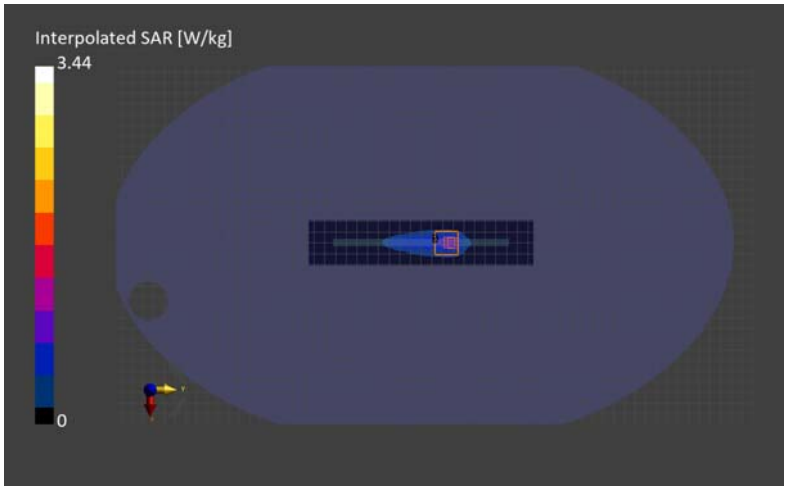
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 ,2023-Jun-20	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 210.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 15.0	4.1 x 4.1 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.903	0.863
psSAR10g [W/Kg]	0.465	0.373
Power Drift [dB]	-0.01	-0.01
M2/M1 [%]		59.7
Dist 3dB Peak [mm]		4.8



F.19 Plot No.WL2S

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-07-06, 14:00
Room Temp_22.5 deg.C._Liquid Temp_22.0 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	WLAN 2.4GHz	WLAN, 10012-CAB	2462.0, 11	7.85	1.75	38.8

Hardware Setup

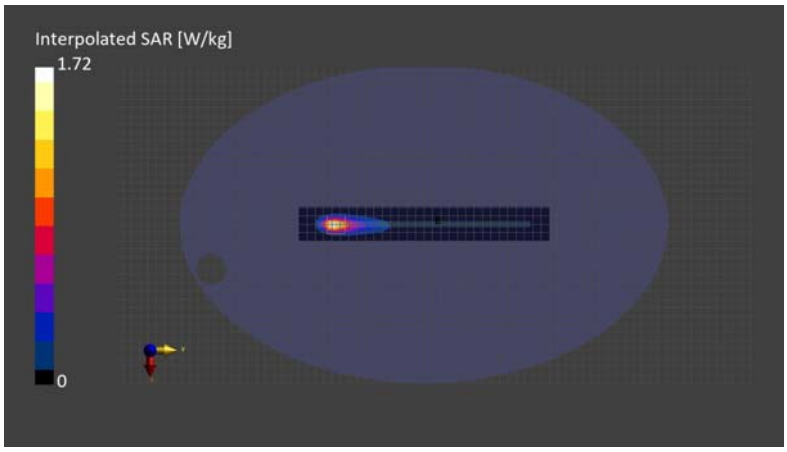
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000 2023-Jun-30 for pre check, 2023-Jul-06	EX3DV4 - SN3922, 2022-08-19	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	7.0 x 10.0	4.1 x 4.1 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.558	0.548
psSAR10g [W/Kg]	0.221	0.208
Power Drift [dB]	0.01	0.00
M2/M1 [%]		74.6
Dist 3dB Peak [mm]		5.2



F.20 Plot No. WL2M

UL Japan, Inc. Ise EMC Lab. SAR#3
Date/Time: 2023/07/20 9:32:51
Room Temp_23.0 deg.C._Liquid Temp_22.5 deg.C

Frequency: 2412 MHz; Communication System Channel Number: 1; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.751 S/m; ε_r = 39.541; ρ = 1000 kg/m^3

DASY5 Configuration:
- Electronics: DAE4 Sn554; Calibrated: 2023/04/14
- Probe: EX3DV4 - SN3745; ConvF(6.89, 6.89, 6.89) @ 2412 MHz; Calibrated: 2023/04/18
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Phantom: ELI v4.0 (20deg probe tilt); Phantom section: Flat Section ; Type: QDOVA001BB
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Full/WLAN 2.4 MIMO Rear/Area Scan (19x7x1): Measurement grid: dx=12 mm, dy=12 mm

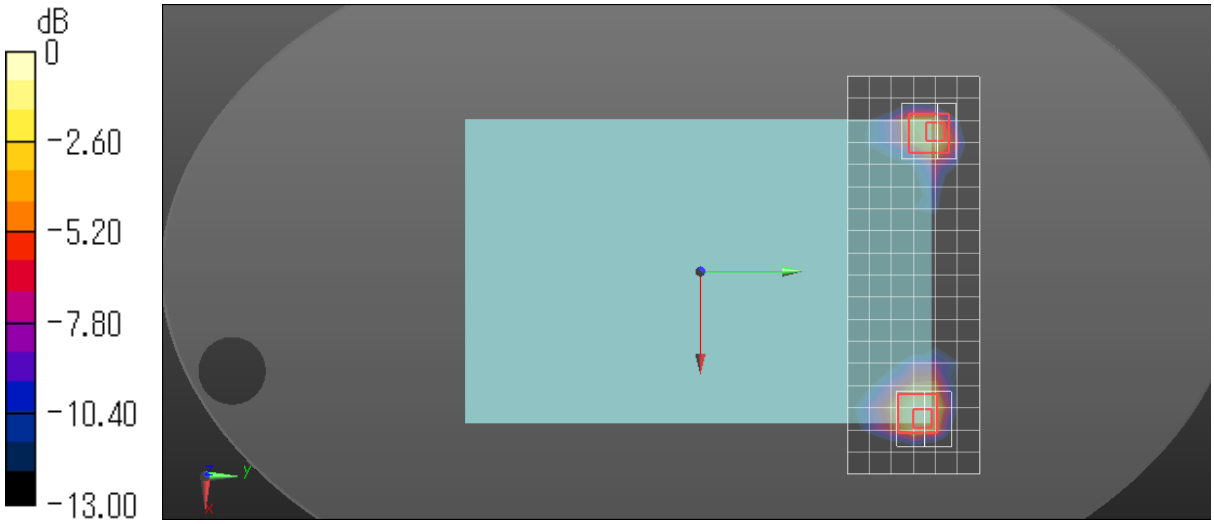
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.707 W/kg

Full/WLAN 2.4 MIMO Rear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5 mm, dy=5 mm, dz=5 mm
Reference Value = 27.16 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 0.591 W/kg; SAR(10 g) = 0.224 W/kg
Smallest distance from peaks to all points 3 dB below = 5 mm
Ratio of SAR at M2 to SAR at M1 = 37.5 %

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.18 W/kg

Full/WLAN 2.4 MIMO Rear/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5 mm, dy=5 mm, dz=5 mm
Reference Value = 27.16 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.370 W/kg; SAR(10 g) = 0.157 W/kg
Smallest distance from peaks to all points 3 dB below = 5.7 mm
Ratio of SAR at M2 to SAR at M1 = 32.3 %

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.792 W/kg



0 dB = 0.792 W/kg = -1.01 dBW/kg

F.21 Plot No. WL5.3S

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-07-05, 19:22
Room Temp_22.5 deg.C._Liquid Temp_22.0 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0	WLAN 5GHz	WLAN, 10626-AAC	5290.0, 58	5.54	4.72	36.1

Hardware Setup

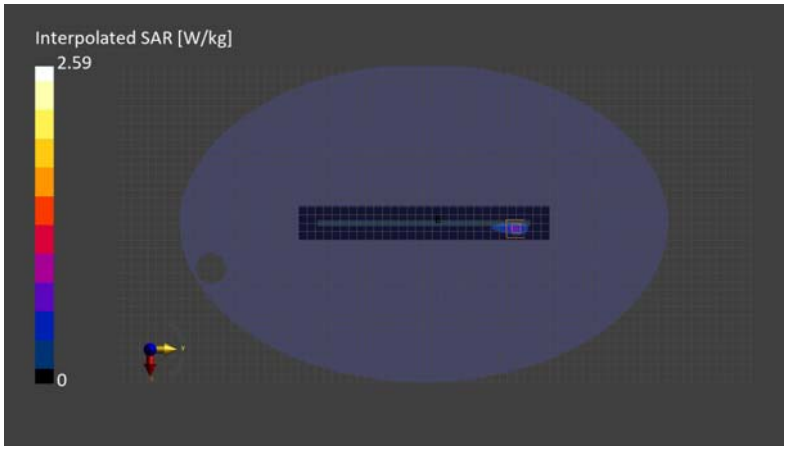
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000, 2023-Jul-05	EX3DV4 - SN3922, 2022-08-19	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	7.0 x 10.0	3.8 x 3.8 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.521	0.563
psSAR10g [W/Kg]	0.146	0.153
Power Drift [dB]	-0.10	-0.09
M2/M1 [%]		62.3
Dist 3dB Peak [mm]		4.6



F.22 Plot No. WL5.3M

UL Japan, Inc. Ise EMC Lab. SAR#1
Date/Time:2023-07-06, 10:00
Room Temp_22.5 deg.C._Liquid Temp_22.0 deg.C
Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0	WLAN 5GHz	WLAN, 10626-AAC	5290.0, 58	5.54	4.72	36.1

Hardware Setup

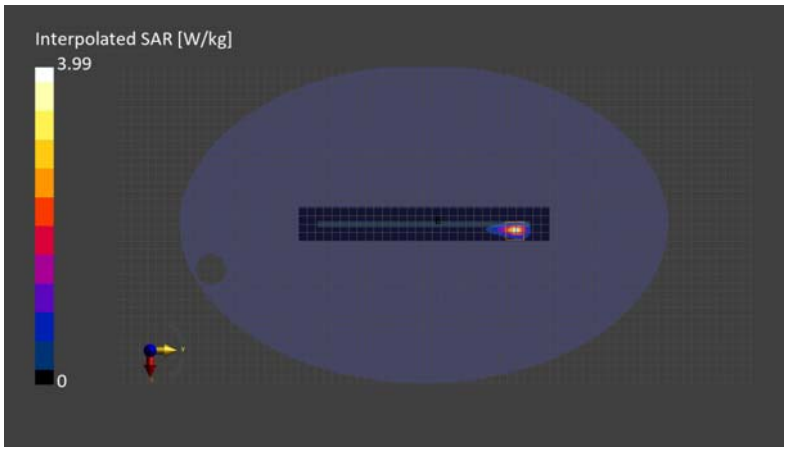
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1203	HBBL-600-10000, 2023-Jul-05	EX3DV4 - SN3922, 2022-08-19	DAE4 Sn1369, 2023-05-23

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	7.0 x 10.0	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.706	0.771
psSAR10g [W/Kg]	0.183	0.191
Power Drift [dB]	-0.05	-0.13
M2/M1 [%]		58.9
Dist 3dB Peak [mm]		4.1



F.23 Plot No. WL5.5S

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-07-13, 14:52

Room Temp_20.0 deg.C._Liquid Temp_20.0 deg.C

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	U-NII-2C, U-NII-3	WLAN, 10062-CAD	5700.0, 140	5.24	5.16	34.8

Hardware Setup

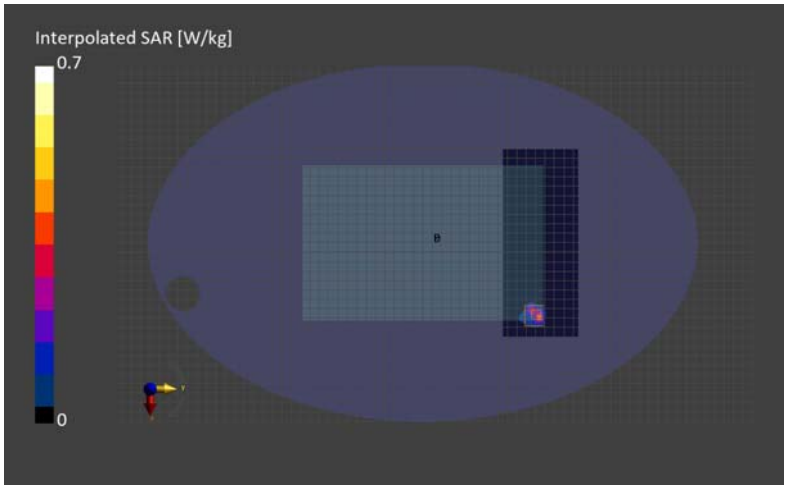
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 2023-Jul-12, 2023-Jul-12	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	200.0 x 80.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	10.0 x 10.0	3.8 x 3.8 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.248	0.519
psSAR10g [W/Kg]	0.070	0.099
Power Drift [dB]	-0.04	0.01
M2/M1 [%]		61.2
Dist 3dB Peak [mm]		3.8



F.24 Plot No. WL5.5M

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-07-14, 13:23

Room Temp_20.0 deg.C._Liquid Temp_20.0 deg.C

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	U-NII-2C, U-NII-3	WLAN, 10062-CAD	5700.0, 140	5.24	5.16	34.8

Hardware Setup

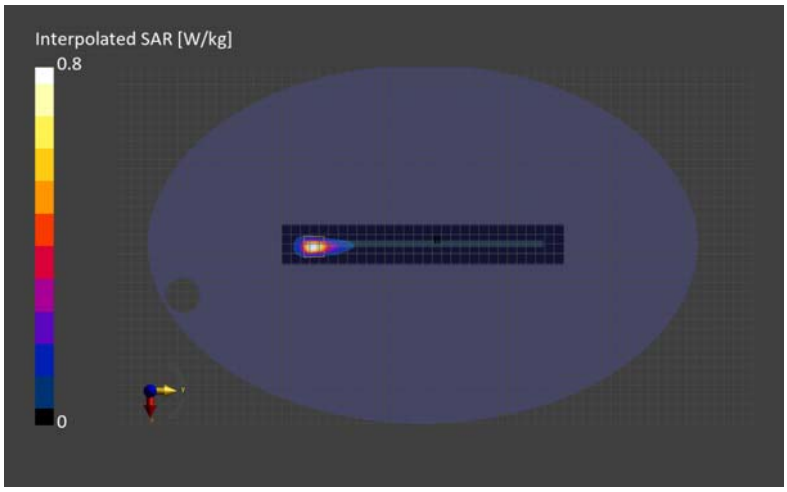
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 2023-Jul-12, 2023-Jul-12	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	7.0 x 10.0	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.548	0.666
psSAR10g [W/Kg]	0.153	0.168
Power Drift [dB]	0.02	0.01
M2/M1 [%]		53.0
Dist 3dB Peak [mm]		4.6



F.25 Plot No. WL5.8S

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-07-14, 12:14

Room Temp_20.0 deg.C._Liquid Temp_20.0 deg.C

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	U-NII-2C, U-NII-3	WLAN, 10062-CAD	5785.0, 157	5.19	5.25	34.7

Hardware Setup

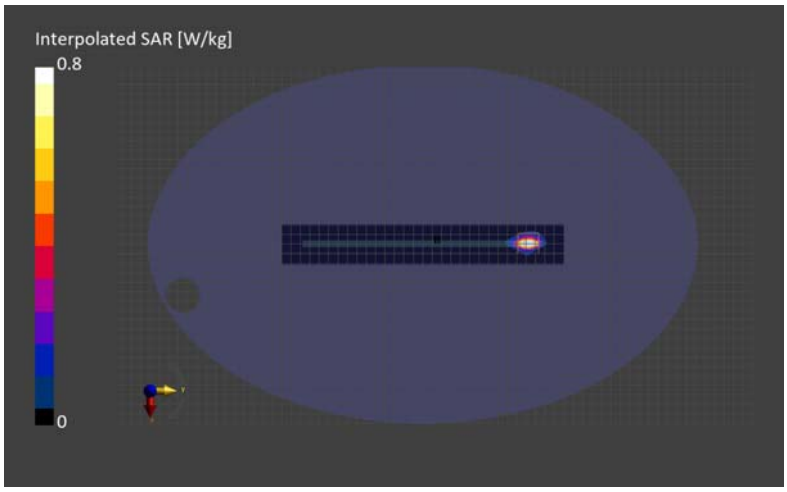
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 2023-Jul-12, 2023-Jul-12	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	7.0 x 10.0	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.643	0.659
psSAR10g [W/Kg]	0.154	0.143
Power Drift [dB]	-0.05	0.04
M2/M1 [%]		48.9
Dist 3dB Peak [mm]		4.2



F.26 Plot No. WL5.8M

UL Japan, Inc. Ise EMC Lab. SAR#2
Date/Time:2023-07-14, 12:57

Room Temp_20.0 deg.C._Liquid Temp_20.0 deg.C

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	U-NII-2C, U-NII-3	WLAN, 10062-CAD	5785.0, 157	5.19	5.25	34.7

Hardware Setup

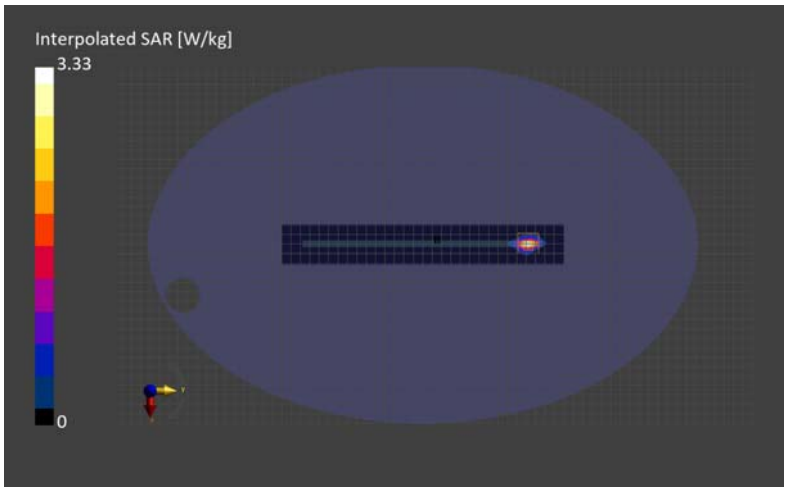
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1207	HBBL-600-10000 2023-Jul-12, 2023-Jul-12	EX3DV4 - SN7652, 2023-04-24	DAE4 Sn1372, 2023-03-16

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	42.0 x 300.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	7.0 x 10.0	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/Kg]	0.451	0.485
psSAR10g [W/Kg]	0.106	0.099
Power Drift [dB]	0.13	-0.01
M2/M1 [%]		47.8
Dist 3dB Peak [mm]		4.4



F.27 Plot No. BT

UL Japan,Inc. Ise EMC Lab. SAR#3
Date/Time: 2023/07/18 12:57:03
Room Temp_24.0 deg.C._Liquid Temp_23.5 deg.C

Frequency: 2402 MHz; Communication System Channel Number: 0; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.739 S/m; ε_r = 39.569; ρ = 1000 kg/m^3

DASY5 Configuration:
- Electronics: DAE4 Sn554; Calibrated: 2023/04/14
- Probe: EX3DV4 - SN3745; ConvF(6.89, 6.89, 6.89) @ 2402 MHz; Calibrated: 2023/04/18
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Phantom: ELI v4.0 (20deg probe tilt); Phantom section: Flat Section ; Type: QDOVA001BB
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

BT/BT 2402 MHz Right/Area Scan (6x28x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.512 W/kg

BT/BT 2402 MHz Right/Zoom Scan, dist=1.4mm 2 (8x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.02 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.755 W/kg
SAR(1 g) = 0.265 W/kg; SAR(10 g) = 0.102 W/kg
Smallest distance from peaks to all points 3 dB below = 5.4 mm
Ratio of SAR at M2 to SAR at M1 = 33.8%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.539 W/kg