Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

SAR Test Report: T206 (PXITR-503-A2)

Date of test: May 14,15,and 16, 2002

Laboratory: SAR Testing Laboratory
Sony Ericsson Mobile Communications, Inc.
7001 Development Drive, P.O. Box 13969,
Research Triangle Park, NC, 27709, USA

Tested by: William Stewart
Development Engineer, Antenna Development Group
Dulce Altabella
Staff Engineer, Antenna Development Group

Test Responsible: Dulce Altabella
Staff Engineer, Antenna Development Group

Accreditation: This laboratory is accredited to ISO/IEC 17025-1999 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: Sony Ericsson Mobile Communications, Inc. declares under its sole responsibility that the product

T206
FCC ID: PXITR-503-A2
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 using specifications that closely conform to the latest appropriate measurement standards, guidelines and recommended practices. Any deviations from these specifications or from ISO/IEC 17025-1999 are noted below:

None

Table of Contents

1. Introduction

In this report, compliance of the T206 wireless handset with RF safety guidelines is demonstrated while the device is held next to the ear of a person. The T206 model is a dual band tri-mode CDMA cellular phone, which operates in the 800 MHz and 1900 MHz frequency bands. The applicable RF safety guidelines and the SAR measurement specifications used for the test are described in [1].

2. Device Under Test

2.1 Antenna description

Type	Internal antenna	
Location	Inside the back cover, near the top	
Dimensions	Maximum length	20 mm
	Maximum width	40 mm
Configuration	Patch antenna	

2.2 Device description

Device model	T206		
FCC ID	PXITR-503-A2		
Serial number	UA2020NPHM		
Maximum Size	Length	113 mm	
	Width	50 mm	
	Thickness	26 mm	
Modes	800 AMPS	800 CDMA	1900 CDMA
Multiple Access Scheme	FDMA	CDMA	CDMA
Maximum Output Power Setting	26.0 dBm	23.4 dBm	23.4 dBm
Factory Tolerance in Power Setting	± 0.25	± 0.40	± 0.40
Maximum Peak Output Power	26.25 dBm	23.8 dBm	23.8 dBm
Duty Cycle	1	1	1
Transmitting Frequency Range	824 – 849 MHz	824 – 849 MHz	1850 – 1910 MHz
Prototype or Production Unit	Prototype		
Device Category	Portable		
RF Exposure Environment [2]	General population / uncontrolled		

3. Test equipment

3.1 Dosimetric system

SAR measurements were made using a DASY3 professional system (software version 3.1d) with a SAM phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The measurement uncertainty of the system is given in [1]. Below is a list of the calibrated equipment.

Description	**Serial Number**	**Due Date**
DASY3 DAE V1	415	12 / 2002
DASY3 DAE V1	416	12 / 2002
E-field probe ET3DV5	1324	12 / 2002
E-field probe ET3DV6	1539	12 / 2002
Dipole Validation Kit, D835V2	429	03 / 2003
Dipole Validation Kit, D1900V2	536	03 / 2003

3.2 Additional calibrated equipment

Description	Serial Number	Due Date
Signal Generator HP8648C	3537A01598	9/2002
Dielectric probe kit HP 85070B	US33020256	10/2002
Network analyzer HP 8752C	3410A03105	8/2002
Power meter HP 437B	3125U16190	4/2003
Power sensor HP 8482H	2704A06235	3/2003
Power meter HP 437B	3125U113481	6/2002
Power sensor HP 8482H	MY41090240	6/2002
Power meter E4418B	GB40206594	9/2002
Power sensor HP 8482H	3318A09268	8/2002
Hygrometer / Thermometer	21242911	10/2002
Thermometer / Probe	350078/99172351	10/2002
Thermometer / Probe	21117674/21117824	11/2002
Spectrum Analyzer MS2623A	M07418	10/2002

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 are tabulated below. A mass density of $\rho = 1.00$ g/cm^3 was entered into the DASY3 program in all cases. The temperatures of the tissue simulants during measurements are also given. During the tests, the ambient temperature of the laboratory was in the range 21.8 – 24.5 °C, the relative humidity was 28.5 – 35.2% and the liquid depth above the ear reference points was 160 – 168 mm. It can be seen that the measured parameters are within tolerance of the recommended limits [1].

f (MHz)	Tissue type	Date	Dielectric Parameters		Simulant Temp (°C)
			e_r	s (S/m)	
835	Head	15MAY02	41.37	0.90	22.3
835	Head	16MAY02	41.03	0.89	22.8
1900	Head	14MAY02	38.88	1.43	22.3

5. System performance check

A system performance check of the DASY3 was performed using the dipole validation kits listed in Section 3.1. System performance checks were conducted on the same day as the measurement of the DUT. The obtained results are displayed in the table below (SAR values are scaled to 1 Watt power delivered to the antenna). During the tests, the ambient temperature of the laboratory was in the range 21.8 – 24.5 °C, the relative humidity was 28.5 – 35.2% and the liquid depth above the ear reference points was 160 – 168 mm. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values. Reference values are taken from IEEE P1528 for both the 835MHz and 1900MHz head simulant. The SAR distributions are shown in Appendix 1.

Daily, prior to conducting tests, measurements were made with RF sources powered off to determine system noise. The highest system noise value was 0.0089 W/kg, which is below the recommended limit [2].

f MHz	Tissue type	Measured / Reference	SAR (W/kg) 1 g/10 g	Dielectric Parameters		Simulant Temp. (°C)
				e_r	s (S/m)	
835	Head	Measured, 5/15/02	9.61 / 6.25	41.37	0.90	22.2
		Reference (IEEE P1528)	9.5 / 6.2	41.5	0.90	+/-2.0 of value in §4
		Measured, 5/16/02	9.58 / 6.23	41.03	0.89	22.6
		Reference (IEEE P1528)	9.5 / 6.2	41.5	0.90	+/-2.0 of value in §4
1900	Head	Measured, 5/14/02	40.5/21.1	38.88	1.43	22.0
		Reference (IEEE P1528)	39.7/20.5	40.0	1.40	+/-2.0 of value in §4

6. Test results

The measured 1- and 10-gram averaged SAR values of the device are provided in Tables 1 and 2. Also shown are the measured conducted output powers and the temperature of the tissue simulant during the test. The depth of the tissue simulating liquid was at least 15 cm for all the cases. The humidity and ambient temperature of the test facility were in the ranges 28.5 – 35.2% and 21.8 – 24.5 °C respectively. Test commands were used to control the device during the SAR measurements.

SAR measured against the side of the head, using battery BKB-193-1054 (800mAh) is presented in Table 1 and 2. The device was tested on the right-hand phantom (corresponding to the right side of the head) and the left-hand phantom using both the "Cheek" and "Tilt" positions. For 800 AMPS and 1900 CDMA modes, the device was tested at the lowest, middle, and highest frequencies of the transmit band. For 800 CDMA mode, the maximum power is significantly lower than that of AMPS mode, therefore SAR values are also lower.

Mode / Battery	*f* (MHz)	Output Power (dBm)	Left hand (CHEEK)			Right hand (CHEEK)		
			Simulant Temps. (°C)	SAR, 1g /10g (W/kg)		Simulant Temps. (°C)	SAR, 1g /10g (W/kg)	
				measured	Calculated to max. power		measured	Calculated to max. power
800 AMPS BKB-193-1054	824	26.13	22.1	0.92/0.61	0.95/0.64	22.1	0.92/0.58	0.95/0.60
	837	26.12	22.2	1.38/0.87	1.42/0.90	22.3	1.42/0.89	1.46/0.92
	849	26.12	22.2	1.44/0.88	1.48/0.91	22.1	1.44/0.88	1.48/0.91
			Left hand (TILT)			Right hand (TILT)		
	824	26.13	22.5	0.52/0.35	0.53/0.36	22.6	0.48/0.33	0.49/0.34
	837	26.12	22.5	0.69/0.47	0.71/0.48	22.6	0.64/0.43	0.66/0.44
	849	26.12	22.5	0.68/0.46	0.71/0.47	22.6	0.56/0.38	0.58/0.40

Table 1: SAR measurement results for the T206 telephone at highest possible output power. AMPS mode

Mode / Battery	*f* (MHz)	Output Power (dBm)	Left hand (CHEEK)			Right hand (CHEEK)		
			Simulant Temps. (°C)	SAR, 1g /10g (W/kg)		Simulant Temps. (°C)	SAR, 1g /10g (W/kg)	
				measured	Calculated to max. power		measured	Calculated to max. power
1900 CDMA BKB-193-1054	1850	23.57	22.6	0.92/0.56	0.96/0.59	22.0	1.06/0.64	1.10/0.67
	1880	23.63	22.8	1.02/0.63	1.06/0.65	22.1	1.23/0.73	1.28/0.76
	1910	23.79	22.7	0.86/0.53	0.90/0.55	22.3	1.05/0.64	1.09/0.66
			Left hand (TILT)			Right hand (TILT)		
	1850	23.42	22.6	1.01/0.59	1.05/0.61	22.5	1.09/0.63	1.13/0.65
	1880	23.48	22.8	1.10/0.63	1.14/0.65	22.4	1.14/0.65	1.18/0.67
	1910	23.64	22.9	0.88/0.51	0.92/0.53	22.4	1.08/0.62	1.12/0.65

Table 2: SAR measurement results for the T206 telephone at highest possible output power. CDMA 1900 mode.

References

[1] D. Altabella, “SAR Measurement Specification of Wireless Handsets,” Sony Ericsson internal document EUS/CV/R-01:1061/REP, February 2002.

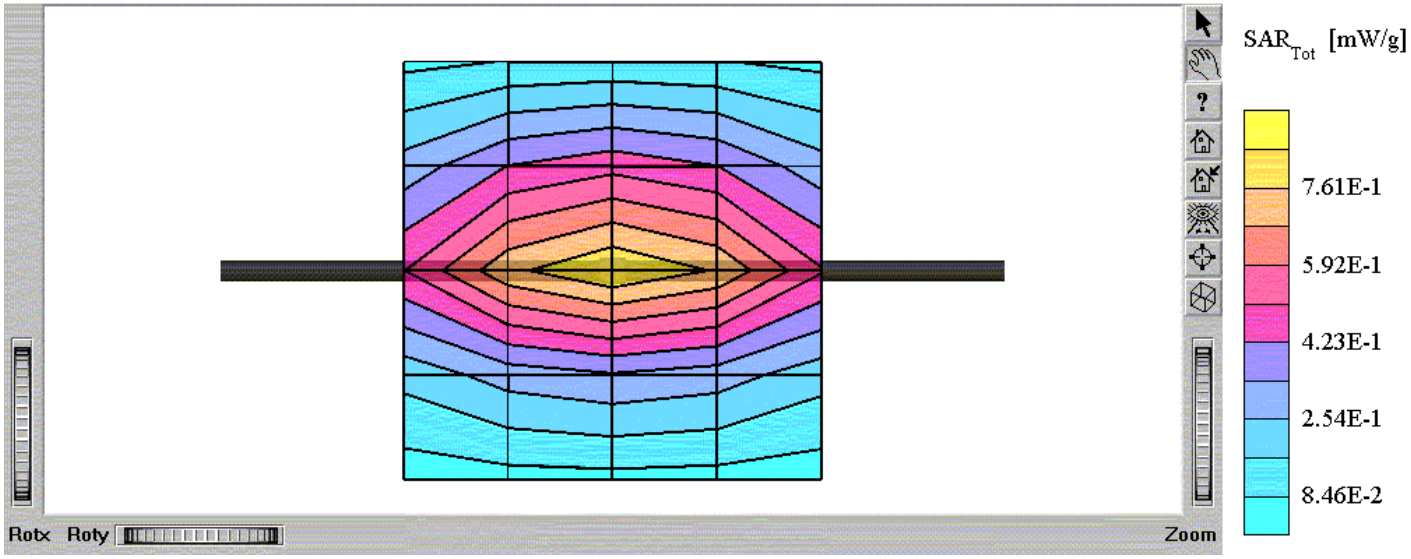
[2] FCC, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions,” Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01).

[3] IEEE, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques,” Std 1528-200X, Draft 6.5 – August 20, 2001.

[4] CENELEC, “Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz – 3 GHz)”, European Standard EN 50361, July 2001.

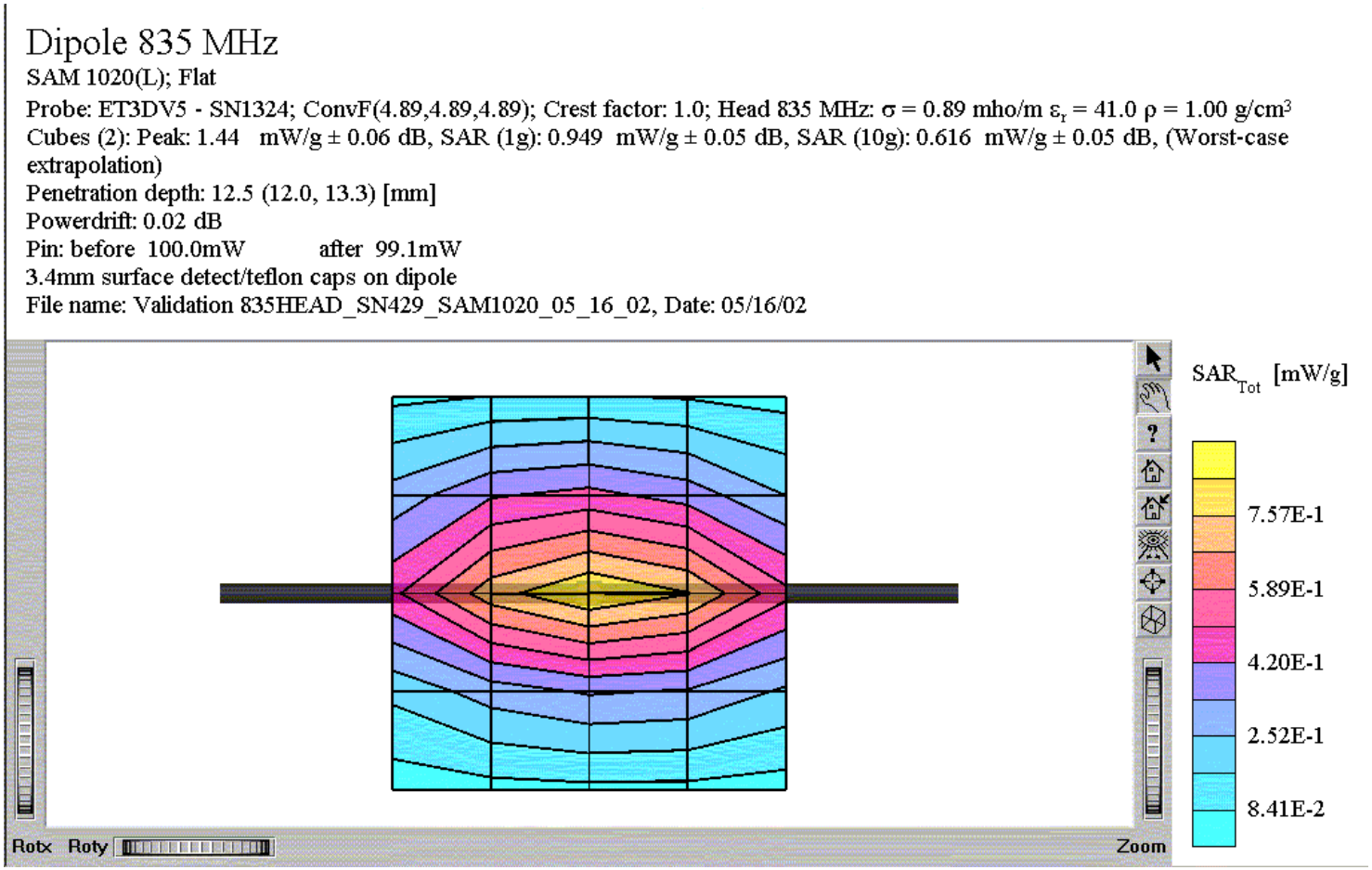
Appendix 1: SAR distribution comparison for system performance check

Dipole 835 MHz
SAM 1020(L); Flat
Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3
Cubes (2): Peak: 1.45 mW/g ± 0.04 dB, SAR (1g): 0.961 mW/g ± 0.05 dB, SAR (10g): 0.625 mW/g ± 0.05 dB, (Worst-case extrapolation)
Penetration depth: 12.5 (11.9, 13.3) [mm]
Powerdrift: 0.04 dB
Pin: before 100.0mW after 100.0mW
3.4mm surface detect/teflon caps on dipole
File name: Validation 835HEAD_SN429_SAM1020_05_15_02, Date: 05/15/02



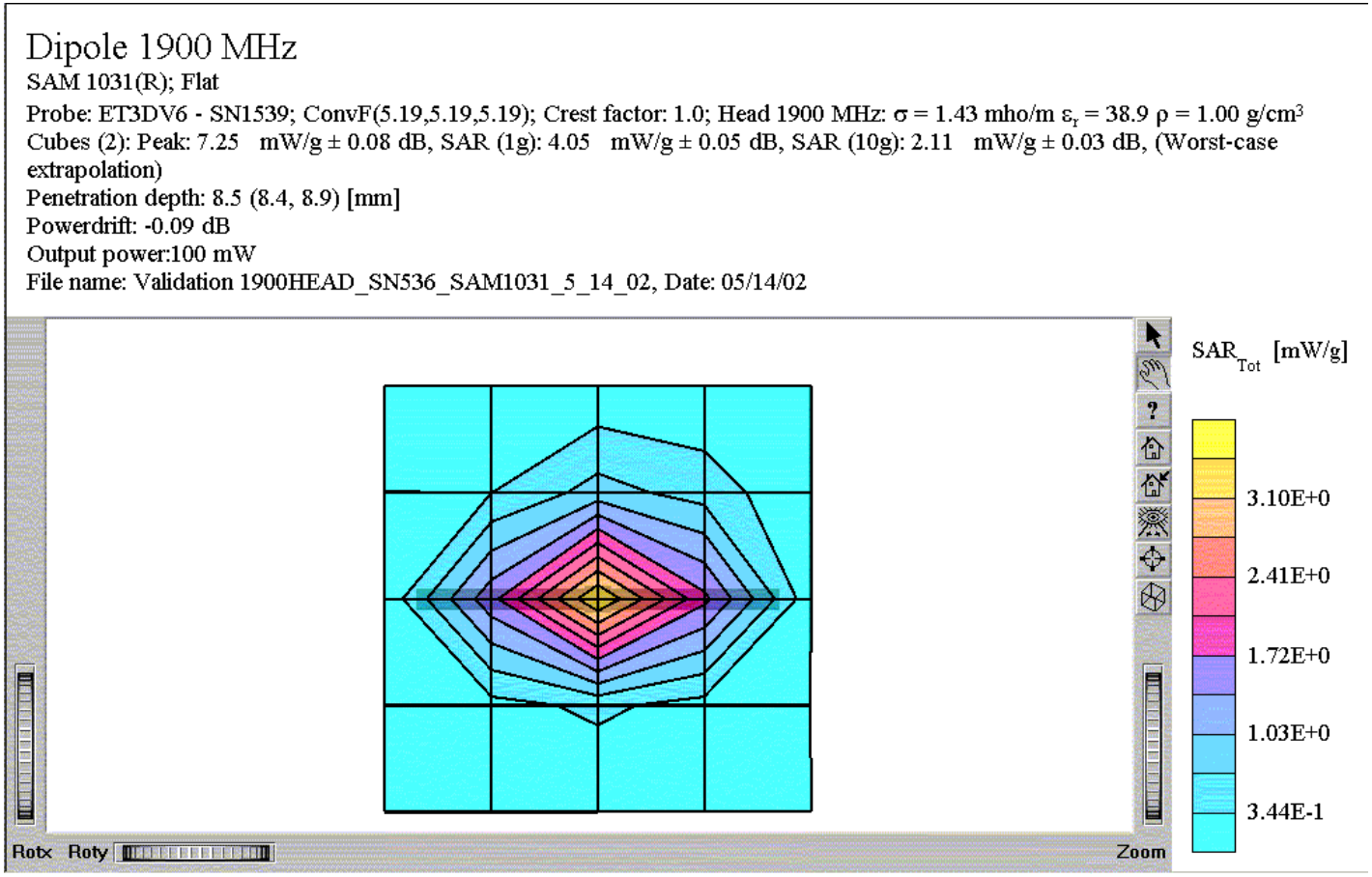
835 MHz SAR distribution of validation dipole antenna from system performance check on May 15, 2002. Using head tissue.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc



835 MHz SAR distribution of validation dipole antenna from system performance check on May 16, 2002. Using head tissue.

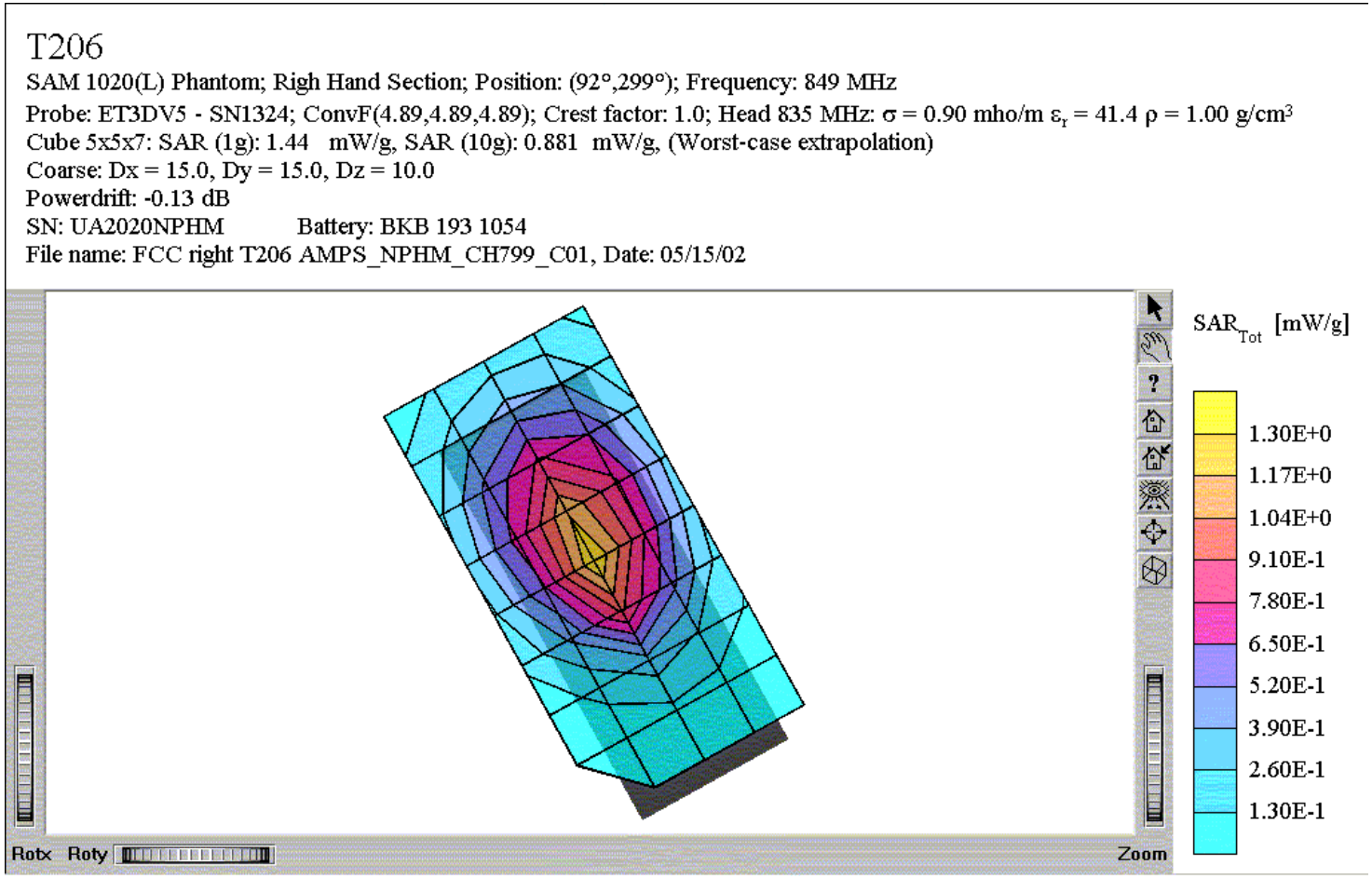
Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc



1900 MHz SAR distribution of validation dipole antenna from system performance check on May 14, 2002. Using head tissue.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

Appendix 2: SAR distribution plots

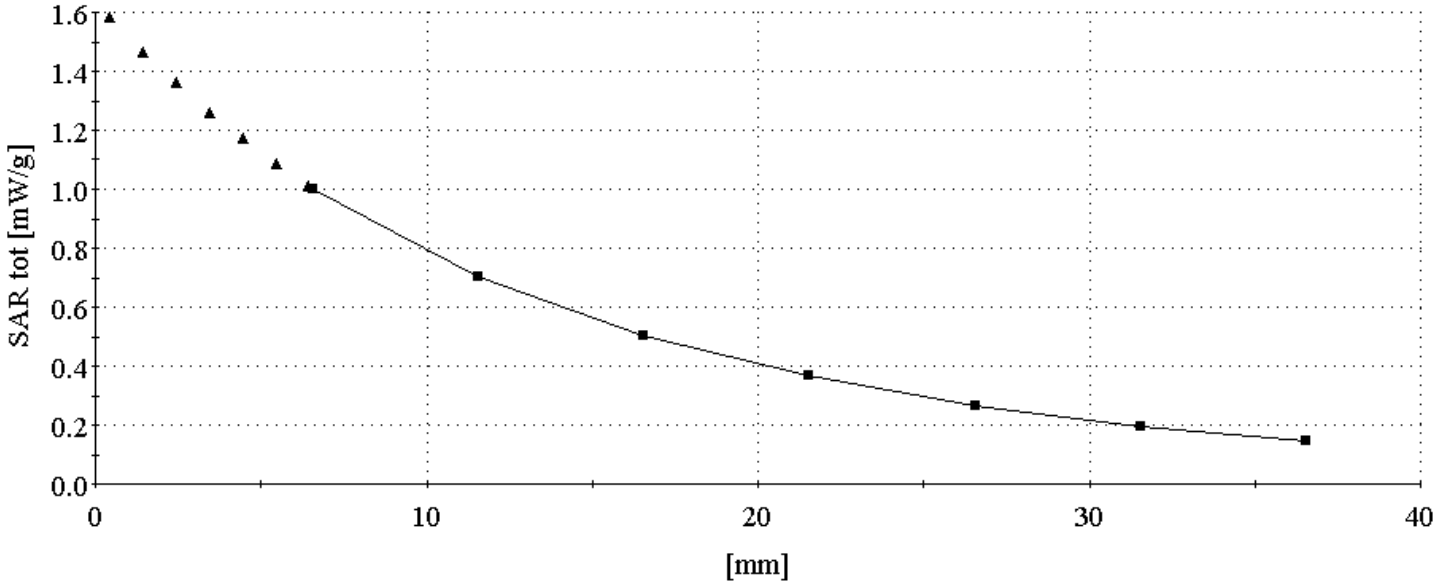


Distribution of maximum SAR in 800 AMPS band. Measured against the right hand side of the head in the "Cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1020(L) Phantom; Righ Hand Section; Position: (92°,299°); Frequency: 849 MHz
Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3
Cube 5x5x7: SAR (1g): 1.44 mW/g, SAR (10g): 0.881 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0
Penetration depth: 11.6 (10.5, 13.1) [mm]
SN: UA2020NPHM Battery: BKB 193 1054
File name: FCC right T206 AMPS_NPHM_CH799_C01, Date: 05/15/02



SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 AMPS band, while phone is against the right hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31 B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1020(L) Phantom; Left Hand Section; Position: (92°,61°); Frequency: 849 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3

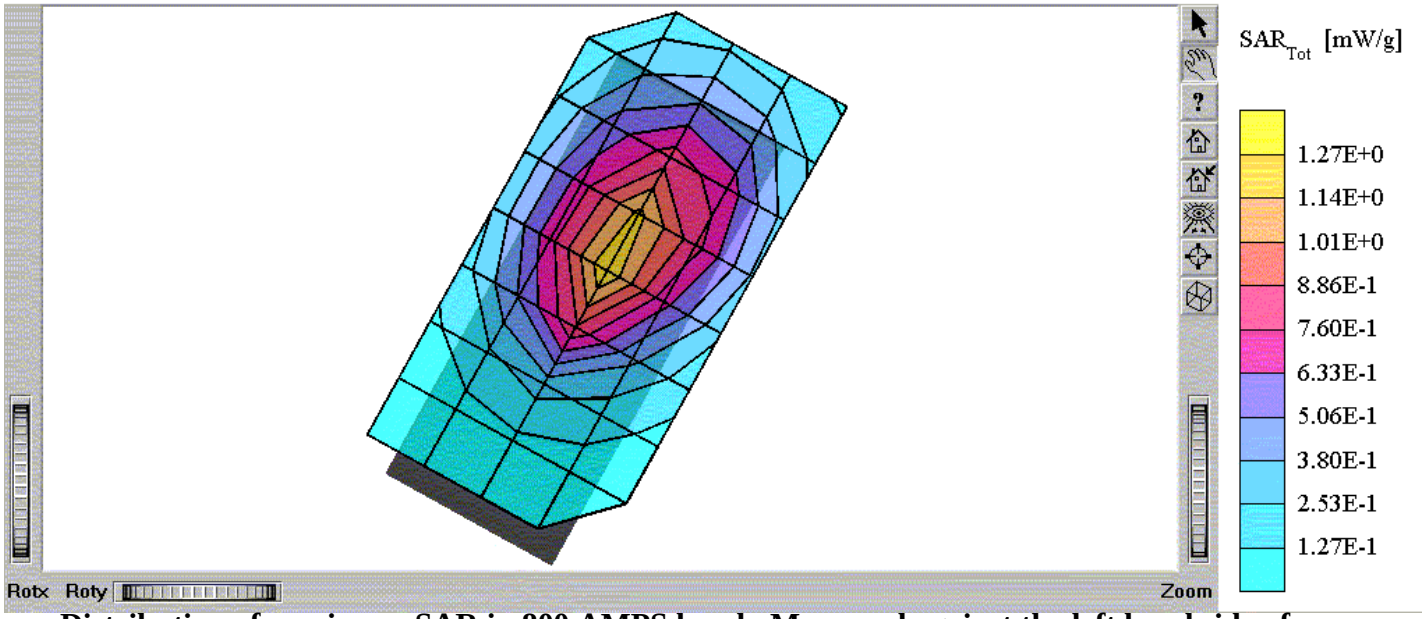
Cube 5x5x7: SAR (1g): 1.44 mW/g, SAR (10g): 0.882 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Powerdrift: 0.09 dB

SN:UA2020NPHM Battery:BKB-193-1054

File name: FCC left T206 AMPS_NPHM_CH799_C01, Date: 05/15/02



Distribution of maximum SAR in 800 AMPS band. Measured against the left hand side of the head in the "Cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1020(L) Phantom; Left Hand Section; Position: (92°,61°); Frequency: 849 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3

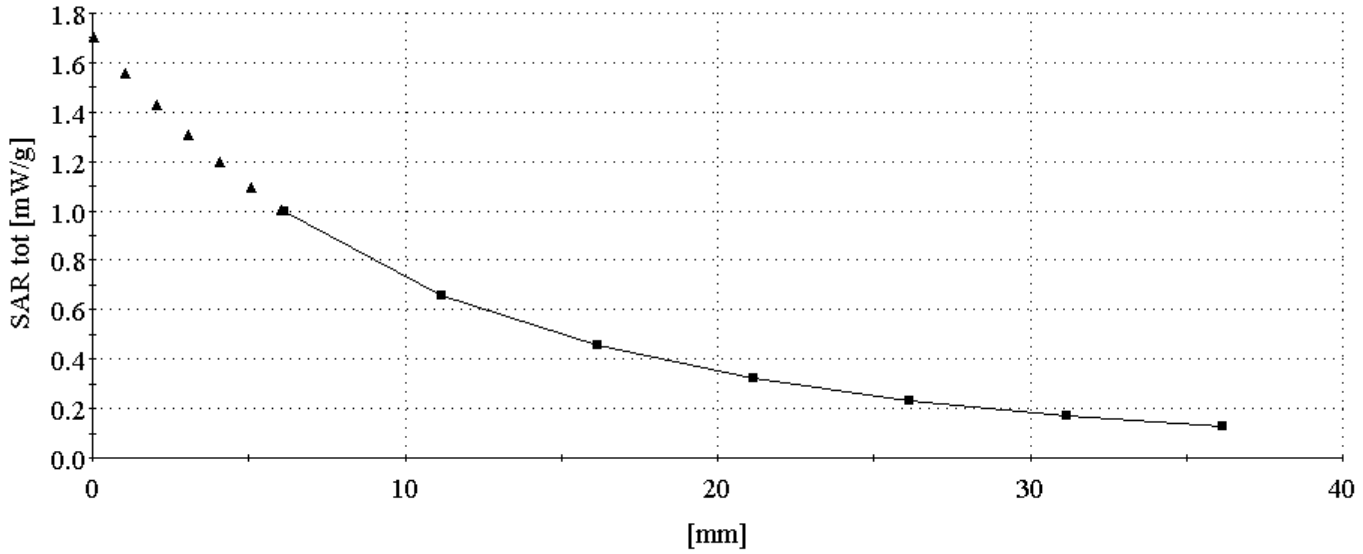
Cube 5x5x7: SAR (1g): 1.44 mW/g, SAR (10g): 0.882 mW/g, (Worst-case extrapolation)

Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0

;Penetration depth: 11.6 (10.6, 13.0) [mm]

SN:UA2020NPHM Battery:BKB-193-1054

File name: FCC left T206 AMPS_NPHM_CH799_C01, Date: 05/15/02



SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 AMPS band, while phone is against the left hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1020(L) Phantom; Left Hand Section; Position: (107°,61°); Frequency: 837 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.0$ $\rho = 1.00$ g/cm^3

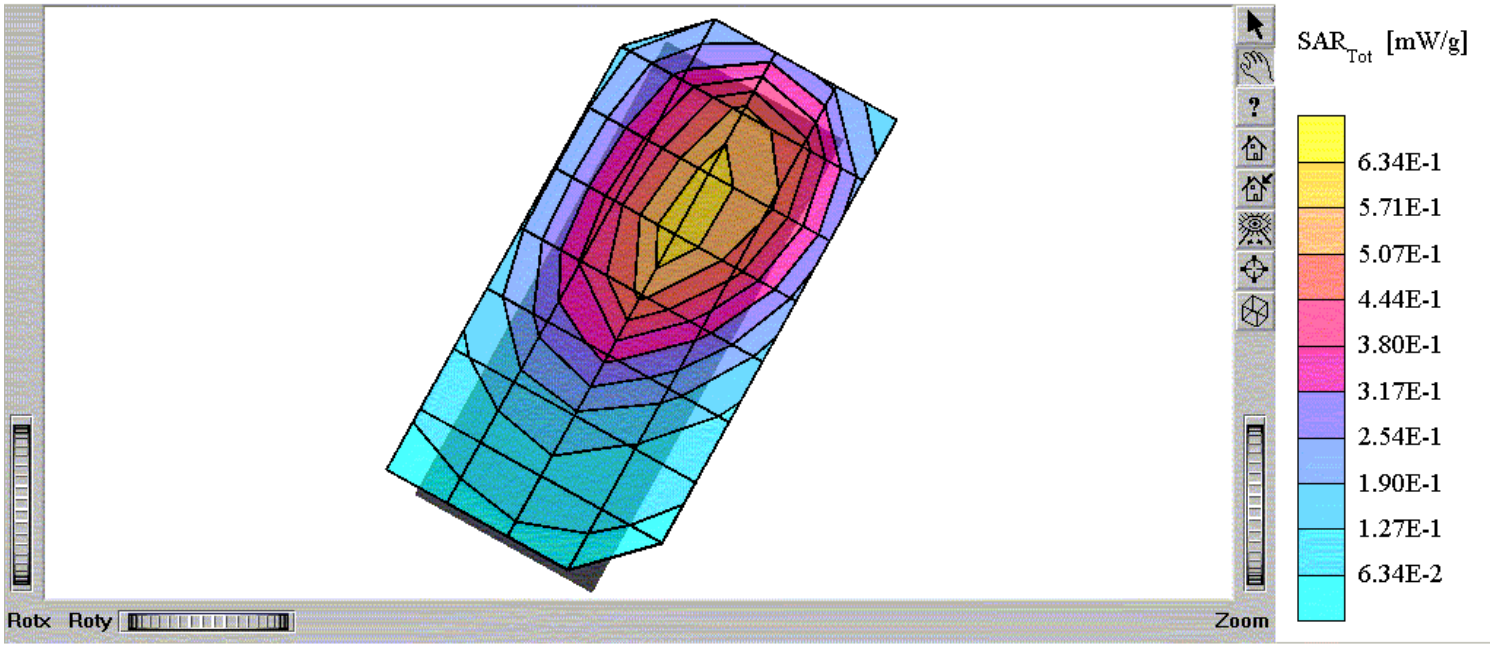
Cube 5x5x7: SAR (1g): 0.691 mW/g, SAR (10g): 0.473 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Powerdrift: -0.18 dB;Penetration depth: 14.9 (14.3, 15.6) [mm]

SN:UA2020MPHM Battery:BKB 193 1054

File name: FCC left T206 AMPS_NPHM_CH383_T01, Date: 05/16/02



Distribution of maximum SAR in 800 AMPS band. Measured against the left hand side of the head in the "Tilt" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1020(L) Phantom; Left Hand Section; Position: (107°,61°); Frequency: 837 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.0$ $\rho = 1.00$ g/cm^3

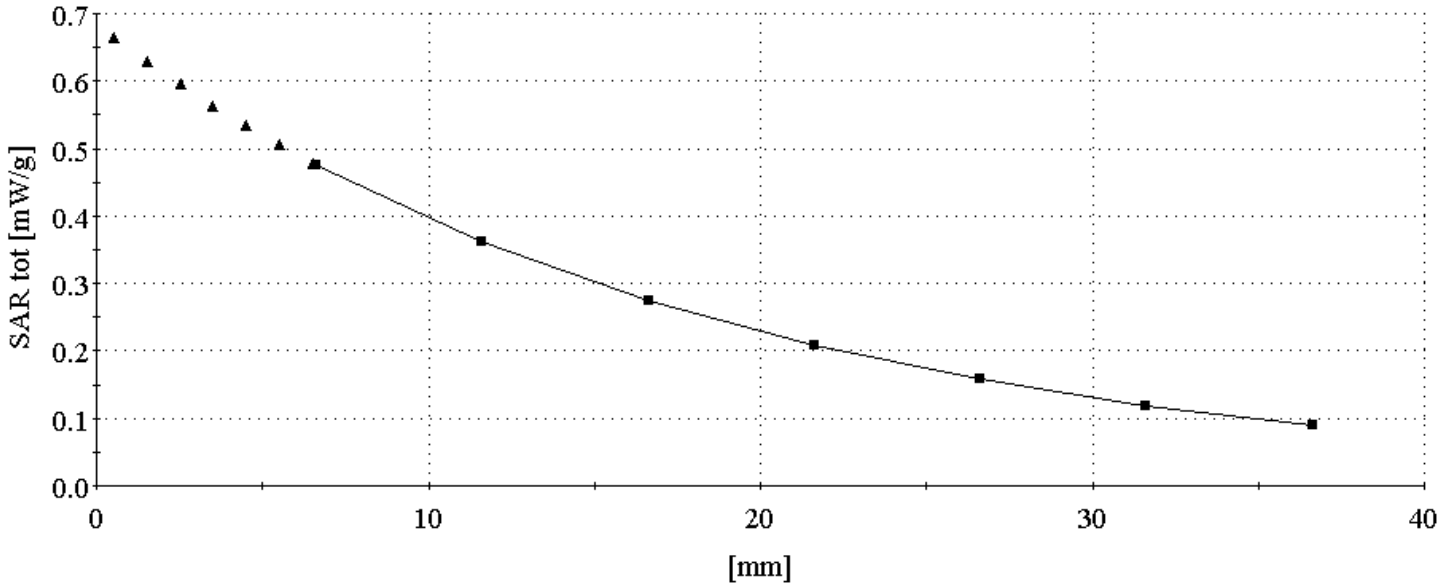
Cube 5x5x7: SAR (1g): 0.691 mW/g, SAR (10g): 0.473 mW/g, (Worst-case extrapolation)

Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0

;Penetration depth: 14.9 (14.3, 15.6) [mm]

SN:UA2020MPHM Battery:BKB 193 1054

File name: FCC left T206 AMPS_NPHM_CH383_T01, Date: 05/16/02



SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 AMPS band, while phone is against the left hand side of the head in the "tilt" position.

T206

SAM 1031(R) Phantom; Righ Hand Section; Position: (92°,299°); Frequency: 1880 MHz

Probe: ET3DV6 - SN1539; ConvF(5.19,5.19,5.19); Crest factor: 1.0; Head 1900 MHz: $\sigma = 1.43$ mho/m $\varepsilon_r = 38.9$ $\rho = 1.00$ g/cm^3

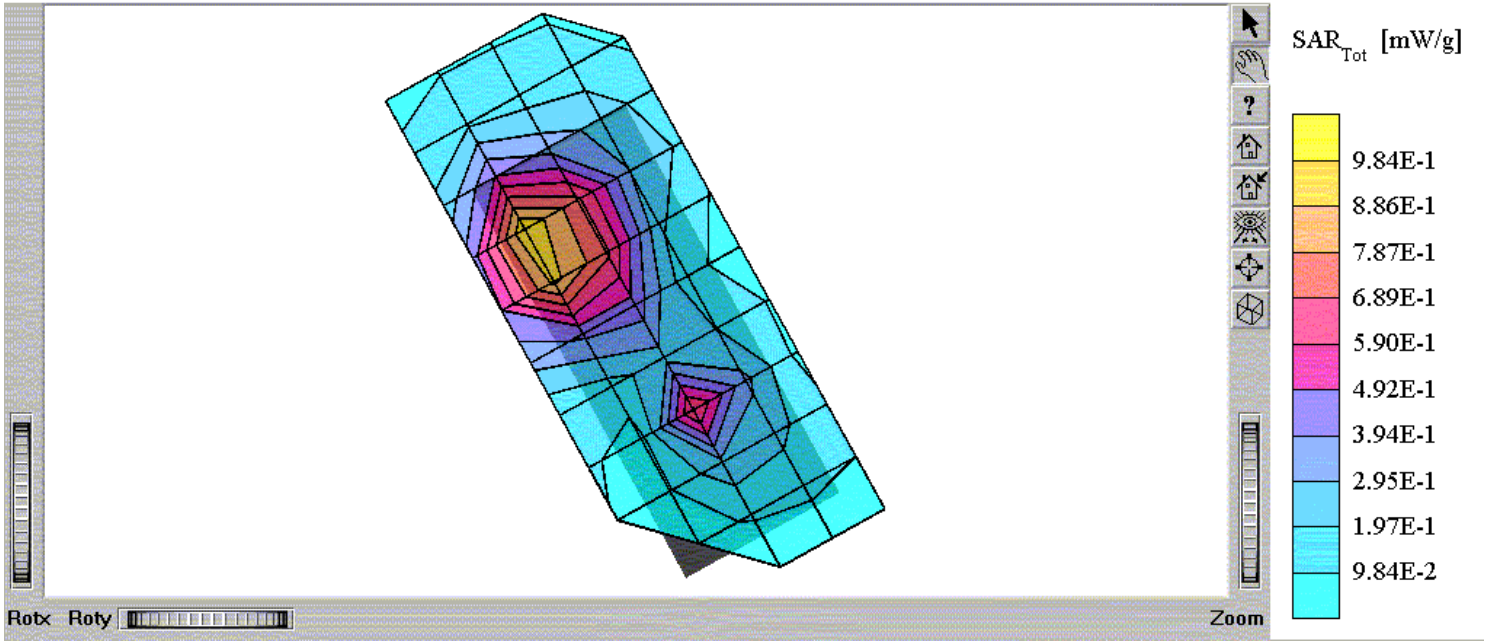
Cube 5x5x7: SAR (1g): 1.23 mW/g, SAR (10g): 0.732 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Powerdrift: 0.00 dB

SN: UA2020NPHM Battery:BKB 193 1054

File name: FCC right_CDMAPCS_1880_cheek, Date: 05/14/02

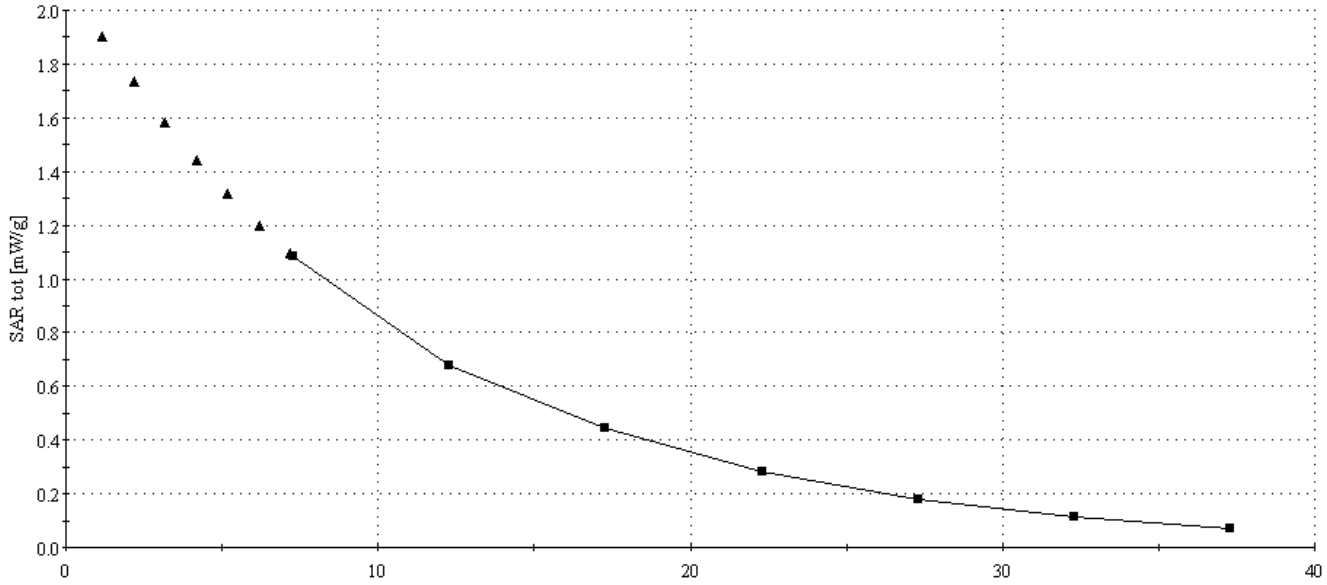


Distribution of maximum SAR in 1900 CDMA band. Measured against the right hand side of the head in the "Cheek" position.

T206

SAM 1031(R) Phantom; Righ Hand Section; Position: (92°,299°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1539; ConvF(5.19,5.19,5.19); Crest factor: 1.0; Head 1900 MHz: σ = 1.43 mho/m ε_r = 38.9 ρ = 1.00 g/cm^3
Cube 5x5x7: Peak: 1.92 mW/g;SAR (1g): 1.23 mW/g, SAR (10g): 0.732 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0
;Penetration depth: 10.9 (10.8, 11.2) [mm]

File name: FCC right_CDMAPCS_1880_cheek, Date: 05/14/02



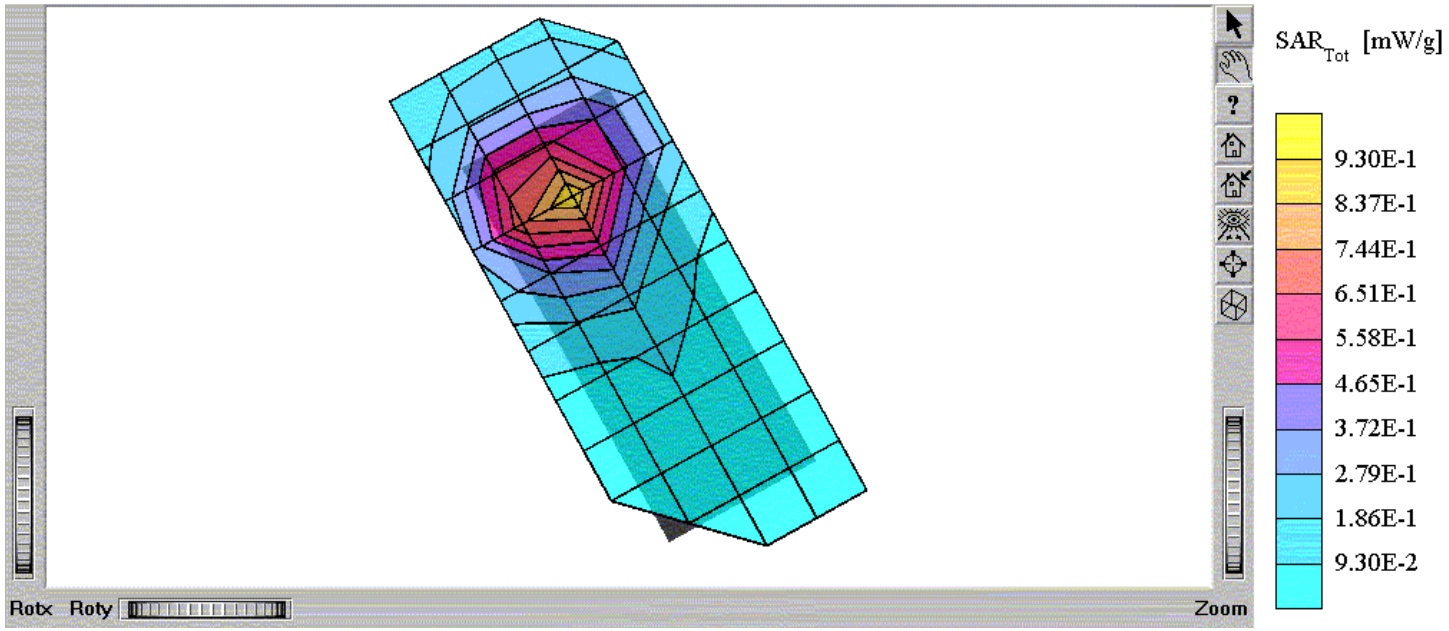
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 CDMA band, while phone is against the right hand side of head in the "cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1031(R); Righ Hand

Probe: ET3DV6 - SN1539; ConvF(5.19,5.19,5.19); Crest factor: 1.0; Head 1900 MHz: σ = 1.43 mho/m ε_r = 38.9 ρ = 1.00 g/cm^3
Cube 5x5x7: Peak: 1.86 mW/g, SAR (1g): 1.14 mW/g, SAR (10g): 0.649 mW/g, (Worst-case extrapolation)
Penetration depth: 10.6 (10.6, 10.8) [mm]
Powerdrift: -0.11 dB
SN:UA2020NPHM Battery: BKB 193 1054
File name: FCC right_CDMAPCS_1880_tilted, Date: 05/14/02



Distribution of maximum SAR in 1900 AMPS band. Measured against the right hand side of the head in the "Tilt" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

T206

SAM 1031(R) Phantom; Righ Hand Section; Position: (107°,299°); Frequency: 1880 MHz

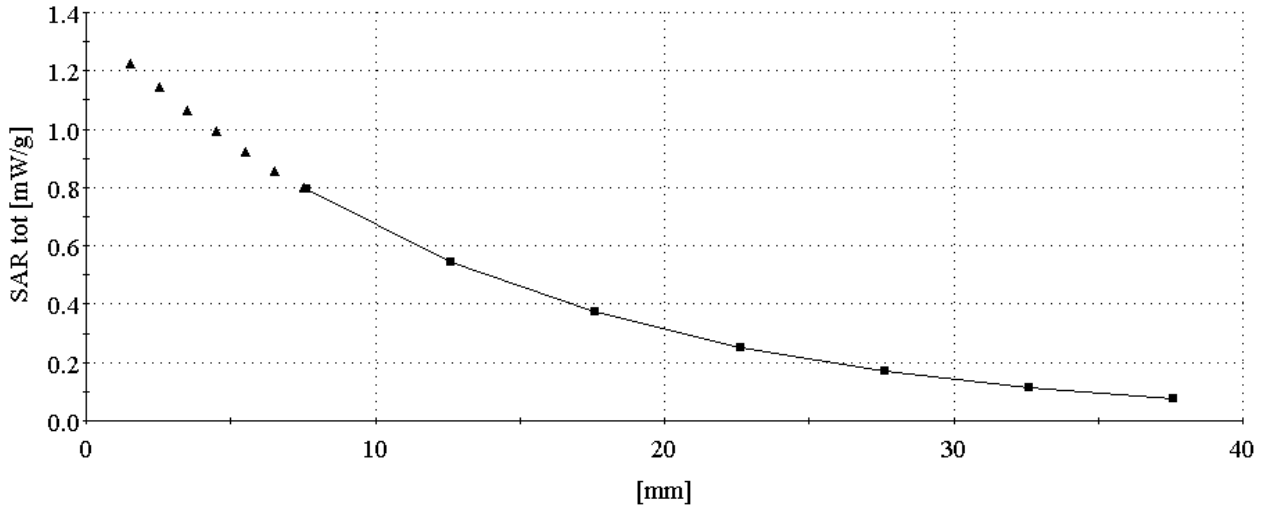
Probe: ET3DV6 - SN1539; ConvF(5.19,5.19,5.19); Crest factor: 1.0; Head 1900 MHz: σ = 1.43 mho/m ε_r = 38.9 ρ = 1.00 g/cm^3

Cube 5x5x7: SAR (1g): 1.14 mW/g, SAR (10g): 0.649 mW/g, (Worst-case extrapolation)

Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0

SN:UA2020NPHM Battery: BKB 193 1054

File name: FCC right_CDMAPCS_1880_tilted, Date: 05/14/02



SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 CDMA band, while phone is against the right hand side of head in the "tilt" position.

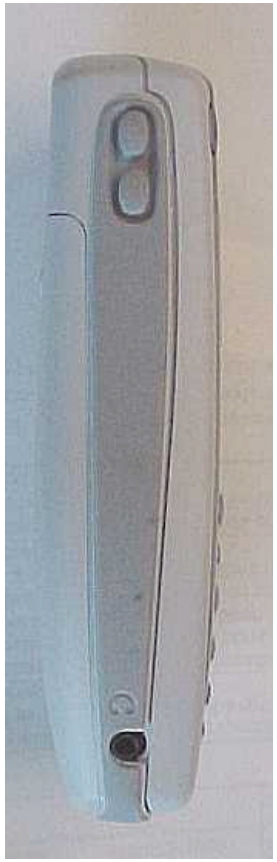
Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

Appendix 3: Photographs of Device Under Test

Front view of device

Back view of device

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

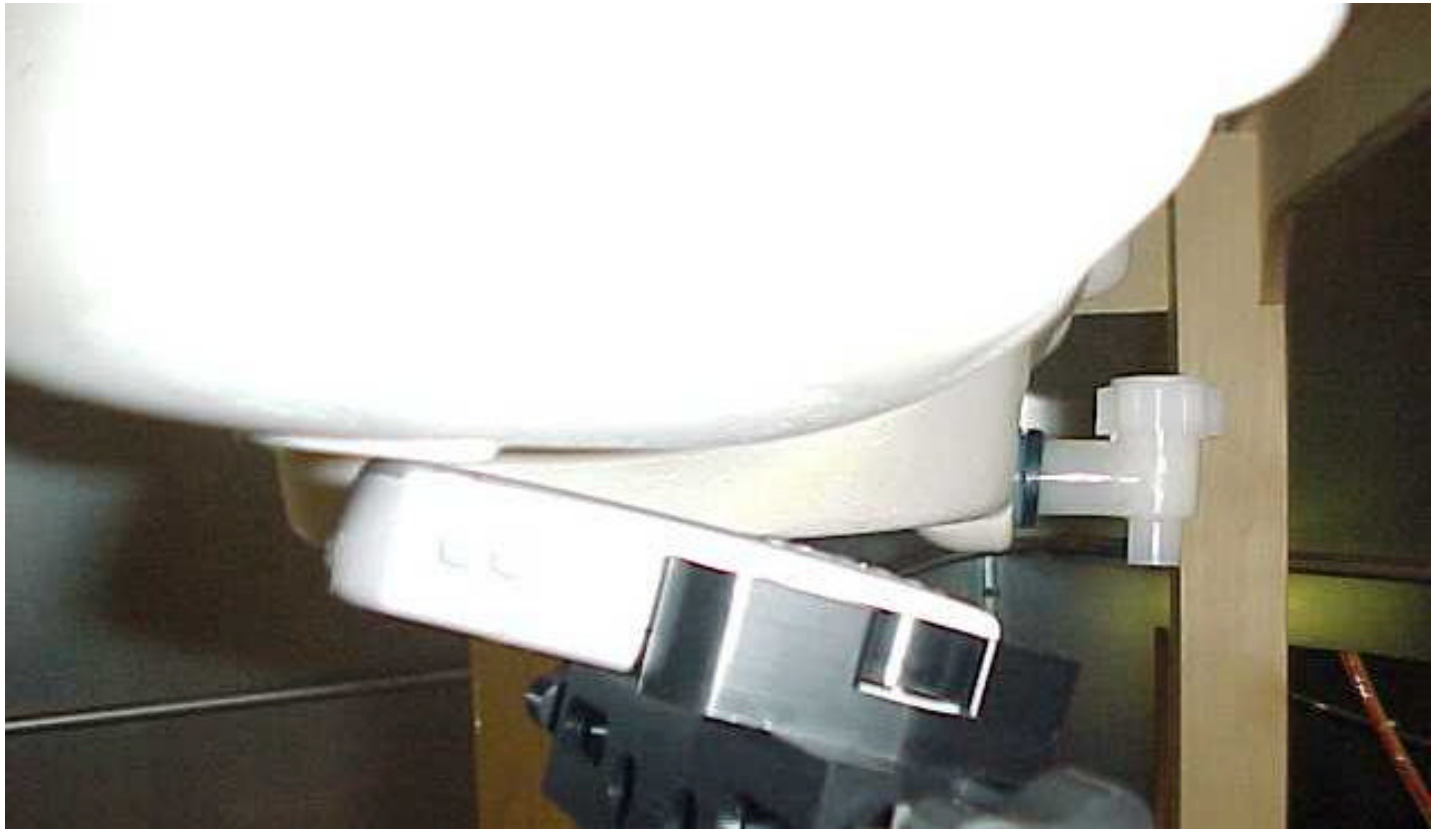


Side view of device.

Appendix 4: Position of Device on Phantom

Position of device against head phantom using the “cheek” position

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B



Position of device against head phantom using the “tilt” position

Appendix 5: Probe calibration parameters

ET3DV5 SN:1324

DASY3 - Parameters of Probe: ET3DV5 SN:1324

Sensitivity in Free Space

		Diode Compression	
NormX	1.52 $\mu V/(V/m)^2$	DCP X	103 mV
NormY	1.73 $\mu V/(V/m)^2$	DCP Y	103 mV
NormZ	1.53 $\mu V/(V/m)^2$	DCP Z	103 mV

Sensitivity in Tissue Simulating Liquid

Head 450 MHz ε_r = 43.5 ± 5% σ = 0.87 ± 10% mho/m

ConvF X	5.23 extrapolated	Boundary effect:	
ConvF Y	5.23 extrapolated	Alpha	0.65
ConvF Z	5.23 extrapolated	Depth	1.63

Head 700 - 950 MHz ε_r = 39.4 - 43.6 σ = 0.75 - 0.99 mho/m

ConvF X	4.89 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	4.89 ± 9.5% (k=2)	Alpha	0.67
ConvF Z	4.89 ± 9.5% (k=2)	Depth	1.71

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

ConvF X	4.43 interpolated	Boundary effect:	
ConvF Y	4.43 interpolated	Alpha	0.70
ConvF Z	4.43 interpolated	Depth	1.82

Brain 1700 - 1910 MHz ε_r = 39.3 - 41.6 σ = 1.53 - 1.90 mho/m

ConvF X	4.21 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	4.21 ± 9.5% (k=2)	Alpha	0.72
ConvF Z	4.21 ± 9.5% (k=2)	Depth	1.88

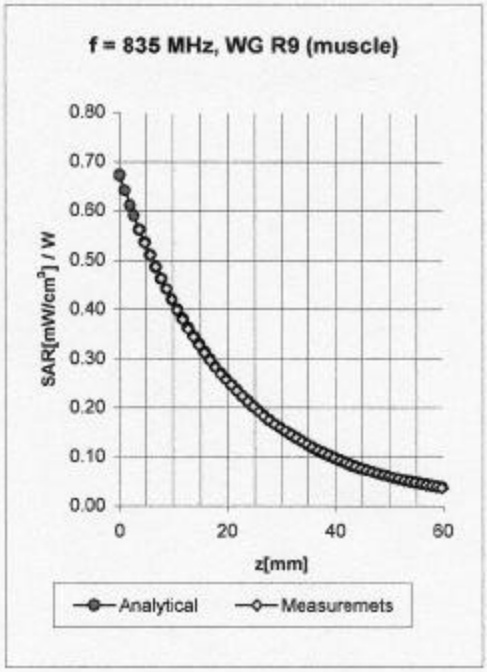
Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.8 ± 0.2	mm

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

ET3DV5 SN:1324

Conversion Factor Assessment



Muscle **750 - 950** **MHz** ε_r **= 52.4 - 58.0** σ **= 0.90 - 1.05 mho/m**

ConvF X	**4.72** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.72** ± 9.5% (k=2)	Alpha	**0.69**
ConvF Z	**4.72** ± 9.5% (k=2)	Depth	**1.70**

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

ET3DV6 SN:1539

DASY3 - Parameters of Probe: ET3DV6 SN:1539

Sensitivity in Free Space

Diode Compression

NormX	1.30 $\mu V/(V/m)^2$	DCP X	95 mV
NormY	1.19 $\mu V/(V/m)^2$	DCP Y	95 mV
NormZ	1.28 $\mu V/(V/m)^2$	DCP Z	95 mV

Sensitivity in Tissue Simulating Liquid

Head 450 MHz ε_r = 43.5 ± 5% σ = 0.87 ± 10% mho/m

ConvF X	6.95 extrapolated	Boundary effect:	
ConvF Y	6.95 extrapolated	Alpha	0.27
ConvF Z	6.95 extrapolated	Depth	2.88

Head 700 - 950 MHz ε_r = 39.4 - 43.6 σ = 0.75 - 0.99 mho/m

ConvF X	6.37 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.37 ± 9.5% (k=2)	Alpha	0.39
ConvF Z	6.37 ± 9.5% (k=2)	Depth	2.64

Head 1500 MHz ε_r = 40.4 ± 5% σ = 1.23 ± 10% mho/m

ConvF X	5.58 interpolated	Boundary effect:	
ConvF Y	5.58 interpolated	Alpha	0.66
ConvF Z	5.58 interpolated	Depth	2.32

Head 1800 - 2000 MHz ε_r = 38.0 - 42.0 σ = 1.20 - 1.65 mho/m

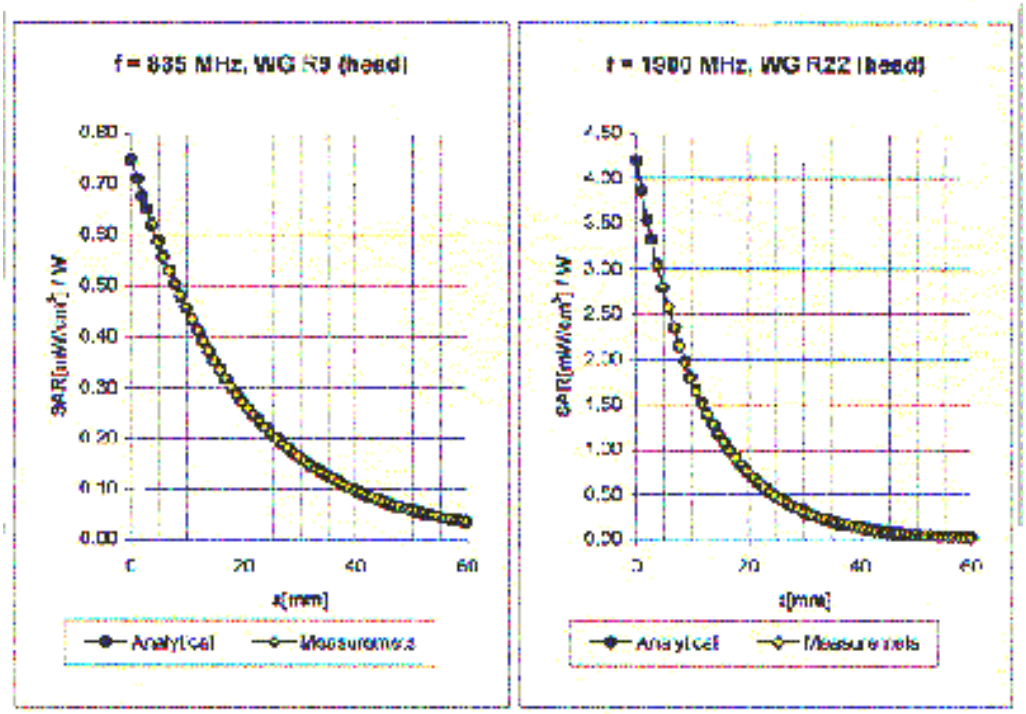
ConvF X	5.19 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.19 ± 9.5% (k=2)	Alpha	0.64
ConvF Z	5.19 ± 9.5% (k=2)	Depth	2.16

Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.3 ± 0.2	mm

ET3DV6 SN:1539

Conversion Factor Assessment



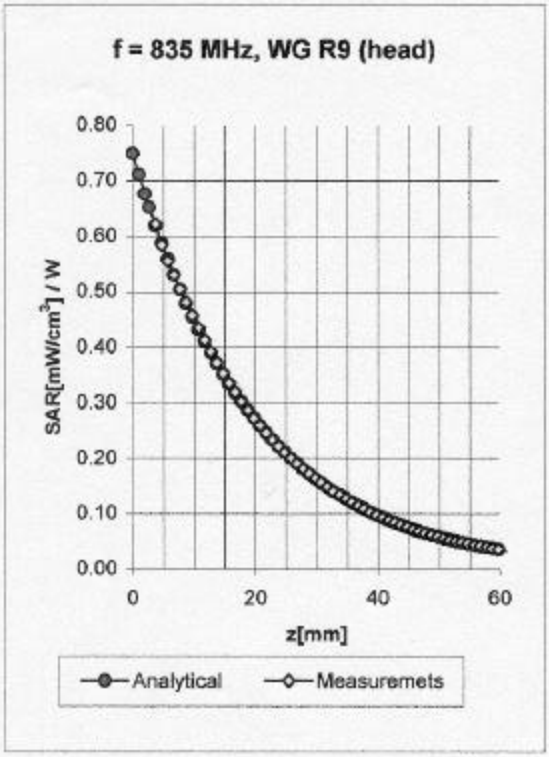
Head	700 - 950 MHz	ε_r = 39.4 - 43.6	σ = 0.75 - 0.99 mho/m	
	ConvF X	6.37 ±9.5% (k=2)	Boundary effect:	
	ConvF Y	6.37 ±9.5% (k=2)	Alpha	0.39
	ConvF Z	6.37 ±9.5% (k=2)	Depth	2.64

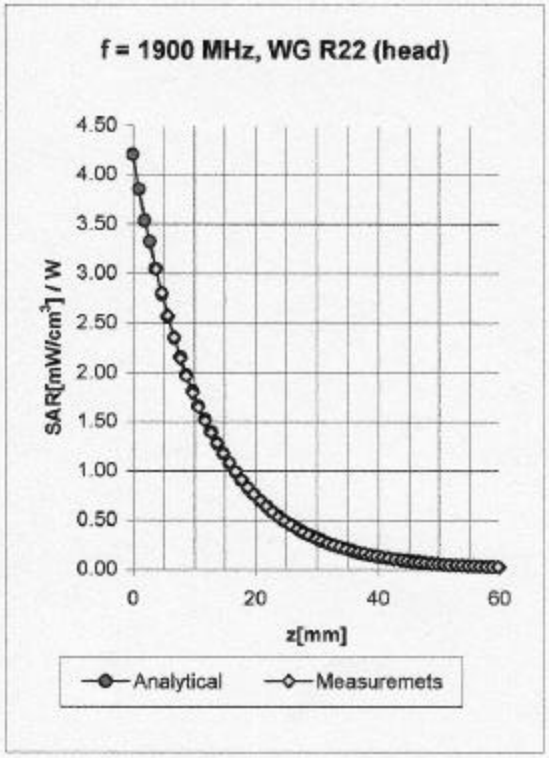
Head	1300 - 2000 MHz	ε_r = 38.0 - 42.0	σ = 1.20 - 1.55 mho/m	
	ConvF X	5.19 ±9.5% (k=2)	Boundary effect:	
	ConvF Y	5.19 ±9.5% (k=2)	Alpha	0.54
	ConvF Z	5.19 ±9.5% (k=2)	Depth	2.16

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CV/P-02:0536/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA	2002-5-31	B	N:\DULCE\T206\T206_headok.doc

ET3DV6 SN:1539

Conversion Factor Assessment





Head **700 - 950 MHz** ε_r **= 39.4 - 43.6** σ **= 0.75 - 0.99 mho/m**

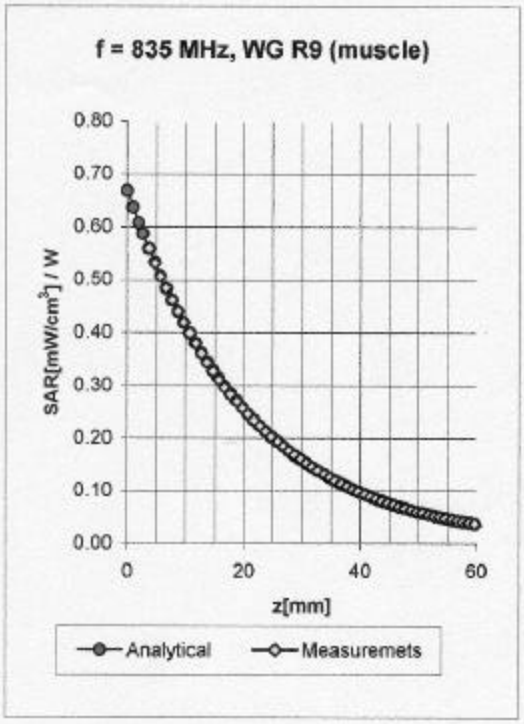
ConvF X	**6.37** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.37** ± 9.5% (k=2)	Alpha	**0.39**
ConvF Z	**6.37** ± 9.5% (k=2)	Depth	**2.64**

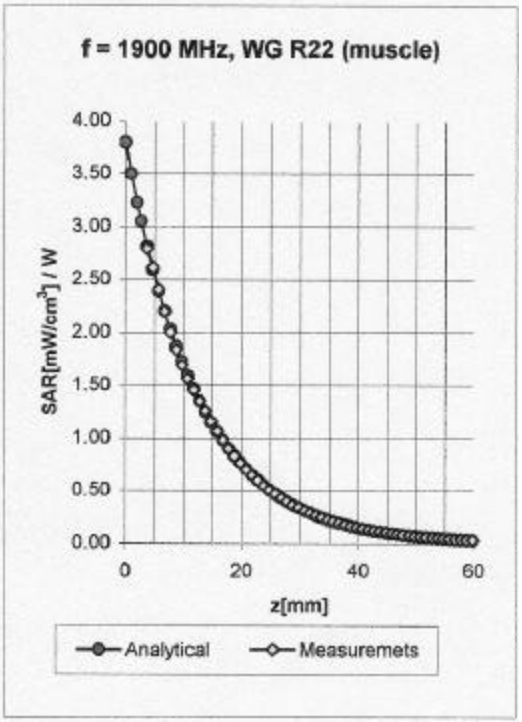
Head **1800 - 2000 MHz** ε_r **= 38.0 - 42.0** σ **= 1.20 - 1.55 mho/m**

ConvF X	**5.19** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.19** ± 9.5% (k=2)	Alpha	**0.64**
ConvF Z	**5.19** ± 9.5% (k=2)	Depth	**2.16**

ET3DV6 SN:1539

Conversion Factor Assessment





Muscle **750 - 950 MHz** ε_r **= 52.4 - 58.0** σ **= 0.90 - 1.05 mho/m**

ConvF X	**6.24** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.24** ± 9.5% (k=2)	Alpha	**0.61**
ConvF Z	**6.24** ± 9.5% (k=2)	Depth	**2.01**

Muscle **1800 - 2050 MHz** ε_r **= 50.6 - 56.0** σ **= 1.40 - 1.60 mho/m**

ConvF X	**4.82** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.82** ± 9.5% (k=2)	Alpha	**0.91**
ConvF Z	**4.82** ± 9.5% (k=2)	Depth	**1.92**