15. Measurement Uncertainty

15.1. Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	12	N	2	1	1	6.0	6.0	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	√0.5	√0.5	4.3	4.3	∞
3	Hemispherical isotropy	B	9.6	R	$\sqrt{3}$	1	1	4.8	4.8	∞
4	Boundary effect	B	1.1	R	$\sqrt{3}$	1	1	0.6	0.6	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Modulation response	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
8	Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
9	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
11	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioned mech. restrictions	B	0.35	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
19	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	9
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.96	0.78	9
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{23} c_i^2 u_i^2}$						11.3	11.2	95.5
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						22.6	22.4	

15.2. Measurement Uncertainty for Normal SAR Tests (3GHz~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	13.1	N	2	1	1	6.65	6.65	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	√0.5	√0.5	4.3	4.3	∞
3	Hemispherical isotropy	B	9.6	R	$\sqrt{3}$	1	1	4.8	4.8	∞
4	Boundary effect	B	1.1	R	$\sqrt{3}$	1	1	0.6	0.6	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	modulation response	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
8	Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
9	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
10	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
11	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioned mech. Restrictions	B	0.35	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
19	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	43
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.96	0.78	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						11.6	11.5	257
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						23.2	23.0	

16. Main Test Instruments

Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46103759	2022-11-14	One year
02	Dielectric probe	85070E	MY44300317	/	/
03	Power meter	E4418B	MY50000366	2022-12-11	One year
04	Power sensor	E9304A	MY50000188	2022-12-11	One year
05	Power meter	NRP	101260	2022-12-29	One year
06	Power sensor	NRP-Z91	102211	2022-12-29	One year
07	Signal Generator	E8257D	MY47461211	2023-01-13	One year
08	Amplifier	VTL5400	0404	/	/
09	DAE	DAE4	1527	2022-06-21	One year
10	E-field Probe	EX3DV4	7621	2022-05-06	One year
11	Dipole Validation Kit	D750V3	1163	2022-08-22	Three years
12	Dipole Validation Kit	D835V2	4d057	2021-10-18	Three years
13	Dipole Validation Kit	D1750V2	1152	2022-08-22	Three years
14	Dipole Validation Kit	D1900V2	5d088	2021-10-18	Three years
15	Dipole Validation Kit	D2300V2	1059	2021-09-22	Three years
16	Dipole Validation Kit	D2450V2	873	2021-10-21	Three years
17	Dipole Validation Kit	D3500V2	1084	2019-09-20	Three years
18	Dipole Validation Kit	D3700V2	1049	2022-09-22	Three years
19	Dipole Validation Kit	D3900V2	1028	2019-09-20	Three years
20	Dipole Validation Kit	D5GHzV2	1238	2022-08-17	Three years
21	BTS	MT8820C	6201341853	2023-01-13	One year
22	BTS	CMW500	152499	2022-07-15	One year
23	Software	DASY5	/	/	/

ANNEX A: Graph Results

WCDMA Band 2 Head

Date: 2023-1-21

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 38.925; ρ = 1000 kg/m^3

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Right Cheek Middle/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.286 W/kg

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

Reference Value = 2.321 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.319 W/kg

SAR(1 g) = 0.219 W/kg; SAR(10 g) = 0.142 W/kg

Maximum value of SAR (measured) = 0.272 W/kg

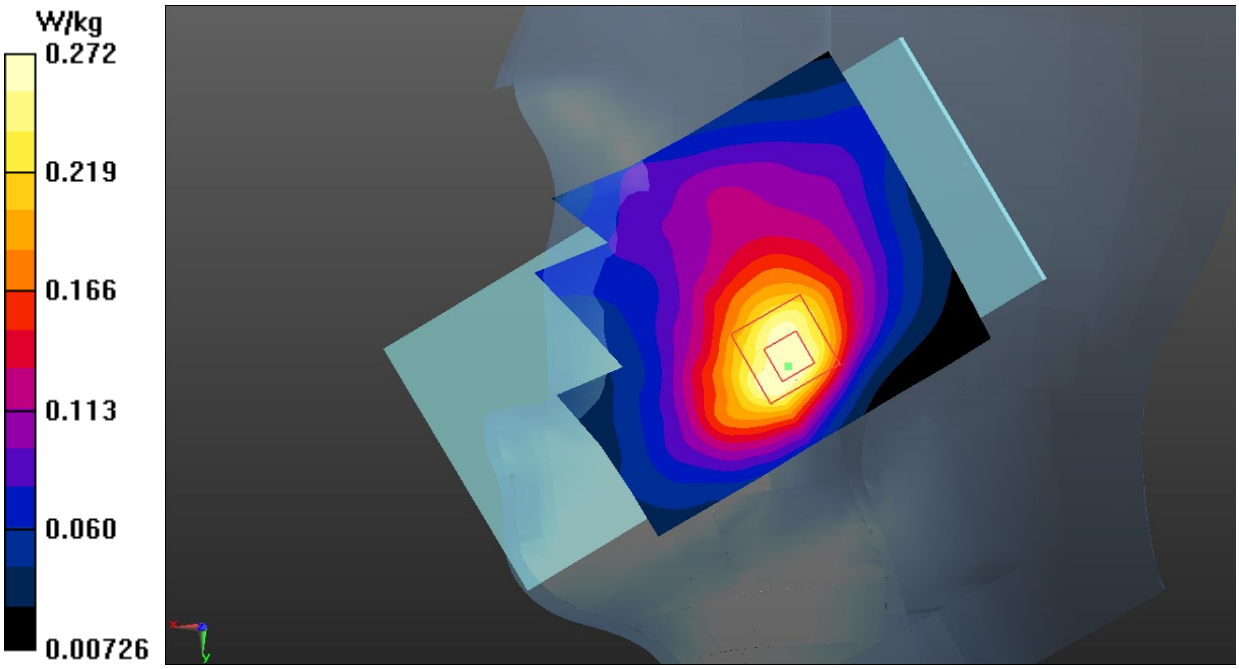


Fig.1 WCDMA Band 2 Head

WCDMA Band 2 Body

Date: 2023-1-21

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.389 S/m; ε_r = 39.033; ρ = 1000 kg/m^3

Communication System: UID 0, WCDMA (0) Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Bottom Side Low/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.01 W/kg

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

Reference Value = 23.47 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.728 W/kg; SAR(10 g) = 0.392 W/kg

Maximum value of SAR (measured) = 0.812 W/kg

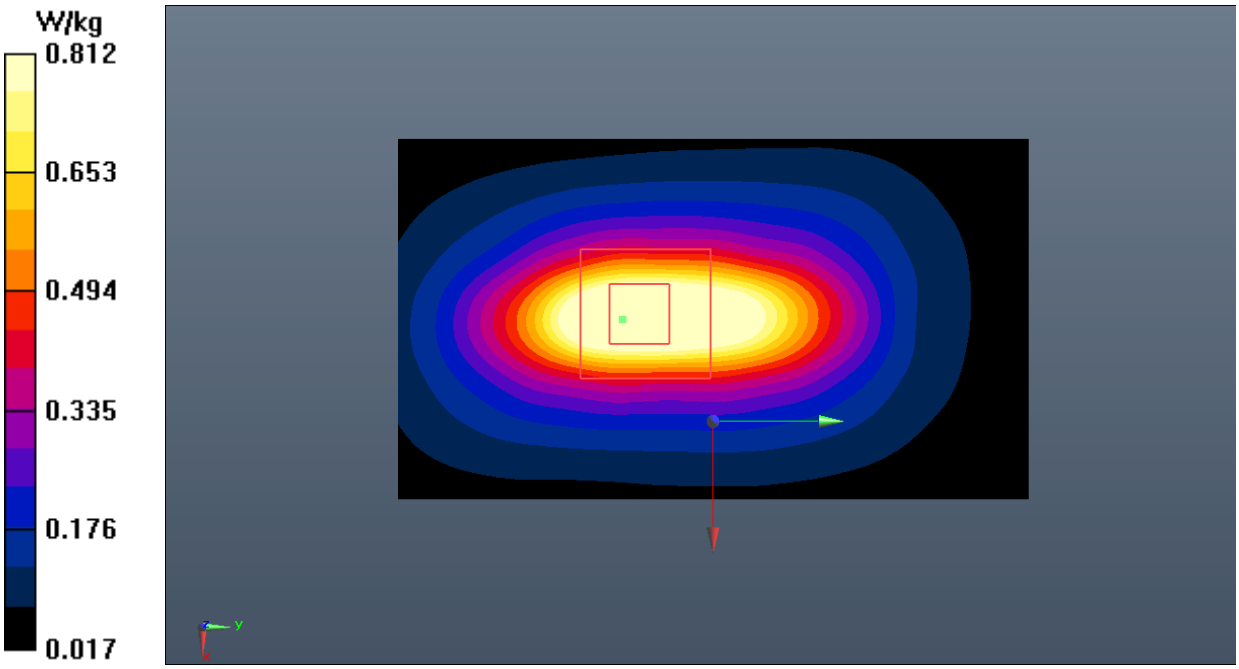


Fig.2 WCDMA Band 2 Body

WCDMA Band 4 Head
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1733 MHz; σ = 1.37 S/m; ε_r = 39.499; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Right Cheek Middle/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.254 W/kg

Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.017 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.199 W/kg; SAR(10 g) = 0.130 W/kg
Maximum value of SAR (measured) = 0.247 W/kg

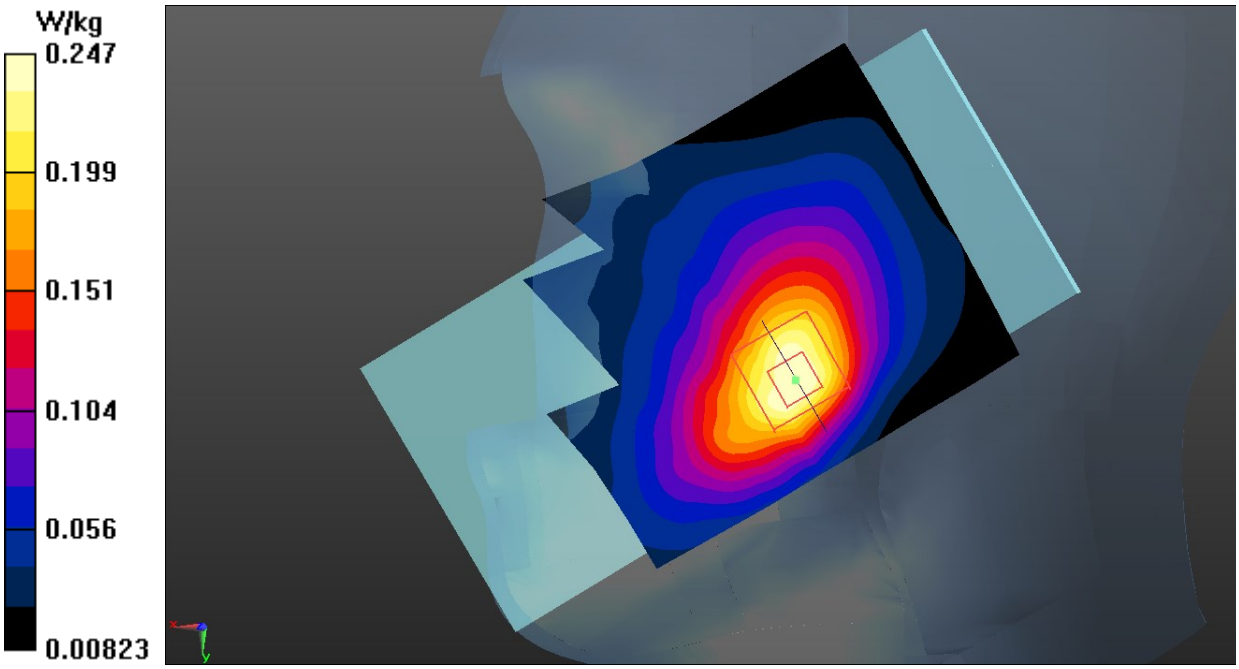


Fig.3 WCDMA Band 4 Head

WCDMA Band 4 Body
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1753 MHz; σ = 1.388 S/m; ε_r = 39.421; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Bottom Side High/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.913 W/kg

Bottom Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.41 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.658 W/kg; SAR(10 g) = 0.357 W/kg
Maximum value of SAR (measured) = 0.736 W/kg

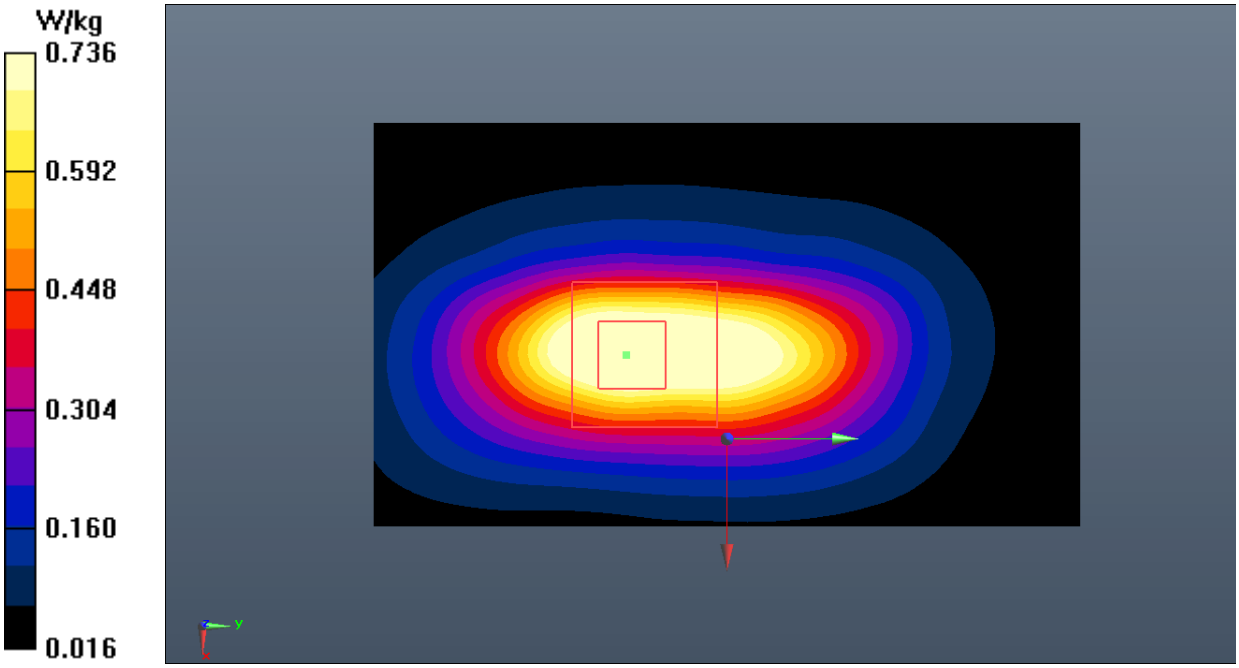


Fig.4 WCDMA Band 4 Body

WCDMA Band 5 Head
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.913 S/m; ε_r = 40.659; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 836.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Left Cheek Middle/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.322 W/kg

Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.222 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.356 W/kg
SAR(1 g) = 0.277 W/kg; SAR(10 g) = 0.210 W/kg
Maximum value of SAR (measured) = 0.318 W/kg

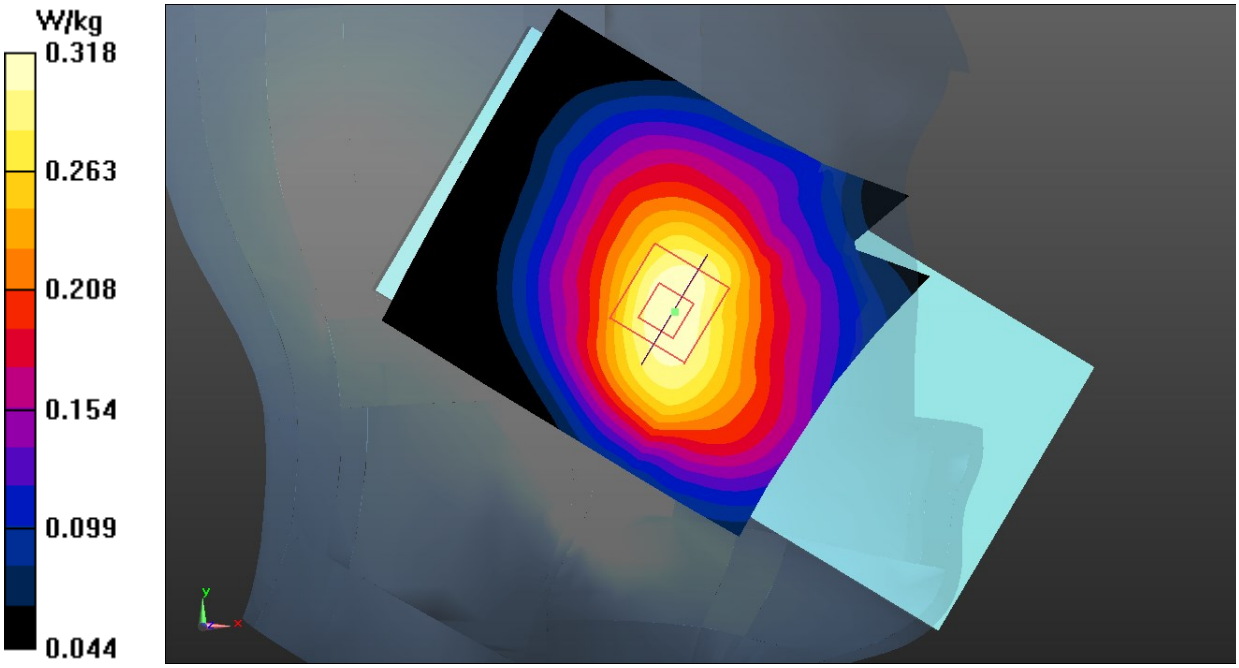


Fig.5 WCDMA Band 5 Head

WCDMA Band 5 Body
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.913 S/m; ε_r = 40.659; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 836.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Middle/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.395 W/kg

Rear Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.68 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.423 W/kg
SAR(1 g) = 0.334 W/kg; SAR(10 g) = 0.253 W/kg
Maximum value of SAR (measured) = 0.350 W/kg

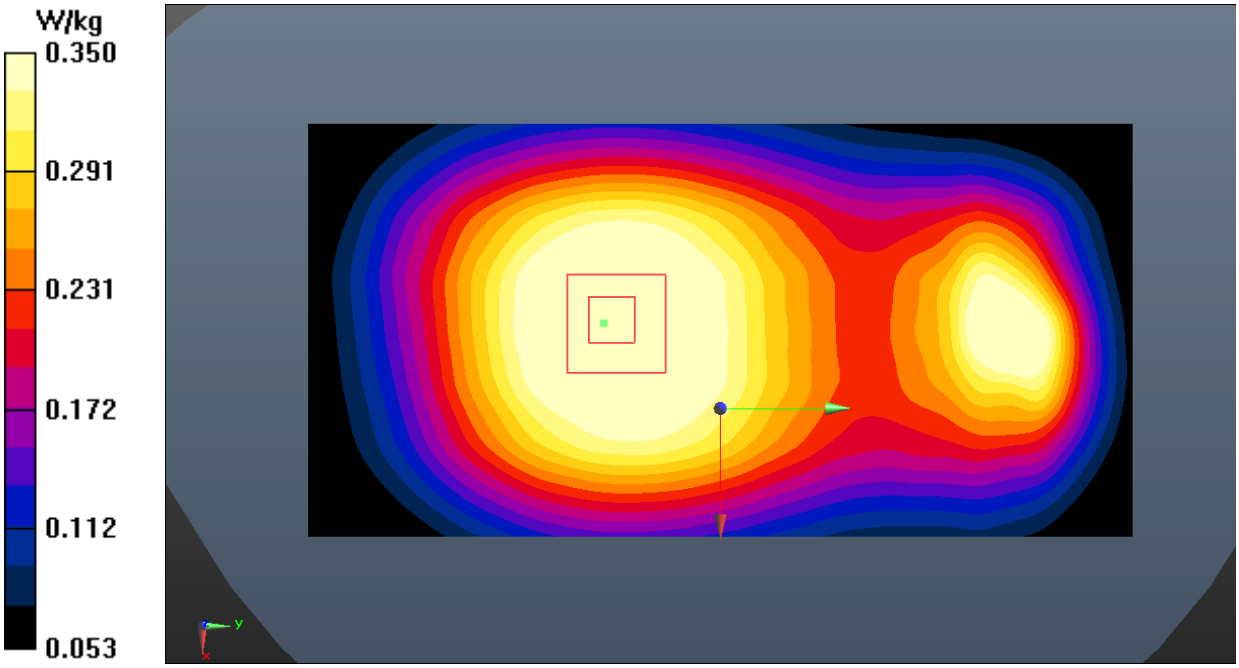


Fig.6 WCDMA Band 5 Body

LTE Band 2 Head
Date: 2023-1-21
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Right Cheek Middle 1RB50/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.309 W/kg

Right Cheek Middle 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.610 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.332 W/kg
SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.151 W/kg
Maximum value of SAR (measured) = 0.286 W/kg

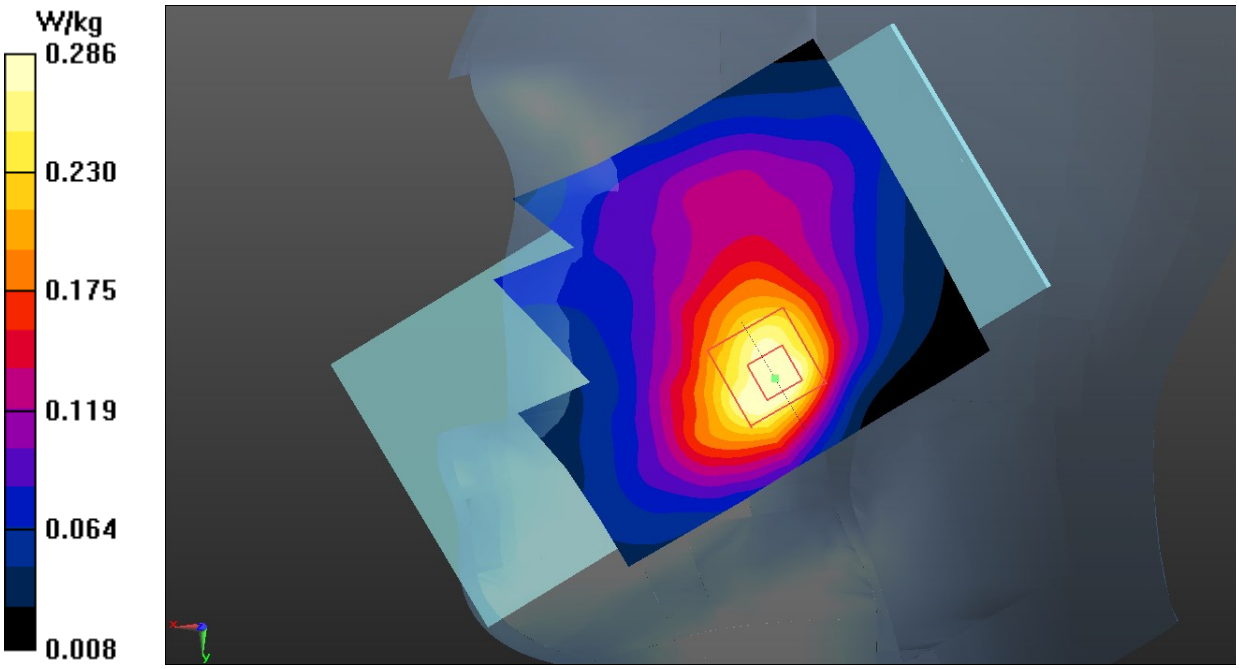


Fig.7 LTE Band 2 Head

LTE Band 2 Body
Date: 2023-1-21
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1860 MHz; σ = 1.396 S/m; ε_r = 39.002; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Bottom Side Low 1RB50/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.66 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.787 W/kg; SAR(10 g) = 0.426 W/kg
Maximum value of SAR (measured) = 0.875 W/kg

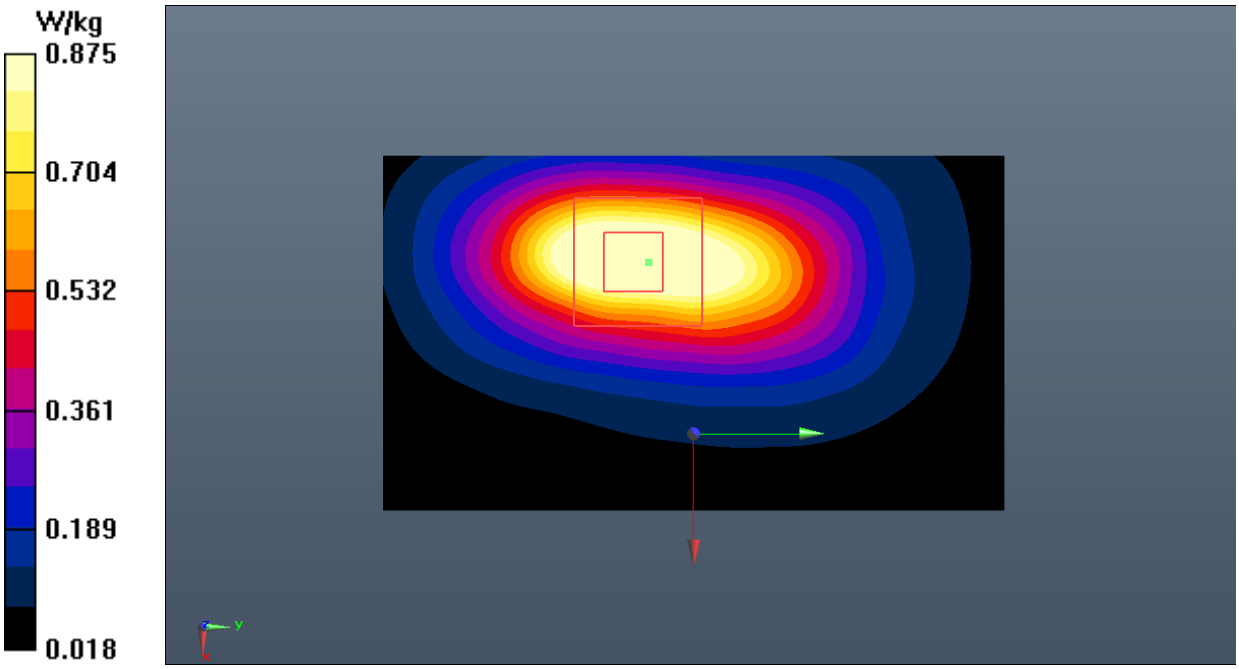


Fig.8 LTE Band 2 Body

LTE Band 5 Head
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 829 MHz; σ = 0.907 S/m; ε_r = 40.75; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Right Cheek Low 1RB49/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.339 W/kg

Right Cheek Low 1RB49/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.469 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.373 W/kg
SAR(1 g) = 0.299 W/kg; SAR(10 g) = 0.232 W/kg
Maximum value of SAR (measured) = 0.338 W/kg

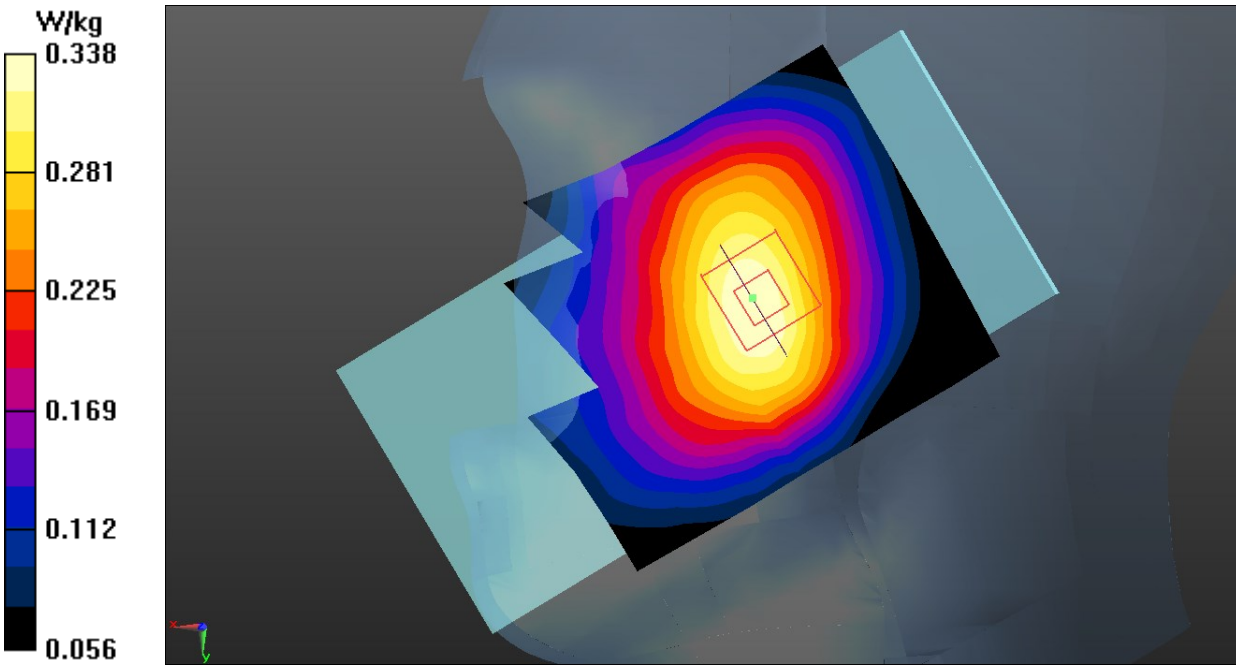


Fig.9 LTE Band 5 Head

LTE Band 5 Body
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 829 MHz; σ = 0.907 S/m; ε_r = 40.75; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Low 1RB49/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.492 W/kg

Rear Side Low 1RB49/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.28 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.526 W/kg
SAR(1 g) = 0.420 W/kg; SAR(10 g) = 0.320 W/kg
Maximum value of SAR (measured) = 0.440 W/kg

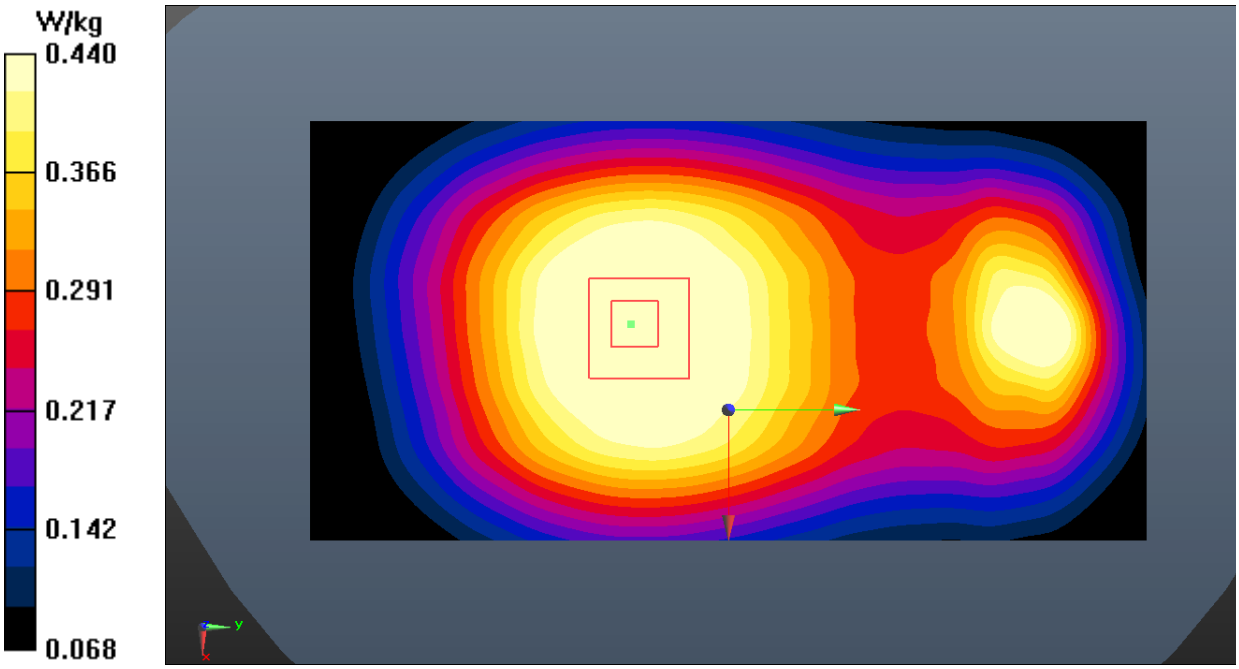


Fig.10 LTE Band 5 Body

LTE Band 12 Head
Date: 2023-1-28
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 704 MHz; σ = 0.853 S/m; ε_r = 42.943; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Left Cheek Low 1RB49/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.321 W/kg

Left Cheek Low 1RB49/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.053 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.353 W/kg
SAR(1 g) = 0.279 W/kg; SAR(10 g) = 0.216 W/kg
Maximum value of SAR (measured) = 0.319 W/kg

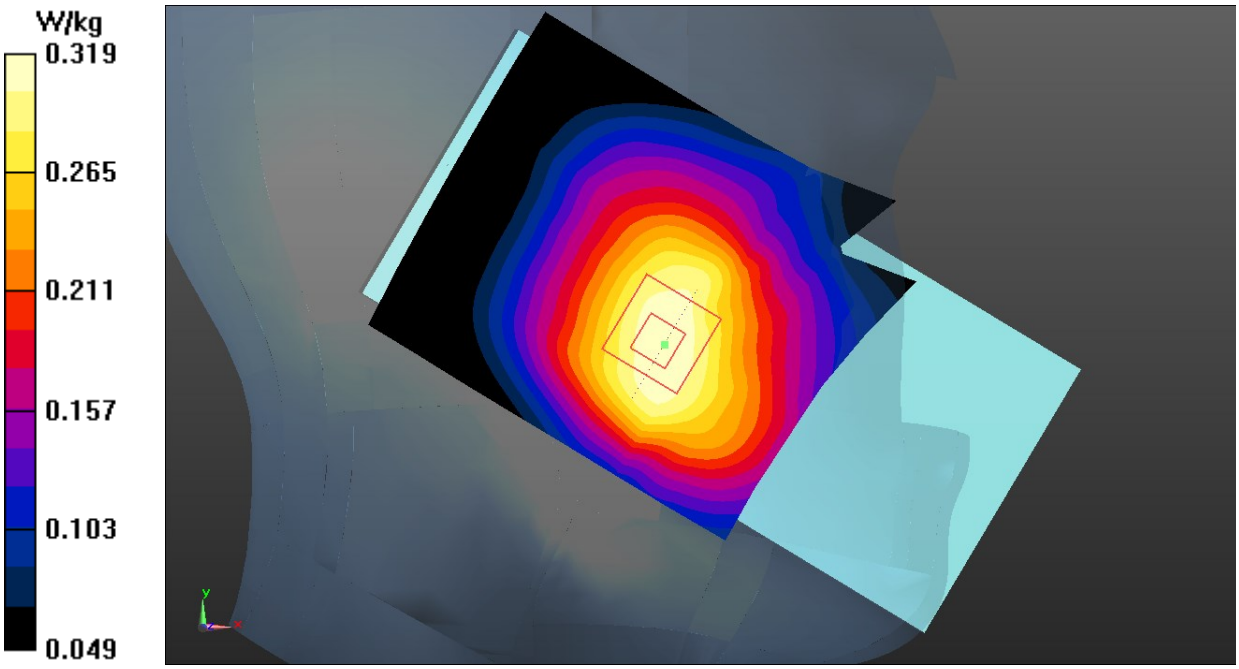


Fig.11 LTE Band 12 Head

LTE Band 12 Body
Date: 2023-1-28
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 704 MHz; σ = 0.853 S/m; ε_r = 42.943; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Low 1RB49/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.527 W/kg

Rear Side Low 1RB49/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.81 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.557 W/kg
SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.349 W/kg
Maximum value of SAR (measured) = 0.472 W/kg

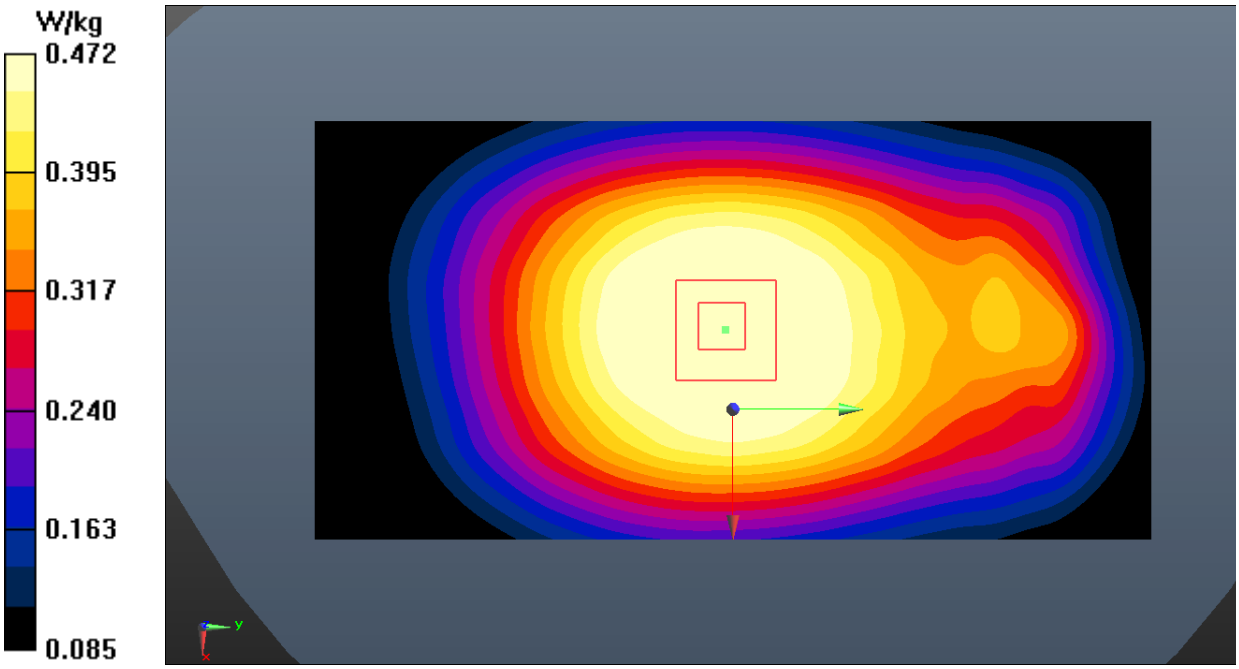


Fig.12 LTE Band 12 Body

LTE Band 14 Head
Date: 2023-1-28
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used (interpolated): f = 793 MHz; σ = 0.904 S/m; ε_r = 41.875; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Right Cheek Middle 1RB24/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.334 W/kg

Right Cheek Middle 1RB24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.006 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.293 W/kg; SAR(10 g) = 0.229 W/kg
Maximum value of SAR (measured) = 0.333 W/kg

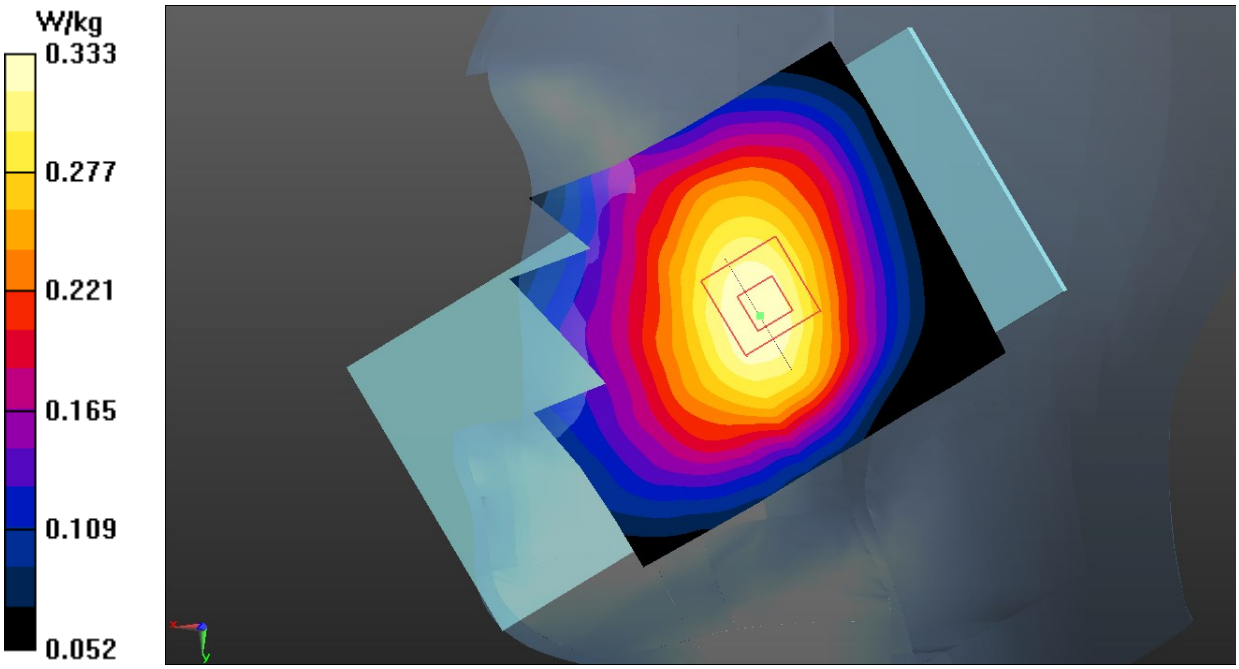


Fig.13 LTE Band 14 Head

LTE Band 14 Body
Date: 2023-1-28
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used (interpolated): f = 793 MHz; σ = 0.904 S/m; ε_r = 41.875; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Middle 1RB24/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.498 W/kg

Rear Side Middle 1RB24/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.54 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.528 W/kg
SAR(1 g) = 0.423 W/kg; SAR(10 g) = 0.326 W/kg
Maximum value of SAR (measured) = 0.442 W/kg

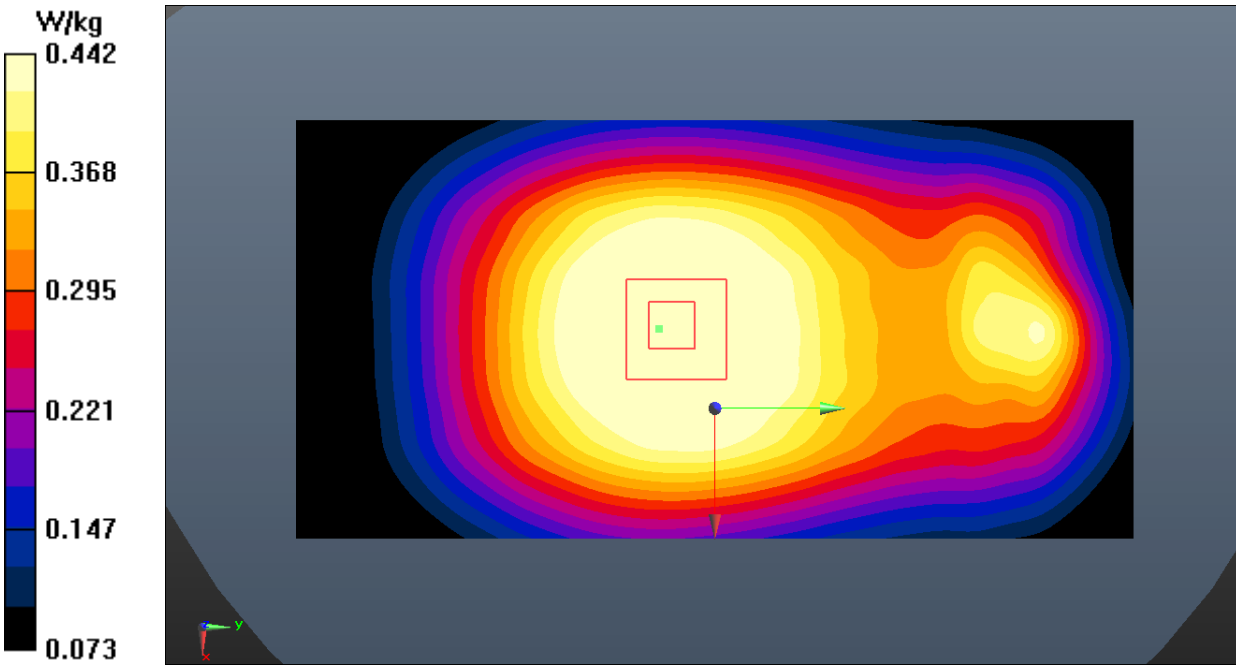


Fig.14 LTE Band 14 Body

LTE Band 30 Head
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.908; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

Right Cheek Middle 1RB49/Area Scan (91x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.153 W/kg

Right Cheek Middle 1RB49/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.144 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.180 W/kg
SAR(1 g) = 0.107 W/kg; SAR(10 g) = 0.063 W/kg
Maximum value of SAR (measured) = 0.142 W/kg

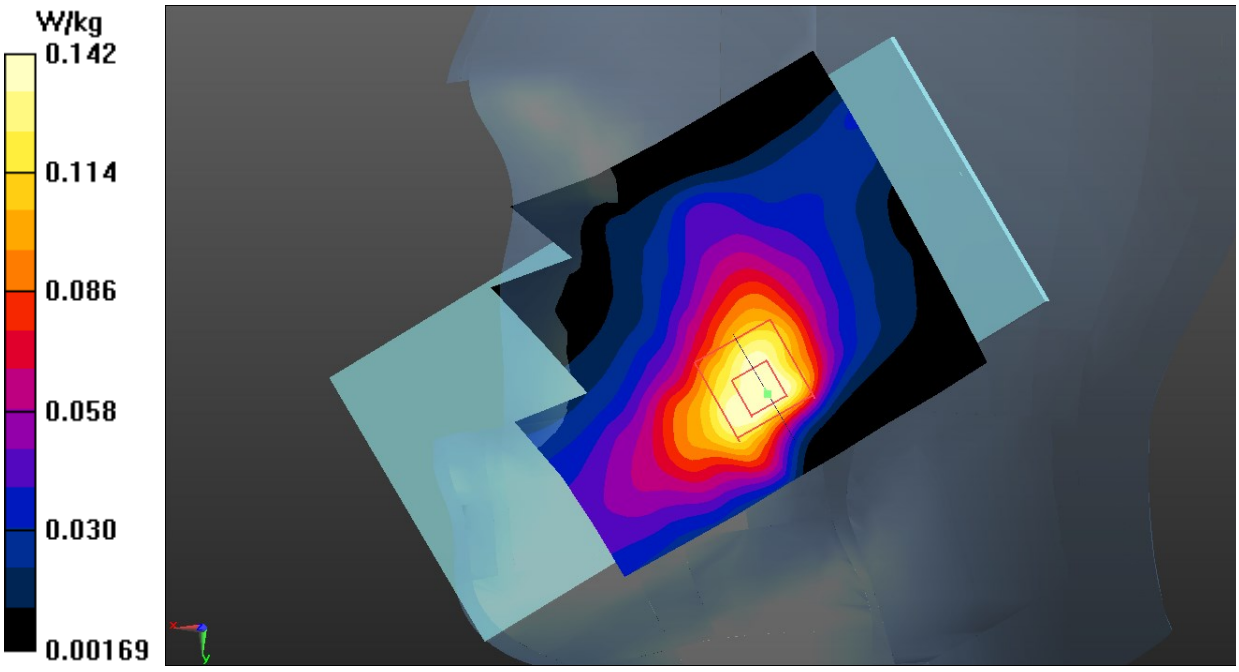


Fig.15 LTE Band 30 Head

LTE Band 30 Body
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.908; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

Bottom Side Middle 1RB49/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.33 W/kg

Bottom Side Middle 1RB49/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.82 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 0.915 W/kg; SAR(10 g) = 0.415 W/kg
Maximum value of SAR (measured) = 1.05 W/kg

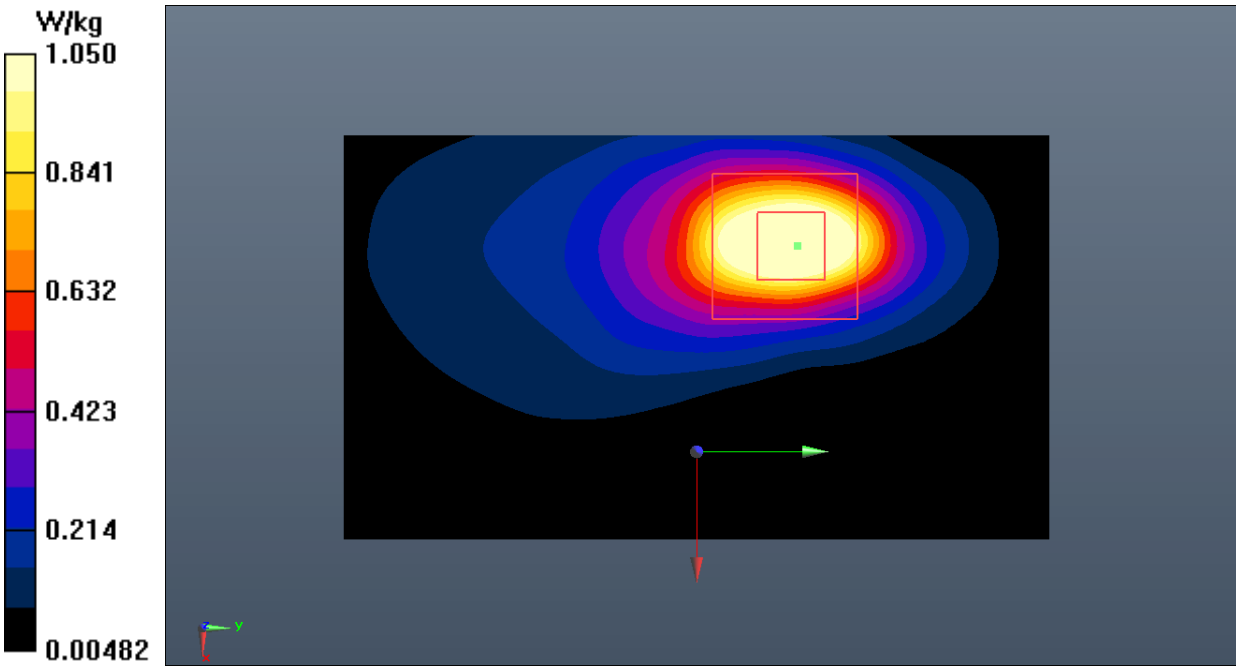


Fig.16 LTE Band 30 Body

LTE Band 48 Head
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used: f = 3560 MHz; σ = 3.006 S/m; ε_r = 37.212; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_TDD (0) Frequency: 3560 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7621 ConvF (7.56, 7.56, 7.56)

Right Cheek Low 1RB50/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.914 W/kg

Right Cheek Low 1RB50/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.039 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.71 W/kg
SAR(1 g) = 0.604 W/kg; SAR(10 g) = 0.243 W/kg
Maximum value of SAR (measured) = 1.08 W/kg

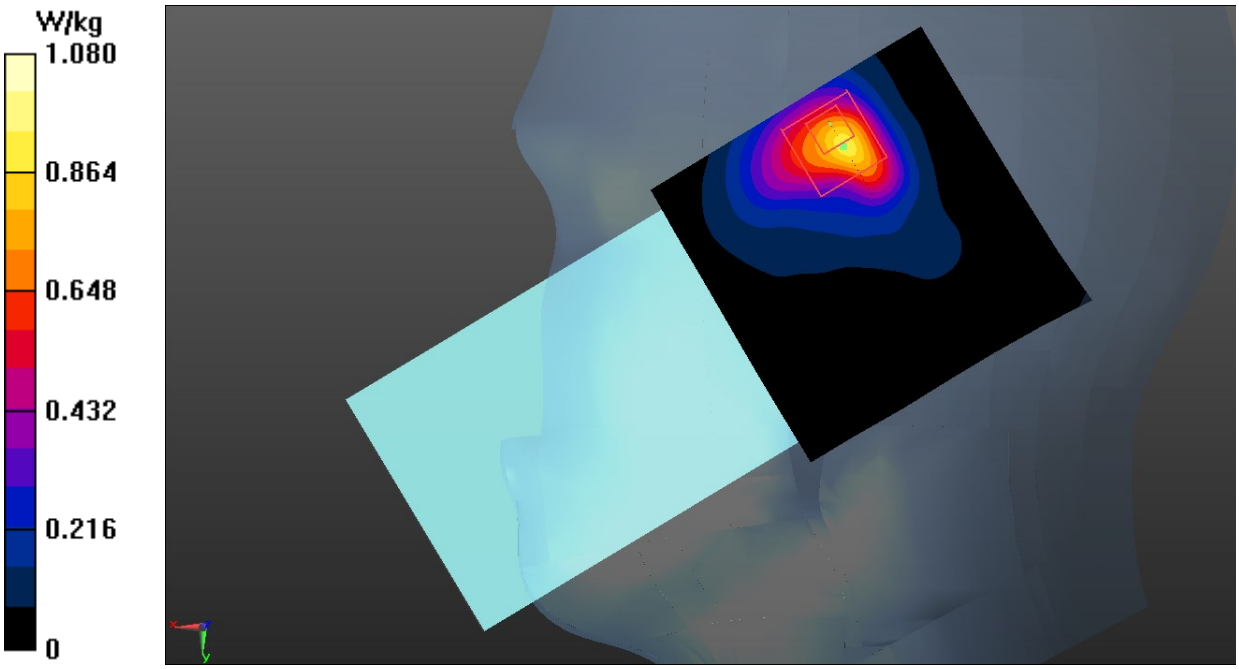


Fig.17 LTE Band 48 Head

LTE Band 48 Body
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3700MHz
Medium parameters used (interpolated): f = 3603.3 MHz; σ = 3.06 S/m; ε_r = 36.896; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_TDD (0) Frequency: 3603.3 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7621 ConvF (7.18, 7.18, 7.18)

Rear Side Low-Mid 1RB50/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.34 W/kg

Rear Side Low-Mid 1RB50/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.163 V/m; Power Drift = 0.07dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.906 W/kg; SAR(10 g) = 0.392 W/kg
Maximum value of SAR (measured) = 0.930 W/kg

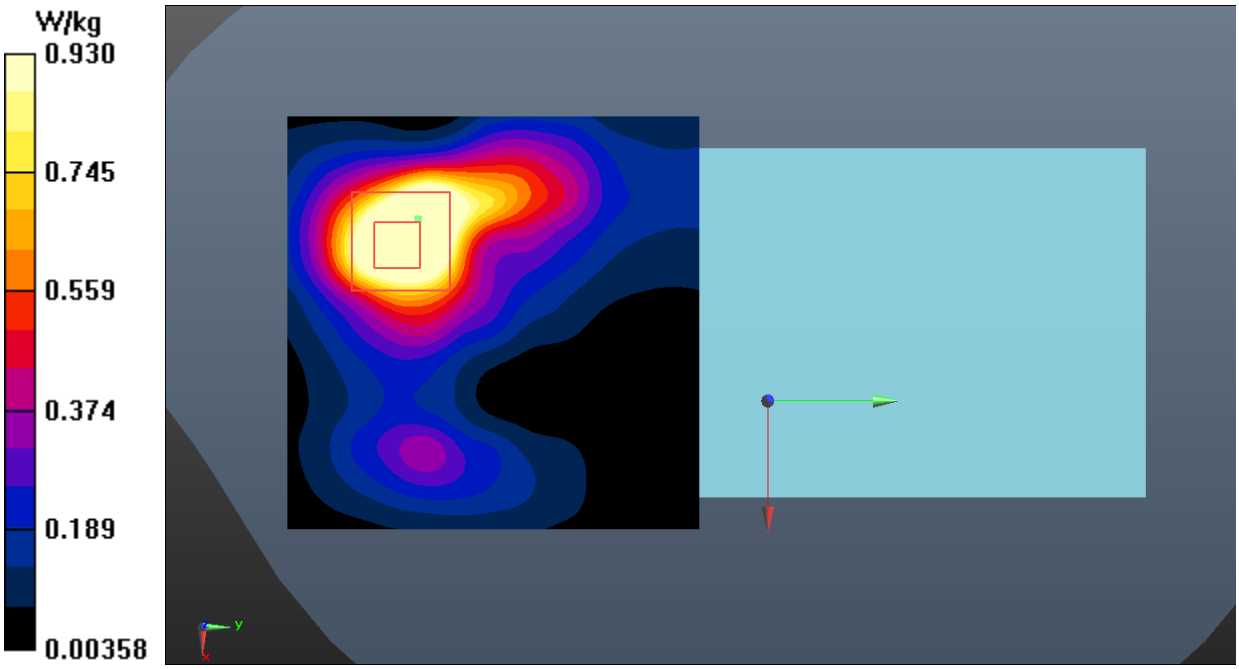


Fig.18 LTE Band 48 Body

LTE Band 66 Head
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1745 MHz; σ = 1.381 S/m; ε_r = 39.453; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Right Cheek Middle 1RB50/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.238 W/kg

Right Cheek Middle 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.233 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.190 W/kg; SAR(10 g) = 0.123 W/kg
Maximum value of SAR (measured) = 0.232 W/kg

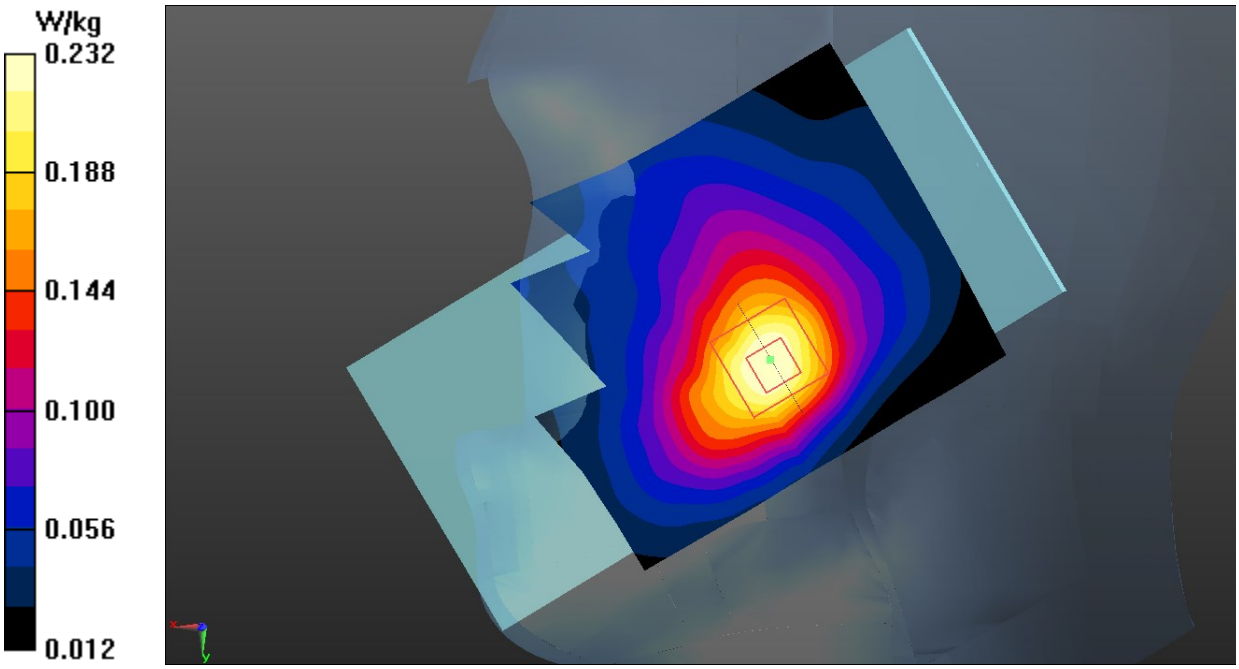


Fig.19 LTE Band 66 Head

LTE Band 66 Body
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1770 MHz; σ = 1.403 S/m; ε_r = 39.355; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1770 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Bottom Side High 1RB50/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.00 W/kg

Bottom Side High 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.24 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.727 W/kg; SAR(10 g) = 0.399 W/kg
Maximum value of SAR (measured) = 0.803 W/kg

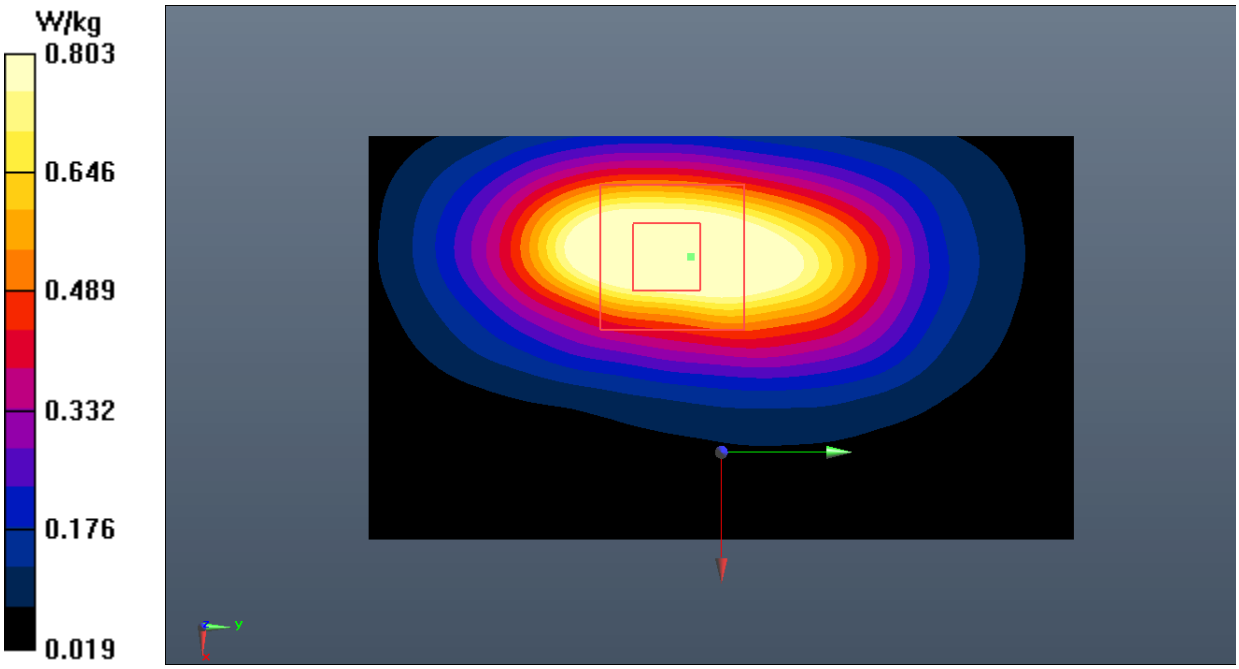


Fig.20 LTE Band 66 Body

NR n2 Head
Date: 2023-1-21
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Right Cheek Middle 12@6/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.272 W/kg

Right Cheek Middle 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.733 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.299 W/kg
SAR(1 g) = 0.207 W/kg; SAR(10 g) = 0.135 W/kg
Maximum value of SAR (measured) = 0.255 W/kg

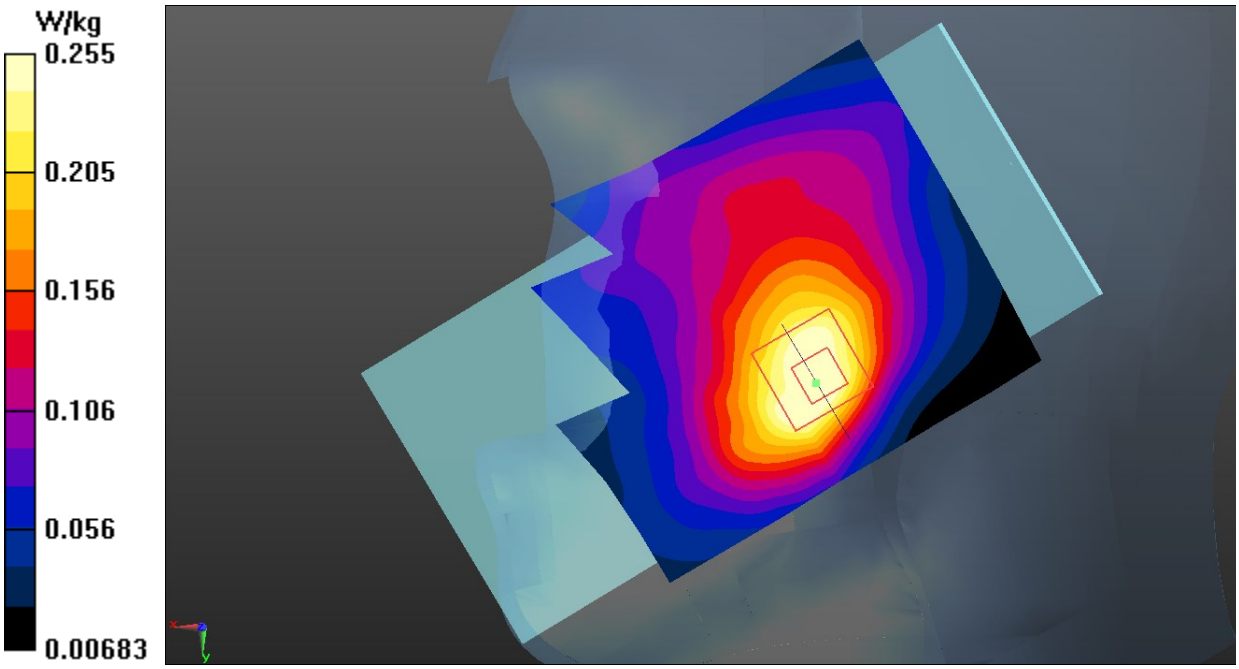


Fig.21 NR n2 Head

NR n2 Body
Date: 2023-1-21
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Bottom Side Middle 12@6/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.670 W/kg

Bottom Side Middle 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.782 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.968 W/kg
SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.287 W/kg
Maximum value of SAR (measured) = 0.684 W/kg

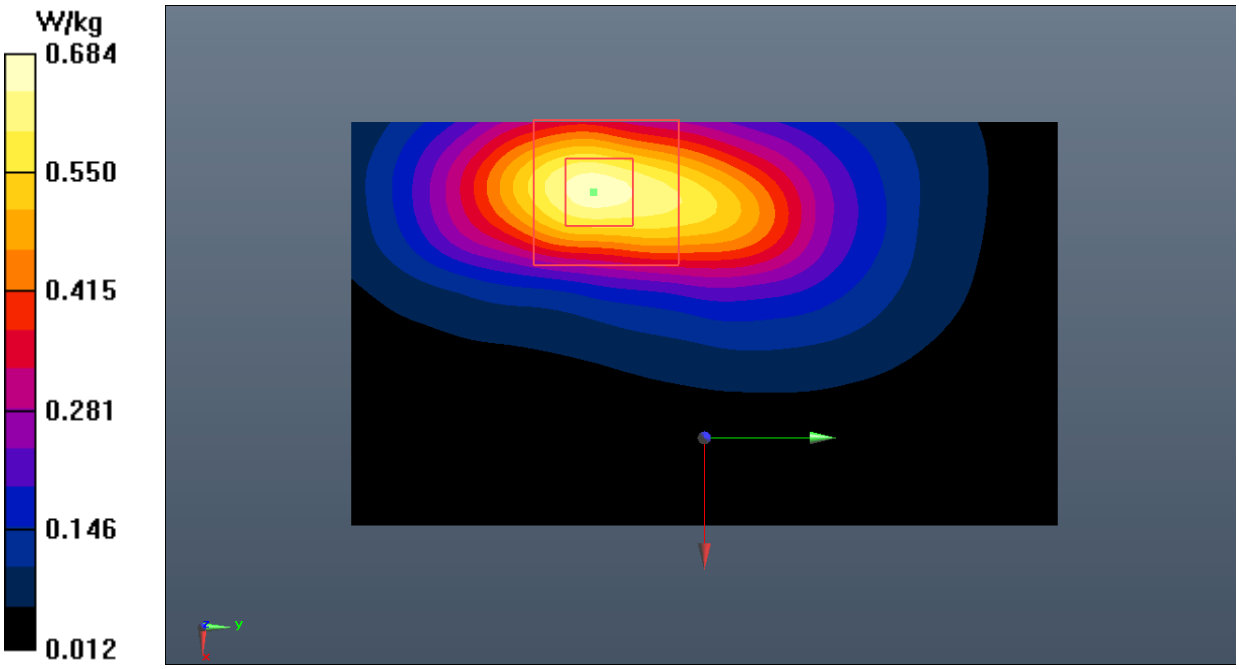


Fig.22 NR n2 Body

NR n5 Head
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.913 S/m; ε_r = 40.66; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Left Cheek Middle 50@25/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.326 W/kg

Left Cheek Middle 50@25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.724 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.357 W/kg
SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.212 W/kg
Maximum value of SAR (measured) = 0.322 W/kg

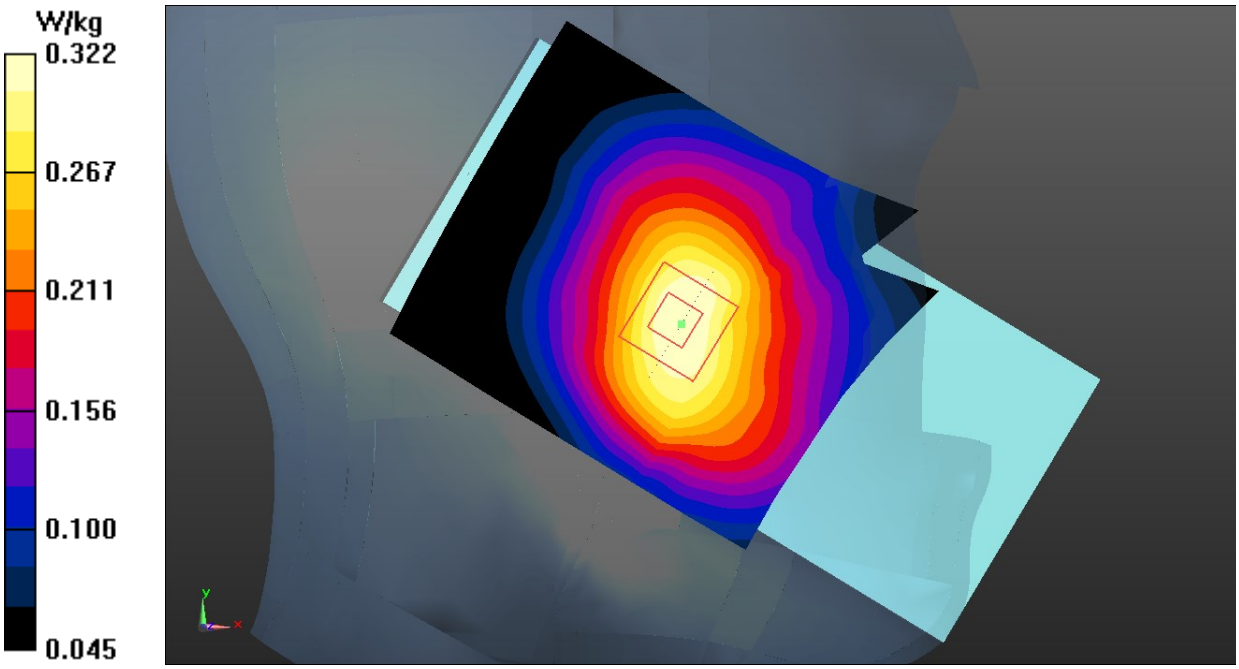


Fig.23 NR n5 Head

NR n5 Body
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.913 S/m; ε_r = 40.66; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

Rear Side Middle 50@25/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.413 W/kg

Rear Side Middle 50@25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.56 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.444 W/kg
SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.268 W/kg
Maximum value of SAR (measured) = 0.368 W/kg

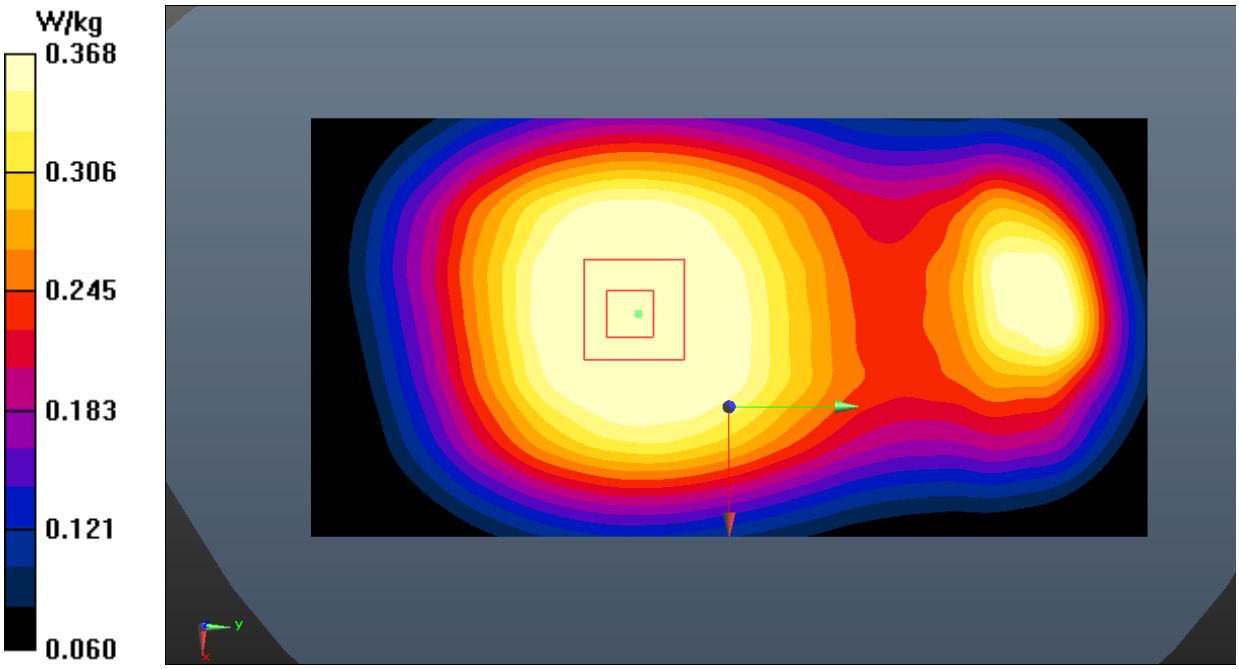


Fig.24 NR n5 Body

NR n30 Head
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.908; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

Right Cheek Middle 12@6/Area Scan (91x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.126 W/kg

Right Cheek Middle 12@6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.009 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.090 W/kg; SAR(10 g) = 0.054 W/kg
Maximum value of SAR (measured) = 0.118 W/kg

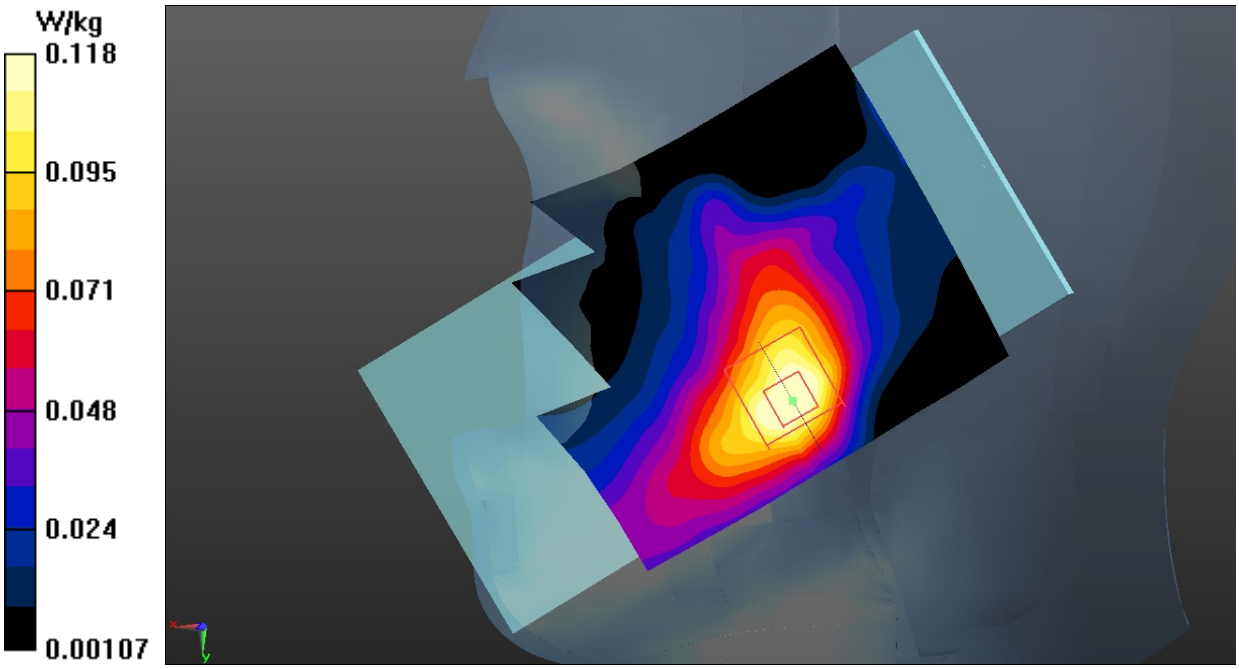


Fig.25 NR n30 Head

NR n30 Body
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.908; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

Bottom Side Middle 12@6/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.744 W/kg

Bottom Side Middle 12@6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.530 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.528 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.689 W/kg

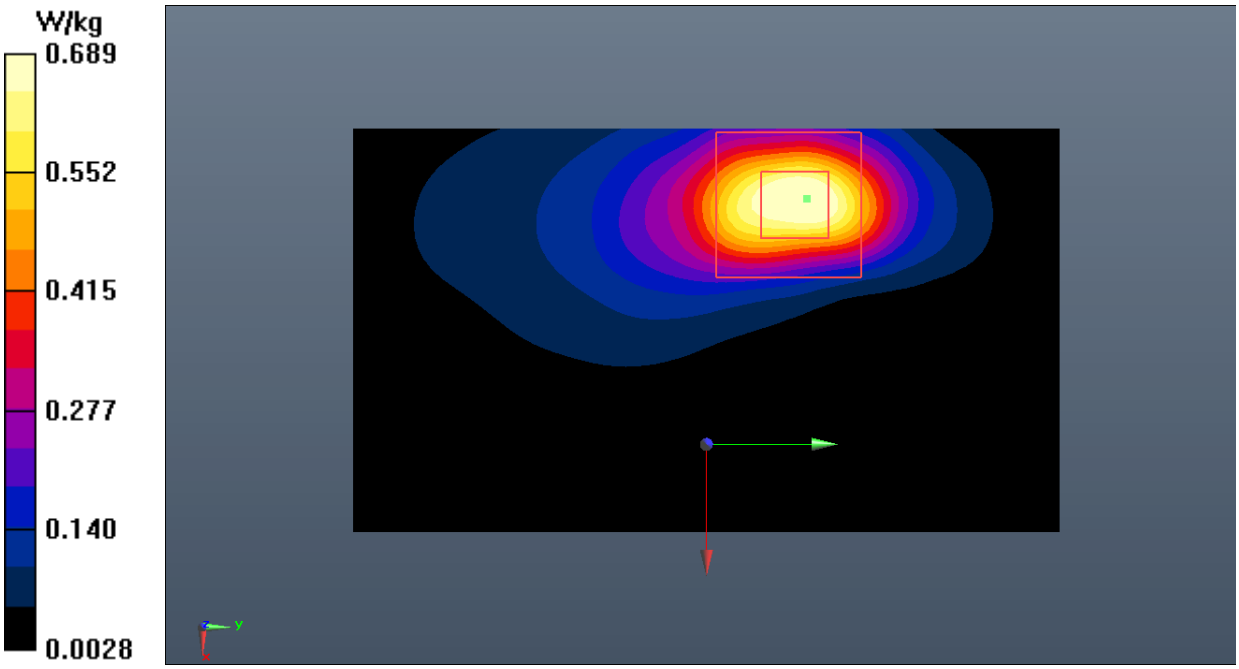


Fig.26 NR n30 Body

NR n66 Head
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1745 MHz; σ = 1.381 S/m; ε_r = 39.453; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Right Cheek Middle 108@54/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.197 W/kg

Right Cheek Middle 108@54/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.013 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.223 W/kg
SAR(1 g) = 0.157 W/kg; SAR(10 g) = 0.104 W/kg
Maximum value of SAR (measured) = 0.193 W/kg

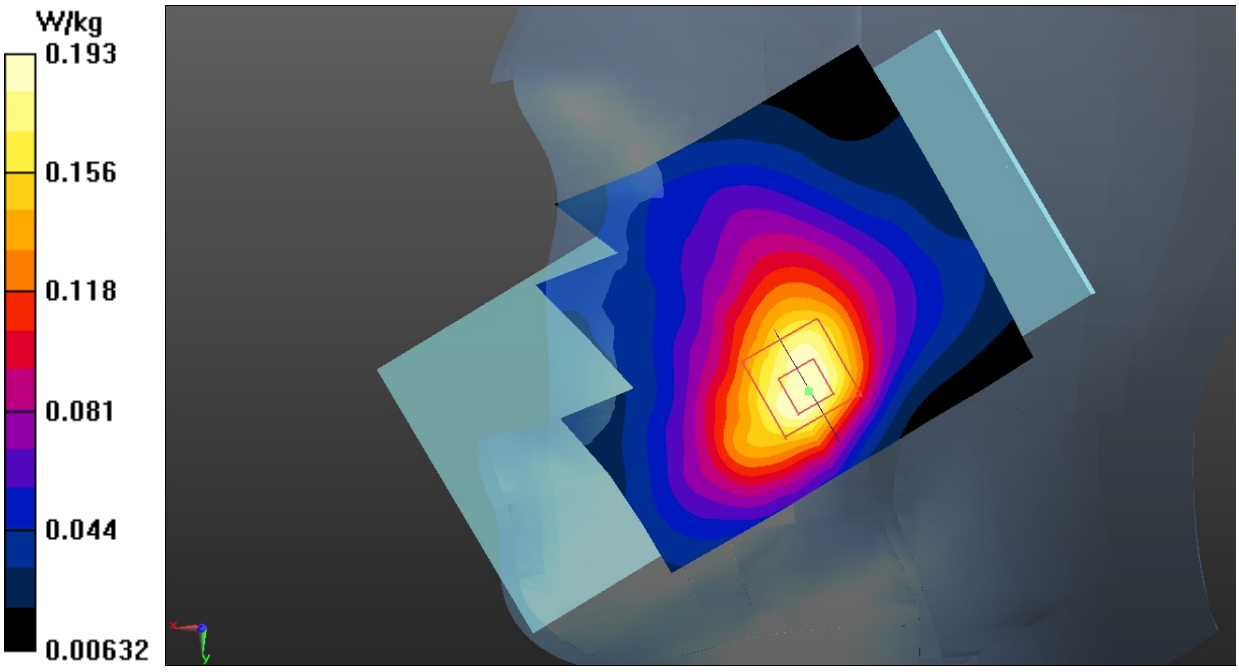


Fig.27 NR n66 Head

NR n66 Body
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1745 MHz; σ = 1.381 S/m; ε_r = 39.453; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Bottom Side Middle 108@54/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.618 W/kg

Bottom Side Middle 108@54/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.37 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.845 W/kg
SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.601 W/kg

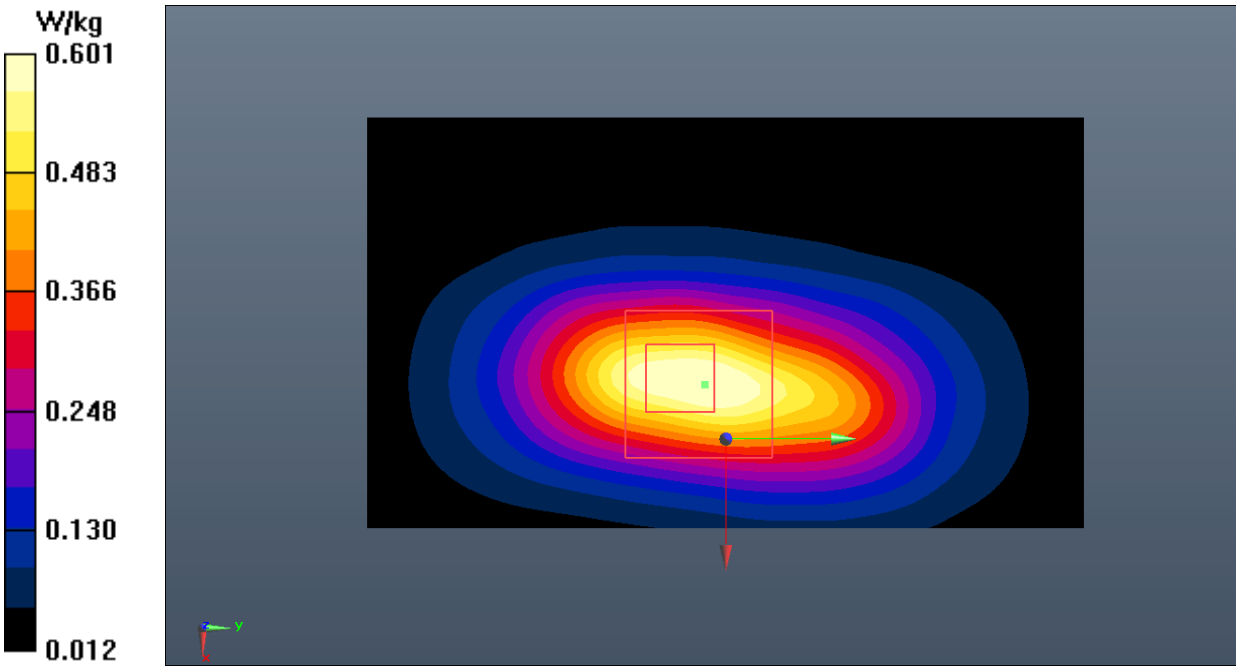


Fig.28 NR n66 Body

NR n77 Part 27Q (PC2) Head
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used (interpolated): f = 3500.01 MHz; σ = 2.935 S/m; ε_r = 37.413; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3500.01 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.56, 7.56, 7.56)

Left Cheek Middle 135@67/Area Scan (111x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.627 W/kg

Left Cheek Middle 135@67/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.269 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.118 W/kg
Maximum value of SAR (measured) = 0.665 W/kg

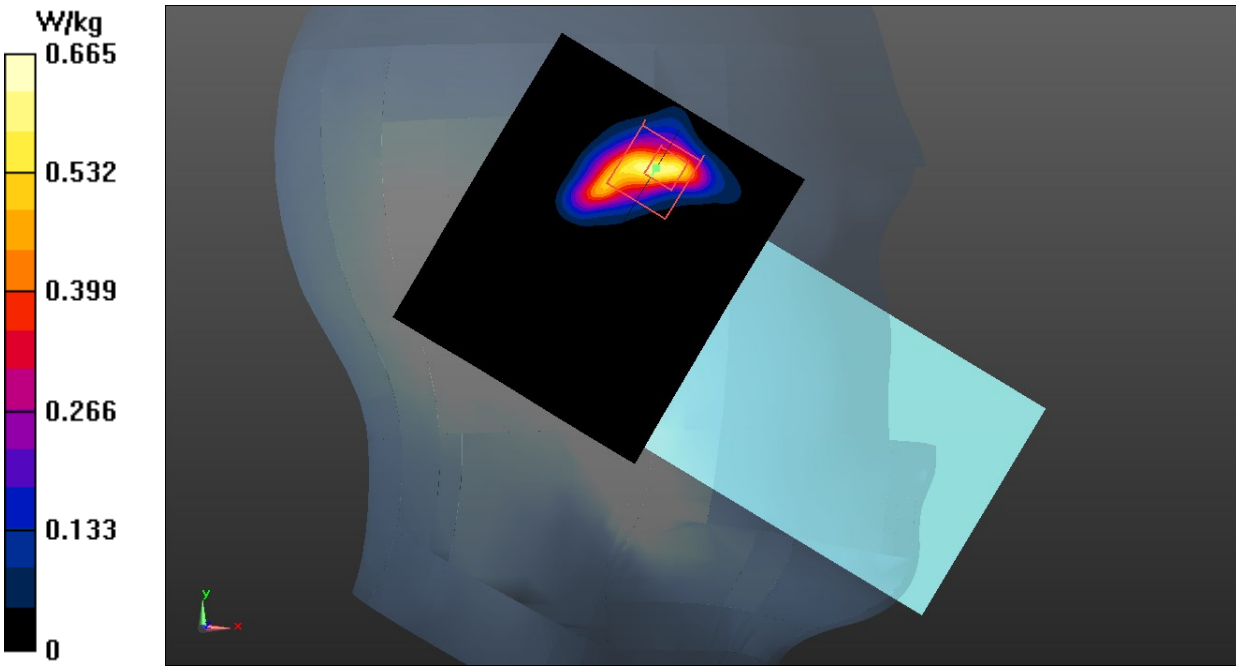


Fig.29 NR n77 Part 27Q Head

NR n77 Part 27Q (PC2) Body
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used (interpolated): f = 3500.01 MHz; σ = 2.935 S/m; ε_r = 37.413; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3500.01 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.56, 7.56, 7.56)

Left Side Middle 135@67/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.860 W/kg

Left Side Middle 135@67/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.378 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.561 W/kg; SAR(10 g) = 0.255 W/kg
Maximum value of SAR (measured) = 0.609 W/kg

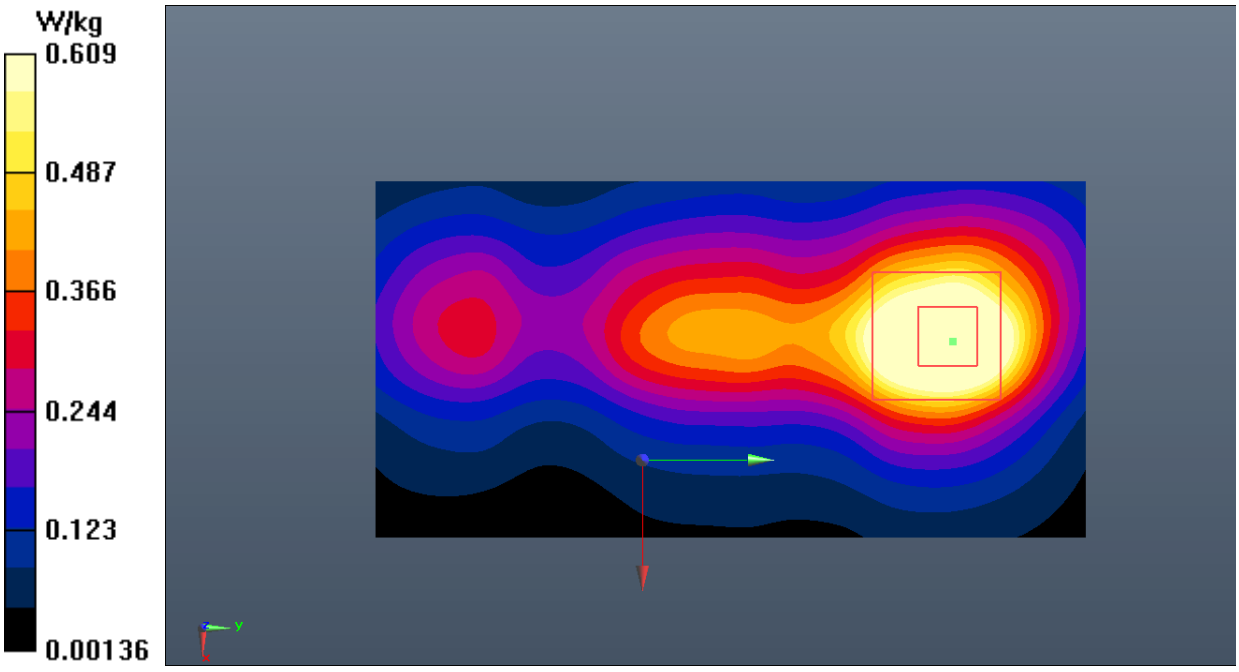


Fig.30 NR n77 Part 27Q Body

NR n77 Part 27O (PC2) Head
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3900MHz
Medium parameters used: f = 3840 MHz; σ = 3.181 S/m; ε_r = 38.159; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3840 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.26, 7.26, 7.26)

Right Cheek Middle 135@67/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.526 W/kg

Right Cheek Middle 135@67/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.711 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.405 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.679 W/kg

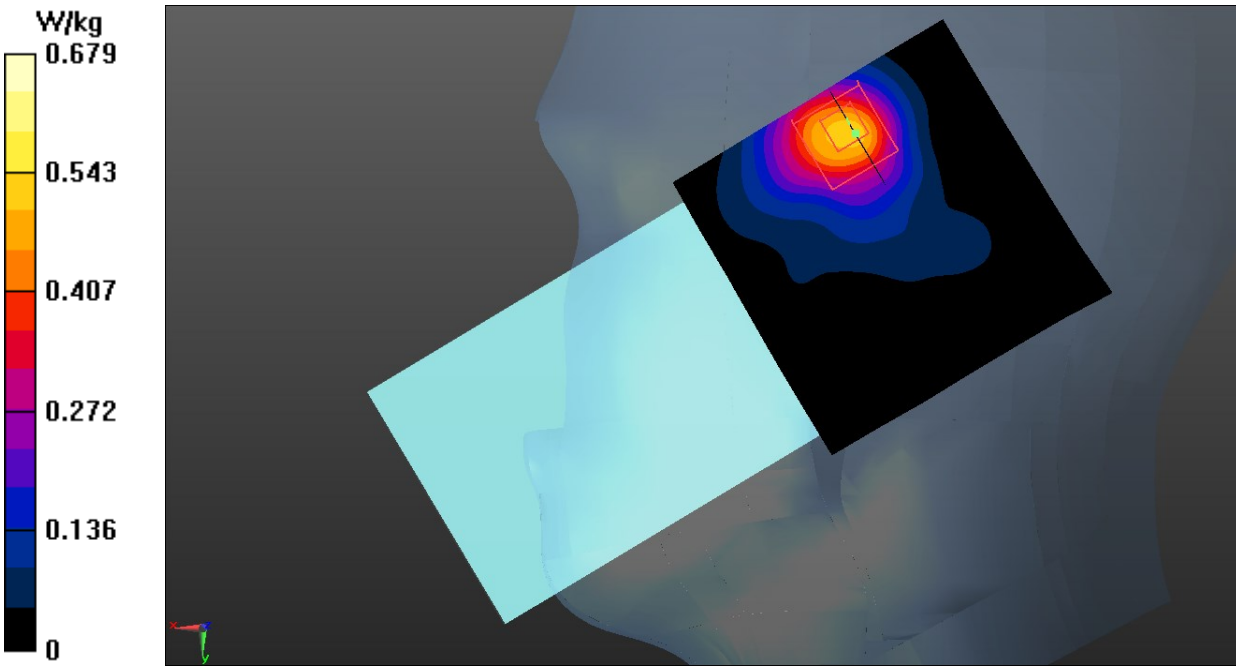


Fig.31 NR n77 Part 27O Head

NR n77 Part 27O (PC2) Body
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3900MHz
Medium parameters used (interpolated): f = 3975.02 MHz; σ = 3.431 S/m; ε_r = 37.715; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3975.02 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.26, 7.26, 7.26)

Right Side High 12@6/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.979 W/kg

Right Side High 12@6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.498 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.225 W/kg
Maximum value of SAR (measured) = 1.03 W/kg

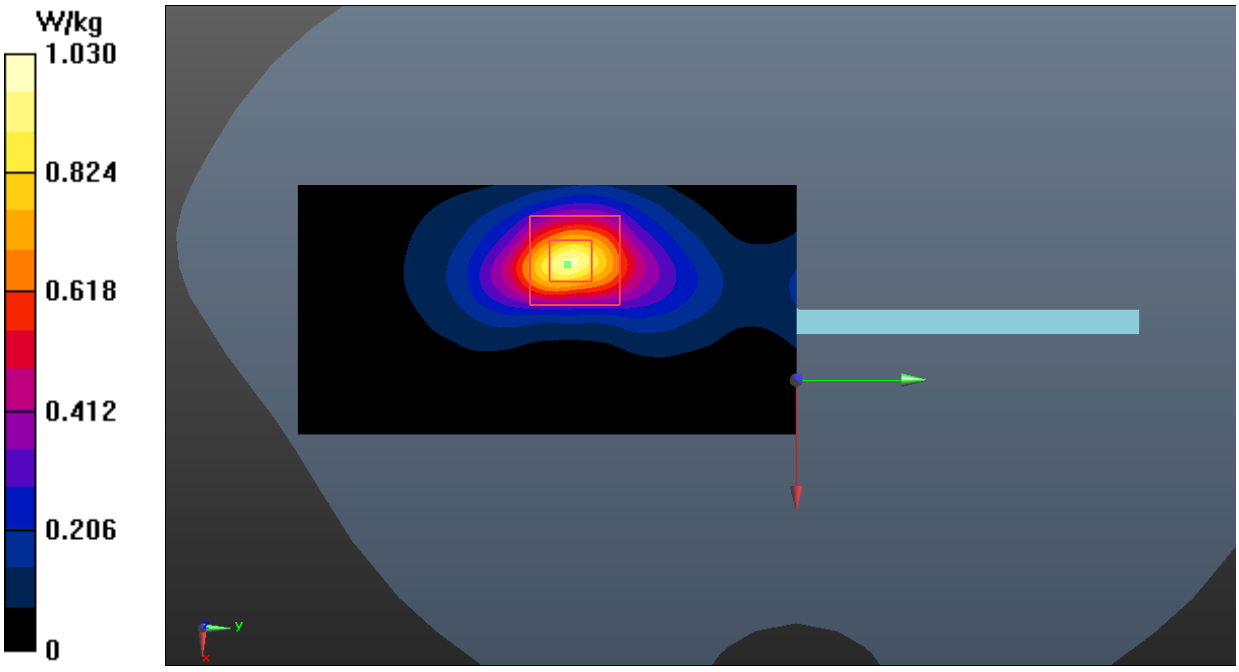


Fig.32 NR n77 Part 27O Body

Bluetooth Head
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2402 MHz; σ = 1.779 S/m; ε_r = 38.677; ρ = 1000 kg/m^3
Communication System: UID 0, BT (0) Frequency: 2402 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Left Tilt Ch.0/Area Scan (91x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.450 W/kg

Left Tilt Ch.0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.590 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.754 W/kg
SAR(1 g) = 0.308 W/kg; SAR(10 g) = 0.116 W/kg
Maximum value of SAR (measured) = 0.493 W/kg

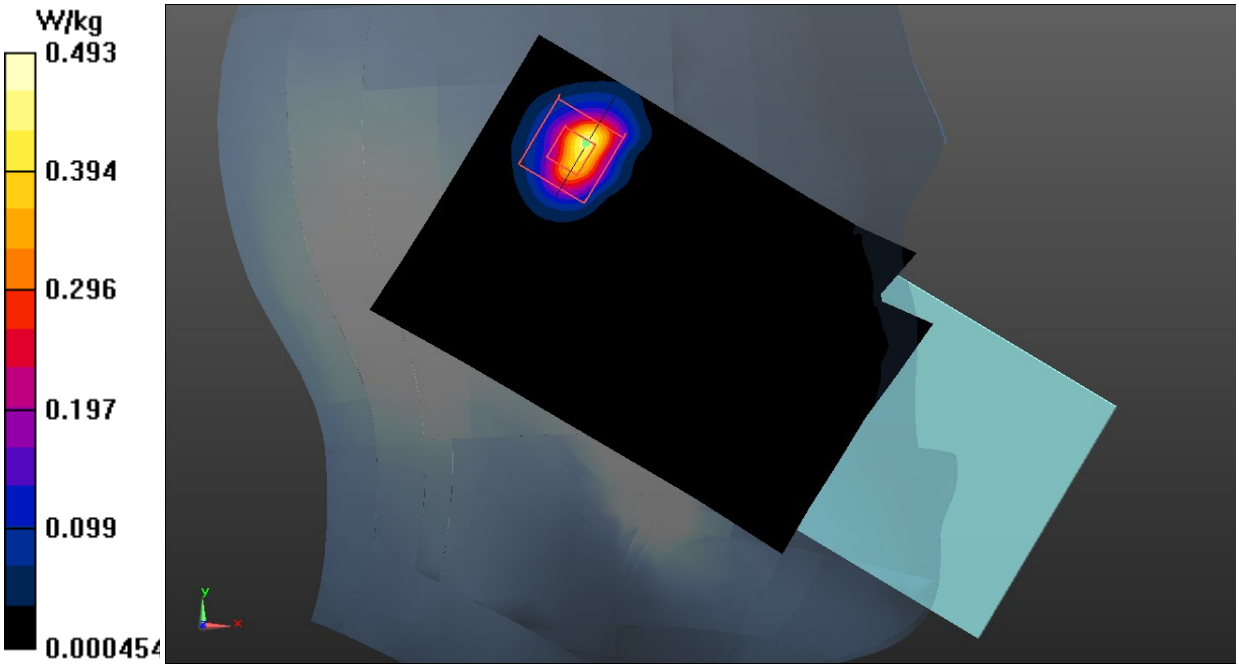


Fig.33 Bluetooth Head

Bluetooth Body
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2402 MHz; σ = 1.779 S/m; ε_r = 38.677; ρ = 1000 kg/m^3
Communication System: UID 0, BT (0) Frequency: 2402 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Top Side Ch.0/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0971 W/kg

Top Side Ch.0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.122 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.108 W/kg
SAR(1 g) = 0.052 W/kg; SAR(10 g) = 0.023 W/kg
Maximum value of SAR (measured) = 0.0600 W/kg

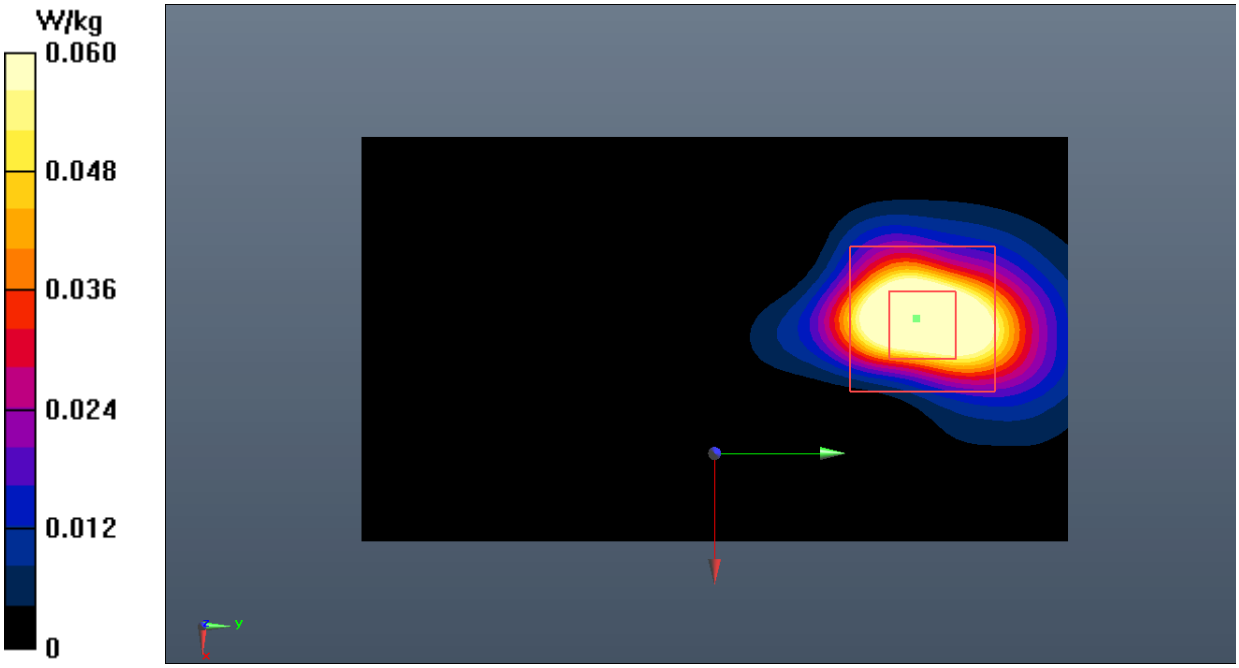


Fig.34 Bluetooth Body

WLAN 2.4GHz Head
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.821 S/m; ε_r = 38.563; ρ = 1000 kg/m^3
Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Left Tilt Ch.6/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.40 W/kg

Left Tilt Ch.6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.097 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.36 W/kg
SAR(1 g) = 0.911 W/kg; SAR(10 g) = 0.318 W/kg
Maximum value of SAR (measured) = 1.45 W/kg

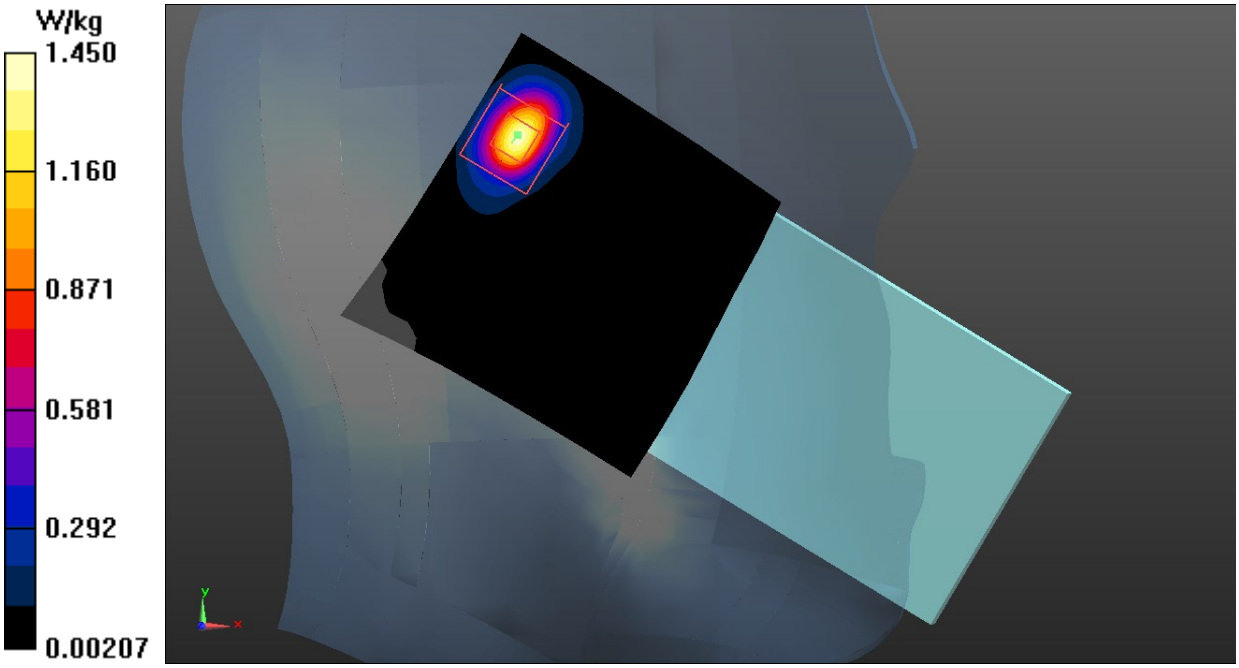


Fig.35 WLAN 2.4GHz Head

WLAN 2.4GHz Body
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.821 S/m; ε_r = 38.563; ρ = 1000 kg/m^3
Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Top Side Ch.6/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Top Side Ch.6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.25 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 0.827 W/kg; SAR(10 g) = 0.353 W/kg
Maximum value of SAR (measured) = 1.11 W/kg

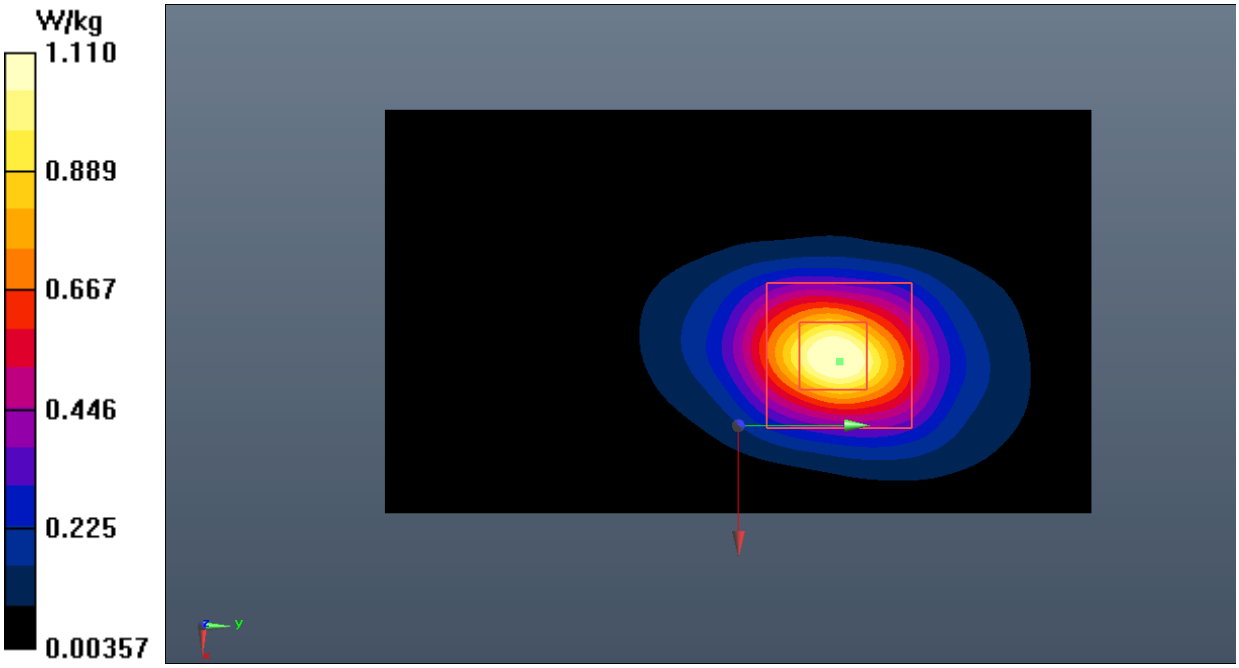


Fig.36 WLAN 2.4GHz Body

WLAN 5GHz Head
Date: 2023-2-16
Electronics: DAE4 Sn1527
Medium: Head 5600MHz
Medium parameters used (interpolated): f = 5690 MHz; σ = 5.104 S/m; ε_r = 35.633; ρ = 1000 kg/m^3
Communication System: UID 0, WLAN 5G (0) Frequency: 5825 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.47, 5.47, 5.47)

Left Tilt Ch.138/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.82 W/kg

Left Tilt Ch.138/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.851 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 4.81 W/kg
SAR(1 g) = 0.948 W/kg; SAR(10 g) = 0.232 W/kg
Maximum value of SAR (measured) = 2.00 W/kg

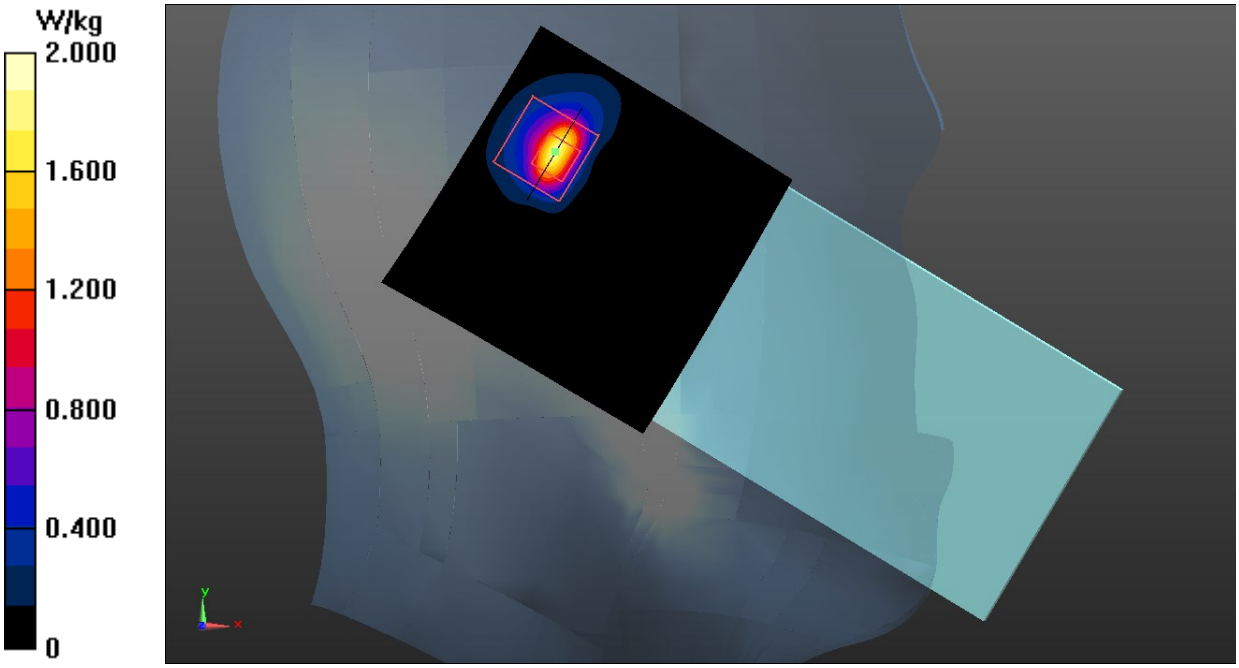


Fig.37 WLAN 5GHz Head

WLAN 5GHz Body
Date: 2023-2-16
Electronics: DAE4 Sn1527
Medium: Head 5750MHz
Medium parameters used (interpolated): f = 5755 MHz; σ = 5.153 S/m; ε_r = 36.575; ρ = 1000 kg/m^3
Communication System: UID 0, WLAN 5G (0) Frequency: 5755 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

Rear Side Ch.151/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.34 W/kg

Rear Side Ch.151/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.106 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 5.09 W/kg
SAR(1 g) = 0.925 W/kg; SAR(10 g) = 0.325 W/kg
Maximum value of SAR (measured) = 0.754 W/kg

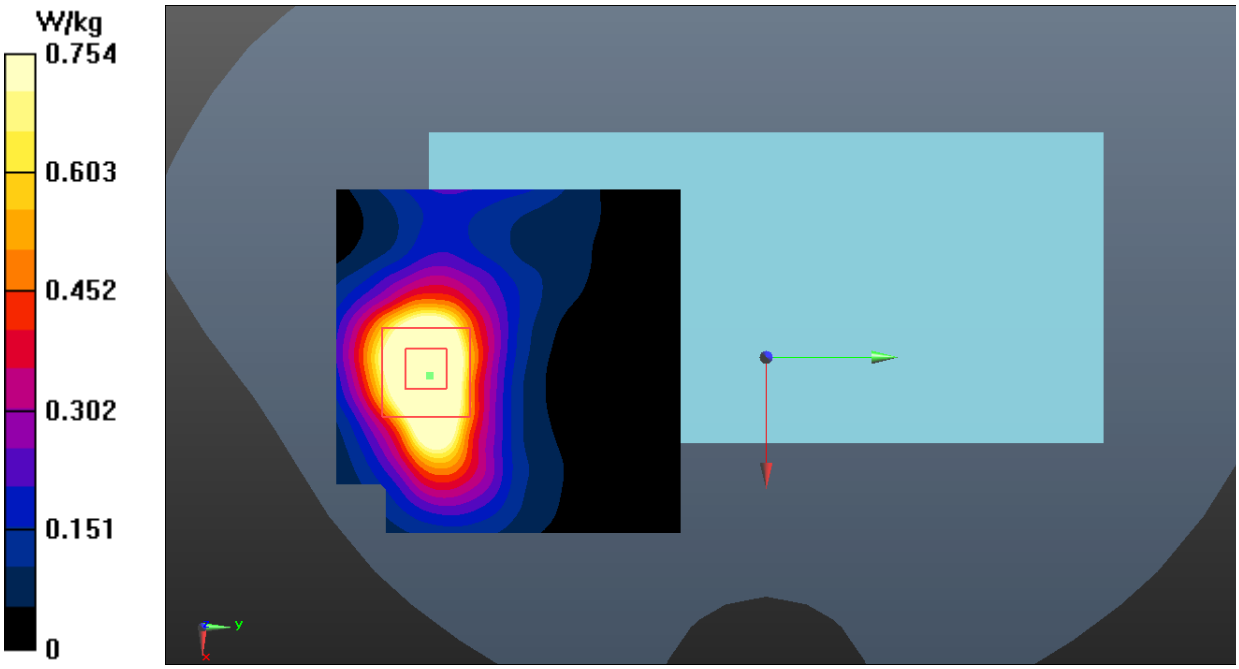


Fig.38 WLAN 5GHz Body

WCDMA Band 2 Extremity

Date: 2023-1-21

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used: f = 1908 MHz; σ = 1.438 S/m; ε_r = 38.816; ρ = 1000 kg/m^3

Communication System: UID 0, WCDMA (0) Frequency: 1907.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Bottom Side High/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.07 W/kg

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

Reference Value = 46.93 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 11.4 W/kg

SAR(1 g) = 4.97 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 5.95 W/kg

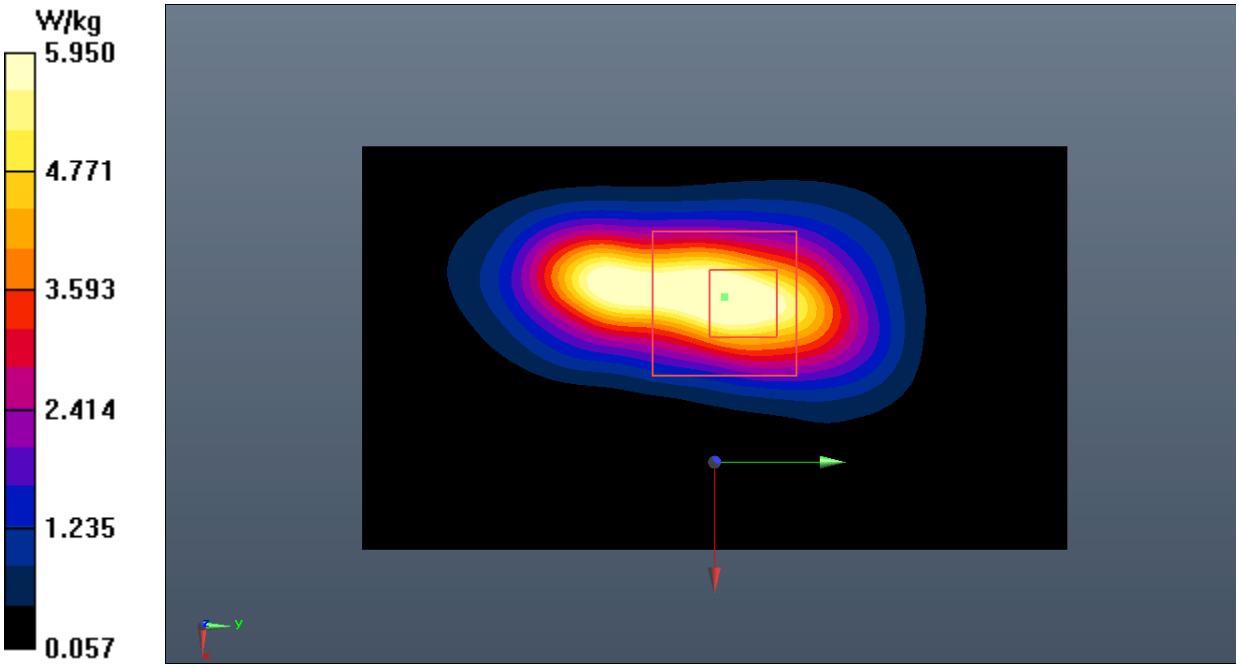


Fig.39 WCDMA Band 2 Extremity

WCDMA Band 4 Extremity
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1733 MHz; σ = 1.37 S/m; ε_r = 39.499; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Bottom Side Middle/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 8.02 W/kg

Bottom Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 46.24 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 12.1 W/kg
SAR(1 g) = 5.35 W/kg; SAR(10 g) = 2.38 W/kg
Maximum value of SAR (measured) = 6.39 W/kg

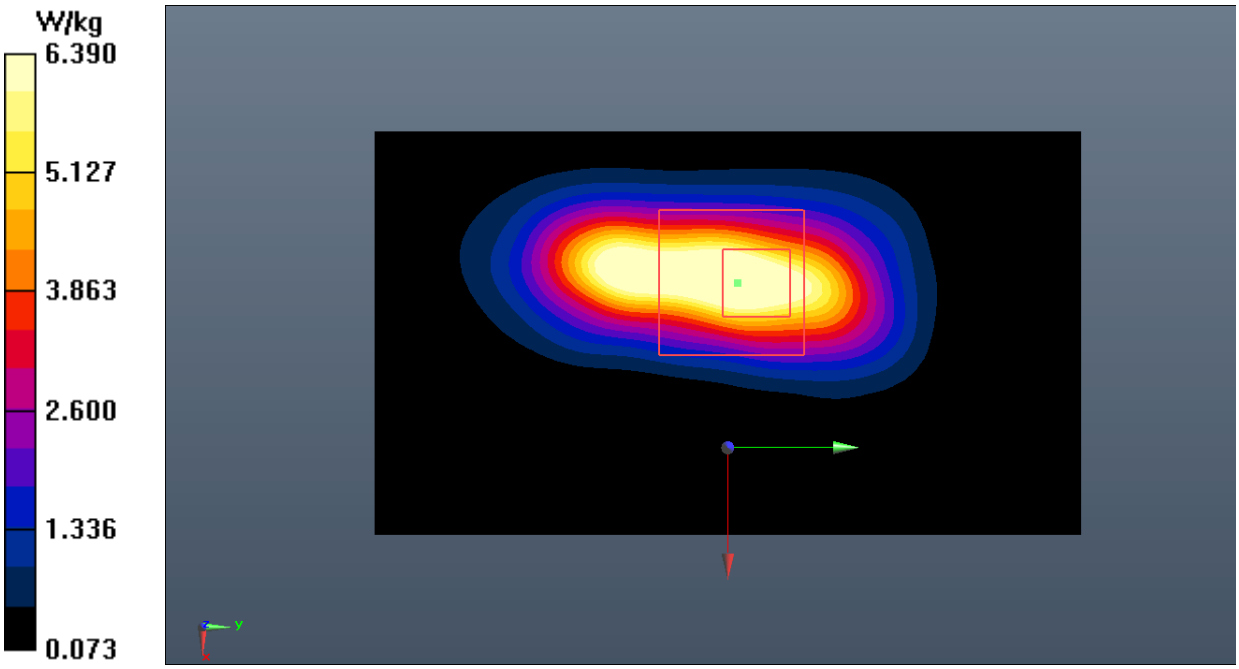


Fig.40 WCDMA Band 4 Extremity

LTE Band 2 Extremity

Date: 2023-1-21

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used: f = 1860 MHz; σ = 1.396 S/m; ε_r = 39.002; ρ = 1000 kg/m^3

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

Bottom Side Low 1RB50/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.03 W/kg

Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 42.04 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 4.97 W/kg; SAR(10 g) = 2.20 W/kg

Maximum value of SAR (measured) = 5.99 W/kg

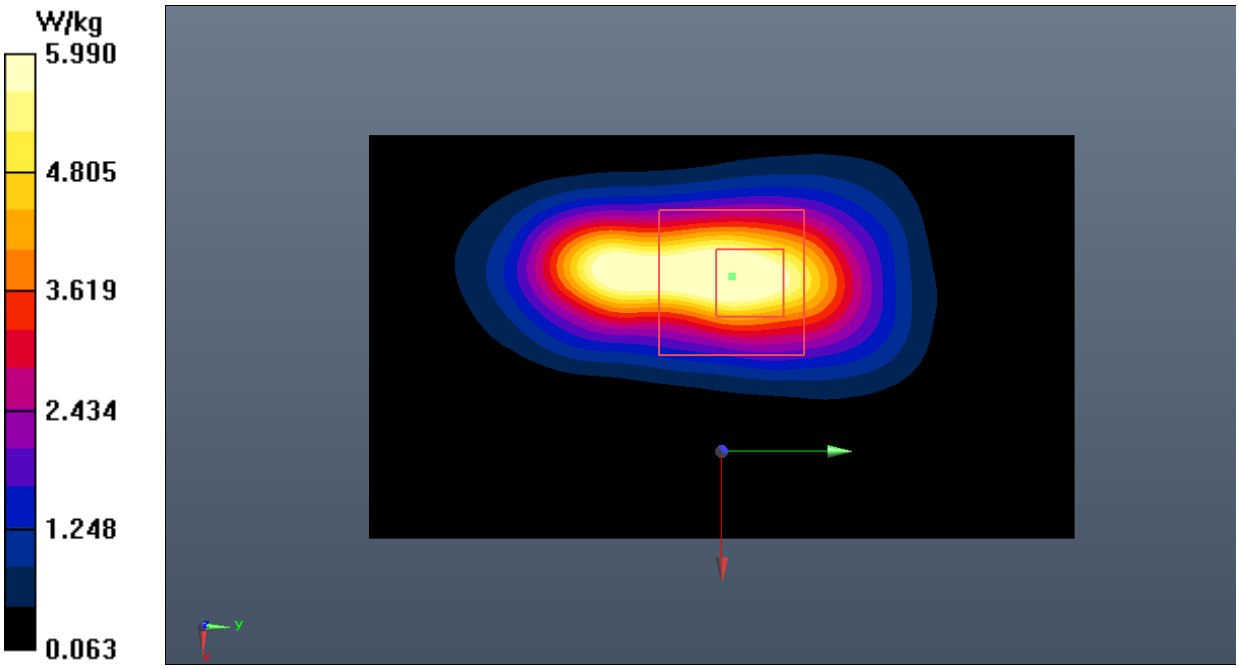


Fig.41 LTE Band 2 Extremity

LTE Band 30 Extremity
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.908; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

Bottom Side Middle 1RB24/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 9.06 W/kg

Bottom Side Middle 1RB24/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 48.69 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 5.71 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 8.10 W/kg

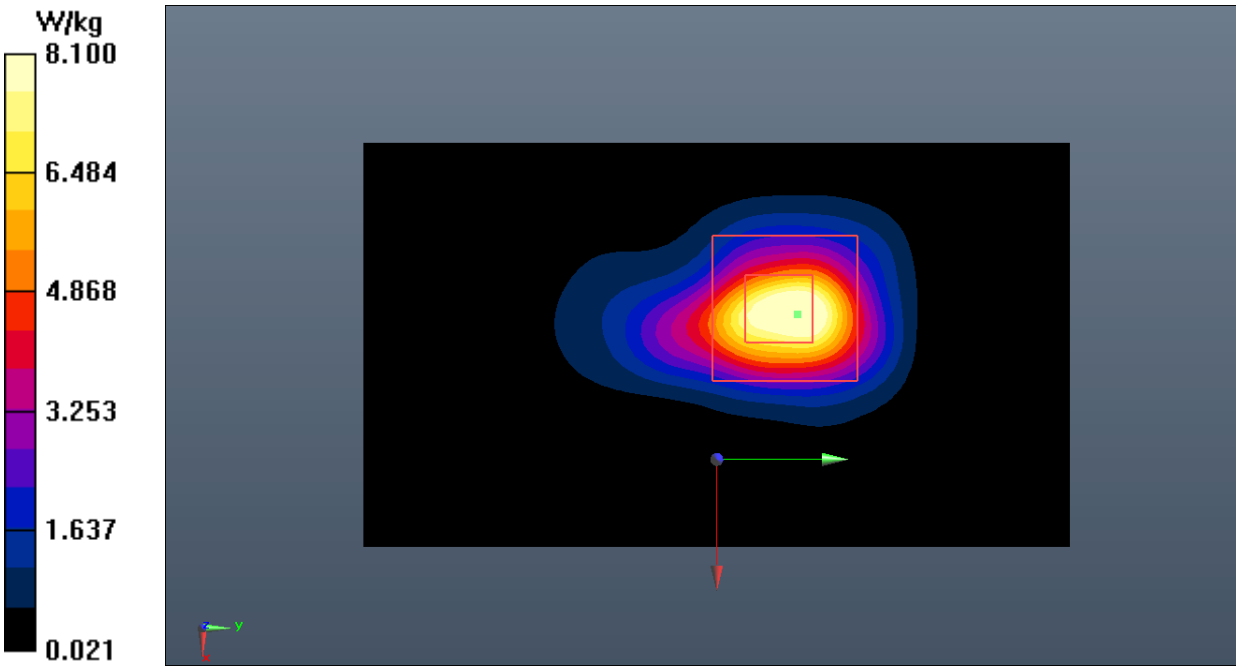


Fig.42 LTE Band 30 Extremity

LTE Band 48 Extremity
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3700MHz
Medium parameters used (interpolated): f = 3603.3 MHz; σ = 3.06 S/m; ε_r = 36.896; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_TDD (0) Frequency: 3603.3 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7621 ConvF (7.18, 7.18, 7.18)

Rear Side Low-Mid 1RB50/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 6.80 W/kg

Rear Side Low-Mid 1RB50/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.573 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 19.5 W/kg
SAR(1 g) = 4.86 W/kg; SAR(10 g) = 1.65 W/kg
Maximum value of SAR (measured) = 4.41 W/kg

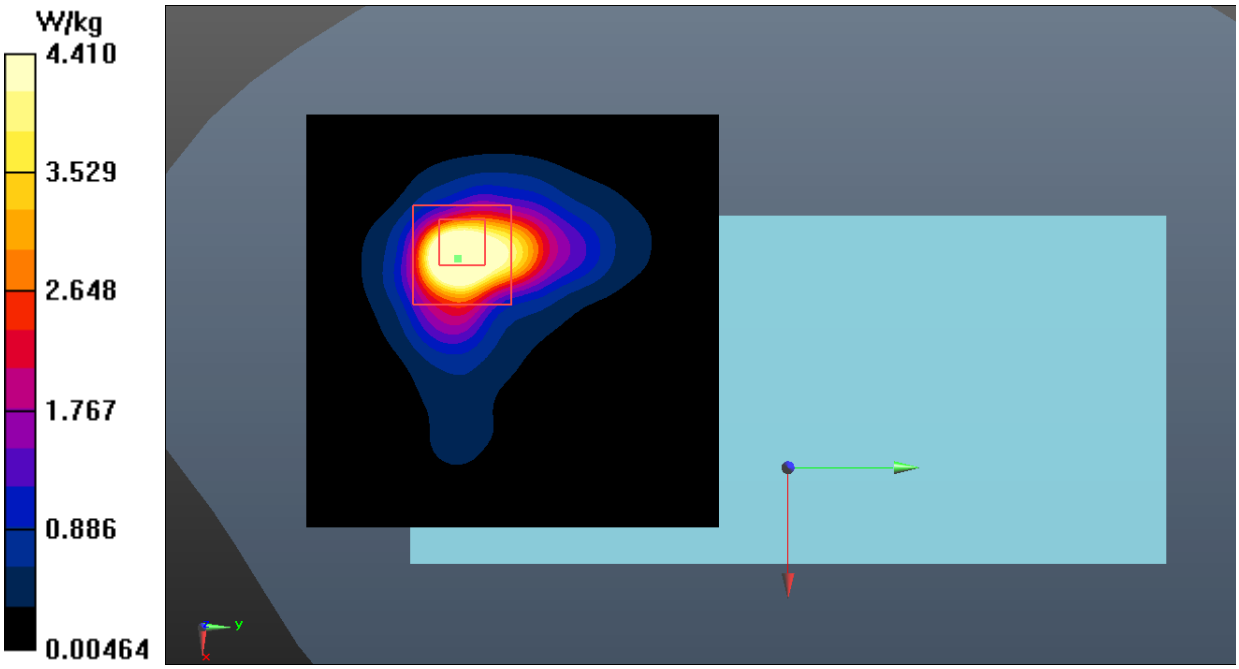


Fig.43 LTE Band 48 Extremity

LTE Band 66 Extremity
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1745 MHz; σ = 1.381 S/m; ε_r = 39.453; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

Bottom Side Middle 1RB50/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 8.44 W/kg

Bottom Side Middle 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.64 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 5.63 W/kg; SAR(10 g) = 2.52 W/kg
Maximum value of SAR (measured) = 6.79 W/kg

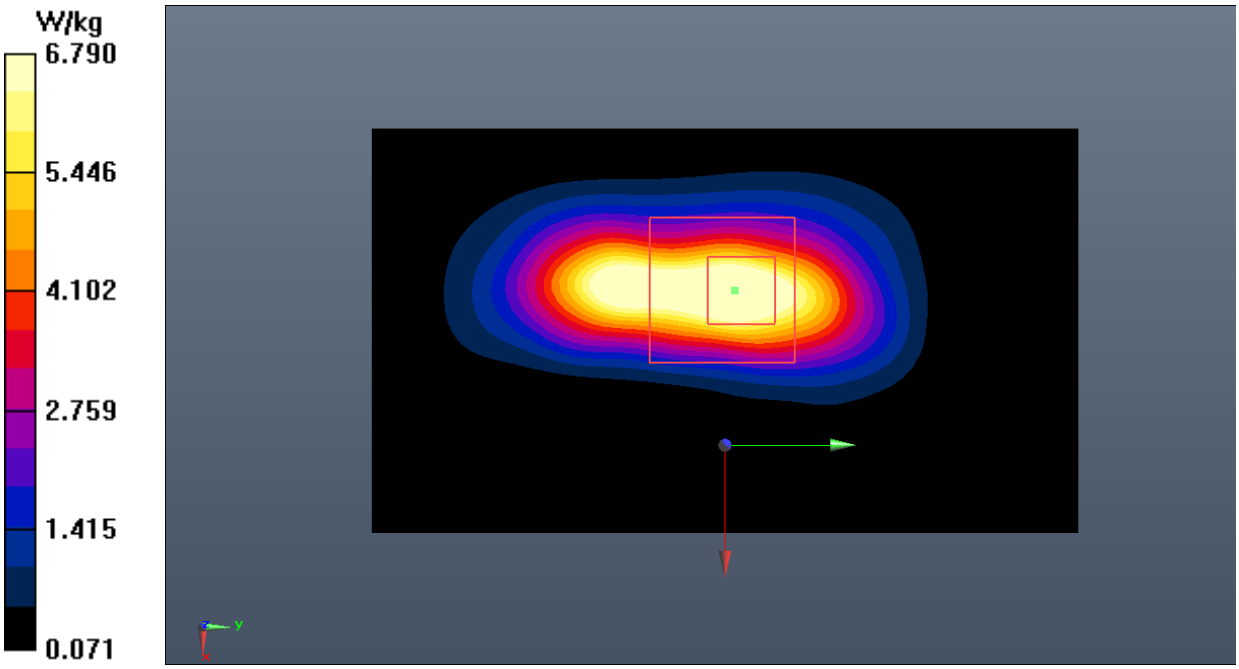


Fig.44 LTE Band 66 Extremity

WLAN 2.4GHz Extremity
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.821 S/m; ε_r = 38.563; ρ = 1000 kg/m^3
Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

Top Side Ch.6/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 14.5 W/kg

Top Side Ch.6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.521 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 9.63 W/kg; SAR(10 g) = 2.97 W/kg
Maximum value of SAR (measured) = 15.6 W/kg

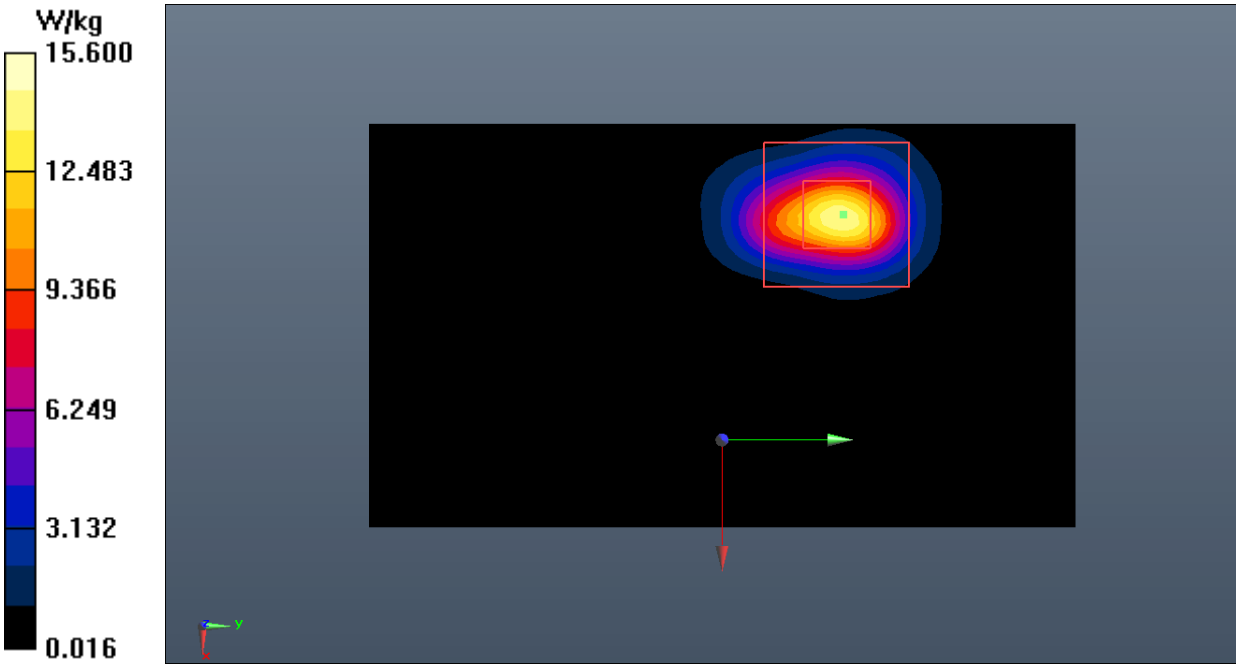


Fig.45 WLAN 2.4GHz Extremity

WLAN 5GHz Extremity

Date: 2023-2-16

Electronics: DAE4 Sn1527

Medium: Head 5600MHz

Medium parameters used: f = 5630 MHz; σ = 5.023 S/m; ε_r = 35.795; ρ = 1000 kg/m^3

Communication System: UID 0, WLAN 5G (0) Frequency: 5630 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.47, 5.47, 5.47)

Top Side Ch.126/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 22.3 W/kg

Top Side Ch.126/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 13.45 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 41.6 W/kg

SAR(1 g) = 10.5 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 16.4 W/kg

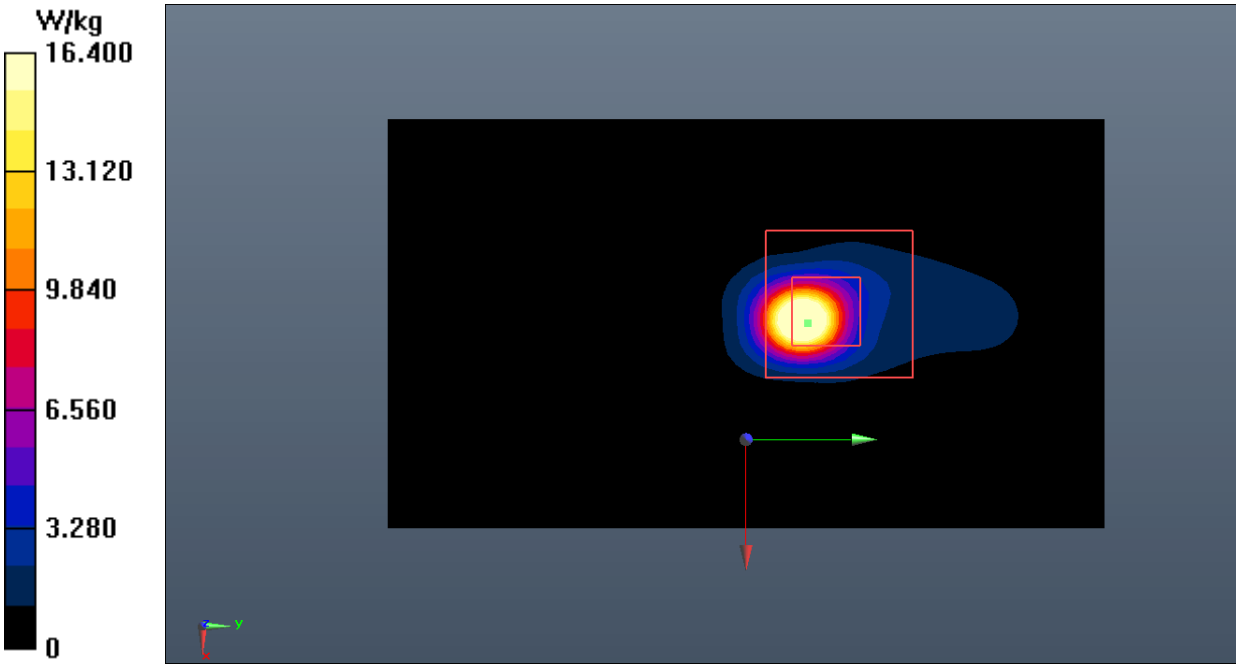


Fig.46 WLAN 5GHz Extremity

ANNEX B: SystemVerification Results

750MHz

Date: 2023-1-28

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used: f = 750 MHz; σ = 0.877 S/m; ε_r = 42.391; ρ = 1000 kg/m^3

Communication System: CW_TMC Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

System Validation/Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 59.518 V/m; Power Drift = -0.13 dB

SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (interpolated) = 2.69 W/kg

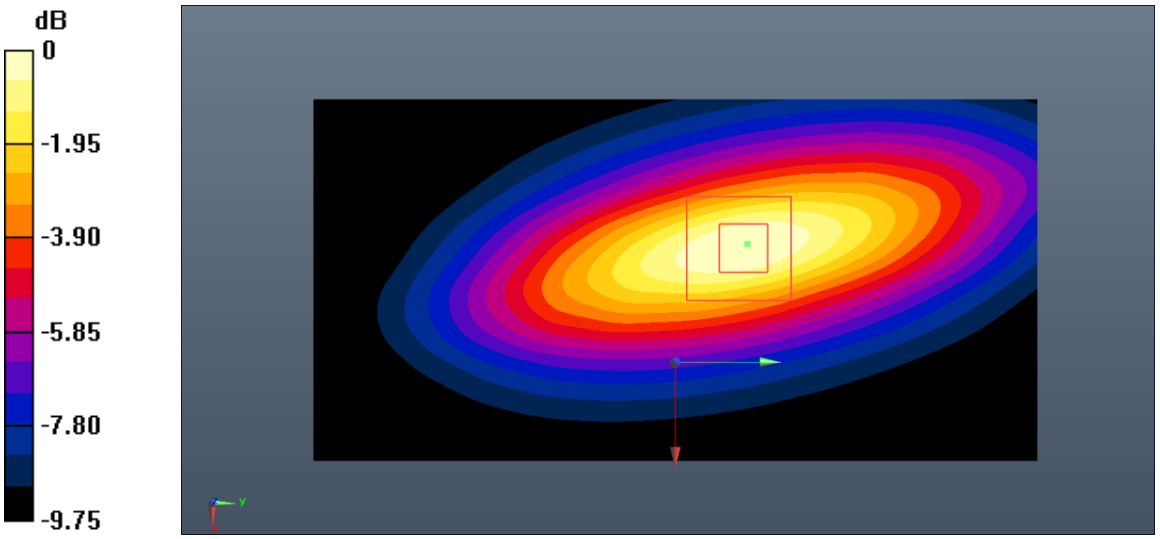
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.518 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 3.15 W/kg

SAR(1 g) = 2.06 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (measured) = 2.66 W/kg



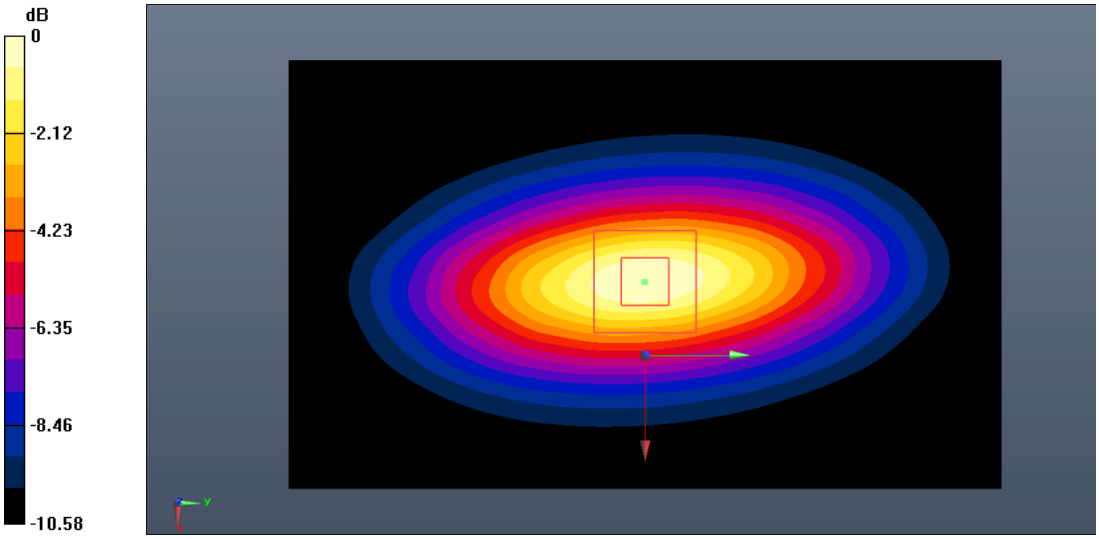
0 dB = 2.66 W/kg = 4.25 dB W/kg

Fig.B.1. Validation 750MHz 250mW

835MHz
Date: 2023-1-20
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; σ = 0.912 S/m; εr = 40.678; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

System Validation/Area Scan (91x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.713 V/m; Power Drift = 0.07 dB
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.60 W/kg
Maximum value of SAR (interpolated) = 3.71 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 64.713 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 4.45 W/kg
SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.75 W/kg



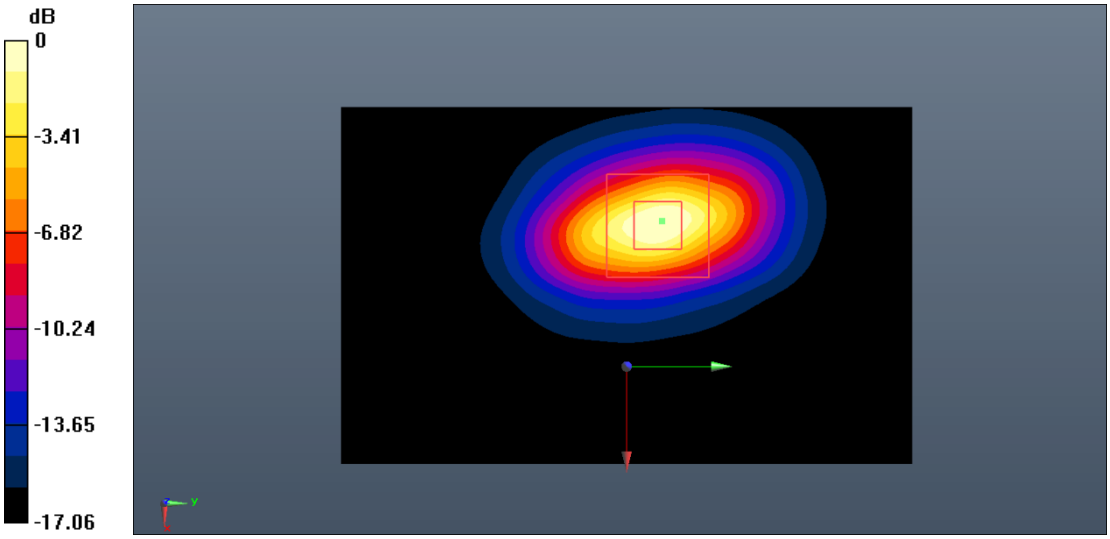
0 dB = 3.75 W/kg = 5.74 dB W/kg

Fig.B.2. Validation 835MHz 250mW

1750MHz
Date: 2023-1-24
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1750 MHz; σ = 1.385 S/m; ε_r = 39.433; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 79.752 V/m; Power Drift = 0.03 dB
SAR(1 g) = 9.07 W/kg; SAR(10 g) = 4.85 W/kg
Maximum value of SAR (interpolated) = 11.1 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 79.752 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 21.8 W/kg
SAR(1 g) = 9.34 W/kg; SAR(10 g) = 4.96 W/kg
Maximum value of SAR (measured) = 11.3 W/kg



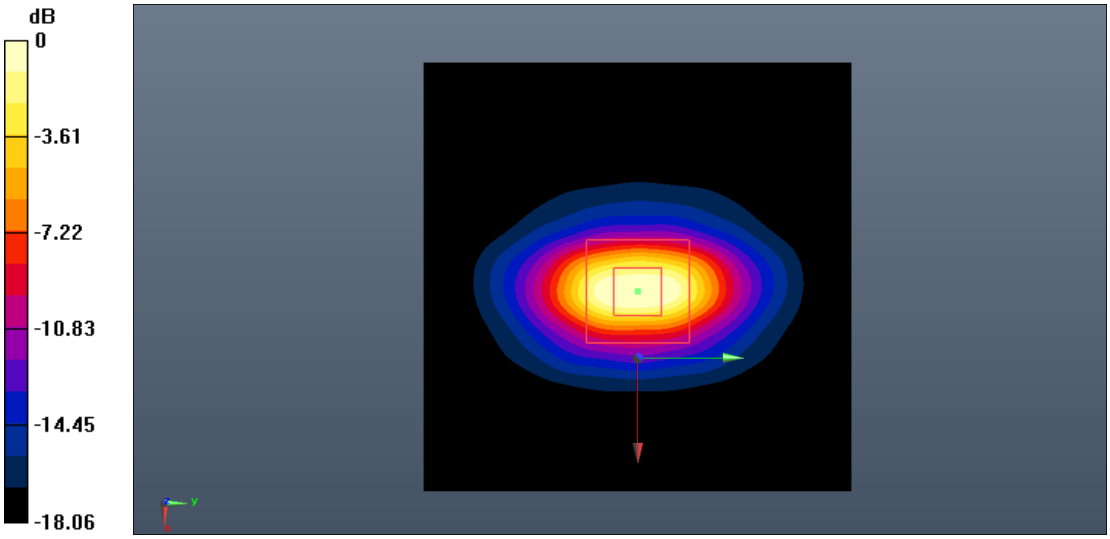
0 dB = 11.3 W/kg = 10.53 dB W/kg

Fig.B.3. Validation 1750MHz 250mW

1900MHz
Date: 2023-1-21
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.431 S/m; ε_r = 38.847; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 81.586 V/m; Power Drift = 0.12 dB
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.10 W/kg
Maximum value of SAR (interpolated) = 12.1 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.586 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 26.0 W/kg
SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 12.3 W/kg



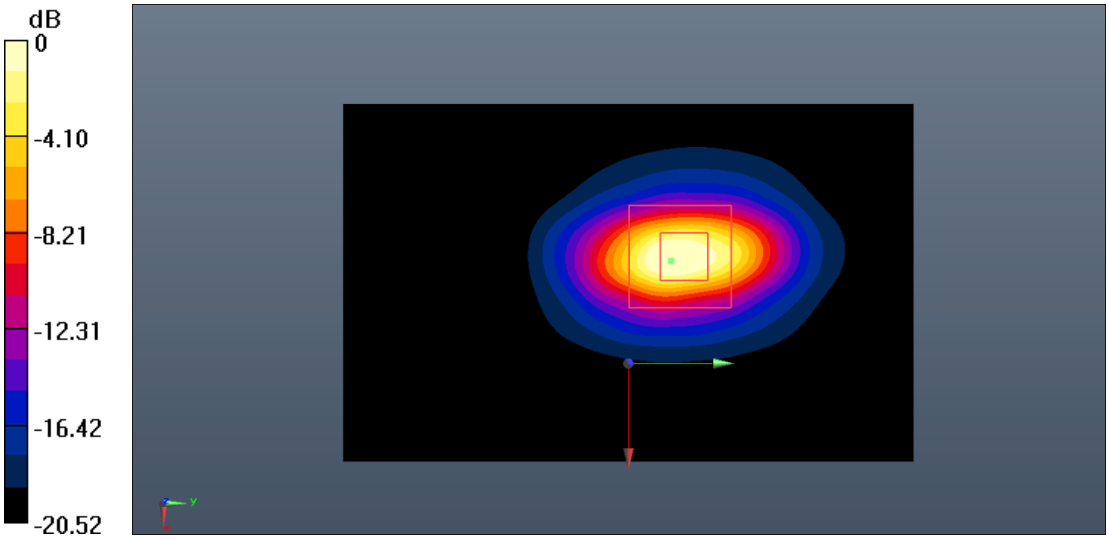
0 dB = 12.3 W/kg = 10.90 dB W/kg

Fig.B.4. Validation 1900MHz 250mW

2300MHz
Date: 2023-2-22
Electronics: DAE4 Sn1527
Medium: Head 2300MHz
Medium parameters used: f = 2300 MHz; σ = 1.648 S/m; ε_r = 39.94; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 2300 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.60, 8.60, 8.60)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 83.069 V/m; Power Drift = -0.05 dB
SAR(1 g) = 12.0 W/kg; SAR(10 g) = 5.64 W/kg
Maximum value of SAR (interpolated) = 14.1 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.069 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 25.5 W/kg
SAR(1 g) = 11.8 W/kg; SAR(10 g) = 5.57 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



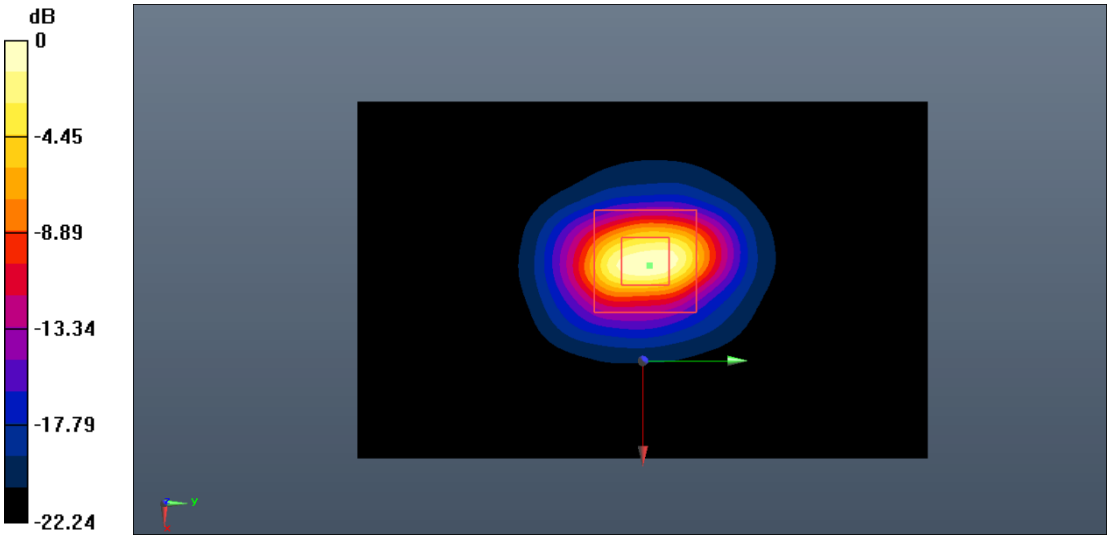
0 dB = 13.9 W/kg = 11.43 dB W/kg

Fig.B.5. Validation 2300MHz 250mW

2450MHz
Date: 2023-2-12
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; σ = 1.836 S/m; ε_r = 38.519; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 92.125 V/m; Power Drift = 0.02 dB
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.16 W/kg
Maximum value of SAR (interpolated) = 15.6 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.125 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 36.2 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.20 W/kg
Maximum value of SAR (measured) = 15.7 W/kg



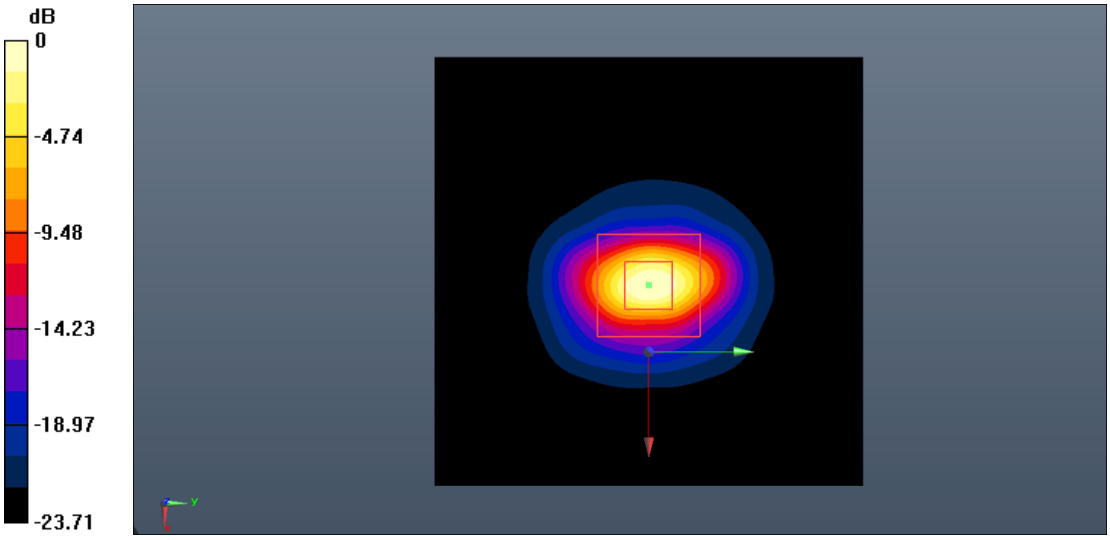
0 dB = 15.7 W/kg = 11.96 dB W/kg

Fig.B.6. Validation 2450MHz 250mW

3500MHz
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used: f = 3500 MHz; σ = 2.935 S/m; ε_r = 37.413; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 3500 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.56, 7.56, 7.56)

System Validation/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 71.248 V/m; Power Drift = 0.04 dB
SAR(1 g) = 6.76 W/kg; SAR(10 g) = 2.52 W/kg
Maximum value of SAR (interpolated) = 12.7 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 71.248 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 6.84 W/kg; SAR(10 g) = 2.56 W/kg
Maximum value of SAR (measured) = 12.9 W/kg



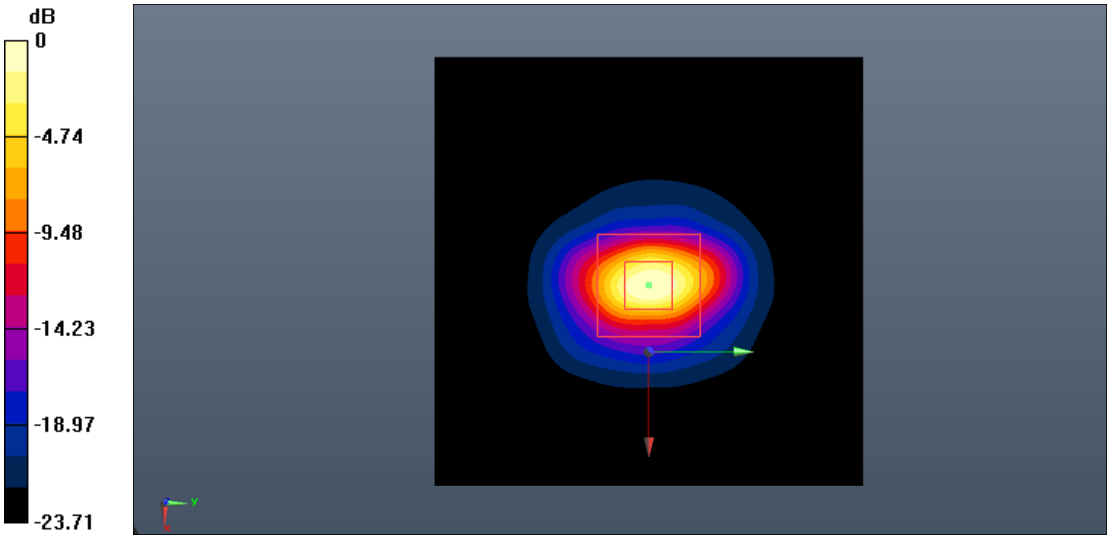
0 dB = 12.9 W/kg = 11.11 dB W/kg

Fig.B.7. Validation 3500MHz 100mW

3700MHz
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3700MHz
Medium parameters used: f = 3700 MHz; σ = 3.174 S/m; ε_r = 36.577; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 3700 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.18, 7.18, 7.18)

System Validation/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 74.369 V/m; Power Drift = 0.10 dB
SAR(1 g) = 6.87 W/kg; SAR(10 g) = 2.55 W/kg
Maximum value of SAR (interpolated) = 13.2 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 74.369 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 21.1 W/kg
SAR(1 g) = 6.96 W/kg; SAR(10 g) = 2.58 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



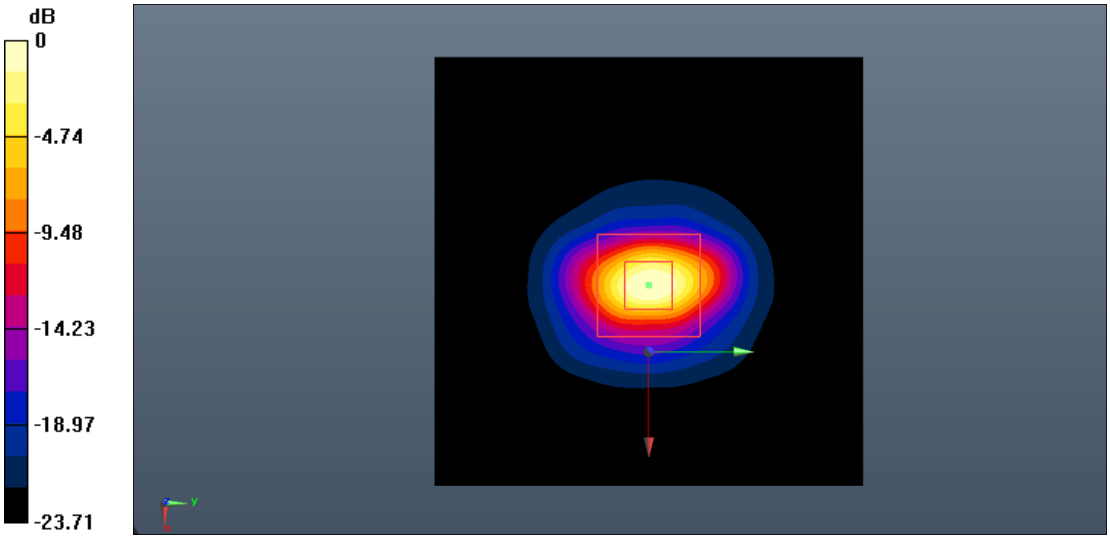
0 dB = 13.4 W/kg = 11.27 dB W/kg

Fig.B.8. Validation 3700MHz 100mW

3900MHz
Date: 2023-2-18
Electronics: DAE4 Sn1527
Medium: Head 3900MHz
Medium parameters used: f = 3900 MHz; σ = 3.252 S/m; ε_r = 37.962; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 3900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (7.26, 7.26, 7.26)

System Validation/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 70.485 V/m; Power Drift = -0.07 dB
SAR(1 g) = 6.88 W/kg; SAR(10 g) = 2.46 W/kg
Maximum value of SAR (interpolated) = 12.5 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 70.485 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 18.8 W/kg
SAR(1 g) = 6.81 W/kg; SAR(10 g) = 2.43 W/kg
Maximum value of SAR (measured) = 12.2 W/kg



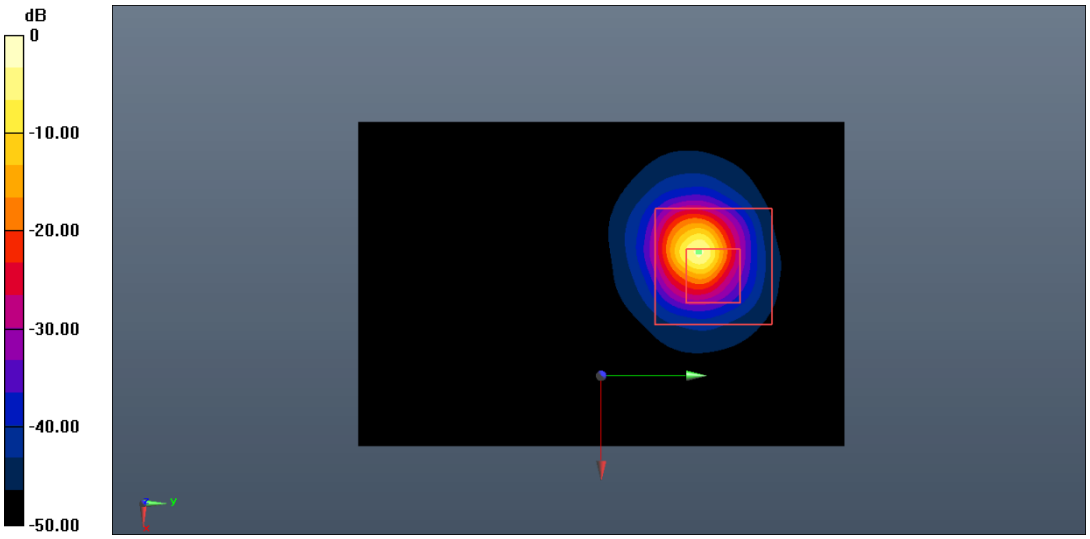
0 dB = 12.2 W/kg = 10.86 dB W/kg

Fig.B.9. Validation 3900MHz 100mW

5250MHz
Date: 2023-2-16
Electronics: DAE4 Sn1527
Medium: Head 5250MHz
Medium parameters used: f = 5250 MHz; σ = 4.777 S/m; ε_r = 35.291; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.98, 5.98, 5.98)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 69.056 V/m; Power Drift = 0.06 dB
SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.31 W/kg
Maximum value of SAR (interpolated) = 10.2 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.056 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 27.6 W/kg
SAR(1 g) = 8.30 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 10.5 W/kg



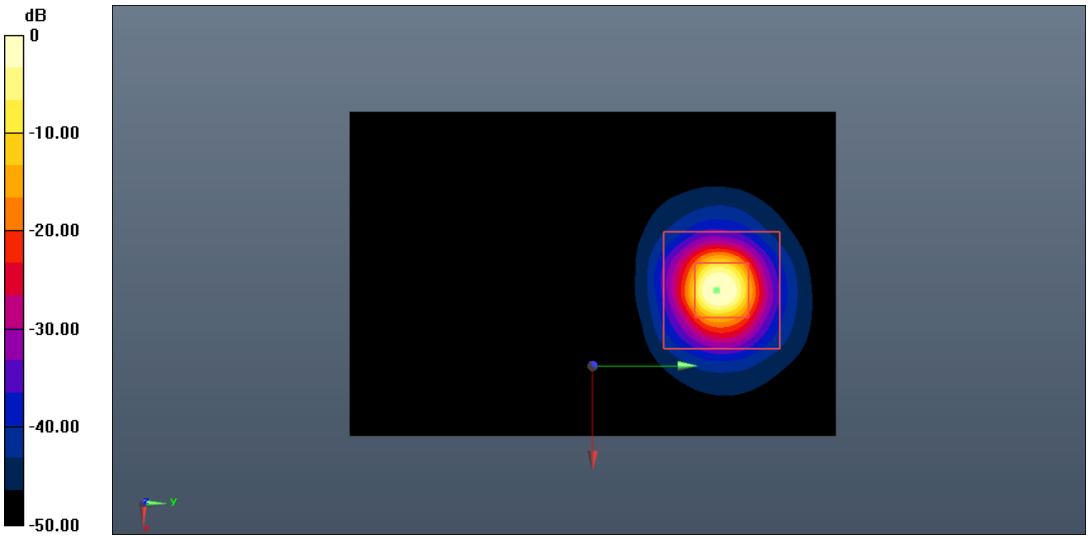
0 dB = 10.5 W/kg = 10.21 dB W/kg

Fig.B.10. Validation 5250MHz 100mW

5600MHz
Date: 2023-2-16
Electronics: DAE4 Sn1527
Medium: Head 5600MHz
Medium parameters used: f = 5600 MHz; σ = 4.982 S/m; ε_r = 35.876; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.47, 5.47, 5.47)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 68.783 V/m; Power Drift = -0.15 dB
SAR(1 g) = 8.07 W/kg; SAR(10 g) = 2.33 W/kg
Maximum value of SAR (interpolated) = 10.1 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.783 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.30 W/kg
Maximum value of SAR (measured) = 9.95 W/kg



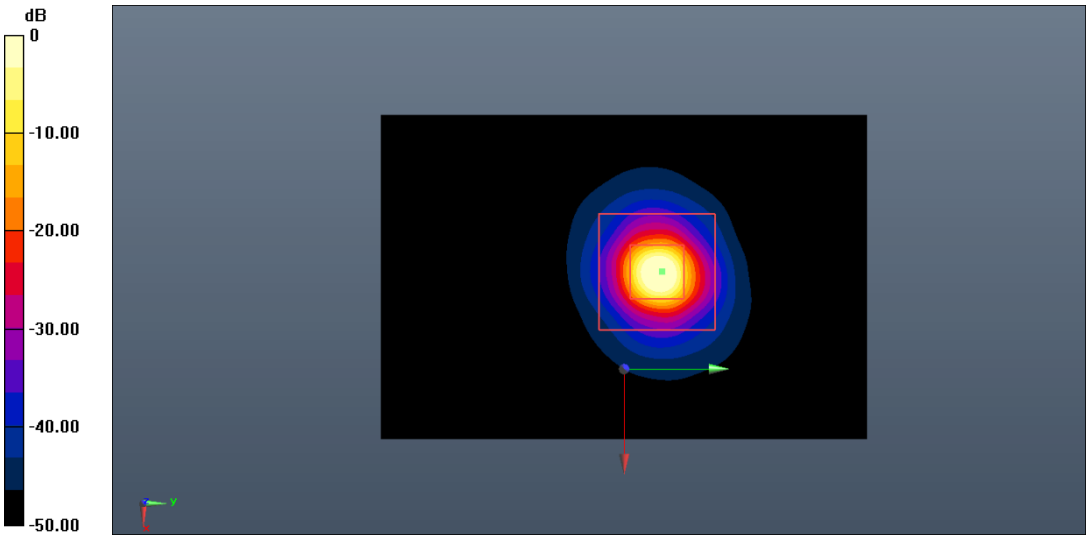
0 dB = 9.95 W/kg = 9.98 dB W/kg

Fig.B.11. Validation 5600MHz 100mW

5750MHz
Date: 2023-2-16
Electronics: DAE4 Sn1527
Medium: Head 5750MHz
Medium parameters used: f = 5750 MHz; σ = 5.146 S/m; ε_r = 36.588; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 66.347 V/m; Power Drift = -0.03 dB
SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (interpolated) = 9.91 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.347 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 24.9 W/kg
SAR(1 g) = 7.61 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 9.85 W/kg



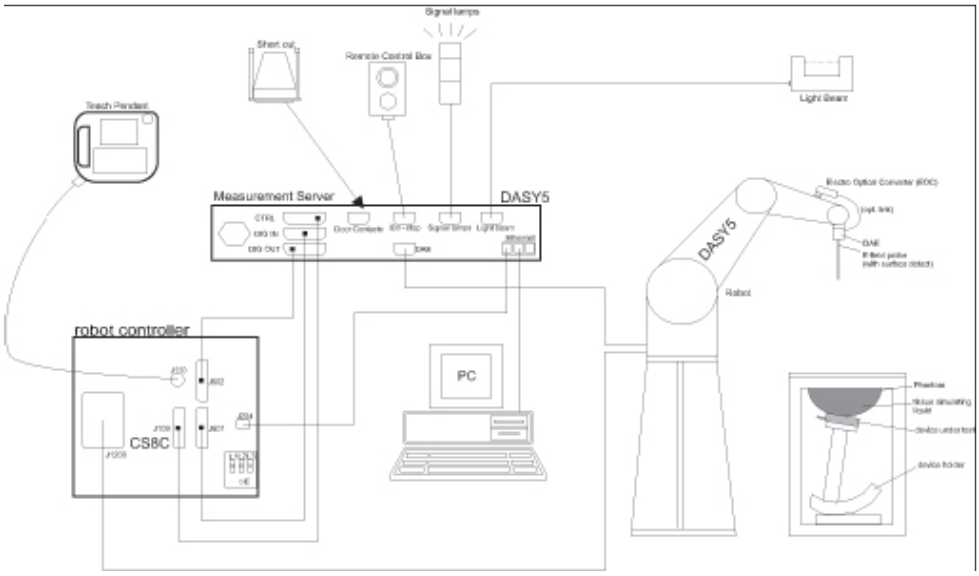
0 dB = 9.85 W/kg = 9.93 dB W/kg

Fig.B.12. Validation 5750MHz 100mW

ANNEX C: SAR Measurement Setup

C.1. Measurement Set-up

DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

C.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection durning a software approach and looks for the maximum using 2ndord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 10MHz — 6.0GHz(EX3DV4)
Range: 10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: SAR Dosimetry Testing
Compliance tests of mobile phones
Dosimetry in strong gradient fields

Picture C.2 Near-field Probe

Picture C.3 E-field Probe

C.3. E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/ cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

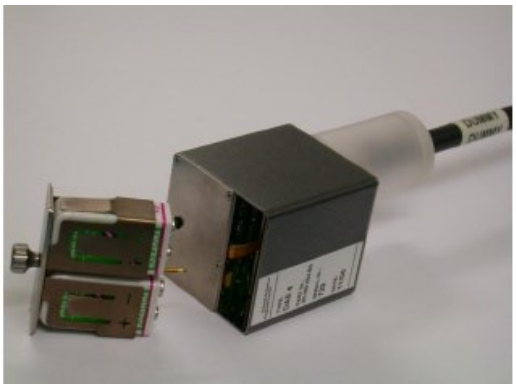
C.4. Other Test Equipment

C.4.1. Data Acquisition Electronics (DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



PictureC.4: DAE

C.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5 DASY 5

C.4.3. Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5:128MB), RAM (DASY5:128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.6 Server for DASY 5

C.4.4. Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss

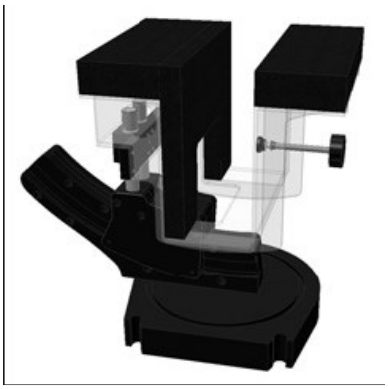
POM material having the following dielectric

parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.7-1: Device Holder



Picture C.7-2: Laptop Extension Kit

C.4.5. Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to

Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

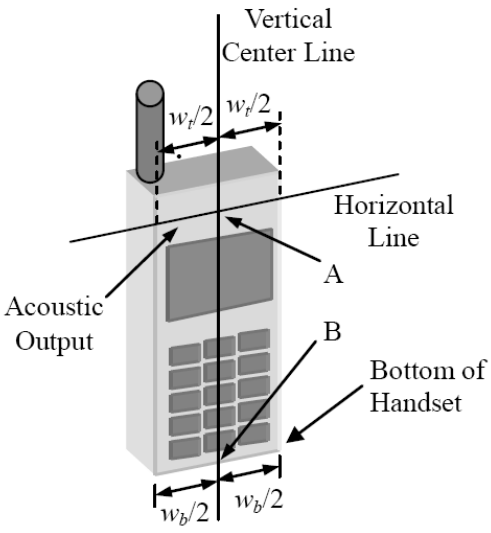
Shell Thickness:	2 ± 0. 2 mm
Filling Volume:	Approx. 25 liters
Dimensions:	810 x l000 x 500 mm (H x L x W)
Available:	Special

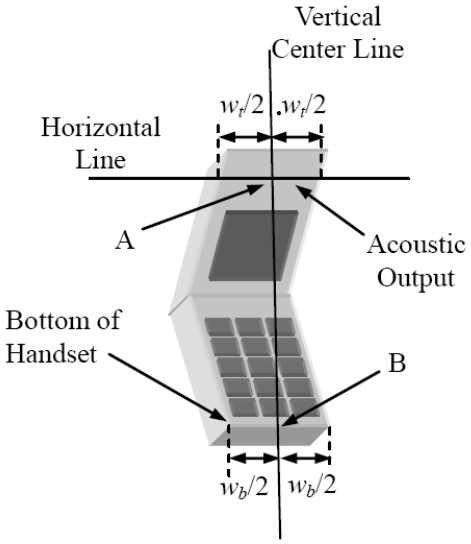
Picture C.8: SAM Twin Phantom

ANNEX D: Position of the wireless device in relation to the phantom

D.1. General considerations

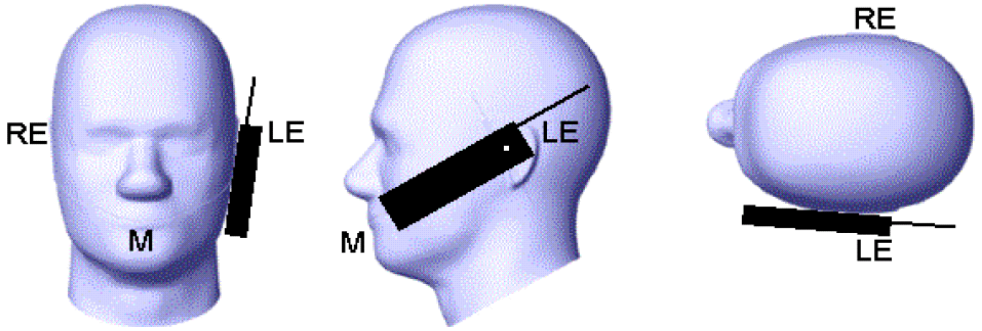
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.



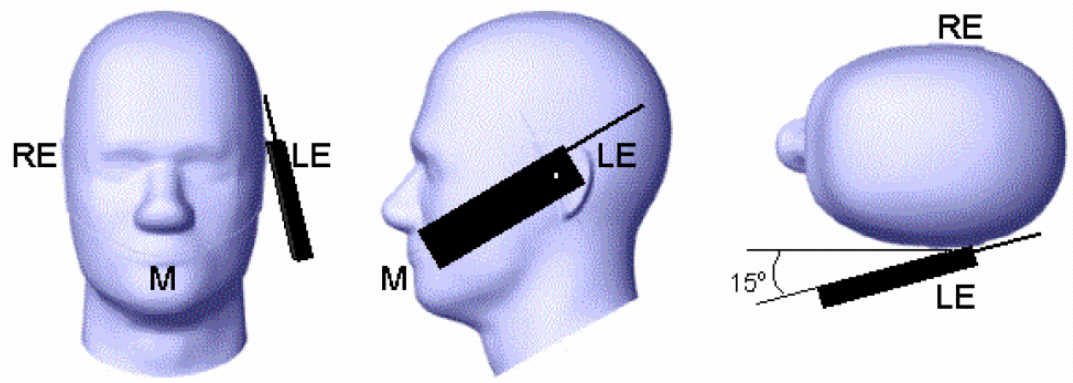


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset **Picture D.1-b Typical “clam-shell” case handset**



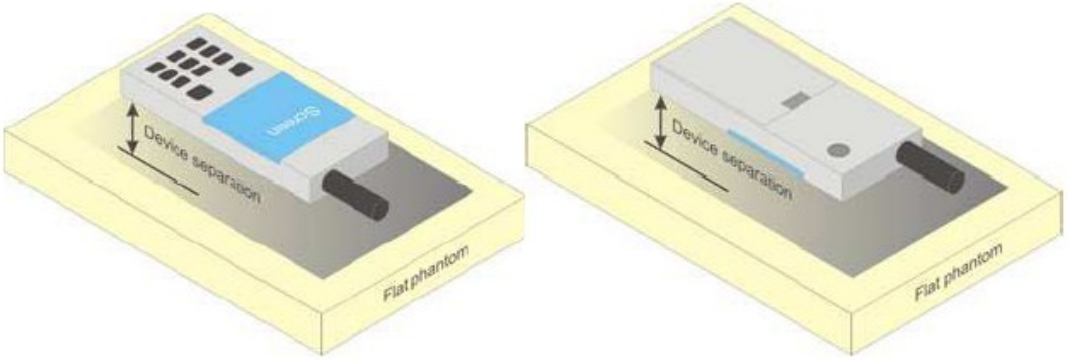
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

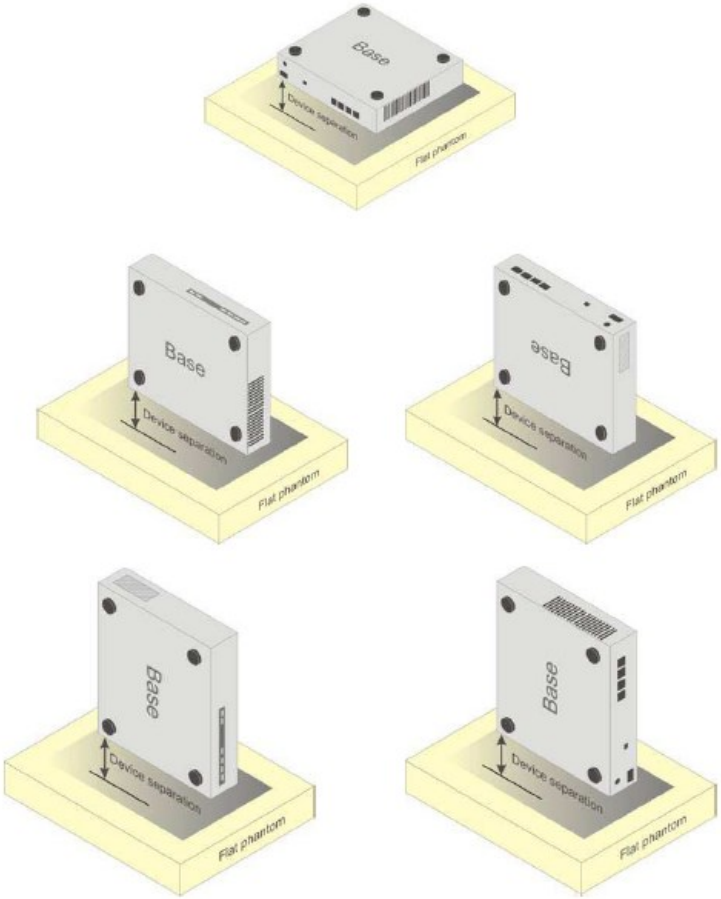


Picture D.4 Test positions for body-worn devices

D.3. Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

D.4. DUT Setup Photos

Picture D.6

ANNEX E: Equivalent Media Recipes

The liquid used for the frequency range of 700-6000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

Table E.1: Composition of the Tissue Equivalent Matter

Frequency (MHz)	835	1750	1900	2450	2600	5200	5800
Water	41.45	55.242	55.242	58.79	58.79	65.53	66.10
Sugar	56.0	/	/	/	/	/	/
Salt	1.45	0.306	0.306	0.06	0.06		
Preventol	0.1	/	/	/	/	17.24	16.95
Cellulose	1.0	/	/	/	/	17.24	16.95
Glycol Monobutyl	/	44.452	44.452	41.15	41.15	/	/
Diethylenglycol monohexylether	/	/	/	/	/	/	/
Triton X-100	/	/	/	/	/	/	/
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=40.08 σ=1.37	ε=40.0 σ=1.40	ε=39.20 σ=1.80	ε=39.01 σ=1.96	ε=35.99 σ=4.66	ε=35.30 σ=5.27

Note: There is a little adjustment respectively for 750, 5300 and 5600, based on the recipe of closest frequency in table E.1

ANNEX F: System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

Table F.1: System Validation

Probe SN.	Liquid name (MHz)	Validation date	Frequency point	CW Validation	Modulation Signal Validation		
					Modulation Type	Duty Factor	PAR
7621	Head 750	2022-05-09	750MHz	Pass	N/A	N/A	N/A
7621	Head 835	2022-05-09	835MHz	Pass	GMSK	Pass	N/A
7621	Head 1750	2022-05-09	1750MHz	Pass	N/A	N/A	N/A
7621	Head 1900	2022-05-09	1900MHz	Pass	GMSK	Pass	N/A
7621	Head 2300	2022-05-08	2300MHz	Pass	N/A	N/A	N/A
7621	Head 2450	2022-05-08	2450MHz	Pass	OFDM/TDD	Pass	Pass
7621	Head 2550	2022-05-08	2550MHz	Pass	TDD	Pass	N/A
7621	Head 3500	2022-05-10	3500MHz	Pass	TDD	Pass	N/A
7621	Head 3700	2022-05-10	3700MHz	Pass	TDD	Pass	N/A
7621	Head 3900	2022-05-10	3900MHz	Pass	TDD	Pass	N/A
7621	Head 4200	2022-05-10	4200MHz	Pass	TDD	Pass	N/A
7621	Head 5250	2022-05-08	5250MHz	Pass	OFDM	N/A	Pass
7621	Head 5600	2022-05-08	5600MHz	Pass	OFDM	N/A	Pass
7621	Head 5750	2022-05-08	5750MHz	Pass	OFDM	N/A	Pass

ANNEX G: DAE Calibration Certificate

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: Saict-SZ (Auden)

Certificate No: DAE4-1527_Jun22

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BM - SN: 1527
Calibration procedure(s)	QA CAL-06.v30 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	June 21, 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
Keithley Multimeter Type 2001	SN: 0810278	31-Aug-21 (No:31368)	Aug-22
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	24-Jan-22 (in house check)	In house check: Jan-23
Calibrator Box V2.1	SE UMS 006 AA 1002	24-Jan-22 (in house check)	In house check: Jan-23

	Name	Function	Signature
Calibrated by:	Adrian Gehring	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: June 21, 2022

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

Certificate No: DAE4-1527_Jun22 Page 1 of 5

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

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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	403.865 ± 0.02% (k=2)	403.595 ± 0.02% (k=2)	403.805 ± 0.02% (k=2)
Low Range	3.95898 ± 1.50% (k=2)	3.98939 ± 1.50% (k=2)	3.96763 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	61.0 ° ± 1 °

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200037.59	1.98	0.00
Channel X	+ Input	20007.61	1.34	0.01
Channel X	- Input	-20004.09	1.79	-0.01
Channel Y	+ Input	200037.45	1.53	0.00
Channel Y	+ Input	20002.68	-3.42	-0.02
Channel Y	- Input	-20007.17	-1.14	0.01
Channel Z	+ Input	200037.73	2.17	0.00
Channel Z	+ Input	20005.72	-0.34	-0.00
Channel Z	- Input	-20006.63	-0.49	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2001.36	-0.15	-0.01
Channel X	+ Input	201.70	0.16	0.08
Channel X	- Input	-198.10	0.49	-0.24
Channel Y	+ Input	2001.44	0.07	0.00
Channel Y	+ Input	201.07	-0.21	-0.11
Channel Y	- Input	-199.66	-0.98	0.50
Channel Z	+ Input	2001.52	0.21	0.01
Channel Z	+ Input	200.81	-0.41	-0.20
Channel Z	- Input	-199.00	-0.15	0.07

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	-3.95	-5.31
	- 200	5.96	4.97
Channel Y	200	-16.18	-16.25
	- 200	14.41	14.34
Channel Z	200	3.01	2.86
	- 200	-3.93	-4.13

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	-	-0.68	-2.76
Channel Y	200	5.43	-	-0.31
Channel Z	200	10.73	3.29	-

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	16059	17078
Channel Y	15965	16219
Channel Z	15888	13556

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	1.40	0.30	2.25	0.35
Channel Y	-0.62	-1.30	0.47	0.33
Channel Z	-0.18	-0.90	0.60	0.31

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

ANNEX H: Probe Calibration Certificate

In Collaboration with
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CALIBRATION LABORATORY
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: cttl@chinattl.com http://www.caict.ac.cn

CALIBRATION CNAS L0570

Client SAICT Certificate No: Z22-60124

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN : 7621
Calibration Procedure(s)	FF-Z11-004-02 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	May 06, 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)℃ 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	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101547	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101548	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Reference 10dBAttenuator	18N50W-10dB	20-Jan-21(CTTL, No.J21X00486)	Jan-23
Reference 20dBAttenuator	18N50W-20dB	20-Jan-21(CTTL, No.J21X00485)	Jan-23
Reference Probe EX3DV4	SN 7464	26-Jan-22(SPEAG, No.EX3-7464_Jan22)	Jan-23
DAE4	SN 1555	20-Aug-21(SPEAG, No.DAE4-1555_Aug21/2)	Aug-22

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	16-Jun-21(CTTL, No.J21X04467)	Jun-22
Network Analyzer E5071C	MY46110673	14-Jan-22(CTTL, No.J22X00406)	Jan-23

	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 23, 2022

In Collaboration with
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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

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 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

c) 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

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7621

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (*k*=2)
Norm(μV/(V/m)²)[A]	0.71	0.71	0.56	±10.0%
DCP(mV)[B]	111.7	111.8	115.7	

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	210.8	±3.5%
		Y	0.0	0.0	1.0		218.6	
		Z	0.0	0.0	1.0		190.8	

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 E²-field uncertainty inside TSL (see Page 4).
[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.