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

S Schweizerischer Kalibrierdienst
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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	V52.10.0
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	37.8 ± 6 %	1.87 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	13.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.7 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	52.1 ± 6 %	2.04 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	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**50.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.03 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.8 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	52.0 Ω + 5.0 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.6 Ω + 6.3 jΩ
Return Loss	- 24.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 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
Manufactured on	November 10, 2009

DASY5 Validation Report for Head TSL

Date: 20.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

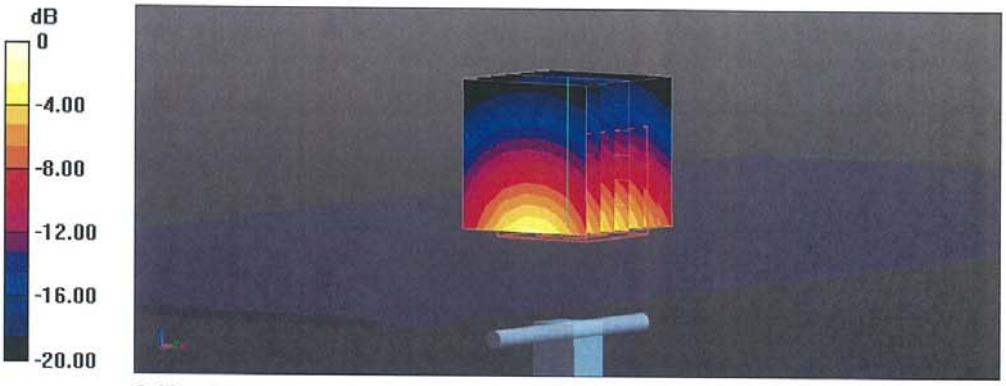
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.87 S/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

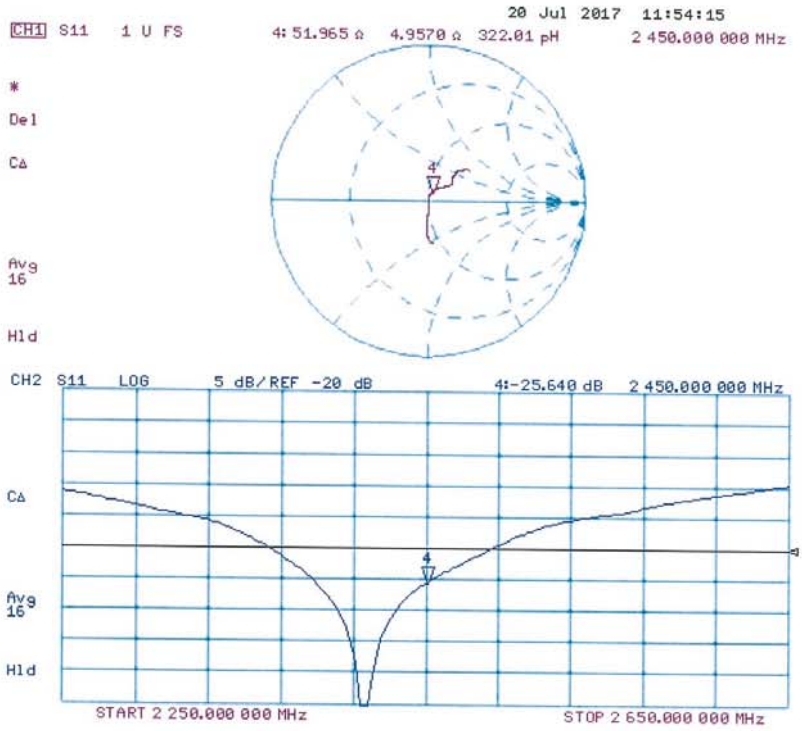
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 112.7 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 27.0 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.26 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: 21.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

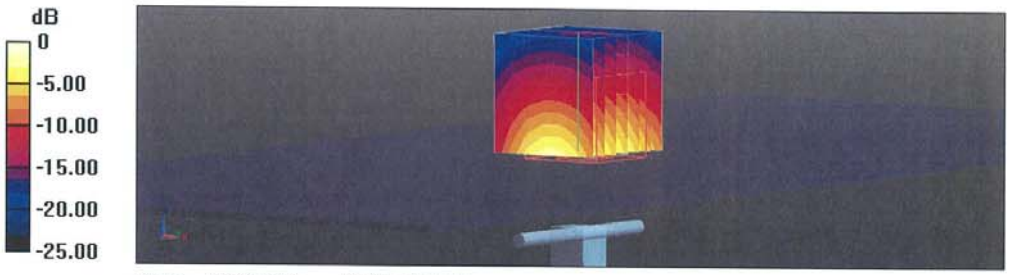
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 S/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.1, 8.1, 8.1); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

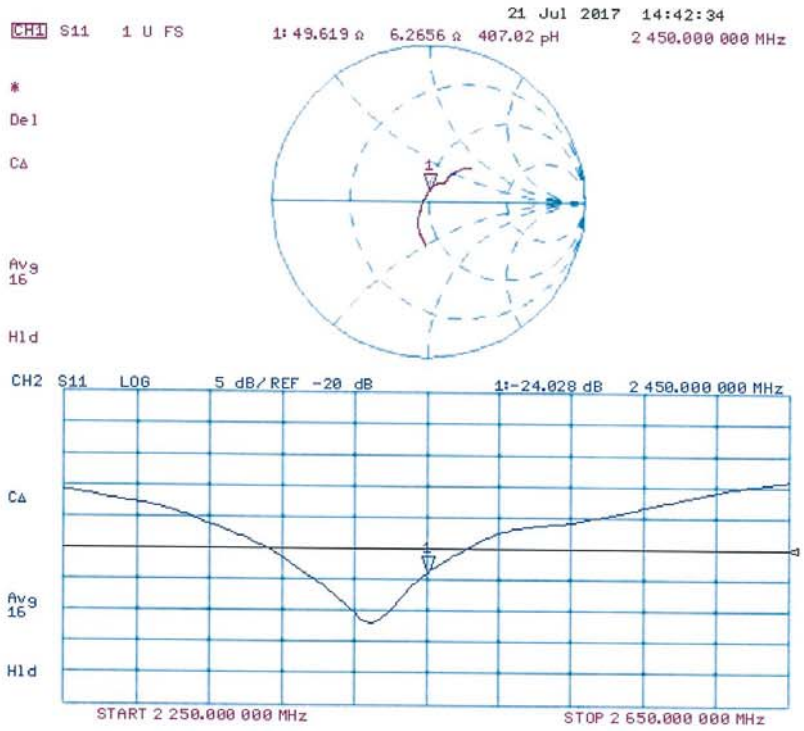
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.1 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 25.5 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.03 W/kg
Maximum value of SAR (measured) = 20.0 W/kg



0 dB = 20.0 W/kg = 13.01 dBW/kg

Impedance Measurement Plot for Body TSL



2600 MHz Dipole Calibration Certificate

Calibration Laboratory of
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Accreditation No.: SCS 0108

Client CTTL-BJ (Auden)

Certificate No: D2600V2-1012_Jul17

CALIBRATION CERTIFICATE

Object	D2600V2 - SN:1012
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 21, 2017

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	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: July 24, 2017

Calibration Laboratory of
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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

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	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.2 ± 6 %	2.04 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	14.9 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**57.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.8 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	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.6 ± 6 %	2.22 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	14.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**55.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.25 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.8 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	46.8 Ω - 5.0 jΩ
Return Loss	- 24.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.5 Ω - 5.3 jΩ
Return Loss	- 21.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.151 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
Manufactured on	October 30, 2007

DASY5 Validation Report for Head TSL

Date: 20.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

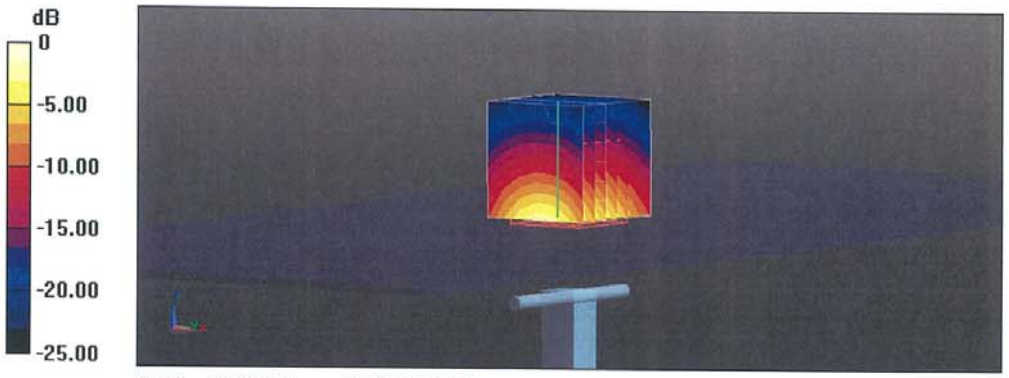
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1012

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.04 S/m; ε_r = 37.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

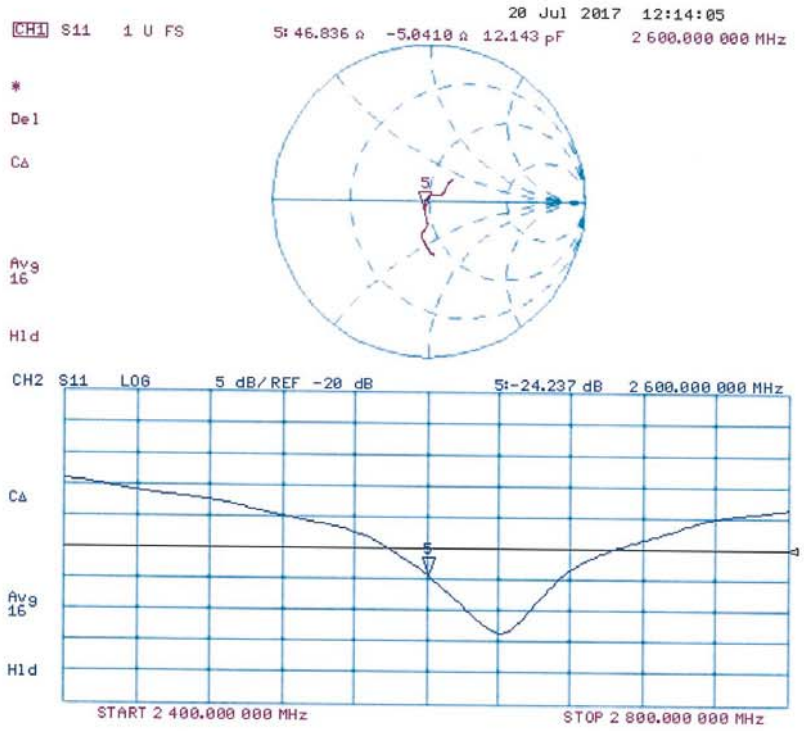
- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 113.6 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 14.9 W/kg; SAR(10 g) = 6.57 W/kg
Maximum value of SAR (measured) = 25.0 W/kg



0 dB = 25.0 W/kg = 13.98 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

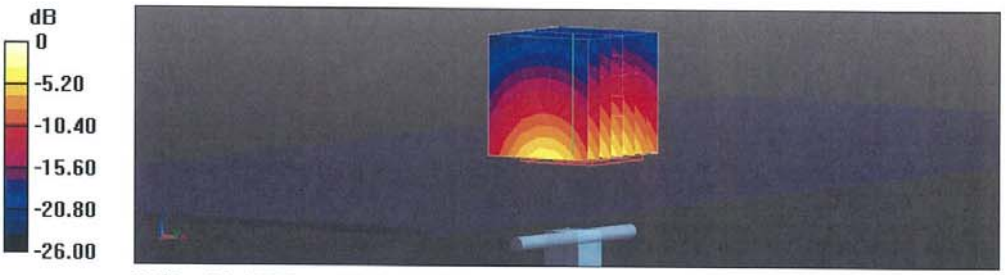
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1012

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.22 S/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

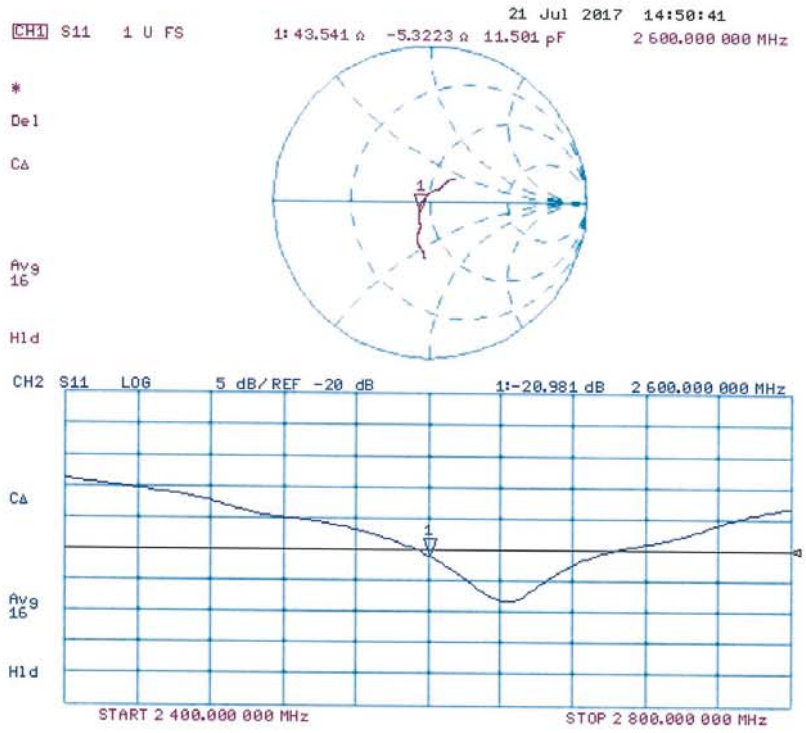
- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 106.6 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 30.1 W/kg
SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.25 W/kg
Maximum value of SAR (measured) = 23.4 W/kg



0 dB = 23.4 W/kg = 13.69 dBW/kg

Impedance Measurement Plot for Body TSL



5 GHz Dipole Calibration Certificate

Calibration Laboratory of
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Accreditation No.: SCS 0108

Client CTTL-BJ (Auden)

Certificate No: D5GHzV2-1060_Jul17

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN:1060
Calibration procedure(s)	QA CAL-22.v2 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	July 25, 2017

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	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 3503	31-Dec-16 (No. EX3-3503_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 27, 2017

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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

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	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5500 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.3 ± 6 %	4.51 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.6 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.0 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.1 ± 6 %	4.61 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**83.8 W / kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.0 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	4.81 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.48 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**84.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.1 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.7 ± 6 %	4.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**84.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.1 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.4 ± 6 %	5.14 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.9 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.9 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.45 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.56 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**75.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.1 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.2 ± 6 %	5.58 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.75 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**77.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.6 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.9 ± 6 %	5.85 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**81.4 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**22.5 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.7 ± 6 %	5.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.10 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**80.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**22.6 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.4 ± 6 %	6.28 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.84 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**78.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	50.5 Ω - 6.6 jΩ
Return Loss	- 23.7 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	47.5 Ω - 2.8 jΩ
Return Loss	- 28.3 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	51.1 Ω - 3.7 jΩ
Return Loss	- 28.5 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	54.0 Ω + 2.0 jΩ
Return Loss	- 27.4 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	52.3 Ω - 2.9 jΩ
Return Loss	- 28.9 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.7 Ω - 4.7 jΩ
Return Loss	- 26.5 dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	46.8 Ω - 1.9 jΩ
Return Loss	- 28.3 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	50.7 Ω - 2.2 jΩ
Return Loss	- 32.8 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	55.1 Ω + 1.2 jΩ
Return Loss	- 26.1 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	52.5 Ω - 1.9 jΩ
Return Loss	- 30.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 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
Manufactured on	November 27, 2006

DASY5 Validation Report for Head TSL

Date: 25.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1060

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.51 S/m; ε_r = 36.3; ρ = 1000 kg/m^3 , Medium parameters used: f = 5300 MHz; σ = 4.61 S/m; ε_r = 36.1; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 4.81 S/m; ε_r = 35.8; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 4.92 S/m; ε_r = 35.7; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 5.14 S/m; ε_r = 35.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.76, 5.76, 5.76); Calibrated: 31.12.2016, ConvF(5.35, 5.35, 5.35); Calibrated: 31.12.2016, ConvF(5.2, 5.2, 5.2); Calibrated: 31.12.2016, ConvF(5.09, 5.09, 5.09); Calibrated: 31.12.2016, ConvF(5.01, 5.01, 5.01); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

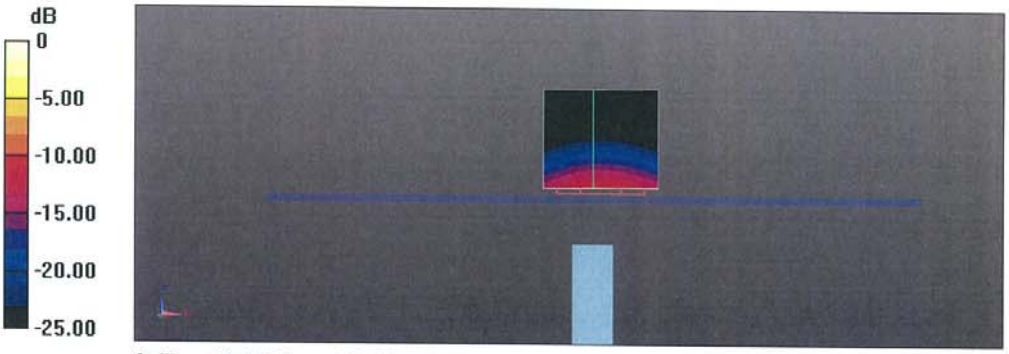
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.18 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 8.05 W/kg; SAR(10 g) = 2.30 W/kg
Maximum value of SAR (measured) = 18.4 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.70 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 8.38 W/kg; SAR(10 g) = 2.4 W/kg
Maximum value of SAR (measured) = 19.4 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.97 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.3 W/kg
SAR(1 g) = 8.48 W/kg; SAR(10 g) = 2.41 W/kg
Maximum value of SAR (measured) = 20.2 W/kg

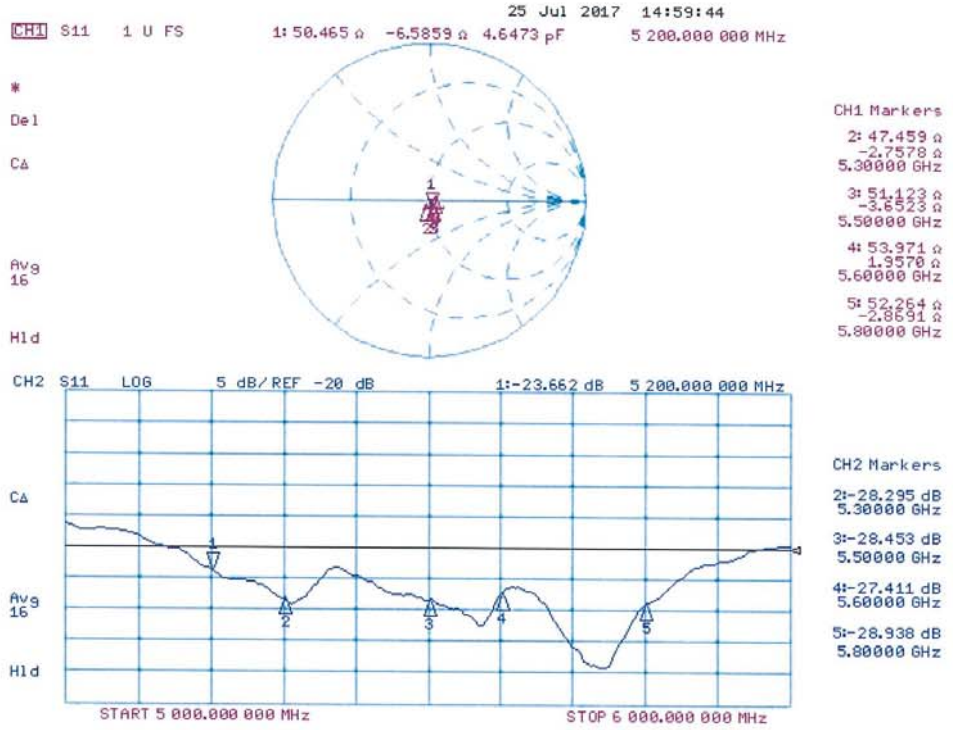
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.72 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 33.6 W/kg
SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg
Maximum value of SAR (measured) = 20.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.66 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 8.10 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 19.6 W/kg



0 dB = 18.4 W/kg = 12.66 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 17.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1060

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.45 S/m; ε_r = 47.4; ρ = 1000 kg/m^3 , Medium parameters used: f = 5300 MHz; σ = 5.58 S/m; ε_r = 47.2; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 5.85 S/m; ε_r = 46.9; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 5.99 S/m; ε_r = 46.7; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 6.28 S/m; ε_r = 46.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.29, 5.29, 5.29); Calibrated: 31.12.2016, ConvF(5.04, 5.04, 5.04); Calibrated: 31.12.2016, ConvF(4.62, 4.62, 4.62); Calibrated: 31.12.2016, ConvF(4.57, 4.57, 4.57); Calibrated: 31.12.2016, ConvF(4.48, 4.48, 4.48); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

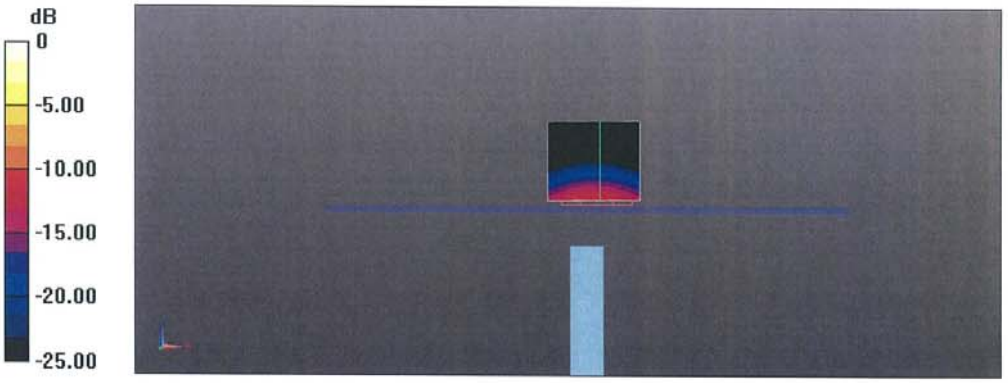
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.89 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 7.56 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 18.0 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.82 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.18 W/kg
Maximum value of SAR (measured) = 18.6 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.03 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.19 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 19.9 W/kg

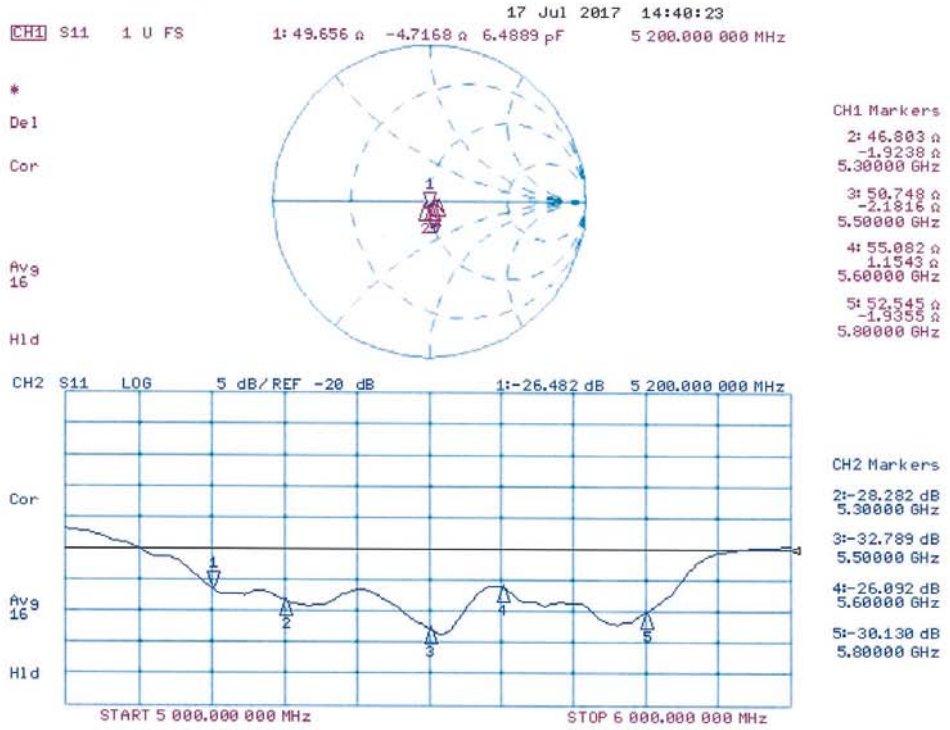
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.05 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 34.5 W/kg
SAR(1 g) = 8.1 W/kg; SAR(10 g) = 2.28 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 63.30 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 35.2 W/kg
SAR(1 g) = 7.84 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 18.0 W/kg = 12.55 dBW/kg

Impedance Measurement Plot for Body TSL



ANNEX I SPOT CHECK

I.1 Conducted power of selected case

Table I.1-1: The conducted power results for GPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)		
	251	190	128
3 Txslots	30.45	30.38	30.24
PCS1900 GPRS (GMSK)	Measured Power (dBm)		
	810	661	512
4 Txslots	27.89	27.84	27.69

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

Item	**band**	**FDDV result**		
	ARFCN	**4233(846.6MHz)**	**4182(836.4MHz)**	**4132(826.4MHz)**
WCDMA	\	23.75	23.68	23.69
Item	**band**	**FDDII result**		
	ARFCN	**9538(1907.6MHz)**	**9400(1880MHz)**	**9262(1852.4MHz)**
WCDMA	\	24.14	24.22	24.16
Item	**band**	**FDDIV result**		
	ARFCN	**1513 (1752.6MHz)**	**1412 (1732.4MHz)**	**1312 (1712.4MHz)**
WCDMA	\	23.74	23.88	23.97

Table I.1-3: The conducted Power for WCDMA (Low Power)

Item	**band**	**FDDIV result**		
	ARFCN	**1513 (1752.6MHz)**	**1412 (1732.4MHz)**	**1312 (1712.4MHz)**
WCDMA	\	22.19	22.36	22.48

Table I.1-4: The conducted Power for LTE

LTE Band2 20MHz	1RB-Low (0)	1900 (19100)	23.95
LTE Band510MHz	1RB-High (49)	829 (20450)	23.89
LTE Band7 20MHz	1RB-Low (0)	2510 (20850)	24.41
LTE Band7 20MHz (Low Power)	100RB (0)	2510 (20850)	20.44
LTE Band12 10MHz	1RB-High (49)	711 (23130)	23.82
LTE Band13 10MHz	1RB-Low (0)	782 (23230)	23.94
LTE Band38 20MHz	1RB-Middle (50)	2610 (38150)	23.61
LTE Band41 20MHz	1RB-High (99)	2680 (41490)	23.99
	1RB-High (99)	2506 (39750)	23.97

Table I.1-5: The conducted Power for WLAN

Mode / data rate	Channel	Measured Power (dBm)
802.11b (Low power)	6	13.97
802.11b	6	18.81
802.11a	120	11.82

I.2 Measurement results

Test Band	Channel	Frequency	Test Position	Figure No./Note	Conducted Power (dBm)	Tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
GSM850	128	824.2	Right	Fig I.1	30.24	30.5	0.334	**0.35**	0.428	**0.45**	-0.05
GSM850	128	824.2	Front	Fig I.2	30.24	30.5	0.468	**0.50**	0.842	**0.89**	-0.05
GSM1900	512	1850.2	Left	Fig I.3	27.69	28	0.106	**0.11**	0.180	**0.19**	-0.04
GSM1900	661	1880	Front	Fig I.4	27.84	28	0.404	**0.42**	0.683	**0.71**	0.11
WCDMA 850	4233	846.6	Right	Fig I.5	23.75	24	0.250	**0.26**	0.323	**0.34**	0.01
WCDMA 850	4233	846.6	Rear	Fig I.6	23.75	24	0.452	**0.48**	0.649	**0.69**	-0.05
WCDMA1700	1537	1712.4	Left	Fig I.7	23.97	24	0.147	**0.15**	0.217	**0.22**	0.04
WCDMA1700	1738	1752.6	Front	Fig I.8	22.19	22.5	0.464	**0.50**	0.791	**0.85**	-0.08
WCDMA1700	1537	1712.4	Front	Fig I.9	23.97	24	0.330	**0.33**	0.536	**0.54**	-0.01
WCDMA1900	9938	1907.6	Left	Fig I.10	24.14	24.5	0.121	**0.13**	0.183	**0.20**	0.03
WCDMA1900	9662	1852.4	Front	Fig I.11	24.16	24.5	0.459	**0.50**	0.773	**0.84**	0.05
LTE Band2	19100	1900	Left	Fig I.12	23.95	24	0.097	**0.10**	0.148	**0.15**	0.02
LTE Band2	19100	1900	Rear	Fig I.13	23.95	24	0.423	**0.43**	0.710	**0.72**	-0.09
LTE Band5	20450	829	Right	Fig I.14	23.89	24	0.277	**0.28**	0.360	**0.37**	-0.15
LTE Band5	20450	829	Rear	Fig I.15	23.89	24	0.395	**0.41**	0.549	**0.56**	0.16
LTE Band7	20850	2510	Right	Fig I.16	24.41	24.5	0.165	**0.17**	0.309	**0.32**	0.09
LTE Band7	20850	2510	Bottom	Fig I.17	20.44	20.5	0.491	**0.50**	0.939	**0.95**	0.03
LTE Band7	20850	2510	Front	Fig I.18	24.41	24.5	0.286	**0.29**	0.502	**0.51**	-0.03
LTE Band12	23130	711	Right	Fig I.19	23.82	24	0.142	**0.15**	0.177	**0.18**	0.07
LTE Band12	23130	711	Rear	Fig I.20	23.82	24	0.264	**0.28**	0.375	**0.39**	-0.10
LTE Band13	23230	782	Right	Fig I.21	23.94	24	0.160	**0.16**	0.208	**0.21**	0.08
LTE Band13	23230	782	Rear	Fig I.22	23.94	24	0.222	**0.23**	0.348	**0.35**	-0.19
LTE Band38	38150	2610	Right	Fig I.23	23.61	24	0.040	**0.04**	0.078	**0.08**	0.01
LTE Band38	38150	2610	Bottom	Fig I.24	23.61	24	0.272	**0.30**	0.533	**0.58**	-0.07
LTE Band41	41490	2680	Right	Fig I.27	23.99	24	0.041	**0.04**	0.079	**0.08**	0.06
LTE Band41	39750	2506	Bottom	Fig I.28	23.97	24	0.405	**0.41**	0.777	**0.78**	-0.01
Wi-Fi 2.4G	6	2437	Left	Fig I.29	13.97	14.5	0.386	**0.44**	0.961	**1.09**	-0.11
Wi-Fi 2.4G	6	2437	Top	Fig I.30	18.81	19	0.239	**0.25**	0.493	**0.52**	-0.04
Wi-Fi 5G	120	5600	Right	Fig I.31	11.82	12	0.209	**0.22**	0.789	**0.82**	0.14
Wi-Fi 5G	120	5600	Top	Fig I.32	11.82	12	0.075	**0.08**	0.214	**0.22**	0.09

Table I.2-1: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.						
2437	6	Left	Tilt	95.48%	100%	**1.09**	**1.14**

Table I.2-2: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Top	97.39%	100%	**0.52**	**0.53**

Table I.2-3: SAR Values (WLAN - Head) – 802.11a (Scaled Reported SAR)

Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.						
5600	120	Right	Tilt	86.92%	100%	**0.82**	**0.94**

Table I.2-4: SAR Values (WLAN - Body) – 802.11a (Scaled Reported SAR)

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
5600	120	Top	86.92%	100%	**0.22**	**0.25**

I.3 Reported SAR Comparison

Exposure Configuration	Technology Band	Reported SAR 1g (W/Kg): spot check	Reported SAR 1g (W/Kg): original
Head (Separation Distance 0mm)	GSM 850	0.45	0.63
	PCS 1900	0.19	0.21
	UMTS FDD 5	0.34	0.34
	UMTS FDD 4	0.22	0.26
	UMTS FDD 2	0.20	0.15
	LTE Band 2	0.15	0.17
	LTE Band 5	0.37	0.43
	LTE Band 7	0.32	0.46
	LTE Band 12	0.18	0.15
	LTE Band 13	0.21	0.33
	LTE Band 38	0.08	0.09
	LTE Band 41	0.08	0.08
	WLAN 2.4 GHz	1.14	1.16
	WLAN 5 GHz	0.94	0.95
Hotspot (Separation Distance 10mm)	GSM 850	0.89	1.17
	PCS 1900	0.71	1.04
	UMTS FDD 5	0.69	0.78
	UMTS FDD 4	0.85	1.11
	UMTS FDD 2	0.84	1.26
	LTE Band 2	0.72	0.80
	LTE Band 5	0.56	0.68
	LTE Band 7	0.95	1.09
	LTE Band 12	0.39	0.29
	LTE Band 13	0.35	0.50
	LTE Band 38	0.58	0.70
	LTE Band 41	0.78	1.18
	WLAN 2.4 GHz	0.53	0.53
	WLAN 5 GHz	0.25	0.16
Body-worn (Separation Distance 15mm)	UMTS FDD 4	0.54	0.82
	LTE Band 7	0.51	0.65

Note: All the spot check results marked blue are larger than the original result.So it replace the original results and others are shared.

I.4 Graph Results of spotcheck

850 Right Cheek Low

Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used: f = 825 MHz; σ = 0.889 mho/m; εr = 42.02; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2.67
Probe: EX3DV4 – SN3846ConvF(9.33, 9.33, 9.33)

Area Scan (81x131x1): 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 = 5.156 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.428 W/kg; SAR(10 g) = 0.334 W/kg
Maximum value of SAR (measured) = 0.462 W/kg

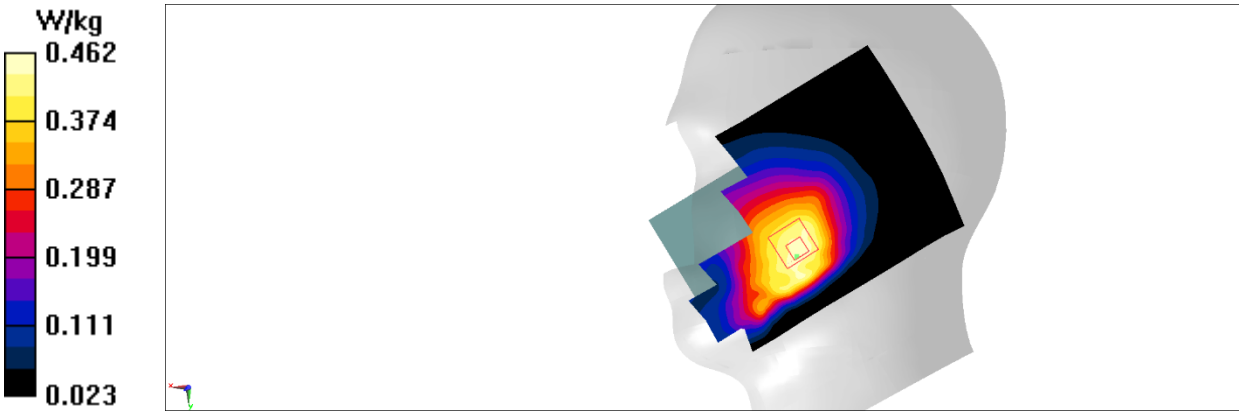


Fig I.1 850MHz

850Body FrontLow
Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used: f = 825 MHz; σ = 0.96 mho/m; εr = 56.1; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:2.67
Probe: EX3DV4 –SN3846ConvF(9.52, 9.52, 9.52)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.79 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.22 V/m; Power Drift = -0.05dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.842 W/kg; SAR(10 g) = 0.468 W/kg
Maximum value of SAR (measured) = 0.840 W/kg

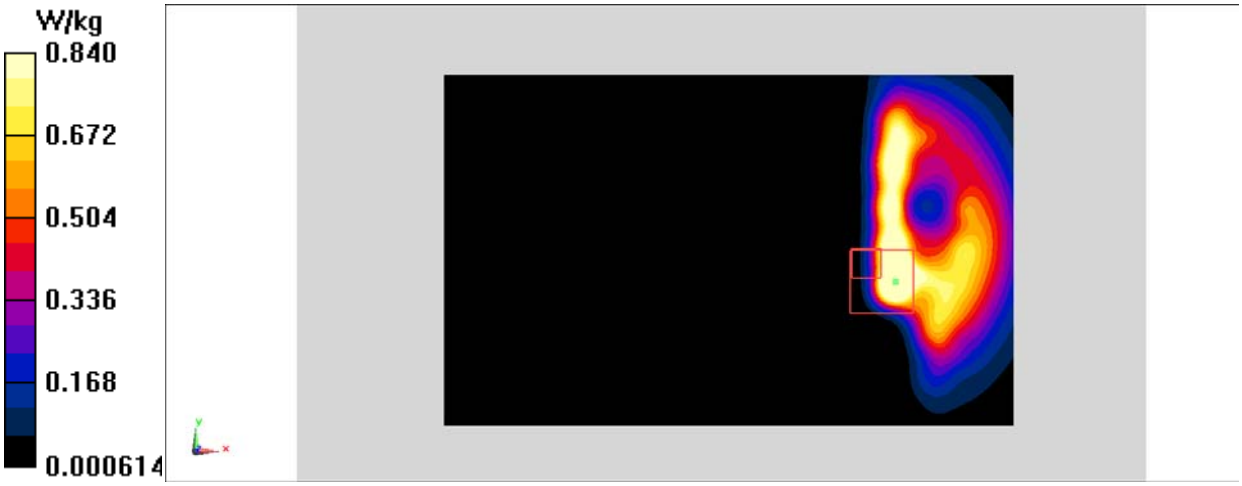


Fig I.2 850 MHz

1900 LeftCheek Low
Date: 2017-8-9
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.399 mho/m; εr = 40.66; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHzFrequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4– SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.303 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.738 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.420 W/kg
SAR(1 g) = 0.180 W/kg; SAR(10 g) = 0.106 W/kg
Maximum value of SAR (measured) = 0.185 W/kg

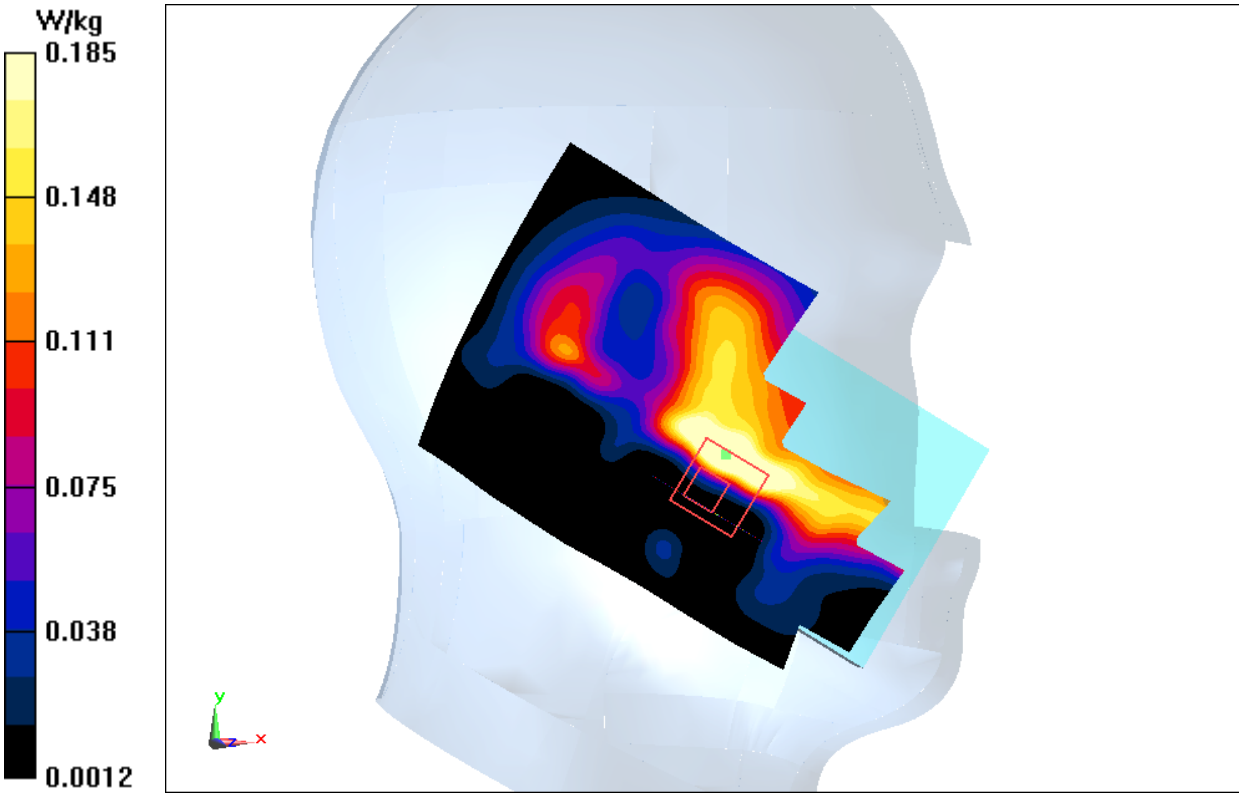


Fig I.3 1900 MHz

1900 Body FrontMiddle
Date: 2017-8-9
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ =1.545 mho/m; εr = 52.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.00 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.908 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.683 W/kg; SAR(10 g) = 0.404 W/kg
Maximum value of SAR (measured) = 0.752 W/kg

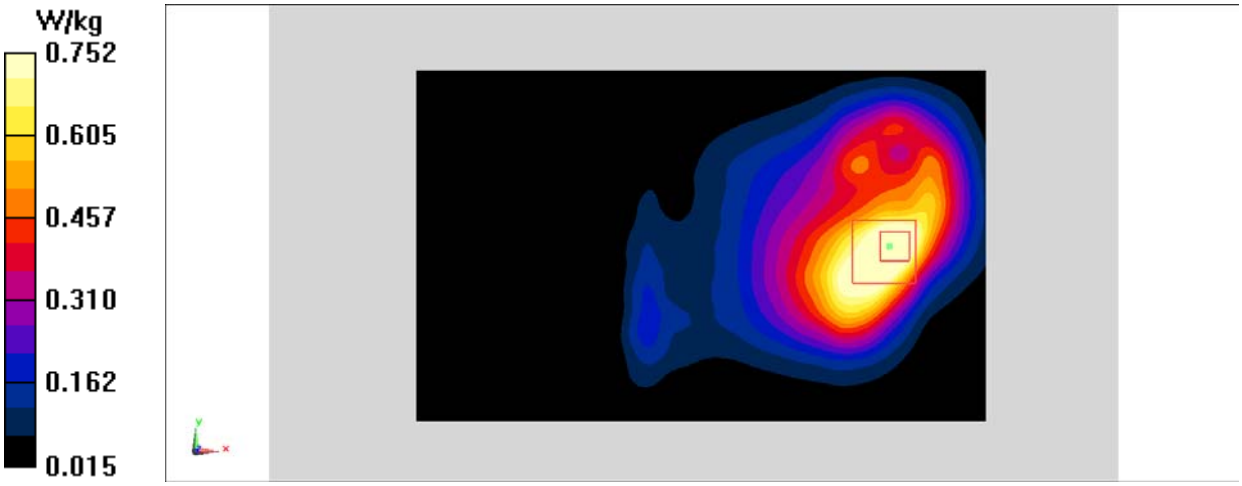


Fig I.4 1900 MHz

WCDMA 850 Right Cheek High

Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.909 mho/m; εr = 41.725; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 –SN3846 ConvF(9.33, 9.33, 9.33)

Area Scan (81x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.361 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.210 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.323 W/kg; SAR(10 g) = 0.250 W/kg.
Maximum value of SAR (measured) = 0.349 W/kg

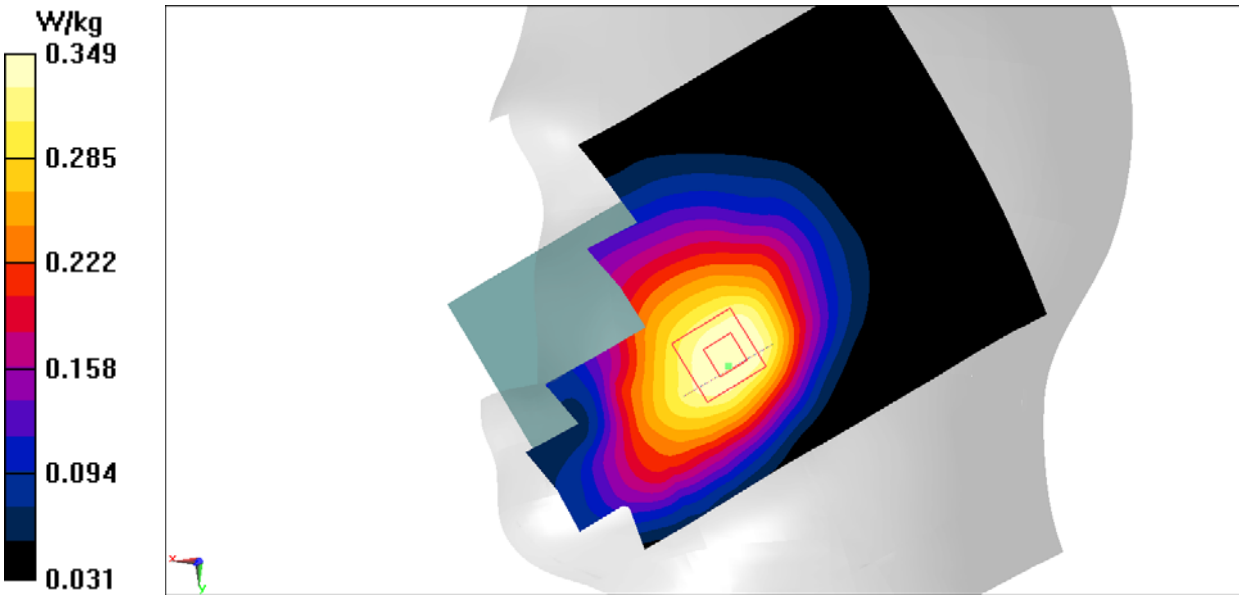


Fig I.5 WCDMA 850

WCDMA 850 Body Rear High

Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.981 mho/m; εr = 55.876; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 –SN3846ConvF(9.52, 9.52, 9.52)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.765 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.43 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.904 W/kg
SAR(1 g) = 0.649 W/kg; SAR(10 g) = 0.452 W/kg
Maximum value of SAR (measured) = 0.694 W/kg

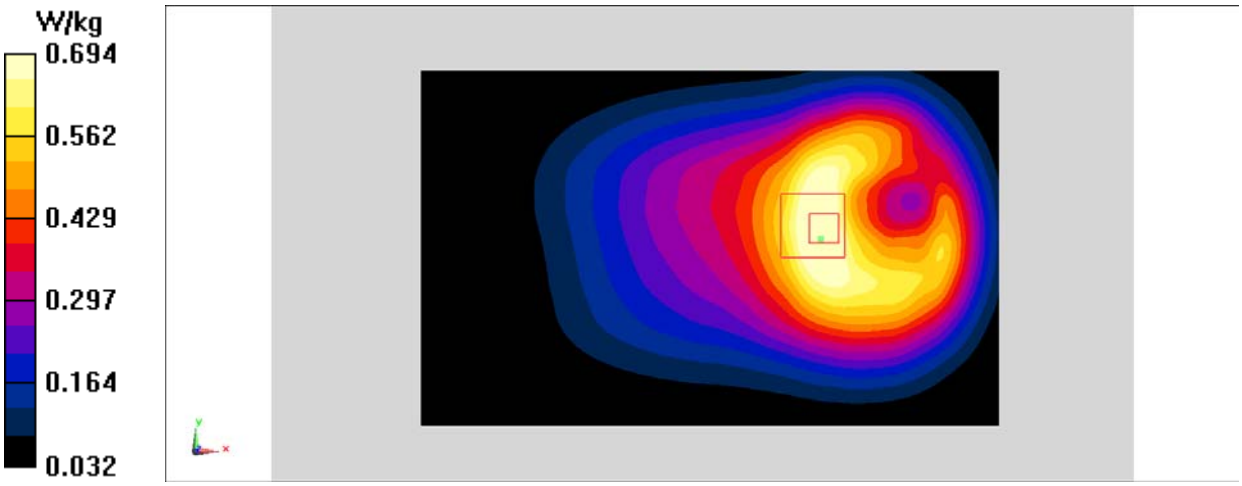


Fig I.6 WCDMA 850

WCDMA 1700Left Cheek Low

Date: 2017-8-13
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.307 mho/m; εr = 40.677; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1750 Frequency: 1712.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(8.16, 8.16, 8.16)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.265 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.339 V/m; Power Drift = 0.04dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.217 W/kg; SAR(10 g) = 0.147 W/kg
Maximum value of SAR (measured) = 0.248 W/kg

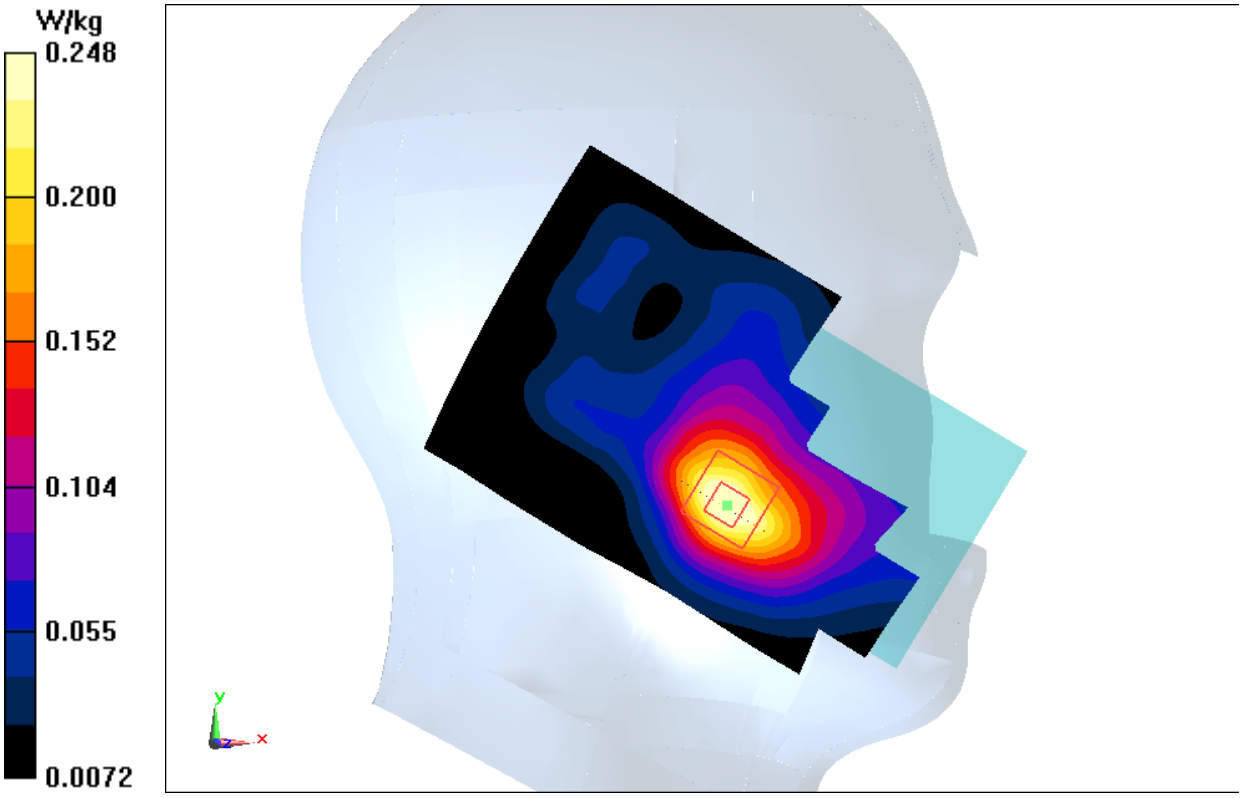


Fig I.7WCDMA1700

WCDMA 1700 Body FrontHigh – 10mm

Date: 2017-8-13
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used (interpolated): f = 1752.6 MHz; σ = 1.509 mho/m; εr = 53.718; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.90, 7.90, 7.90)

Area Scan (131x81x1): 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 = 8.691 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.791 W/kg; SAR(10 g) = 0.464 W/kg
Maximum value of SAR (measured) = 0.875 W/kg

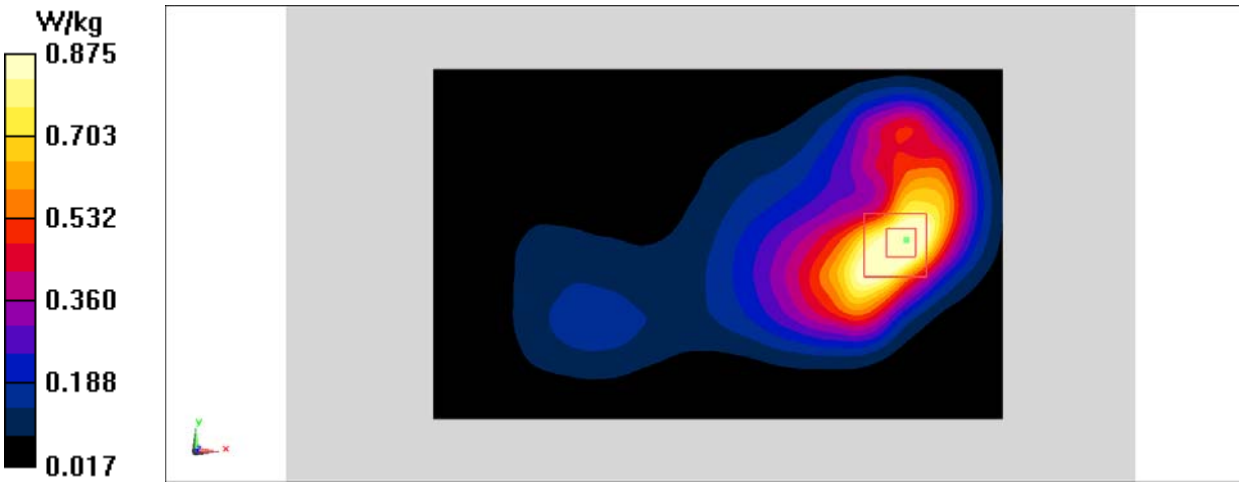


Fig I.8WCDMA1700

WCDMA 1700 Body Front Low – 15mm

Date: 2017-8-13
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.481 mho/m; εr = 53.828; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1712.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.90, 7.90, 7.90)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.663 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.806 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.821 W/kg
SAR(1 g) = 0.536 W/kg; SAR(10 g) = 0.330 W/kg
Maximum value of SAR (measured) = 0.584 W/kg

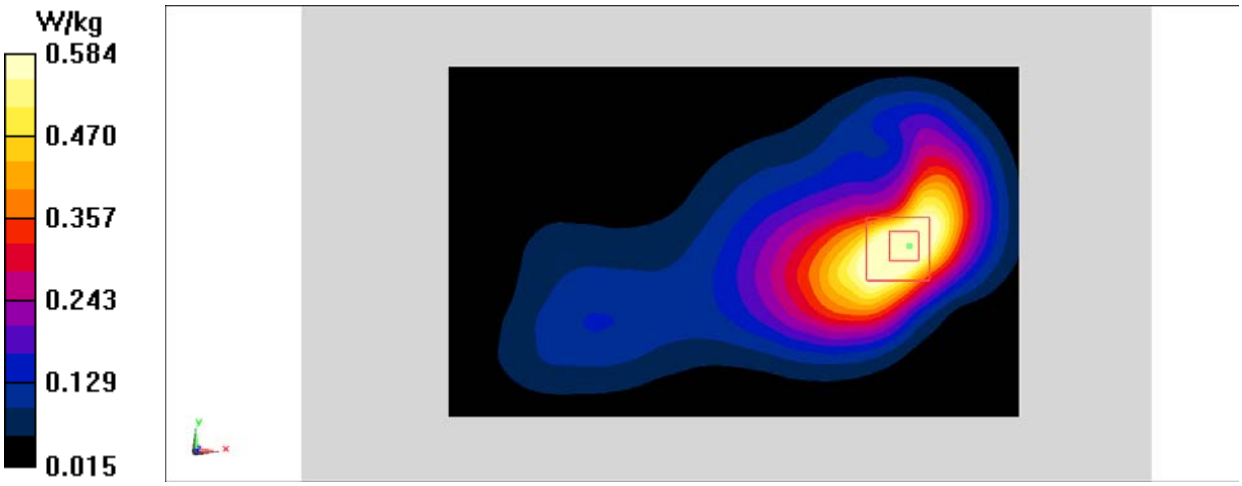


Fig I.9WCDMA1700

WCDMA 1900 Left Cheek High

Date: 2017-8-9
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.465 mho/m; εr = 40.806; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.232 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.947 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.257 W/kg
SAR(1 g) = 0.183 W/kg; SAR(10 g) = 0.121 W/kg
Maximum value of SAR (measured) = 0.210 W/kg

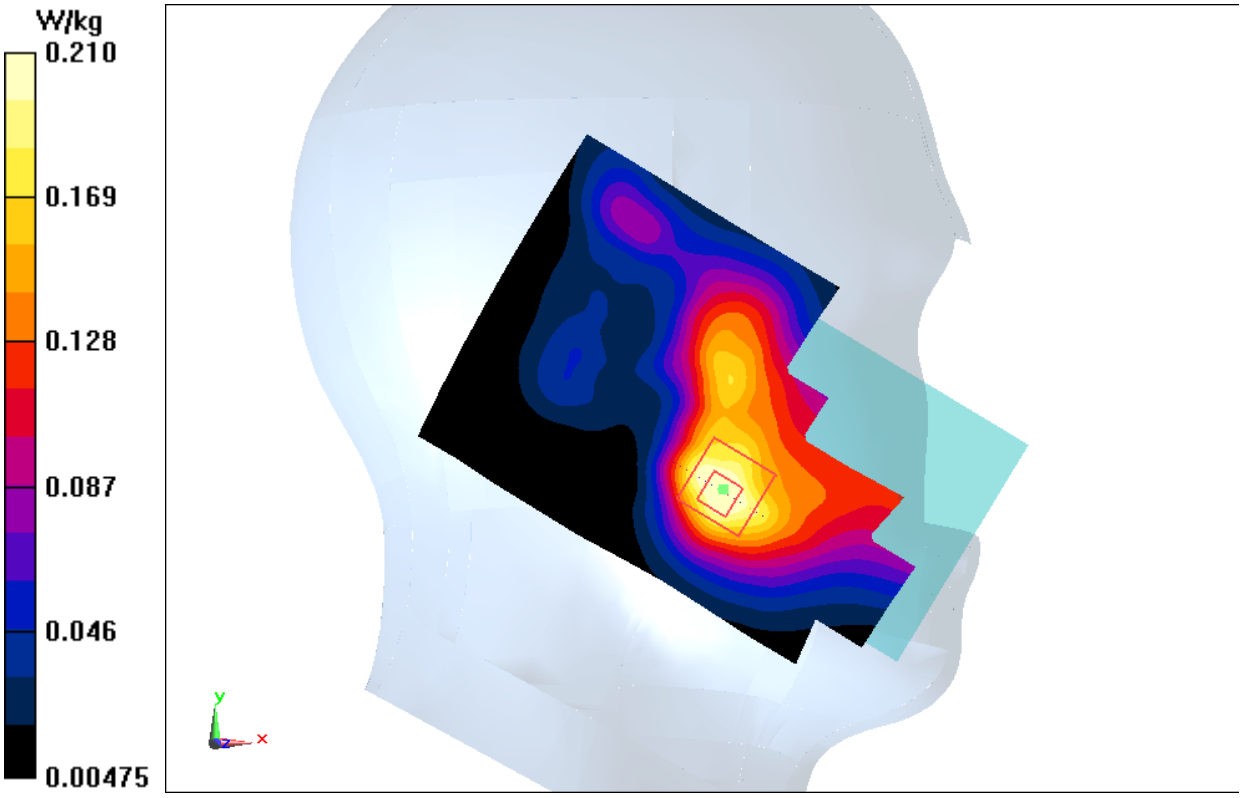


Fig I.10WCDMA1900

WCDMA 1900 Body FrontLow

Date: 2017-8-9

Electronics: DAE4 Sn1331

Medium: Body 1900 MHz

Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.501 mho/m; εr = 53.18; ρ = 1000 kg/m^3

Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C

Communication System: WCDMA 1900 Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.992 W/kg

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

Reference Value = 11.74 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.773 W/kg; SAR(10 g) = 0.459 W/kg

Maximum value of SAR (measured) = 0.858 W/kg

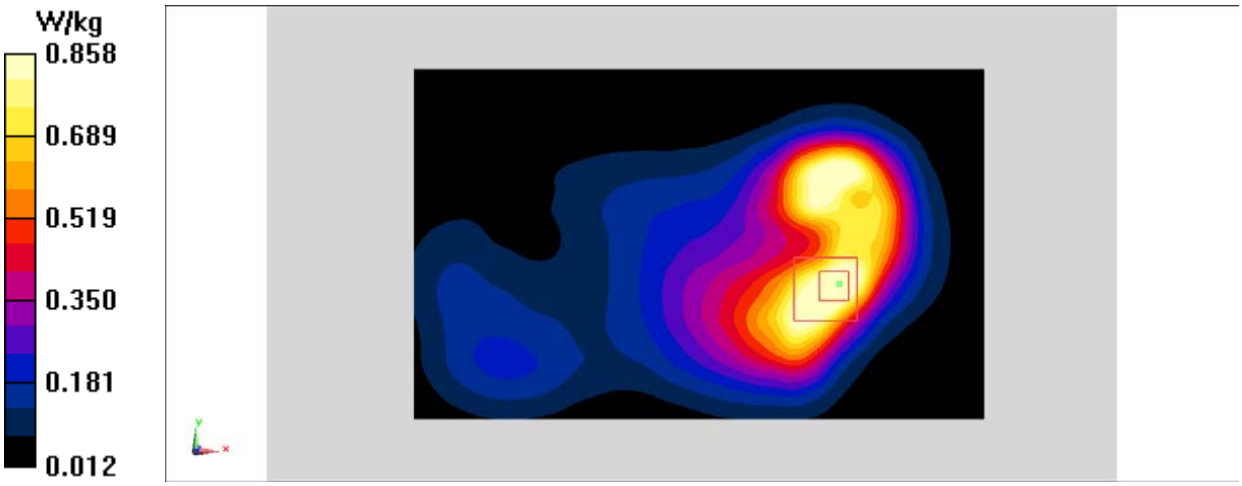


Fig I.11WCDMA1900

LTE Band2 Left Cheek High with QPSK_20M_1RB_Low
Date: 2017-8-9
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.411. mho/m; εr = 40.61; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band2 Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.186 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.380 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.097 W/kg
Maximum value of SAR (measured) = 0.169 W/kg

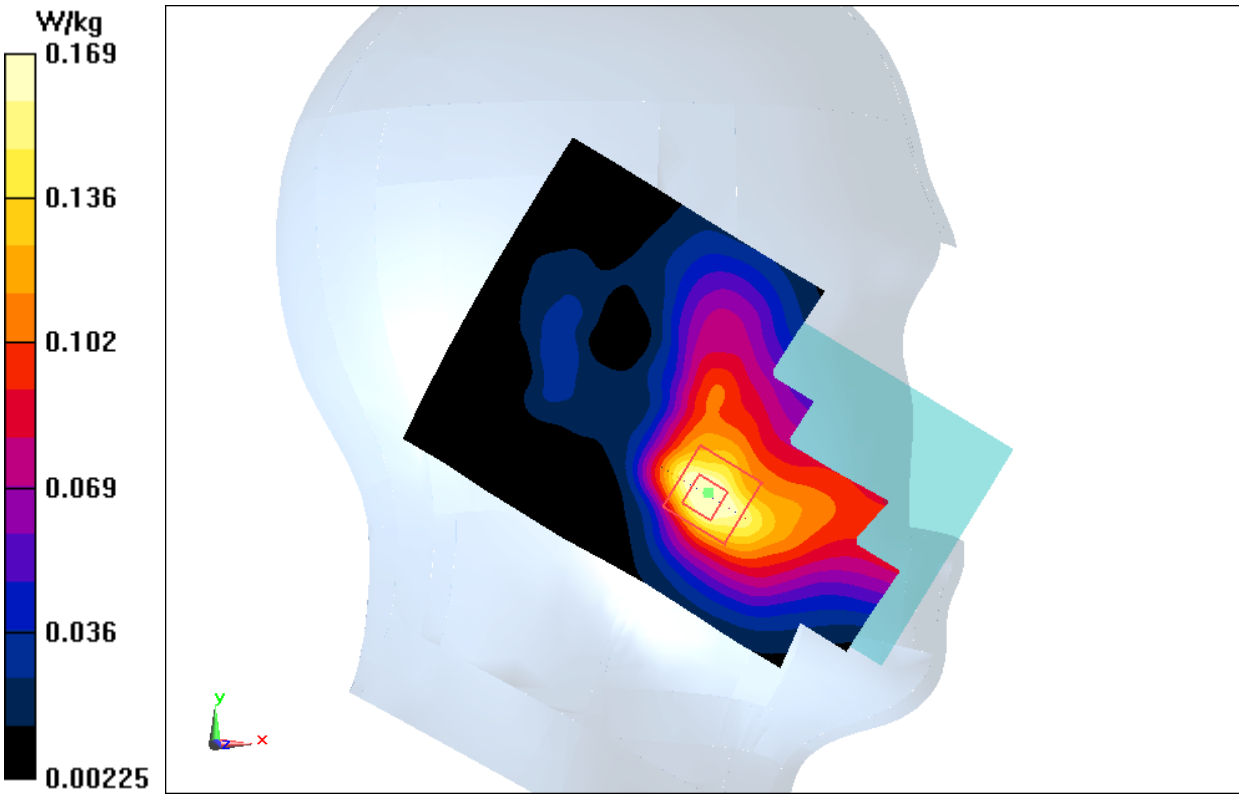


Fig I.12 LTE Band2

LTE Band2 Body Rear High with QPSK_20M_1RB_Low
Date: 2017-8-9
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.507 mho/m; εr = 52.71; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band2 Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.874 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.57 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.710 W/kg; SAR(10 g) = 0.423 W/kg
Maximum value of SAR (measured) = 0.780 W/kg

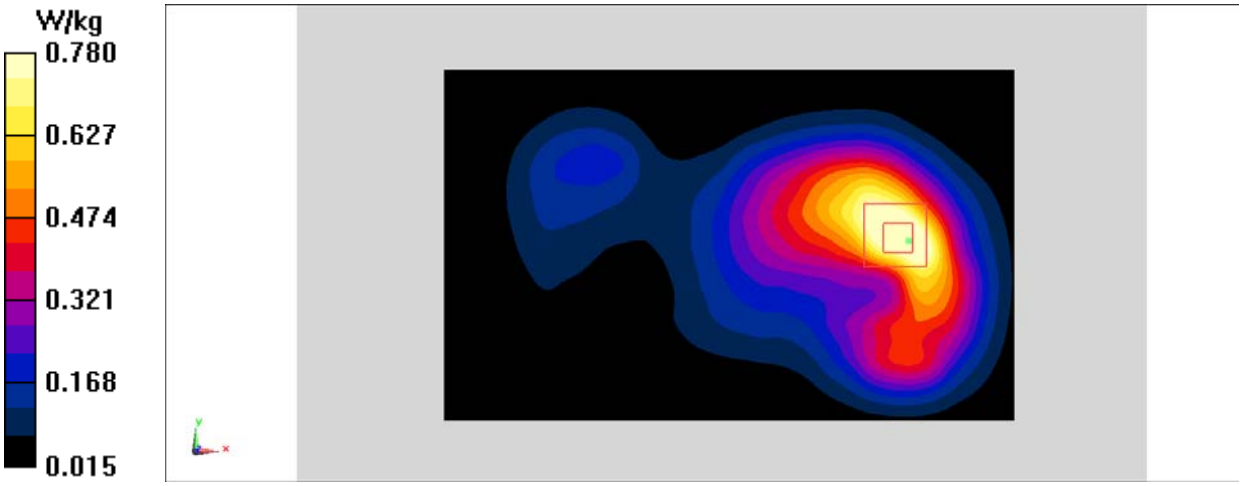


Fig I.13 LTE Band2

LTE Band5 RightCheek Low with QPSK_10M_1RB_High

Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 829 MHz; σ = 0.904 mho/m; εr = 41.851; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band5 Frequency: 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(9.33, 9.33, 9.33)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.403 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.376 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.454 W/kg
SAR(1 g) = 0.360 W/kg; SAR(10 g) = 0.277 W/kg
Maximum value of SAR (measured) = 0.393 W/kg

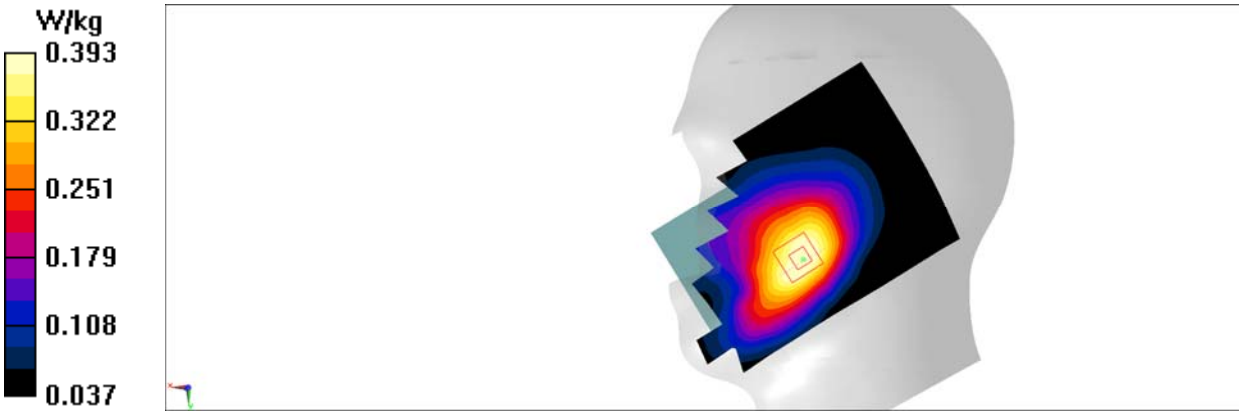


Fig l.14 LTE Band5

LTE Band5 Body RearLow with QPSK_10M_1RB_High
Date: 2017-8-8
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 829 MHz; σ = 1.003 mho/m; εr = 55.694; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band5 Frequency: 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3846 ConvF(9.52, 9.52, 9.52)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.674 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.29 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.730 W/kg
SAR(1 g) = 0.549 W/kg; SAR(10 g) = 0.395 W/kg
Maximum value of SAR (measured) = 0.593 W/kg

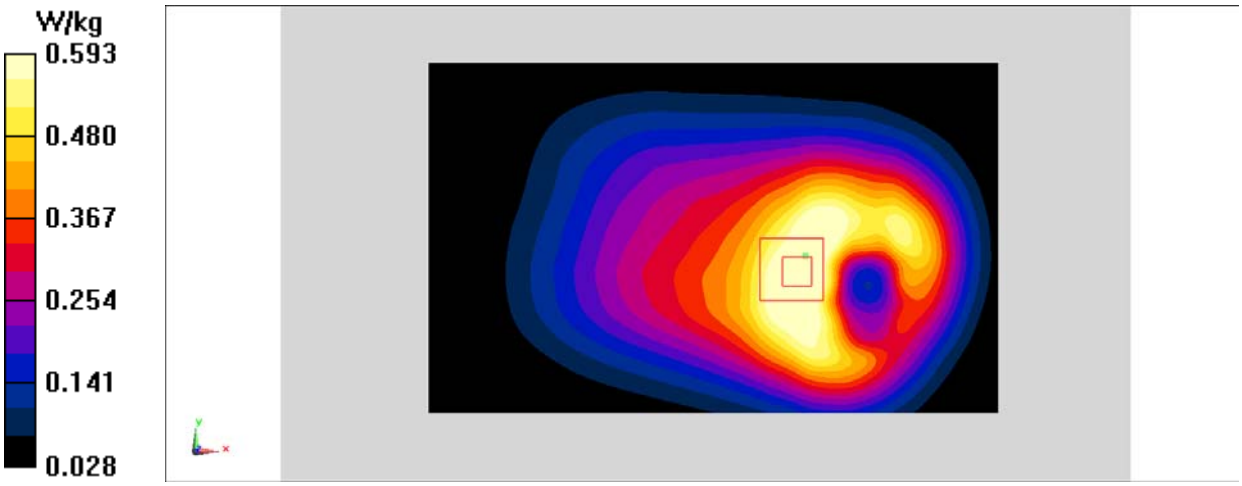


Fig l.15 LTE Band5

LTE Band7 Right Cheek Low with QPSK_20M_1RB_Low
Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Head2600 MHz
Medium parameters used: f = 2510 MHz; σ = 1.925mho/m; εr = 38.52; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band7Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.12, 7.12, 7.12)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.383 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.275 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.542 W/kg
SAR(1 g) = 0.309 W/kg; SAR(10 g) = 0.165 W/kg
Maximum value of SAR (measured) = 0.385 W/kg

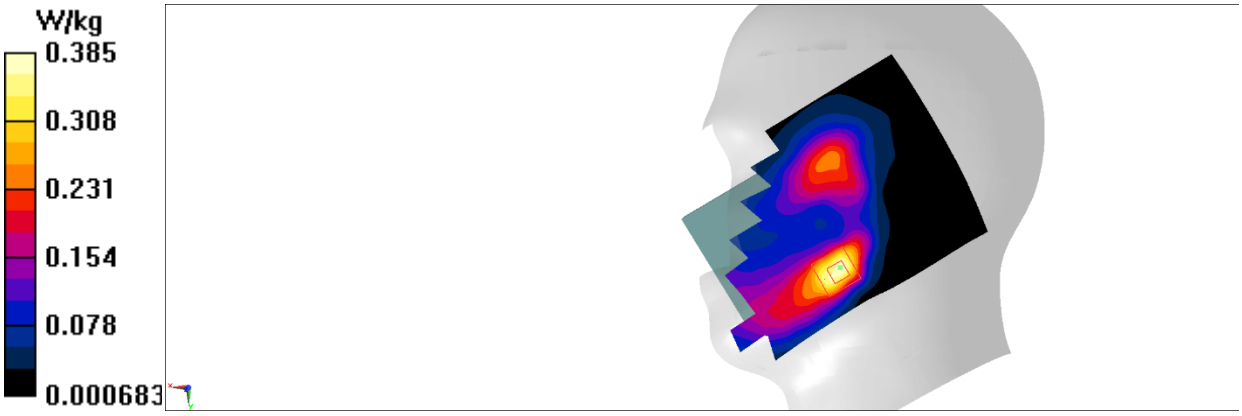


Fig I.16 LTE Band7

LTE Band7Body Bottom Low with QPSK_20M_100RB – 10mm
Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used: f = 2510 MHz; σ = 2.095 mho/m; εr = 51.85; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.13 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.05 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.939 W/kg; SAR(10 g) = 0.491 W/kg
Maximum value of SAR (measured) = 1.19 W/kg

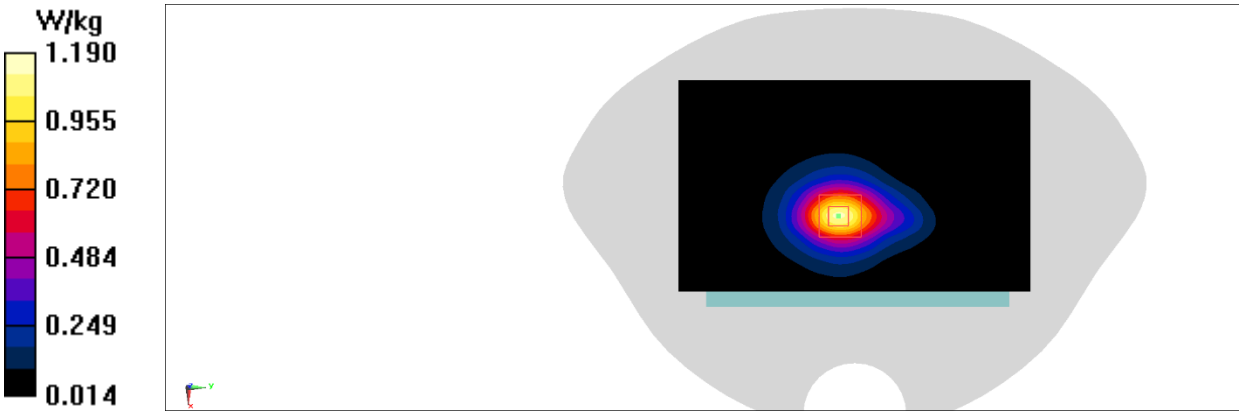


Fig I.17 LTE Band7

LTE Band7Body FrontLow with QPSK_20M_1RB_Low – 15mm
Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used: f = 2510 MHz; σ = 2.095 mho/m; εr = 51.85; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.692 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.548 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.502 W/kg; SAR(10 g) = 0.286 W/kg
Maximum value of SAR (measured) = 0.541 W/kg

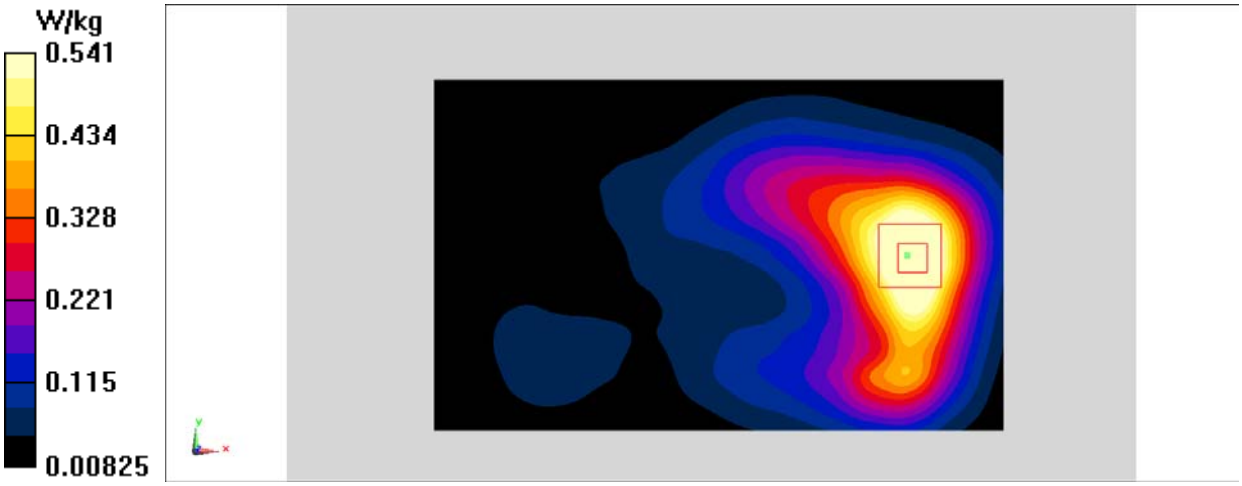


Fig I.18 LTE Band7

LTE Band12 Right Cheek High with QPSK_10M_1RB_HIgh

Date: 2017-8-10
Electronics: DAE4 Sn1331
Medium: Head750 MHz
Medium parameters used (interpolated): f = 711 MHz; σ = 0.861 mho/m; εr = 42.25; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band12Frequency: 711 MHz Duty Cycle: 1:1
Probe: EX3DV4–SN3846 ConvF(10.47,10.47, 10.47)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.230 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.921 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.177 W/kg; SAR(10 g) = 0.142 W/kg
Maximum value of SAR (measured) = 0.191 W/kg

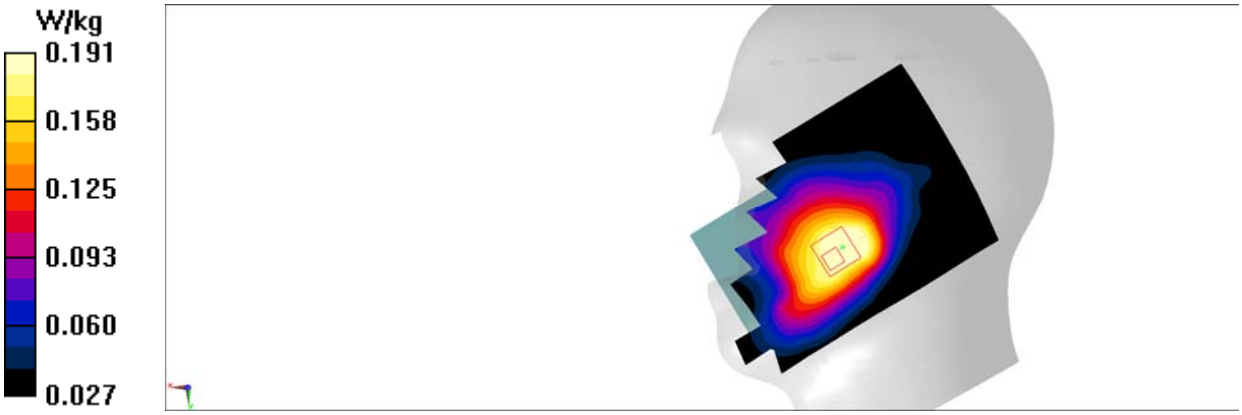


Fig I.19 LTE Band12

LTE Band12 Body Rear High with QPSK_10M_1RB_High

Date: 2017-8-10
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used (interpolated): f = 711 MHz; σ = 0.933 mho/m; εr = 56.45; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band12Frequency: 711 MHz Duty Cycle: 1:1
Probe: EX3DV4–SN3846 ConvF(9.96, 9.96, 9.96)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.421 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.47 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.677 W/kg
SAR(1 g) = 0.375 W/kg; SAR(10 g) = 0.264 W/kg
Maximum value of SAR (measured) = 0.469 W/kg

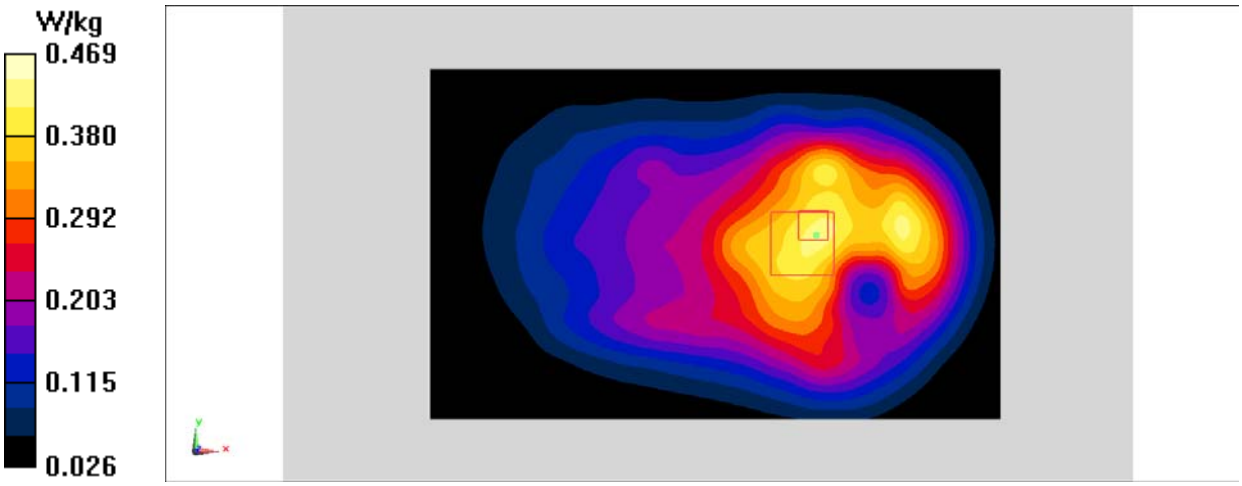


Fig I.20 LTE Band12

LTE Band13Right Cheek with QPSK_10M_1RB_Low
Date: 2017-8-10
Electronics: DAE4 Sn1331
Medium: Head750 MHz
Medium parameters used (interpolated): f = 782 MHz; σ = 0.899 mho/m; εr = 42.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band13Frequency: 782 MHz Duty Cycle: 1:1
Probe: EX3DV4–SN3846 ConvF(9.65, 9.65, 9.65)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.221 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.216 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.296 W/kg
SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.248 W/kg

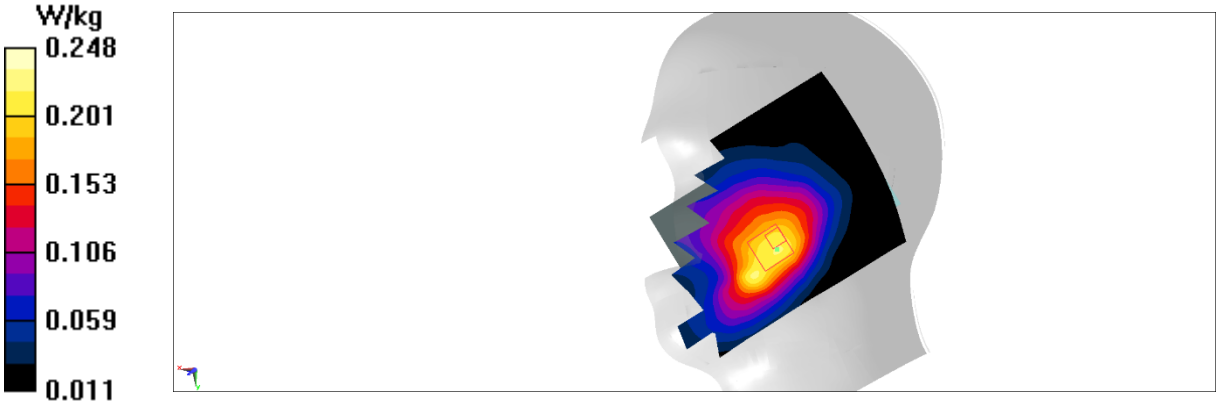


Fig I.21 LTE Band13

LTE Band13 Body Rear with QPSK_10M_1RB_Low
Date: 2017-8-10
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used (interpolated): f = 782 MHz; σ = 0.96 mho/m; εr = 56.36; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band13Frequency: 782 MHz Duty Cycle: 1:1
Probe: EX3DV4–SN3846 ConvF(9.96, 9.96, 9.96)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.505 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.86 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.554 W/kg
SAR(1 g) = 0.348 W/kg; SAR(10 g) = 0.222 W/kg
Maximum value of SAR (measured) = 0.405 W/kg

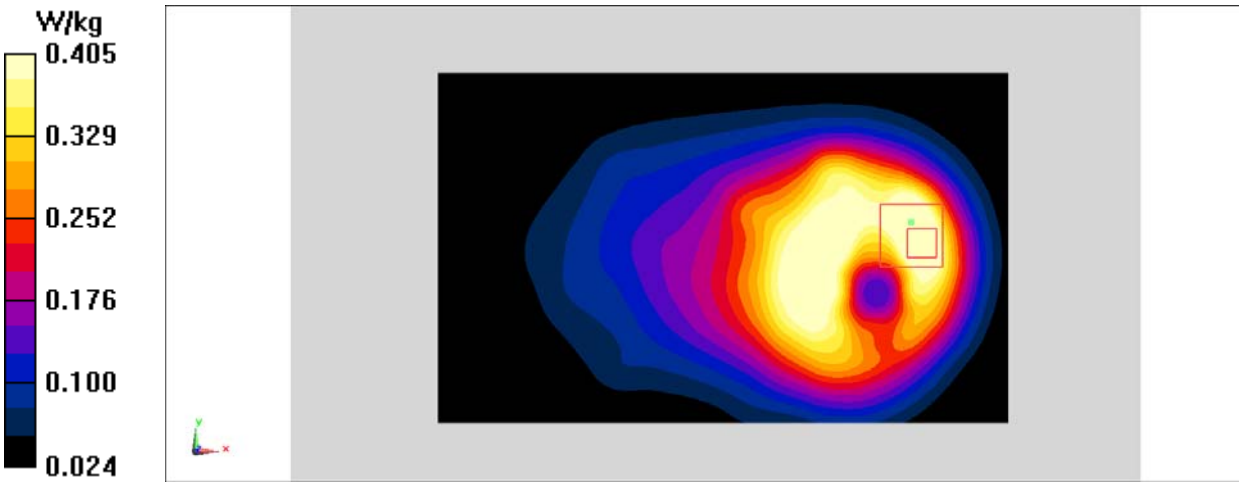


Fig I.22 LTE Band13

LTE Band38 Right Cheek High with QPSK_20M_1RB_Middle

Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2610 MHz; σ = 1.962 mho/m; εr = 38.41; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band38 Frequency: 2610 MHz Duty Cycle: 1:1.58
Probe: EX3DV4– SN3846 ConvF(7.12, 7.12,7.12)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0935 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.254 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.143 W/kg
SAR(1 g) = 0.078 W/kg; SAR(10 g) = 0.040 W/kg
Maximum value of SAR (measured) = 0.0974 W/kg

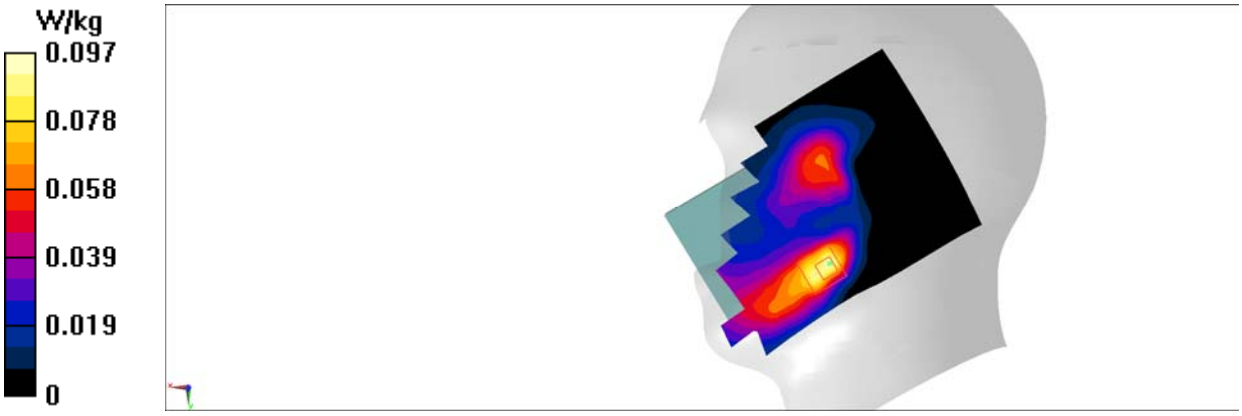


Fig I.23 LTE Band38

LTE Band38 Body Bottom High with QPSK_20M_1RB_Middle

Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2610 MHz; σ = 2.161 mho/m; εr = 51.663; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band38 Frequency: 2610 MHz Duty Cycle: 1:1.58
Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.735 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.52 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.533 W/kg; SAR(10 g) = 0.272 W/kg
Maximum value of SAR (measured) = 0.590 W/kg

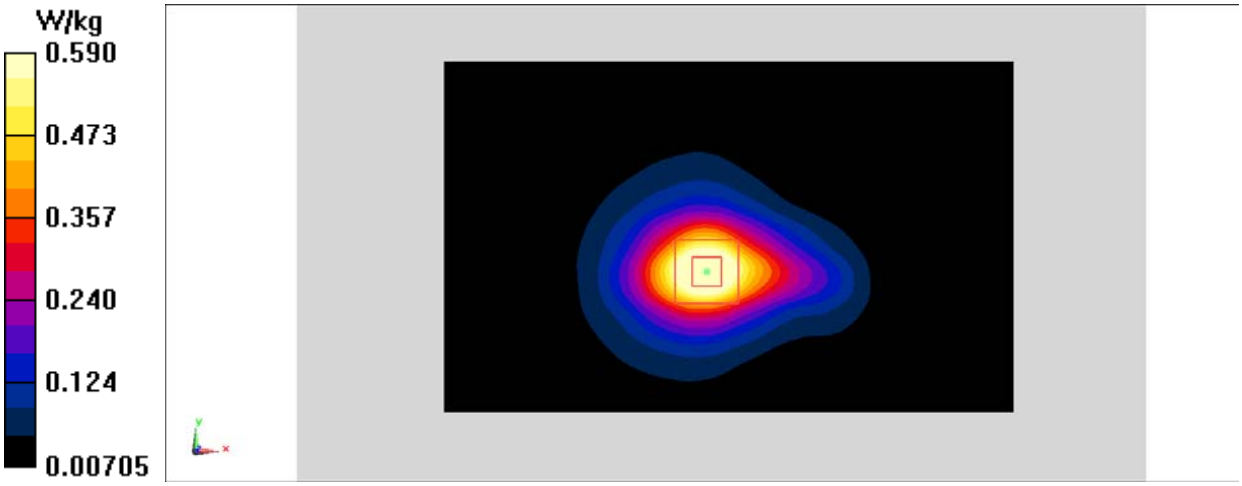


Fig I.24 LTE Band38

LTE Band 41Right Cheek High with QPSK_20M_1RB_High
Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Head2600 MHz
Medium parameters used: f = 2680 MHz; σ = 2.029 mho/m; εr = 38.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band41Frequency: 2680 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN3846 ConvF(7.12, 7.12,7.12)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0903 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.241 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.146 W/kg
SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.041 W/kg
Maximum value of SAR (measured) = 0.101 W/kg

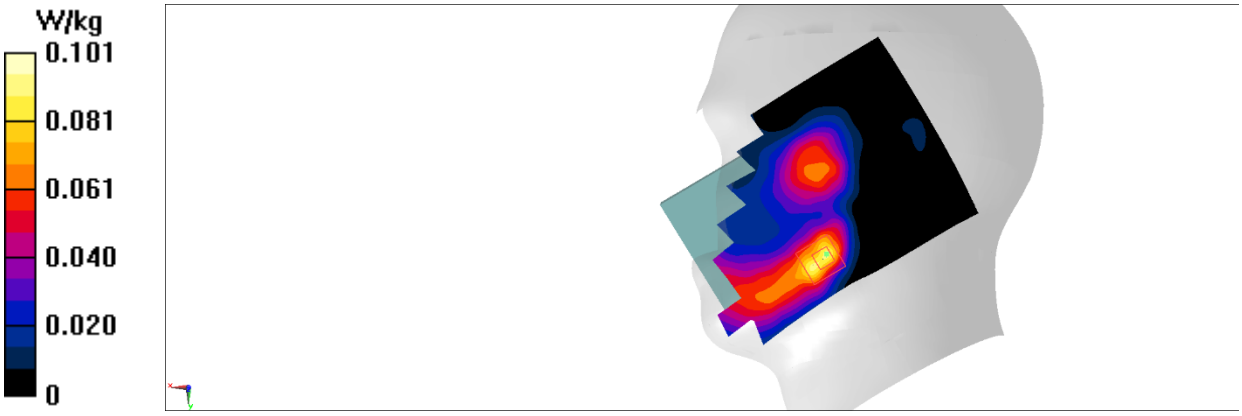


Fig I.27 LTE Band 41

LTE Band 41Body Bottom Low with QPSK_20M_1RB_High
Date: 2017-8-12
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters use (interpolated): f = 2506 MHz; σ = 2.013 mho/m; εr = 52.139; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: LTE Band41 Frequency: 2506 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.02 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.45 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.777 W/kg; SAR(10 g) = 0.405 W/kg
Maximum value of SAR (measured) = 0.869 W/kg

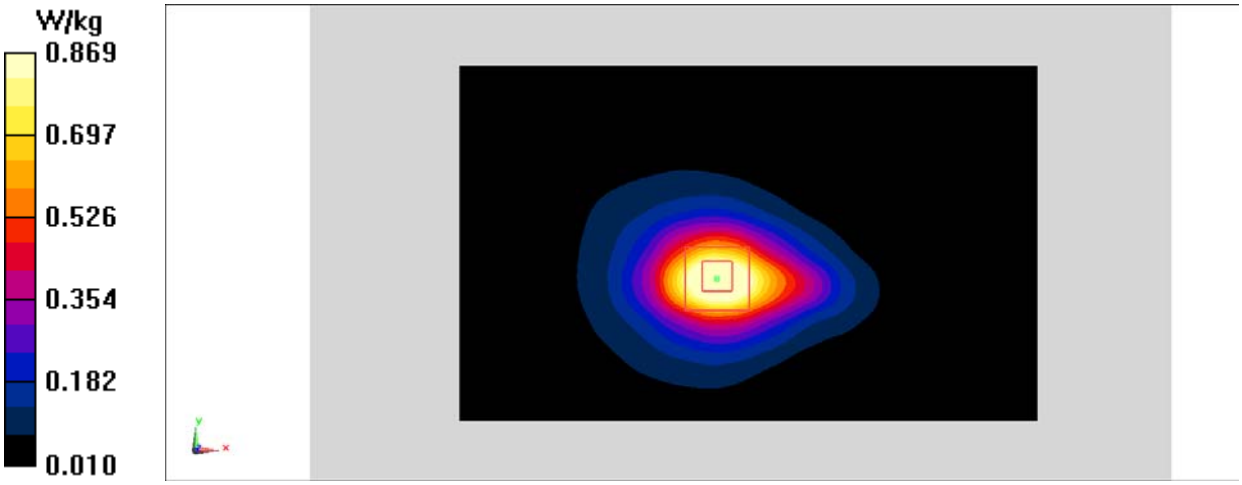


Fig I.28 LTE Band 41

Wifi 802.11b LeftTiltChannel 6
Date: 2017-8-14
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.799 mho/m; ε_r = 38.97; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.22, 7.22, 7.22)

Area Scan (91x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.24 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.71 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 0.961 W/kg; SAR(10 g) = 0.386 W/kg
Maximum value of SAR (measured) = 1.35 W/kg

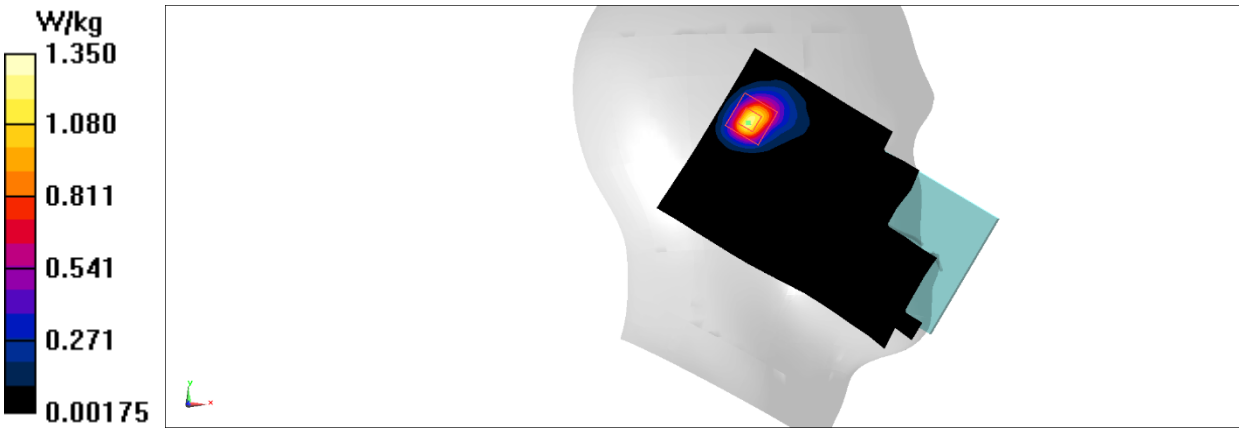


Fig I.29 2450 MHz

Wifi 802.11b Body TopChannel 6
Date: 2017-8-14
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.966 mho/m; ε_r = 52.12; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN3846 ConvF(7.31, 7.31, 7.31)

Area Scan (131x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.713 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.83 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.963 W/kg
SAR(1 g) = 0.493 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.584 W/kg

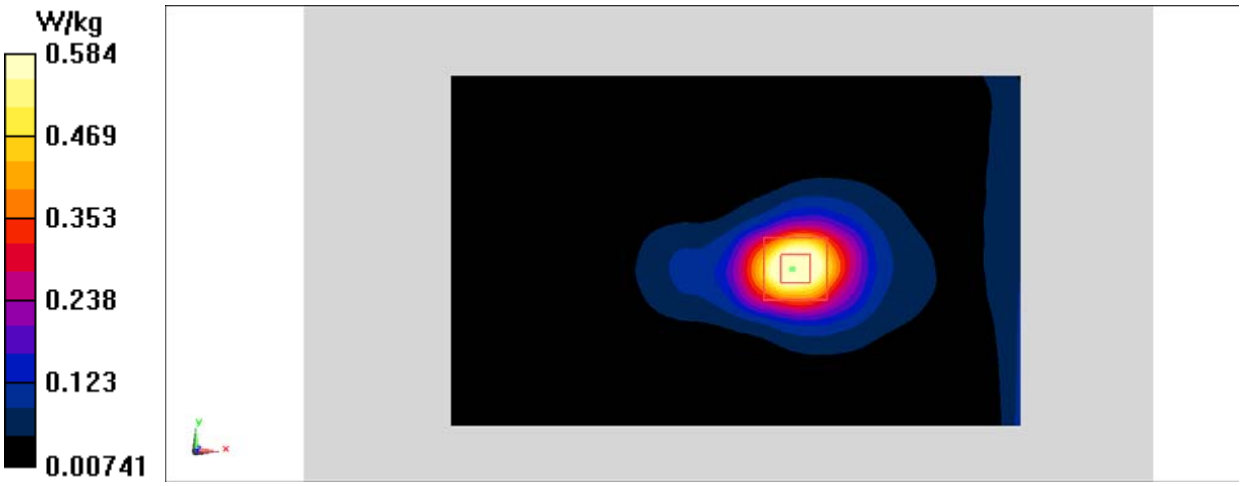


Fig I.30 2450 MHz

Wifi 802.11aRightTiltChannel 120
Date: 2017-8-15
Electronics: DAE4 Sn1331
Medium: Head 5 GHz
Medium parameters used: f = 5600 MHz; σ = 5.06 mho/m; ε_r = 35.297; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WLan 5G Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.72, 4.72, 4.72)

Area Scan (111x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 9.003 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 0.789 W/kg; SAR(10 g) = 0.209 W/kg
Maximum value of SAR (measured) = 2.10 W/kg

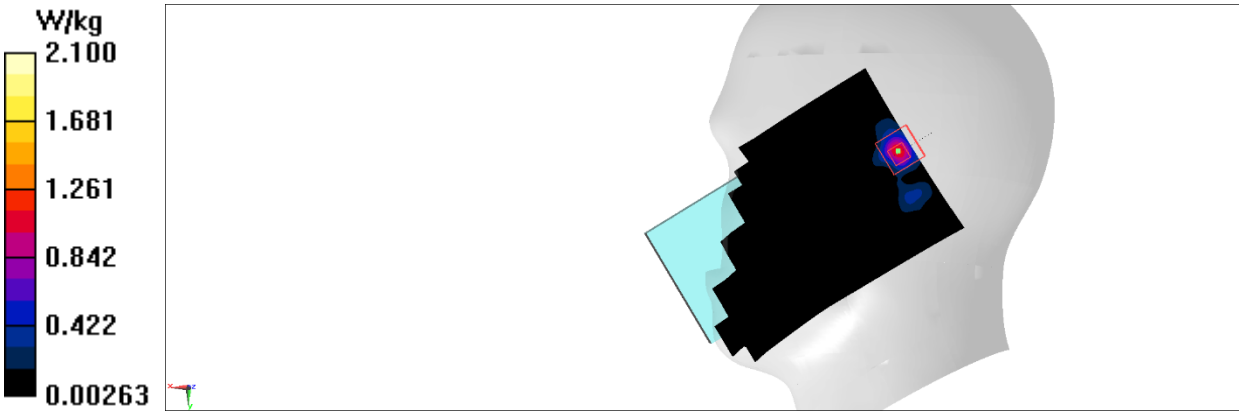


Fig I.315GHz

Wifi 802.11aTopChannel 120
Date: 2017-8-15
Electronics: DAE4 Sn1331
Medium: Body5 GHz
Medium parameters used: f = 5600 MHz; σ = 5.709 mho/m; ε_r = 46.843; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: WLan 5G Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4–SN3846 ConvF(4.18, 4.18, 4.18)

Area Scan (181x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.412 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 5.273 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.815 W/kg
SAR(1 g) = 0.214 W/kg; SAR(10 g) = 0.075 W/kg
Maximum value of SAR (measured) = 0.505 W/kg

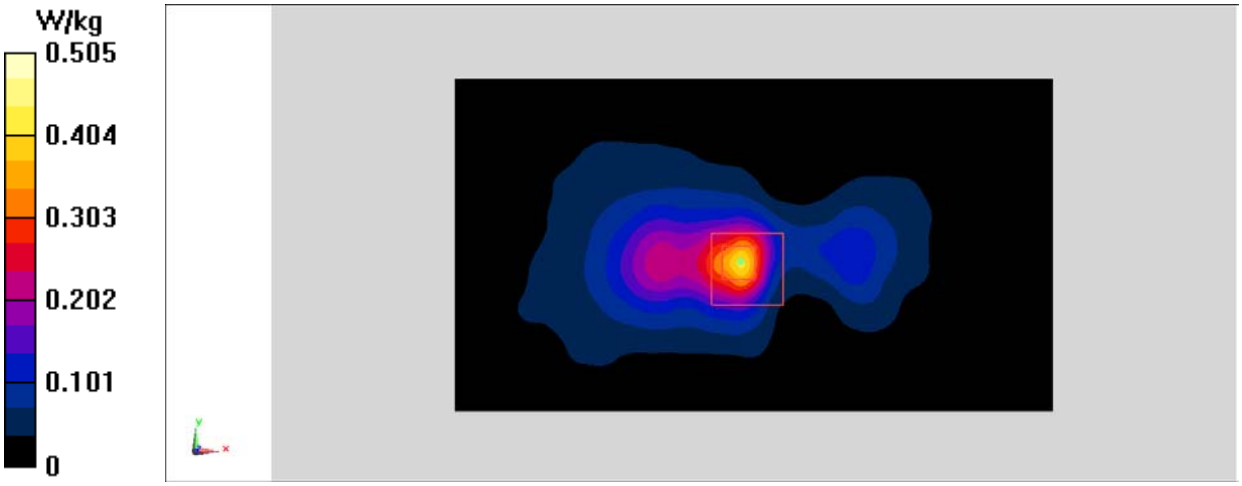


Fig I.325GHz

ANNEX JAccreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2016-09-29 through 2017-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program