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Accreditation No.: **SCS 108**

Client **Ultratech Labs (UEL inc)**

Certificate No: **D2450V2-821\_Feb09**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 821**

Calibration procedure(s) **QA CAL-05.v7  
Calibration procedure for dipole validation kits**

Calibration date: **February 04, 2009**

Condition of the calibrated item **In Tolerance**

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 EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: S5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by:	Name <b>Claudio Leubler</b>	Function <b>Laboratory Technician</b>	Signature 
Approved by:	Name <b>Katja Pokovic</b>	Function <b>Technical Manager</b>	Signature 

Issued: February 27, 2009

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Accreditation No.: **SCS 108**

### 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:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

### Additional Documentation:

- 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.

## Measurement Conditions

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

<b>DASY Version</b>	DASY5	V5.0
<b>Extrapolation</b>	Advanced Extrapolation	
<b>Phantom</b>	Modular Flat Phantom V5.0	
<b>Distance Dipole Center - TSL</b>	10 mm	with Spacer
<b>Zoom Scan Resolution</b>	dx, dy, dz = 5 mm	
<b>Frequency</b>	2450 MHz ± 1 MHz	

## Head TSL parameters

The following parameters and calculations were applied.

	<b>Temperature</b>	<b>Permittivity</b>	<b>Conductivity</b>
<b>Nominal Head TSL parameters</b>	22.0 °C	39.2	1.80 mho/m
<b>Measured Head TSL parameters</b>	(22.0 ± 0.2) °C	38.0 ± 6 %	1.82 mho/m ± 6 %
<b>Head TSL temperature during test</b>	(22.0 ± 0.2) °C	----	----

## SAR result with Head TSL

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>	Condition	
SAR measured	250 mW input power	13.3 mW / g
SAR normalized	normalized to 1W	53.2 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>52.6 mW / g ± 17.0 % (k=2)</b>

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b>	condition	
SAR measured	250 mW input power	6.16 mW / g
SAR normalized	normalized to 1W	24.6 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>24.5 mW / g ± 16.5 % (k=2)</b>

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.3 $\Omega$ + 3.0 j $\Omega$
Return Loss	- 24.8 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 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.

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/Time: 04.02.2009 13:32:01

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN821**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.82$  mho/m;  $\epsilon_r = 38$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:**

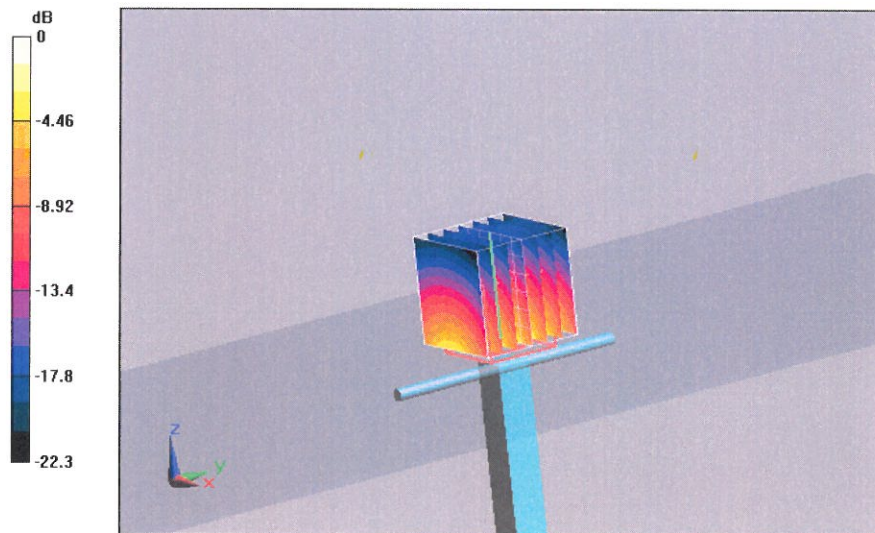
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.7 V/m; Power Drift = 0.073 dB

Peak SAR (extrapolated) = 28.1 W/kg

**SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.16 mW/g**

Maximum value of SAR (measured) = 15.8 mW/g



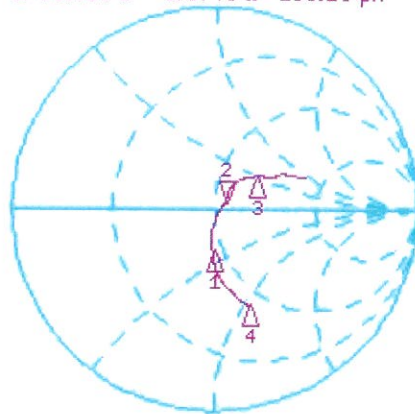
0 dB = 15.8mW/g

# Impedance Measurement Plot for Head TSL

4 Feb 2009 11:43:33

CH1 S11 1 U FS 2: 55.313  $\Omega$  2.9746  $\Omega$  193.23  $\mu\text{H}$  2 450.000 000 MHz

\*  
Del  
Cor  
Avg  
16  
↑



CH1 Markers  
1: 45.000  $\Omega$   
-20.100  $\Omega$   
2.30000 GHz  
3: 70.418  $\Omega$   
24.254  $\Omega$   
2.60000 GHz  
4: 40.637  $\Omega$   
-52.203  $\Omega$   
2.10000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 2: -24.760 dB 2 450.000 000 MHz



CH2 Markers  
1: -13.420 dB  
2.30000 GHz  
3: -11.764 dB  
2.60000 GHz  
4: -5.8988 dB  
2.10000 GHz

START 2 100.000 000 MHz STOP 2 800.000 000 MHz



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Accreditation No.: **SCS 108**

Client **Ultratech Labs (UEL inc)**

Certificate No: **D5GHzV2-1069\_Feb09**

## CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1069**

Calibration procedure(s) **QA CAL-22.v1  
Calibration procedure for dipole validation kits between 3-6 GHz**

Calibration date: **February 20, 2009**

Condition of the calibrated item **In Tolerance**

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 EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe EX3DV4	SN: 3503	8-Mar-08 (No. EX3-3503_Mar08)	Mar-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by:	Name Marcel Fehr	Function Laboratory Technician	Signature 
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature 

Issued: February 23, 2009

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Accreditation No.: **SCS 108**

### 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) IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004
- b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

### Additional Documentation:

- c) 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.



## Measurement Conditions

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

<b>DASY Version</b>	DASY5	V5.0
<b>Extrapolation</b>	Advanced Extrapolation	
<b>Phantom</b>	Modular Flat Phantom V5.0	
<b>Distance Dipole Center - TSL</b>	10 mm	with Spacer
<b>Area Scan resolution</b>	dx, dy = 10 mm	
<b>Zoom Scan Resolution</b>	dx, dy = 4.0 mm, dz = 2.5 mm	
<b>Frequency</b>	5200 MHz ± 1 MHz 5800 MHz ± 1 MHz	

## Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Head TSL parameters</b>	22.0 °C	36.0	4.66 mho/m
<b>Measured Head TSL parameters</b>	(22.0 ± 0.2) °C	35.4 ± 6 %	4.53 mho/m ± 6 %
<b>Head TSL temperature during test</b>	(22.2 ± 0.2) °C	----	----

## SAR result with Head TSL at 5200 MHz

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>	condition	
SAR measured	100 mW input power	7.53 mW / g
SAR normalized	normalized to 1W	75.3 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>75.0 mW / g ± 19.9 % (k=2)</b>

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b>	condition	
SAR measured	100 mW input power	2.12 mW / g
SAR normalized	normalized to 1W	21.2 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>21.1 mW / g ± 19.5 % (k=2)</b>

<sup>1</sup> Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

## 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	34.3 ± 6 %	5.08 mho/m ± 6 %
Head TSL temperature during test	(22.2 ± 0.2) °C	----	----

## SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	condition	
SAR measured	100 mW input power	7.22 mW / g
SAR normalized	normalized to 1W	72.2 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>71.7 mW / g ± 19.9 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.02 mW / g
SAR normalized	normalized to 1W	20.2 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>20.0 mW / g ± 19.5 % (k=2)</b>

<sup>1</sup> Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

### Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Body TSL parameters</b>	22.0 °C	49.0	5.30 mho/m
<b>Measured Body TSL parameters</b>	(22.0 ± 0.2) °C	47.5 ± 6 %	5.25 mho/m ± 6 %
<b>Body TSL temperature during test</b>	(21.0 ± 0.2) °C	----	----

### SAR result with Body TSL at 5200 MHz

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b>	condition	
SAR measured	100 mW input power	7.71 mW / g
SAR normalized	normalized to 1W	77.1 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	<b>76.6 mW / g ± 19.9 % (k=2)</b>

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b>	condition	
SAR measured	100 mW input power	2.15 mW / g
SAR normalized	normalized to 1W	21.5 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	<b>21.3 mW / g ± 19.5 % (k=2)</b>

### Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Body TSL parameters</b>	22.0 °C	48.2	6.00 mho/m
<b>Measured Body TSL parameters</b>	(22.0 ± 0.2) °C	46.2 ± 6 %	5.97 mho/m ± 6 %
<b>Body TSL temperature during test</b>	(21.0 ± 0.2) °C	----	----

### SAR result with Body TSL at 5800 MHz

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b>	condition	
SAR measured	100 mW input power	7.27 mW / g
SAR normalized	normalized to 1W	72.7 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	<b>72.1 mW / g ± 19.9 % (k=2)</b>

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b>	condition	
SAR measured	100 mW input power	2.00 mW / g
SAR normalized	normalized to 1W	20.0 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	<b>19.8 mW / g ± 19.5 % (k=2)</b>

<sup>2</sup> Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

## Appendix

### Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	50.1 $\Omega$ - 2.9 j $\Omega$
Return Loss	-30.9 dB

### Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	57.6 $\Omega$ - 1.4 j $\Omega$
Return Loss	-22.8 dB

### Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	50.4 $\Omega$ - 3.3 j $\Omega$
Return Loss	-29.6 dB

### Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	57.8 $\Omega$ - 0.8 j $\Omega$
Return Loss	-22.8 dB



## General Antenna Parameters and Design

Electrical Delay (one direction)	1.205 ns
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After long term use with 40 W 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.

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	September 26, 2008

## DASY5 Validation Report for Head TSL

Date/Time: 05.02.2009 16:10:24

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 5GHz; Type: D5GHz; Serial: D5GHzV2 - SN:1069**

Communication System: CW-5GHz; Frequency: 5200 MHz Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: HSL 5800 MHz

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 4.52$  mho/m;  $\epsilon_r = 35.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium parameters used:  $f = 5800$  MHz;  $\sigma = 5.07$  mho/m;  $\epsilon_r = 34.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.63, 5.63, 5.63)ConvF(5.04, 5.04, 5.04); Calibrated: 08.03.2008
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**d=10mm, Pin=100mW, f=5200 MHz/Area Scan (61x61x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.2 mW/g

**d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 49.4 V/m; Power Drift = 0.114 dB

Peak SAR (extrapolated) = 29.2 W/kg

**SAR(1 g) = 7.53 mW/g; SAR(10 g) = 2.12 mW/g**

Maximum value of SAR (measured) = 15.7 mW/g

**d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:**

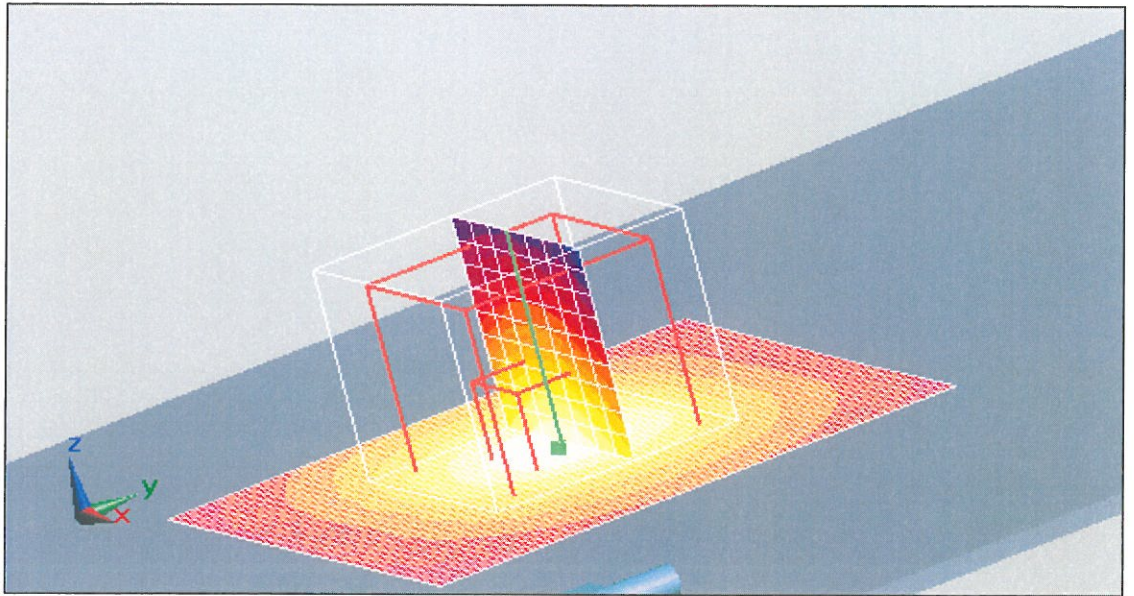
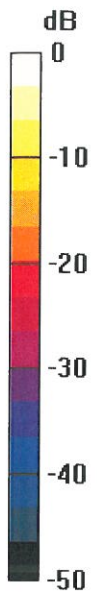
Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 45.4 V/m; Power Drift = 0.093 dB

Peak SAR (extrapolated) = 30.8 W/kg

**SAR(1 g) = 7.22 mW/g; SAR(10 g) = 2.02 mW/g**

Maximum value of SAR (measured) = 15.3 mW/g



0 dB = 15.3mW/g

## DASY5 Validation Report for Body TSL

Date/Time: 20.02.2009 17:52:51

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 5GHz; Type: D5GHz; Serial: D5GHzV2 - SN:1069**

Communication System: CW-5GHz; Frequency: 5200 MHz Frequency: 5800 MHz; Duty Cycle: 1:1  
Medium: MSL 5800 MHz

Medium parameters used:  $f = 5200$  MHz;  $\sigma = 5.31$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> Medium parameters used:  $f = 5800$  MHz;  $\sigma = 6.04$  mho/m;  $\epsilon_r = 46.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.95, 4.95, 4.95)ConvF(4.74, 4.74, 4.74); Calibrated: 08.03.2008
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**d=10mm, Pin=100mW, f=5200 MHz/Area Scan (61x61x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 16.9 mW/g

**d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 58.9 V/m; Power Drift = 0.085 dB

Peak SAR (extrapolated) = 29.3 W/kg

**SAR(1 g) = 7.71 mW/g; SAR(10 g) = 2.15 mW/g**

Maximum value of SAR (measured) = 16.1 mW/g

**d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 44.8 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 31 W/kg

**SAR(1 g) = 7.27 mW/g; SAR(10 g) = 2 mW/g**

Maximum value of SAR (measured) = 15.7 mW/g

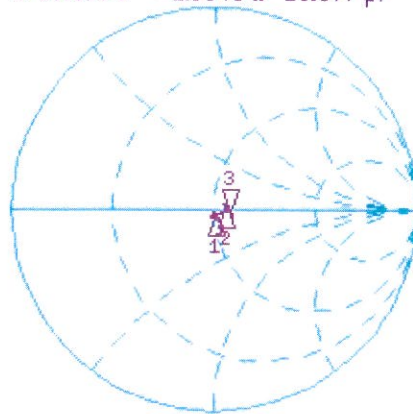


# Impedance Measurement Plot for Head TSL

5 Feb 2009 10:18:20

CH1 S11 1 U FS 3: 57.639  $\Omega$  -1.3945  $\Omega$  19.677 pF 5 800.000 000 MHz

\*  
Del  
Cor

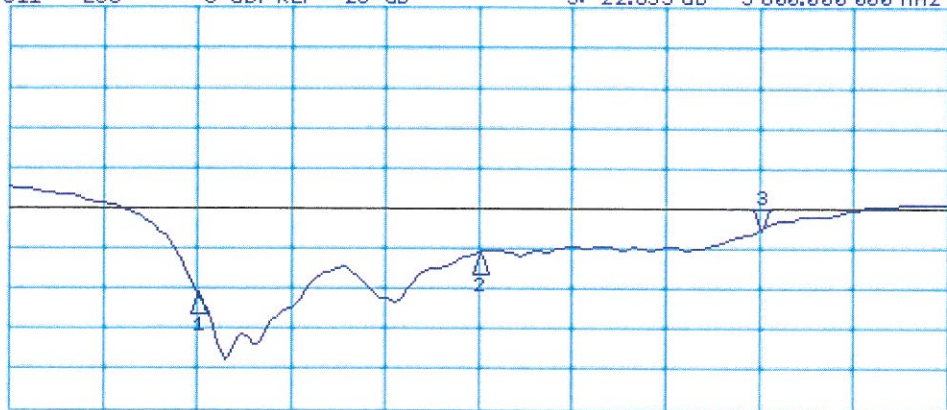


CH1 Markers  
1: 50.129  $\Omega$   
-2.8691  $\Omega$   
5.20000 GHz  
2: 55.404  $\Omega$   
0.3477  $\Omega$   
5.50000 GHz

Avg  
16  
↑

CH2 S11 LOG 5 dB/REF -20 dB 3: -22.835 dB 5 800.000 000 MHz

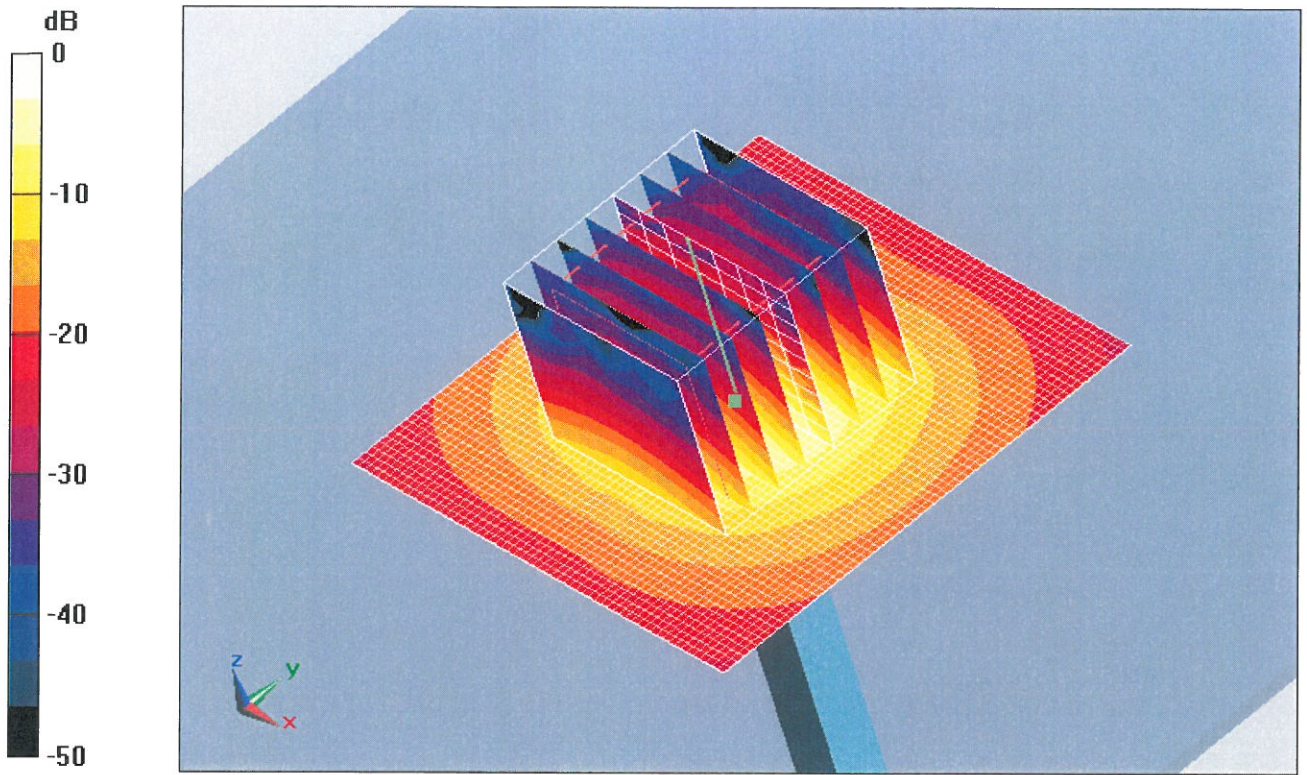
Cor  
Avg  
16  
↑



CH2 Markers  
1: -30.849 dB  
5.20000 GHz  
2: -25.779 dB  
5.50000 GHz  
3: -22.835 dB  
5.80000 GHz

START 5 000.000 000 MHz

STOP 5 800.000 000 MHz



0 dB = 12mW/g

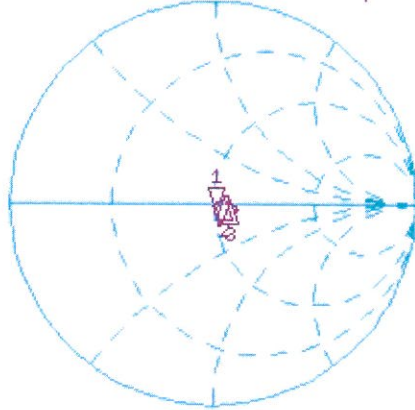
# Impedance Measurement Plot for Body TSL

11 Feb 2009 15:32:36

CH1 S11 1 U FS

1: 50.416  $\Omega$  -3.2988  $\Omega$  9.2781 pF 5 200.000 000 MHz

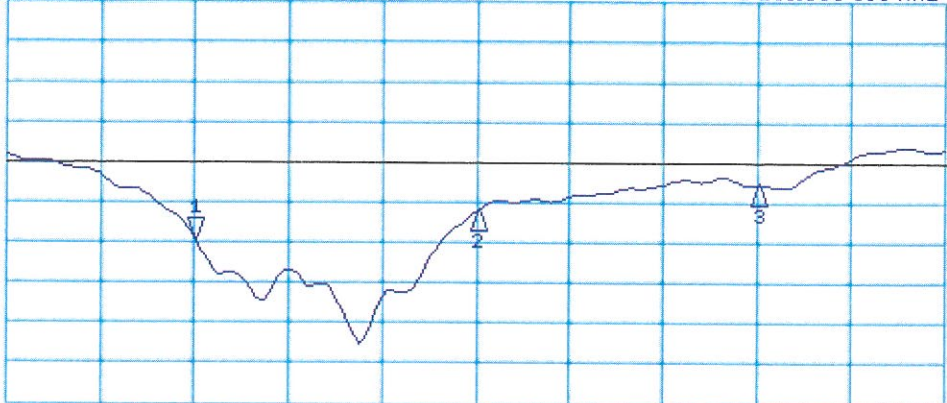
\*  
De1  
Cor  
Avg  
16  
↑



CH1 Markers  
2: 54.830  $\Omega$   
1.9531  $\Omega$   
5.50000 GHz  
3: 57.779  $\Omega$   
-802.73 m $\Omega$   
5.80000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 1:-29.606 dB 5 200.000 000 MHz

Cor  
Avg  
16  
↑



CH2 Markers  
2:-26.069 dB  
5.50000 GHz  
3:-22.785 dB  
5.80000 GHz

START 5 000.000 000 MHz

STOP 6 000.000 000 MHz