Author Data	Dates of Test	Test Report No
Daoud Attayi	Nov. 27 - Dec. 06, 2002 Jan. 06 – 07, 2003	RIM-0001-0301-04
		FCC ID: L6AR6120CN

APPENDIX A: SAR DISTRIBUTION COMPARISON FOR THE ACCURACY VERIFICATION

11/27/02

Dipole 835

SAM 2; Flat

Probe: ET3DV6 - SN1644; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.89 mho/m ϵ_r = 40.6 ρ = 1.00 g/cm³

Cube 5x5x7: Peak: 17.2 mW/g, SAR (1g): 10.6 mW/g, SAR (10g): 6.71 mW/g, (Worst-case extrapolation)

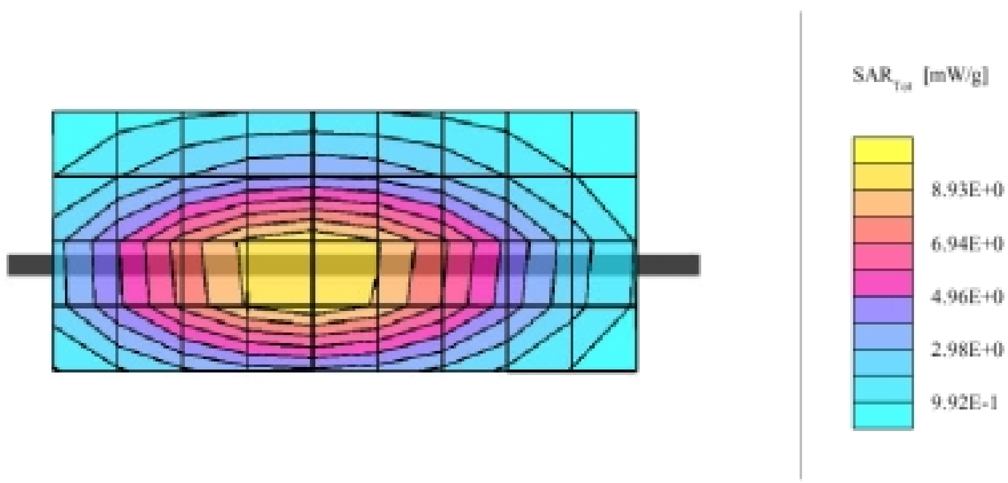
Penetration depth: 11.6 (10.3, 13.4) [mm]

Powerdrift: -0.03 dB

Date: November 27, 2002

Ambient temperature: 24.2 deg. cel.

Liquid temperature: 23.3 deg. cel.



12/06/02

Dipole 835

SAM 1; Flat

Probe: ET3DV6 - SN1644; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.91 mho/m ε_r = 42.2 ρ = 1.00 g/cm³

Cube 5x5x7: Peak: 18.0 mW/g, SAR (1g): 11.0 mW/g, SAR (10g): 6.94 mW/g, (Worst-case extrapolation)

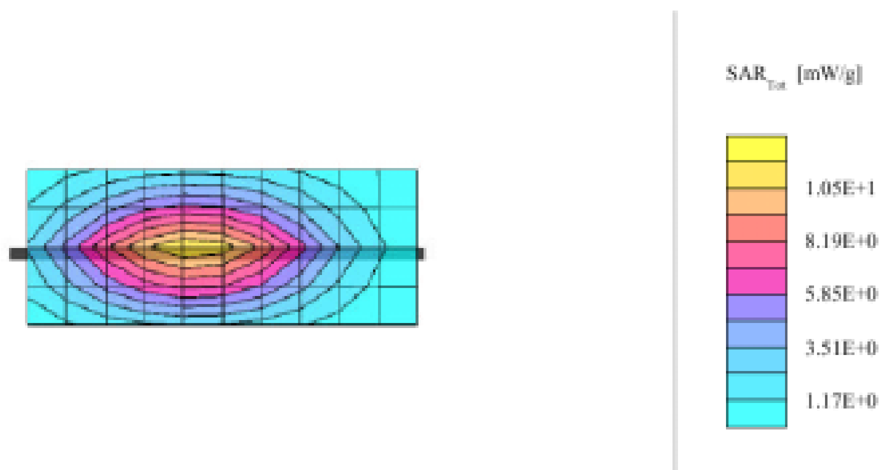
Penetration depth: 11.5 (10.1, 13.5) [mm]

Powerdrift: -0.01 dB

Date: December 06, 2002

Ambient temperature: 24.1 deg. cel.

Liquid temperature: 23.5 deg. cel.

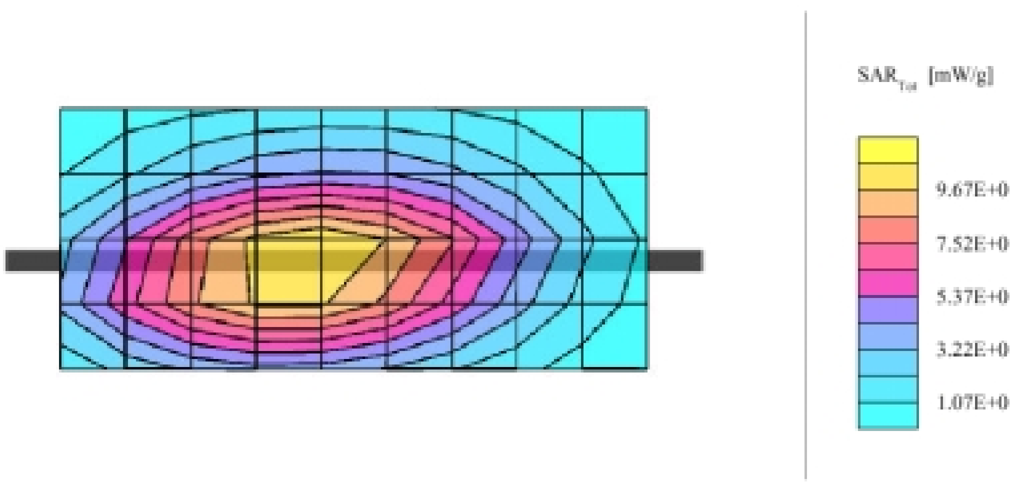


01/06/03

Dipole 835

SAM 2; Flat
Probe: ET3DV6 - SN1644; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.90 mho/m ϵ_r = 41.3 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 18.3 mW/g, SAR (1g): 11.2 mW/g, SAR (10g): 7.02 mW/g, (Worst-case extrapolation)
Penetration depth: 11.5 (10.0, 13.5) [mm]
Powerdrift: -0.08 dB

Tested on January 6th, 2003
Ambient temperature: 23.9 deg. cel.
Liquid tempearture: 22.8 deg. cel.



11/28/02

Dipole 1900 MHz

SAM 2; Flat

Probe: ET3DV6 - SN1644; ConvF(5.40,5.40,5.40); Crest factor: 1.0; Head 1900 MHz: σ = 1.44 mho/m ε_r = 38.2 ρ = 1.00 g/cm³

Cube 5x5x7: Peak: 82.6 mW/g, SAR (1g): 42.8 mW/g, SAR (10g): 21.5 mW/g, (Worst-case extrapolation)

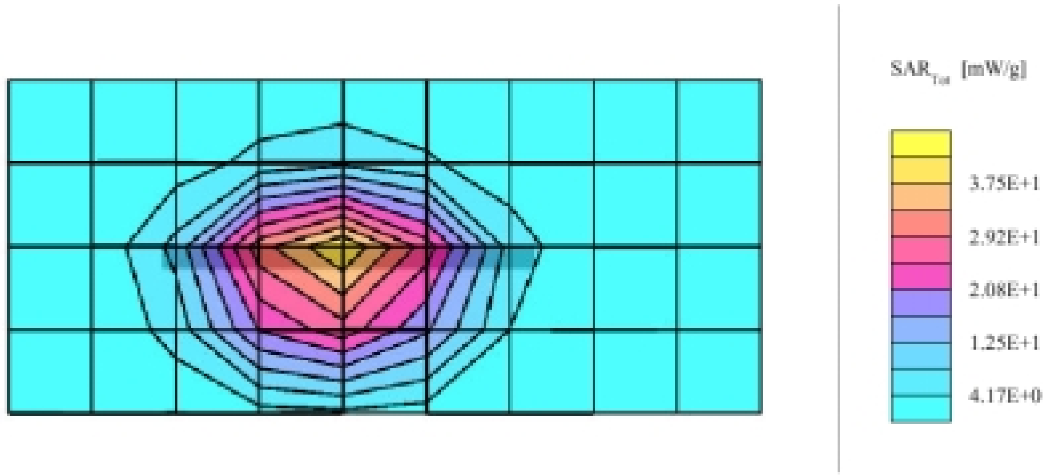
Penetration depth: 7.7 (7.3, 8.7) [mm]

Powerdrift: -0.08 dB

Date: November 28, 2002

Ambient temperature: 24.2 deg. cel.

Liquid temperature: 23.2 deg. cel.



APPENDIX B: SAR DISTRIBUTION PLOTS FOR HEAD CONFIGURATION

12/06/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 1; Left Hand

Probe: ET3DV6 - SN1644; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.91 mho/m ε_r = 42.2 ρ = 1.00 g/cm³

Cube 5x5x7: Peak: 1.96 mW/g, SAR (1g): 1.19 mW/g, SAR (10g): 0.721 mW/g, (Worst-case extrapolation)

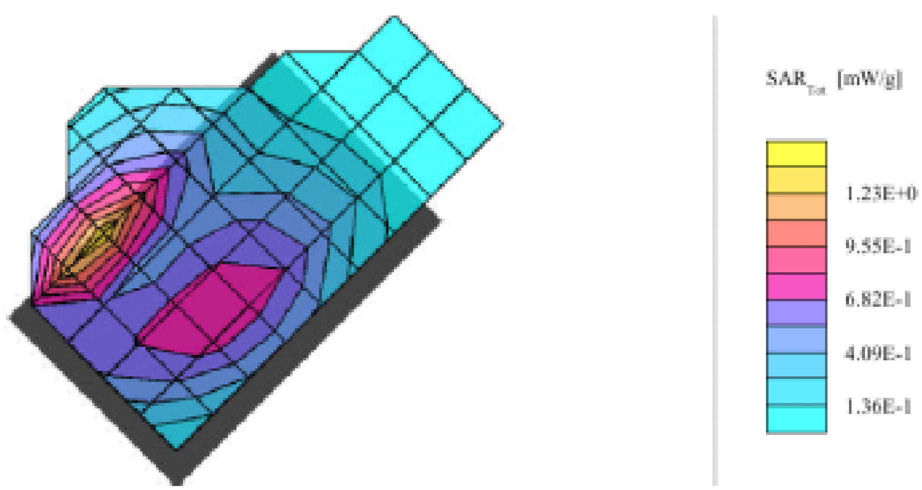
Penetration depth: 12.9 (11.5, 14.8) [mm]

Powerdrift: -0.01 dB

Date: December 06, 2002

Ambient temperature: 23.9 deg. cel.

Liquid temperature: 23.0 deg. cel.

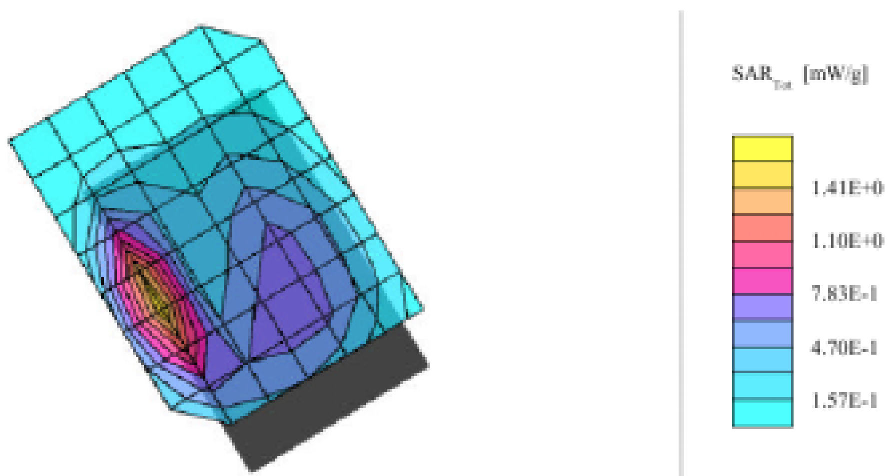


12/06/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 1; Right Hand
Probe: ET3DV6 - SN1644; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.91 mho/m ε_r = 42.2 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 2.62 mW/g, SAR (1g): 1.46 mW/g, SAR (10g): 0.821 mW/g, (Worst-case extrapolation)
Penetration depth: 12.7 (11.1, 14.7) [mm]
Powerdrift: -0.01 dB

Date: December 06, 2002
Ambient temperature: 23.9 deg. cel.
Liquid temperature: 23.4 deg. cel.

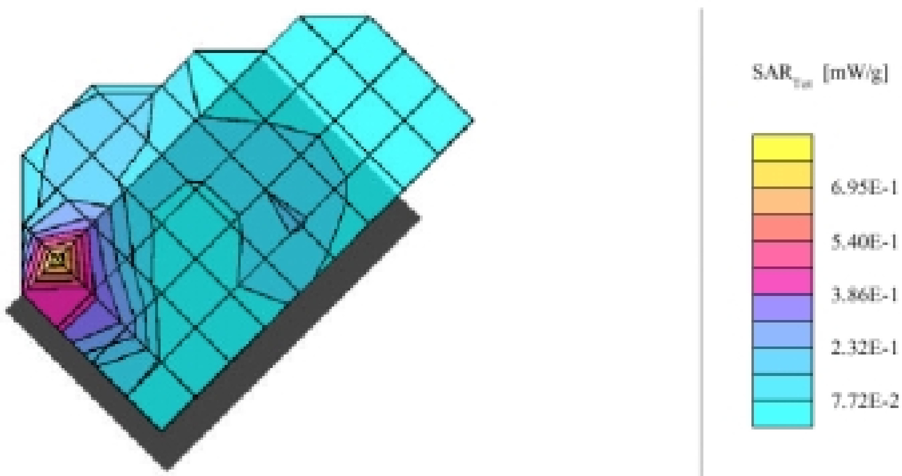


11/29/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Left Hand
Probe: ET3DV6 - SN1644; ConvF(5.40,5.40,5.40); Crest factor: 1.0; Head 1900 MHz: σ = 1.44 mho/m ε_r = 38.2 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 1.34 mW/g, SAR (1g): 0.713 mW/g, SAR (10g): 0.364 mW/g, (Worst-case extrapolation)
Penetration depth: 8.5 (8.1, 9.3) [mm]
Powerdrift: -0.30 dB

Date: November 28, 2002
Ambient temperature: 24.1 deg. cel.
Liquid temperature: 22.8 deg. cel.

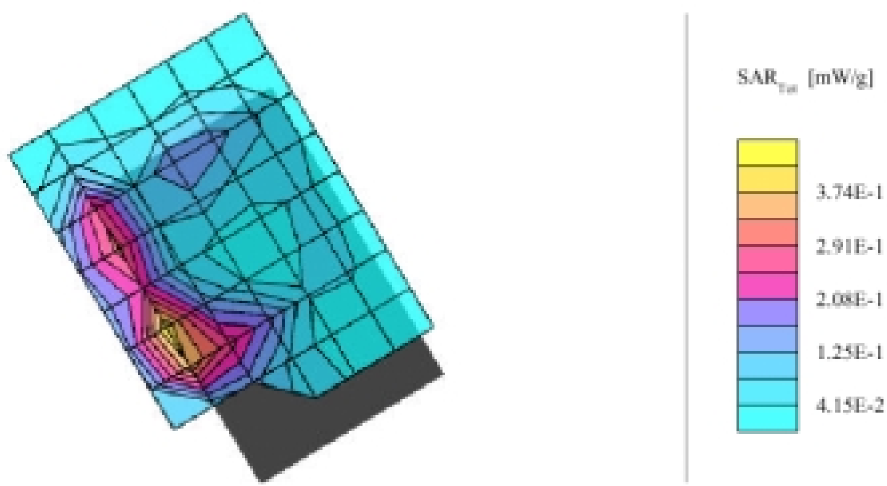


11/29/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Right Hand
Probe: ET3DV6 - SN1644; ConvF(5.40,5.40,5.40); Crest factor: 1.0; Head 1900 MHz: σ = 1.44 mho/m ϵ_r = 38.2 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 0.839 mW/g, SAR (1g): 0.443 mW/g, SAR (10g): 0.225 mW/g, (Worst-case extrapolation)
Penetration depth: 9.5 (8.8, 10.7) [mm]
Powerdrift: -0.19 dB

Date: November 28, 2002
Ambient temperature: 24.0 deg. cel.
Liquid temperature: 23.1 deg. cel.



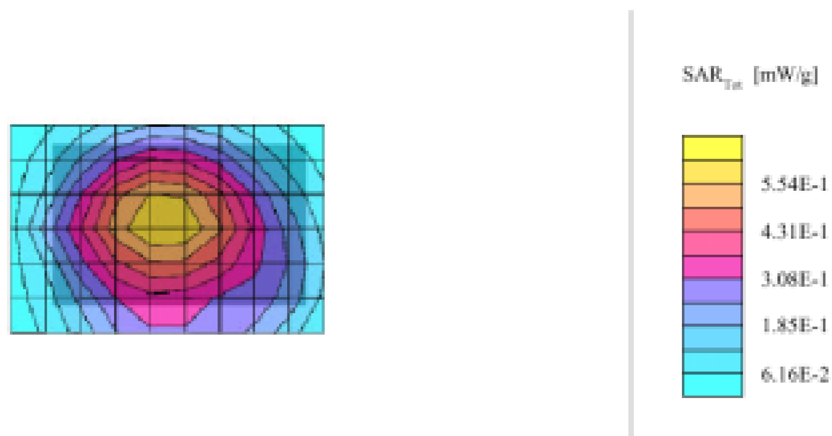
APPENDIX C: SAR DISTRIBUTION PLOTS FOR BODY-WORN AND HAND SAR CONFIGURATION

01/07/03

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Flat
Probe: ET3DV6 - SN1644; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Muscle 835 MHz: σ = 0.99 mho/m ε_r = 56.1 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 0.851 mW/g, SAR (1g): 0.609 mW/g, SAR (10g): 0.438 mW/g, (Worst-case extrapolation)
Penetration depth: 16.8 (15.0, 18.5) [mm]
Powerdrift: -0.12 dB

Body-worn with holster
Low channel: 1013
Tested on January 7th, 2003
Ambient teperature: 23.7 deg. cel.
Liquid temperature: 22.8 deg. cel.

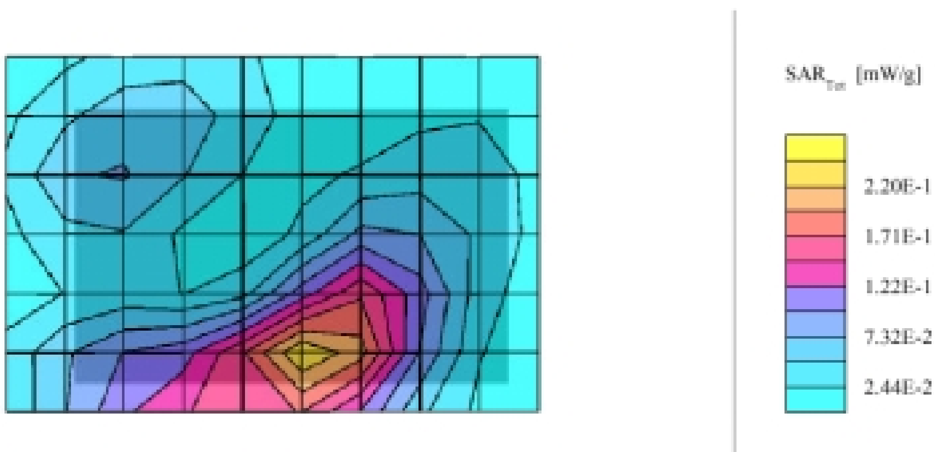


12/02/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Flat
Probe: ET3DV6 - SN1644; ConvF(5.10,5.10,5.10); Crest factor: 1.0; Muscle 1900 MHz: σ = 1.51 mho/m ϵ_r = 52.0 ρ = 1.00 g/cm^3
Cube 5x5x7: Peak: 0.406 mW/g, SAR (1g): 0.234 mW/g, SAR (10g): 0.137 mW/g, (Worst-case extrapolation)
Penetration depth: 9.9 (8.8, 11.6) [mm]
Powerdrift: -0.11 dB

Body-worn with holster
Date: December 02, 2002
Ambient temperature: 24.1 deg. cel.
Liquid temperature: 22.7 deg. cel.

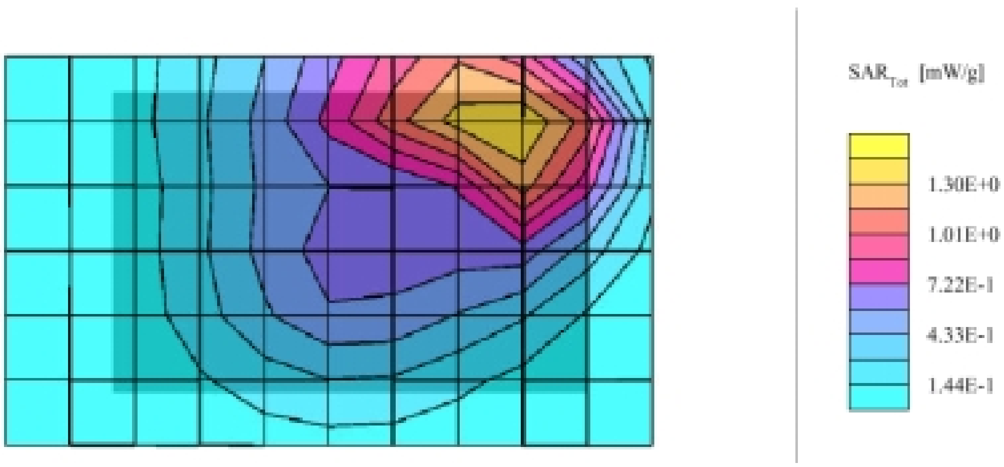


11/28/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 1; Flat
Probe: ET3DV6 - SN1644; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Muscle 835 MHz: σ = 0.98 mho/m ε_r = 56.6 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 3.29 mW/g, SAR (1g): 1.70 mW/g, SAR (10g): 0.897 mW/g, (Worst-case extrapolation)
Penetration depth: 9.0 (7.9, 11.1) [mm]
Powerdrift: -0.15 dB

Hand SAR, unit back touching flat phantom
Date: November 27, 2002
Ambient temperature: 24.2 deg. cel.
Liquid temperature: 22.8 deg. cel.

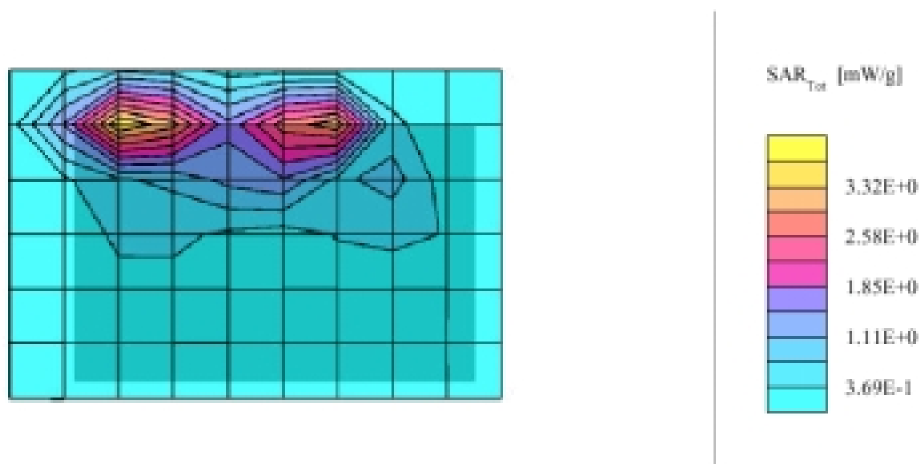


12/02/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Flat
Probe: ET3DV6 - SN1644; ConvF(5.10,5.10,5.10); Crest factor: 1.0; Muscle 1900 MHz: σ = 1.51 mho/m ε_r = 52.0 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 6.81 mW/g, SAR (1g): 3.41 mW/g, SAR (10g): 1.58 mW/g, (Worst-case extrapolation)
Penetration depth: 7.8 (7.4, 8.6) [mm]
Powerdrift: 0.42 dB

Hand SAR, back side touching
Date: December 02, 2002
Ambient temperature: 23.5 deg. cel.
Liquid temperature: 22.5 deg. cel.

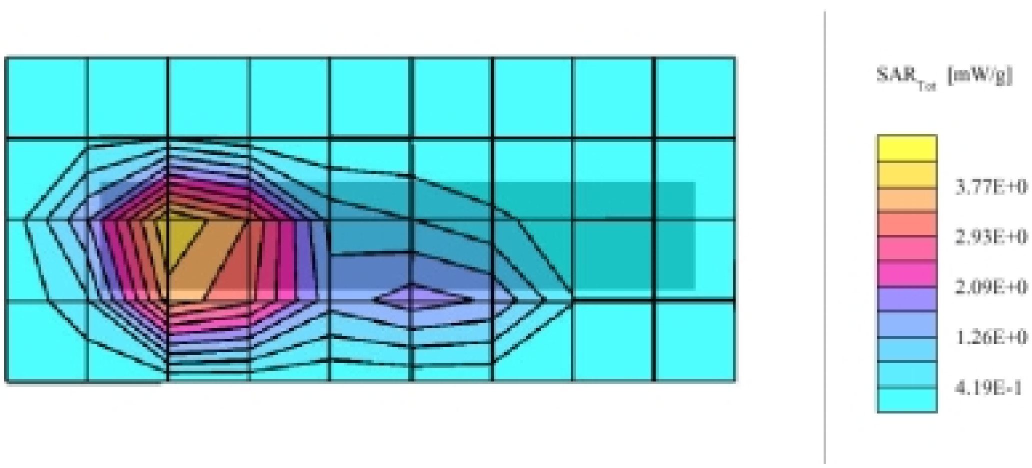


12/02/02

BlackBerry Wireless Handheld Model No. R6120CN

SAM 2; Flat
Probe: ET3DV6 - SN1644; ConvF(5.10,5.10,5.10); Crest factor: 1.0; Muscle 1900 MHz: σ = 1.51 mho/m ε_r = 52.0 ρ = 1.00 g/cm³
Cube 5x5x7: Peak: 18.2 mW/g, SAR (1g): 8.00 mW/g, SAR (10g): 3.17 mW/g, (Worst-case extrapolation)
Penetration depth: 6.7 (6.0, 8.4) [mm]
Powerdrift: -0.34 dB

Hand SAR, left edge touching flat phantom
Date: December 02, 2002
Ambient temperature: 23.8 deg. cel.
Liquid temperature: 22.6 deg. cel.



APPENDIX D: PROBE & DIPOLES CALIBRATION DATA

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

Dosimetric E-Field Probe

Type:	ET3DV6
Serial Number:	1644
Place of Calibration:	Zurich
Date of Calibration:	October 21, 2002
Calibration Interval:	12 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:	N. Vetterli
Approved by:	[signature]

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Telephone +41 1 245 97 00, Fax +41 1 245 97 79

Probe ET3DV6

SN:1644

Manufactured:	November 7, 2001
Last calibration:	November 26, 2001
Recalibrated:	October 21, 2002

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1644 October 21, 2002

DASY - Parameters of Probe: ET3DV6 SN:1644

Sensitivity in Free Space

NormX	1.73 $\mu V/(V/m)^2$
NormY	1.88 $\mu V/(V/m)^2$
NormZ	1.83 $\mu V/(V/m)^2$

Diode Compression

DCP X	95	mV
DCP Y	95	mV
DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid

Head	**900 MHz**	ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m
Head	**835 MHz**	ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m

ConvF X	**6.6** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.6** ± 9.5% (k=2)		Alpha	**0.32**
ConvF Z	**6.6** ± 9.5% (k=2)		Depth	**2.91**

Head	**1800 MHz**	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m
Head	**1900 MHz**	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m

ConvF X	**5.4** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**5.4** ± 9.5% (k=2)		Alpha	**0.49**
ConvF Z	**5.4** ± 9.5% (k=2)		Depth	**2.47**

Boundary Effect

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

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	10.4	6.1
SAR_{be} [%]	With Correction Algorithm	0.5	0.6

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

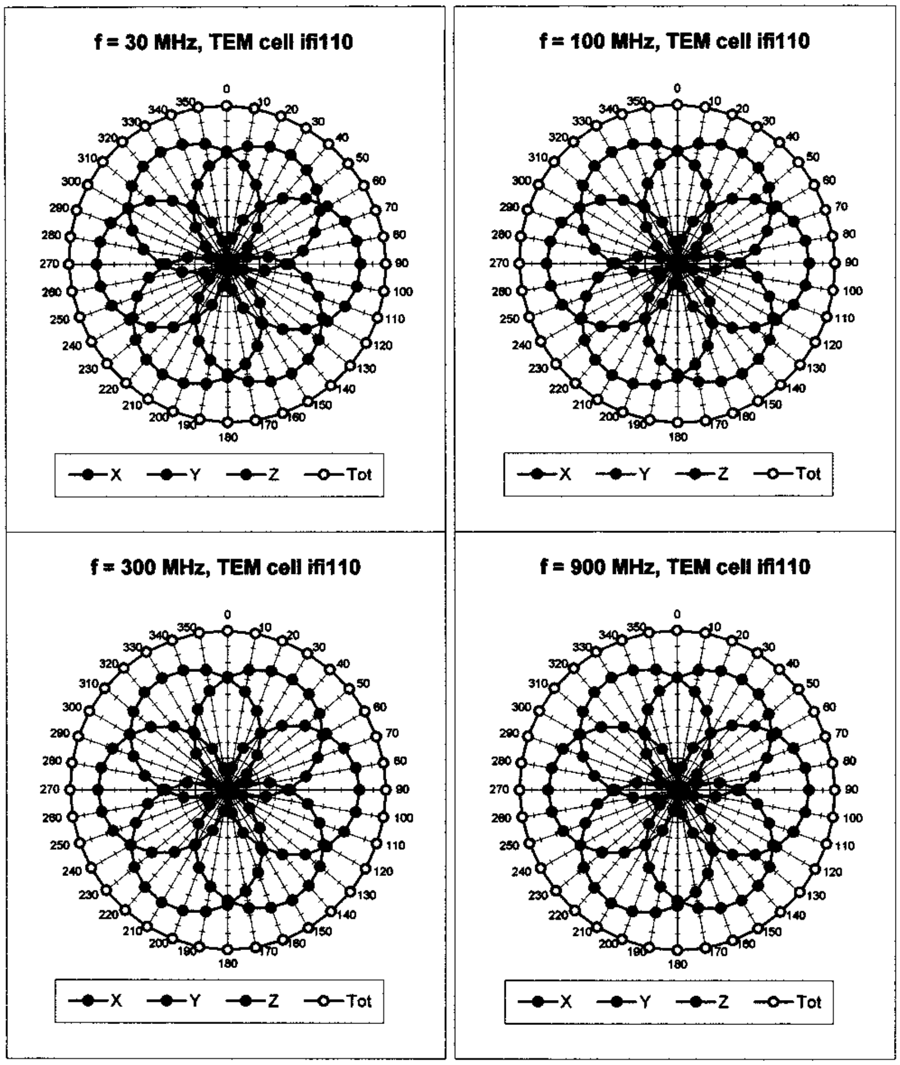
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	12.2	8.0
SAR_{be} [%]	With Correction Algorithm	0.1	0.1

Sensor Offset

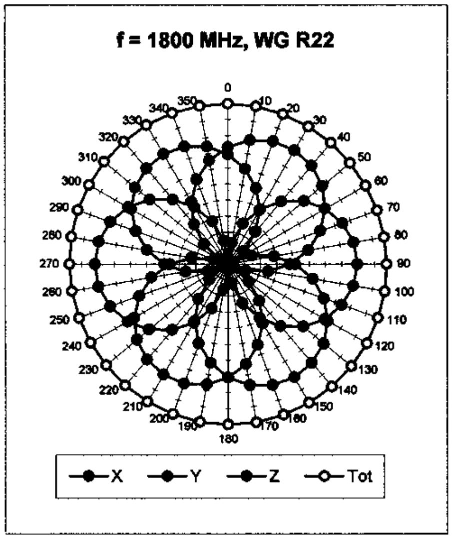
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.4 ± 0.2**	mm

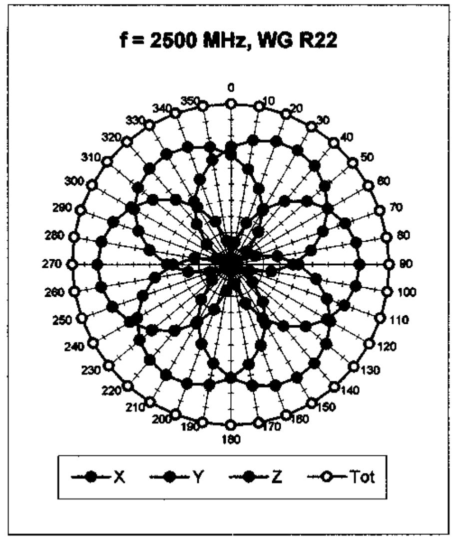
ET3DV6 SN:1644 **October 21, 2002**

Receiving Pattern (ϕ), θ = 0°

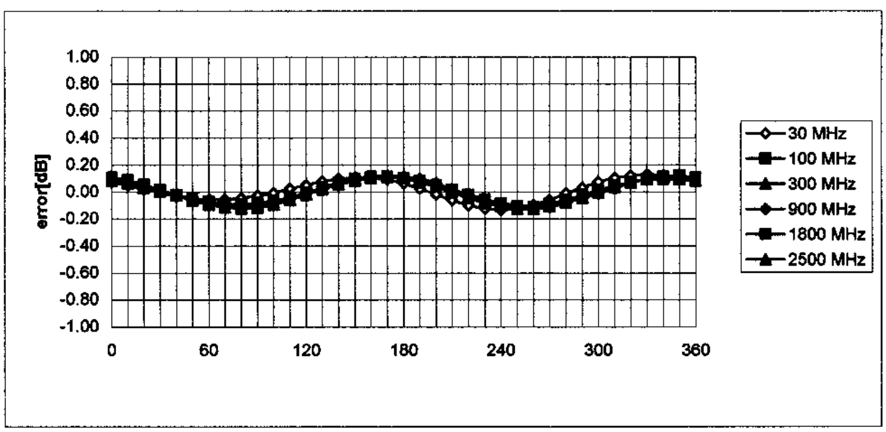


ET3DV6 SN:1644 **October 21, 2002**





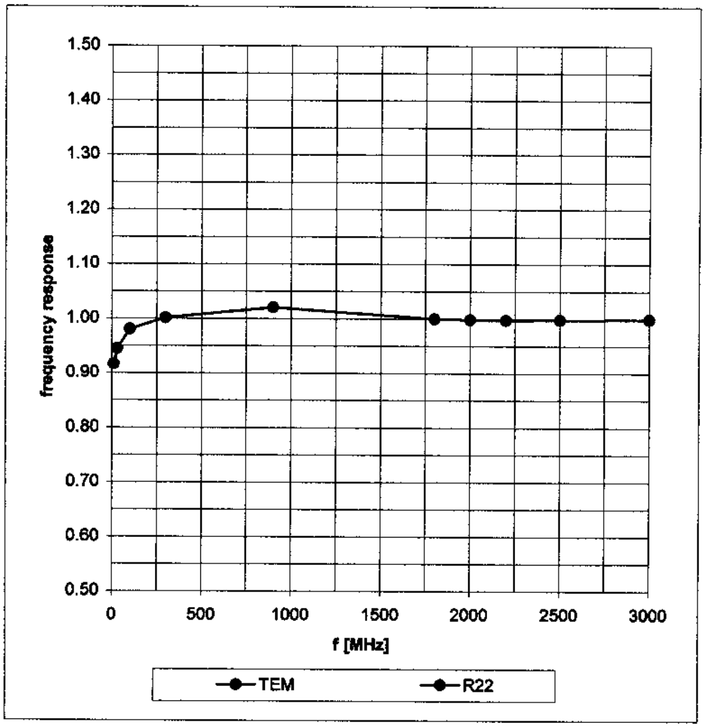
Isotropy Error (ϕ), θ = 0°



ET3DV6 SN:1644 October 21, 2002

Frequency Response of E-Field

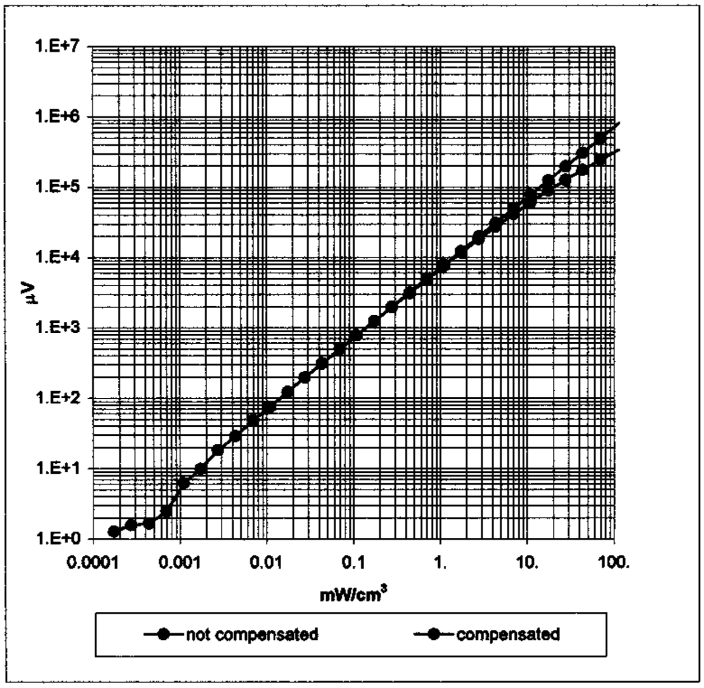
(TEM-Cell:ifi110, Waveguide R22)

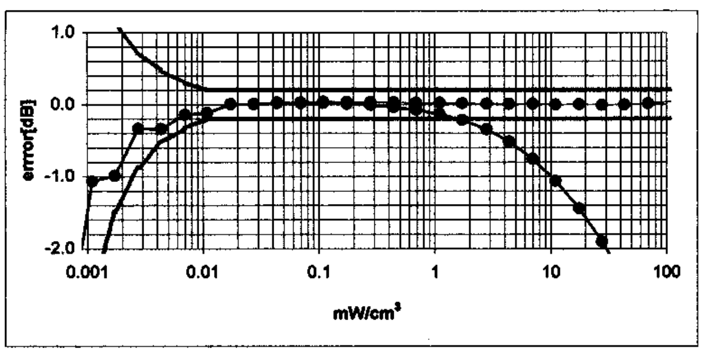


ET3DV6 SN:1644 **October 21, 2002**

Dynamic Range f(SAR_{brain})

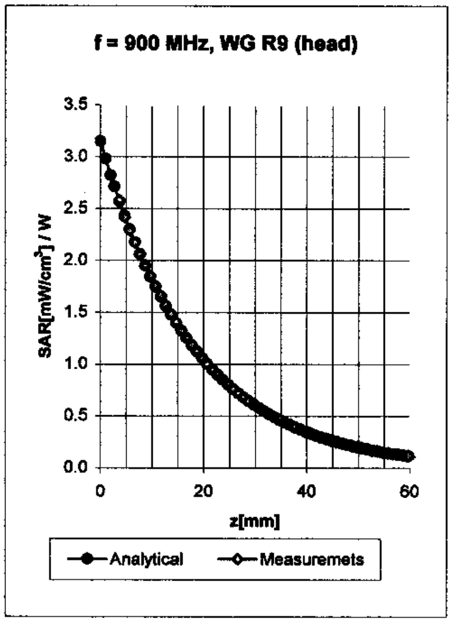
(Waveguide R22)

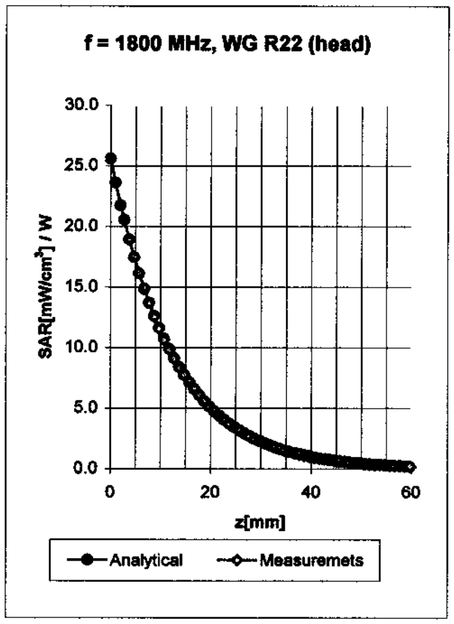




ET3DV6 SN:1644 **October 21, 2002**

Conversion Factor Assessment



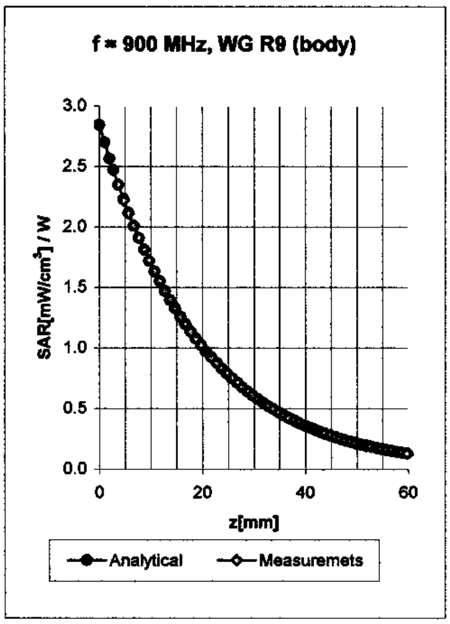


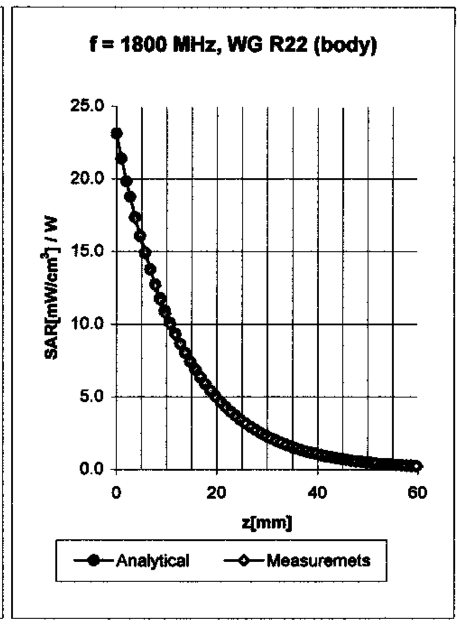
Head	900 MHz	ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m	
Head	835 MHz	ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m	
	ConvF X	**6.6** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.6** ± 9.5% (k=2)	Alpha	**0.32**
	ConvF Z	**6.6** ± 9.5% (k=2)	Depth	**2.91**

Head	1800 MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
Head	1900 MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
	ConvF X	**5.4** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.4** ± 9.5% (k=2)	Alpha	**0.49**
	ConvF Z	**5.4** ± 9.5% (k=2)	Depth	**2.47**

ET3DV6 SN:1644 **October 21, 2002**

Conversion Factor Assessment





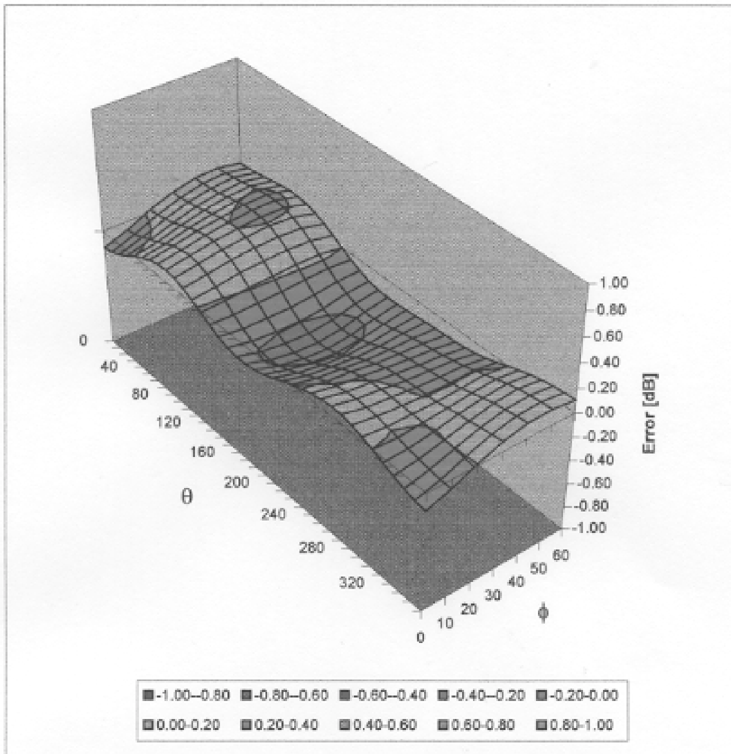
Body	**900 MHz**	ε_r **= 55.0 ± 5%**	σ **= 1.05 ± 5% mho/m**	
Body	**835 MHz**	ε_r **= 55.2 ± 5%**	σ **= 0.97 ± 5% mho/m**	
	ConvF X	**6.4** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.4** ± 9.5% (k=2)	Alpha	**0.39**
	ConvF Z	**6.4** ± 9.5% (k=2)	Depth	**2.56**

Body	**1800 MHz**	ε_r **= 53.3 ± 5%**	σ **= 1.52 ± 5% mho/m**	
Body	**1900 MHz**	ε_r **= 53.3 ± 5%**	σ **= 1.52 ± 5% mho/m**	
	ConvF X	**5.1** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.1** ± 9.5% (k=2)	Alpha	**0.61**
	ConvF Z	**5.1** ± 9.5% (k=2)	Depth	**2.35**

ET3DV6 SN:1644 October 21, 2002

Deviation from Isotropy in HSL

Error (θ,ϕ), f = 900 MHz



Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

835 MHz System Validation Dipole

Type:	D835V2
Serial Number:	446
Place of Calibration:	Zurich
Date of Calibration:	November 12, 2001
Calibration Interval:	24 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

Approved by:

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

DASY

Dipole Validation Kit

Type: D835V2

Serial: 446

Manufactured: October 24, 2001
Calibrated: November 12, 2001

1. Measurement Conditions

The measurements were performed in the flat section of the new generic twin phantom filled with head simulating solution of the following electrical parameters at 835 MHz:

Relative Dielectricity	42.3	± 5%
Conductivity	0.91 mho/m	± 5%

The DASY3 System (Software version 3.1c) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.27 at 900 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 15mm 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 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 1. The results have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**10.7 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.84 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well.

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:	**1.401 ns**	(one direction)
Transmission factor:	**0.993**	(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 835 MHz:	Re{Z} = **49.8 Ω**
	Im {Z} = **-4.8 Ω**
Return Loss at 835 MHz	**-26.4 dB**

4. Handling

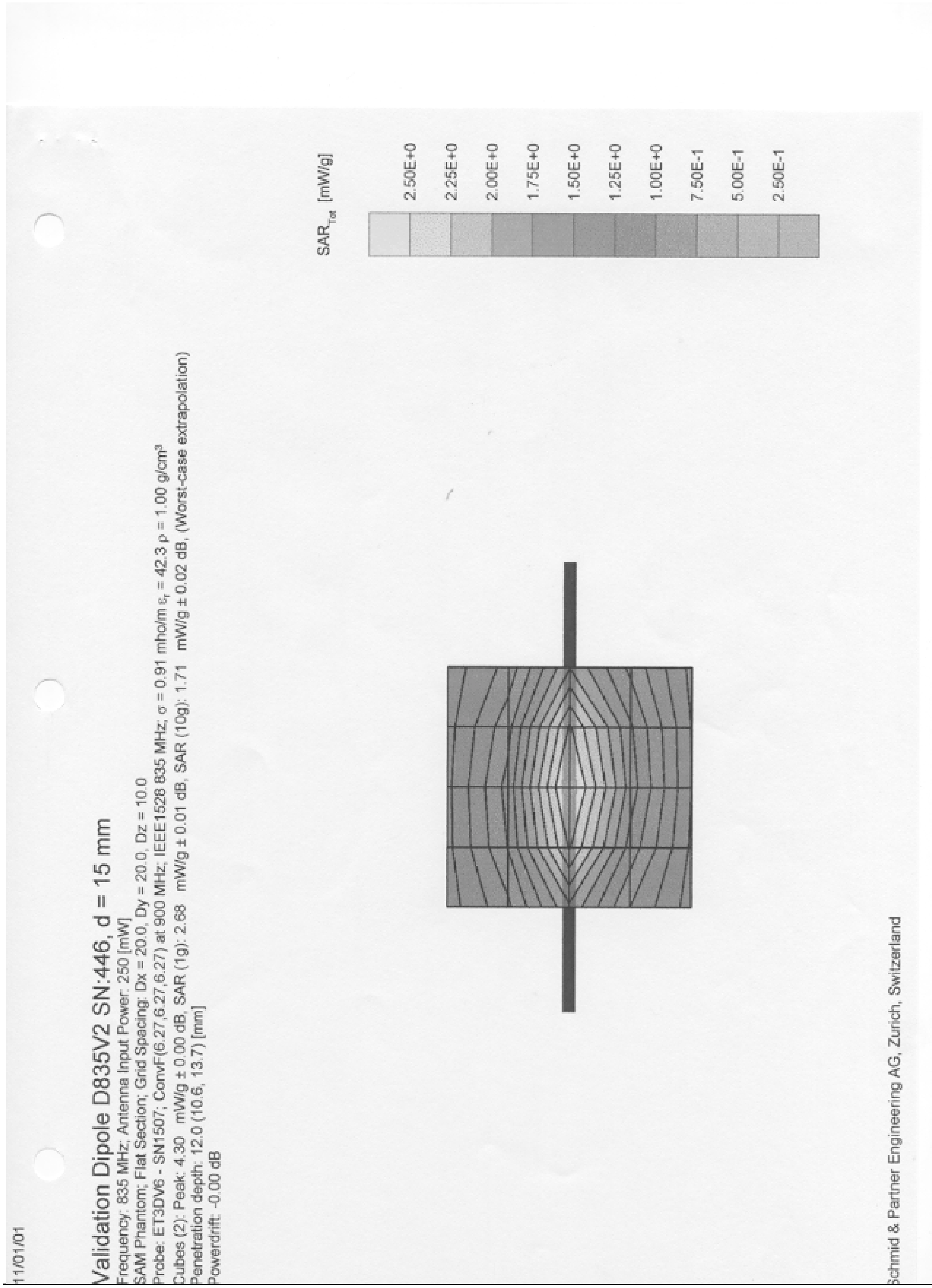
Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

5. Design

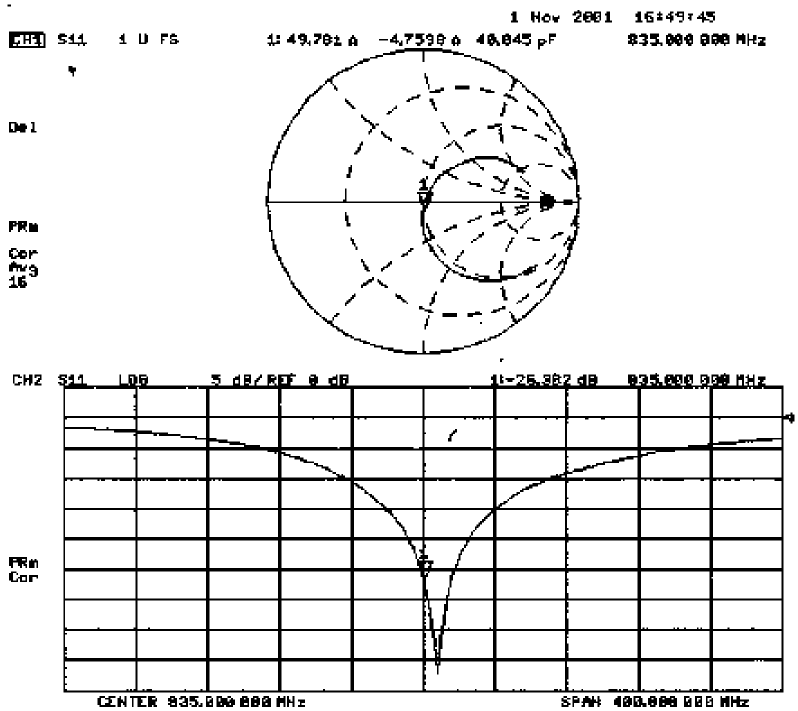
The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

6. Power Test

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.



11/01/01
Validation Dipole D835V2 SN:446, d = 15 mm
Frequency: 835 MHz; Antenna Input Power: 250 [mW]
SAM Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.27,6.27,6.27) at 900 MHz; IEEE1528 835 MHz: σ = 0.91 mho/m εr = 42.3 ρ = 1.00 g/cm3
Cubes (2): Peak: 4.30 mW/g ± 0.00 dB, SAR (1g): 2.68 mW/g ± 0.01 dB, SAR (10g): 1.71 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 12.0 (10.6, 13.7) [mm]
Powerdrift: -0.00 dB
SAR_Tot [mW/g]
2.50E+0
2.25E+0
2.00E+0
1.75E+0
1.50E+0
1.25E+0
1.00E+0
7.50E-1
5.00E-1
2.50E-1
Schmid & Partner Engineering AG, Zurich, Switzerland


1 Nov 2001 16:49:45
CH1 S11 1 U FS
1: 49.781 Ω -4.7598 Ω 40.045 pF 835.000 000 MHz
Del
PRm
Cor
Avg
16
CH2 S11 LOG 5 dB/REF 0 dB
1:-26.382 dB 835.000 000 MHz
PRm
Cor
CENTER 835.000 000 MHz
SPAN 400.000 000 MHz

Schmid & Partner
Engineering AG

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Calibration Certificate

1900 MHz System Validation Dipole

Type:	D1900V2
Serial Number:	545
Place of Calibration:	Zurich
Date of Calibration:	November 26, 2001
Calibration Interval:	24 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

Approved by:

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

DASY3

Dipole Validation Kit

Type: D1900V2

Serial: 545

Manufactured: November 15, 2001
Calibrated: November 26, 2001

1. Measurement Conditions

The measurements were performed in the flat section of the new generic twin phantom filled with brain simulating sugar solution of the following electrical parameters at 1900 MHz:

Relative permitivity	**40.0**	± 5%
Conductivity	**1.45 mho/m**	± 10%

The DASY3 System (Software version 3.1d) with a dosimetric E-field probe ET3DV6 (SN:1507, conversion factor 5.31 at 1800 MHz) was used for the measurements.

The dipole feedpoint was positioned below the center marking and 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 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the head phantom according to the measurement conditions described in section 1. The results (see figure) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue: **43.2 mW/g**

averaged over 10 cm^3 (10 g) of tissue: **22.0 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well. The estimated sensitivities of SAR-values and penetration depths to the liquid parameters are listed in the DASY Application Note 4: 'SAR Sensitivities'.

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:	**1.216 ns**	(one direction)
Transmission factor:	**0.992**	(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 1900 MHz:	Re{Z} = **50.4 Ω**
	Im {Z} = **1.9 Ω**
Return Loss at 1900 MHz	**- 34.3 dB**

4. Handling

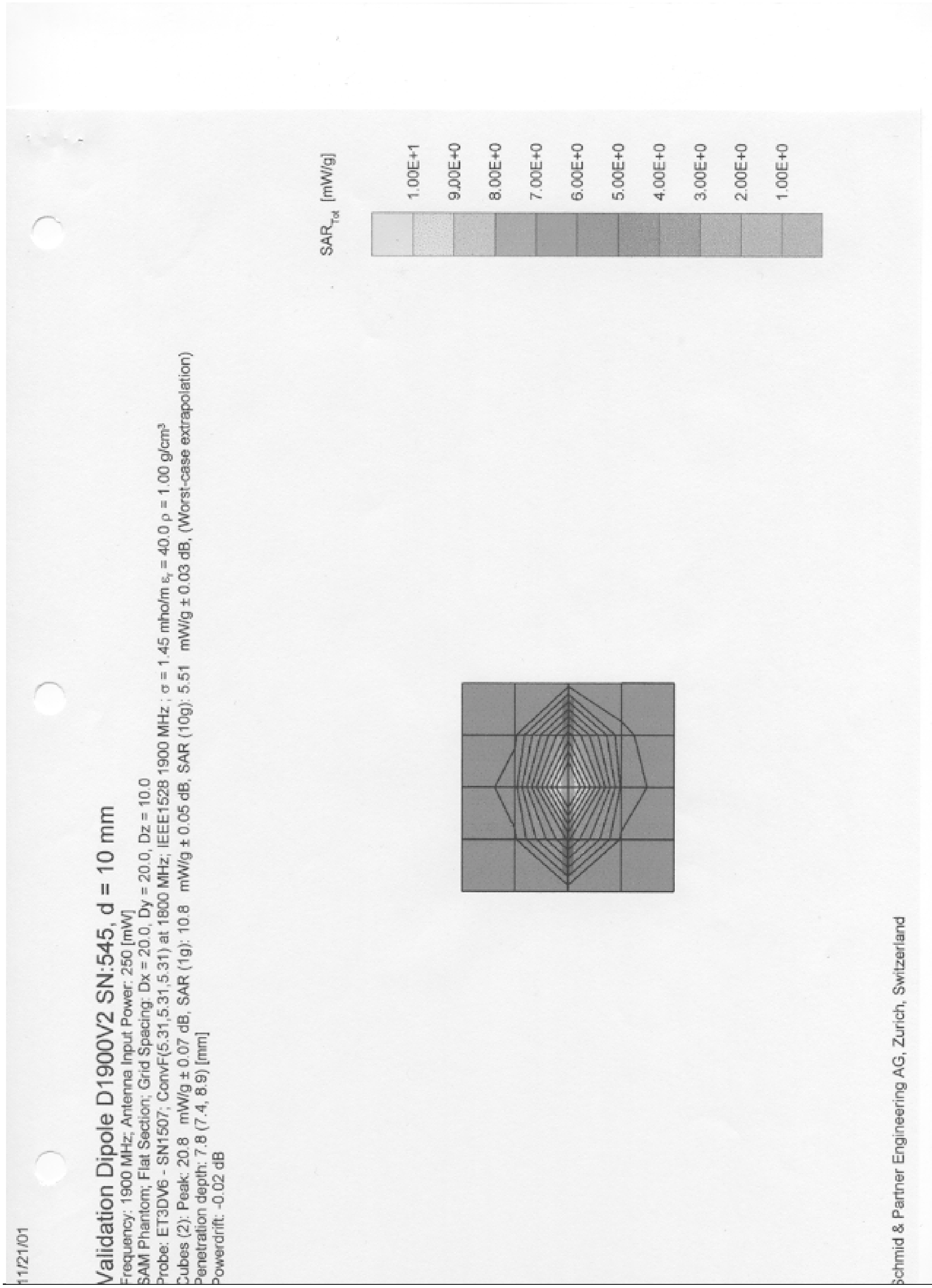
Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

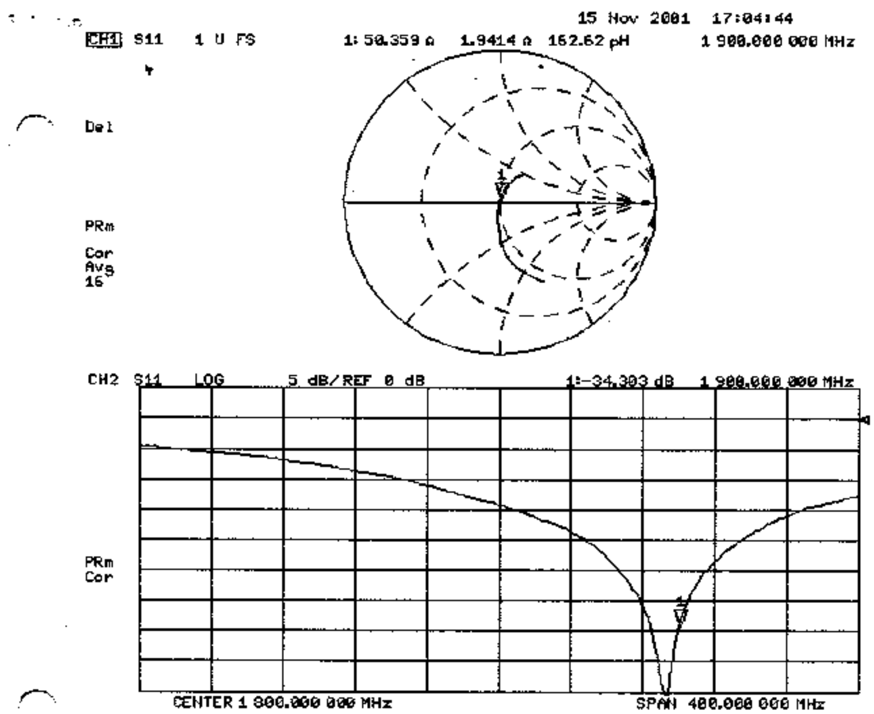
5. Design

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.

6. Power Test

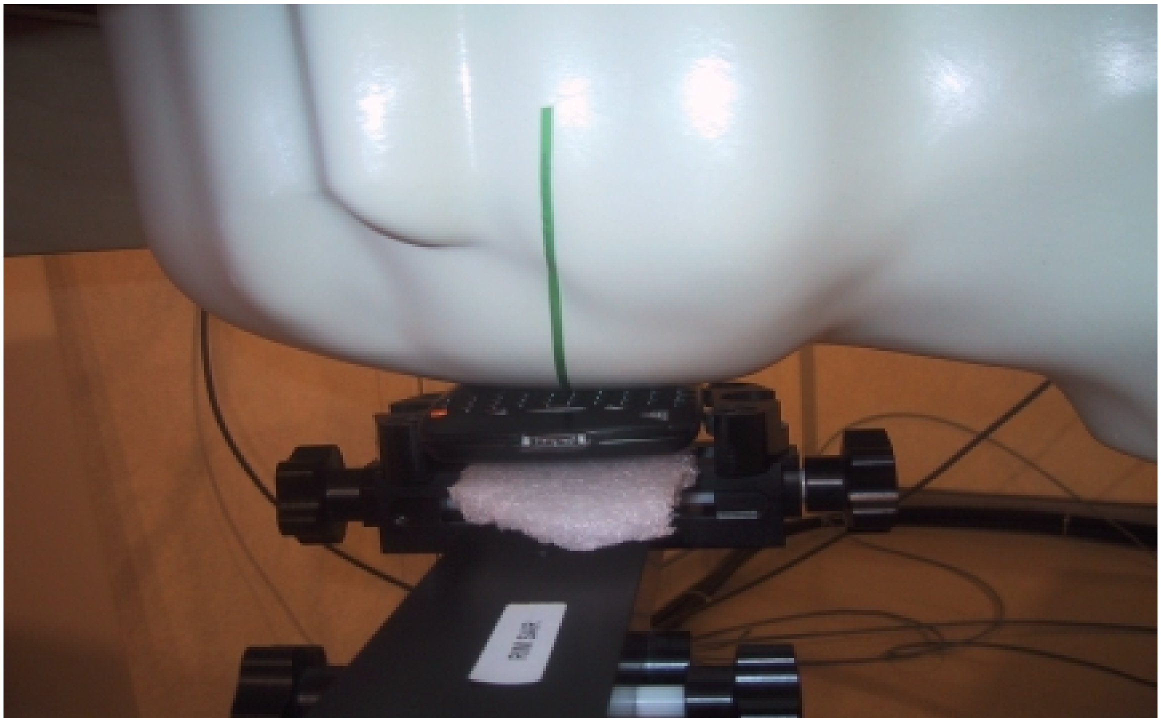
After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.


11/21/01
Validation Dipole D1900V2 SN:545, d = 10 mm
Frequency: 1900 MHz; Antenna Input Power: 250 [mW]
SAM Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(5.31,5.31,5.31) at 1800 MHz; IEEE1528 1900 MHz ; σ = 1.45 mho/m εr = 40.0 ρ = 1.00 g/cm³
Cubes (2): Peak: 20.8 mW/g ± 0.07 dB, SAR (1g): 10.8 mW/g ± 0.05 dB, SAR (10g): 5.51 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 7.8 (7.4, 8.9) [mm]
Powerdrift: -0.02 dB
SARTot [mW/g]
1.00E+1
9.00E+0
8.00E+0
7.00E+0
6.00E+0
5.00E+0
4.00E+0
3.00E+0
2.00E+0
1.00E+0
Schmid & Partner Engineering AG, Zurich, Switzerland


15 Nov 2001 17:04:44
CH1 S11 1 U FS
1: 50.359 Ω 1.9414 Ω 152.62 pH
1 900.000 000 MHz
Del
PRm
Cor
Avg
16
CH2 S11 LOG 5 dB/REF 0 dB
1:-34.303 dB 1 900.000 000 MHz
PRm
Cor
CENTER 1 800.000 000 MHz
SPAN 400.000 000 MHz

APPENDIX E: SAR SET UP PHOTOS

Figure E1. Left ear configuration


RIM SAR


SAR

Figure E2. Right ear configuration

Figure E3. Body worn configuration with holster and headset

Figure E4. Hand SAR configuration, unit left edge and back touching flat phantom