

APPENDIX B – PROBE CALIBRATION CERTIFICATES

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



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Accreditation No.: **SCS 108**

Client **Bay Area**

Certificate No: **ET3-1604_May06**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN: 1604**

Calibration procedure(s) **QA CAL-01.v5 and QA CAL-12.v4**
Calibration procedure for dosimetric E-field probes

Calibration date: **May 2, 2006**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: May 3, 2006

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Certificate No: ET3-1604_May06

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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * *frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ET3DV6 SN:1604

May 2, 2006

Probe ET3DV6

SN:1604

Manufactured:	July 30, 2001
Last calibrated:	March 18, 2005
Recalibrated:	May 2, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1604_May06

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ET3DV6 SN:1604

May 2, 2006

DASY - Parameters of Probe: ET3DV6 SN:1604**Sensitivity in Free Space^A****Diode Compression^B**

NormX	1.87 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	93 mV
NormY	1.80 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	93 mV
NormZ	1.91 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect**TSL 900 MHz Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	7.9	4.1
SAR _{be} [%]	With Correction Algorithm	0.1	0.2

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	7.0	4.1
SAR _{be} [%]	With Correction Algorithm	0.1	0.3

Sensor OffsetProbe Tip to Sensor Center **2.7 mm**

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%.

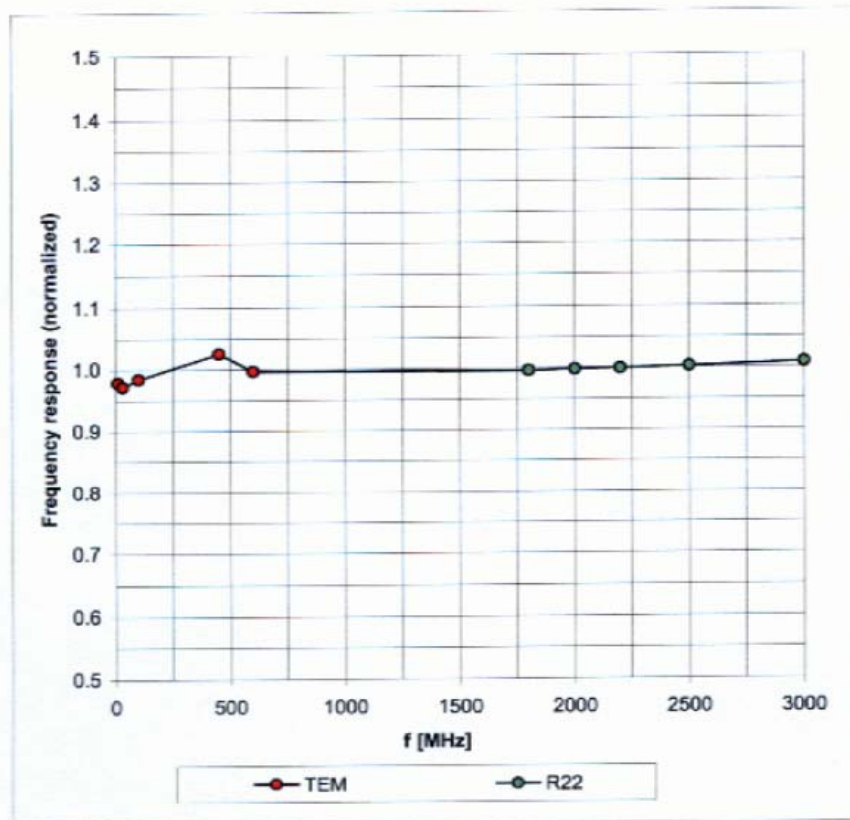
^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).^B Numerical linearization parameter; uncertainty not required.

ET3DV6 SN:1604

May 2, 2006

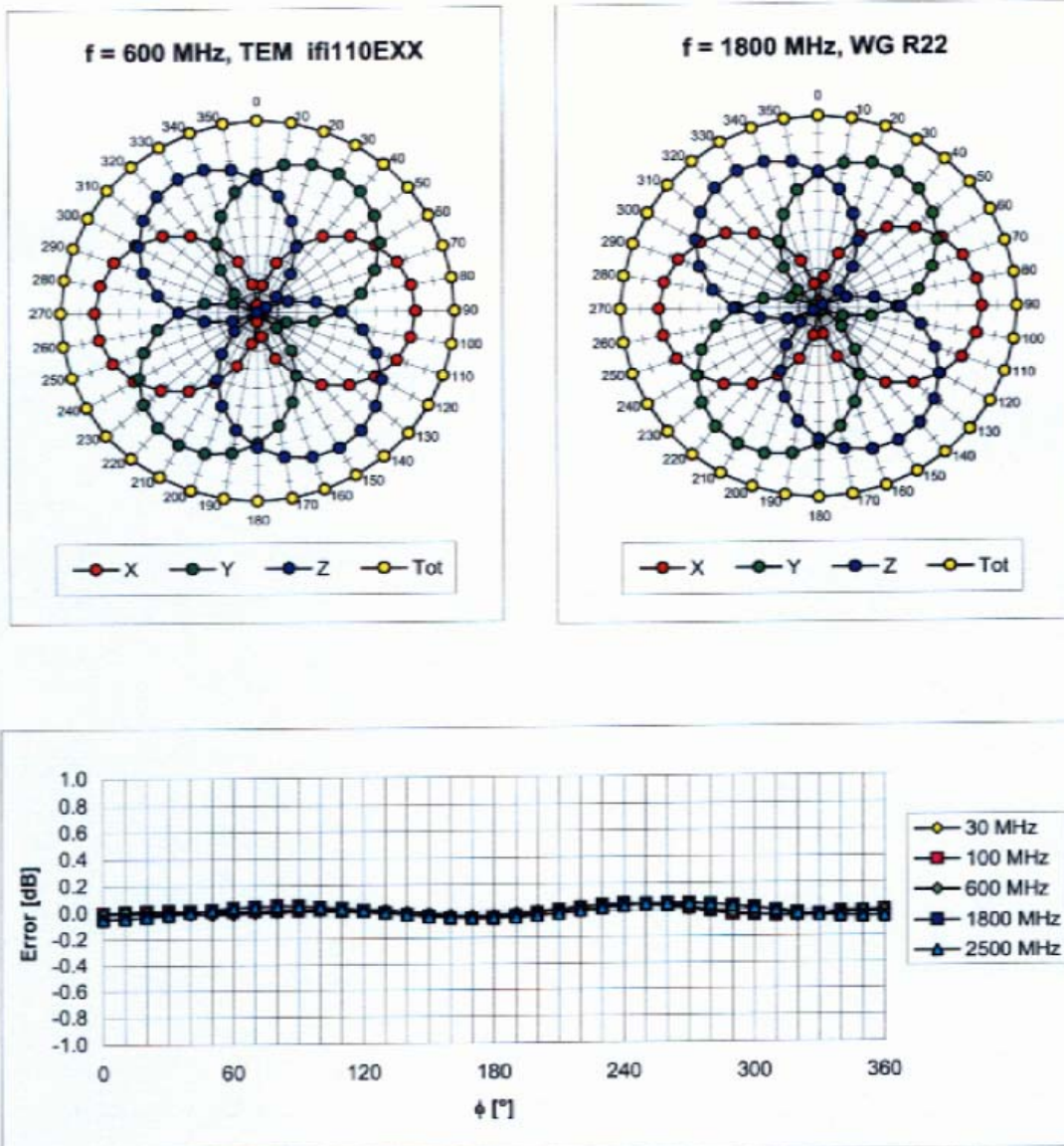
Frequency Response of E-Field

(TEM-Cell: ifi110 EXX, Waveguide: R22)

Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ET3DV6 SN:1604

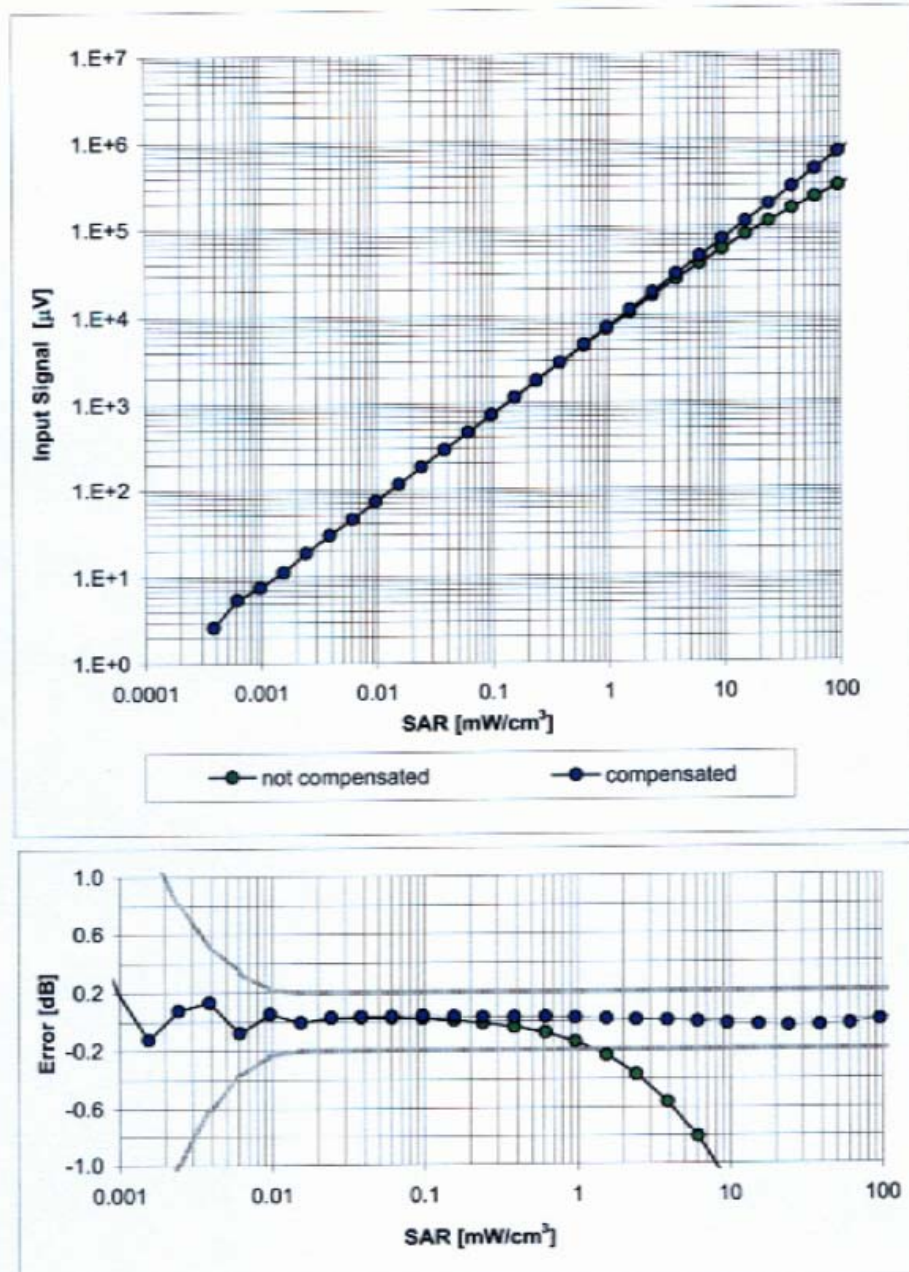
May 2, 2006

Receiving Pattern (ϕ), $\theta = 0^\circ$ Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ET3DV6 SN:1604

May 2, 2006

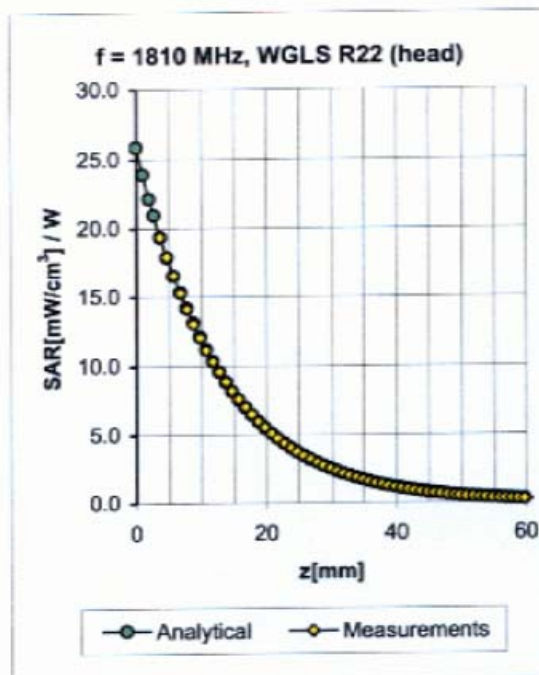
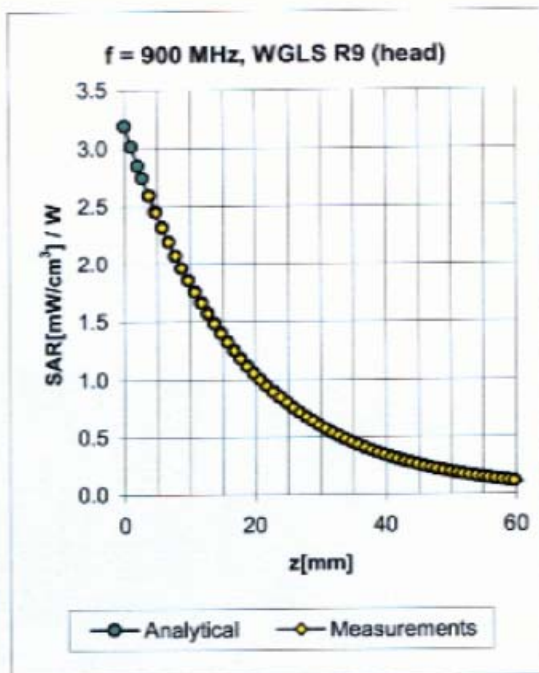
Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$)

Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ET3DV6 SN:1604

May 2, 2006

Conversion Factor Assessment



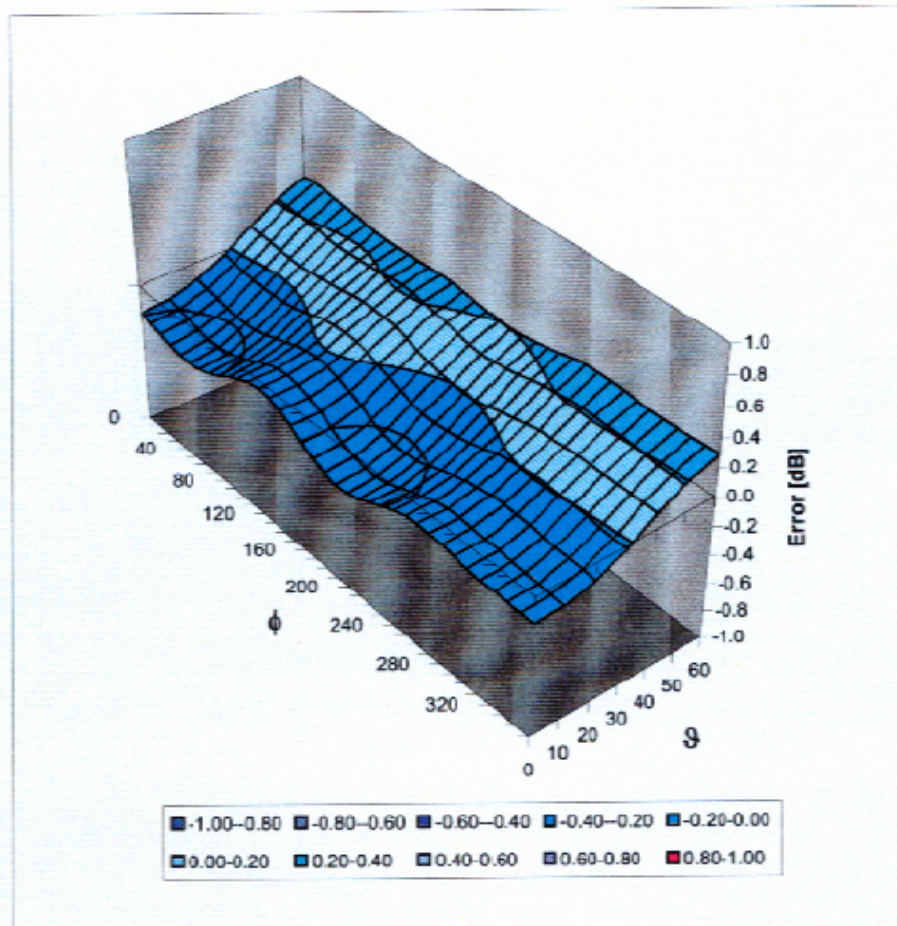
f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.26	2.94	7.14 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.81	6.60 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.59	5.29 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.68	1.85	4.60 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.25	4.44	7.42 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.47	2.08	6.27 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.56	2.66	4.88 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.66	1.95	4.27 ± 11.8% (k=2)

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1604

May 2, 2006

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHzUncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

APPENDIX C – DIPOLE CALIBRATION CERTIFICATES

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Accreditation No.: **SCS 108**

Client **BACL**

Certificate No: **D900V2-122_Jun06**

CALIBRATION CERTIFICATE

Object

D900V2 - SN: 122

Calibration procedure(s)

QA CAL-05.v6
Calibration procedure for dipole validation kits

Calibration date:

June 16, 2006

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Power sensor HP 8481A	US37292783	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Reference 20 dB Attenuator	SN: 5086 (20g)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference 10 dB Attenuator	SN: 5047.2 (10r)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference Probe ET3DV6 (HF)	SN 1507	28-Oct-05 (SPEAG, No. ET3-1507_Oct05)	Oct-06
DAE4	SN 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov-06

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

Issued: June 19, 2006

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Certificate No: D900V2-122_Jun06

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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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- 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 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.

APPENDIX C – DIPOLE CALIBRATION CERTIFICATES

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	900 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.1 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.73 mW / g
SAR normalized	normalized to 1W	10.9 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	10.9 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.75mW / g
SAR normalized	normalized to 1W	7.00 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.99 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.2 Ω - 6.4 j Ω
Return Loss	- 24.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.412 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.
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	July 04, 2001

DASY4 Validation Report for Head TSL

Date/Time: 16.06.2006 11:35:14

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:122

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.961 \text{ mho/m}$; $\epsilon_r = 41.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.8, 5.8, 5.8); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 171

Pin = 250 mW; d = 10 mm/Area Scan (71x81x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 2.94 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 57.7 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 4.12 W/kg

SAR(1 g) = 2.73 mW/g; SAR(10 g) = 1.75 mW/g

Maximum value of SAR (measured) = 2.97 mW/g

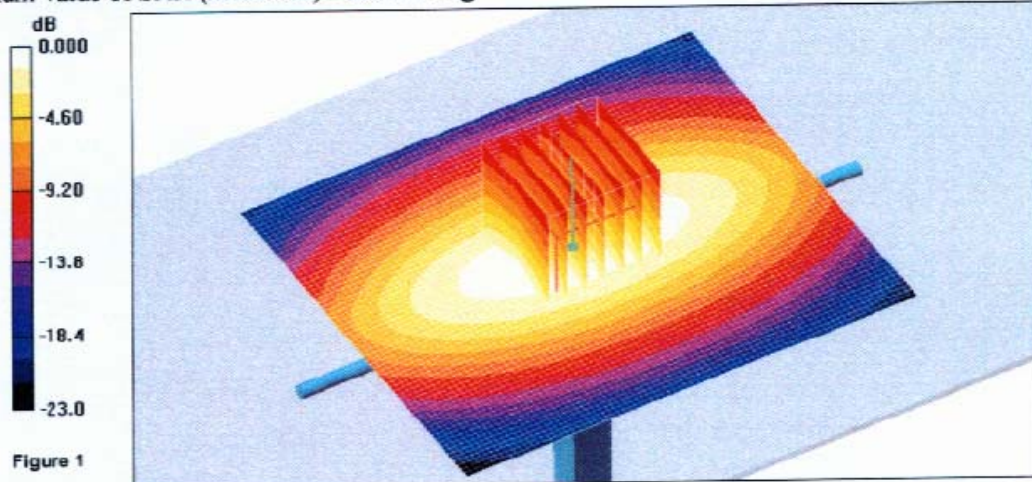
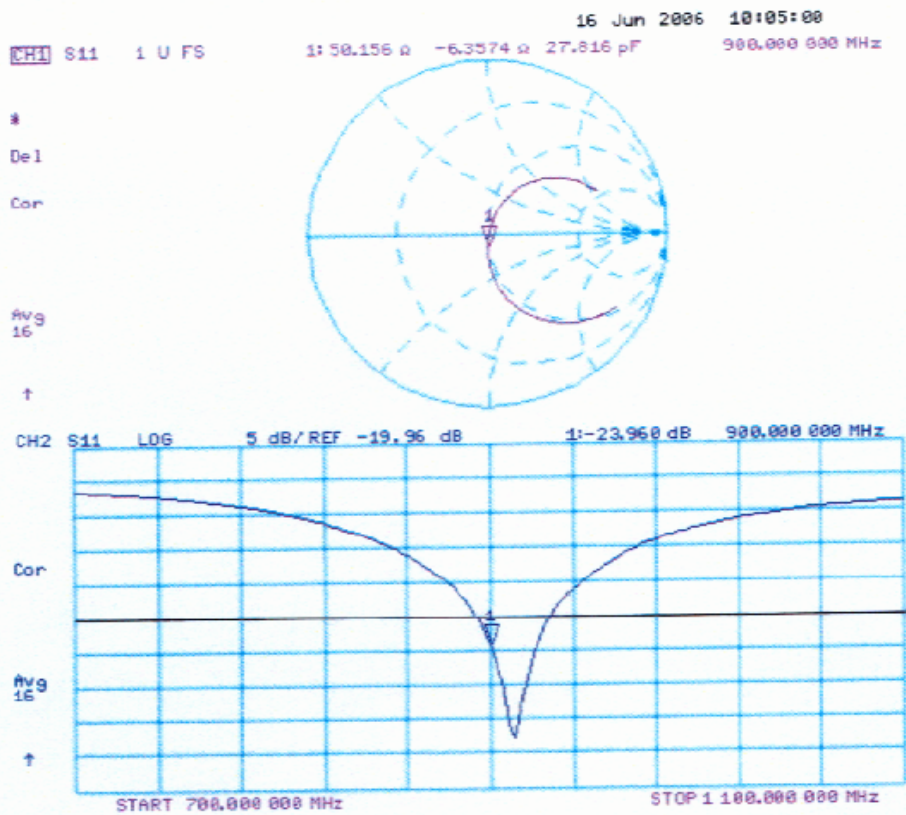


Figure 1

0 dB = 2.97mW/g

Impedance Measurement Plot for Head TSL

APPENDIX D - TEST SYSTEM VERIFICATIONS SCANS**Liquid Measurement Result**

2006-11-17

Simulant	Freq [MHz]	Parameters	Liquid Temp [°C]	Target Value	Measured Value	Deviation [%]	Limits [%]
Head	835	ϵ_r	22	41.5	41.2	-0.72	±5
		σ	22	0.90	0.89	-1.11	±5
		1g SAR	22	9.5	9.52	0.22	±10
Body	835	ϵ_r	22	55.2	54.8	-0.72	±5
		σ	22	0.97	0.96	-1.03	±5
		1g SAR	22	7.86	8.03	-2.12	±10

ϵ_r = relative permittivity, σ = conductivity and $\rho=1000\text{kg/m}^3$

Test Laboratory: Bay Area Compliance Lab Corp.(BACL)**System Performance Check 835 MHz for Head Liquid****Dipole Antenna; DUT Type: D900V2; SN: 122**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(6.6, 6.6, 6.6); Calibrated: 5/2/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3, SN: 456; Calibrated: 10/18/2005
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 161

System Performance Check 835 MHz for Head Liquid, 1W/ Area Scan (61x121x1): Measurement grid:

$dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 10.1 mW/g

System Performance Check 835 MHz for Head Liquid, 1W/ Zoom Scan (7x7x7)/Cube 0: Measurement grid:

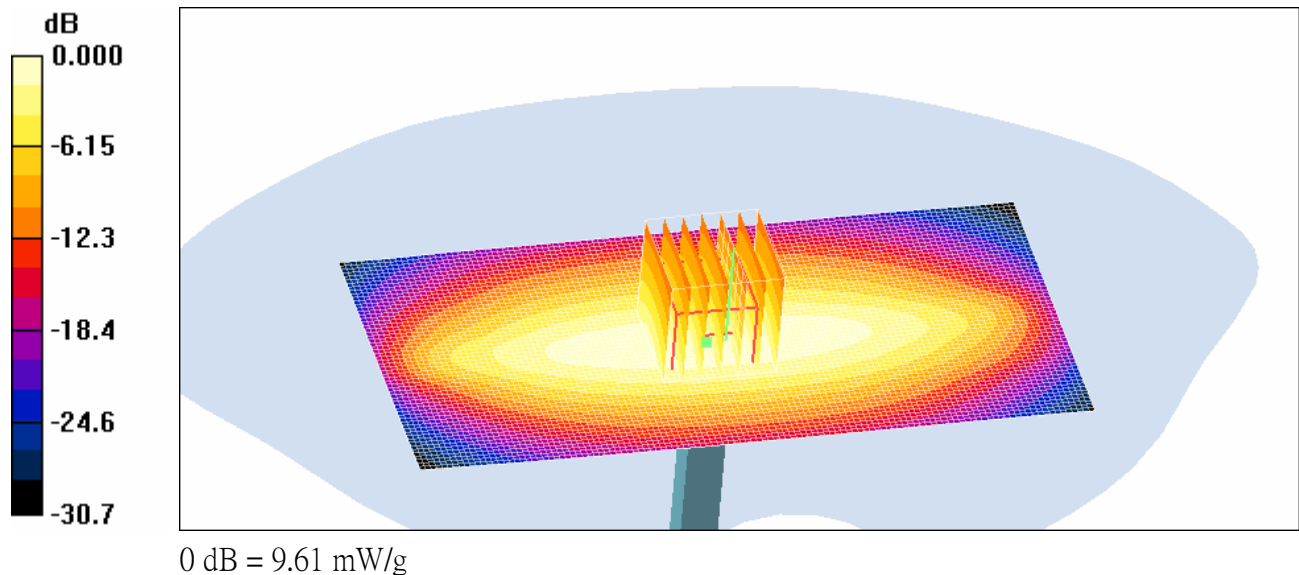
$dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 102.8 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 9.52 mW/g; SAR(10 g) = 6.46 mW/g

Maximum value of SAR (measured) = 9.61 mW/g



Test Laboratory: Bay Area Compliance Lab Corp.(BACL)**System Performance Check for 835 MHz Body liquid****Dipole Antenna; DUT Type: D900V2; SN: 122****Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1**Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.96 \text{ mho/m}$; $\epsilon_r = 54.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(6.27, 6.27, 6.27); Calibrated: 5/2/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3, SN:456; Calibrated: 10/18/2005
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 161

System Performance Check 835 MHz for Body Liquid, 1W/ Area Scan (61x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 8.80 mW/g

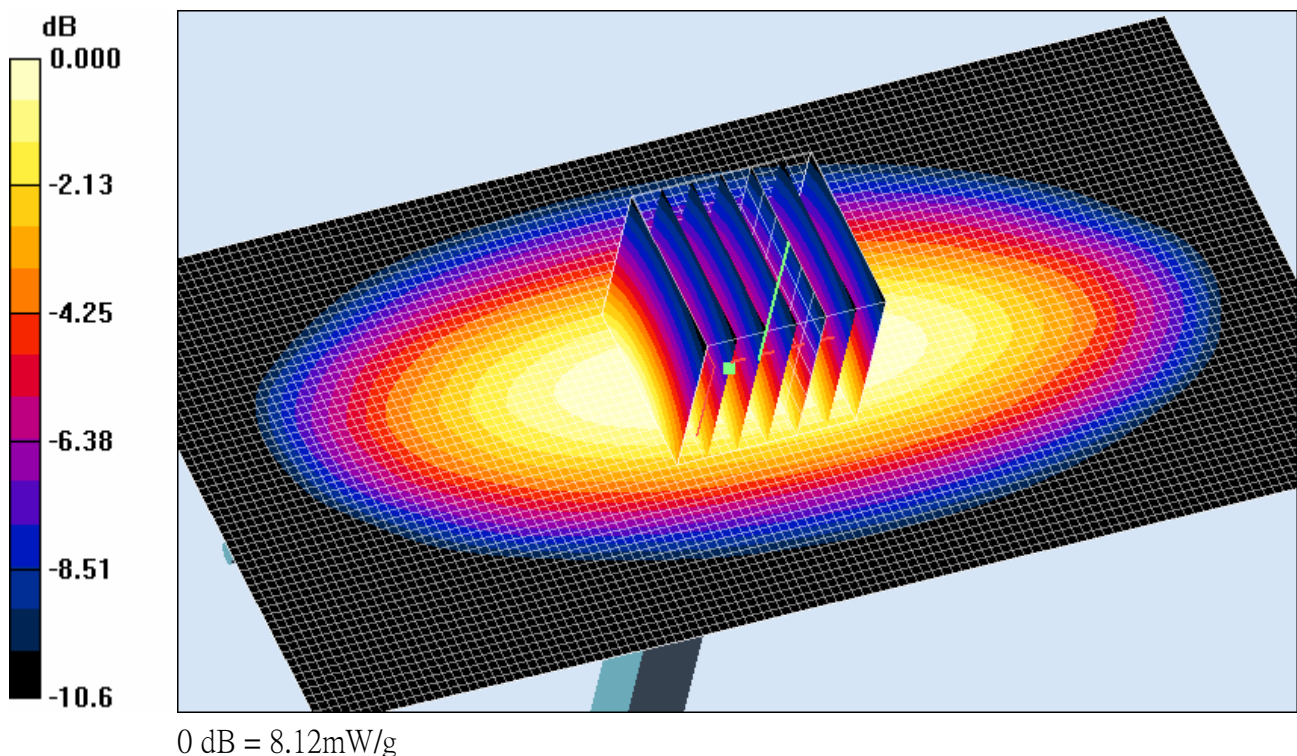
System Performance Check 835 MHz for Body Liquid, 1W/ Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 98.2 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 13.5 W/kg

SAR(1 g) = 8.03 mW/g; SAR(10 g) = 5.38 mW/g

Maximum value of SAR (measured) = 8.12 mW/g



APPENDIX E – DUT SAR TEST DATA

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Dell Laptop with DUT back touching to the flat phantom

Maxon; DUT Type: MiniMax-USB3-8521; Serial Number: 23100620; Dell Laptop, Laptop Model: PR04S

Communication System: 850 MHz WCDMA / HSDPA; Frequency: 834.94 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(6.27, 6.27, 6.27); Calibrated: 5/2/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 10/18/2005
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 161

DUT back touching to the flat phantom (Middle Channel)/ Area Scan (51x101x1): Measurement grid:

$dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.698 mW/g

DUT back touching to the flat phantom (Middle Channel)/ Zoom Scan (7x7x7)/Cube 0: Measurement grid:

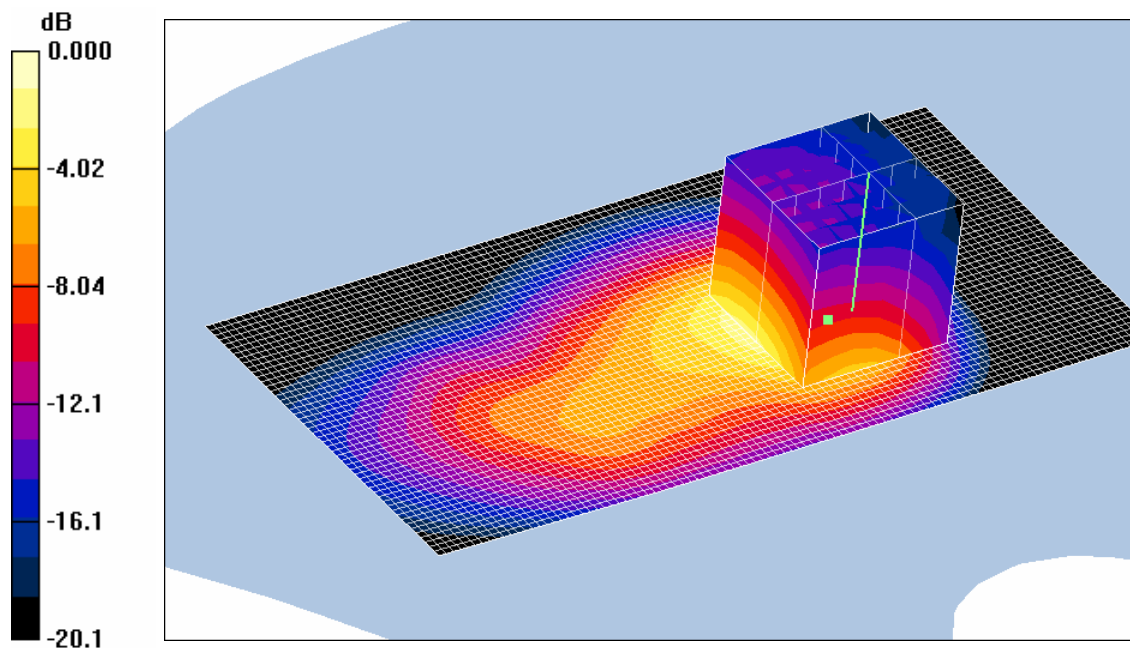
$dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 24.1 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 2.09 W/kg

SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.286 mW/g

Maximum value of SAR (measured) = 0.687 mW/g



Plot#1

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)**IBM Laptop with DUT back touching to the flat phantom****Maxon; DUT Type: MiniMax-USB3-8521; Serial Number: 23100620; IBM Laptop, Laptop Model: 2373**

Communication System: 850 MHz WCDMA / HSDPA; Frequency: 834.94 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(6.27, 6.27, 6.27); Calibrated: 5/2/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 10/18/2005
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 161

DUT perpendicular to the flat phantom (Middle Channel)/ Area Scan (51x101x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.752 mW/g

DUT perpendicular to the touching to flat phantom (Middle Channel)/ Zoom Scan (7x7x7)/Cube 0:

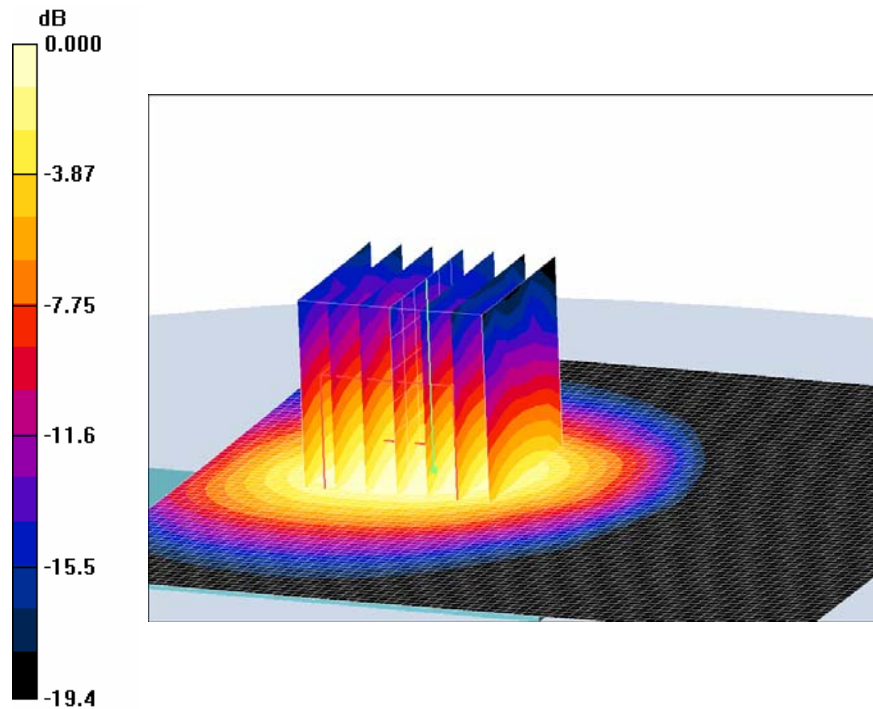
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.2 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.18 W/kg

SAR(1 g) = 0.747 mW/g; SAR(10 g) = 0.353 mW/g

Maximum value of SAR (measured) = 0.767 mW/g



0 dB = 0.767mW/g

Plot#2

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)**Acer Laptop with DUT back touching to the flat phantom****Maxon; DUT Type: MiniMax-USB3-8521; Serial Number: 23100620; Acer Laptop Model: ZG1S**

Communication System: 850 MHz WCDMA / HSDPA; Frequency: 834.94 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(4.88, 4.88, 4.88); Calibrated: 5/2/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 10/18/2005
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 161

DUT back touching to the flat phantom (Middle Channel)/ Area Scan (81x81x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.726 mW/g

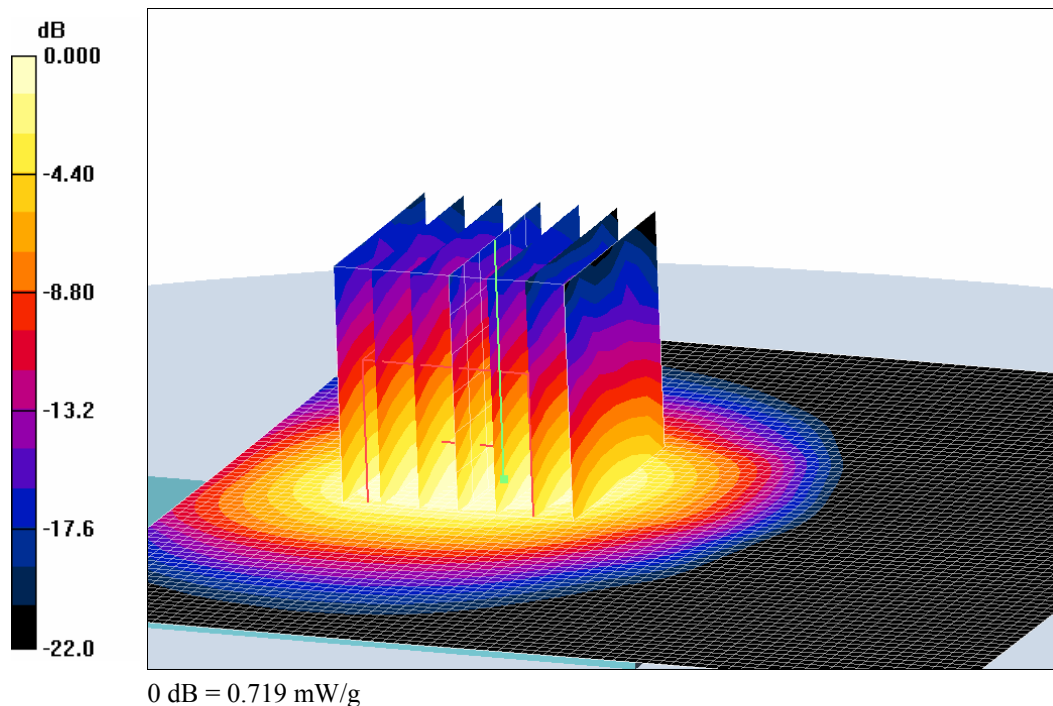
DUT back touching to the flat phantom (Middle Channel)/ Zoom Scan (7x7x7)/ Cube 0: Measurement grid:
dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.4 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 0.708 mW/g; SAR(10 g) = 0.336 mW/g

Maximum value of SAR (measured) = 0.719 mW/g

**Plot#3**

APPENDIX F – CONDUCTED OUTPUT POWER MEASUREMENT

Provision Applicable

The measured peak output power should be greater and within 5% than EMI measurement.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

Test equipment

Agilent PSA E4446A Spectrum Analyzer, Calibration Due Date: 2007-03-06.

Test Results

Frequency (MHz)	Output Power in dBm
826.40	24.6
834.94	24.8
846.60	24.7

Note: TX PDM Set at 333 for the Output Power

APPENDIX G – EUT TEST POSITION PHOTOS

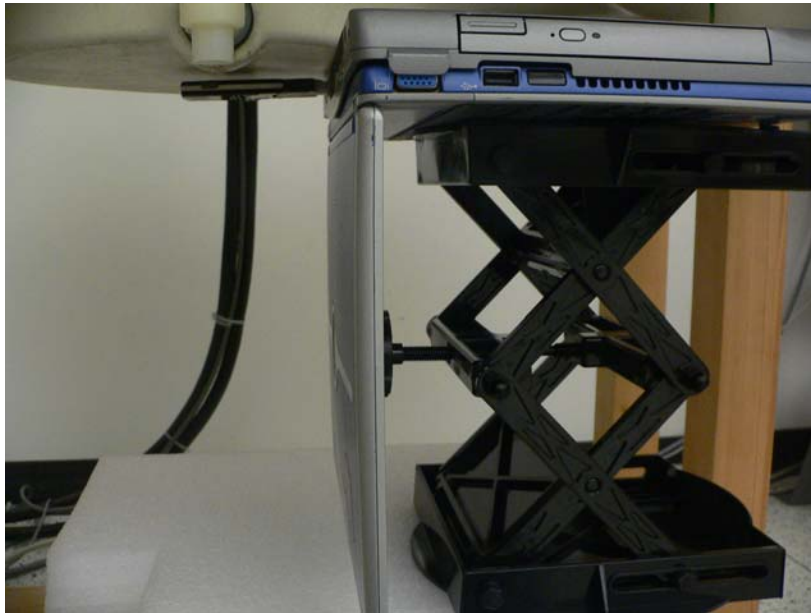
Acer laptop with DUT back touching to the flat phantom



IBM laptop with DUT back touching to the flat phantom



Dell laptop with DUT back touching to the flat phantom



APPENDIX H – EUT & ACCESSORIES PHOTOS

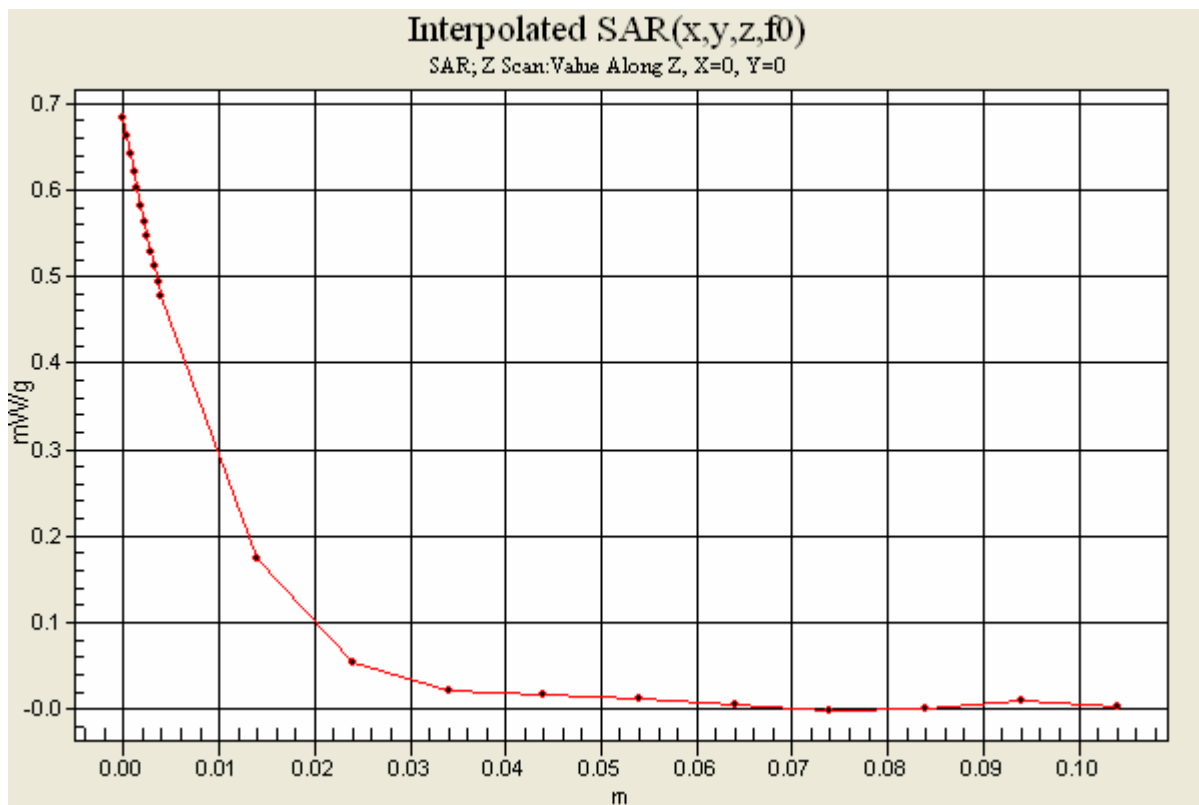
EUT - Top View



EUT - Rear View



APPENDIX I – Z-Axis



APPENDIX J - INFORMATIVE REFERENCES

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Appendix – speag Equipment Evaluation Report

Schmid & Partner Engineering AG

s p e a g

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 info@speag.com, http://www.speag.com

EVALUATION REPORT

DAE 4 SN:	456
CUSTOMER:	BACL USA
CONTACT PERSON:	hans.mellberg@baclicorp.com
DELIVERY DATE OF DAE 662:	17.09.2001
DATE OF LAST CALIBRATION:	Oct. 2005
DATE OF INITIAL COMPLAINT:	Nov.15.2006
DATE OF RECEIVING AT SPEAG	16.11.2006

DESCRIPTION OF NONCONFORMANCE, DEFECT OR UNDESIRABLE CONDITION:

Support e-mail 7727

The calibration on this DAE expired on Oct. 18.2006. The customer has used this DAE SN 456 for compliance measurements beyond the validity of the calibration. The customer therefore requested a verification measurement to be performed upon receiving the unit. This verification measurement shall show if the measurements taken during the above mentioned time period are valid or not.

FIRST RESPONSE BY SPEAG:

SPEAG submitted a quotation for these additional measurements.

EVALUATION OF NONCONFORMANCE BY Schmid & Partner Engineering AG:

Observation / Troubleshooting

A calibration measurement with the DAE SN: 456 was performed using the gain factors from the previous Oct.2005 calibration. The results are shown below

Gain Factors:

Calibration Factors	X	Y	Z
High Range	404.472 ± 0.1% (k=2)	403.935 ± 0.1% (k=2)	404.012 ± 0.1% (k=2)
Low Range	3.93535 ± 0.7% (k=2)	3.94181 ± 0.7% (k=2)	3.91679 ± 0.7% (k=2)

1. DC Voltage Linearity

High Range	Input (µV)	Reading (µV)	Error (%)
Channel X + Input	20000	19999.7	0.00
Channel X + Input	2000	20007.16	0.04
Channel X - Input	2000	-20003.70	0.02
Channel Y + Input	20000	19999.5	-0.01
Channel Y + Input	2000	20004.13	0.02
Channel Y - Input	2000	-20005.64	0.03
Channel Z + Input	20000	19999.4	0.00
Channel Z + Input	2000	20003.74	0.02
Channel Z - Input	2000	-20005.05	0.03

TOLERANCE
<0.05%

Low Range	Input (μA)	Reading (μA)	Error (%)
Channel X + Input	2000	2000.0	0.00
Channel X + Input	200	199.66	-0.17
Channel X - Input	200	-200.42	0.21
Channel Y + Input	2000	1999.9	0.00
Channel Y + Input	200	199.99	-0.31
Channel Y - Input	200	-200.76	0.38
Channel Z + Input	2000	2000.3	0.02
Channel Z + Input	200	198.96	-0.62
Channel Z - Input	200	-201.29	0.64

— TOLERANCE
<1.5%

CONCLUSION OF Schmid & Partner Engineering AG:

The accuracy verification measurement performed on DAE SN: 456 passed. The DAE is still in tolerance.

EVALUATION CONDUCTED BY:

EVALUATION APPROVED BY:

DATE: 21.11.2006

DATE: 21.11.2006