Prepared (also subject responsible if other)		No.		
EUS/CV/RF/P Dulce Altabella		EUS/CV/R-01:0373/REP		
Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc

Addendum to

"SAR Test Report: R300d with internal antenna"

Date of test: March 7 and 12, 2001

Laboratory: Electromagnetic Near Field and Radio Frequency Dosimetry Laboratory
Ericsson, Inc.
7001 Development Drive, P.O. Box 13969,
Research Triangle Park, NC, 27709, USA

Test Responsible: Mark Douglas, Ph.D.
Senior Staff Engineer, Antenna Development Group

This laboratory is accredited to ISO/IEC Guide 25-1990 to perform the following electromagnetic tests:
Specific Absorption Rate (SAR), dielectric parameters, and RF power measurement on the following types of products:
Wireless communications devices

A2LA certificate Number: 1650-01

Statement of Compliance: Ericsson, Inc. declares under its sole responsibility that the product

R300d

to which this declaration relates, is in conformity with the appropriate RF exposure standards, recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(none)

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Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc

Table of Contents

1. Introduction

This test report is an addendum to report EUS/CV/R-01:0143/REP, "SAR Test Report: R300d with internal antenna." In this report, compliance of the Ericsson R300d portable telephone with RF safety guidelines is demonstrated using an additional carry accessory (applicable RF safety guidelines are given in [1]). The device was tested in accordance with the latest available test guidelines [1]. Detailed procedures of the test are described in the *Ericsson SAR Measurement Specification* [1].

2. Device Under Test

2.1 Antenna description

Type	Internal antenna	
Location	Inside the back cover, near the top	
Dimensions	length	34.5 mm
	width	41 mm
Configuration	Patch antenna	

2.2 Device description

Device model	R300d		
FCC ID	xxxx		
Serial number	2236		
Mode	800 AMPS	800 TDMA	1900 TDMA
Multiple Access Scheme	FDMA	TDMA	TDMA
Maximum Output Power Setting [1]	26.0 dBm	26.0 dBm	26.0 dBm
Factory Tolerance in Power Setting	± 0.25	± 0.25	± 0.25
Maximum Peak Output Power [2]	26.25 dBm	26.25 dBm	26.25 dBm
Duty Cycle	1	1 / 3	1 / 3
Transmitting Frequency Range	824 – 849 MHz	824 – 849 MHz	1850 – 1910 MHz
Prototype or Production Unit	Prototype		

3. Test equipment

3.1 Dosimetric system

SAR measurements were made using two DASY3 professional systems (software version 3.1c), manufactured by Schmid & Partner Engineering AG and installed in February 1998, and November 2000. The total SAR assessment uncertainty (K = 1) of the system is ±16% and includes a +15% offset (overestimation). The extended uncertainty (K = 2) is ±32% with a +15% offset. This results in a total uncertainty range of –1% to +31% for K = 1, or –17% to +47% for K = 2. The equipment list is given below.

Description	**Serial Number**	**Due Date**
DASY3 DAE V1	392	9/01
E-field probe ET3DV5	1324	1/02
Dipole Validation Kit, D900V2	049	1/03
Dipole Validation Kit, D1800V2	217	12/01

[1] This is the conducted power measured at the antenna port when the device is set to its highest power setting. It is measured at the middle of the transmit frequency band. Note that the output power may be different at other frequencies.
[2] This equals the maximum output power setting plus the factory tolerance.

3.2 Additional equipment

Description	Serial Number	Due Date
Signal Generator HP8648C	3537A01598	9/02
Dielectric probe kit HP 85070B	US33020256	10/01
Network analyser HP 8752C	3410A03105	7/01
Power meter E4418B	GB40206594	10/01
Power sensor HP 8482H	3318A09268	8/01
Power meter HP 437B	3125U16190	4/01
Power sensor HP 8482H	2704A06235	4/01

4. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with the dielectric probe kit. These values are shown in the table below. The mass density, ρ, entered into the DASY3 program is also given. Recommended limits for maximum permittivity, minimum conductivity and maximum mass density are also shown [2]. It is seen that the measured parameters result in an overestimation of SAR compared to the recommended values.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters			Chamber Temp. (°C)
			e_r	s (S/m)	r (g/cm^3)	
835	Muscle	**Measured, 3/12/01**	55.57	0.98	1.00	24.3
		Recommended Limits [2]	56.11	0.95	1.04	--
1800	Muscle	**Measured, 3/07/01**	40.75	1.78	1.00	23.8
		Recommended Limits [2]	54.44	1.39	1.04	--

5. System accuracy verification

A system accuracy verification of the DASY3 was performed using the dipole validation kits listed in Section 3.1. The system verification test was conducted on the same day as the measurement of the DUT. The obtained results are displayed in the table below. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values. At 900 MHz, reference values are taken from the system manufacturer. At 1800 MHz, reference values are based on an analysis performed at the laboratory using the dielectric parameters specified below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1).

f (MHz)	Tissue type	Measured / Reference	SAR (W/kg), 1 gram/10 gram	Dielectric Parameters			Chamber Temp. (°C)
				e_r	s (S/m)	r (g/cm^3)	
900	Muscle	**Measured, 3/12/01**	10.78 / 6.84	55.00	1.00	1.00	24.3
		Reference	11.1 / 7.1	56.1	0.99	1.00	?
1800	Head/ Muscle	**Measured, 3/07/01**	41.76 / 20.98	40.75	1.78	1.00	23.8
		Reference	40.8 / 20.76	40.15	1.74	1.00	23.8

6. Test result

The measured 1-gram averaged SAR values of the device are provided in Table 1. Also shown are the measured conducted output powers and the temperature of the test facility during the test. The depth of the tissue simulating liquid was at least 15 cm. Test commands were used to control the device during the SAR measurements. The phone was supplied with a fully-charged battery for the tests.

The device was tested against a flat phantom representing the user's body, using product # SXK 109 4460. SAR was measured at the lowest, middle and highest frequencies of the 800 AMPS and 1900 TDMA bands (800 TDMA is not necessary due to the significantly lower output power).

mode	***f* (MHz)**	**Output Power (dBm)** [3]	**Chamber Temp. (°C)**	**SAR, 1g /10g (W/kg)**	
				measured	**calculated to max. power**
800 AMPS	824	25.9	24.1	0.82 / 0.58	**0.95** / 0.67
	837	25.6	24.2	0.77 / 0.54	0.89 / 0.63
	849	25.4	24.1	0.52 / 0.37	0.60 / 0.43
1900 TDMA	1850	25.7	24.7	0.34 / 0.18	0.38 / 0.20
	1880	25.8	24.8	0.48 / 0.25	0.53 / 0.28
	1910	26.0	24.6	0.51 / 0.26	**0.57** / 0.29

Table 1: SAR measurement results for the Ericsson R300d telephone at highest possible output power. Measured against the body using carry accessory SXK 109 4460.

References

[1] C. Törnevik, M. Siegbahn, T. Persson, M. Douglas, and R. Plicanic, "Ericsson SAR measurement specification", Internal Document ERA/TF-00:037, November 2000.

[2] Federal Communications Commission, "Tissue Dielectric Properties," http://www.fcc.gov/fcc-bin/dielec.sh.

[3] Output power was measured by Ericsson personnel outside the scope and control of the laboratory.

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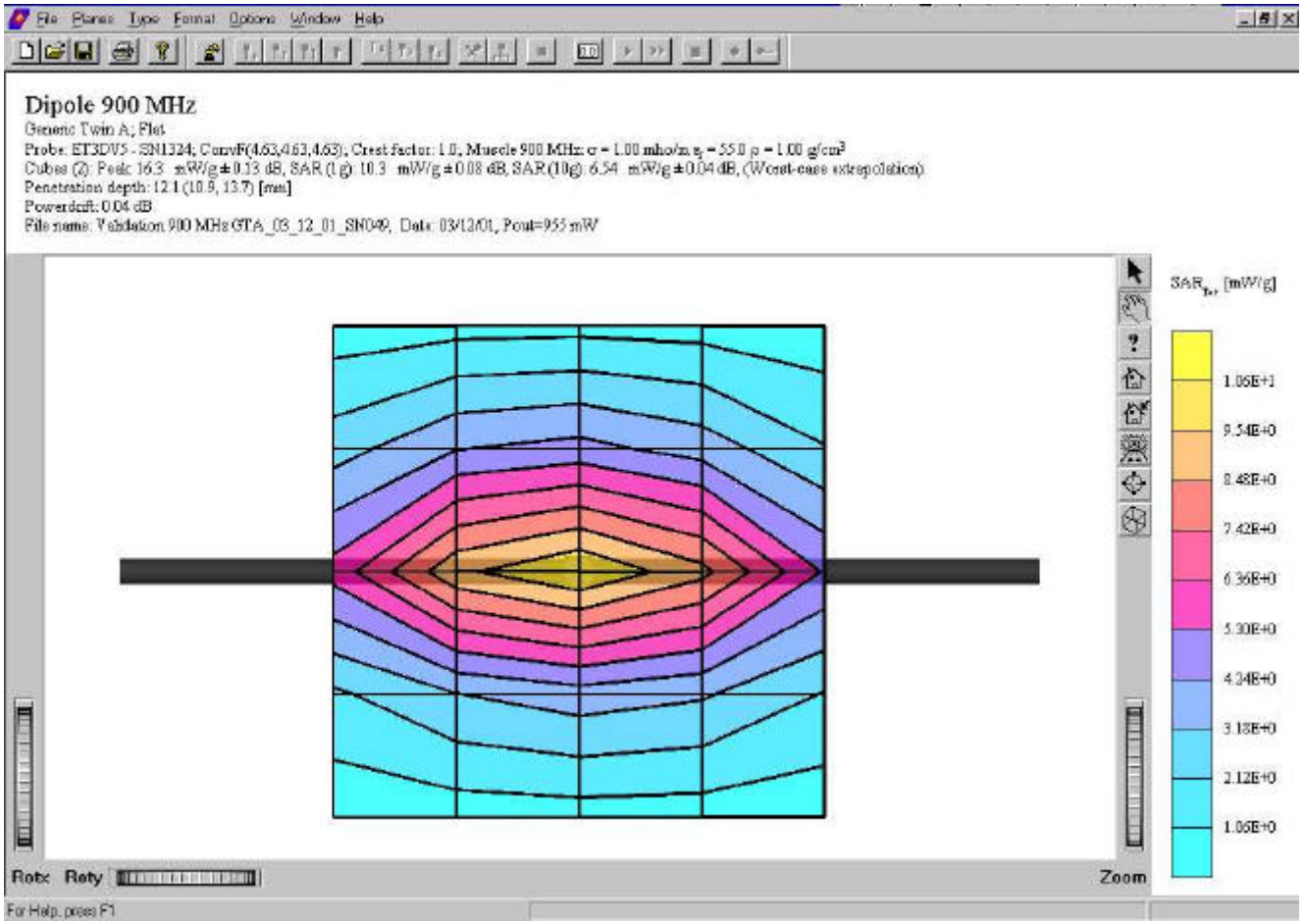
Appendix 1: SAR distribution comparison for system accuracy verification



900 MHz SAR distribution of validation dipole antenna from system accuracy verification test on March 12, 2001. Using muscle tissue.

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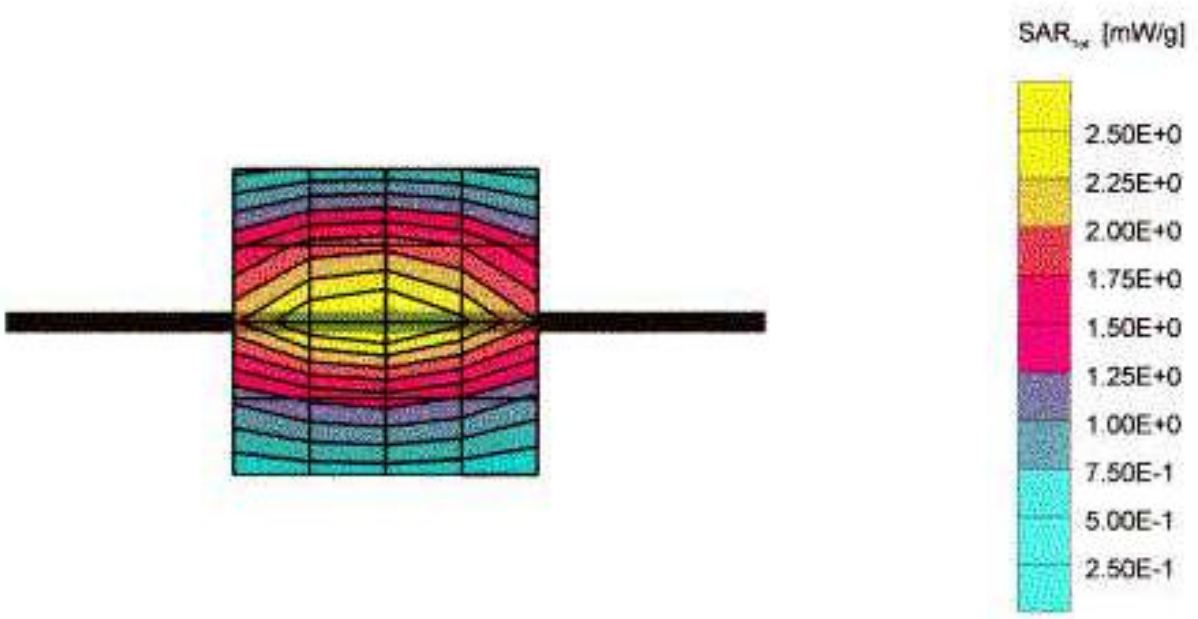
Validation Dipole D900V2 SN:049, d = 15 mm
Frequency: 900 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 15.0, Dy = 15.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.17,6.17,6.17) at 900 MHz; Muscle 900 MHz: σ = 0.99 mho/m ε_r = 56.1 ρ = 1.00 g/cm³
Cubes (2): Peak: 4.42 mW/g ± 0.03 dB, SAR (1g): 2.77 mW/g ± 0.02 dB, SAR (10g): 1.77 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 12.2 (10.7, 14.2) [mm]
Powerdrift: -0.01 dB



900 MHz SAR distribution of validation dipole antenna from reference measurement. Using muscle tissue.

Prepared (also subject responsible if other)		No.		
EUS/CV/RF/P Dulce Altabella		EUS/CV/R-01:0373/REP		
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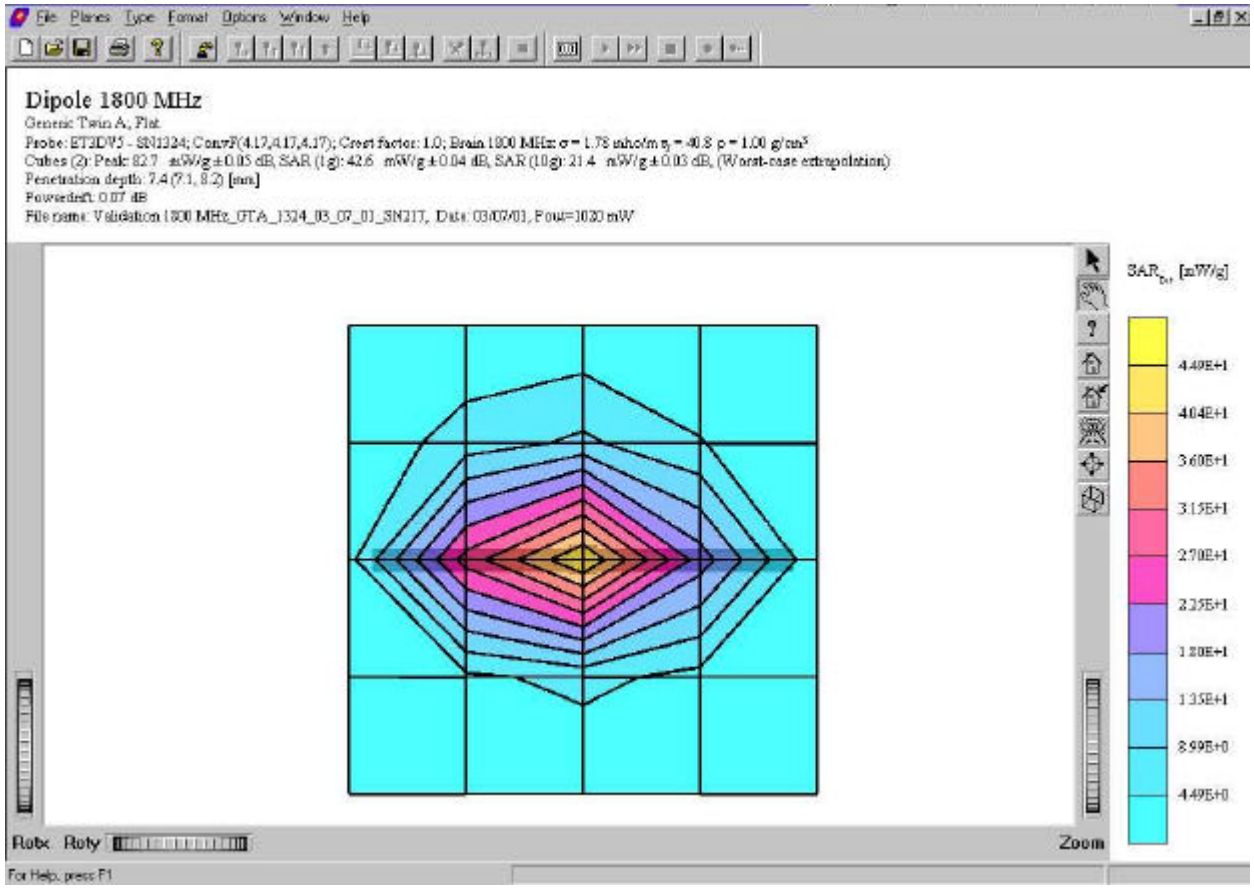

1800 MHz SAR distribution of validation dipole antenna from system accuracy verification test on March 07, 2001. Using head/muscle tissue.

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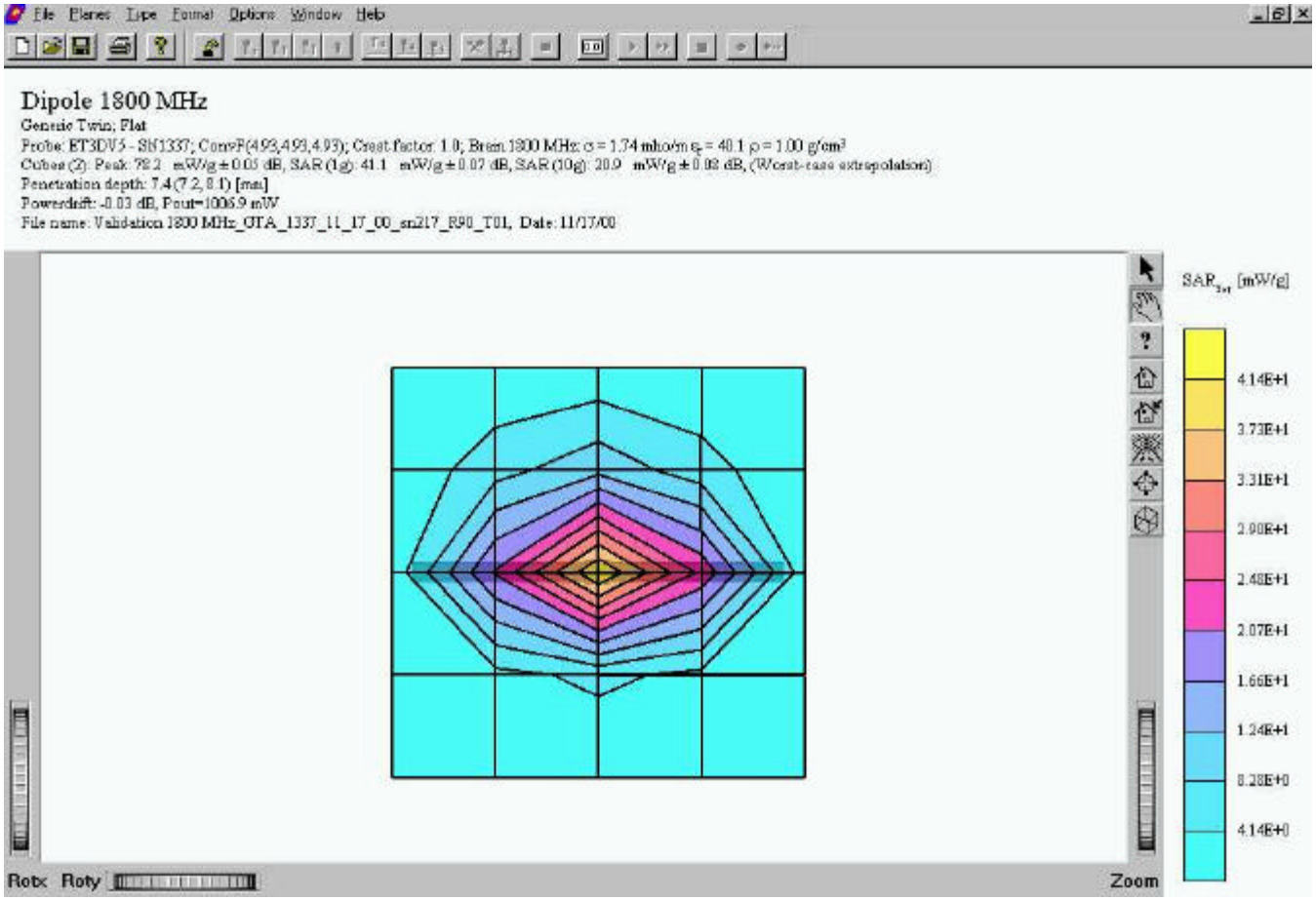
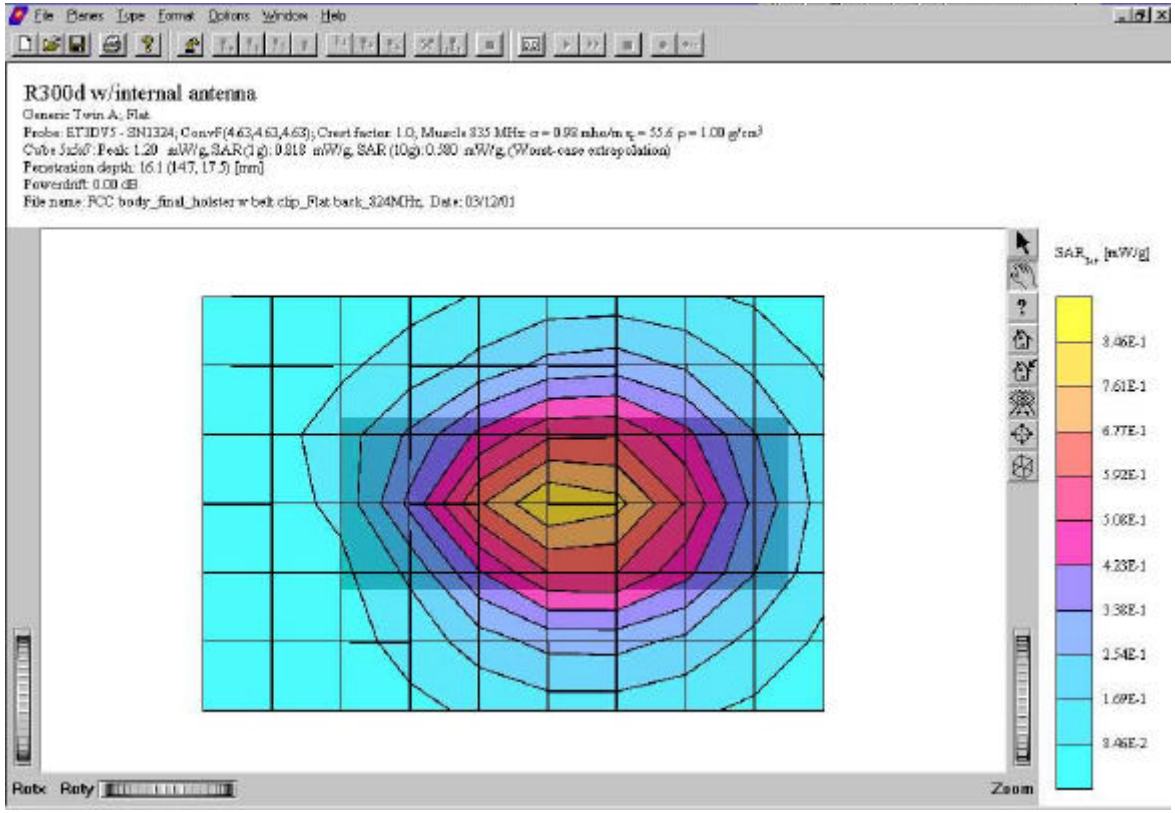
Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc



1800 MHz SAR distribution of validation dipole antenna from reference measurement.
Using head/muscle tissue.

Prepared (also subject responsible if other)		No.		
EUS/CV/RF/P Dulce Altabella		EUS/CV/R-01:0373/REP		
Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc

Appendix 2: SAR distribution plots



Distribution of maximum SAR in 800 AMPS band. Measured against the body using product # SXK 109 4460 as a carry case.

Prepared (also subject responsible if other)		No.		
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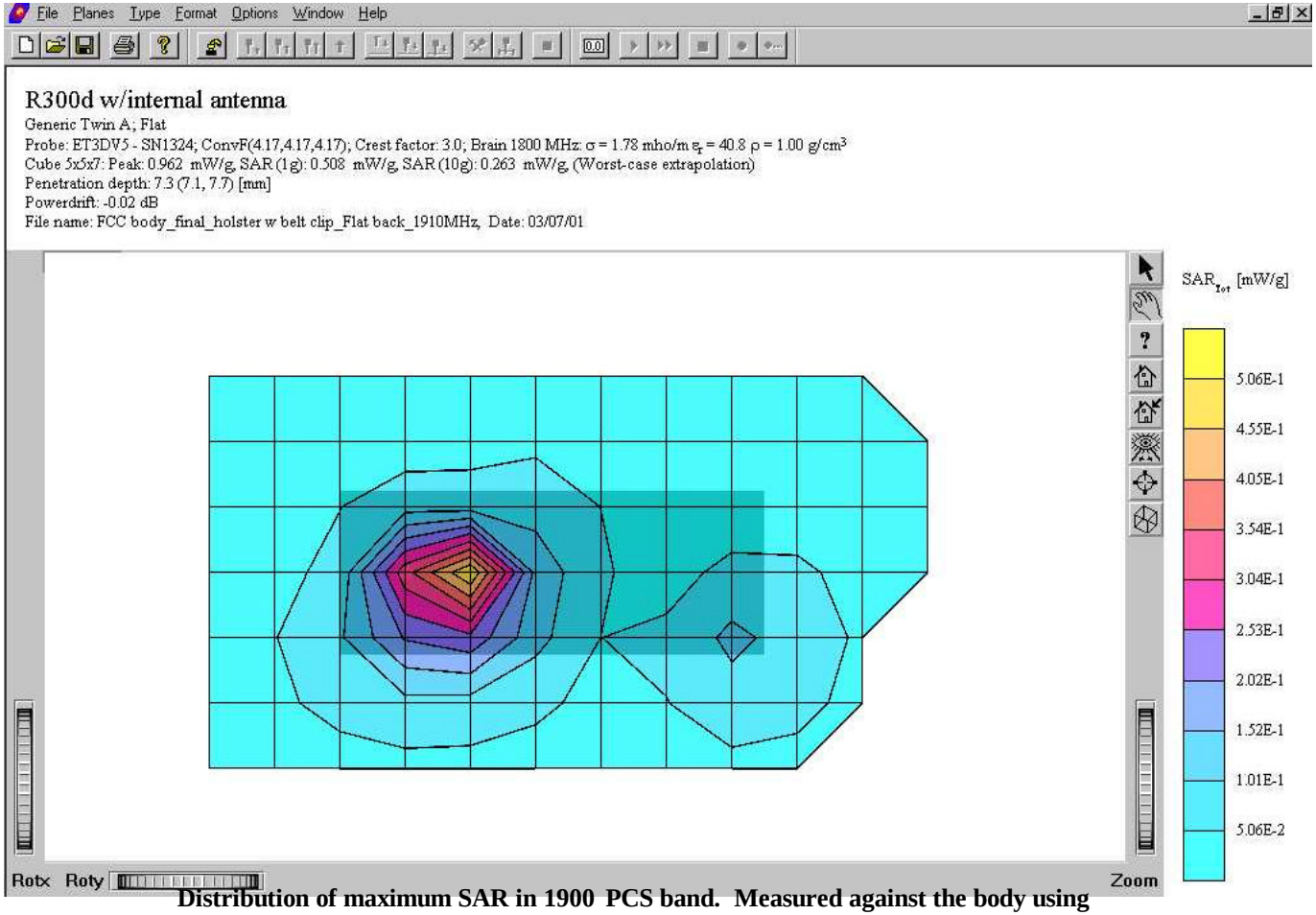
Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc



Distribution of maximum SAR in 1900 PCS band. Measured against the body using product # SXK 109 4460 as a carry accessory.

Prepared (also subject responsible if other)		No.		
EUS/CV/RF/P Dulce Altabella		EUS/CV/R-01:0373/REP		
Approved	Checked			
EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc

Appendix 3: Photographs of Device Under Test

Front view of device.

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Side view of device.

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Approved	Checked			
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EUS/CV/RF/P Mark Douglas	MGD	2001-3-22	A	E:\FCC_TRNS\Fcc_411 Dit Margaretta\class_2 carry case 3_29_01\SAR SXK 109 4460.doc

Front, back, and side views of product number SXK 109 4342.

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Approved	Checked			
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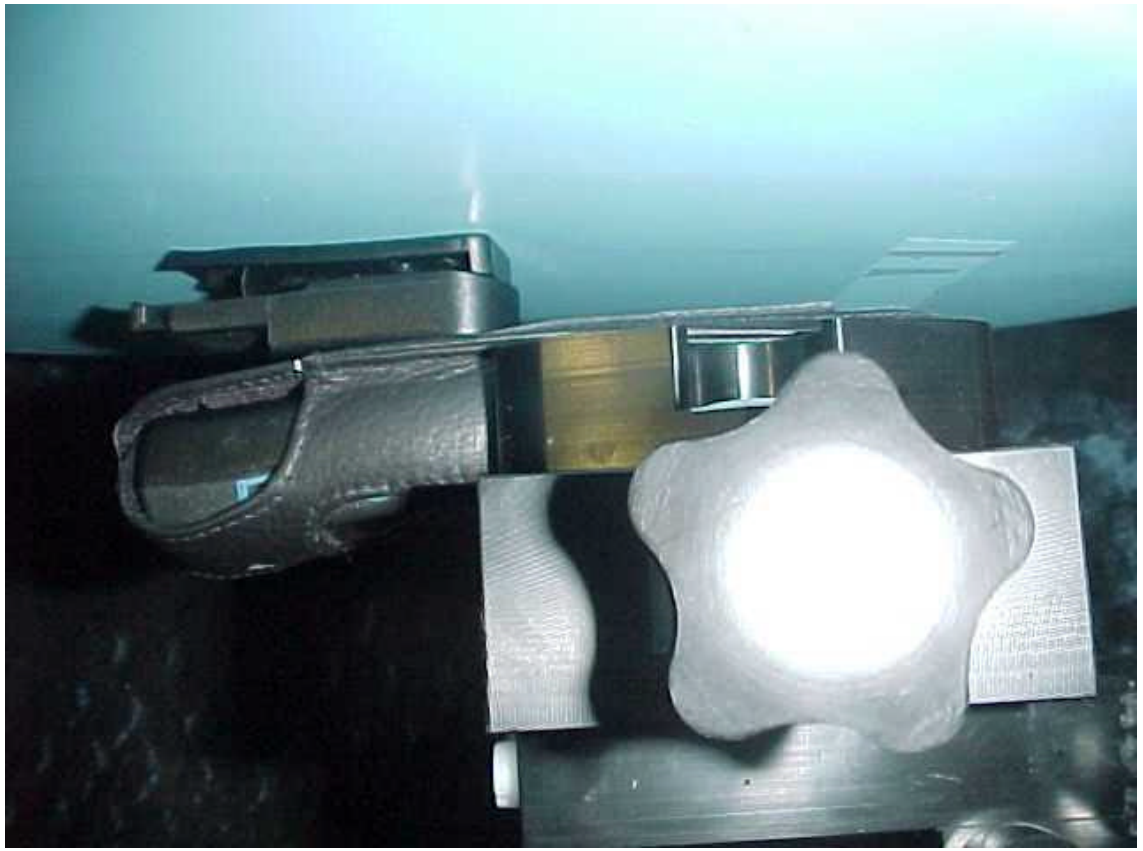
Appendix 4: Position of Device on Phantom



Position of device against flat phantom using carry accessory SXK 109 4460.

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Appendix 5: Probe calibration parameters

DASY3 - Parameters of Probe: ET3DV5 SN:1324

Sensitivity in Free Space

Diode Compression

NormX	1.52 $\mu V/(V/m)^2$	DCP X	104 mV
NormY	1.75 $\mu V/(V/m)^2$	DCP Y	104 mV
NormZ	1.54 $\mu V/(V/m)^2$	DCP Z	104 mV

Sensitivity in Tissue Simulating Liquid

Brain **450 MHz** ε_r = 48 ± 5% σ = 0.50 ± 10% mho/m

ConvF X	5.22 extrapolated	Boundary effect:	
ConvF Y	5.22 extrapolated	Alpha	0.90
ConvF Z	5.22 extrapolated	Depth	1.33

Brain **900 MHz** ε_r = 42.5 ± 5% σ = 0.86 ± 10% mho/m

ConvF X	4.87 ± 7% (k=2)	Boundary effect:	
ConvF Y	4.87 ± 7% (k=2)	Alpha	0.82
ConvF Z	4.87 ± 7% (k=2)	Depth	1.56

Brain **1500 MHz** ε_r = 41 ± 5% σ = 1.32 ± 10% mho/m

ConvF X	4.40 interpolated	Boundary effect:	
ConvF Y	4.40 interpolated	Alpha	0.72
ConvF Z	4.40 interpolated	Depth	1.88