Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.7 Ω + 4.6 jΩ
Return Loss	- 26.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.5 Ω + 6.4 jΩ
Return Loss	- 22.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.203 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 15.07.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d101

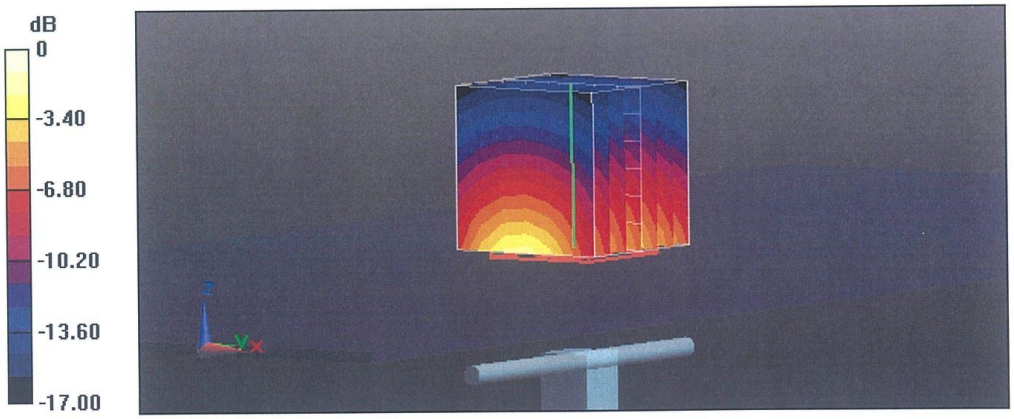
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.37 S/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.44, 8.44, 8.44) @ 1900 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

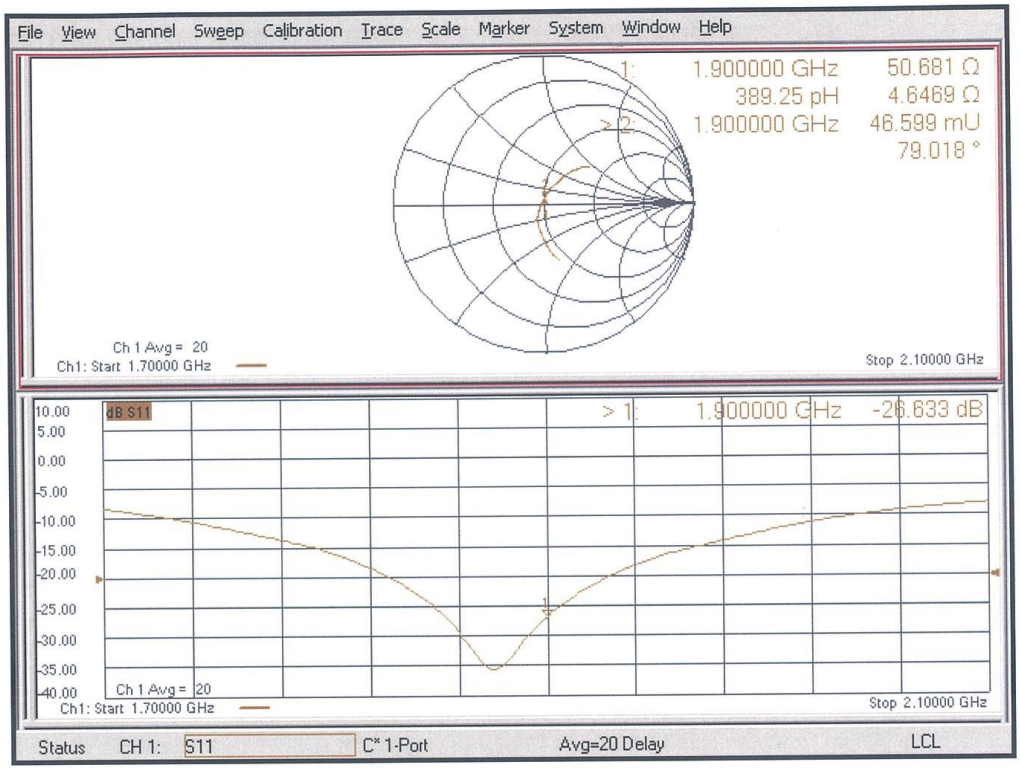
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.4 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 17.6 W/kg
SAR(1 g) = 9.71 W/kg; SAR(10 g) = 5.12 W/kg
Maximum value of SAR (measured) = 14.9 W/kg



0 dB = 14.9 W/kg = 11.73 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 17.07.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d101

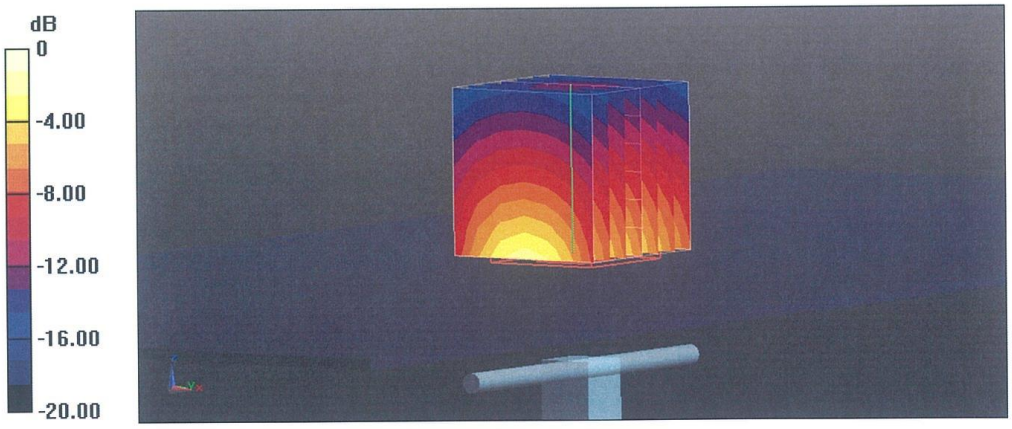
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.48 S/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.42, 8.42, 8.42) @ 1900 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

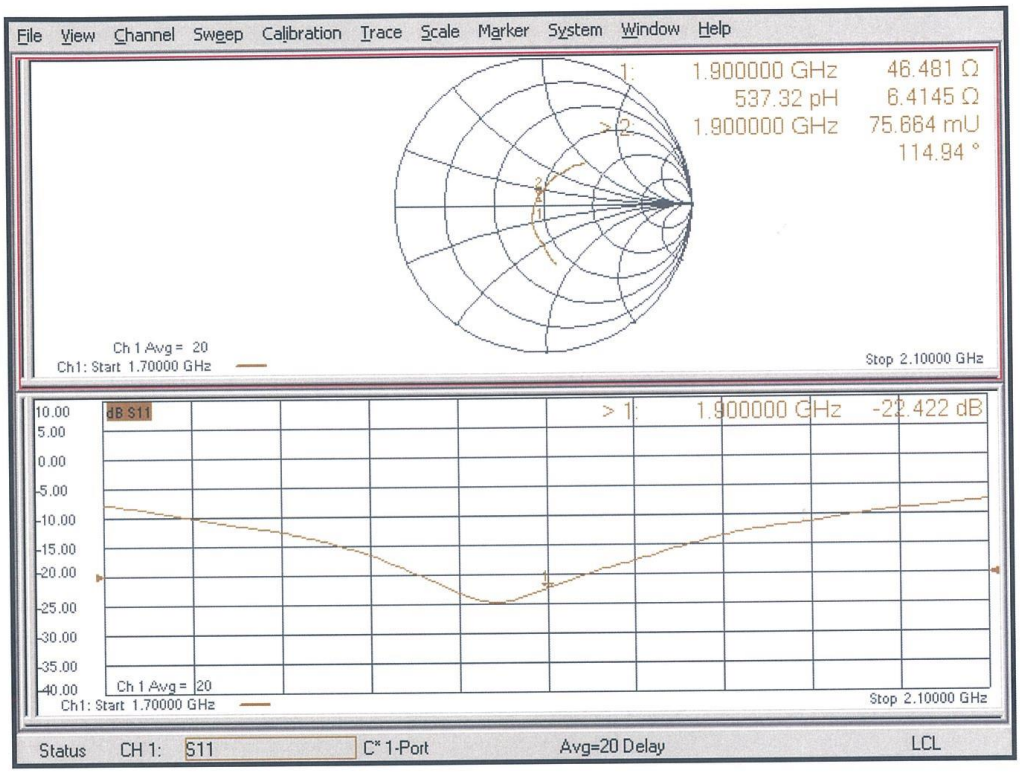
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.3 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 9.74 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Impedance Measurement Plot for Body TSL



2450 MHz Dipole 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 CTTL (Auden)

Certificate No: D2450V2-853_Jul19

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:853
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	July 17, 2019

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 17, 2019

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

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

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

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

Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

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"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.6 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**51.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.13 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.8 ± 6 %	2.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.4 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**52.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.5 Ω + 2.7 jΩ
Return Loss	- 25.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.6 Ω + 5.6 jΩ
Return Loss	- 25.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 16.07.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:853

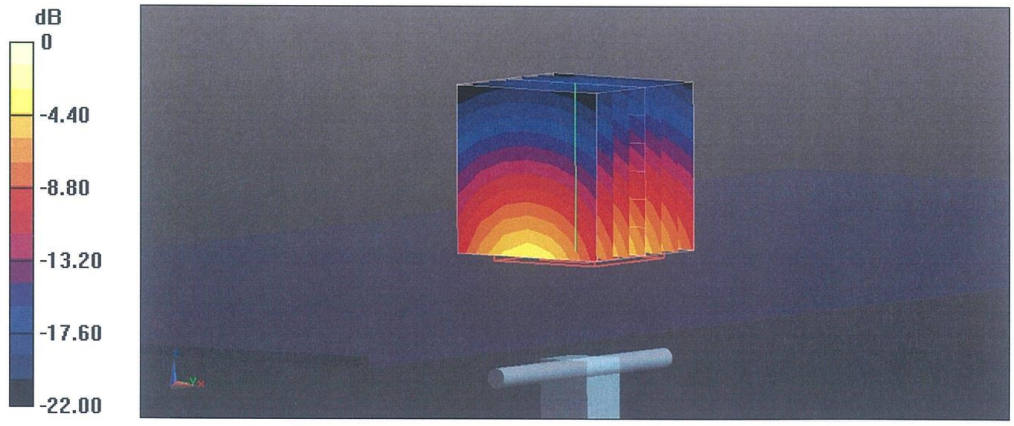
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 S/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.9, 7.9, 7.9) @ 2450 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

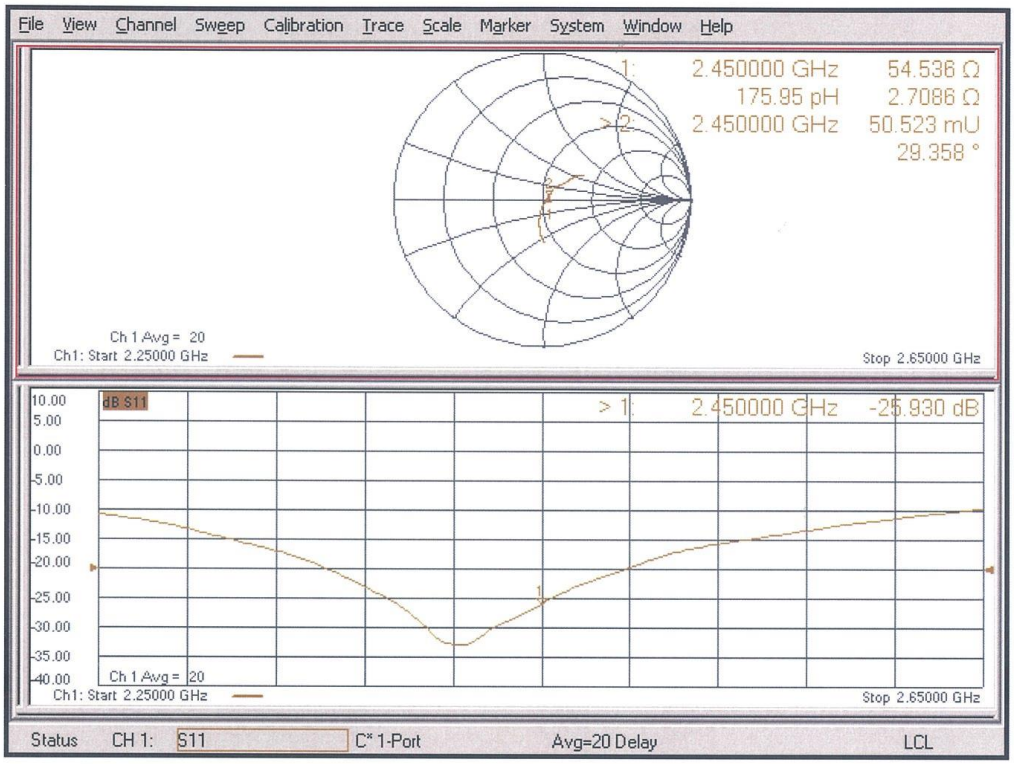
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 115.6 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 25.7 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.13 W/kg
Maximum value of SAR (measured) = 21.5 W/kg



0 dB = 21.5 W/kg = 13.32 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 17.07.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:853

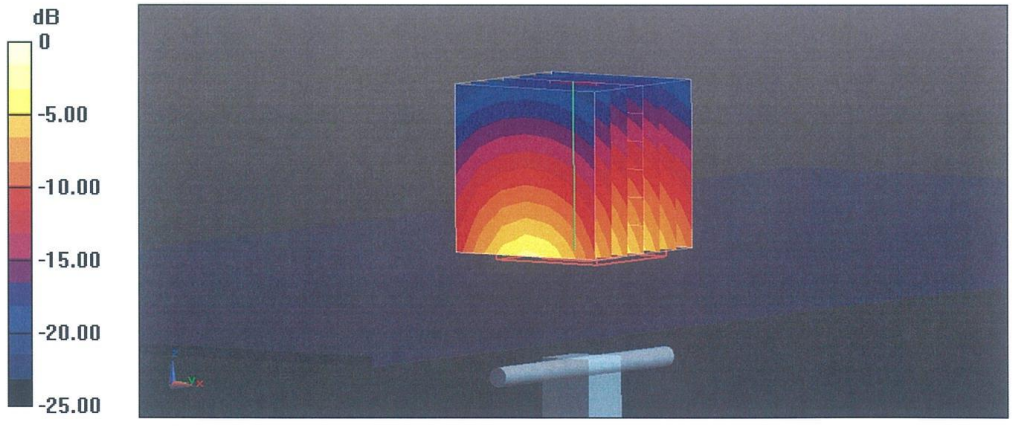
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.02 S/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94) @ 2450 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

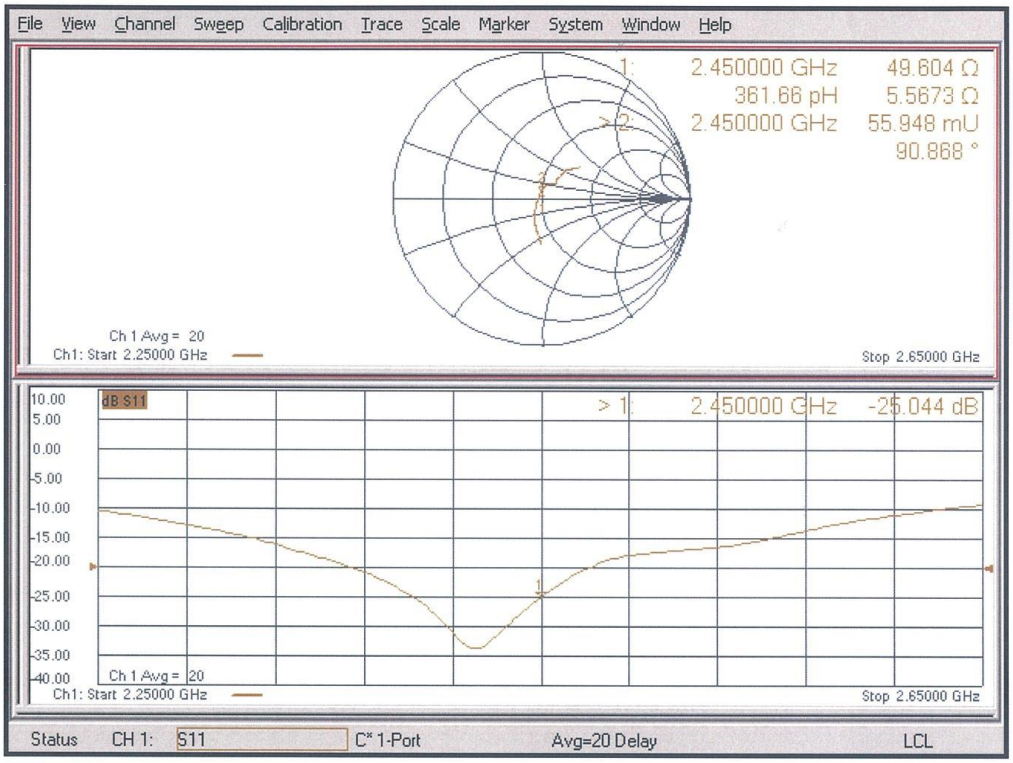
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 110.2 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 26.3 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (measured) = 21.8 W/kg



0 dB = 21.8 W/kg = 13.38 dBW/kg

Impedance Measurement Plot for Body TSL



ANNEX I SPOT CHECK

I.1 Dielectric Performance and System Validation

Table I.1-1: Dielectric Performance of Head Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2020-9-25	Head	750 MHz	41.28	-1.57	0.89	0.00
2020-9-25	Head	835 MHz	40.92	-1.40	0.898	-0.22
2020-9-25	Head	1750 MHz	39.69	-0.97	1.358	-0.88
2020-9-25	Head	1900 MHz	40.74	1.85	1.408	0.57
2020-9-25	Head	2450 MHz	39.19	-0.03	1.836	2.00

Table I.1-2: System Validation of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value(W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2020-9-25	750 MHz	5.53	8.47	5.56	8.32	0.54%	-1.77%
2020-9-25	835 MHz	6.25	9.60	6.36	9.64	1.76%	0.42%
2020-9-25	1750 MHz	19.1	36.5	19.16	36.08	0.31%	-1.15%
2020-9-25	1900 MHz	20.6	39.6	20.64	39.68	0.19%	0.20%
2020-9-25	2450 MHz	24.5	52.5	24.88	52.48	1.55%	-0.04%

I.2 Conducted power of selected case

Table I.2-1: The conducted Power for WCDMA- Normal Power

Item	band	FDDII result		
	ARFCN	9538/9938	9400/9800	9262/9662
WCDMA	\	(1907.6MHz)	(1880MHz)	(1852.4MHz)
		22.85	22.87	/
Item	band	FDDIV result		
	ARFCN	1513	1412	1312
WCDMA	\	(1752.6MHz)	(1732.4MHz)	(1712.4MHz)
		/	/	22.65
Item	band	FDDV result		
	ARFCN	4233/4458	4183/4408	4132/4357
WCDMA	\	(1907.6MHz)	(1880MHz)	(1852.4MHz)
		22.78	22.86	23.02

Table I.2-2: The conducted Power for LTE-Normal Power

LTE Band2	1RB-Middle	1860 (18700)	22.39
LTE Band2	1RB-Middle	1880 (18900)	22.69
LTE Band4	1RB-Middle	1745(20300)	22.64
LTE Band5	1RB-Middle	829 (20450)	23.75
LTE Band12	1RB-Middle	711 (23130)	22.53
LTE Band14	1RB-Middle	793 (23330)	22.68

Table I.2-7: The conducted Power for WLAN-Normal Power

Mode / data rate	Channel	Measured Power (dBm)
2.4G-11b	1	20.78

I.3 SAR results for Main antenna

Test Band	Channel	Frequency	Tune-Up	Measured Power	Test Position	Measured 10g SAR	Measured 1g SAR	Reported 10g SAR	Reported 1g SAR	Power Drift
WCDMA1900-BII	9538	1907.6	24	22.85	Left Cheek	0.306	0.484	0.40	0.63	0.05
WCDMA1900-BII	9400	1880	24	22.87	Rear	0.36	0.62	0.47	0.80	-0.1
WCDMA1700-BIV	1312	1712.4	24	22.65	Left Cheek	0.128	0.189	0.17	0.26	-0.1
WCDMA1700-BIV	1312	1712.4	24	22.65	Rear unfold	0.271	0.463	0.37	0.63	-0.07
WCDMA850-BV	4132	826.4	24	23.2	Left Cheek	0.295	0.384	0.35	0.46	0.16
WCDMA850-BV	4233	846.6	24	22.78	Rear	0.572	0.777	0.76	1.03	-0.19
WCDMA850-BV	4183	836.6	24	22.86	Rear	0.588	0.788	0.76	1.02	-0.09
WCDMA850-BV	4132	826.4	24	23.02	Rear	0.56	0.773	0.70	0.97	-0.07
LTE1900-FDD2	18700	1860	23.5	22.39	Left Cheek	0.17	0.262	0.22	0.34	0.02
LTE1900-FDD2	18900	1880	23.5	22.69	Rear	0.341	0.588	0.41	0.71	-0.03
LTE1700-FDD4	20300	1745	24	22.64	Left Cheek	0.0604	0.0927	0.08	0.13	0.05
LTE1700-FDD4	20300	1745	24	22.64	Rear unfold	0.241	0.406	0.33	0.56	-0.17
LTE850-FDD5	20450	829	24	23.75	Right Cheek	0.351	0.511	0.37	0.54	-0.05
LTE850-FDD5	20450	829	24	23.75	Rear	0.604	0.838	0.64	0.89	-0.07
LTE700-FDD12	23130	711	24	22.53	Right Cheek	0.186	0.284	0.26	0.40	-0.03
LTE700-FDD12	23130	711	24	22.53	Rear unfold	0.345	0.468	0.48	0.66	0.01
LTE700-FDD14	23330	793	24	22.68	Right Cheek	0.262	0.383	0.36	0.52	0.19
LTE700-FDD14	23330	793	24	22.68	Rear	0.508	0.698	0.69	0.95	0.04
WLAN2450	1	2412	21.5	20.78	Left Cheek	0.119	0.234	0.14	0.28	0.03
WLAN2450	1	2412	21.5	20.78	Rear unfold	0.128	0.208	0.15	0.25	-0.04

I.4 Reported SAR Comparison

Table I.4-1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/kg) original	Highest Reported SAR 1g(W/kg) spot check	Equipment Class
Head (Separation Distance 0mm)	UMTS FDD 2	0.49	0.63	PCE
	UMTS FDD 4	0.18	0.26	
	UMTS FDD 5	0.50	0.46	
	LTE Band 2	0.24	0.34	
	LTE Band 4	0.15	0.13	
	LTE Band 5	0.46	0.54	
	LTE Band 12	0.39	0.40	
	LTE Band 14	0.48	0.52	
	WLAN 2.4 GHz	0.42	0.28	DTS
Body (Separation Distance 15mm)	UMTS FDD 2	0.81	0.80	PCE
	UMTS FDD 4	0.82	0.63	
	UMTS FDD 5	0.83	1.03	
	LTE Band 2	**1.07**	0.71	
	LTE Band 4	0.74	0.56	
	LTE Band 5	0.89	0.89	
	LTE Band 12	0.69	0.66	
	LTE Band 14	0.96	0.95	
	WLAN 2.4 GHz	0.43	0.25	DTS

Note: The spot check results marked blue are larger than the original result.

I.5 MAIN TEST INSTRUMENTS

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5239A	MY46110673	January 24, 2020	One year
02	Power meter	NRP2	101919	May 12, 2020	One year
03	Power sensor	NRP-Z91	101547		
04	Signal Generator	E4438C	MY49070393	January 4, 2020	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	129942	February 10, 2020	One year
07	E-field Probe	SPEAG EX3DV4	3617	Jan 30, 2020	One year
08	DAE	SPEAG DAE4	777	January 8, 2020	One year
09	Dipole Validation Kit	SPEAG D750V3	1017	July 24,2020	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 24,,2020	One year
11	Dipole Validation Kit	SPEAG D1750V2	1003	July 24, 2020	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d101	July 28,2020	One year
13	Dipole Validation Kit	SPEAG D2450V2	853	July 21,2020	One year

I.6 GRAPH RESULTS

WCDMA1900-BII_CH9538 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1907.6; σ = 1.416 mho/m; εr = 40.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1907.6 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.703 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.463 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.742 W/kg
SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.306 W/kg
Maximum value of SAR (measured) = 0.646 W/kg

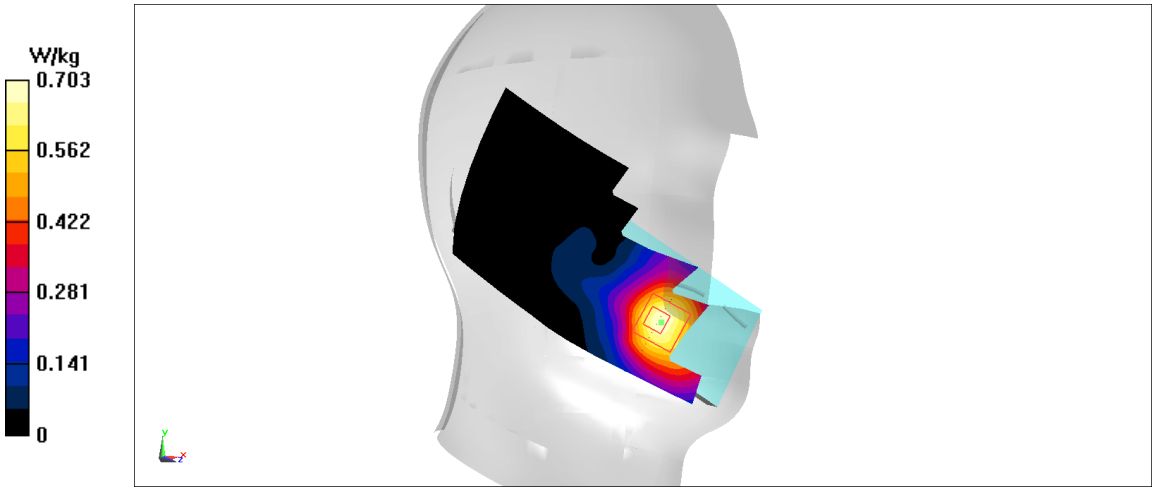


Fig A.1

WCDMA1900-BII_CH9400 Rear
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880; σ = 1.389 mho/m; εr = 40.76; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1880 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.838 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.29 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.62 W/kg; SAR(10 g) = 0.36 W/kg
Maximum value of SAR (measured) = 0.899 W/kg

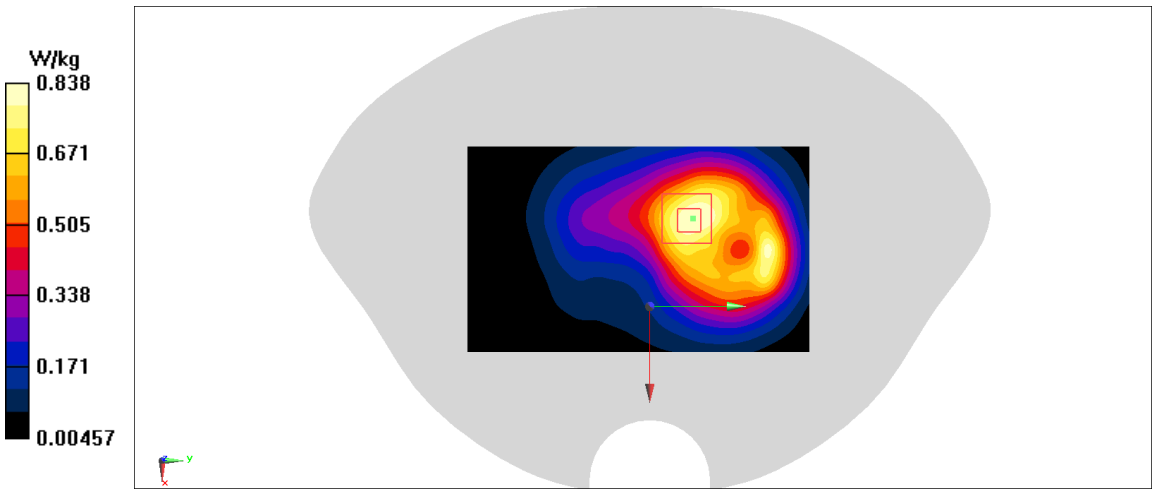


Fig A.2

WCDMA1700-BIV_CH1312 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1712.4; σ = 1.322 mho/m; εr = 39.74; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1712.4 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.269 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.276 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 0.263 W/kg
SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.128 W/kg
Maximum value of SAR (measured) = 0.239 W/kg

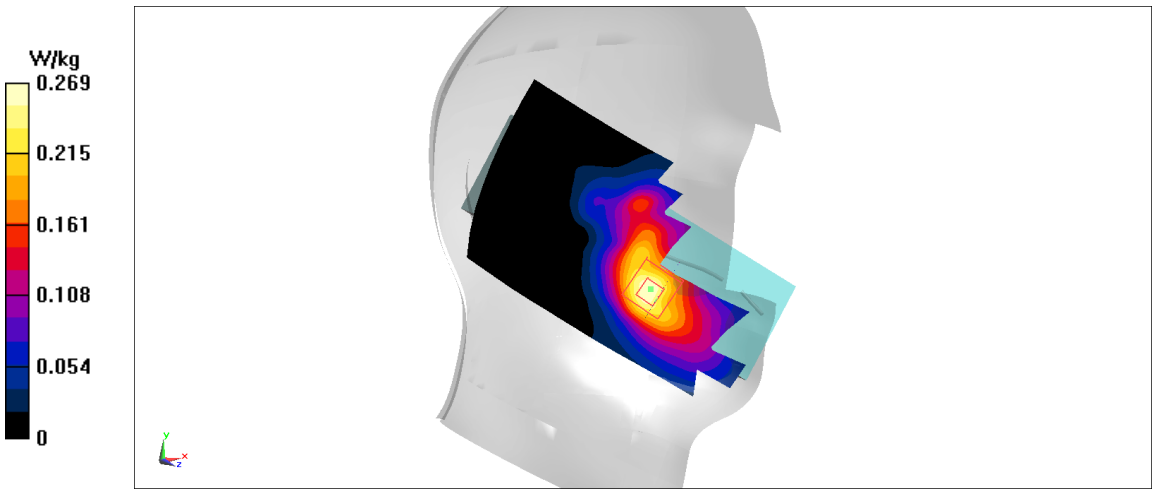


Fig A.3

WCDMA1700-BIV_CH1312 Rear unfold
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1712.4; σ = 1.322 mho/m; εr = 39.74; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1712.4 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.65 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.72 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.789 W/kg
SAR(1 g) = 0.463 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = 0.651 W/kg

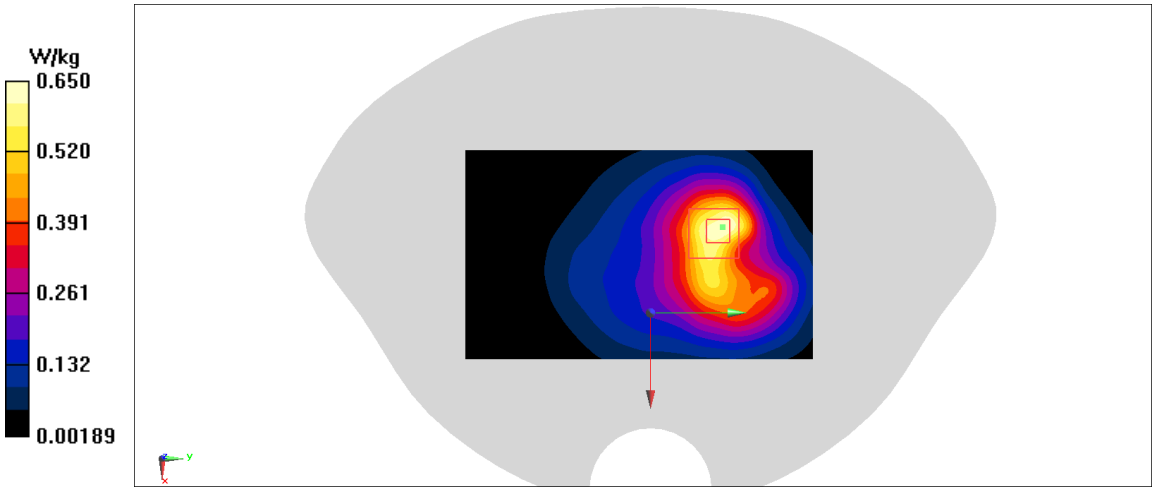


Fig A.4

WCDMA850-BV_CH4132 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 826.4; σ = 0.889 mho/m; εr = 40.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA850-BV 826.4 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.459 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.278 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.384 W/kg; SAR(10 g) = 0.295 W/kg
Maximum value of SAR (measured) = 0.44 W/kg

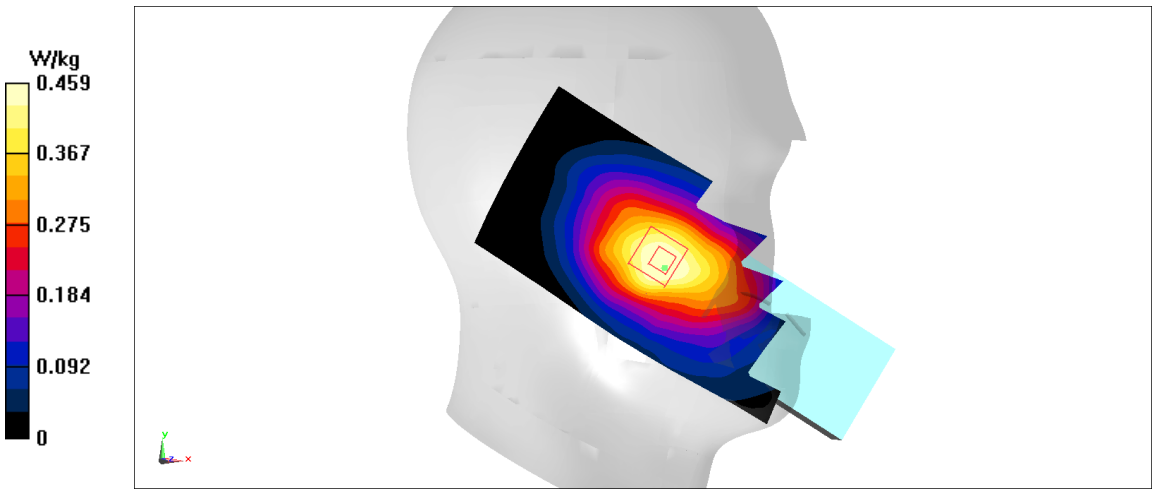


Fig A.5

WCDMA850-BV_CH4233 Rear
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 846.6; σ = 0.909 mho/m; εr = 40.91; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA850-BV 846.6 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.03 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.61 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.988 W/kg
SAR(1 g) = 0.777 W/kg; SAR(10 g) = 0.572 W/kg
Maximum value of SAR (measured) = 0.927 W/kg

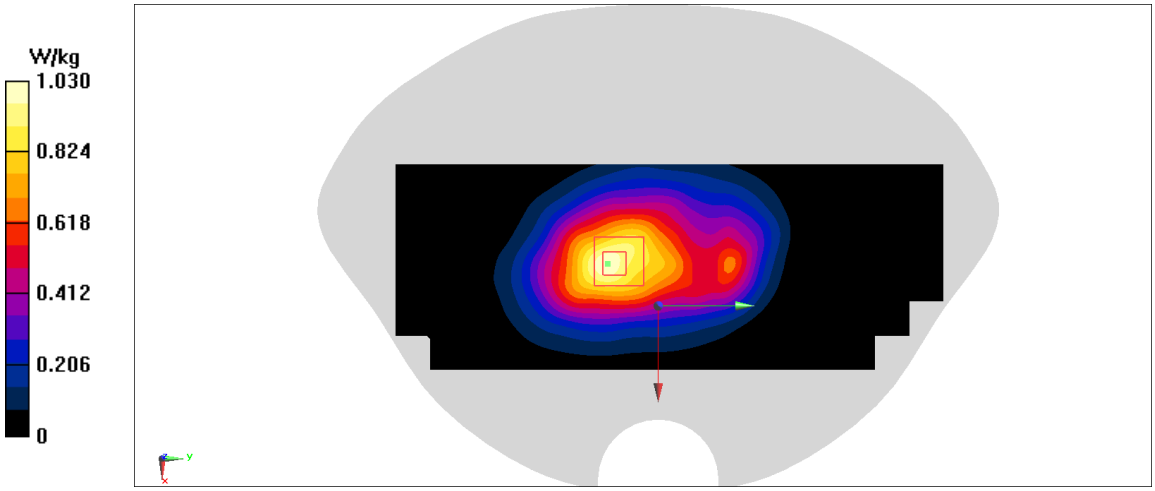


Fig A.6

LTE1900-FDD2_CH18700 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1860 MHz; σ = 1.37 mho/m; εr = 40.79; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD2 1860 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.372 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.567 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.409 W/kg
SAR(1 g) = 0.262 W/kg; SAR(10 g) = 0.17 W/kg
Maximum value of SAR (measured) = 0.352 W/kg

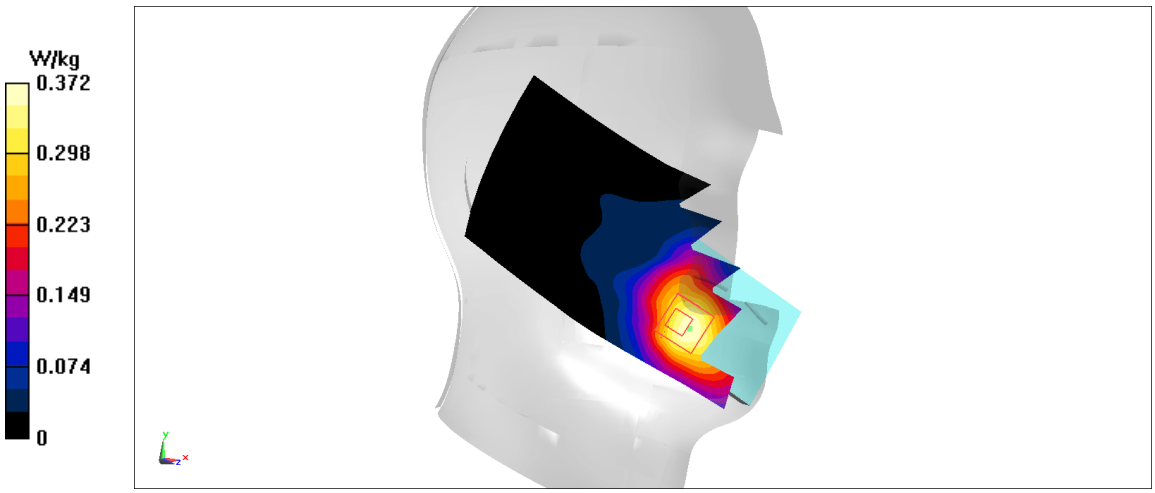


Fig A.7

LTE1900-FDD2_CH18900 Rear
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.389 mho/m; εr = 40.76; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.766 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.588 W/kg; SAR(10 g) = 0.341 W/kg
Maximum value of SAR (measured) = 0.854 W/kg

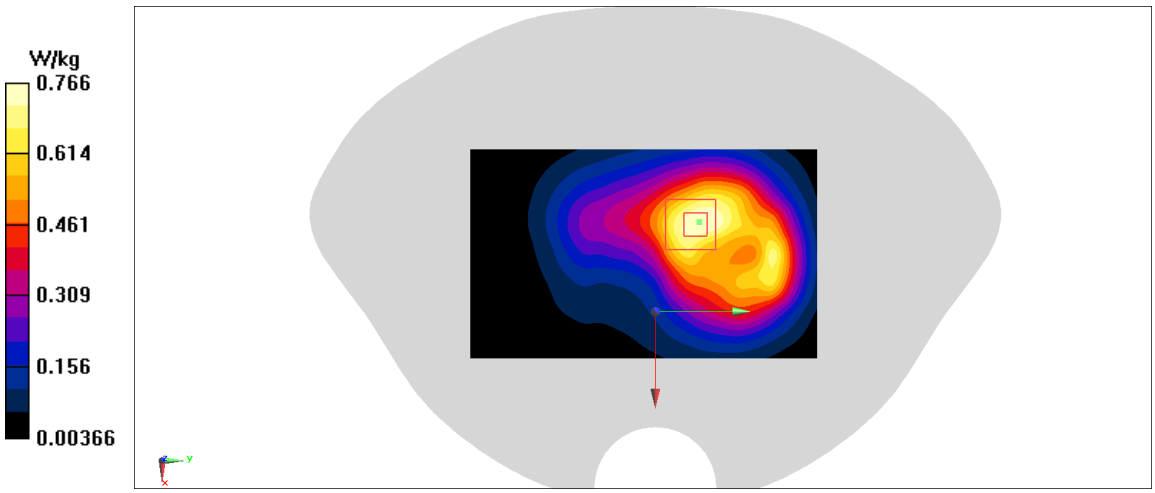


Fig A.8

LTE1700-FDD4_CH20300 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.353 mho/m; εr = 39.7; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.107 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.123 W/kg
SAR(1 g) = 0.0927 W/kg; SAR(10 g) = 0.0604 W/kg
Maximum value of SAR (measured) = 0.113 W/kg

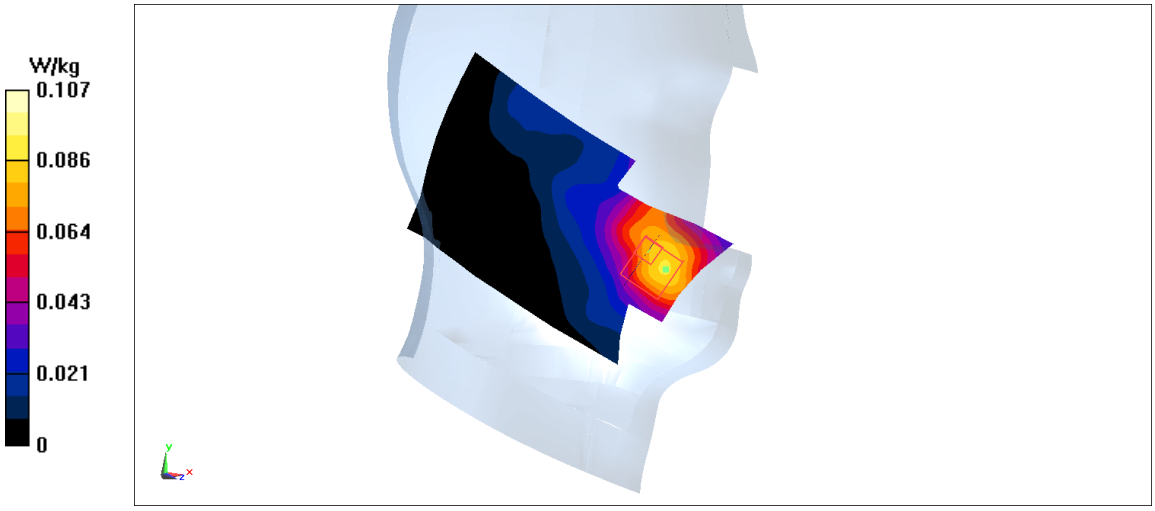


Fig A.9

LTE1700-FDD4_CH20300 Rear unfold
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.353 mho/m; εr = 39.7; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.602 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.36 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.691 W/kg
SAR(1 g) = 0.406 W/kg; SAR(10 g) = 0.241 W/kg
Maximum value of SAR (measured) = 0.575 W/kg

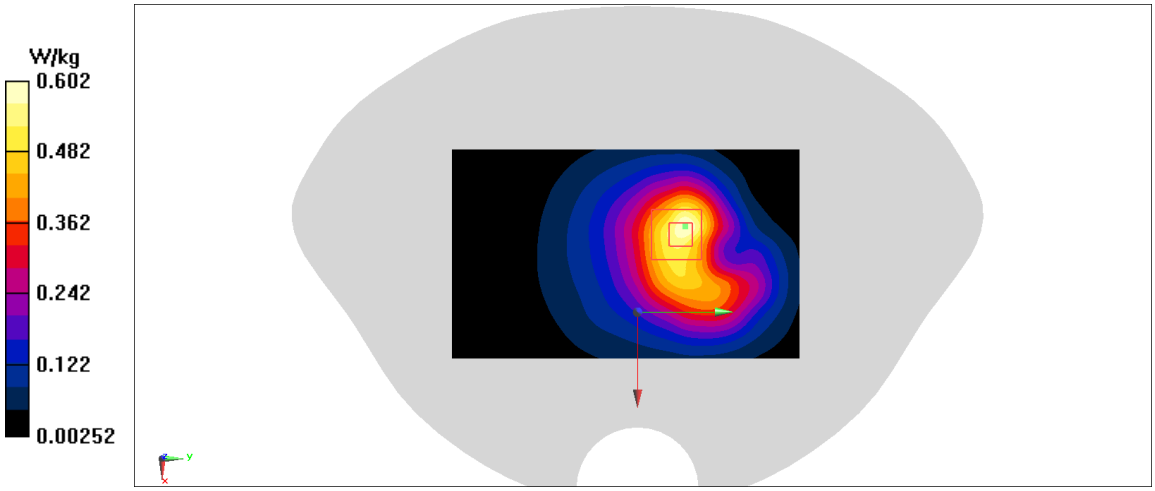


Fig A.10

LTE850-FDD5_CH20450 Right Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.892 mho/m; εr = 40.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.697 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.762 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.801 W/kg
SAR(1 g) = 0.511 W/kg; SAR(10 g) = 0.351 W/kg
Maximum value of SAR (measured) = 0.699 W/kg

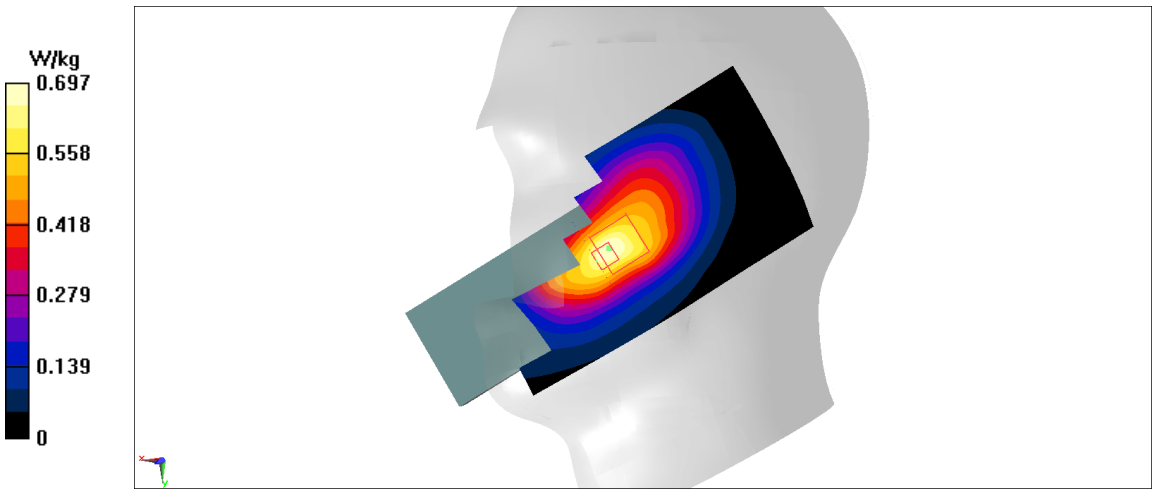


Fig A.11

LTE850-FDD5_CH20450 Rear
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.892 mho/m; εr = 40.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.59 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.838 W/kg; SAR(10 g) = 0.604 W/kg
Maximum value of SAR (measured) = 1.03 W/kg

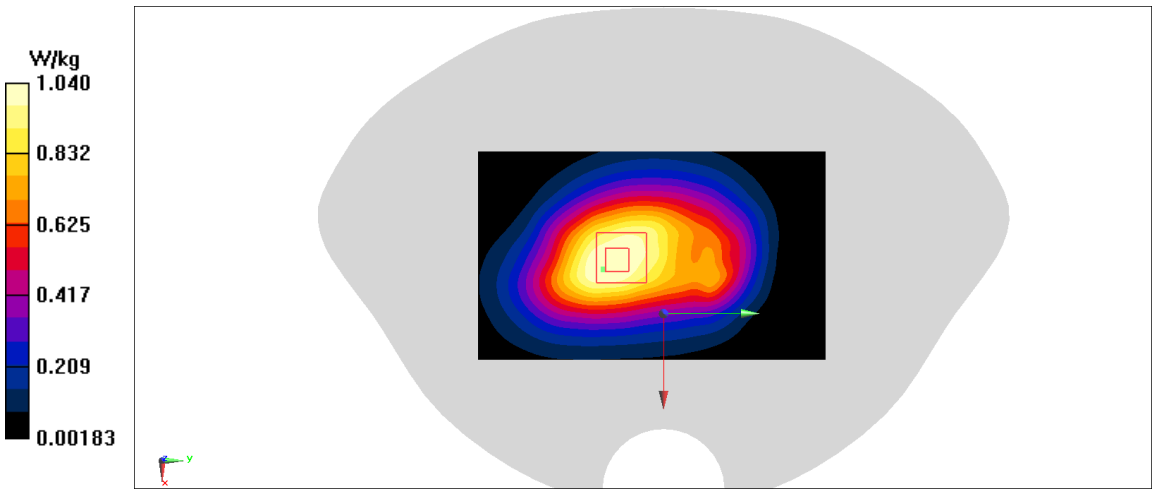


Fig A.12

LTE700-FDD12_CH23130 Right Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 711 MHz; σ = 0.853 mho/m; εr = 41.33; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD12 711 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.371 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.954 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.447 W/kg
SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.186 W/kg
Maximum value of SAR (measured) = 0.376 W/kg

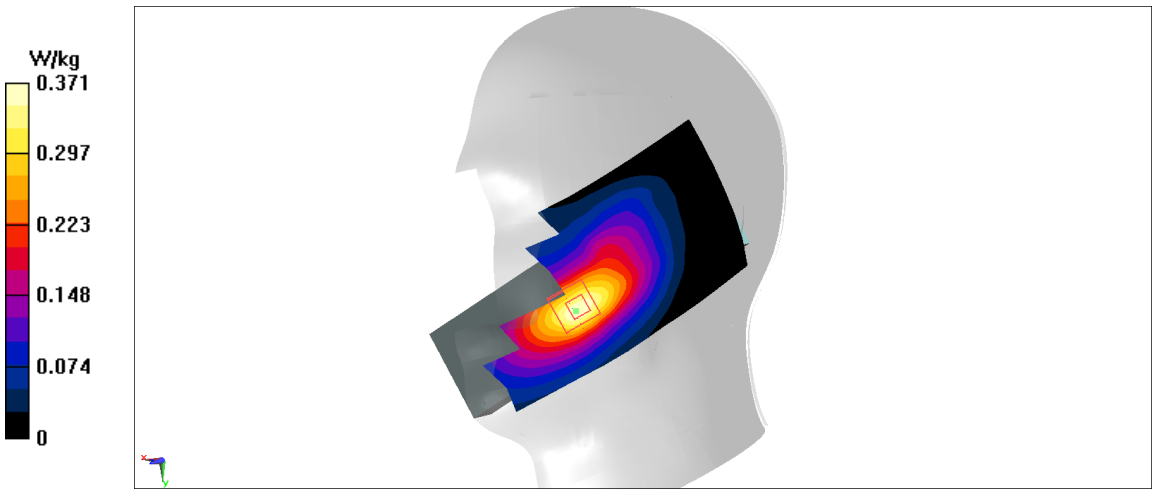


Fig A.13

LTE700-FDD12_CH23130 Rear unfold
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 711 MHz; σ = 0.853 mho/m; εr = 41.33; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD12 711 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.584 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.14 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.649 W/kg
SAR(1 g) = 0.468 W/kg; SAR(10 g) = 0.345 W/kg
Maximum value of SAR (measured) = 0.577 W/kg

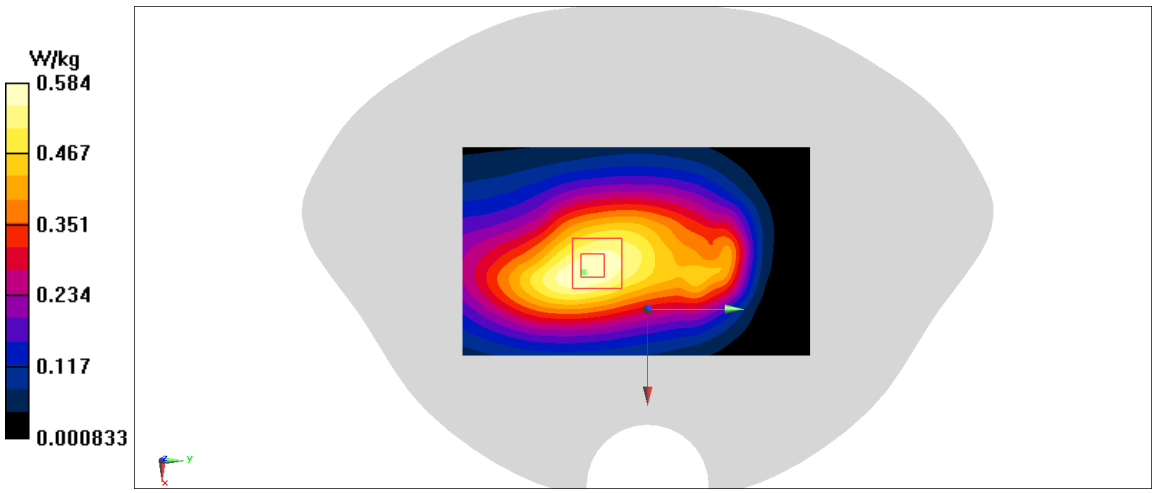


Fig A.14

LTE700-FDD14_CH23330 Right Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.931 mho/m; εr = 41.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.489 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.404 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.583 W/kg
SAR(1 g) = 0.383 W/kg; SAR(10 g) = 0.262 W/kg
Maximum value of SAR (measured) = 0.508 W/kg

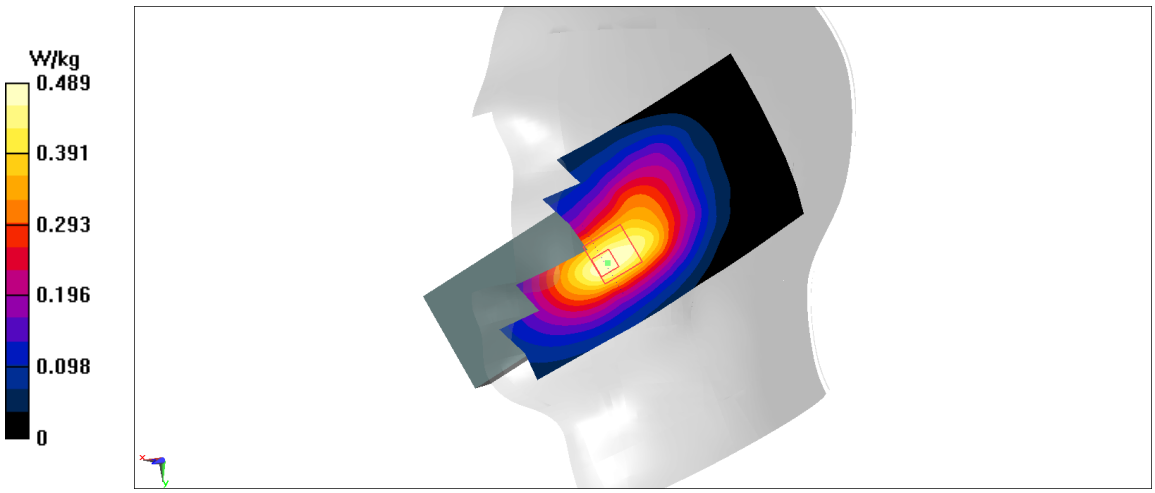


Fig A.15

LTE700-FDD14_CH23330 Rear
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.931 mho/m; εr = 41.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.843 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.22 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.96 W/kg
SAR(1 g) = 0.698 W/kg; SAR(10 g) = 0.508 W/kg
Maximum value of SAR (measured) = 0.868 W/kg

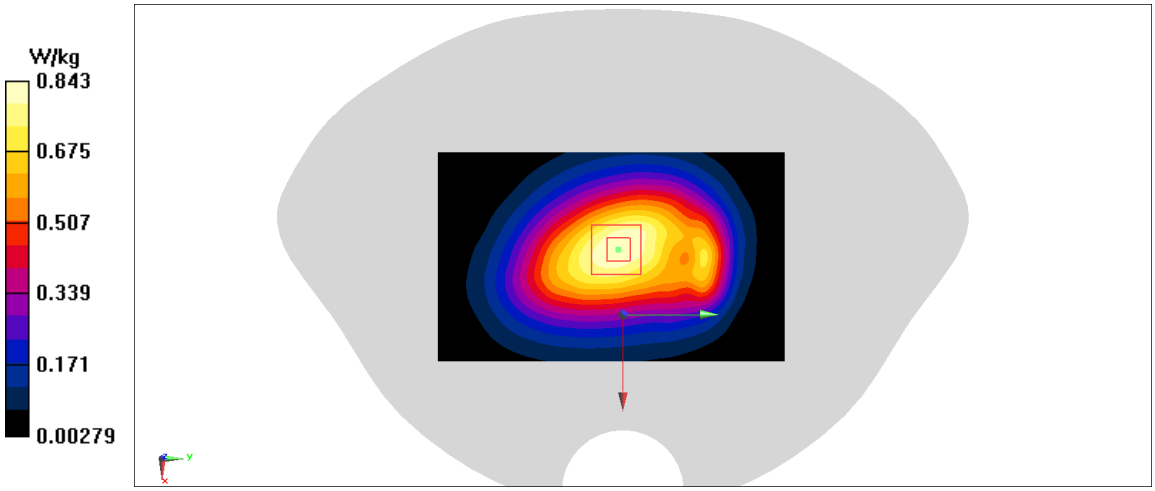


Fig A.16

WLAN2450_CH1 Left Cheek
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 2450 MHz
Medium parameters used: f = 2412; σ = 1.8 mho/m; εr = 39.24; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WLAN2450 2412 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.436 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.395 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.234 W/kg; SAR(10 g) = 0.119 W/kg
Maximum value of SAR (measured) = 0.297 W/kg

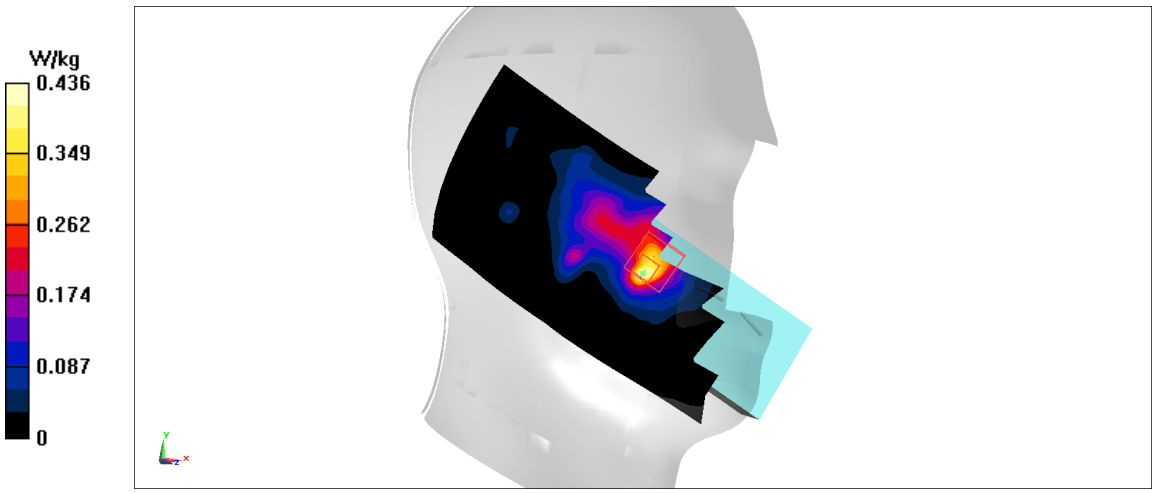


Fig A.17

WLAN2450_CH1 Rear unfold
Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: head 2450 MHz
Medium parameters used: f = 2412; σ = 1.8 mho/m; εr = 39.24; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WLAN2450 2412 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.332 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.541 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.333 W/kg
SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.128 W/kg
Maximum value of SAR (measured) = 0.297 W/kg

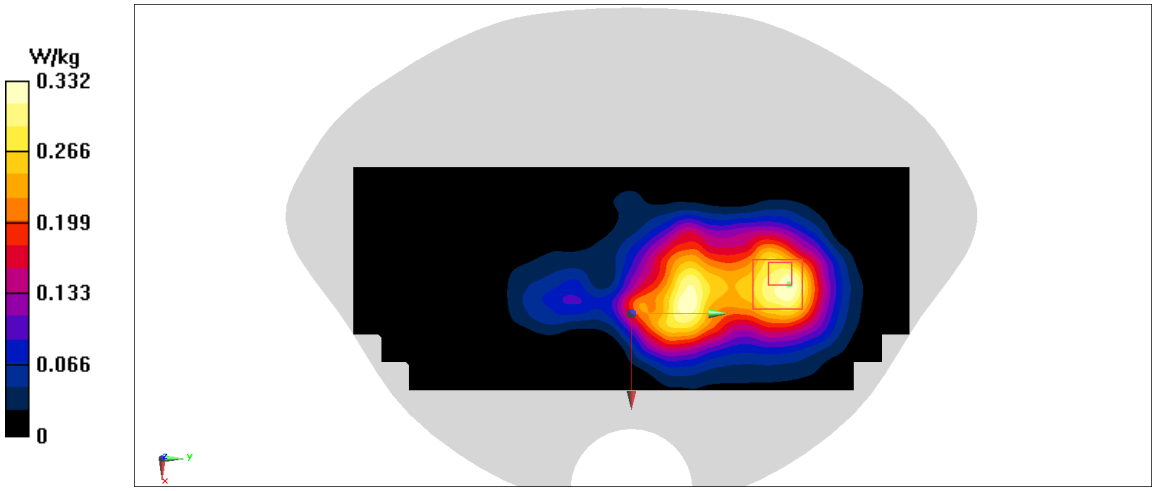


Fig A.18

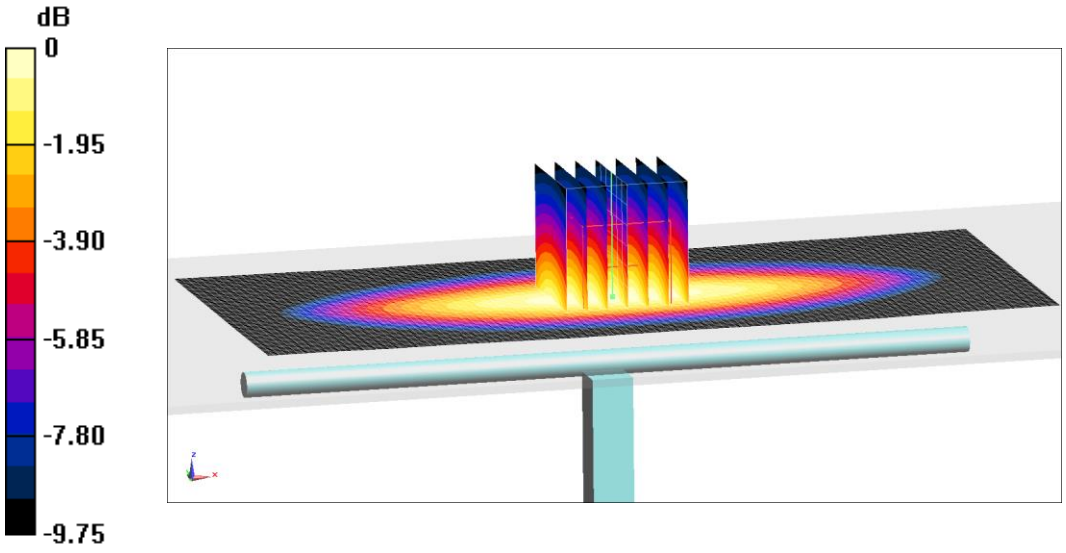
I.7 System Verification Results

750 MHz

Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.89 mho/m; ε_r = 41.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 59.36 V/m; Power Drift = 0.02
Fast SAR: SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (interpolated) = 2.78 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =59.36 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.2 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kg = 4.64 dB W/kg

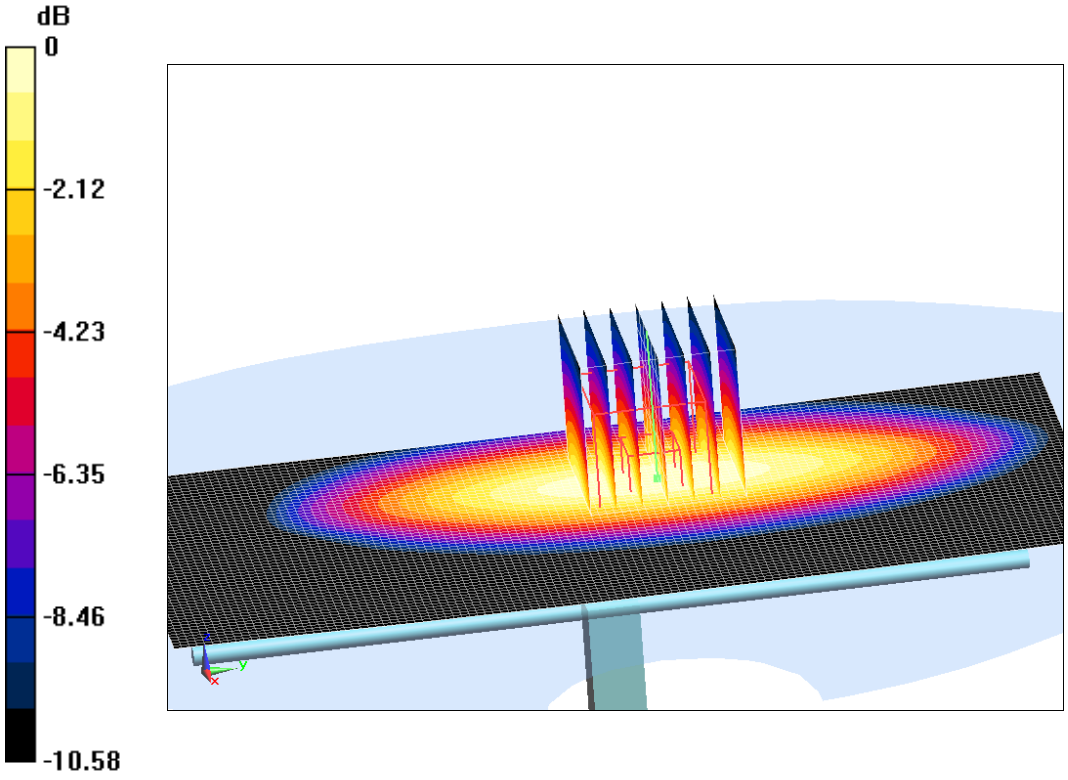
Fig.B.1 validation 750 MHz 250mW

835 MHz

Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.898 mho/m; ε_r = 40.92; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.22 V/m; Power Drift = -0.08
Fast SAR: SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (interpolated) = 3.23 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =64.22 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 3.25 W/kg



0 dB = 3.25 W/kg = 5.12 dB W/kg

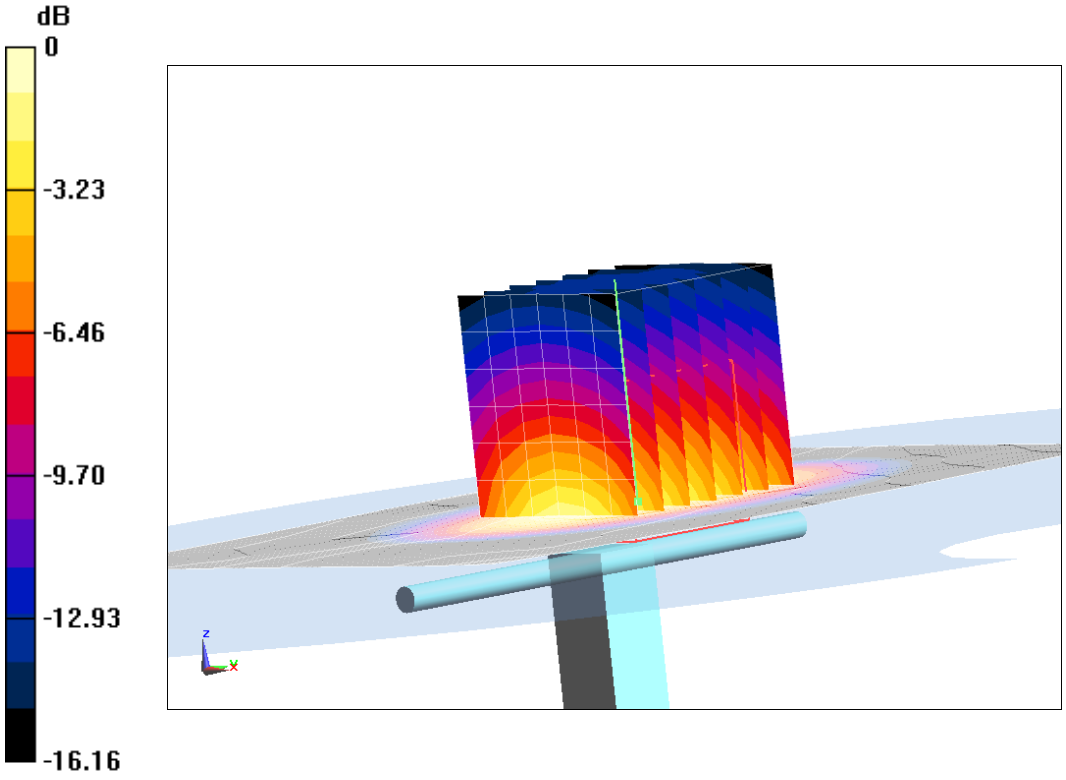
Fig.B.2 validation 835 MHz 250mW

1750 MHz

Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: Head 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.358 mho/m; ε_r = 39.69; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 104.11 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 9.04 W/kg; SAR(10 g) = 4.69 W/kg
Maximum value of SAR (interpolated) = 14.07 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =104.11 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 16.62 W/kg
SAR(1 g) = 9.02 W/kg; SAR(10 g) = 4.79 W/kg
Maximum value of SAR (measured) = 14.34 W/kg



0 dB = 14.34 W/kg = 11.57 dB W/kg

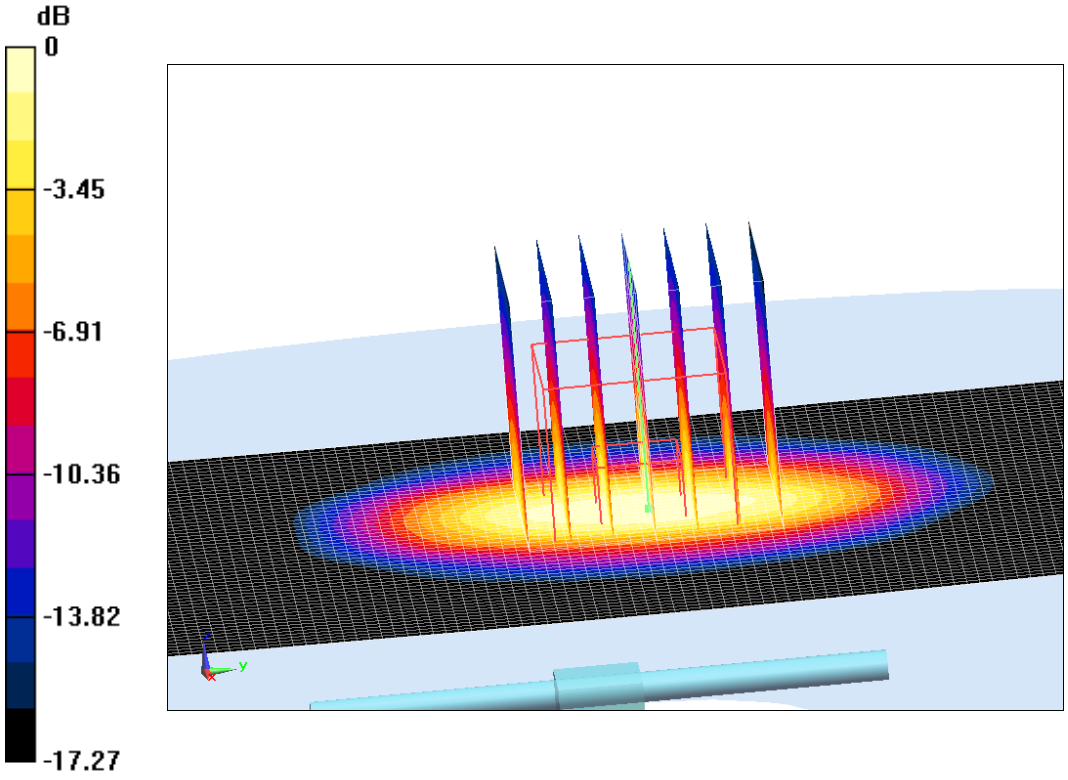
Fig.B.3 validation 1750 MHz 250mW

1900 MHz

Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.408 mho/m; ε_r = 40.74; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 110.74 V/m; Power Drift = -0.03
Fast SAR: SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.05 W/kg
Maximum value of SAR (interpolated) = 15.26 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =110.74 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.19 W/kg
SAR(1 g) = 9.92 W/kg; SAR(10 g) = 5.16 W/kg
Maximum value of SAR (measured) = 15.41 W/kg



0 dB = 15.41 W/kg = 11.88 dB W/kg

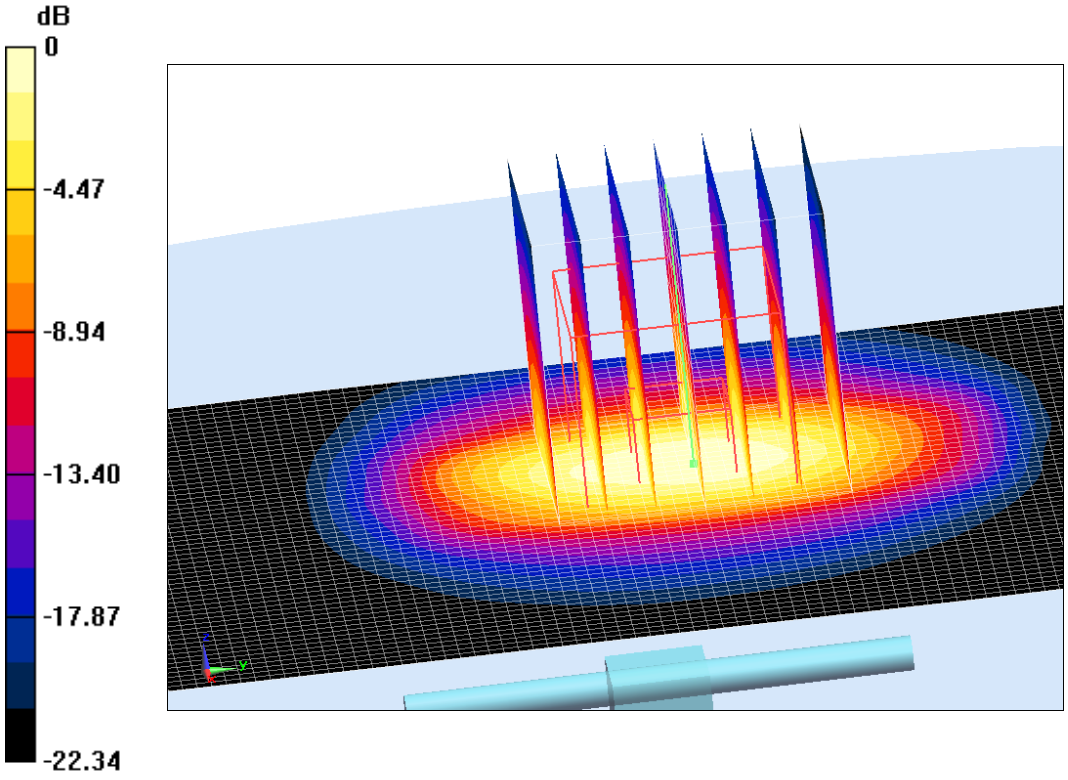
Fig.B.4 validation 1900 MHz 250mW

2450 MHz

Date: 9/25/2020
Electronics: DAE4 Sn777
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.836 mho/m; ε_r = 39.19; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 119.12 V/m; Power Drift = -0.02
Fast SAR: SAR(1 g) = 13.09 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (interpolated) = 21.41 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =119.12 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 26.53 W/kg
SAR(1 g) = 13.12 W/kg; SAR(10 g) = 6.22 W/kg
Maximum value of SAR (measured) = 21.63 W/kg



0 dB = 21.63 W/kg = 13.35 dB W/kg

Fig.B.5 validation 2450 MHz 250mW

I.8 Probe Calibration Certificate

Probe 3617 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
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 CTTL (Auden) **Certificate No: EX3-3617_Jan20/2**

CALIBRATION CERTIFICATE (Replacement of No: EX3-3617_Jan20)

Object	EX3DV4 - SN:3617
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes
Calibration date:	January 30, 2020

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-19 (No. 217-02894)	Apr-20
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 7, 2020