Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P William Stewart		SEM/CV/P-02:0591/REP		
Approved	Checked		Rev.	
SEM/CV/PF/P Dulce Altabella	DA	2002-6-5	B	U:\FCC Submittals\Fcc_502 gerri anna nicole\XHIBIT11\Source\502-11 head.doc

SAR Test Report: T62u (PXITR-502-A2)

Date of test: May 22-23, 28-29, 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

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

T62u
FCC ID: PXITR-502-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

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This test report shall not be reproduced except in full, without written approval of the laboratory. The results and statements contained herein relate only to the items tested. The names of individuals involved may be mentioned only in connection with the statements or results from this report. All feedback on this report is encouraged, both positive and negative.

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1. Introduction

In this report, compliance of the T62u wireless handset with RF safety guidelines is demonstrated while the device is held next to the ear of a person. The T62u model is a dual band 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	38 mm
	Maximum width	51 mm
Configuration	Patch antenna	

2.2 Device description

Device model	T62u				
FCC ID	PXITR-502-A2				
Serial number	UA2020MZVQ				
Maximum Size	Length	121 mm			
	Width	54 mm			
	Thickness	25 mm			
Modes	800 AMPS	800 TDMA	800 GSM	1900 TDMA	1900 GSM
Multiple Access Scheme	FDMA	TDMA	TDMA	TDMA	TDMA
Maximum Output Power Setting	26.0 dBm	26.0 dBm	29.0 dBm	26.0 dBm	30.0 dBm
Factory Tolerance in Power Setting	± 0.25	± 0.40	± 0.60	± 0.25	± 0.60
Maximum Peak Output Power	26.25 dBm	26.40 dBm	29.60 dBm	26.25 dBm	30.60 dBm
Duty Cycle	1	3	8	3	8
Transmitting Frequency Range	824 – 849 MHz	824 – 849 MHz	824 – 849 MHz	1850 – 1910 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	416	12 / 2002
E-field probe ET3DV5	1324	12 / 2002
E-field probe ET3DV6	1583	12 / 2002
Dipole Validation Kit, D835V2	428	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	3125U13729	1/2003
Power sensor HP 8482H	3318A07097	5/2003
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 ρ = 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 22.5 – 23.8 °C, the relative humidity was 30.5 – 39.3% and the liquid depth above the ear reference points was 161 – 162 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	22MAY02	41.43	0.89	21.9
835	Head	23MAY02	41.35	0.90	22.4
1900	Head	28MAY02	39.57	1.41	22.8
1900	Head	29MAY02	39.32	1.41	23.6

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 23.2 – 24.8 °C, the relative humidity was 30.1 – 39.4% and the liquid depth above the ear reference points was 161 – 162 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 0.0007 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, 5/22/02	9.54 / 6.21	41.43	0.89	22.1
		Measured, 5/23/02	9.58 / 6.23	41.35	0.90	22.3
		Reference (IEEE P1528)	9.5 / 6.2	41.5	0.90	+/-2.0 of value in §4
1900	Head	Measured, 5/28/02	41.28/21.74	39.57	1.41	22.7
		Measured, 5/29/02	40.6/21.5	39.32	1.41	23.1
		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 against the side of the head, using battery BKB-193-1051 (800mAh), is presented in Table 1 thru 3. 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, 1900 TDMA, and 1900 GSM modes, the device was tested at the lowest, middle, and highest frequencies of the transmit band. For 800 TDMA and 800 GSM modes, the maximum power is significantly lower than that of AMPS mode, therefore SAR values are also lower and not included. 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 28.2 – 39.8% and 22.3 – 24.9 °C respectively. During the SAR measurements, test commands were used to control the device in the AMPS and TDMA 1900 modes and a base station simulator was used to control the device in the GSM 1900 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
800 AMPS BKB-193-1051	824	25.92	21.8	1.21/0.874	1.21/0.874	22.3	1.25/0.920	1.25/0.920
	837	26.25	21.9	1.36/0.985	1.36/0.985	22.4	1.36/0.978	1.36/0.978
	849	25.25	22.1	1.16/0.842	1.16/0.842	22.3	1.12/0.824	1.12/0.824
			Left hand (TILT)			Right hand (TILT)		
	824	25.92	21.9	0.828/0.552	0.828/0.552	22.3	0.735/0.544	0.735/0.544
	837	26.25	21.9	0.922/0.610	0.922/0.610	22.3	0.736/0.521	0.736/0.521
	849	25.25	22.3	0.735/0.487	0.735/0.487	22.3	0.637/0.450	0.637/0.450

Table 1: SAR measurement results for the T62u telephone at highest possible output power. AMPS mode

Mode / Battery	*f* (MHz)	Output Power (dBm)	Left hand (CHEEK)			Right hand (CHEEK)		
			Simulant Temps. (℃)	SAR, 1g /10g (W/kg)		Simulant Temps. (℃)	SAR, 1g /10g (W/kg)	
				measured	Calculated to max. power		measured	Calculated to max. power
1900 TDMA BKB-193-1051	1850	26.25	21.9	0.28/0.17	0.28/0.17	22.4	0.41/0.25	0.42/0.26
	1880	26.14	22.0	0.26/0.15	0.27/0.15	22.2	0.26/0.16	0.27/0.16
	1910	25.83	22.0	0.24/0.13	0.24/0.13	22.1	0.25/0.13	0.26/0.14
			Left hand (TILT)			Right hand (TILT)		
	1850	26.25	22.0	0.35/0.22	0.36/0.22	22.4	0.47/0.28	0.48/0.29
	1880	26.14	22.0	0.37/0.19	0.38/0.20	22.3	0.38/0.21	0.39/0.21
	1910	25.83	22.0	0.32/0.17	0.33/0.17	22.1	0.39/0.20	0.40/0.20

Table 2: SAR measurement results for the T62u telephone at highest possible output power. TDMA 1900 mode.

Mode / Battery	*f* (MHz)	Output Power (dBm)	Left hand (CHEEK)			Right hand (CHEEK)		
			Simulant Temps. (℃)	SAR, 1g /10g (W/kg)		Simulant Temps. (℃)	SAR, 1g /10g (W/kg)	
				measured	Calculated to max. power		measured	Calculated to max. power
1900 GSM BKB-193-1051	1850	29.86	22.8	0.22/0.13	0.25/0.15	22.0	0.40/0.24	0.45/0.28
	1880	30.05	22.5	0.21/0.12	0.24/0.13	22.0	0.28/0.17	0.32/0.20
	1910	30.18	22.5	0.22/0.12	0.25/0.13	21.9	0.20/0.12	0.23/0.14
			Left hand (TILT)			Right hand (TILT)		
	1850	29.86	22.7	0.26/0.15	0.30/0.17	22.0	0.43/0.25	0.49/0.29
	1880	30.05	22.6	0.31/0.16	0.35/0.18	22.0	0.33/0.19	0.37/0.21
	1910	30.18	22.4	0.28/0.14	0.31/0.16	22.0	0.28/0.15	0.32/0.17

Table 3: SAR measurement results for the T62u telephone at highest possible output power. GSM 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: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3

Cubes (2): Peak: 1.44 mW/g ± 0.04 dB, SAR (1g): 0.949 mW/g ± 0.04 dB, SAR (10g): 0.618 mW/g ± 0.04 dB, (Worst-case extrapolation)

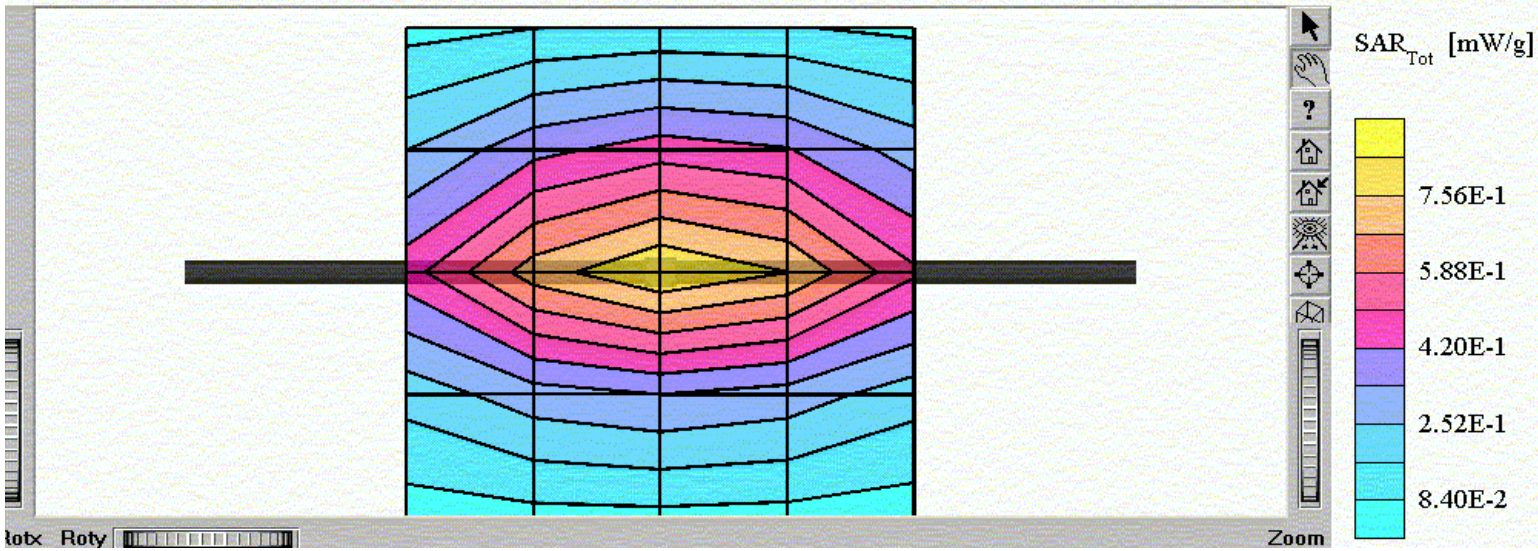
Penetration depth: 12.5 (12.0, 13.3) [mm]

Powerdrift: -0.01 dB; Measured date: 05/22/02

Validation 835HEAD_SN428_SAM1020_05_22_02

Pin: before 100.0mW after 99.5mW

3.4mm surface detect/teflon caps on dipole



835 MHz SAR distribution of validation dipole antenna from system performance check on May 22, 2002. Using head tissue.

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: 1.44 mW/g ± 0.04 dB, SAR (1g): 0.952 mW/g ± 0.04 dB, SAR (10g): 0.619 mW/g ± 0.04 dB, (Worst-case extrapolation)

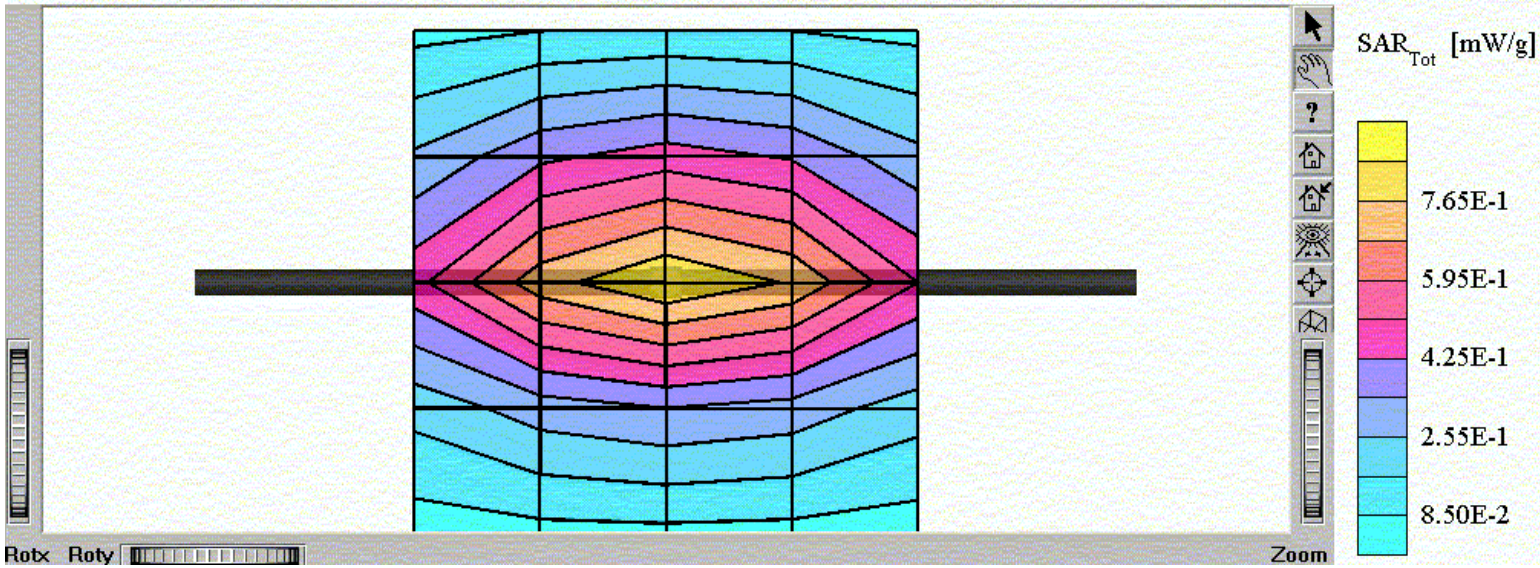
Penetration depth: 12.5 (11.9, 13.3) [mm]

Powerdrift: -0.05 dB; Measured date: 05/23/02

Validation 835HEAD_SN428_SAM1020_05_23_02

Pin: before 100.0mW after 99.4 mW

3.4mm surface detect/teflon caps on dipole



835 MHz SAR distribution of validation dipole antenna from system performance check on May 23, 2002. Using head tissue.

Dipole 1900 MHz

SAM 1031(R); Flat

Probe: ET3DV6 - SN1583; ConvF(5.32,5.32,5.32); Crest factor: 1.0; Head 1900 MHz: σ = 1.41 mho/m ε_r = 39.6 ρ = 1.00 g/cm^3

Cubes (2): Peak: 7.37 mW/g ± 0.05 dB, SAR (1g): 4.14 mW/g ± 0.04 dB, SAR (10g): 2.18 mW/g ± 0.04 dB, (Worst-case extrapolation)

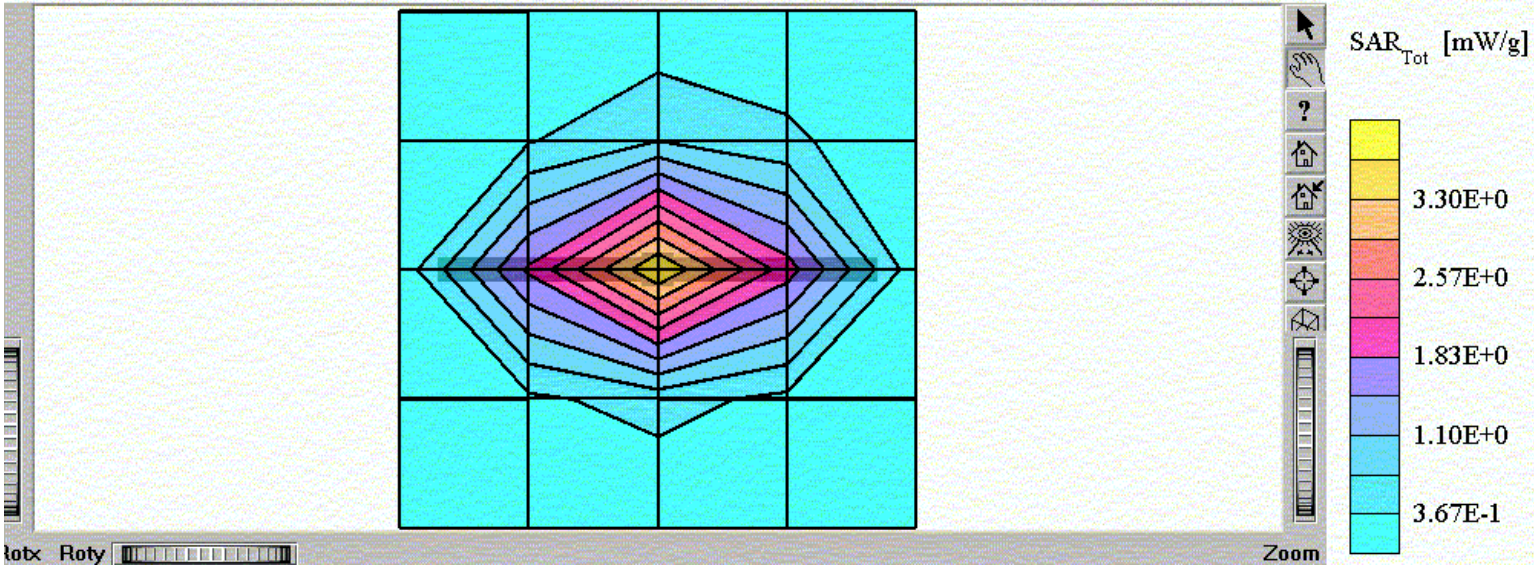
Penetration depth: 8.5 (8.4, 8.9) [mm]

Powerdrift: 0.03 dB; Measured date: 05/28/02

Validation 1900HEAD_SN536_SAM1031_05_28_02

Pin: before 100.0mW after 100.3mW

3.4mm surface detect/teflon caps on dipole



1900 MHz SAR distribution of validation dipole antenna from system performance check on May 28, 2002. Using head tissue.

Dipole 1900 MHz

SAM 1031(R); Flat

Probe: ET3DV6 - SN1583; ConvF(5.32,5.32,5.32); Crest factor: 1.0; Head 1900 MHz: σ = 1.41 mho/m ε_r = 39.3 ρ = 1.00 g/cm^3

Cubes (2): Peak: 7.18 mW/g ± 0.00 dB, SAR (1g): 4.06 mW/g ± 0.02 dB, SAR (10g): 2.15 mW/g ± 0.04 dB, (Worst-case extrapolation)

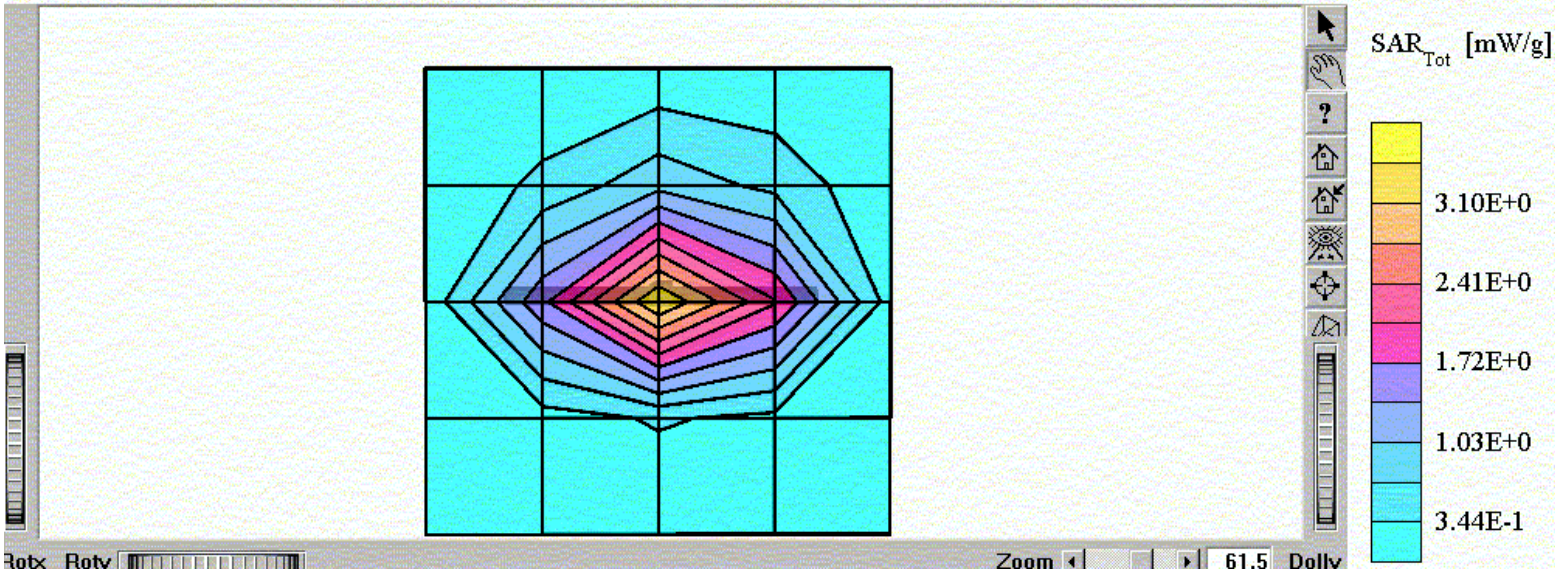
Penetration depth: 8.7 (8.6, 9.1) [mm]

Powerdrift: -0.02 dB; Measured date: 05/29/02

Validation 1900HEAD_SN536_SAM1031_05_29_02

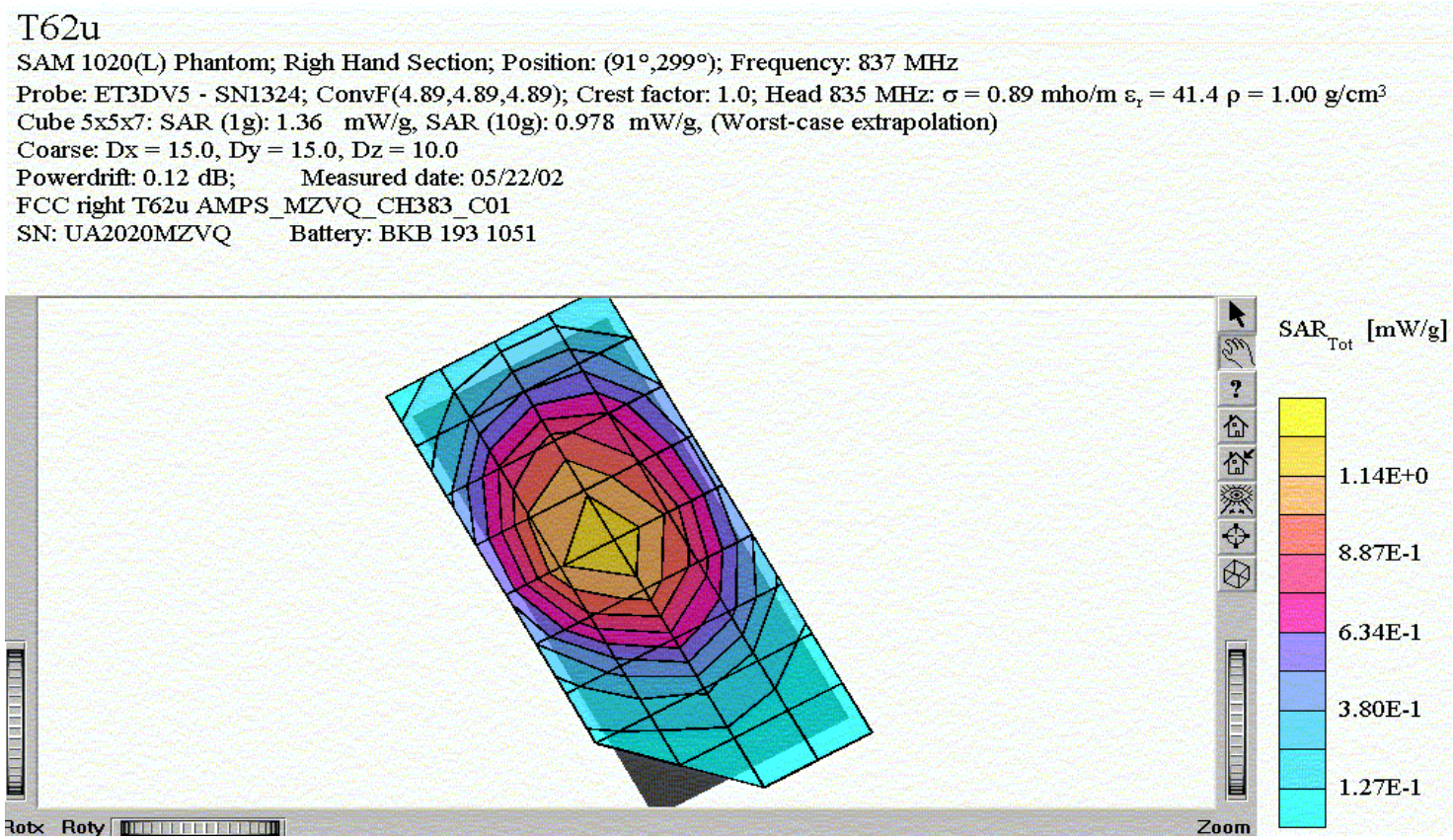
Pin: before 100.0mW after 100.0mW

3.4mm surface detect/teflon caps on dipole



1900 MHz SAR distribution of validation dipole antenna from system performance check on May 29, 2002. Using head tissue.

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.

T62u

SAM 1020(L) Phantom; Righ Hand Section; Position: (91°,299°); Frequency: 837 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: σ = 0.89 mho/m ε_r = 41.4 ρ = 1.00 g/cm^3

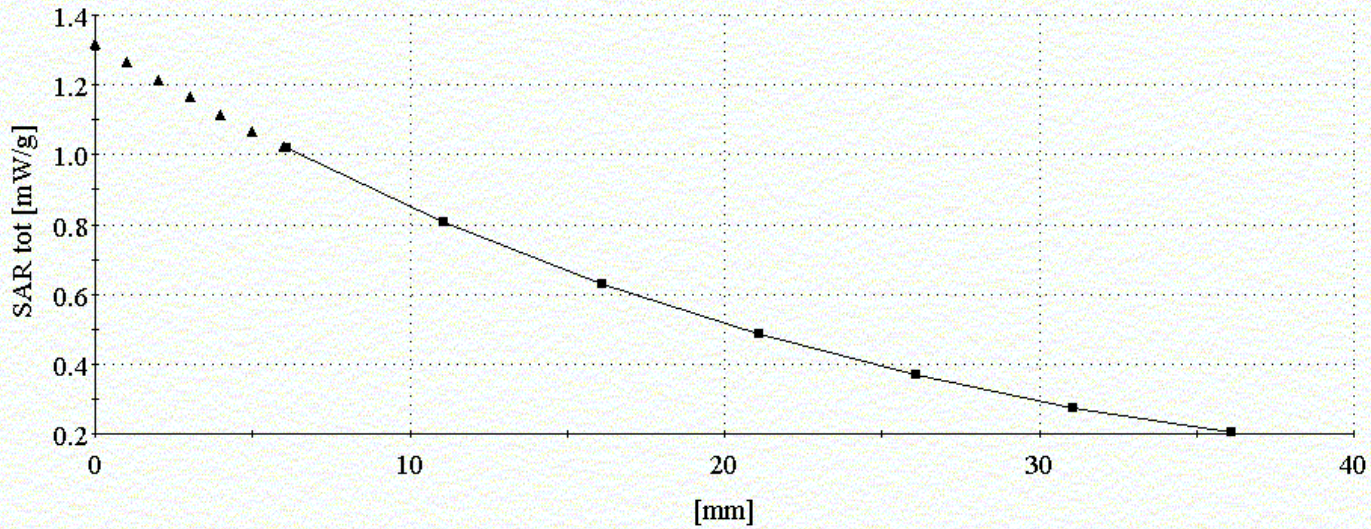
Cube 5x5x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.978 mW/g, (Worst-case extrapolation)

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

; Measured date: 05/22/02

FCC right T62u AMPS_MZVQ_CH383_C01

SN: UA2020MZVQ Battery: BKB 193 1051



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.

T62u

SAM 1020(L) Phantom; Left Hand Section; Position: (91°,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 $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3

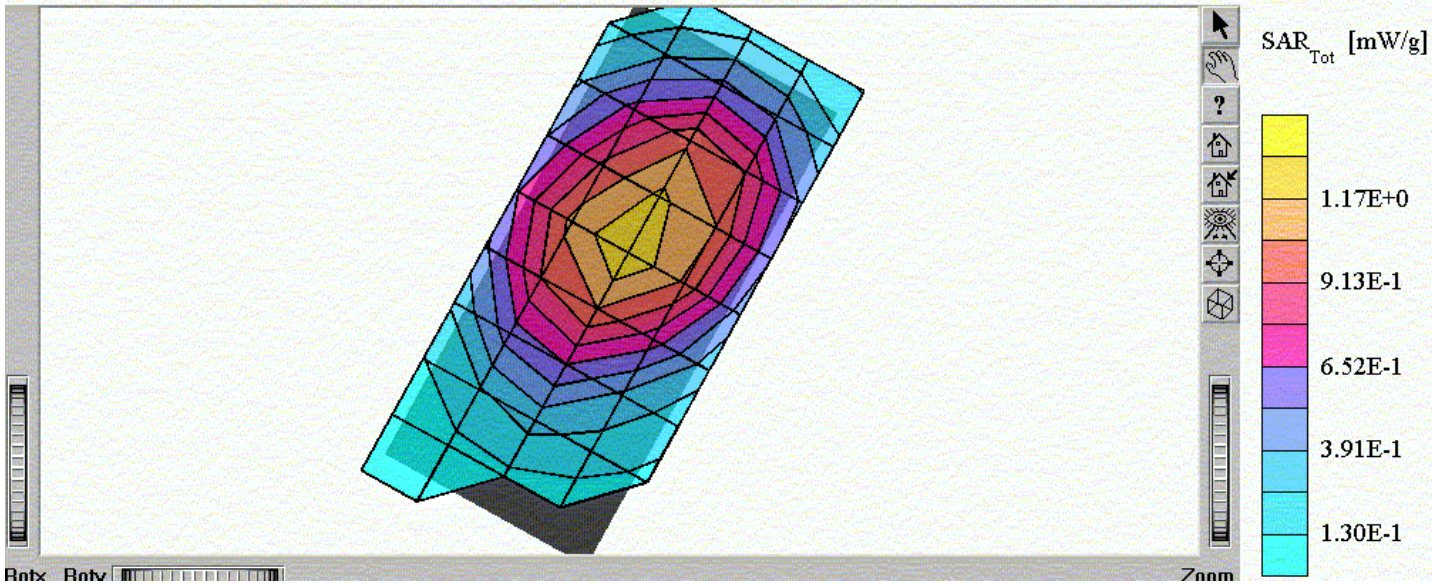
Cube 5x5x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.985 mW/g, (Worst-case extrapolation)

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

Powerdrift: -0.00 dB; Measured date: 05/22/02

FCC left T62u AMPS_MZVQ_CH383_C01

SN:UA2020MZVQ Battery:BKB 193 1051



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 William Stewart		SEM/CV/P-02:0591/REP	
Approved	Checked	Rev.	
SEM/CV/PF/P Dulce Altabella	DA	2002-6-5 B	U:\FCC Submittals\Fcc_502 gerri anna nicole\XHIBIT11\Source\502-11 head.doc

T62u

SAM 1020(L) Phantom; Left Hand Section; Position: (91°,61°); Frequency: 837 MHz

Probe: ET3DV5 - SN1324; ConvF(4.89,4.89,4.89); Crest factor: 1.0; Head 835 MHz: σ = 0.89 mho/m ε_r = 41.4 ρ = 1.00 g/cm^3

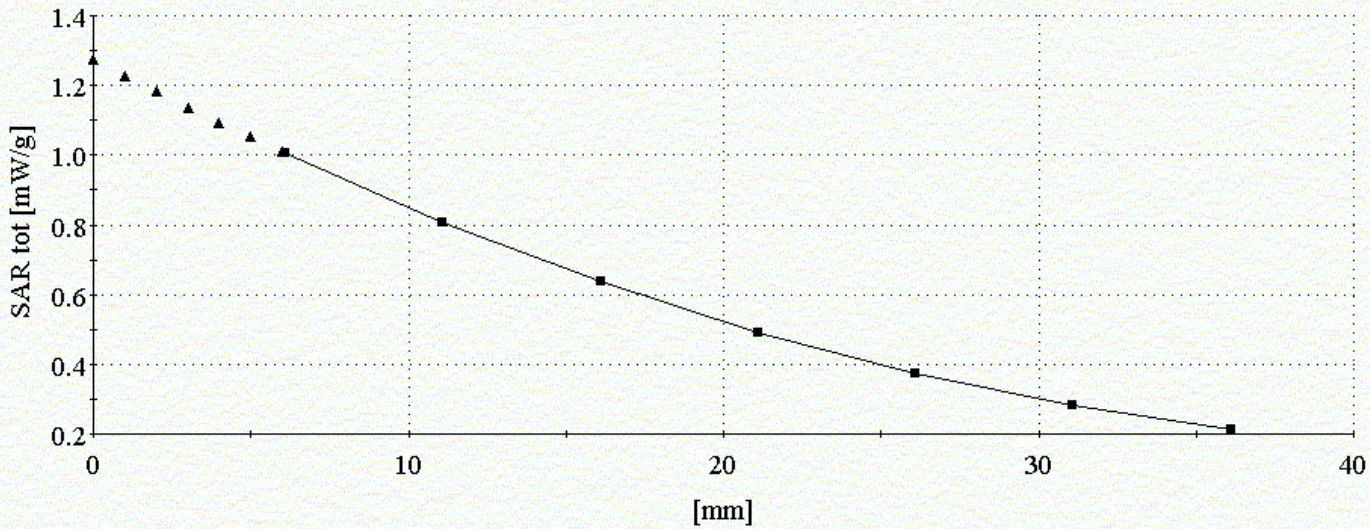
Cube 5x5x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.985 mW/g, (Worst-case extrapolation)

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

; Measured date: 05/22/02

FCC left T62u AMPS_MZVQ_CH383_C01

SN:UA2020MZVQ Battery:BKB 193 1051



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.

T62u

SAM 1020(L) Phantom; Left Hand Section; Position: (106°,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 $\varepsilon_r = 41.4$ $\rho = 1.00$ g/cm^3

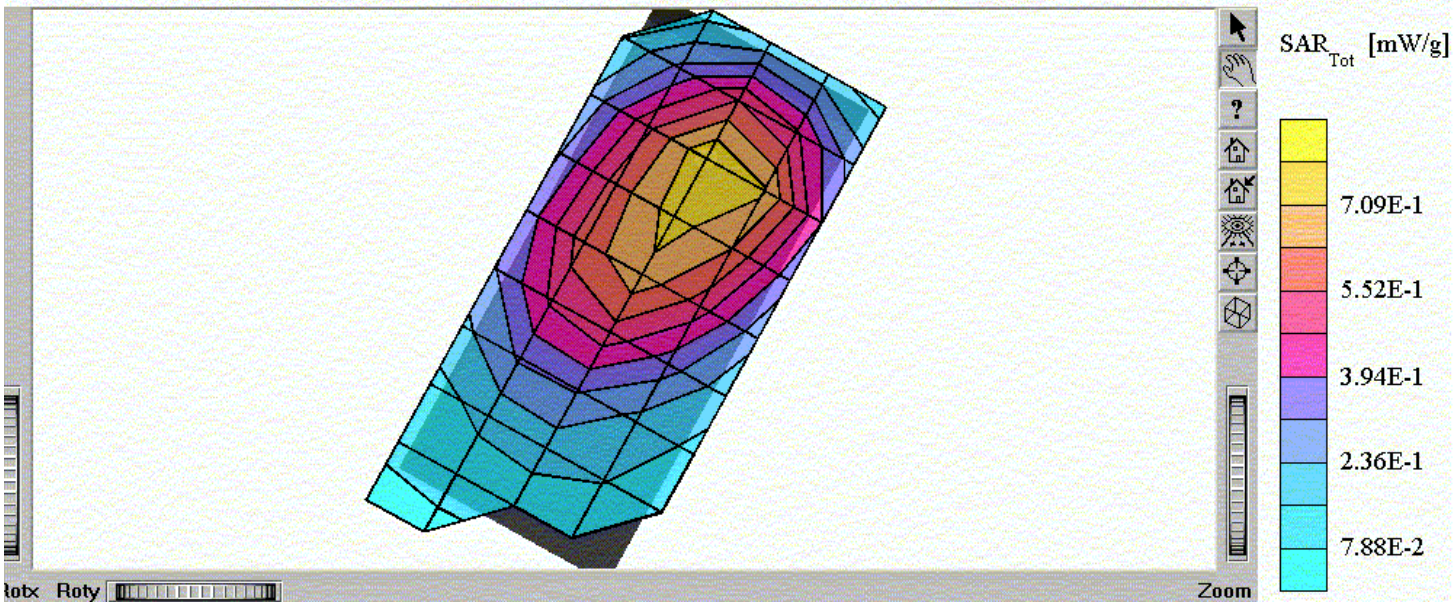
Cube 5x5x7: SAR (1g): 0.922 mW/g, SAR (10g): 0.610 mW/g, (Worst-case extrapolation)

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

Powerdrift: 0.09 dB; Measured date: 05/22/02

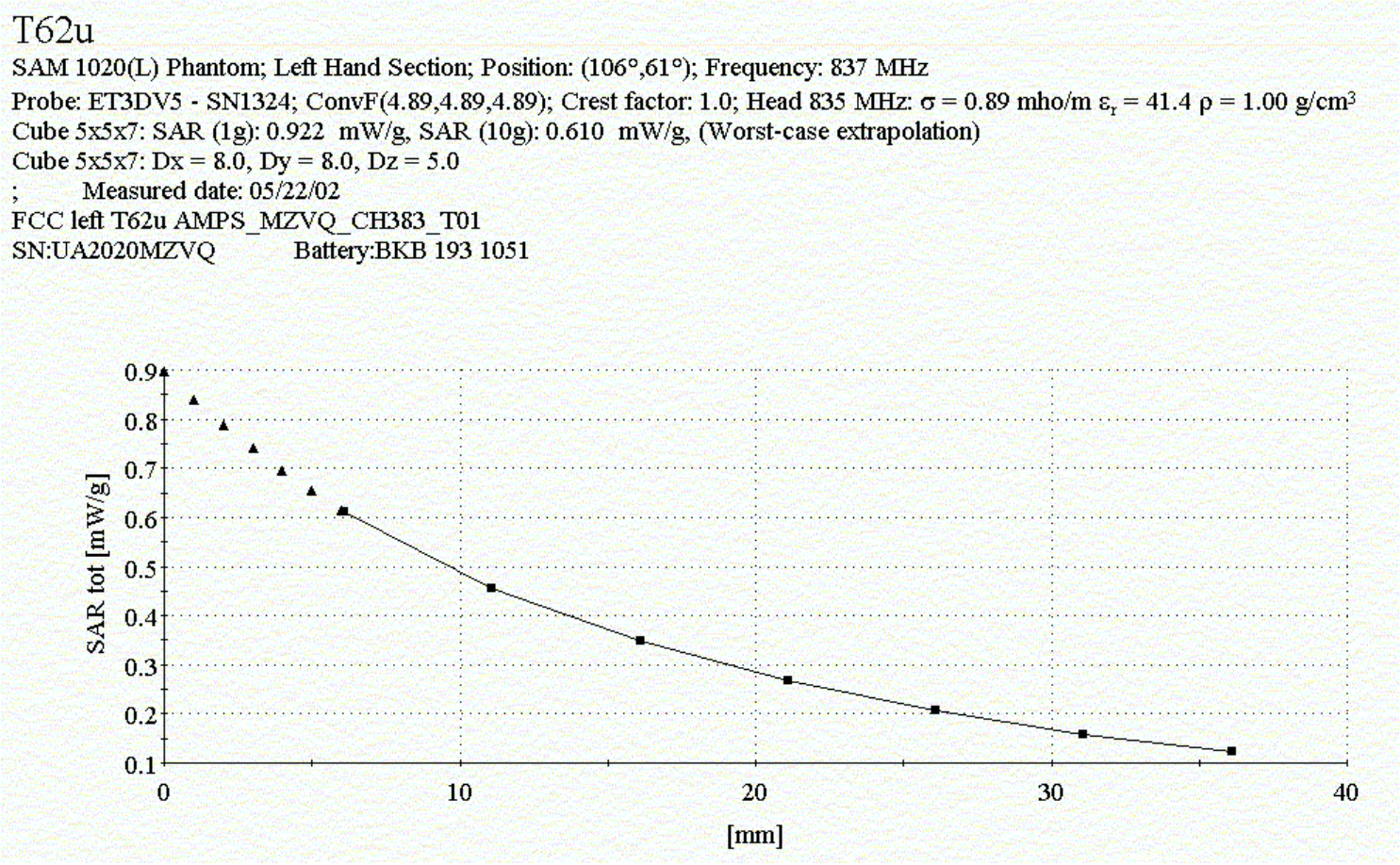
FCC left T62u AMPS_MZVQ_CH383_T01

SN:UA2020MZVQ Battery:BKB 193 1051



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 William Stewart		SEM/CV/P-02:0591/REP	
Approved	Checked	Rev.	
SEM/CV/PF/P Dulce Altabella	DA	2002-6-5 B	U:\FCC Submittals\Fcc_502 gerri anna nicole\XHIBIT11\Source\502-11 head.doc



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.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P William Stewart		SEM/CV/P-02:0591/REP	
Approved	Checked	Rev.	
SEM/CV/PF/P Dulce Altabella	DA	2002-6-5 B	U:\FCC Submittals\Fcc_502 gerri anna nicole\XHIBIT11\Source\502-11 head.doc

T62u

SAM 1031(R) Phantom; Righ Hand Section; Position: (91°,299°); Frequency: 1850 MHz

Probe: ET3DV6 - SN1583; ConvF(5.32,5.32,5.32); Crest factor: 3.0; Head 1900 MHz: σ = 1.41 mho/m ε_r = 39.6 ρ = 1.00 g/cm^3

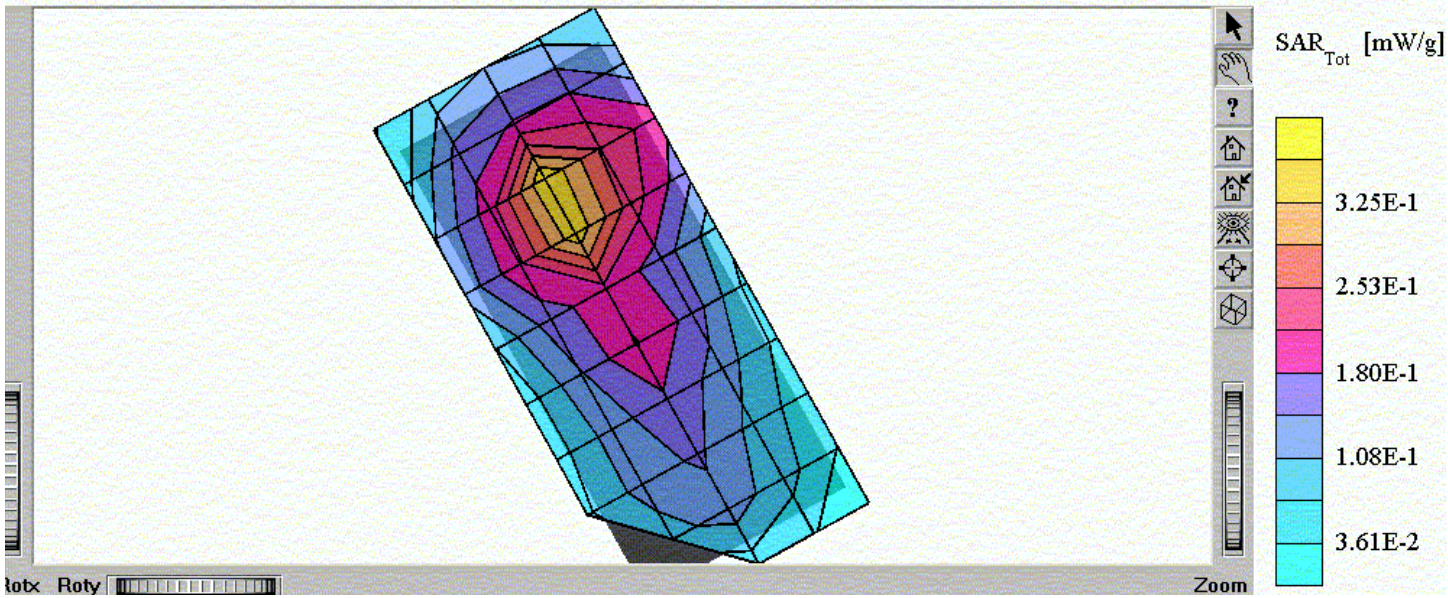
Cube 5x5x7: SAR (1g): 0.407 mW/g, SAR (10g): 0.249 mW/g, (Worst-case extrapolation)

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

Powerdrift: -0.02 dB; Measured date: 05/28/02

FCC right T62u TDMA1900_MZVQ_CH0002_C01

SN: UA2020MZVQ Battery: BKB 193 1051



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