

## Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 $\Omega$ + 2.5 j $\Omega$
Return Loss	- 28.4 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.1 $\Omega$ + 4.4 j $\Omega$
Return Loss	- 27.1 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.165 ns
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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	December 11, 2008

## DASY5 Validation Report for Head TSL

Date: 18.10.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 818**

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.85$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

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

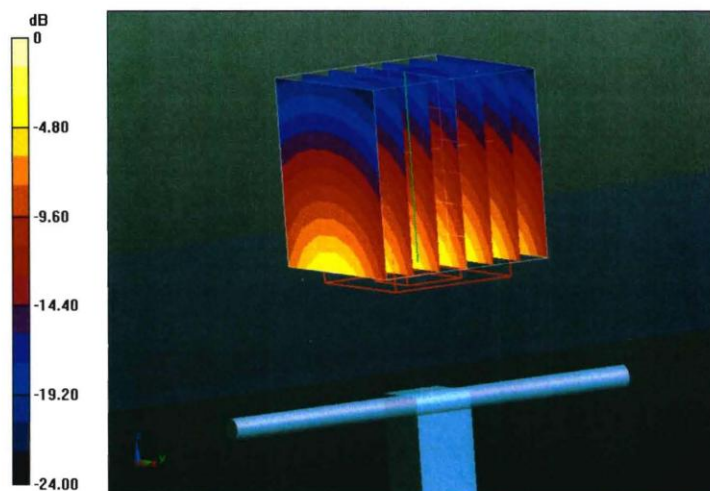
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.551 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 27.4 W/kg

**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.19 W/kg**

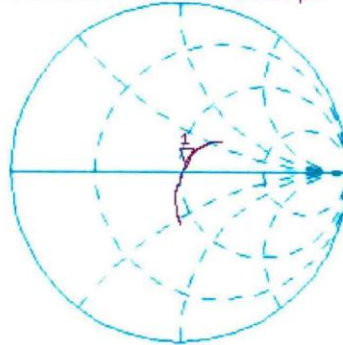
Maximum value of SAR (measured) = 17.0 W/kg



# Impedance Measurement Plot for Head TSL

18 Oct 2012 10:14:13  
[CH1] S11 1 U FS 1: 52.982  $\Omega$  2.5430  $\Omega$  165.19  $\mu$ H 2 450.000 000 MHz

\*  
Del  
Cor



Avg  
16

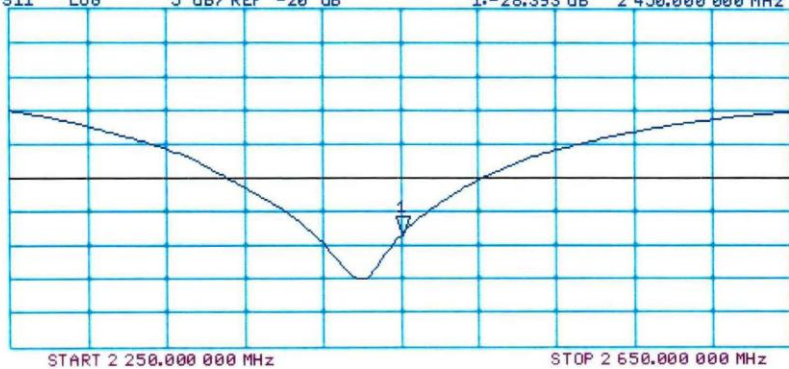
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-28.393 dB 2 450.000 000 MHz

Cor

Avg  
16

H1d



## DASY5 Validation Report for Body TSL

Date: 18.10.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 818**

Communication System: CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.02$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm 2/Zoom Scan (7x7x7)/Cube 0:

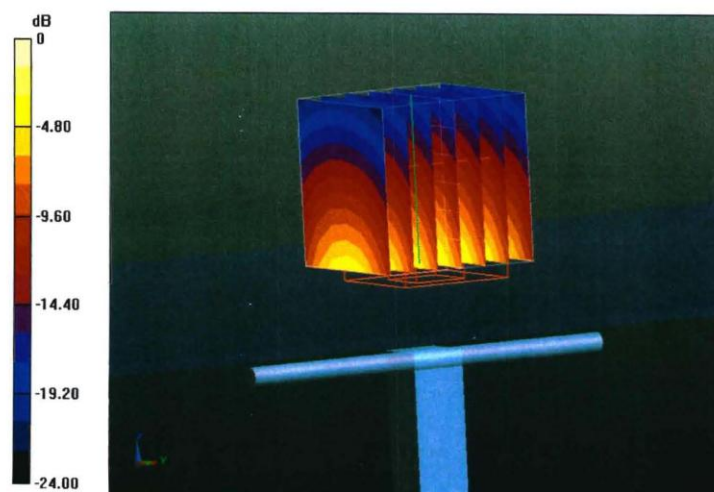
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.079 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 26.9 W/kg

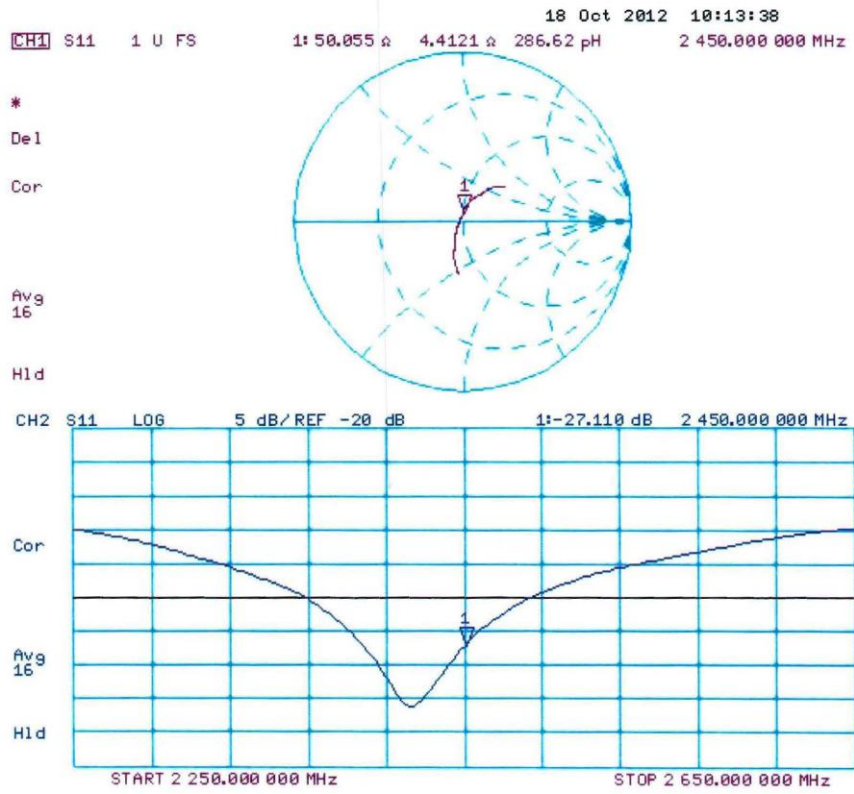
**SAR(1 g) = 13 W/kg; SAR(10 g) = 6.03 W/kg**

Maximum value of SAR (measured) = 17.0 W/kg



0 dB = 17.0 W/kg = 12.30 dBW/kg

# Impedance Measurement Plot for Body TSL



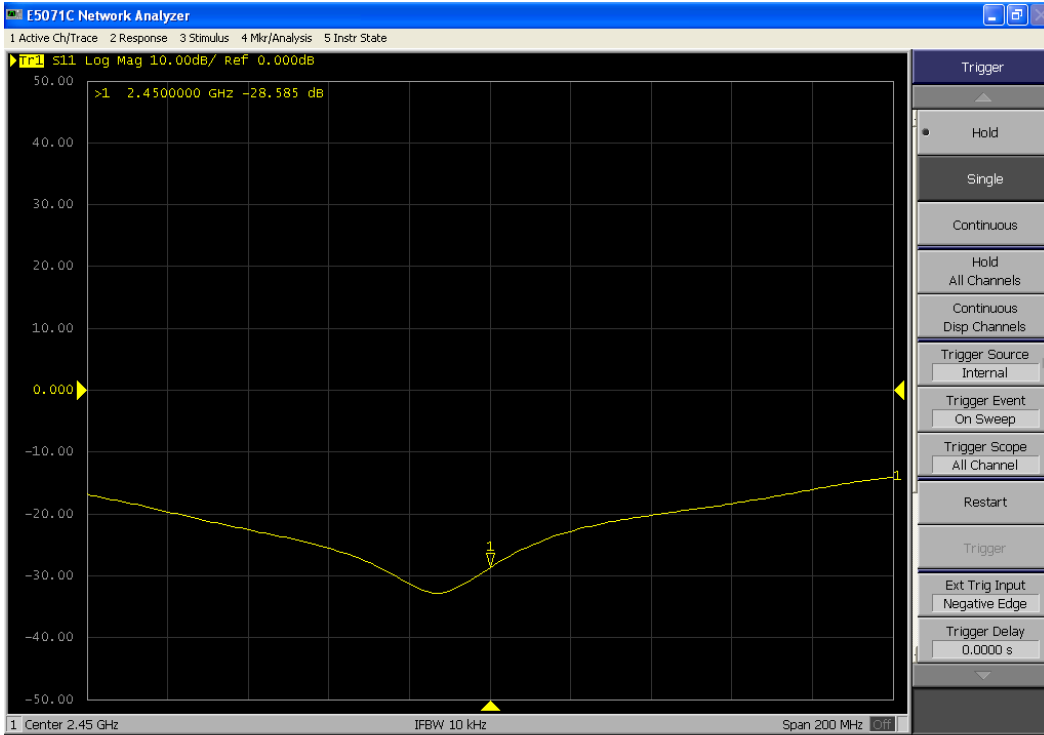
D2450V2, serial No. 818 Extended Dipole Calibrations

Referring to KDB 865664, if dipoles are verified in return loss ( $\leq -20\text{dB}$ , within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

Justification of the extended calibration

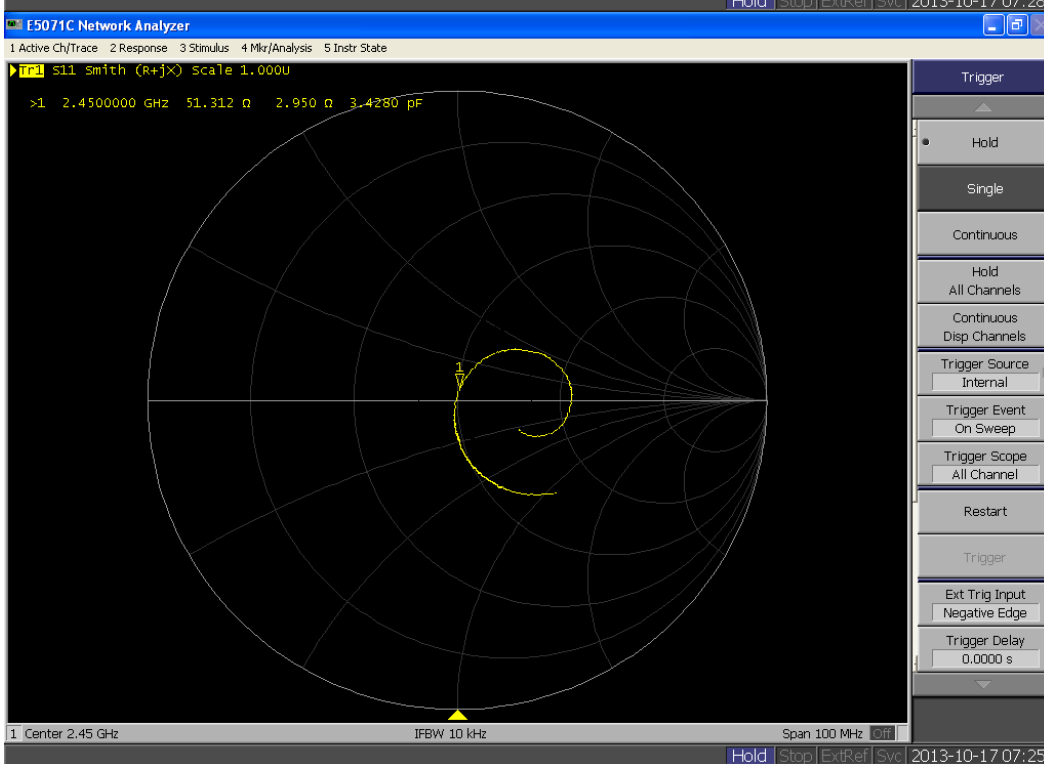
r	2450 Head					
Date of Measurement	Return-Loss (dB)	Delta(%)	Real Impedance(ohm)	Delta (ohm)	Imaginary Impedance(ohm)	Delta (ohm)
2012-10-18	-28.393		52.982		2.543	
2012-10-17	-28.585	0.68	51.312	-1.67	2.950	0.41
	2450 Body					
	Return-Loss (dB)	Delta(%)	Real Impedance(ohm)	Delta (ohm)	Imaginary Impedance(ohm)	Delta (ohm)
2012-10-18	-27.110		50.055		4.4121	
2012-10-17	-26.329	-2.88	51.434	1.38	5.9356	1.52

# 2450 Head



Trigger

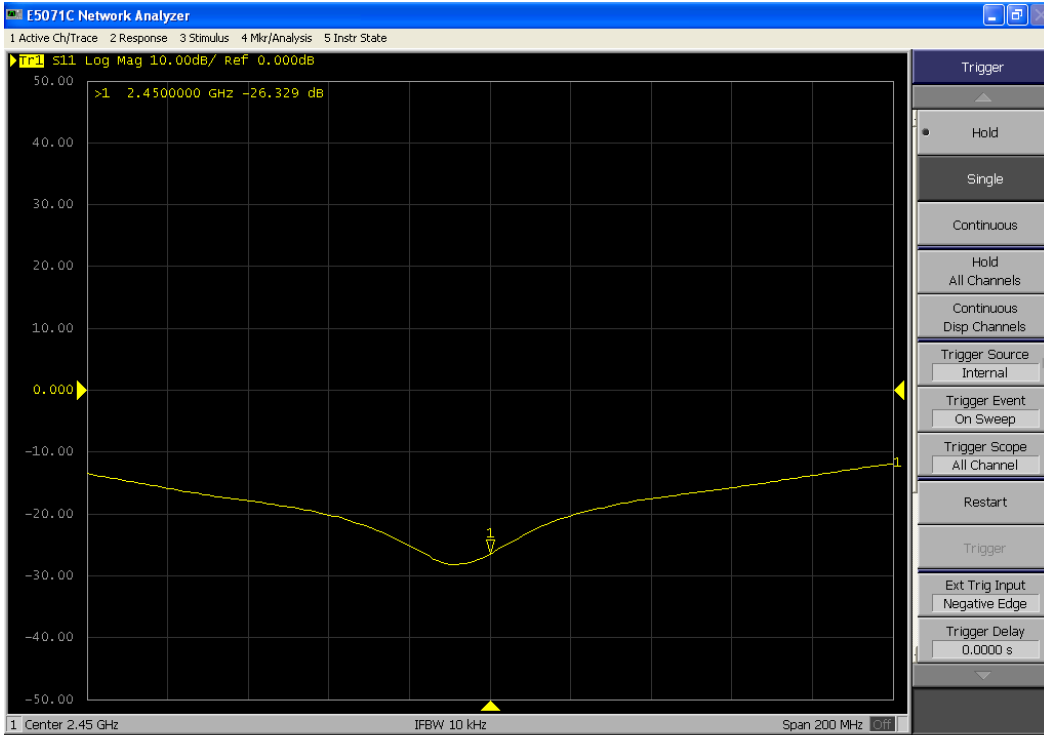
- Hold
- Single
- Continuous
- Hold All Channels
- Continuous Disp Channels
- Trigger Source Internal
- Trigger Event On Sweep
- Trigger Scope All Channel
- Restart
- Trigger
- Ext Trig Input Negative Edge
- Trigger Delay 0.0000 s



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# 2450 Body



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Continuous

Hold All Channels

Continuous Disp Channels

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Trigger Event On Sweep

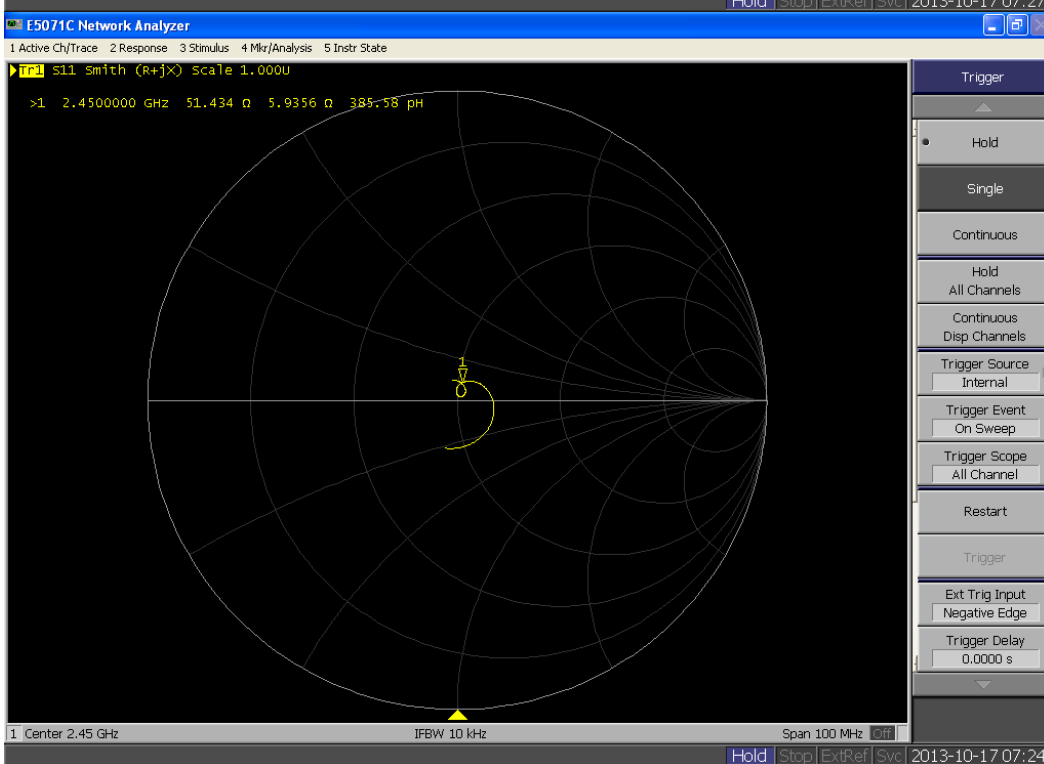
Trigger Scope All Channel

Restart

Trigger

Ext Trig Input Negative Edge

Trigger Delay 0.0000 s



Trigger

Hold

Single

Continuous

Hold All Channels

Continuous Disp Channels

Trigger Source Internal

Trigger Event On Sweep

Trigger Scope All Channel

Restart

Trigger

Ext Trig Input Negative Edge

Trigger Delay 0.0000 s