Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω + 9.2 jΩ
Return Loss	- 20.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω + 8.6 jΩ
Return Loss	- 20.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.152 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 16, 2002

Date: 28.09.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz ; Type: D2450V2; Serial: D2450V2 - SN: 722

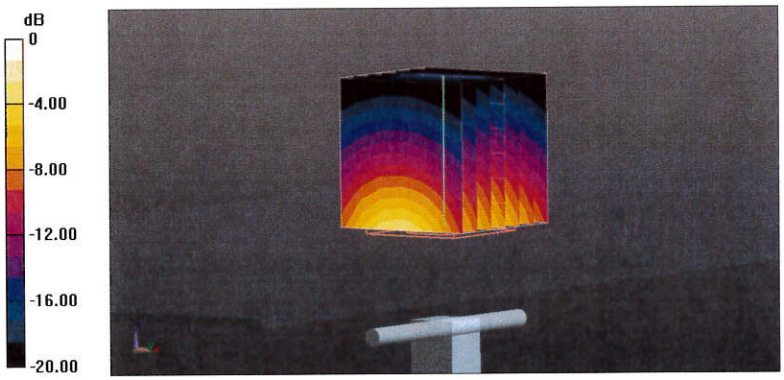
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.67, 7.67, 7.67); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

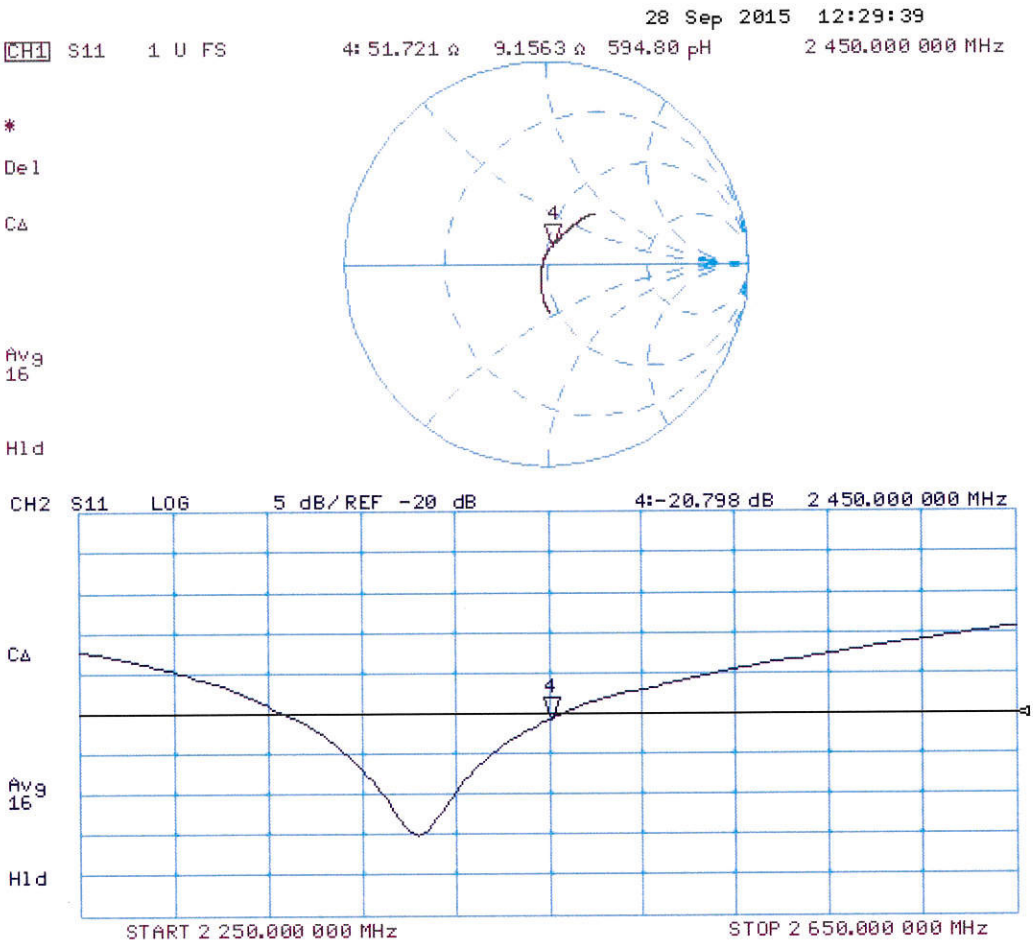
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 111.4 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.9 W/kg
Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.1 W/kg = 13.24 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 28.09.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz ; Type: D2450V2; Serial: D2450V2 - SN: 722

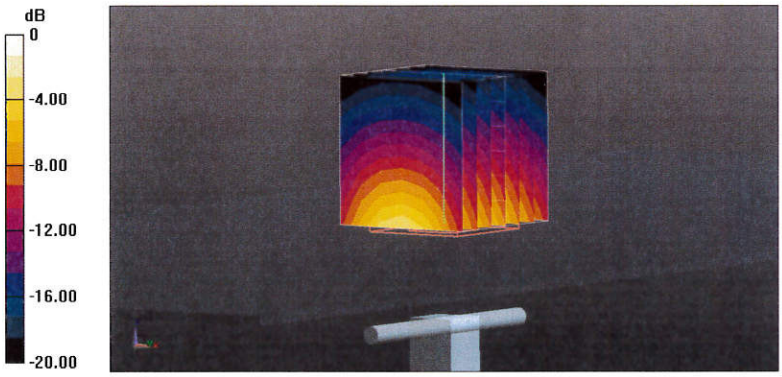
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2 S/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.53, 7.53, 7.53); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

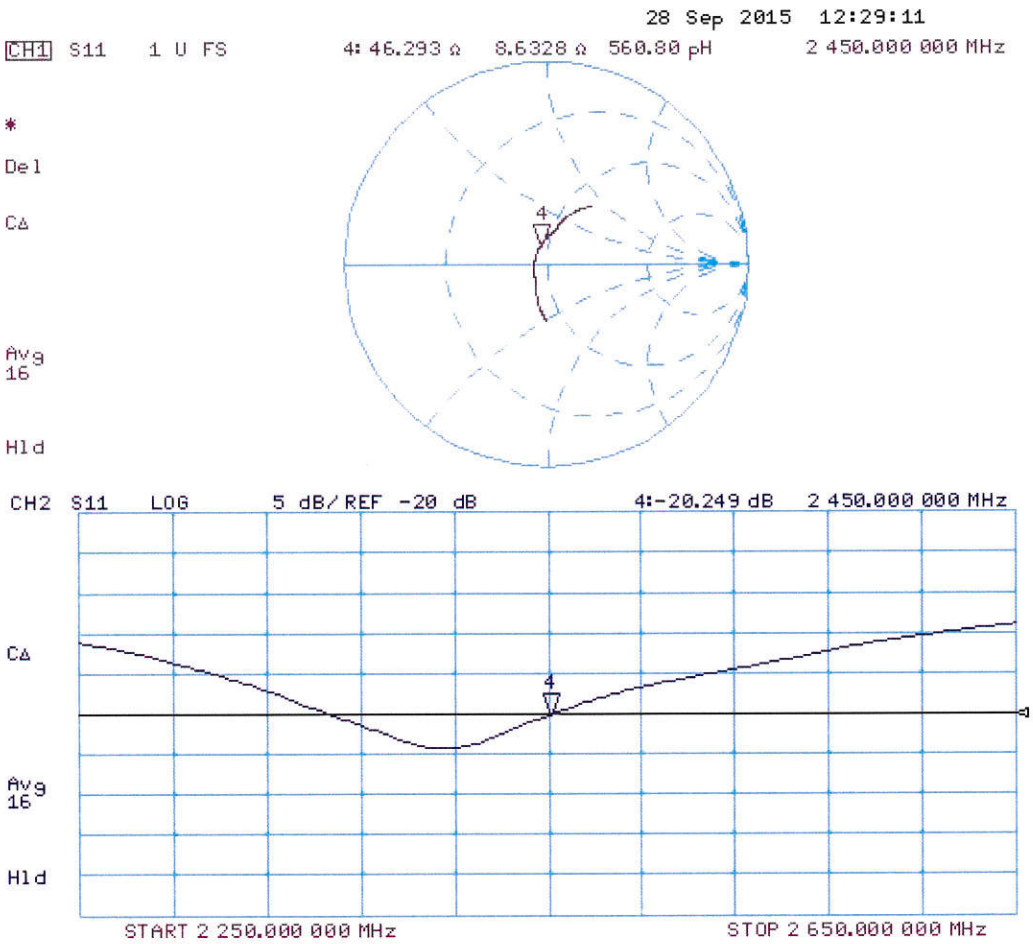
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.8 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 24.7 W/kg
SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.88 W/kg
Maximum value of SAR (measured) = 20.5 W/kg



0 dB = 20.5 W/kg = 13.12 dBW/kg

Impedance Measurement Plot for Body TSL



ANNEX B System Validation Reports

Test Laboratory: Eurofins Product Service GmbH

System Performance Check - ELI Phantom - EX3DV6 - MSL - 2450 MHz 26_10_2015

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1090

Communication System: UID 0 - n/a, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Muscle 2450 MHz Medium parameters used (interpolated): f = 2450 MHz; σ = 1.966 S/m; ε_r = 50.141; ρ = 1000 kg/m^3
Phantom section: Flat Section

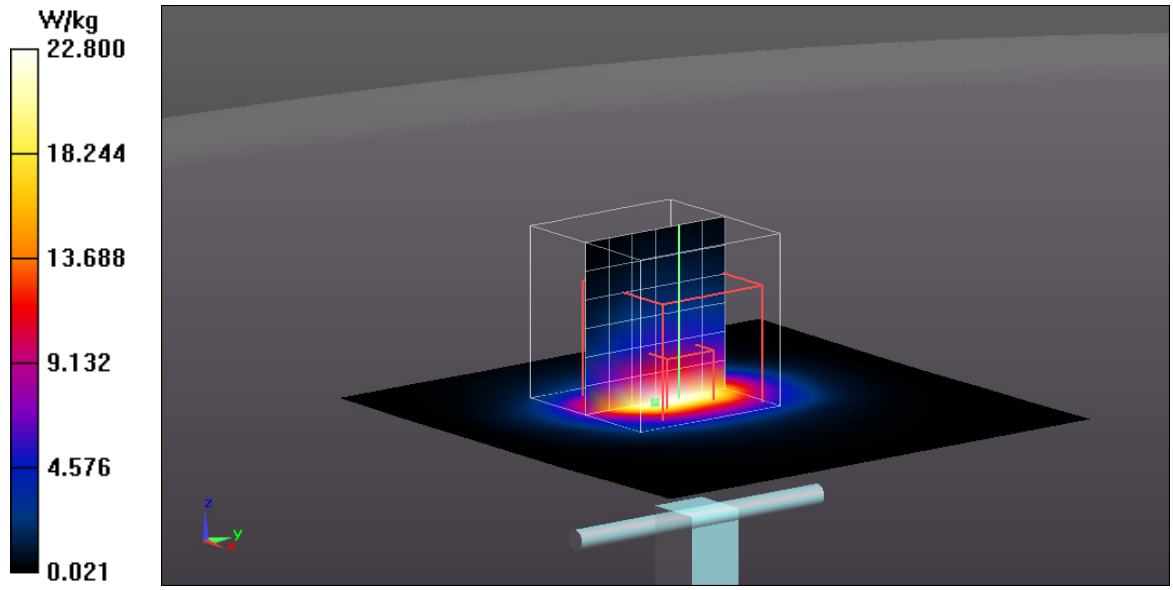
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Probe: EX3DV4 - SN3893 (add ConvF); ConvF(7.6, 7.6, 7.6); Calibrated: 10/22/2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn522; Calibrated: 9/24/2015
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1013
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.9 (7117)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=1.4mm (EX-Probe)/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 22.8 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=1.4mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.331 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (measured) = 23.0 W/kg



ANNEX C SAR Measurement Reports

Test Laboratory: Eurofins Product Service GmbH

Bluetooth - Ch. 39 - DH5 - BACK - 0mm

DUT: Assistant control panel with Bluetooth interface; Type: ACS-AP-W; Serial: -

Communication System: UID 0 - n/a, BT 2.4GHz DH5; Frequency: 2441 MHz;Duty Cycle: 1:1.38388
Medium: Muscle 2450 MHz Medium parameters used (interpolated): f = 2441 MHz; σ = 1.952 S/m; ε_r = 50.171; ρ = 1000 kg/m^3
Phantom section: Flat Section

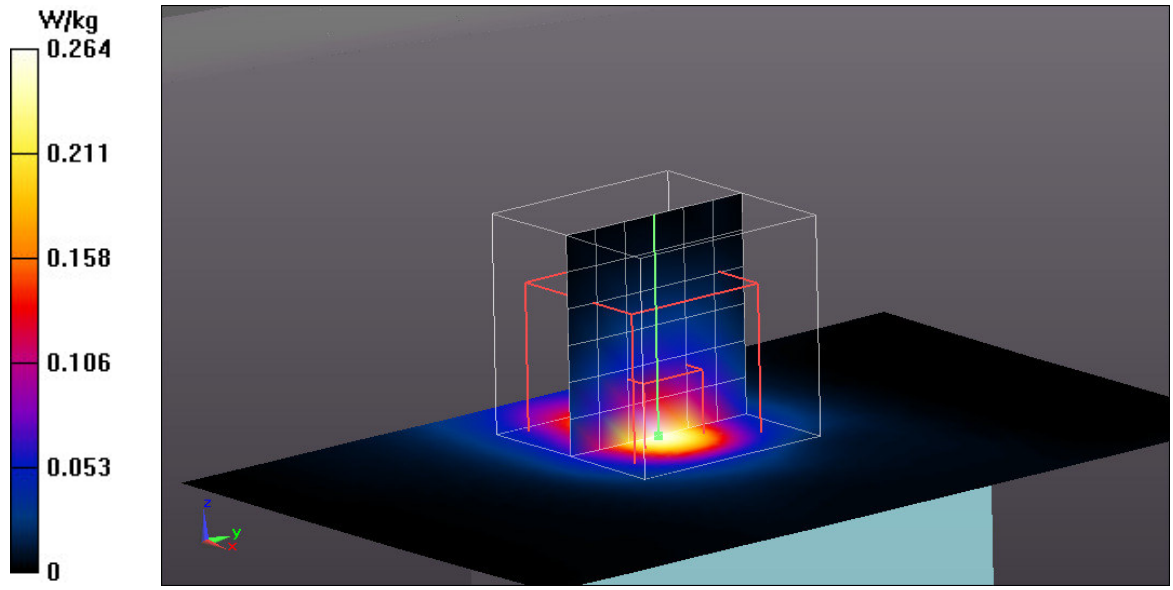
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Probe: EX3DV4 - SN3893 (add ConvF); ConvF(7.6, 7.6, 7.6); Calibrated: 10/22/2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn522; Calibrated: 9/24/2015
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1013
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.9 (7117)

Configuration/Flat Back 0mm/Area Scan (81x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.264 W/kg

Configuration/Flat Back 0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.797 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.312 W/kg
SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.063 W/kg
Maximum value of SAR (measured) = 0.245 W/kg



Test Laboratory: Eurofins Product Service GmbH

Bluetooth Low Energy - Ch. 0 - BACK - 0mm

DUT: Assistant control panel with Bluetooth interface; Type: ACS-AP-W; Serial: -

Communication System: UID 0 - n/a, Bluetooth Low Energy; Frequency: 2402 MHz;Duty Cycle: 1:3.54813
Medium: Muscle 2450 MHz Medium parameters used (interpolated): f = 2402 MHz; σ = 1.883 S/m; ε_r = 50.287; ρ = 1000 kg/m^3
Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5.2 Configuration:

- Probe: EX3DV4 - SN3893 (add ConvF); ConvF(7.6, 7.6, 7.6); Calibrated: 10/22/2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn522; Calibrated: 9/24/2015
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1013
- Measurement SW: DASY52, Version 52.8 (6); SEMCAD X Version 14.6.9 (7117)

Configuration/Flat Back 0mm/Area Scan (81x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0669 W/kg

Configuration/Flat Back 0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.489 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.0760 W/kg
SAR(1 g) = 0.034 W/kg; SAR(10 g) = 0.016 W/kg
Maximum value of SAR (measured) = 0.0596 W/kg