Test Laboratory: AUDEN TECHNO CORP. RF Testing Lab Date/Time: 06/30/03 07:07:05

Flat BenQ C260 PCS Ch25

DUT: BenQ C260 Close; Type: Single-Mode Cellular Phone (PCS CDMA); Serial: 71380001
Program: SAR-00679

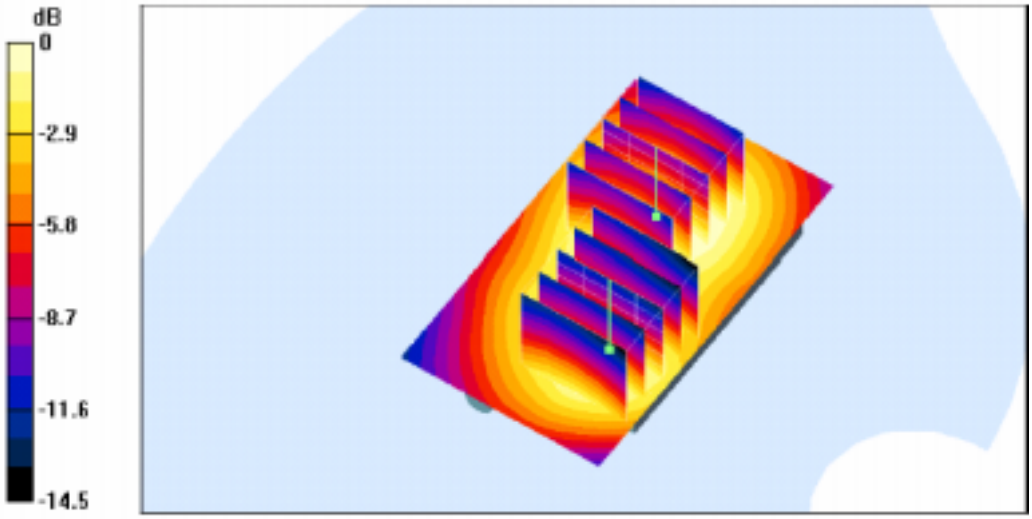
Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium: Body 1800MHz (σ = 1.50426 mho/m, ε_r = 53.3746, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1753; ConvF(4.9, 4.9, 4.9); Calibrated: 5/23/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 12/18/2002
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Flat/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 15.8 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.472 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.672 W/kg
SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.292 mW/g
Reference Value = 15.8 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.481 mW/g

Flat/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.586 W/kg
SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.224 mW/g
Reference Value = 15.8 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.393 mW/g



0 dB = 0.393mW/g

SAR Test Result for Flat Position – Channel 25

Test Laboratory: AUDEN TECHNO CORP. RF Testing Lab Date/Time: 06/30/03 07:42:54

Flat BenQ C260 PCS Ch600

DUT: BenQ C260 Close; Type: Single-Mode Cellular Phone (PCS CDMA); Serial: 71380001
Program: SAR-00679

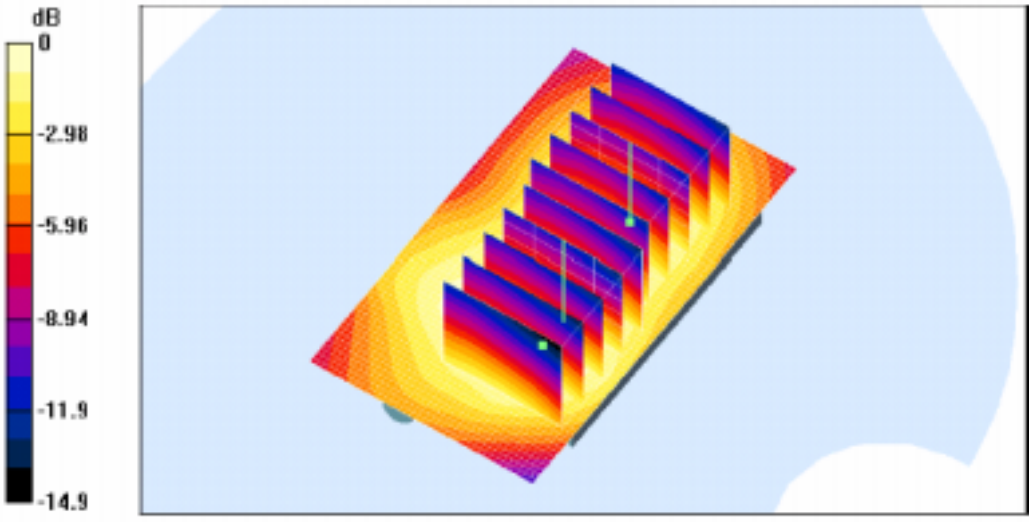
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Body 1800MHz (σ = 1.53221 mho/m, ε_r = 53.2647, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1753; ConvF(4.9, 4.9, 4.9); Calibrated: 5/23/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 12/18/2002
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Flat/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 17.6 V/m
Power Drift = -0.1 dB
Maximum value of SAR = 0.464 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.618 W/kg
SAR(1 g) = 0.415 mW/g; SAR(10 g) = 0.267 mW/g
Reference Value = 17.6 V/m
Power Drift = -0.1 dB
Maximum value of SAR = 0.439 mW/g

Flat/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.607 W/kg
SAR(1 g) = 0.399 mW/g; SAR(10 g) = 0.258 mW/g
Reference Value = 17.6 V/m
Power Drift = -0.1 dB
Maximum value of SAR = 0.42 mW/g



0 dB = 0.42mW/g

SAR Test Result for Flat Position – Channel 600

Test Laboratory: AUDEN TECHNO CORP. RF Testing Lab Date/Time: 06/30/03 08:21:45

Flat BenQ C260 PCS Ch1175

DUT: BenQ C260 Close; Type: Single-Mode Cellular Phone (PCS CDMA); Serial: 71380001
Program: SAR-00679

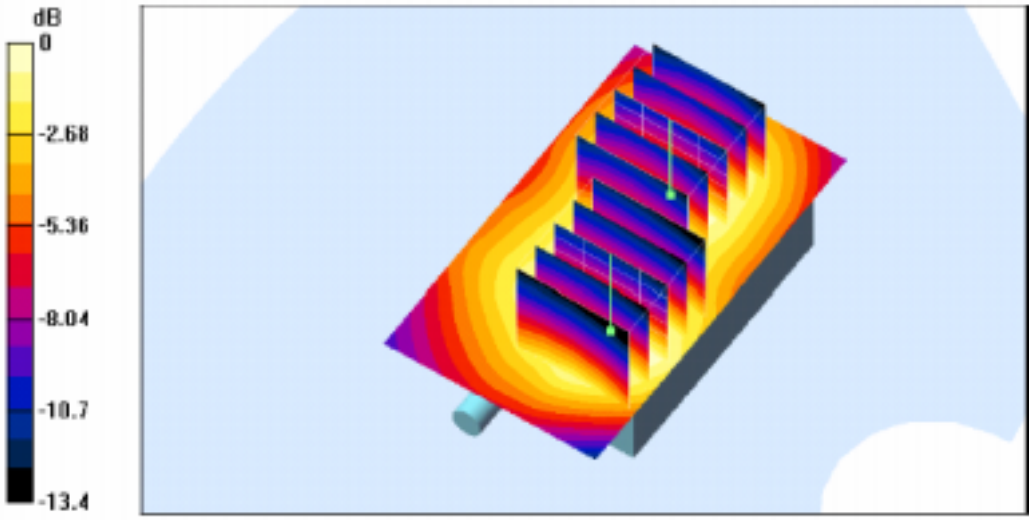
Communication System: PCS 1900; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: Body 1800MHz (σ = 1.56285 mho/m, ε_r = 53.2203, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1753; ConvF(4.9, 4.9, 4.9); Calibrated: 5/23/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 12/18/2002
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Flat/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 16.2 V/m
Power Drift = -0.06 dB
Maximum value of SAR = 0.449 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.645 W/kg
SAR(1 g) = 0.4 mW/g; SAR(10 g) = 0.241 mW/g
Reference Value = 16.2 V/m
Power Drift = -0.06 dB
Maximum value of SAR = 0.423 mW/g

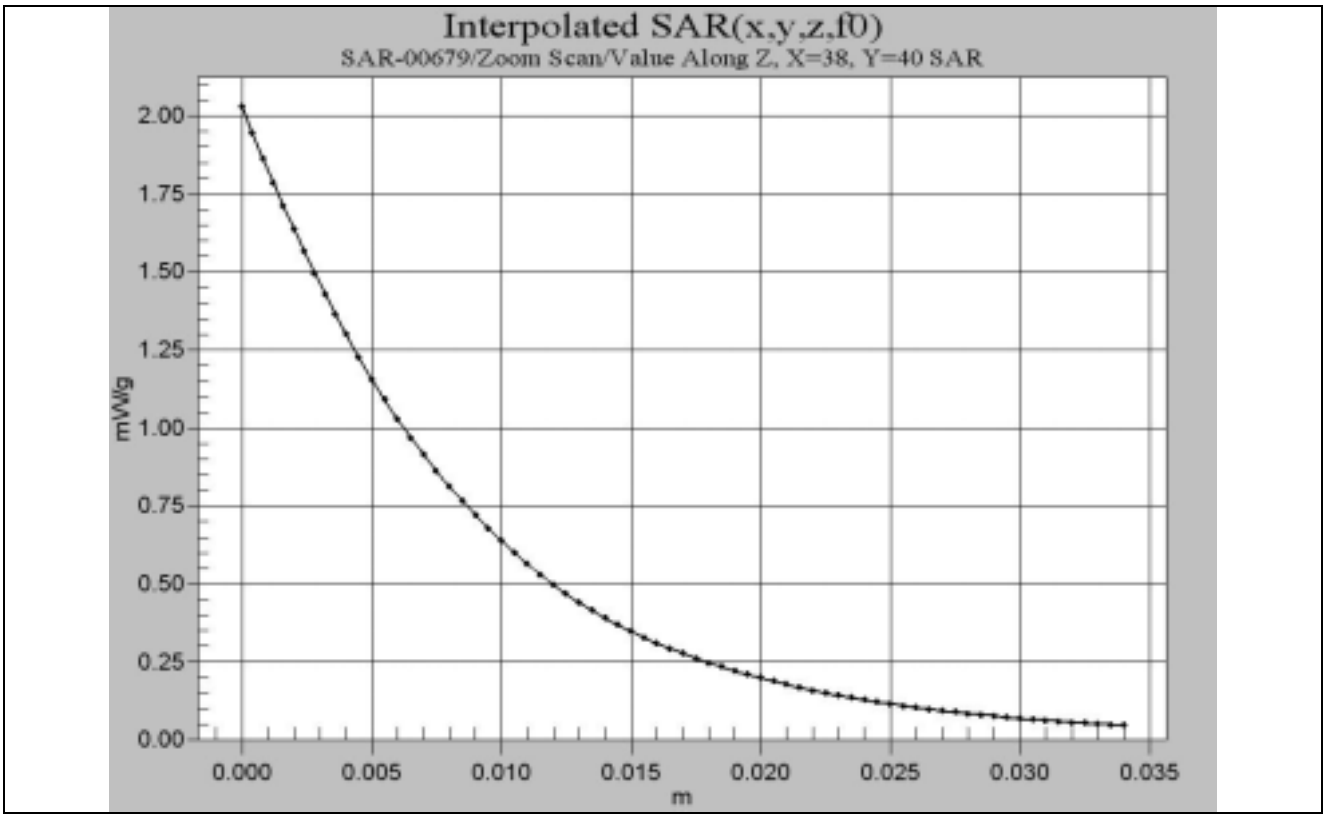
Flat/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 0.554 W/kg
SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.236 mW/g
Reference Value = 16.2 V/m
Power Drift = -0.06 dB
Maximum value of SAR = 0.387 mW/g



0 dB = 0.387mW/g

SAR Test Result for Flat Position – Channel 1175

Z-axis Plot for Maximum SAR



SAR Test Result for Left Cheek Position – Channel 600

Appendix C – Dipole Calibration

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

Client Auden

CALIBRATION CERTIFICATE

Object(s)	D1800V2 - SN:265
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	May 14, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
RF generator R&S SML-03	100698	27-Mar-2002 (R&S, No. 20-82388)	In house check: Mar-05
Power sensor HP 8481A	MY41092317	18-Oct-02 (Agilent, No. 20021018)	Oct-04
Power sensor HP 8481A	US37292783	30-Oct-02 (METAS, No. 252-0236)	Oct-03
Power meter EPM E442	GB37480704	30-Oct-02 (METAS, No. 252-0236)	Oct-03
Network Analyzer HP 8753E	US38432426	3-May-00 (Agilent, No. 8702K0644002)	In house check: May 03

	Name	Function	Signature
Calibrated by:	Judith Mueller	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: May 14, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

合格 92.5.14 專用章

SSD-KP0301061-A

Page 1 (1)

Schmid & Partner Engineering AG
s p e a g
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

DASY

Dipole Validation Kit

Type: D1800V2

Serial: 265

Manufactured: March 5, 2000
Calibrated: May 14, 2003

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with head simulating solution of the following electrical parameters at 1800 MHz:

Relative Dielectricity	**39.2**	± 5%
Conductivity	**1.36 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 5.3 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue: **38.2 mW/g** ± 16.8 % (k=2)[1]

averaged over 10 cm^3 (10 g) of tissue: **20.2 mW/g** ± 16.2 % (k=2)[1]

[1] validation uncertainty

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.165 ns**	(one direction)
Transmission factor:	**0.998**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 1800 MHz:	Re{Z} = **48.3 Ω**
	Im {Z} = **-5.6 Ω**
Return Loss at 1800 MHz	**-24.5 dB**

4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with body simulating glycol solution of the following electrical parameters at 1800 MHz:

Relative Dielectricity	**51.6**	± 5%
Conductivity	**1.49 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 5.0 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

5. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**37.6 mW/g** ± 16.8 % (k=2)[2]
averaged over 10 cm^3 (10 g) of tissue:	**20.0 mW/g** ± 16.2 % (k=2)[2]

6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 1800 MHz:	Re{Z} = **44.4 Ω**
	Im {Z} = **-5.9 Ω**
Return Loss at 1800 MHz	**-21.3 dB**

7. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

8. Design

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.

9. Power Test

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

[2] validation uncertainty

Date/Time: 05/12/03 14:45:52

Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN265_SN1507_HSL1800_120503.da4

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN265
Program: Dipole Calibration

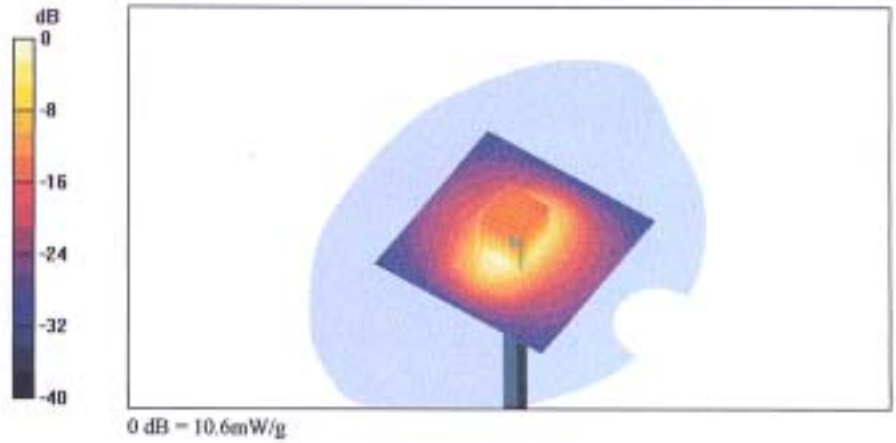
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: HSL 1800 MHz (σ = 1.36 mho/m, ε_r = 39.22, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

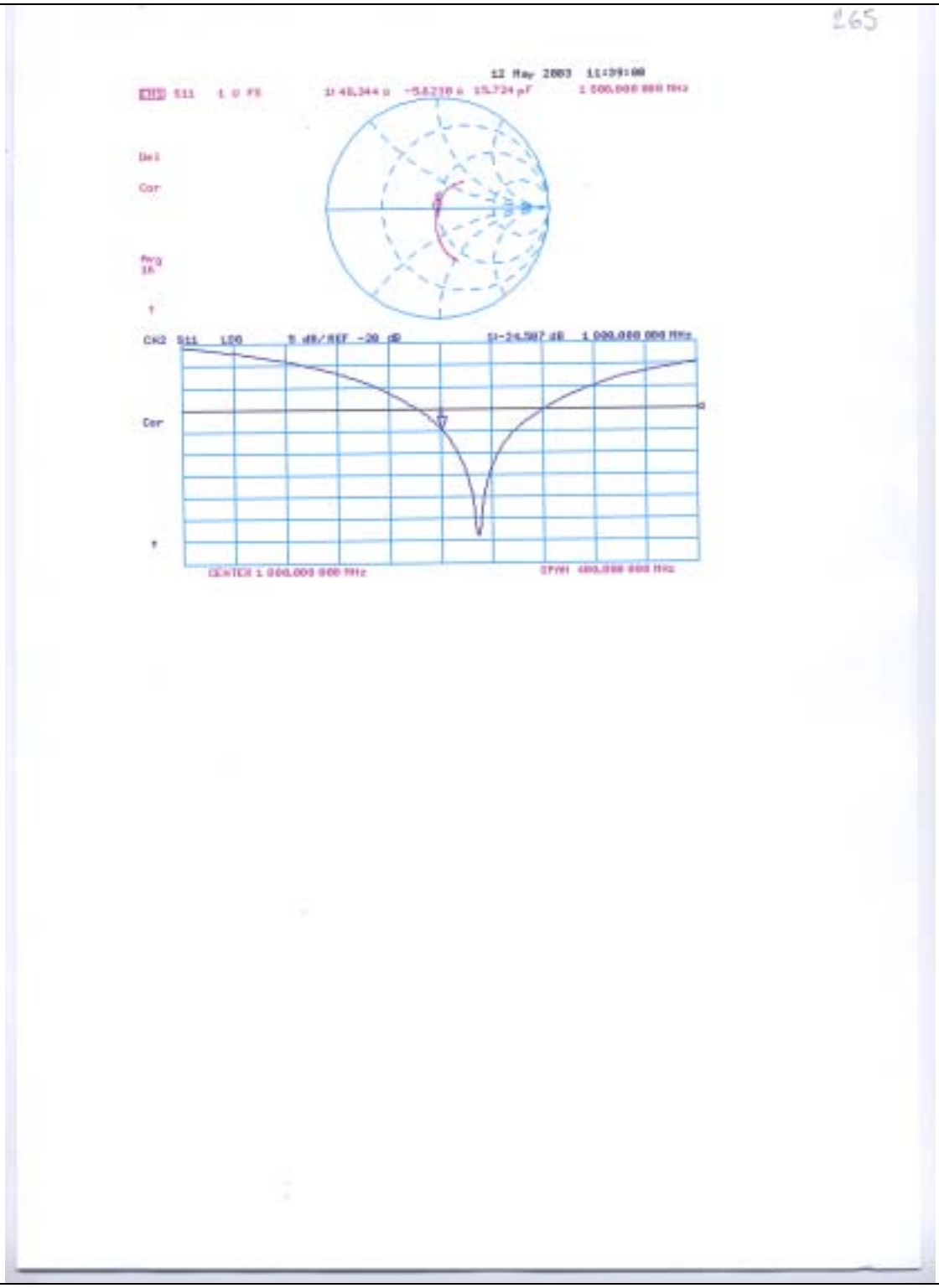
- Probe: ET3DV6 - SN1507; ConvF(5.3, 5.3, 5.3); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 93.1 V/m
Power Drift = 0.05 dB
Maximum value of SAR = 10.5 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.55 mW/g; SAR(10 g) = 5.06 mW/g
Reference Value = 93.1 V/m
Power Drift = 0.05 dB
Maximum value of SAR = 10.6 mW/g



0 dB = 10.6mW/g



Date/Time: 05/14/03 12:24:50

Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN265_SN1507_M1800_140503da4.da4

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN265
Program: Dipole Calibration

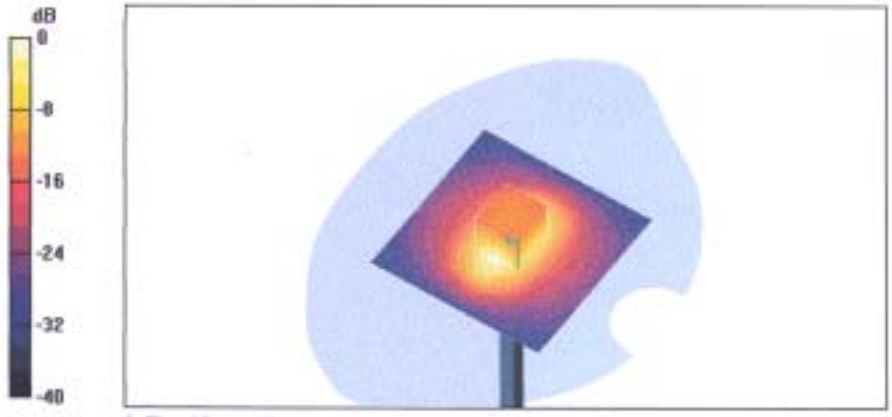
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: Muscle 1800 MHz (σ = 1.49 mho/m, ε_r = 51.55, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

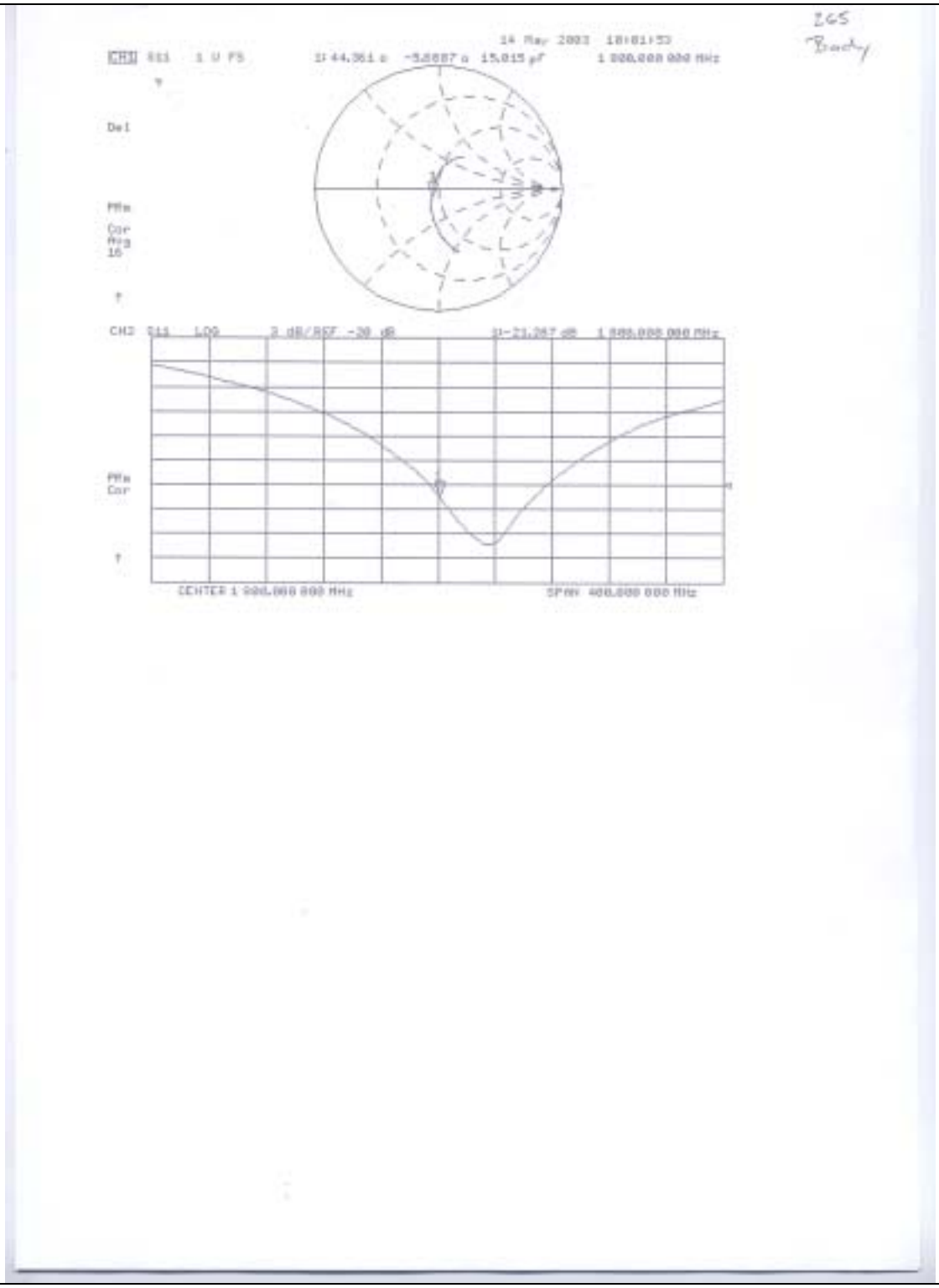
- Probe: ET3DV6 - SN1507; ConvF(5, 5, 5); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 89.7 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 10.5 mW/g

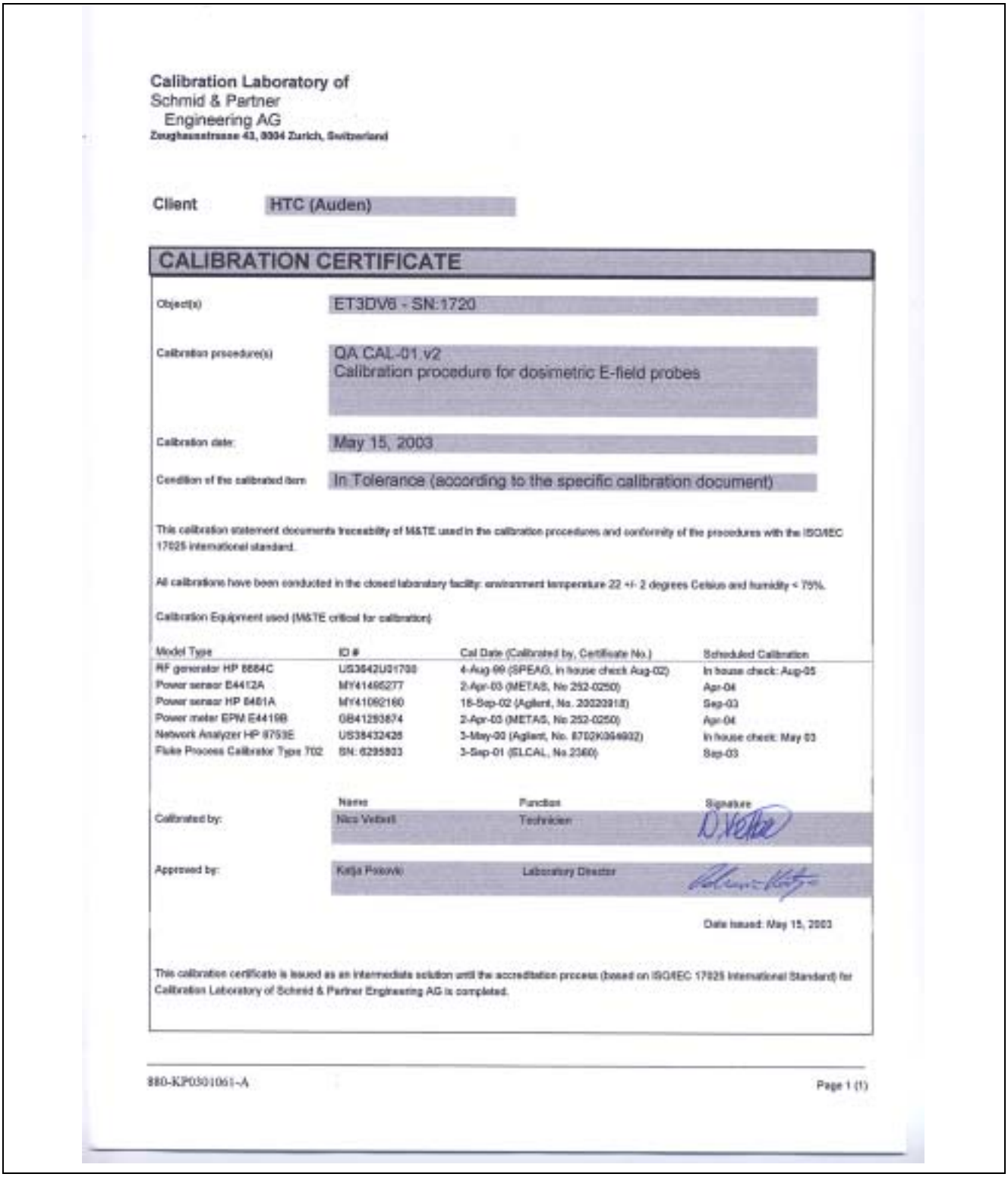
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 9.39 mW/g; SAR(10 g) = 5.01 mW/g
Reference Value = 89.7 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 10.5 mW/g



0 dB = 10.5mW/g


14 May 2003 18:01:53
CH1 S11 1 U FS
1: 44.361 Ω -5.8687 Ω 15.015 pF
1 000.000 000 MHz
Del
Phase
Cor
Avg
16
CH2 S11 LOG 2 dB/REF -20 dB
1: -21.267 dB 1 000.000 000 MHz
Phase
Cor
CENTER 1 000.000 000 MHz
SPAN 400.000 000 MHz

Appendix D – Probe Calibration



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

Client HTC (Auden)

CALIBRATION CERTIFICATE

Object(s) ET3DV6 - SN:1720

Calibration procedure(s) QA CAL-01.v2
Calibration procedure for dosimetric E-field probes

Calibration date: May 15, 2003

Condition of the calibrated item In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor HP 8481A	MY41092160	18-Sep-02 (Agilent, No. 20020918)	Sep-03
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Network Analyzer HP 8753E	US38432426	3-May-00 (Agilent, No. 8702K004902)	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01 (SLCAL, No.2360)	Sep-03

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date Issued: May 15, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

880-KP0301061-A Page 1 (1)

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ET3DV6

SN:1720

Manufactured:	August 26, 2002
Last calibration:	October 2, 2002
Recalibrated:	May 15, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1720 May 15, 2003

DASY - Parameters of Probe: ET3DV6 SN:1720

Sensitivity in Free Space

Diode Compression

NormX	1.68 $\mu V/(V/m)^2$	DCP X	95	mV
NormY	1.87 $\mu V/(V/m)^2$	DCP Y	95	mV
NormZ	1.78 $\mu V/(V/m)^2$	DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid

Head 900 MHz ε_r = 41.5 ± 5% σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	6.5 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.5 ± 9.5% (k=2)	Alpha	0.41
ConvF Z	6.5 ± 9.5% (k=2)	Depth	2.51

Head 1800 MHz ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.2 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.2 ± 9.5% (k=2)	Alpha	0.50
ConvF Z	5.2 ± 9.5% (k=2)	Depth	2.70

Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	10.7	6.0
SAR_{be} [%]	With Correction Algorithm	0.4	0.6

Head 1800 MHz Typical SAR gradient: 10 % per mm

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	14.3	9.6
SAR_{be} [%]	With Correction Algorithm	0.2	0.1

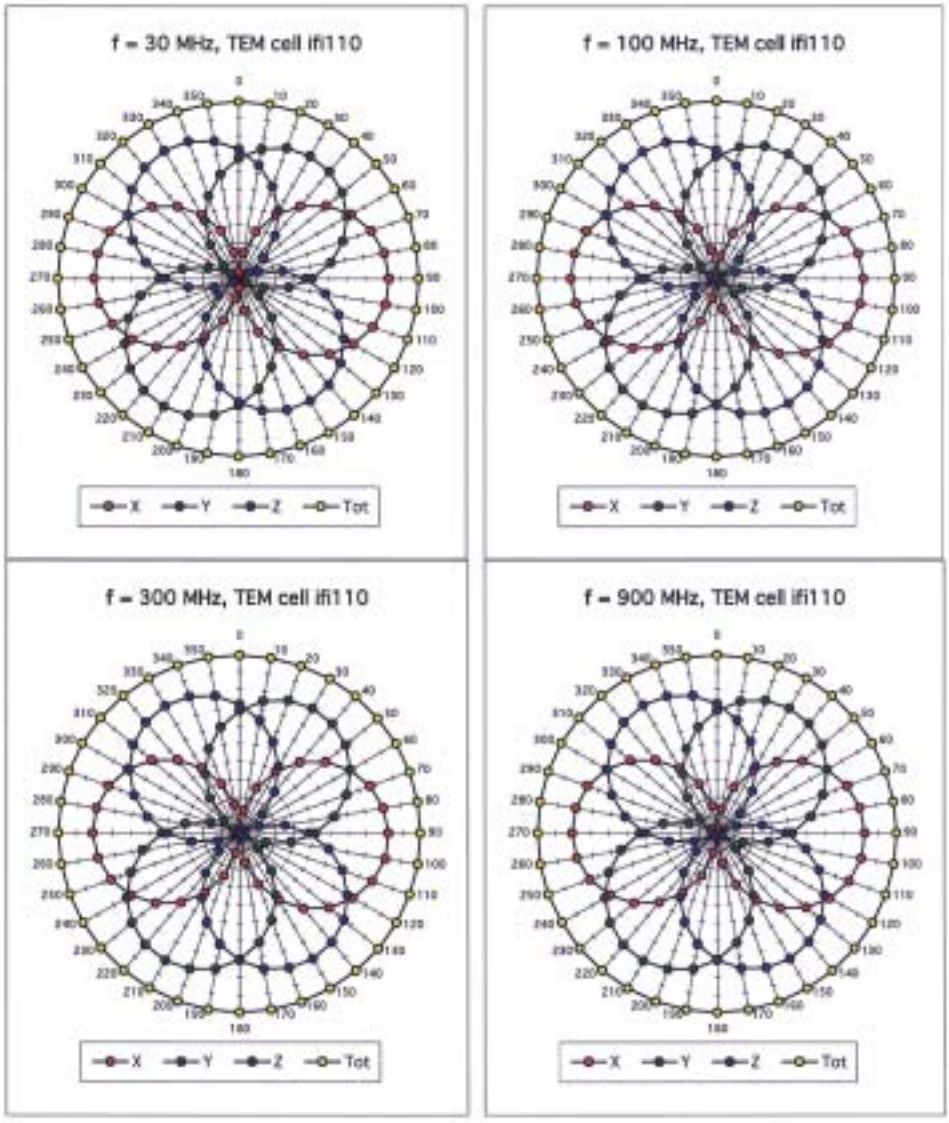
Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.5 ± 0.2	mm

Page 2 of 10

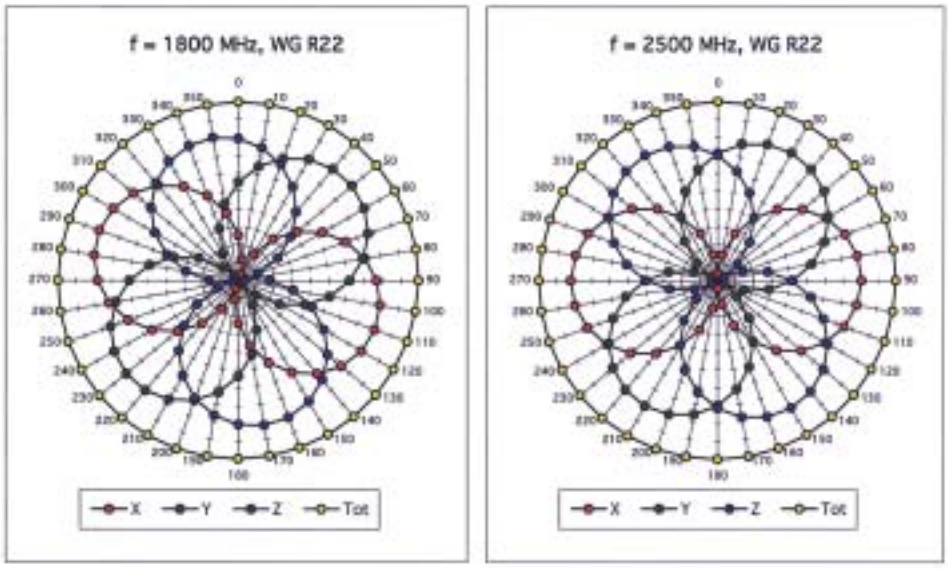
ET3DV6 SN:1720 May 15, 2003

Receiving Pattern (ϕ), θ = 0°

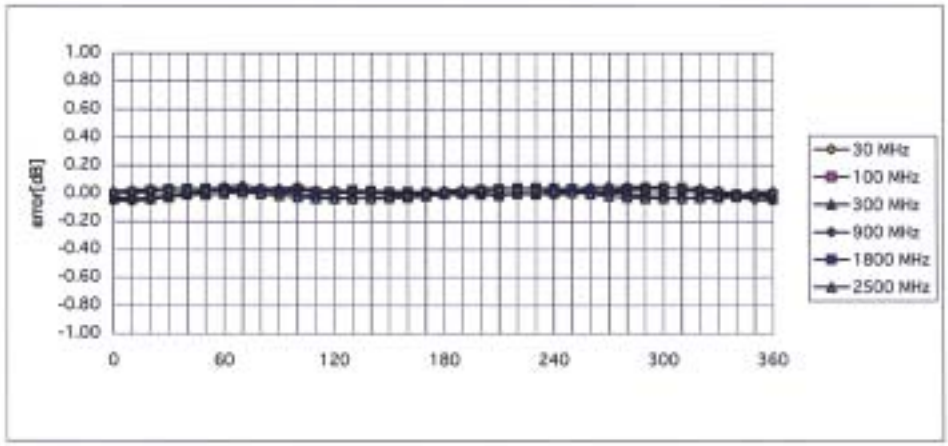


Page 3 of 10

ET3DV6 SN:1720 May 15, 2003



Isotropy Error (ϕ), θ = 0°

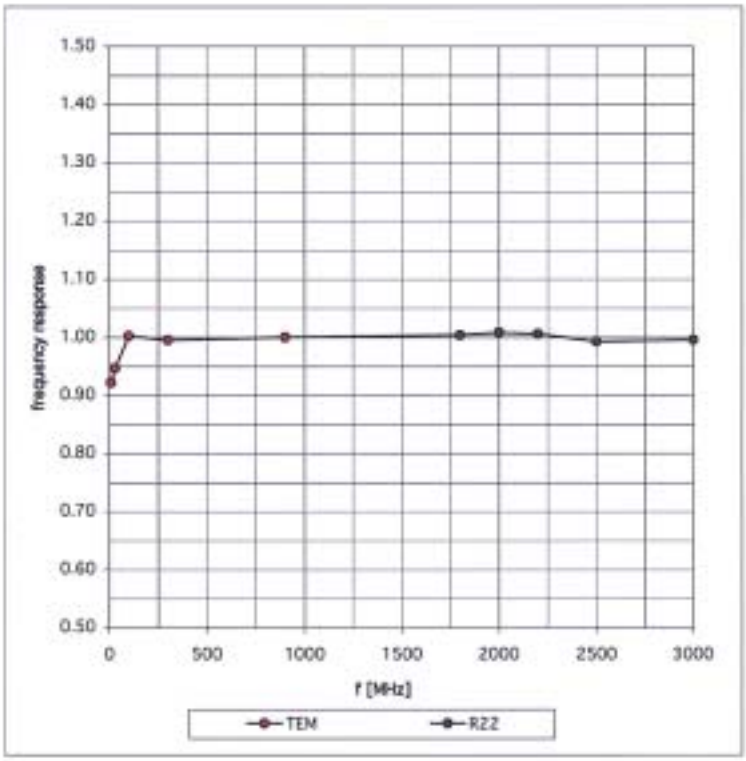


Page 4 of 10

ET3DV6 SN:1720 May 15, 2003

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)

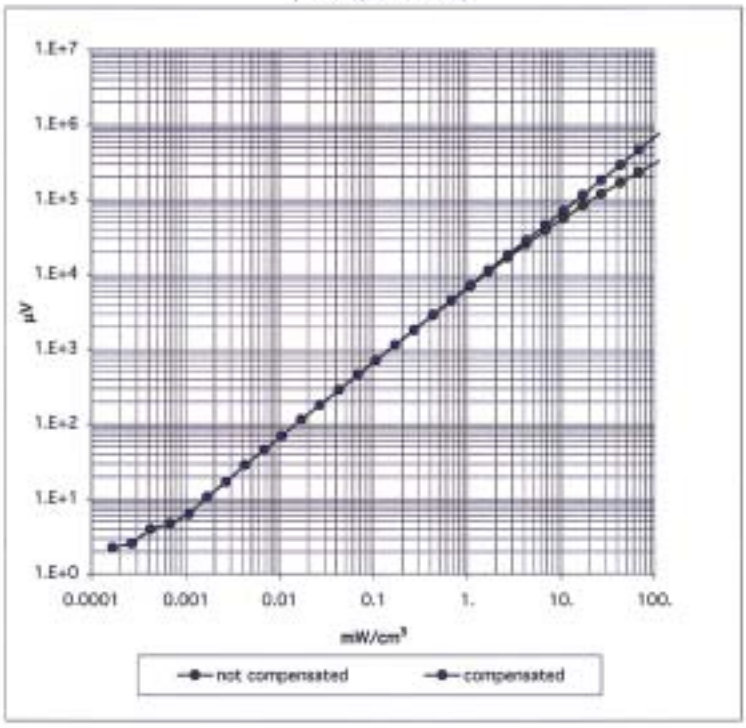


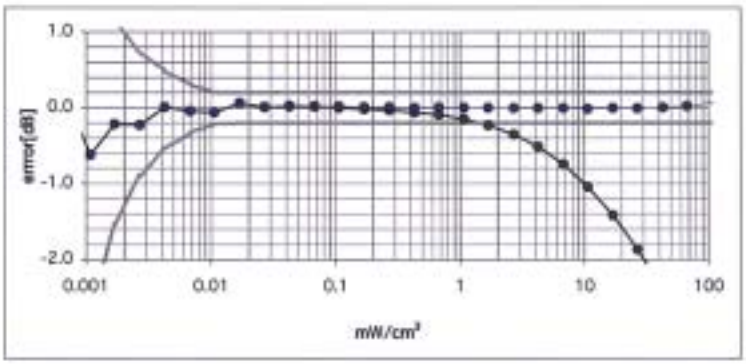
Page 5 of 10

ET3DV6 SN:1720 May 15, 2003

Dynamic Range f(SAR_{brain})

(Waveguide R22)

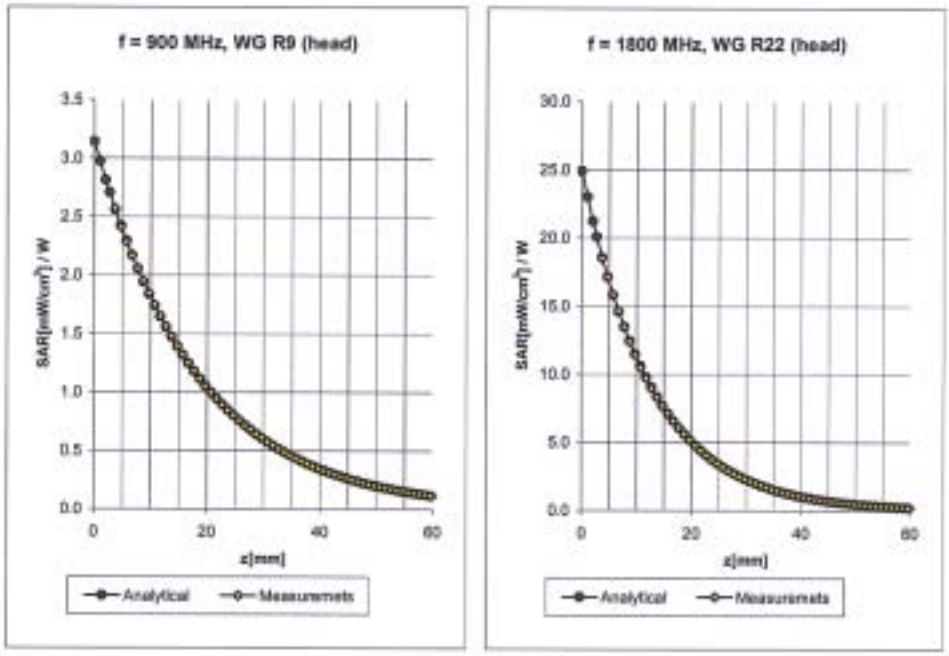




Page 6 of 10

ET3DV6 SN:1720 May 15, 2003

Conversion Factor Assessment



Head 900 MHz ε_r = 41.5 ± 5% σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	6.5 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.5 ± 9.5% (k=2)	Alpha	0.41
ConvF Z	6.5 ± 9.5% (k=2)	Depth	2.51

Head 1800 MHz ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

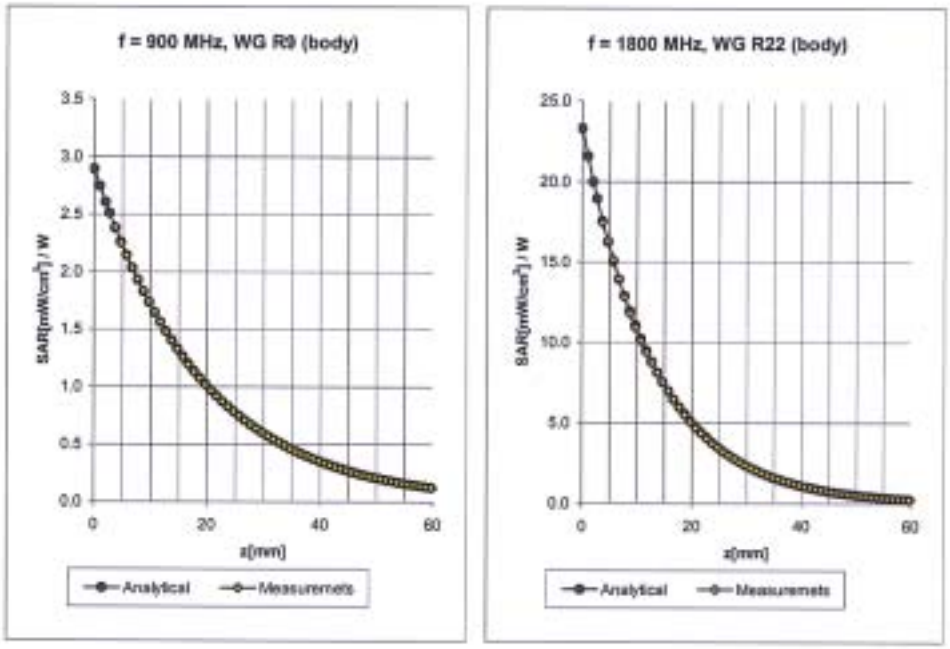
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.2 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.2 ± 9.5% (k=2)	Alpha	0.50
ConvF Z	5.2 ± 9.5% (k=2)	Depth	2.70

Page 7 of 10

ET3DV6 SN:1720 May 15, 2003

Conversion Factor Assessment



Body 900 MHz ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	6.3 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.3 ± 9.5% (k=2)	Alpha	0.42
ConvF Z	6.3 ± 9.5% (k=2)	Depth	2.54

Body 1800 MHz ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m

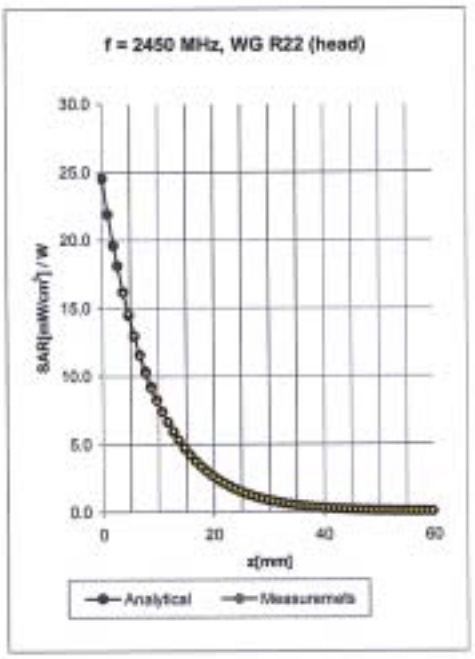
Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

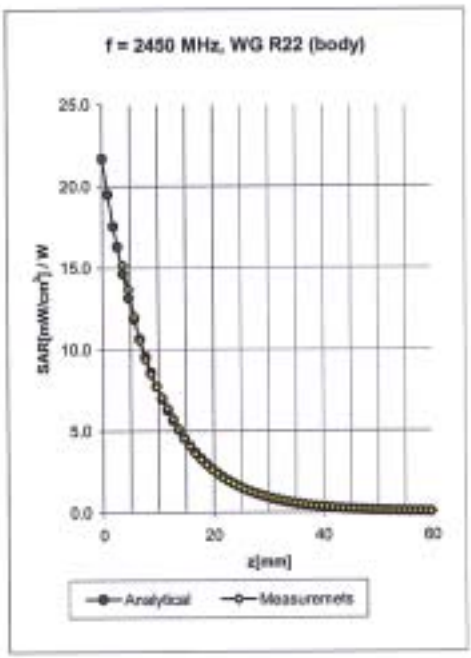
ConvF X	4.8 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	4.8 ± 9.5% (k=2)	Alpha	0.57
ConvF Z	4.8 ± 9.5% (k=2)	Depth	2.63

Page 8 of 10

ET3DV6 SN:1720 May 15, 2003

Conversion Factor Assessment





Head	2450	MHz	ε_r = 39.2 ± 5%	σ = 1.80 ± 5% mho/m

Valid for f=2400-2500 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	4.8 ± 8.9% (k=2)	Boundary effect:	
ConvF Y	4.8 ± 8.9% (k=2)	Alpha	1.01
ConvF Z	4.8 ± 8.9% (k=2)	Depth	1.85

Body	2450	MHz	ε_r = 52.7 ± 5%	σ = 1.95 ± 5% mho/m

Valid for f=2400-2500 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

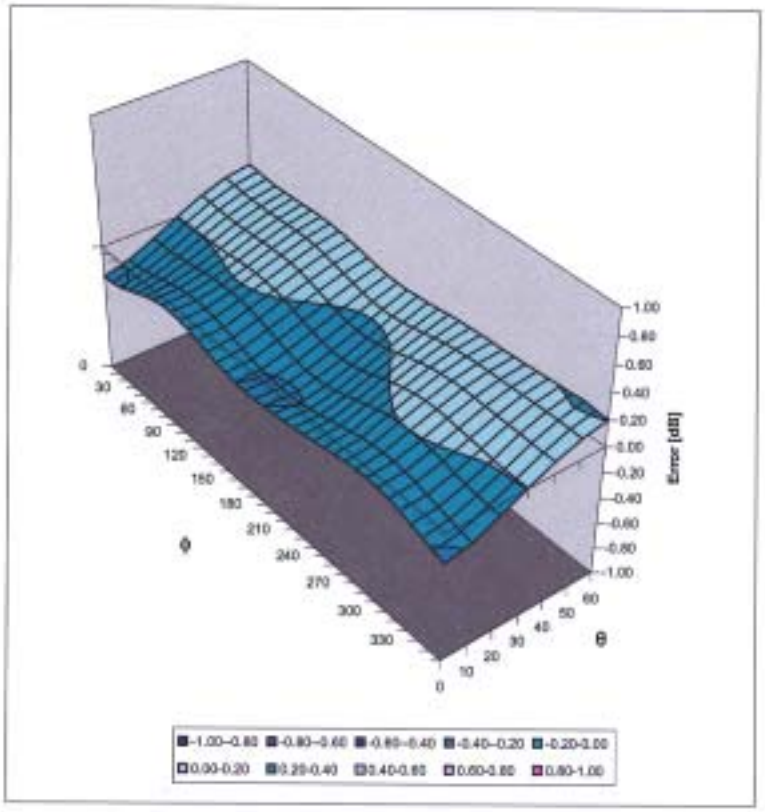
ConvF X	4.4 ± 8.9% (k=2)	Boundary effect:	
ConvF Y	4.4 ± 8.9% (k=2)	Alpha	1.20
ConvF Z	4.4 ± 8.9% (k=2)	Depth	1.60

Page 9 of 10

ET3DV6 SN:1720 May 15, 2003

Deviation from Isotropy in HSL

Error (θ,φ), f = 900 MHz



Page 10 of 10

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

Client JWIT (Auden)

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1753
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date	May 23, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (Agilent, No. 20020918)	Sep-03
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Network Analyzer HP 8753E	US38432426	3-May-03 (Agilent, No. 6702+064602)	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01 (ELCAL, No.2360)	Sep-03

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

Date issued: May 24, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

880-KP0301061-A Page 1 (1)

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ET3DV6

SN:1753

Manufactured: April 15, 2003
Last calibration: May 23, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1753 **May 23, 2003**

DASY - Parameters of Probe: ET3DV6 SN:1753

Sensitivity in Free Space

Diode Compression

NormX	1.59 μV/(V/m)²	DCP X	92	mV
NormY	1.88 μV/(V/m)²	DCP Y	92	mV
NormZ	1.92 μV/(V/m)²	DCP Z	92	mV

Sensitivity in Tissue Simulating Liquid

Head 900 MHz ε_r = 41.5 ± 5% σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	6.9 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.9 ± 9.5% (k=2)	Alpha	0.35
ConvF Z	6.9 ± 9.5% (k=2)	Depth	2.63

Head 1800 MHz ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.4 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.4 ± 9.5% (k=2)	Alpha	0.52
ConvF Z	5.4 ± 9.5% (k=2)	Depth	2.45

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	9.8	5.5
SAR_{be} [%]	With Correction Algorithm	0.5	0.6

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

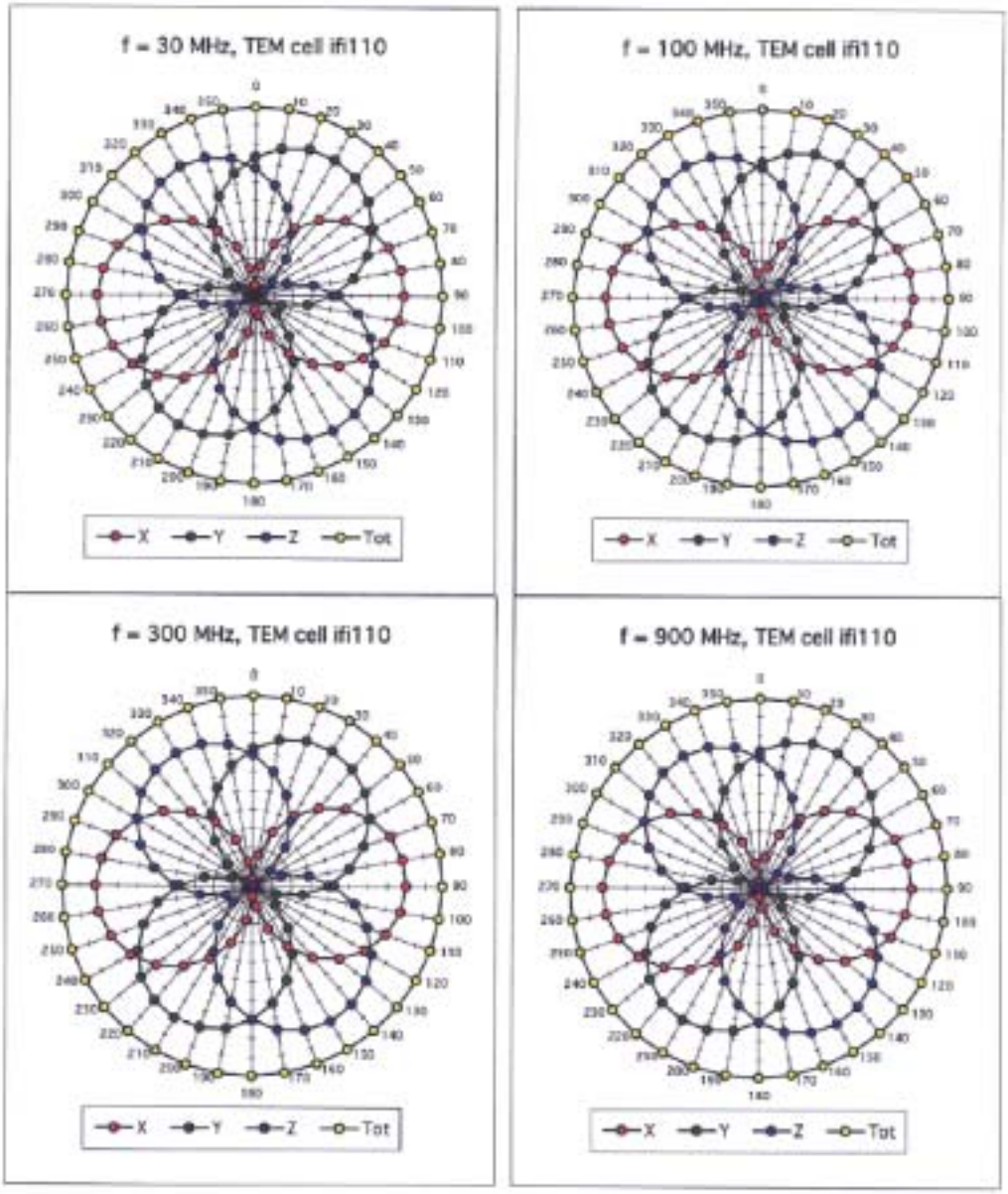
Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	12.8	8.5
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.5 ± 0.2	mm

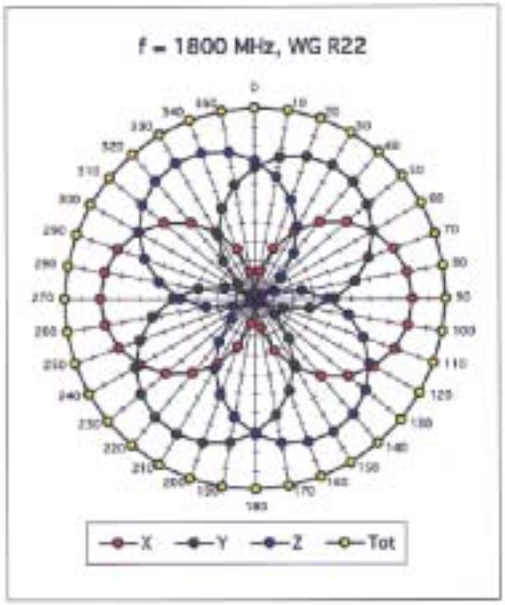
ET3DV6 SN:1753 May 23, 2003

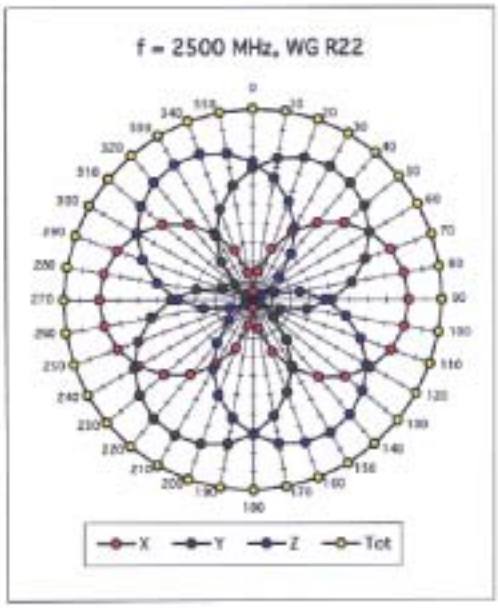
Receiving Pattern (ϕ), θ = 0°



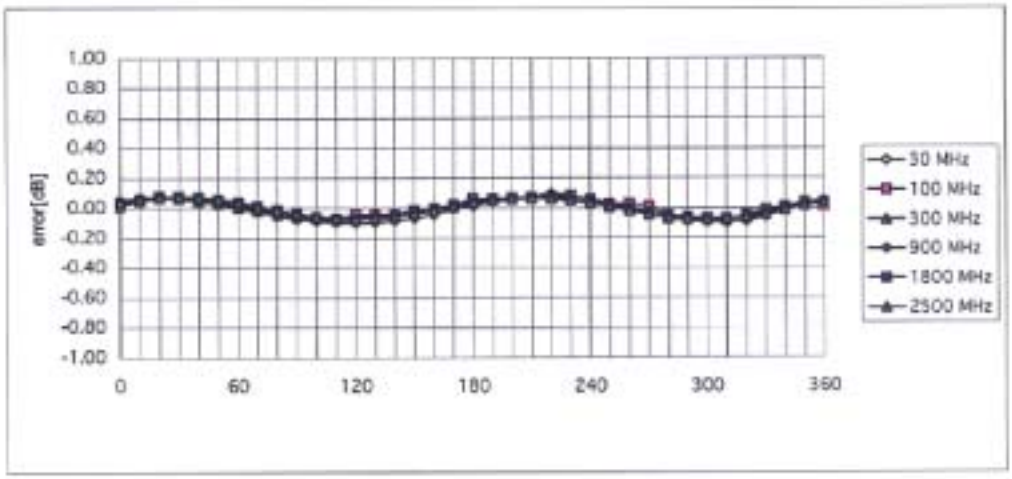
Page 3 of 10

ET3DV6 SN:1753 May 23, 2003





Isotropy Error (ϕ), θ = 0°

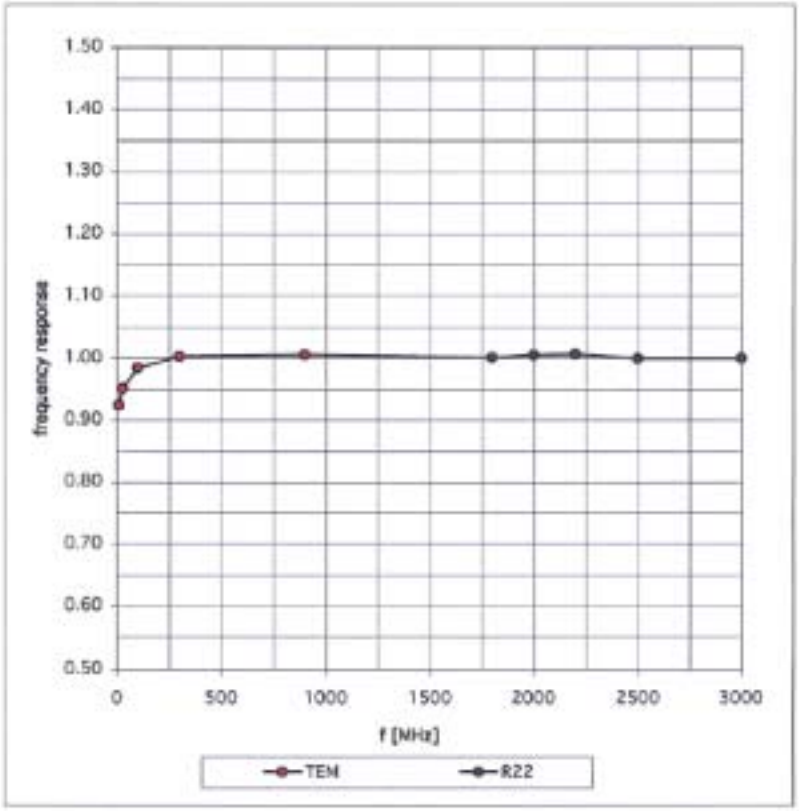


Page 4 of 10

ET3DV6 SN:1753 May 23, 2003

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)

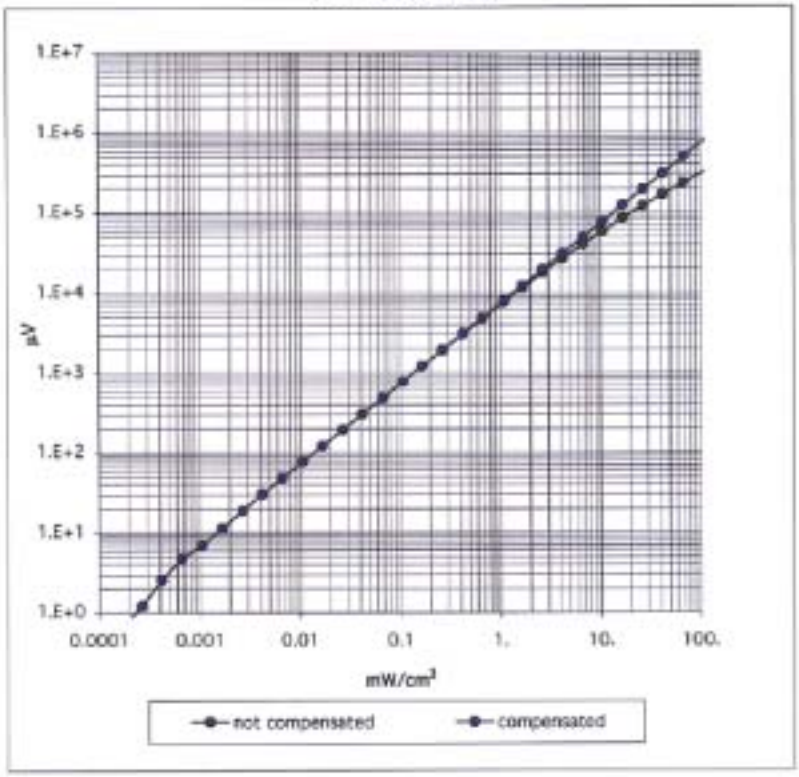


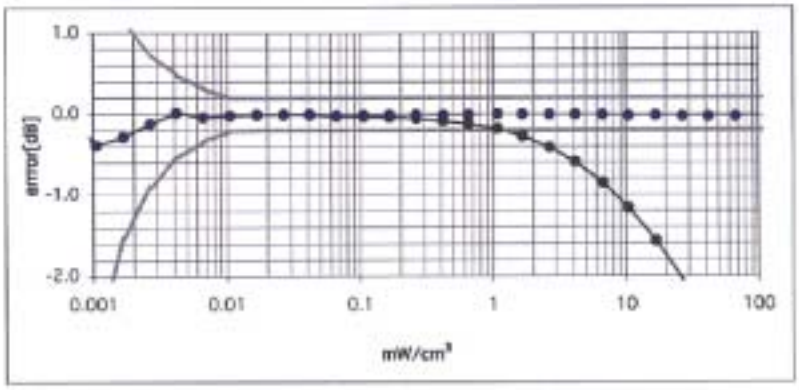
Page 5 of 10

ET3DV6 SN:1753 May 23, 2003

Dynamic Range f(SAR_{brain})

(Waveguide R22)

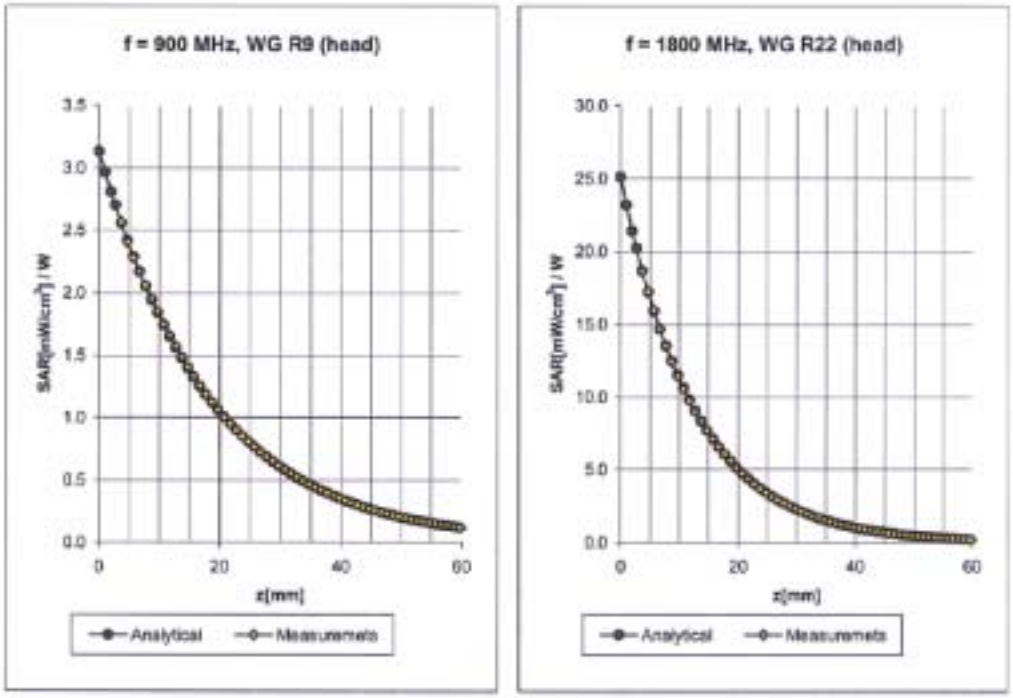




Page 6 of 10

ET3DV6 SN:1753 May 23, 2003

Conversion Factor Assessment



Head	900 MHz	ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	6.9 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.9 ± 9.5% (k=2)	Alpha	0.35
ConvF Z	6.9 ± 9.5% (k=2)	Depth	2.63

Head	1800 MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m

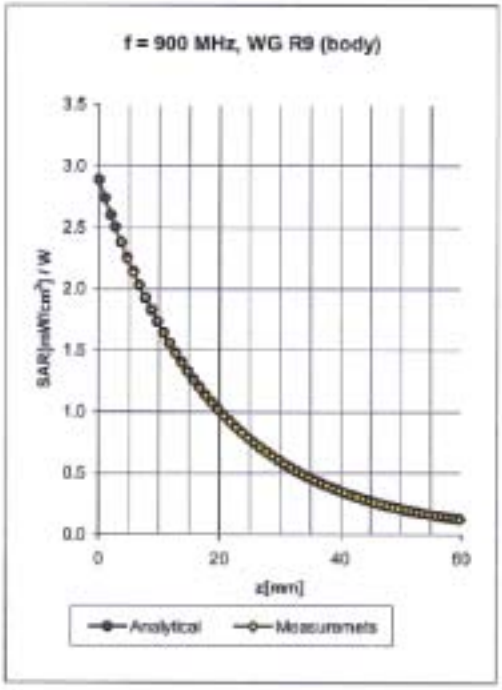
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

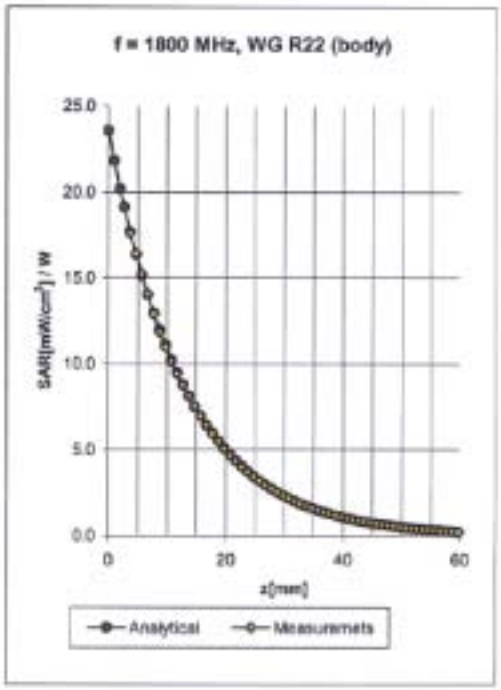
ConvF X	5.4 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.4 ± 9.5% (k=2)	Alpha	0.52
ConvF Z	5.4 ± 9.5% (k=2)	Depth	2.45

Page 7 of 10

ET3DV6 SN:1753 May 23, 2003

Conversion Factor Assessment





Body 900 MHz ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	6.6 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.6 ± 9.5% (k=2)	Alpha	0.39
ConvF Z	6.6 ± 9.5% (k=2)	Depth	2.46

Body 1800 MHz ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m

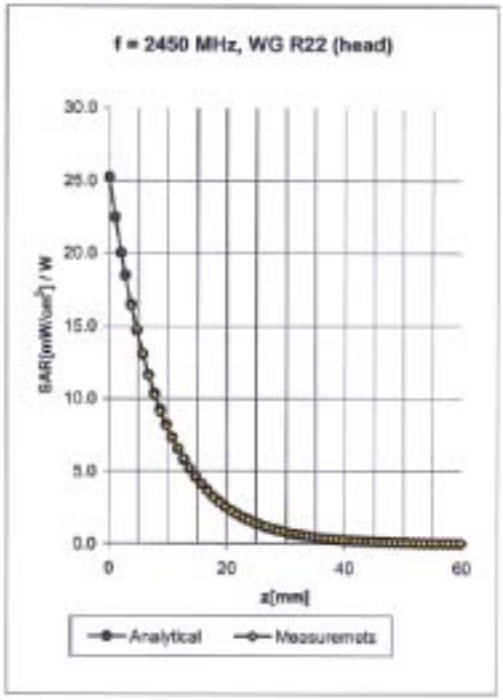
Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

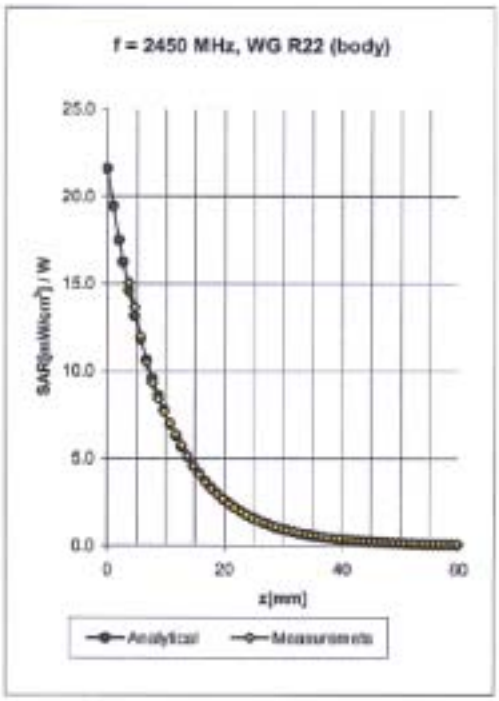
ConvF X	4.9 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	4.9 ± 9.5% (k=2)	Alpha	0.55
ConvF Z	4.9 ± 9.5% (k=2)	Depth	2.59

Page 8 of 10

ET3DV6 SN:1753 May 23, 2003

Conversion Factor Assessment





Head	2450	MHz	ε_r = 39.2 ± 5%	σ = 1.80 ± 5% mho/m

Valid for f=2400-2500 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.0 ± 8.9% (k=2)	Boundary effect:	
ConvF Y	5.0 ± 8.9% (k=2)	Alpha	0.96
ConvF Z	5.0 ± 8.9% (k=2)	Depth	1.90

Body	2450	MHz	ε_r = 52.7 ± 5%	σ = 1.95 ± 5% mho/m

Valid for f=2400-2500 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	4.6 ± 8.9% (k=2)	Boundary effect:	
ConvF Y	4.6 ± 8.9% (k=2)	Alpha	1.55
ConvF Z	4.6 ± 8.9% (k=2)	Depth	1.35

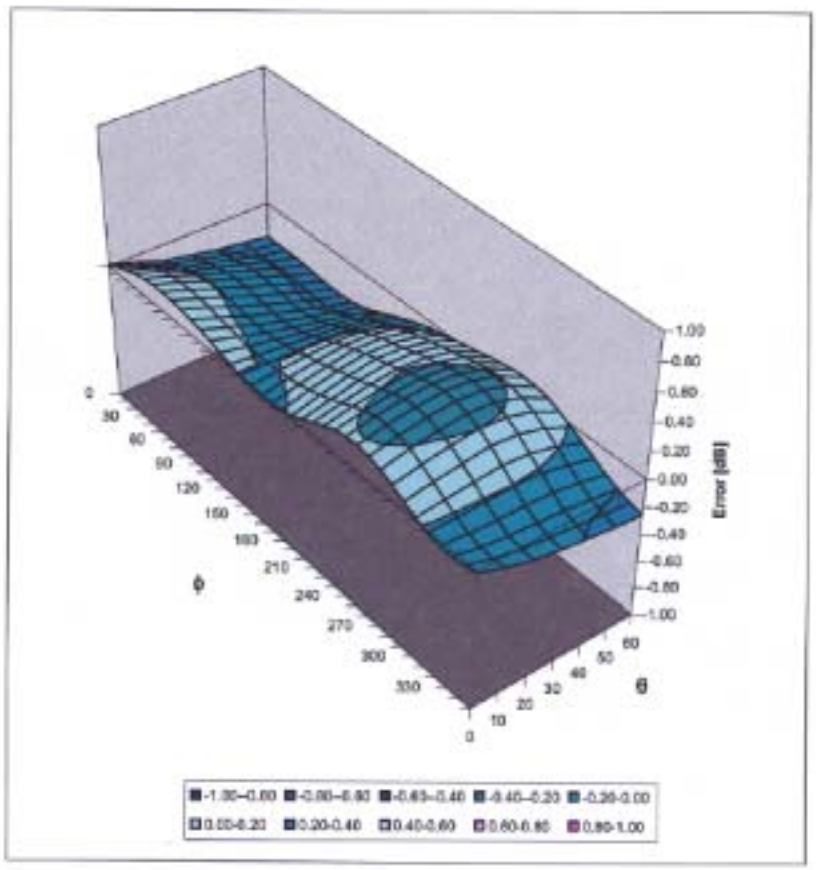
Page 9 of 10

ET3DV6 SN:1753

May 23, 2003

Deviation from Isotropy in HSL

Error (θ,φ), f = 900 MHz



Page 10 of 10

Appendix E – Data Acquisition Electronic (DAE) Calibration

Schmid & Partner
Engineering AG

DASY - DOSIMETRIC ASSESSMENT SYSTEM

CALIBRATION REPORT

DATA ACQUISITION ELECTRONICS

MODEL:	DAE3 V1
SERIAL NUMBER:	393

This Data Acquisition Unit was calibrated and tested using a FLUKE 702 Process Calibrator. Calibration and verification were performed at an ambient temperature of 23 ± 5 °C and a relative humidity of < 70%.

Measurements were performed using the standard DASY software for converting binary values, offset compensation and noise filtering. Software settings are indicated in the reports.

Results from this calibration relate only to the unit calibrated.

Calibrated by:	Storchenegger
Calibration Date:	18.12, 2002
DASY Software Version:	DASY3 V3.1c

合格
- 91.12.23
耀登科技品保部
專用章

Dae393c

1. DC Voltage Measurement

DA - Converter Values from DAE

High Range:	1LSB =	6.1μV ,	full range =	400 mV
Low Range:	1LSB =	61nV ,	full range =	4 mV

Software Set-up: Calibration time: 3 sec Measuring time: 3 sec

Setup	X	Y	Z
High Range	404.0746844	404.3390978	404.1879964
Low Range	3.97137	3.94142	3.95498
Connector Position	19 °		

High Range	Input	Reading in μV	% Error
Channel X + Input	200mV	199999.6	0.00
	20mV	19995.32	-0.02
Channel X - Input	20mV	-19993.79	-0.03
Channel Y + Input	200mV	199999.5	0.00
	20mV	19993.39	-0.03
Channel Y - Input	20mV	-19994.02	-0.03
Channel Z + Input	200mV	200000	0.00
	20mV	19994.5	-0.03
Channel Z - Input	20mV	-20003.01	0.02

Low Range	Input	Reading in μV	% Error
Channel X + Input	2mV	2000.05	0.00
	0.2mV	200.366	0.18
Channel X - Input	0.2mV	-200.379	0.19
Channel Y + Input	2mV	2000.02	0.00
	0.2mV	199.114	-0.44
Channel Y - Input	0.2mV	-200.753	0.38
Channel Z + Input	2mV	2000.02	0.00
	0.2mV	199.202	-0.40
Channel Z - Input	0.2mV	-201.2	0.60

Dae393c

2. Common mode sensitivity

Software Set-up
Calibration time: 3 sec, Measuring time: 3 sec
High/Low Range

in µV	Common mode Input Voltage	High Range Reading	Low Range Reading
Channel X	200mV	11.5195	10.6443
	- 200mV	-9.45899	-10.7877
Channel Y	200mV	8.8208	9.04838
	- 200mV	-10.7208	-10.4891
Channel Z	200mV	2.57815	2.58048
	- 200mV	-3.83723	-5.33249

3. Channel separation

Software Set-up
Calibration time: 3 sec, Measuring time: 3 sec
High Range

in µV	Input Voltage	Channel X	Channel Y	Channel Z
Channel X	200mV	-	3.87894	-0.249448
Channel Y	200mV	0.754446	-	5.51548
Channel Z	200mV	-1.16639	0.548042	-

4. AD-Converter Values with inputs shorted

in LSB	Low Range	High Range
Channel X	15563	16112
Channel Y	15059	15995
Channel Z	17960	16464

5. Input Offset Measurement

Measured after 15 min warm-up time of the Data Acquisition Electronic.
Every Measurement is preceded by a calibration cycle.

Software set-up:

Calibration time:	3 sec
Measuring time:	3 sec
Number of measurements:	100, Low Range

Input 10MΩ

in µV	Average	min. Offset	max. Offset	Std. Deviation
Channel X	0.83	-0.63	2.29	0.31
Channel Y	-1.70	-3.57	-0.50	0.32
Channel Z	-0.63	-2.32	0.23	0.30

Input shorted

in µV	Average	min. Offset	max. Offset	Std. Deviation
Channel X	0.13	-0.34	0.56	0.16
Channel Y	-0.75	-1.29	-0.24	0.18
Channel Z	-1.06	-1.66	-0.49	0.18

6. Input Offset Current

in fA	Input Offset Current
Channel X	< 25
Channel Y	< 25
Channel Z	< 25

7. Input Resistance

	Calibrating	Measuring
Channel X	200 kΩ	200 MΩ
Channel Y	200 kΩ	200 MΩ
Channel Z	200 kΩ	200 MΩ

Dae393c

8. Low Battery Alarm Voltage

In V	Alarm Level
Supply (+ Vcc)	7.36 V
Supply (- Vcc)	-7.32 V

9. Power Consumption

In mA	Switched off	Stand by	Transmitting
Supply (+ Vcc)	0.000	5.29	13.8
Supply (- Vcc)	-0.011	-7.58	-8.8

10. Functional test

Touch async pulse 1	ok
Touch async pulse 2	ok
Touch status bit 1	ok
Touch status bit 2	ok
Remote power off	ok
Remote analog Power control	ok
Modification Status	B – C

Date: 11.12.02 Signature: .....

0ae393c