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Exhibit 11: SAR Test Report of Portable Cellular Phone FCC ID: PY7A1031011 model: T616

Date of test: March 31st, April 1-7, 2003
Date of Report: April 23rd, 2003

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

Tested by: 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 exposure tests:

- Specific Absorption Rate (SAR)
- Dielectric parameters
- RF power measurement

On the following types of products:
Wireless communications devices. A2LA certificate #1650-01

Statement of Compliance: Sony Ericsson Mobile Communications, Inc declares under its sole responsibility that portable cellular telephone FCC ID PY7A1031011 model T616 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). 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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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.
Sony Ericsson Mobile Communications encourages all feedback, both positive and negative, on this test report.

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1. Introduction

The Sony Ericsson SAR Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone FCC ID PYA1031011 model T616. The Specific Absorption Rate (SAR) of this product was measured. The applicable RF safety guidelines and the SAR measurement specifications used for the test are described in [1].

2. Description of the Device Under Test

2.1 Antenna description

Type	Internal antenna	
Location	Inside the back cover, near the top	
Dimensions	Width	38 mm
	Length	22 mm
Configuration	Patch antenna	

2.2 Device description

FCC ID Number / Device Model	PY7A1031011 / T616	
Serial number	A610TV504 and A6101TV51H	
Mode(s) of Operation	GSM 800	GSM 1900
Modulation Mode(s)	TDMA	TDMA
Target Value for Maximum Output Power Setting	29 dBm	30 dBm
Factory Tolerance Window in Power Setting	± 1.0 dB	± 1.0 dB
Duty Cycle	1/8	1/8
Transmitting Frequency Rang(s)	824-849 MHz	1850-1910 MHz
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype	
Device Category	Portable	
RF Exposure Limits	General Population / Uncontrolled	

3. Test Equipment Used

3.1 Dosimetric System

The Sony Ericsson SAR Laboratory utilizes a Dosimetric Assessment System (Dasy3™ v3.1d) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The overall RSS uncertainty of the measurement system is ±10.59% (K=1) with an expanded uncertainty of ±21.17% (K=2). The measurement uncertainty budget is given in Appendix 5. The list of calibrated equipment used for the measurements is shown in the following table.

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Description	Serial Number	Cal Due Date
DASY3 DAE V1	416	11-Dec-2003
DASY3 DAE V1	417	11-Dec-2003
E-Field Probe ETDV6	1583	19-Dec-2003
E-Field Probe ETDV6	1586	20-Jun-2003
Dipole Validation Kit, DV835V2	428	14-Jan-2004
S.A.M. Phantom used for 835MHz	1031	
Dipole Validation Kit, DV1800V2	217	14-Jan-2004
Dipole Validation Kit, DV1900V2	537	14-Jan-2004
S.A.M. Phantom used for 1900MHz	1030	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3537A01598	09-Sep-2003
Power Meter 437B	3125U113481	21-May-2003
Power Meter 437B	3110A05257	21-May-2003
Power Sensor - 8482H	MY41090240	08-May-2003
Power Sensor - 8482H	MY41090241	08-May-2003
Network Analyzer HP8752C	3410A3105	23-Aug-2003
Dielectric Probe Kit HP85070B	US33020390	16- Sep-2003
Digital Thermometer 61220-601	350078	25-Sep-2003
Digital Thermometer 61220-601	21117674	12-Nov-2003
Thermometer Probe 61220-604	99172351	25-Sep-2003
Thermometer Probe 61220-604	21117824	12-Nov-2003
Digital Hygrometer/ Thermometer	21242911	24-Sep-2003
B Power Amplifier 5S1G4	19290	05-May-2003

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, along with the temperature of the simulated tissue are shown in the table below. A mass density of ρ=1g/cm3 was entered into the system in all the cases. It can be seen that the measured parameters are within tolerance of the recommended limits [1]. During the tests, the ambient temperature of the laboratory was in the range 22.2-24.4°C, the relative humidity was 27.5- 35.4 %, and the liquid depth above the ear reference points was more than 150 cm for all the cases. It is seen that the measured parameters are satisfactory for compliance testing.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	Simulated Tissue Temp (°C)
835	Head	Measured, 31-Mar-03	42.69	0.90	21.0
		Measured, 1-April-03	42.11	0.89	21.8
		Recommended Limits	41.50	0.90	20-25
	Body	Measured, 5-April-03	55.57	0.96	22.3
		Recommended Limits	55.20	0.97	20-25
1900	Head	Measured, 28-Mar-03	38.75	1.42	22.0
		Measured, 31-Mar-03	39.50	1.43	21.5
		Measured, 1-April-03	39.43	1.42	21.7
		Recommended Limits	40.00	1.40	20-25
	Body	Measured, 3-April-03	51.40	1.57	21.8
		Measured, 4-April-03	51.28	1.57	22.5
		Measured, 7-April-03	51.60	1.47	23.5
		Recommended Limits	53.30	1.52	20-25

The list of ingredients and the percent composition used for the simulated tissue are indicated in the table below.

Ingredient	800MHz Head	800MHz Body	1800/1900MHz Head	1900MHz Body
Sugar	57.99%	56.00%	--	--
DGBE	--	--	44.92%	30.82%
Water	39.72%	41.76%	54.90%	68.89%
Salt	1.18%	0.76%	0.18%	0.29%
HEC	0.92%	1.21%	--	--
Bact.	0.19%	0.27%	--	--

5. System Accuracy Verification

A system accuracy verification of the DASY3 was performed using the measurement equipment listed in Section 3.1. The daily system accuracy verification occurs within the flat section of the SAM phantom.

A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR indicated on the dipole certification sheet. These tests were done at 835 MHz and/or 1900MHz. These frequencies are within 100MHz of the mid-band frequency of the test device, according to [1]. The test was conducted on the same days as the measurement of the DUT. The results from the system accuracy verification are displayed in the table below (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 22.3-24.5 °C, the relative humidity was in the range 27.3 – 35.5 % and the liquid depth above the ear reference points was above 150 mm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values. The SAR distributions are shown in Appendix 1.

Daily, prior to conducting tests, measurements were made with the RF sources powered off to determine the system

noise level. The highest system noise was 0.0008W/kg, which is below the recommended limit in [1].

f (MHz)	Tissue Type	Description	SAR (W/kg), 1g / 10g	Dielectric Parameters		Tissue Temp (°C)
				ε_r	σ (S/m)	
835	Head	**Measured,** 31-Mar-2003	8.99 / 5.88	42.69	0.90	21.3
		Measured, 1-Apr-2003	9.20 / 6.01	42.11	0.89	21.3
		Recommended Limits	9.50 / 6.20	41.50	0.90	20-25
	Body	**Measured,** 5-Apr-2003	9.59 / 6.32	55.57	0.96	22.3
		Recommended Limits	9.90 / 6.46	55.20	0.97	20-25
1900	Head	**Measured,** 28-Mar-2003	42.47 / 22.17	38.75	1.42	22.0
		Measured, 31-Mar-2003	40.34 / 21.12	39.50	1.43	21.2
		Measured, 01-Apr-2003	39.16 / 20.48	39.43	1.42	21.9
		Recommended Limits	39.70 / 20.50	40.00	1.40	20-25
	Body	**Measured,** 3-Apr-2003	41.48 / 21.60	51.40	1.57	23.3
		Measured, 4-Apr-2003	42.02 / 21.89	51.28	1.57	22.5
		Measured, 7-Apr-2003	38.70 / 20.60	51.60	1.47	23.5
		Recommended Limits	40.50 / 20.89	53.30	1.52	20-25

6. Test Results

The test sample was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of this test the unit is commanded to test mode and set to the proper channel, transmitter power level and transmit mode of operation. The phone was tested in the configurations stipulated in [1,2]. The phone was positioned into these configurations using the positioner supplied with the DASY 3.1d SAR measurement system.
The Cellular Phone FCC ID PY7A1031011 has the following battery options:
Model #1 – BKB 193 167 Battery
This battery was used for SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

6.1 Head Adjacent Test Results

The SAR results shown in tables 1 through 4 are maximum SAR values averaged over 1 gram and 10 grams of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the simulated tissue, the measured drift, and the extrapolated SAR.
The extrapolated SAR corresponds to the measured SAR scaled to the maximum conducted output power.
The humidity and ambient temperature of the test facility were in the ranges 27.3-39.4% and 22.2-24.6°C, respectively.
The SAR measurements were performed using the SAM phantoms listed in section 3.1.

The test conditions indicated as bold numbers in the following table are included in Appendix 2. All other test conditions measured lower SAR values than those included.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
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f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Left Head (Cheek / Touch Position)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.73 / 0.45	0.12	0.74 / 0.45	23.5	21.2
	189 / 837	29.89	0.88 / 0.54	-0.05	**0.89 / 0.54**	23.4	21.1
	251 / 849	29.75	0.88 / 0.53	0.15	0.89 / 0.53	23.6	21.2
800 GSM BT on	189 / 837	29.89	0.82 / 0.50	0.14	0.83 / 0.50	22.4	21.2
1900 GSM	512 / 1850	30.85	0.54 / 0.33	0.20	0.55 / 0.34	23.4	20.7
	660/1880	30.75	0.69 / 0.43	0.03	0.72 / 0.45	23.4	20.3
	810/1910	30.62	0.78 / 0.47	-0.03	**0.81 / 0.49**	23.5	20.4

Table 1: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Right head (Cheek / Touch Position)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.70 / 0.43	0.02	0.71 / 0.37	22.6	21.2
	189 / 837	29.89	0.90 / 0.55	-0.14	**0.91 / 0.55**	22.6	21.2
	251 / 849	29.75	0.89 / 0.54	-0.02	0.90 / 0.55	23.3	21.2
800 GSM BT on	189 / 837	29.89	0.82 / 0.50	0.14	0.30 / 0.19	22.4	21.2
1900 GSM	512 / 1850	30.85	0.77 / 0.43	0.00	0.80 / 0.44	22.8	20.8
	660/1880	30.75	0.96 / 0.53	-0.3	0.99 / 0.55	23.3	20.3
	810/1910	30.62	1.02 / 0.56	-0.12	**1.05 / 0.58**	23.3	20.3

Table 2: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the right head in the Cheek/Touch Position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
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F (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Left Head (15° Tilt Position)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.29 / 0.18	-0.10	0.29 / 0.19	23.4	21.3
	189 / 837	29.89	0.36 / 0.23	-0.07	0.36 / 0.23	23.5	21.1
	251 / 849	29.75	0.40 / 0.26	0.00	**0.40 / 0.26**	23.5	21.2
1900 GSM	512 / 1850	30.85	0.75 / 0.43	-0.07	0.78 / 0.44	23.4	20.7
	660/1880	30.75	0.83 / 0.48	0.01	0.86 / 0.50	23.5	20.4
	810/1910	30.62	0.84 / 0.48	0.00	**0.87 / 0.50**	23.4	20.4
1900 GSM BT on	810/1910	30.62	0.83 / 0.48	0.02	0.86 / 0.49	22.4	20.8

Table 3: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the left head in the 15° Tilt Position.

F (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Right Head (15° Tilt Position)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.34 / 0.22	0.09	0.35 / 0.22	22.7	21.1
	189 / 837	29.89	0.34 / 0.22	0.00	0.34 / 0.22	22.6	21.2
	251 / 849	29.75	0.40 / 0.26	-0.03	**0.41 / 0.26**	23.3	21.2
1900 GSM	512 / 1850	30.85	0.78 / 0.43	-0.01	0.81 / 0.44	23.3	20.8
	660/1880	30.75	1.12/ 0.61	-0.02	**1.16 / 0.63**	23.3	20.3
	810/1910	30.62	1.08/ 0.60	-0.05	1.12 / 0.62	23.3	20.3
1900 GSM BT on	660/1880	30.75	1.10/ 0.59	0.02	1.14 / 0.61	20.7	32.4

Table 4: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the right head in the 15° Tilt Position.

Prepared (also subject responsible if other)		No.	
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6.2 Body-Worn Test Results

The SAR results shown in table 5-8 are the maximum SAR values averaged over 1gram and 10 grams of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the simulated tissue after the test, the measured drift and the extrapolated SAR.
The extrapolated SAR corresponds to the measured SAR scaled to the maximum conducted output power.
The humidity and ambient temperature of the test facility were in the ranges 28.9-36.2% and 23.1-24.7°C, respectively.
A "flat" phantom was used for the body-worn tests. This "flat" phantom corresponds to the flat portion of the SAM phantom.
The tissue stimulant depth above the ear canal was verified to be above 150mm in all the measurements. The same device holder described in section 6 was used for positioning the phone. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.
The following body-worn accessories were tested for this phone:
-Carry case model ICT-14
-20 mm spacer
A full data set output of the three test conditions with the highest SAR values from the Dasy™ measurement system is included as appendix 3. The test conditions included are indicated as bold numbers in the following table. All other test conditions measured lower SAR values than those included.

f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Body Worn PHF: HPB-20 Carry Accessory: ICT-14 (Back of phone facing body)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.40 / 0.29	0.01	**0.41 / 0.29**	24.0	22.3
	189 / 837	29.89	0.33 / 0.24	0.02	0.34 / 0.24	24.5	22.5
	251 / 849	29.75	0.29 / 0.21	0.13	0.29 / 0.21	24.4	22.4
800 GSM BT on	128 / 824	29.94	0.39 / 0.28	-0.02	0.39 / 0.28	24.5	22.4
1900 GSM	512 / 1850	30.85	0.54 / 0.32	-0.13	0.56 / 0.33	23.3	21.5
	660/1880	30.75	0.68 / 0.40	-0.03	**0.71 / 0.41**	23.2	21.3
	810/1910	30.62	0.57 / 0.33	-0.02	0.59 / 0.34	23.1	21.1
1900 GSM BTon	660/1880	30.75	0.63 / 0.37	-0.05	0.65 / 0.38	23.9	23

Table 5: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the body with carry accessory ICT-14. Back of the phone facing the flat phantom.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
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f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Body Worn PHF: HPB-20 Carry Accessory: ICT-14 (Front of phone facing body)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.39 / 0.27	-0.03	**0.40 / 0.28**	24.1	22.4
	189 / 837	29.89	0.33 / 0.23	0.00	0.33 / 0.23	24.4	22.5
	251 / 849	29.75	0.24 / 0.17	0.00	0.25 / 0.17	24.3	22.4
800 GSM BT on	128 / 824	29.94	0.39 / 0.27	-0.04	0.39 / 0.27	24.5	22.2
1900 GSM	512 / 1850	30.85	0.21 / 0.13	-0.13	0.21 / 0.13	23.3	21.5
	660/1880	30.75	0.26 / 0.16	-0.03	**0.27 / 0.17**	23.5	21.3
	810/1910	30.62	0.21 / 0.13	-0.03	0.21 / 0.13	23.8	21.4
1900 GSM BT on	660/1880	30.75	0.25 / 0.15	-0.02	0.25 / 0.16	24.0	22.9

Table 6: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the body with carry accessory ICT-14. Front of the phone facing the flat phantom.

f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Body Worn PHF: HPB-20 Carry Accessory: 20 mm spacer (Back of phone facing body)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.32 / 0.22	0.02	**0.32 / 0.23**	24.6	22.6
	189 / 837	29.89	0.31 / 0.22	0.02	0.31 / 0.22	24.5	22.5
	251 / 849	29.75	0.27 / 0.19	-0.03	0.27 / 0.19	24.6	22.6
800 GSM BT on	128 / 824	29.94	0.38 / 0.27	-0.04	0.39 / 0.27	24.5	22.2
1900 GSM	512 / 1850	30.85	0.30 / 0.18	-0.02	0.31 / 0.19	24.1	22.9
	660/1880	30.75	0.38 / 0.23	-0.03	**0.40 / 0.23**	23.7	22.9
	810/1910	30.62	0.33 / 0.20	0.00	0.34 / 0.20	24.4	23.0
1900 GSM BT on	660/1880	30.75	0.40 / 0.24	-0.02	0.41 / 0.25	24.0	22.9

Table 7: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the body with a 20 mm spacer. Back of the phone facing the flat phantom.

Prepared (also subject responsible if other)		No.	
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f (MHz)	Channel/ frequency	Conducted Output Power (dBm)	Body Worn PHF: HPB-20 Carry Accessory: 20 mm spacer (Front of phone facing body)				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
800 GSM	128 / 824	29.94	0.17 / 0.12	-0.04	0.18 / 0.12	24.5	22.5
	189 / 837	29.89	0.23 / 0.16	-0.01	**0.23 / 0.16**	24.1	22.4
	251 / 849	29.75	0.16 / 0.11	0.05	0.17 / 0.12	24.3	22.5
800 GSM BT on	189 / 837	29.89	0.24 / 0.17	-0.03	0.24 / 0.17	24.6	22.7
1900 GSM	512 / 1850	30.85	0.07 / 0.04	-0.05	0.07 / 0.05	23.7	22.9
	660/1880	30.75	0.14 / 0.08	-0.04	0.15 / 0.09	24.5	22.9
	810/1910	30.62	0.15 / 0.09	-0.02	**0.15 / 0.09**	24.7	22.9
1900 GSM BT on	810/1910	30.62	0.17 /0.14	-0.04	0.17 / 0.11	24.1	23.0

Table 8: SAR measurement results for the portable cellular telephone FCC ID PY7A1031011 model T616 at maximum output power. Measured against the body with a 20 mm spacer. Front of the phone facing the flat phantom.

References

[1] FCC, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields: Additional Information for Evaluating Comp liance 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).

[2] 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.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
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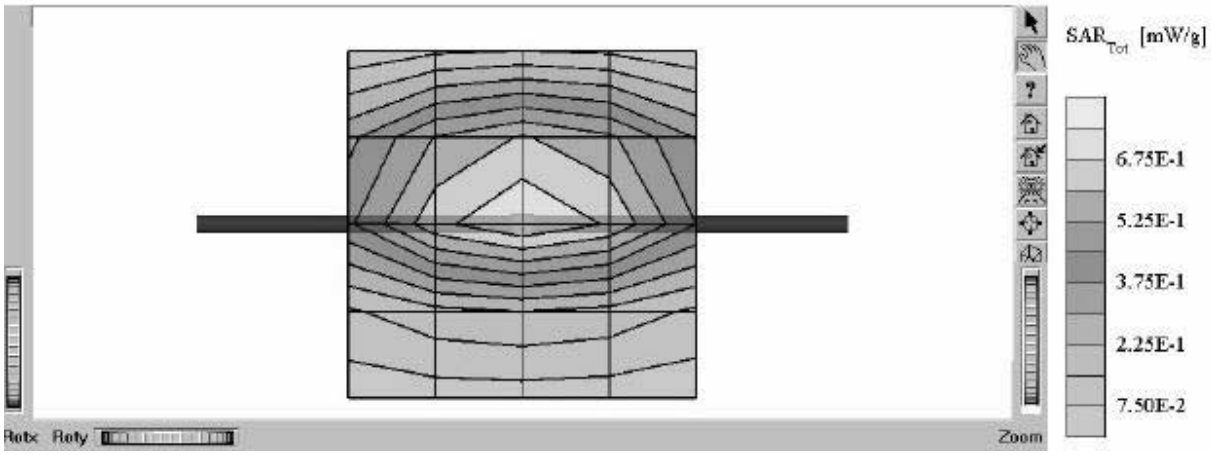
Appendix 1

SAR distribution comparison for the system accuracy verification

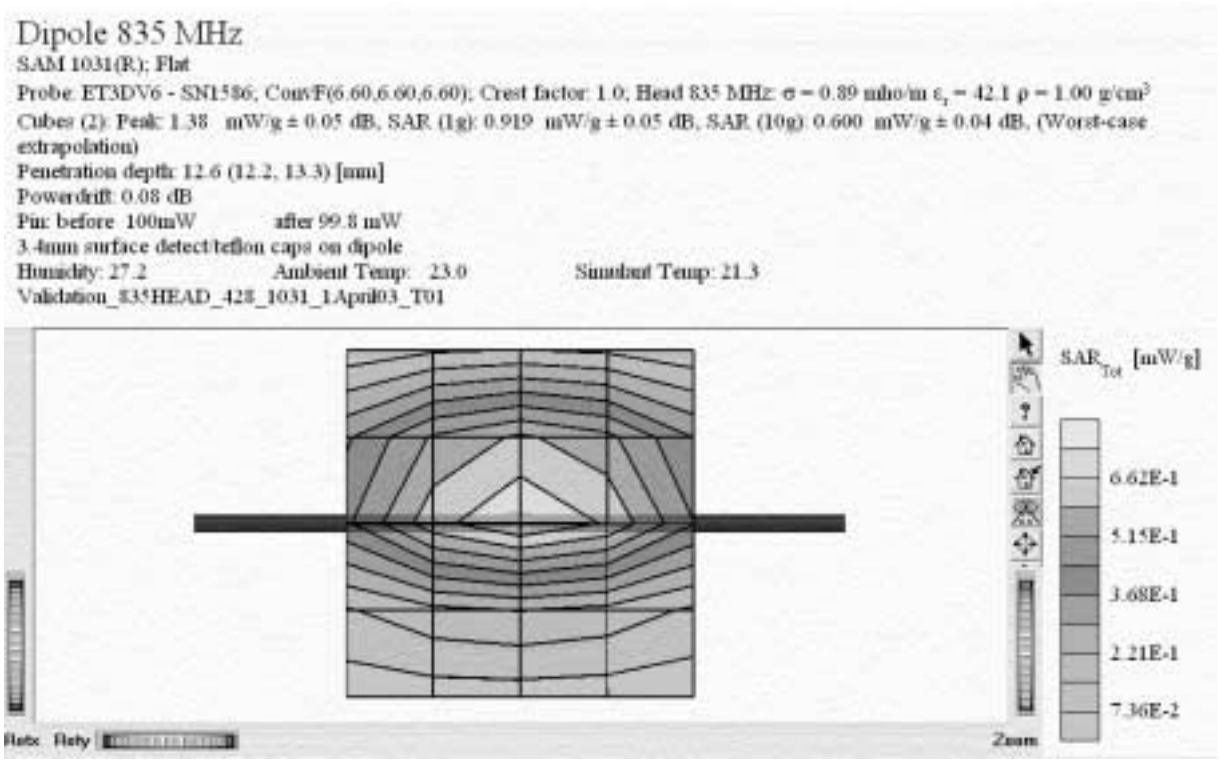
Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Dipole 835 MHz
SAM 1031(R); Flat
Probe: ET3DV6 - SN1586; ConvF(6.60,6.60,6.60); Crest factor: 1.0; Head 835 MHz: σ = 0.90 mho/m ε_r = 42.7 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.39 mW/g ± 0.01 dB, SAR (1g): 0.926 mW/g ± 0.00 dB, SAR (10g): 0.606 mW/g ± 0.00 dB, (Worst-case extrapolation)
Penetration depth: 12.8 (12.3, 13.5) [mm]
Powerdrift: 0.01 dB
Pin: before 100 mW 103 after mW
3.4mm surface detect/teflon caps on dipole
Humidity: 31.2 Ambient Temp:22.3 Simulant Temp:21.3
Validation_835HEAD_428_1031_31MAr03_T01



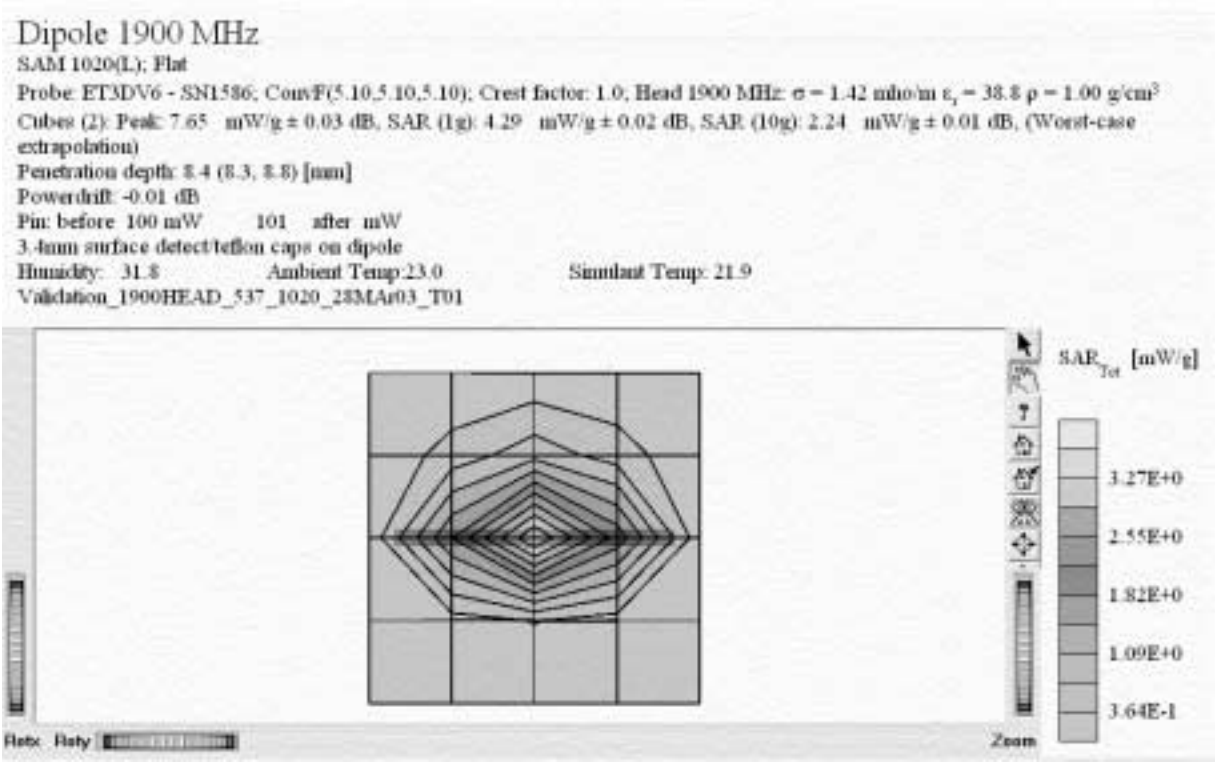
835 MHz SAR distribution of validation dipole antenna from system performance check on March 31, 2003. Using head tissue.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



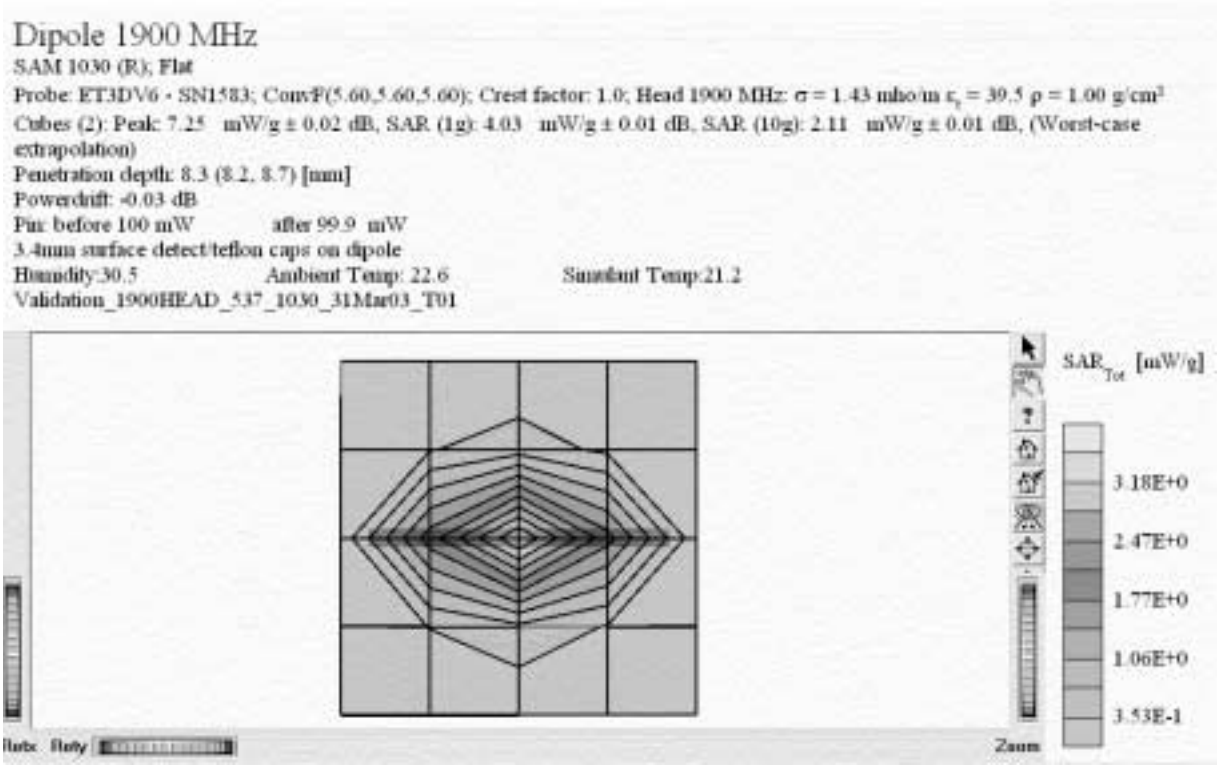
835 MHz SAR distribution of validation dipole antenna from system performance check on April 1, 2003. Using head tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



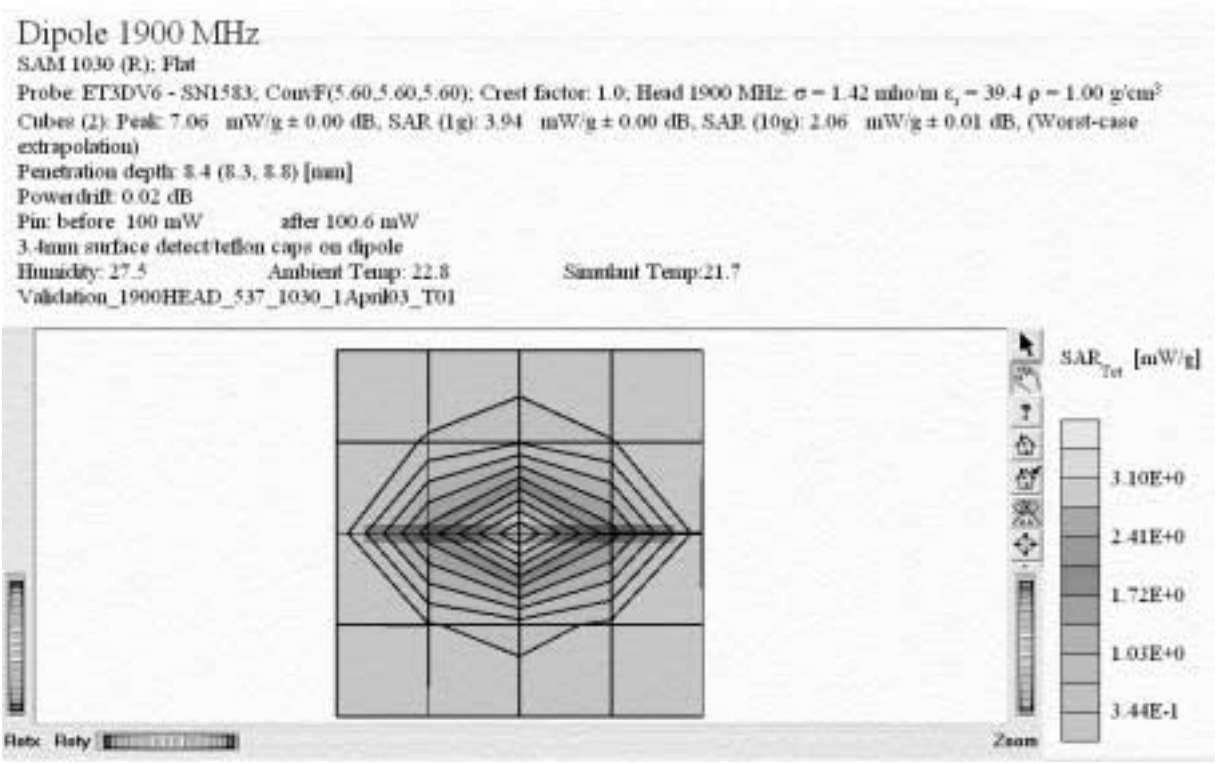
1900 MHz SAR distribution of validation dipole antenna from system performance check on March 28, 2003. Using head tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



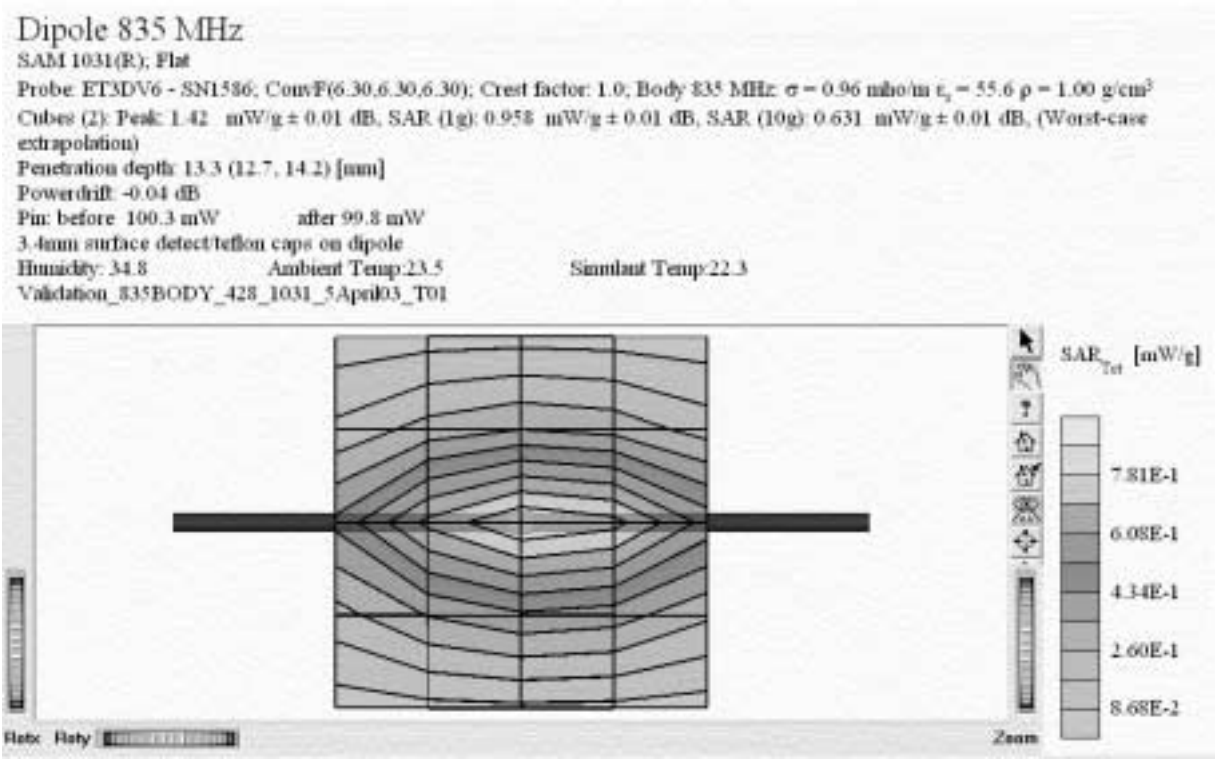
1900 MHz SAR distribution of validation dipole antenna from system performance check on March 31, 2003. Using head tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



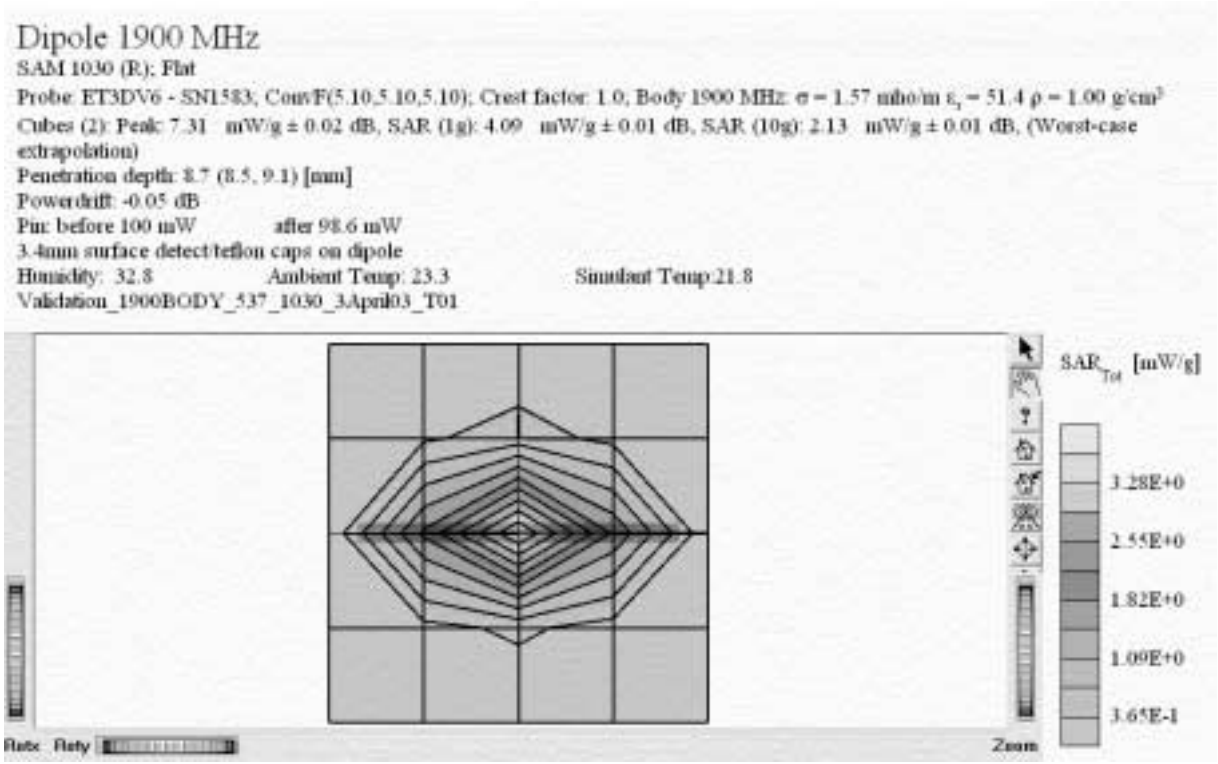
1900 MHz SAR distribution of validation dipole antenna from system performance check on April 1, 2003.Using head tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



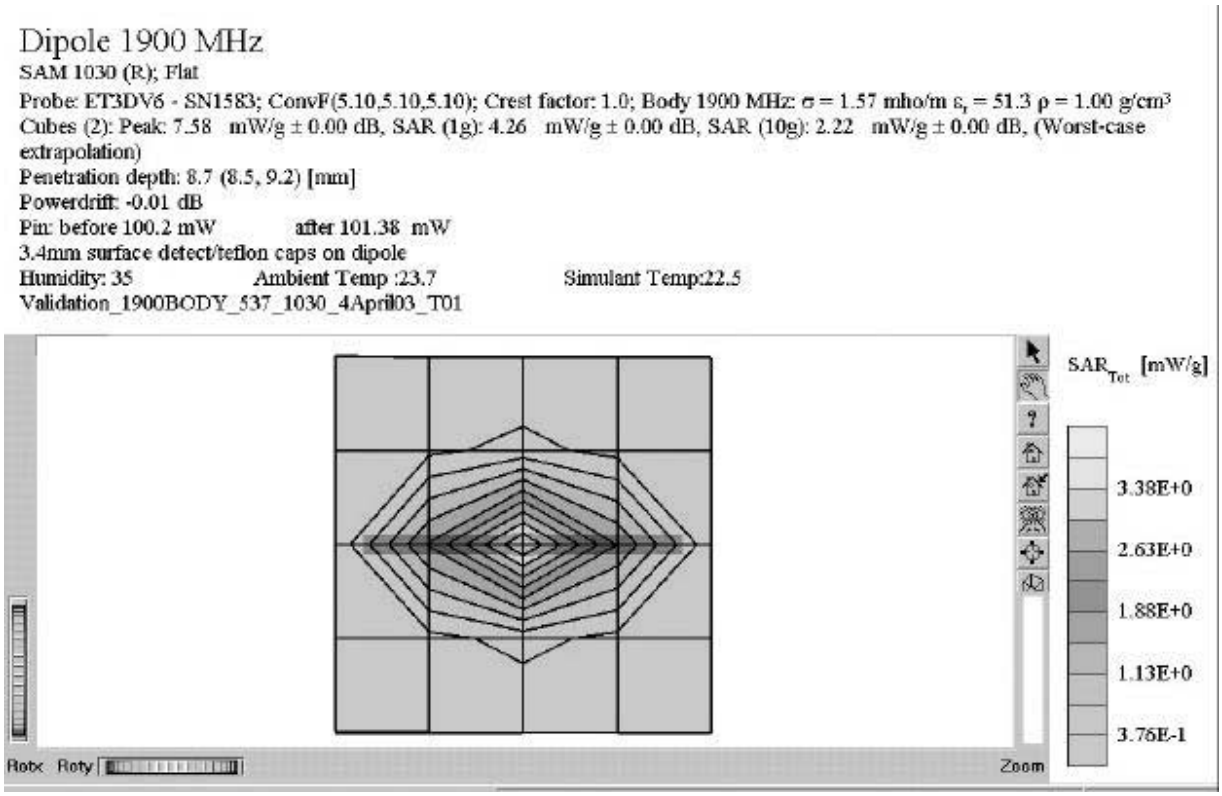
835 MHz SAR distribution of validation dipole antenna from system performance check on April 5, 2003. Using muscle tissue.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



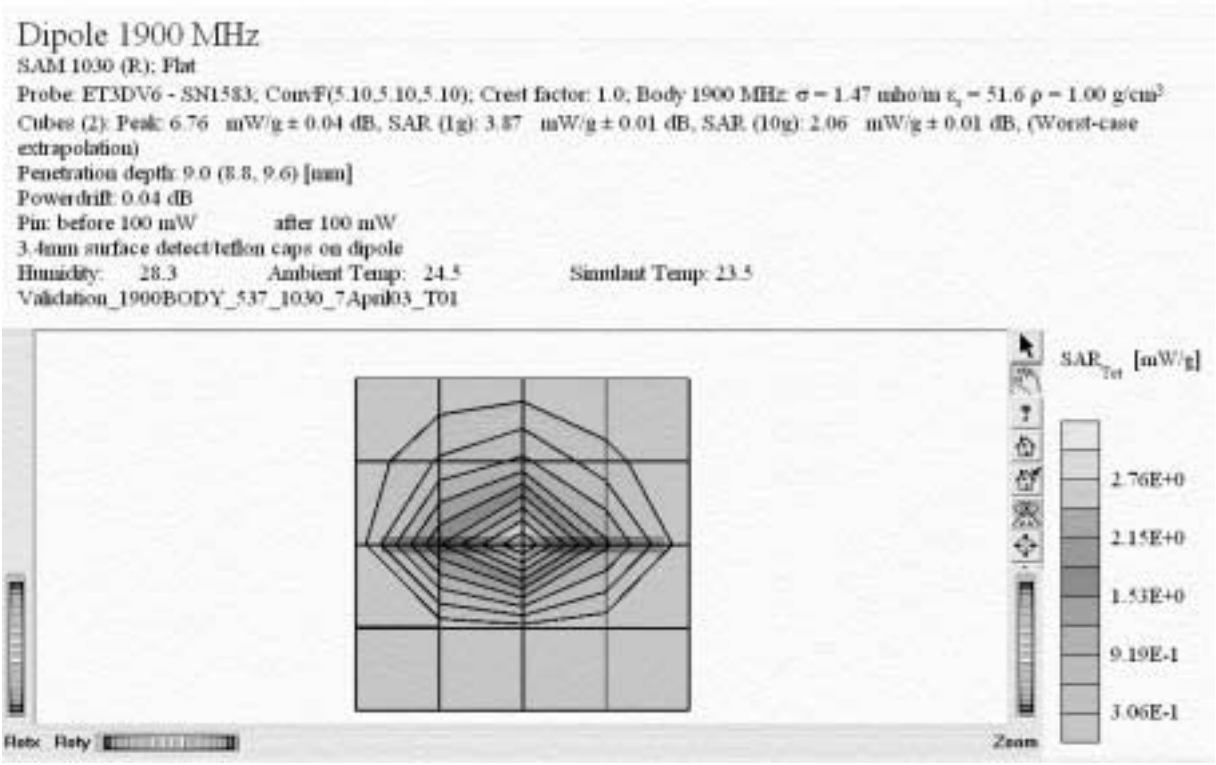
1900 MHz SAR distribution of validation dipole antenna from system performance check on April 3, 2003. Using muscle tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



1900 MHz SAR distribution of validation dipole antenna from system performance check on April 4, 2003. Using muscle tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



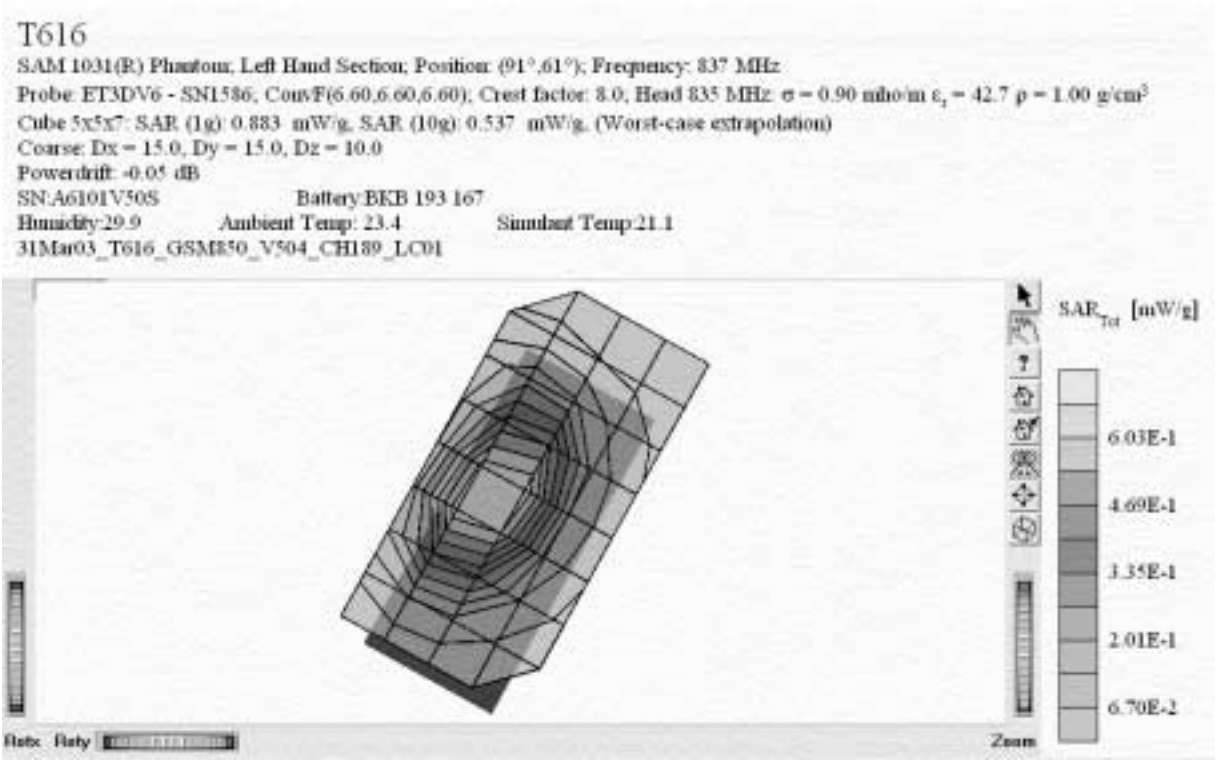
1900 MHz SAR distribution of validation dipole antenna from system performance check on April 7, 2003. Using muscle tissue.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Appendix 2

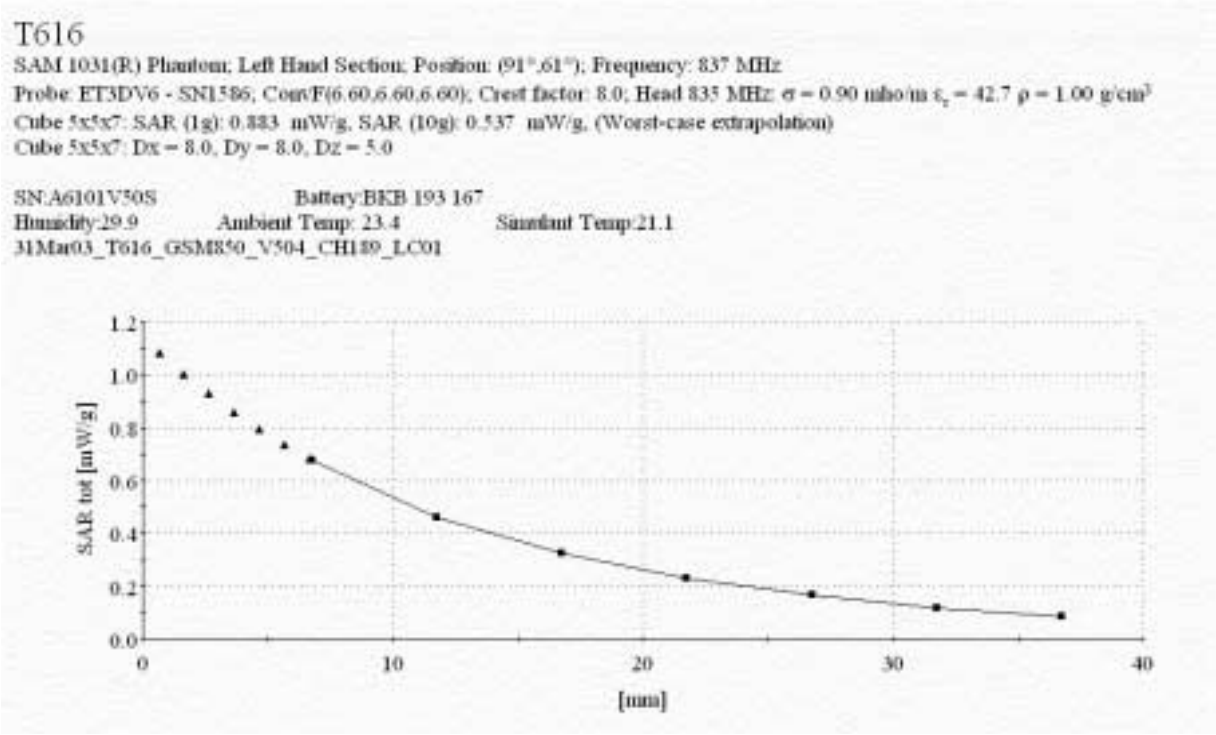
SAR distribution plots for Phantom Head Adjacent Use

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



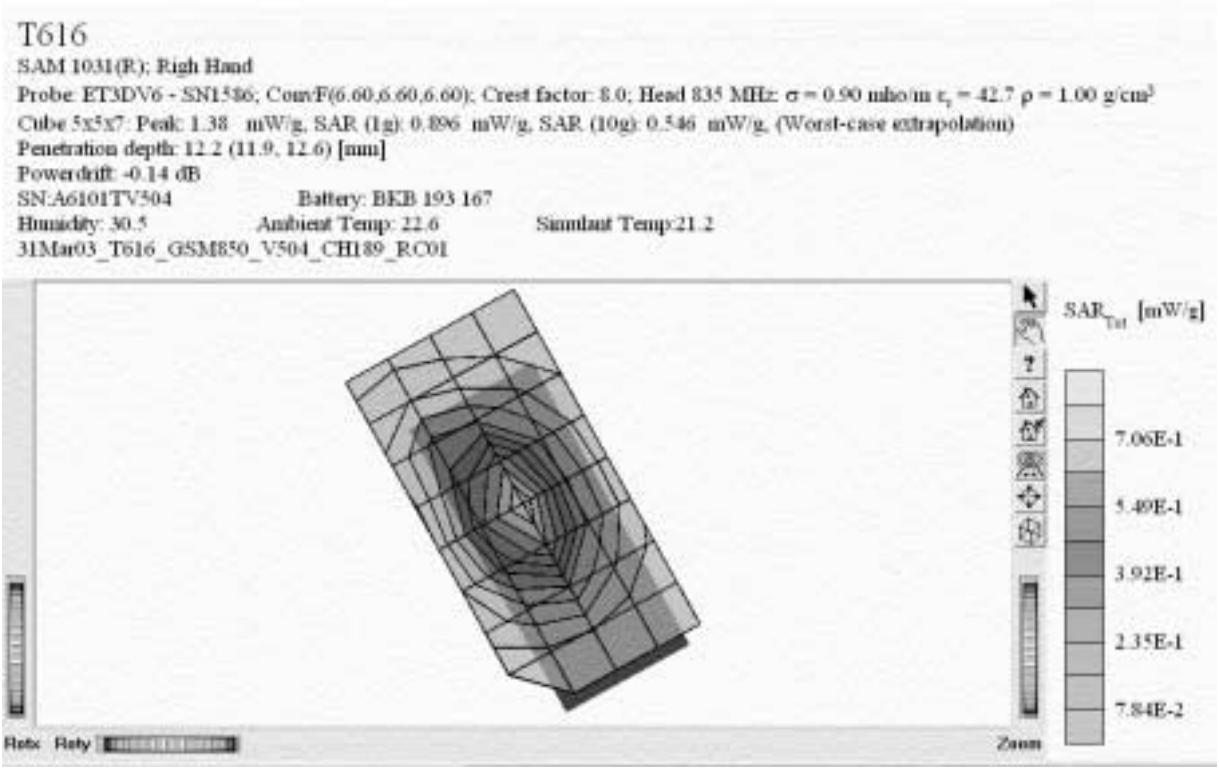
Distribution of maximum SAR in 800 GSM band. Measured against the left hand side of the head in the "Cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



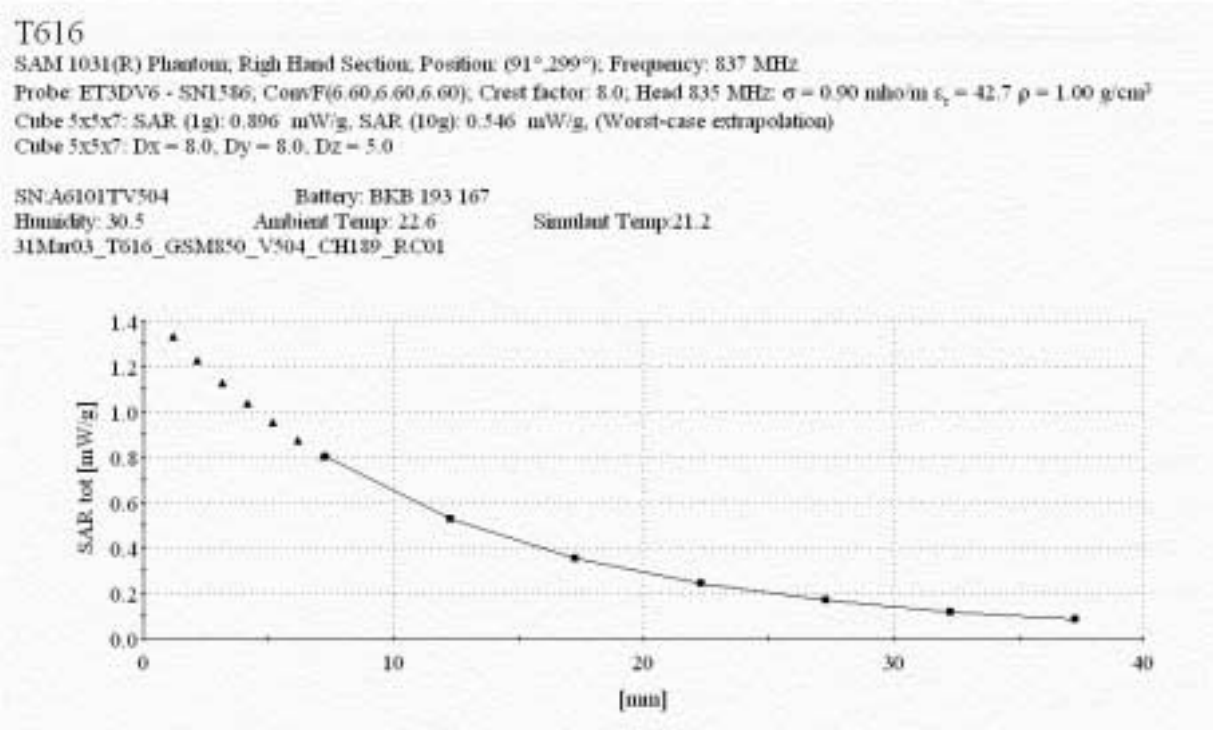
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 GSM band, while phone is against the left hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



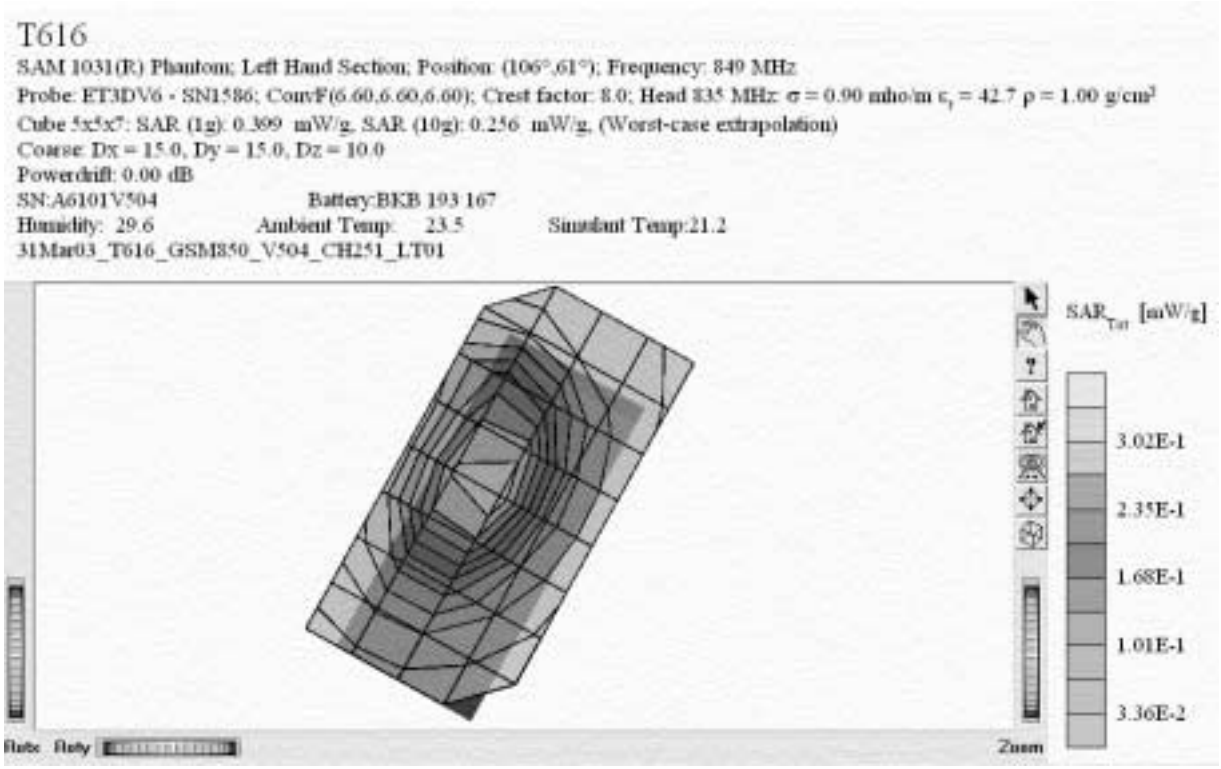
Distribution of maximum SAR in 800 GSM band. Measured against the right hand side of the head in the "Cheek" position.

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



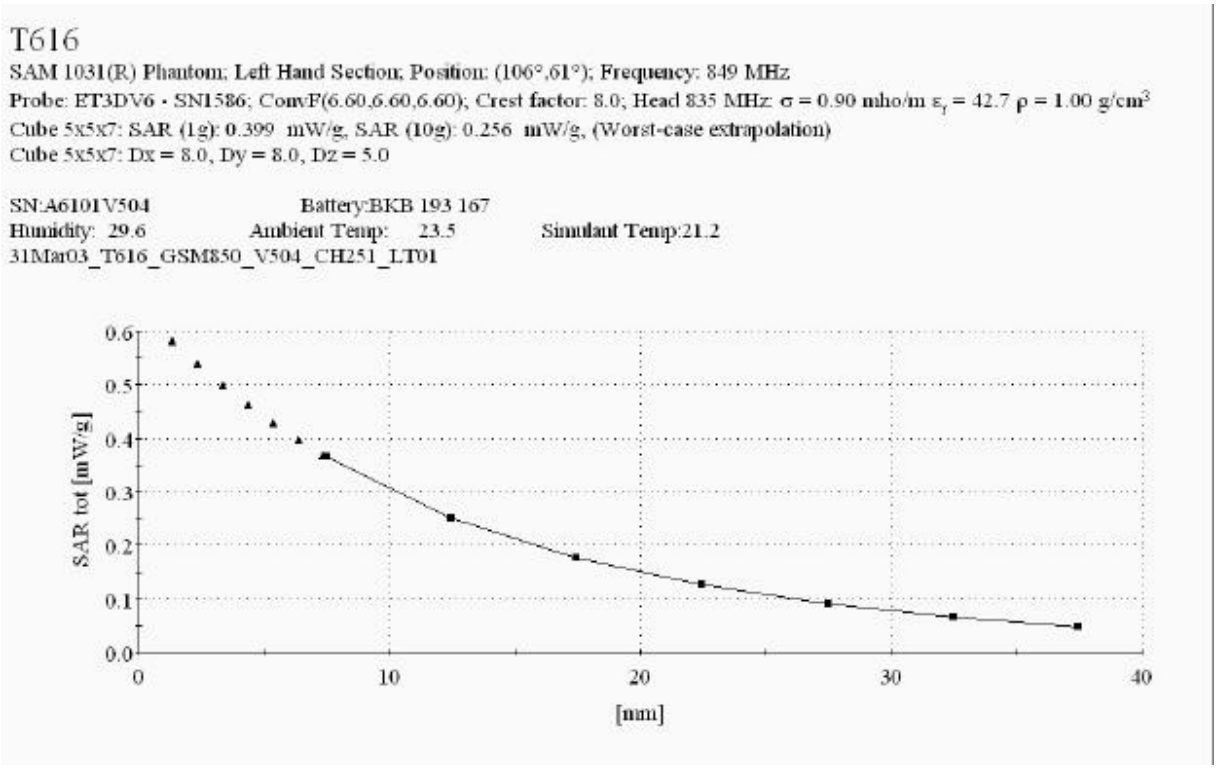
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 GSM band, while phone is against the right hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



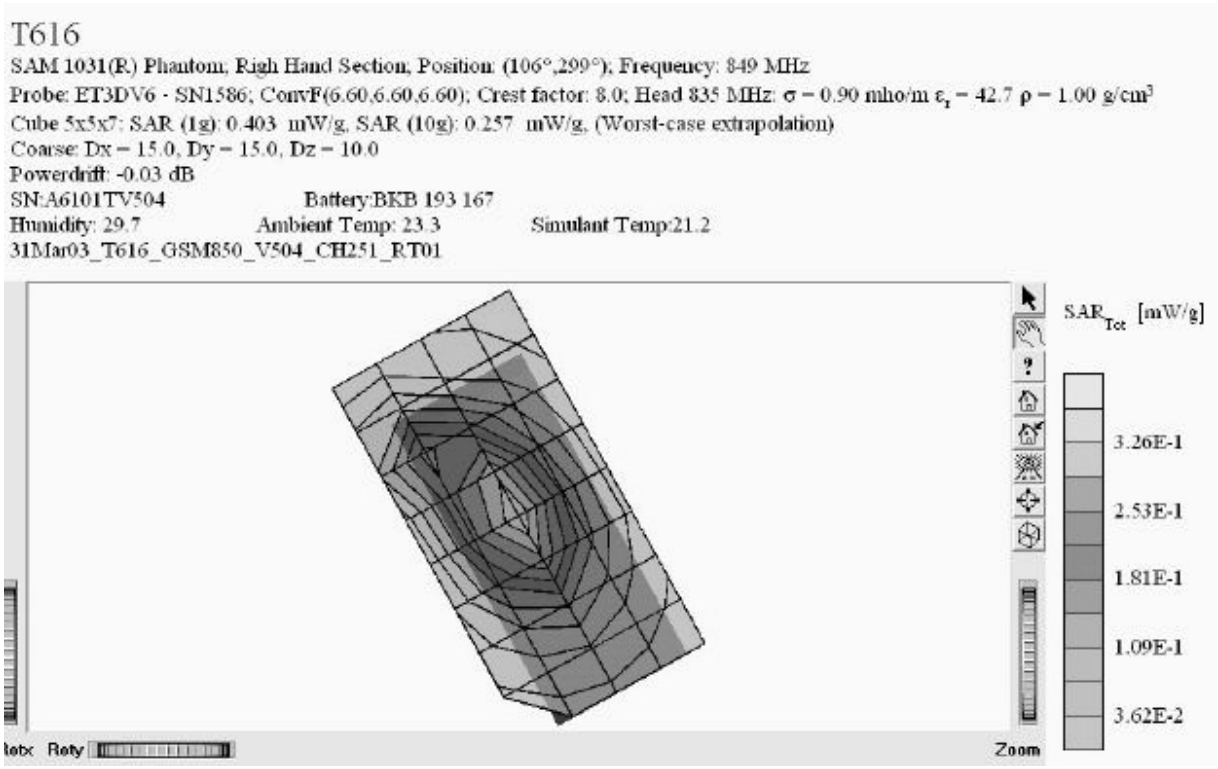
Distribution of maximum SAR in 800 GSM band. Measured against the left hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



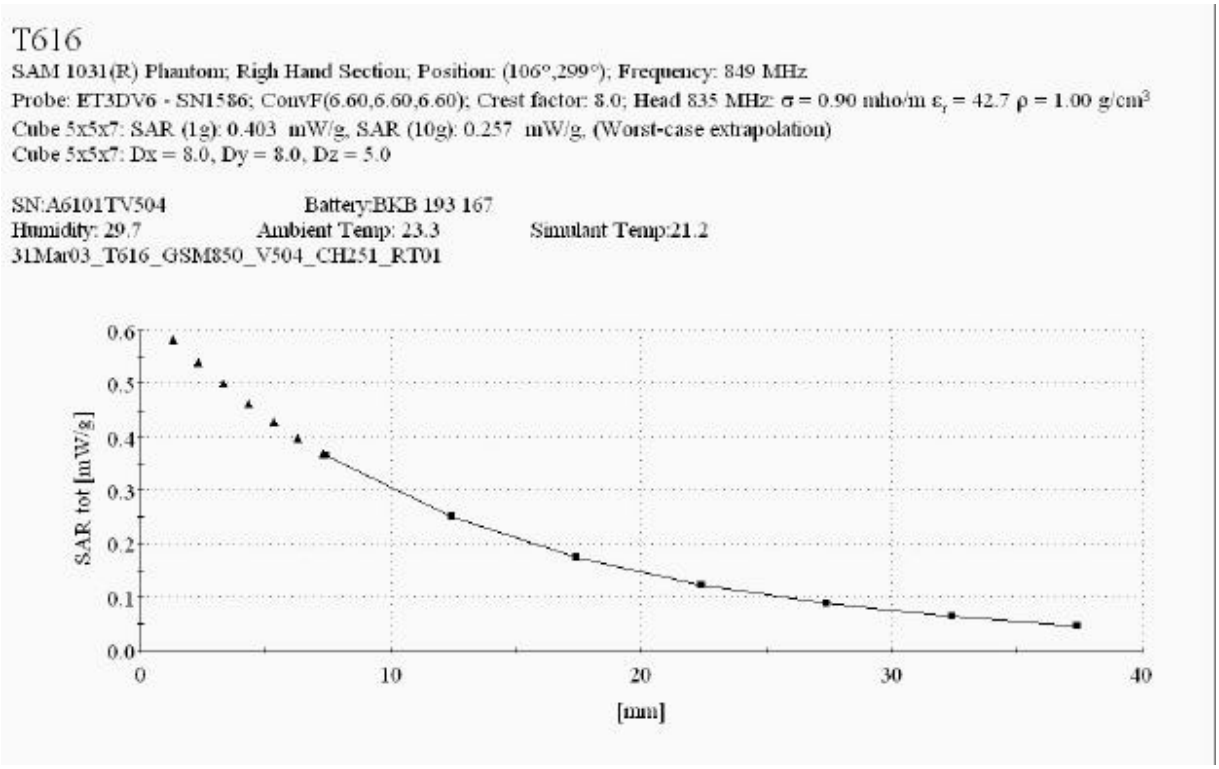
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 GSM band, while phone is against the left hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



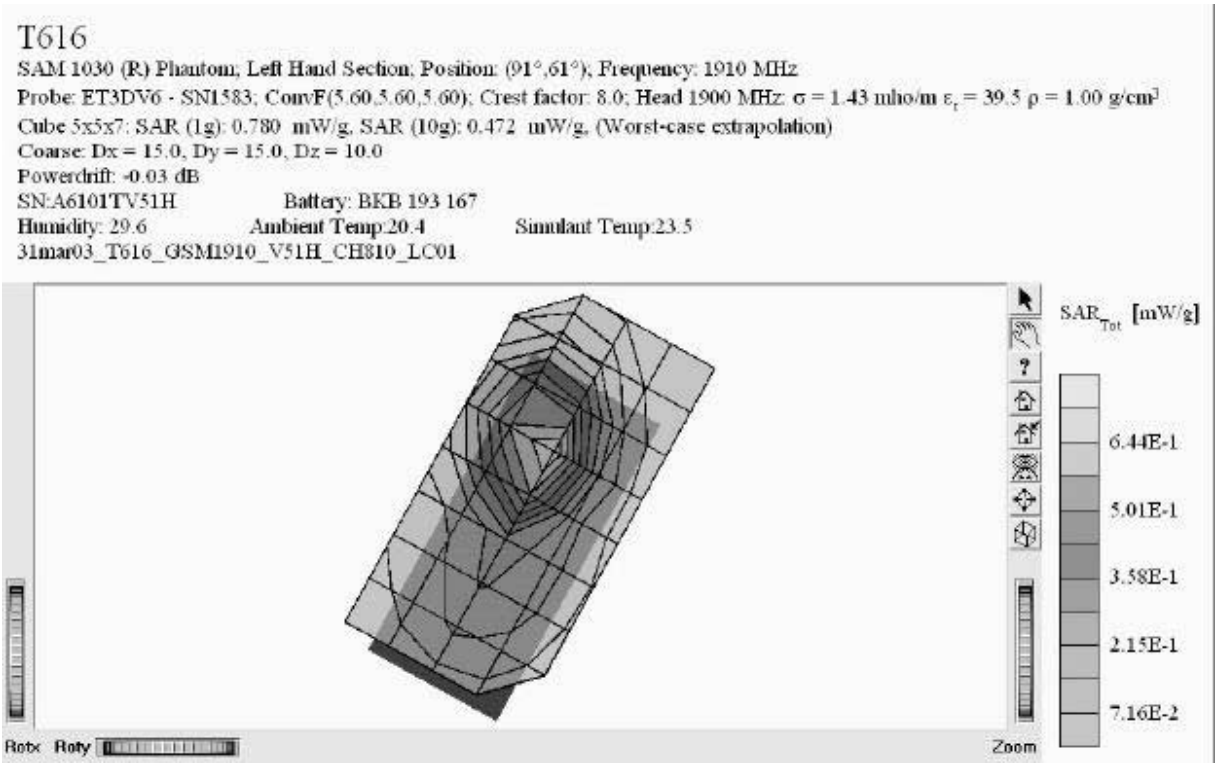
Distribution of maximum SAR in 800 GSM band. Measured against the right hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



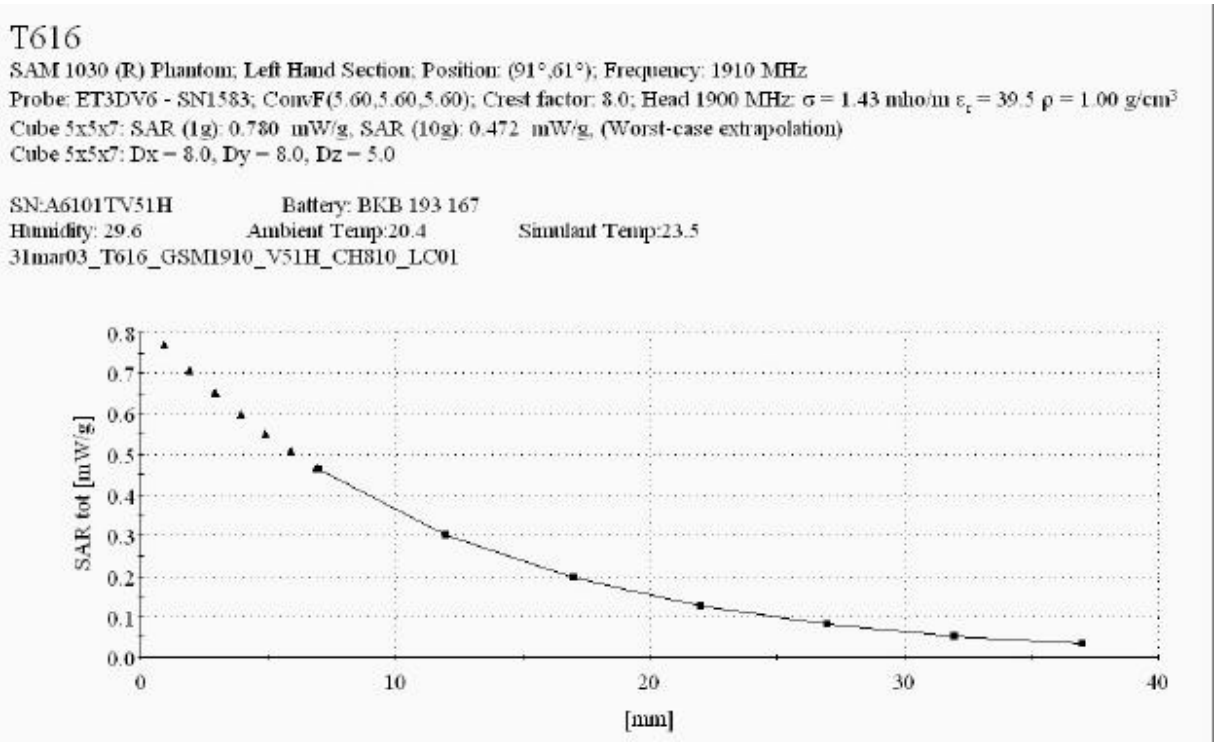
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 800 GSM band, while phone is against the right hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



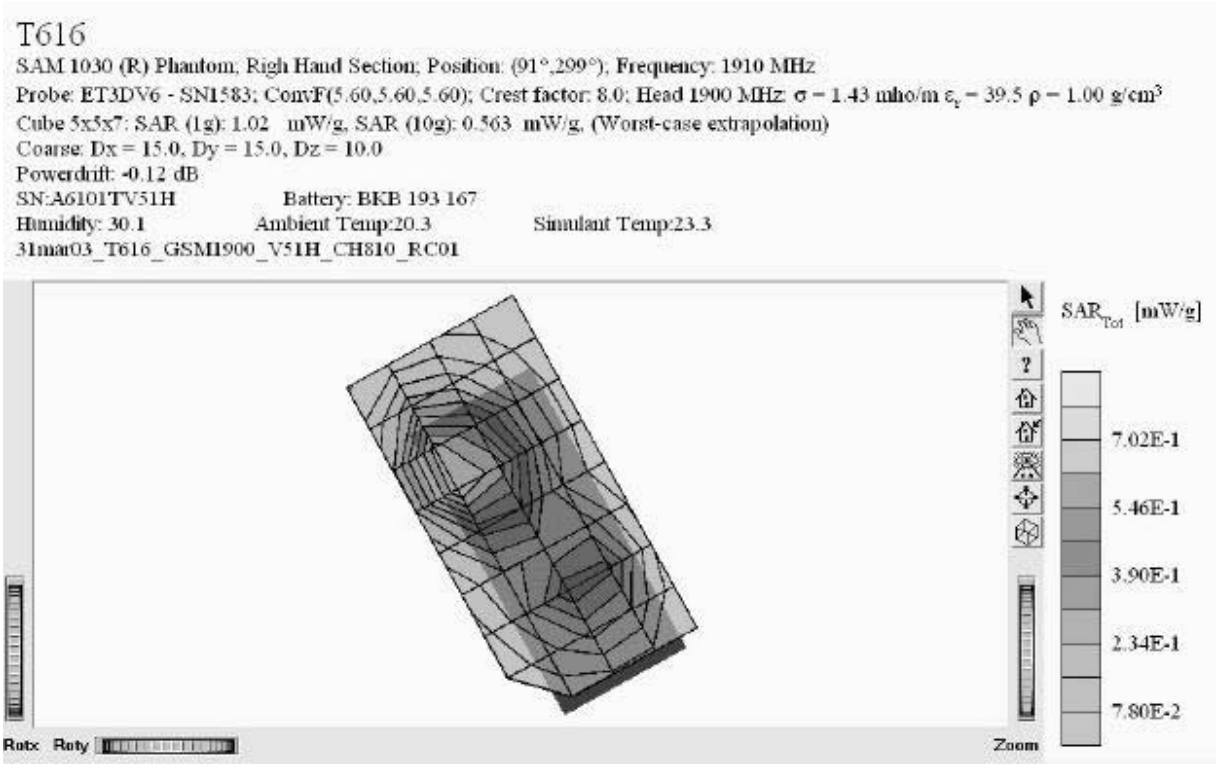
Distribution of maximum SAR in 1900 GSM band. Measured against the left hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



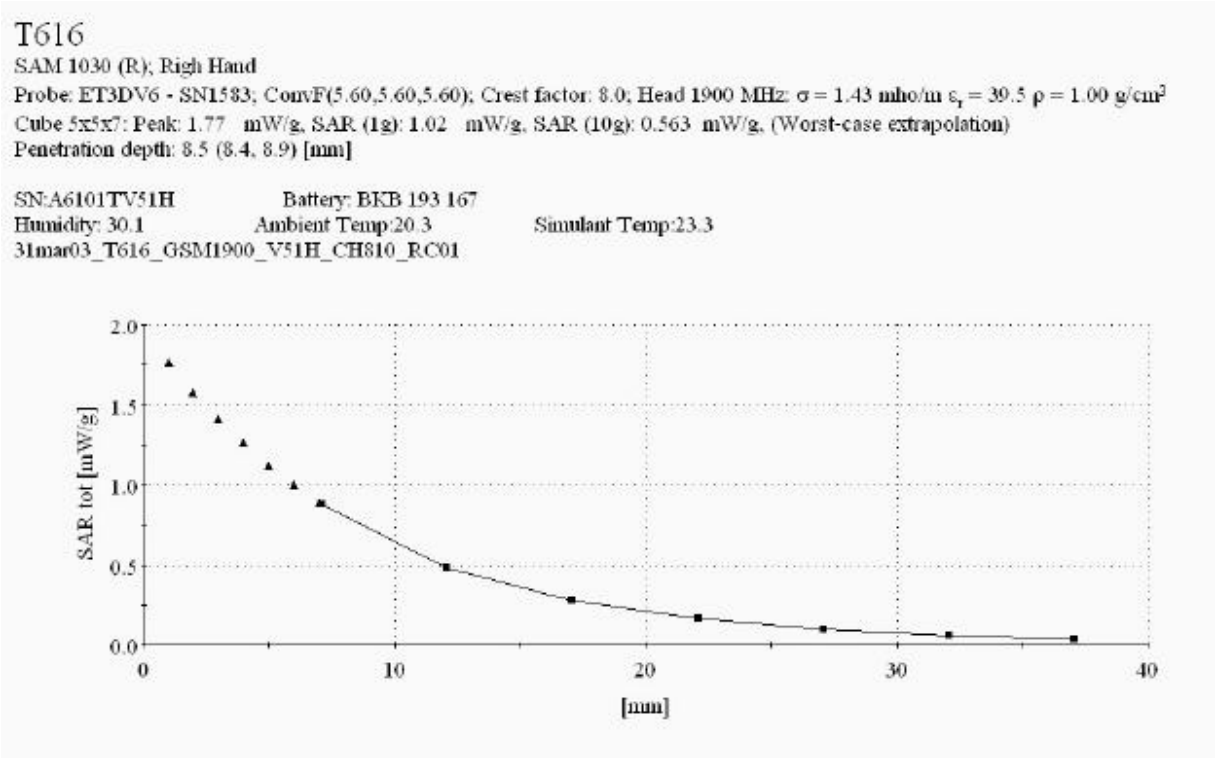
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 GSM band, while phone is against the left hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



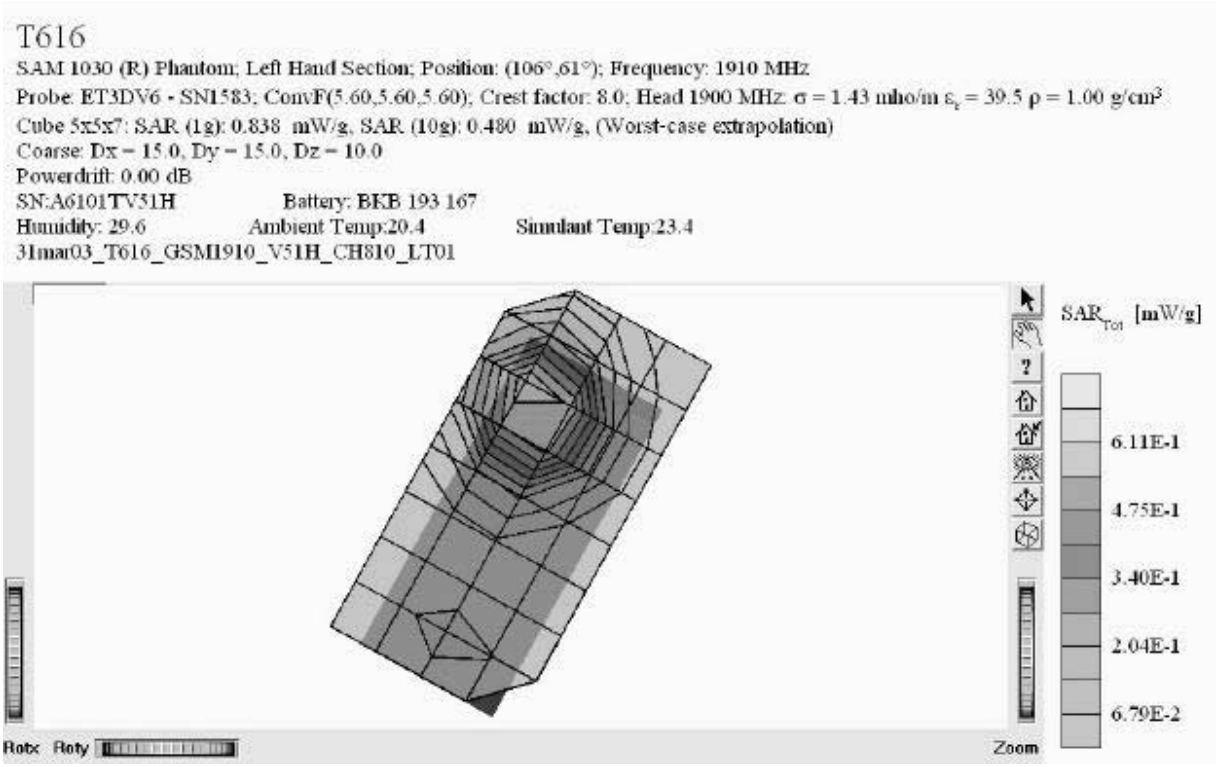
Distribution of maximum SAR in 1900 GSM band. Measured against the right hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



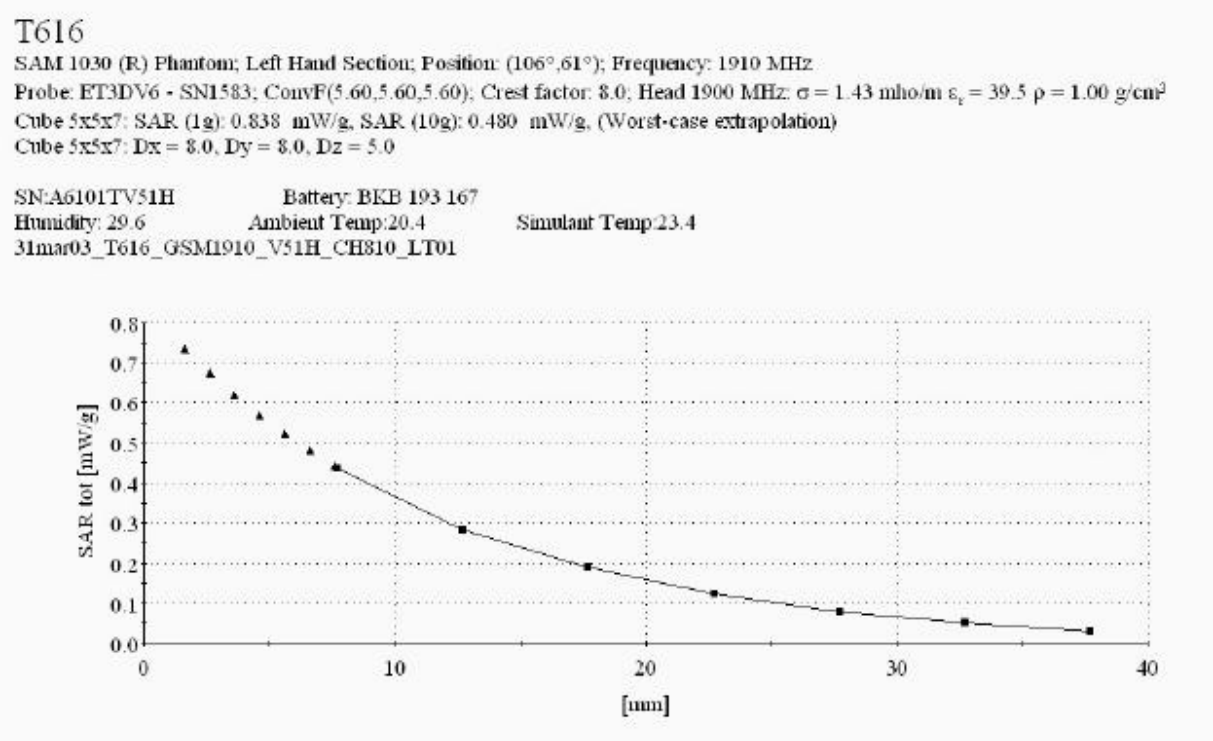
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 GSM band, while phone is against the right hand side of the head in the "cheek" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



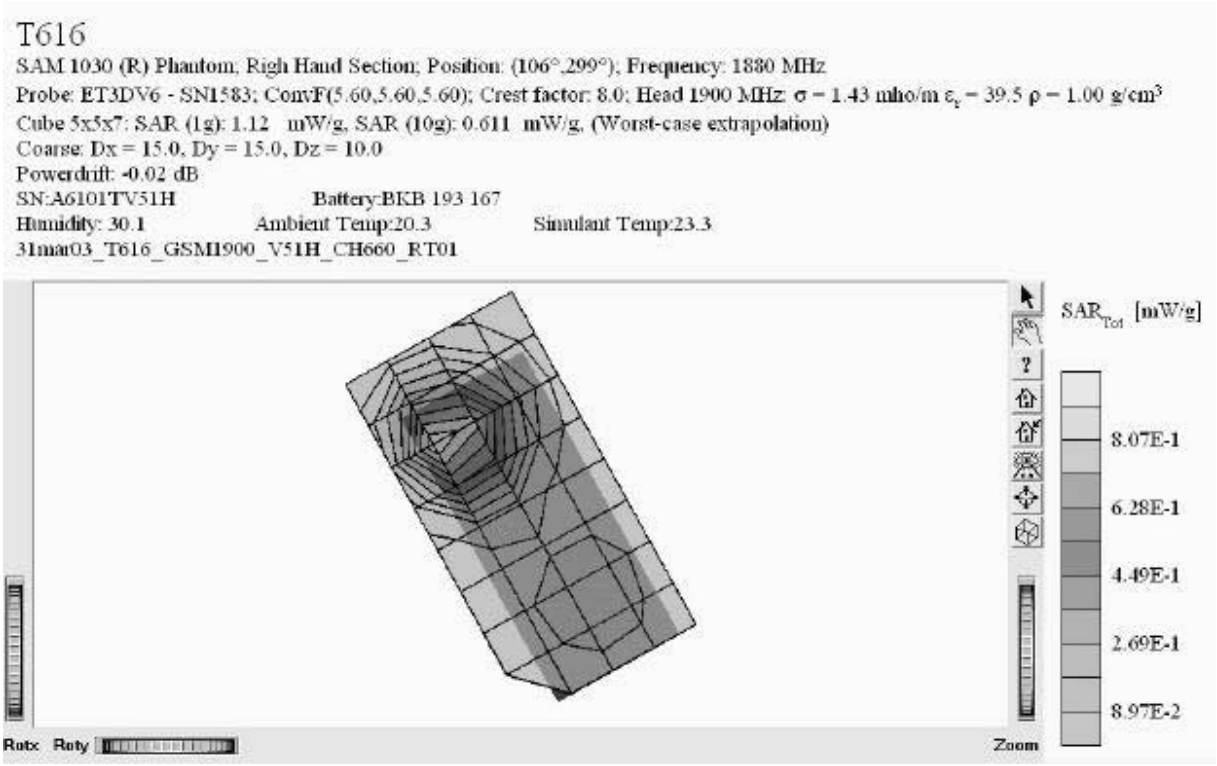
Distribution of maximum SAR in 1900 GSM band. Measured against the left hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



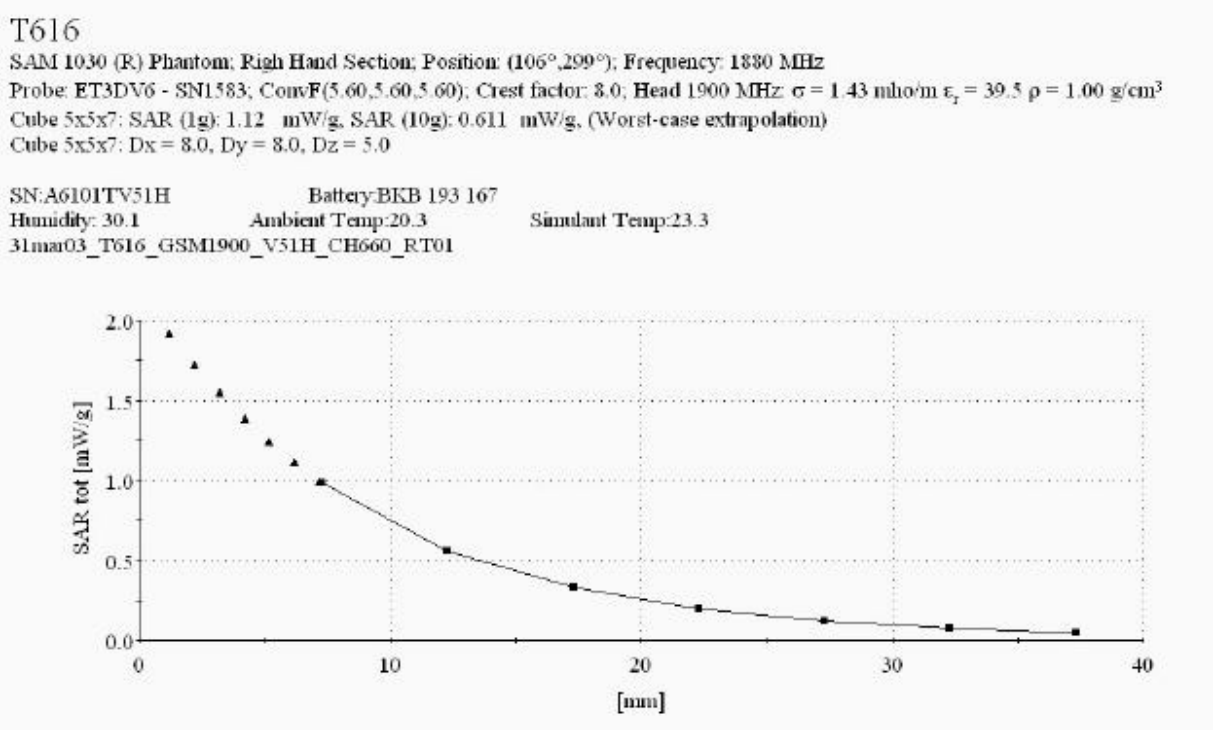
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 GSM band, while phone is against the left hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



Distribution of maximum SAR in 1900 GSM 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/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



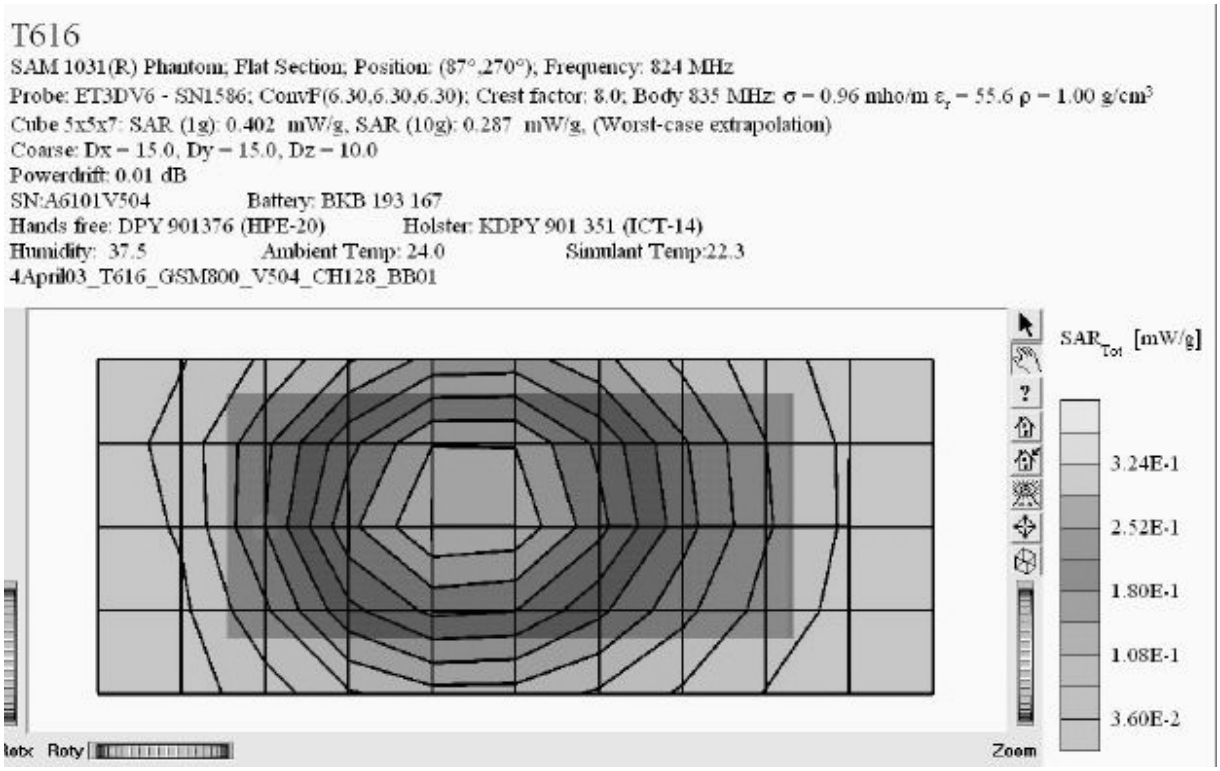
SAR Extrapolation to the phantom inner surface. Measured for Maximum SAR in 1900 GSM band, while phone is against the right hand side of the head in the "tilt" position.

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Appendix 3

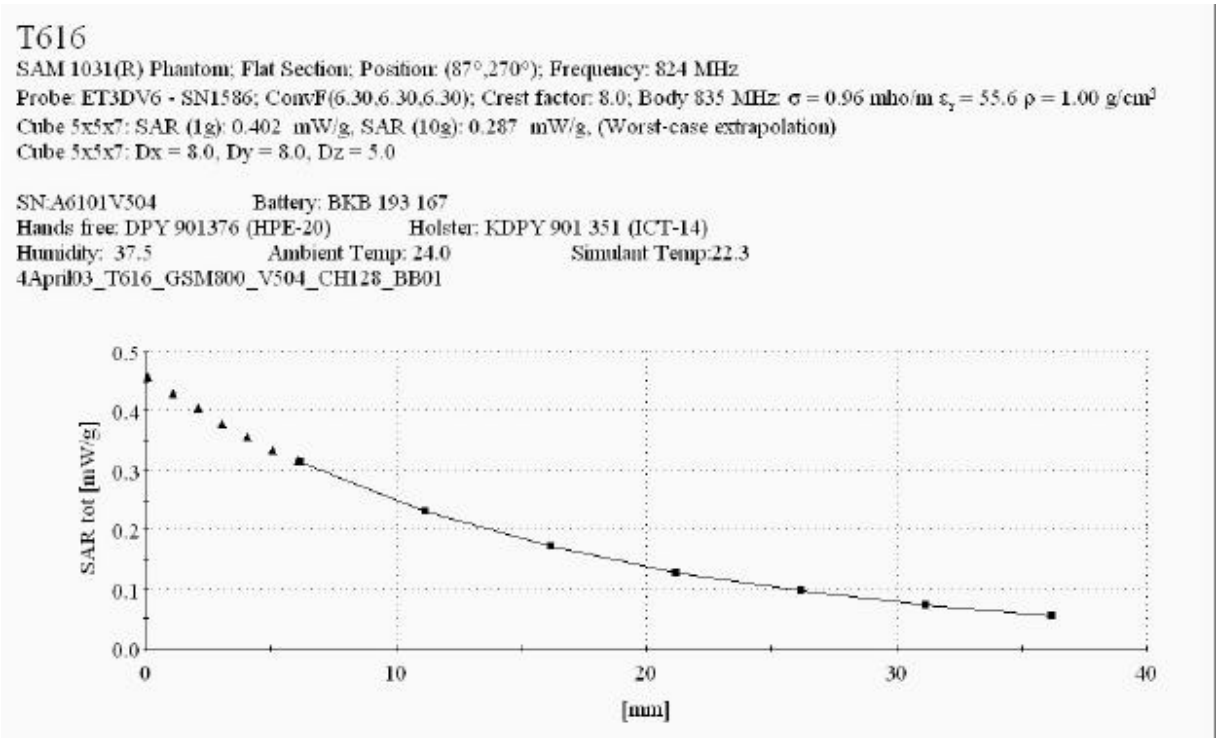
SAR distribution plots for Body Worn Configuration

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



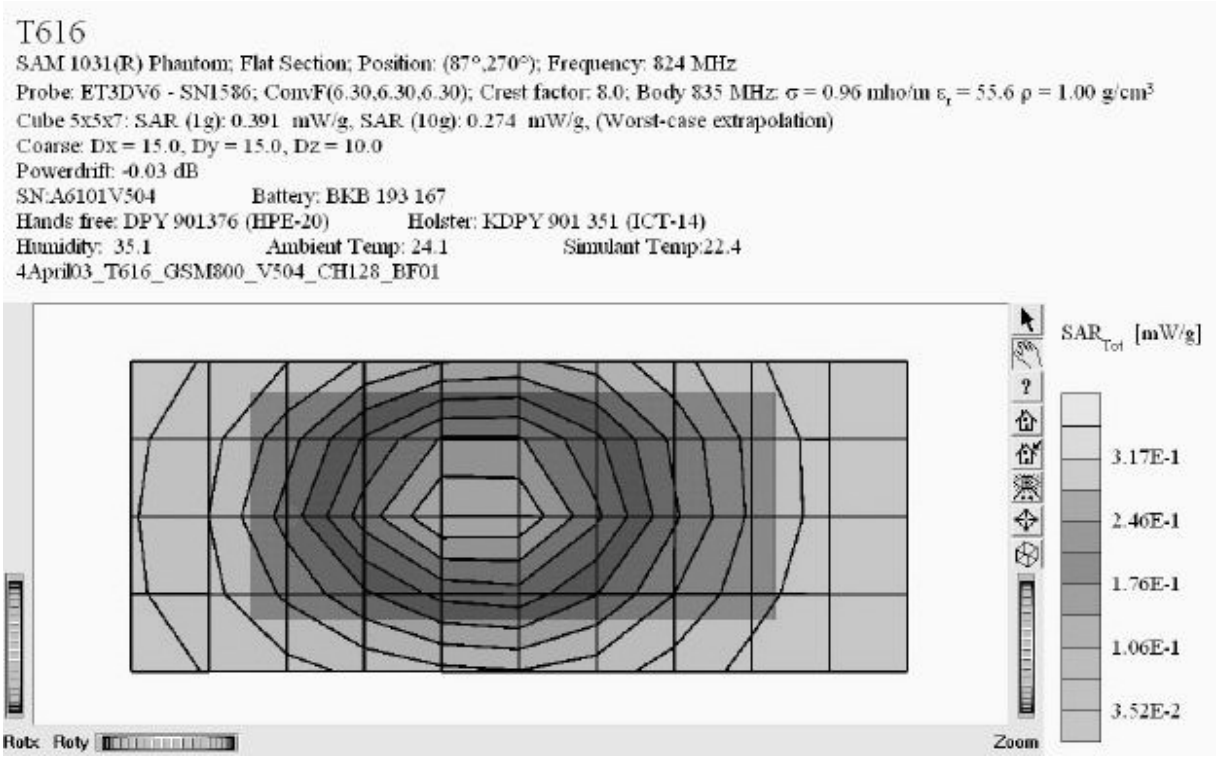
Distribution of maximum SAR in 800 GSM band. Measured with back of device facing the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



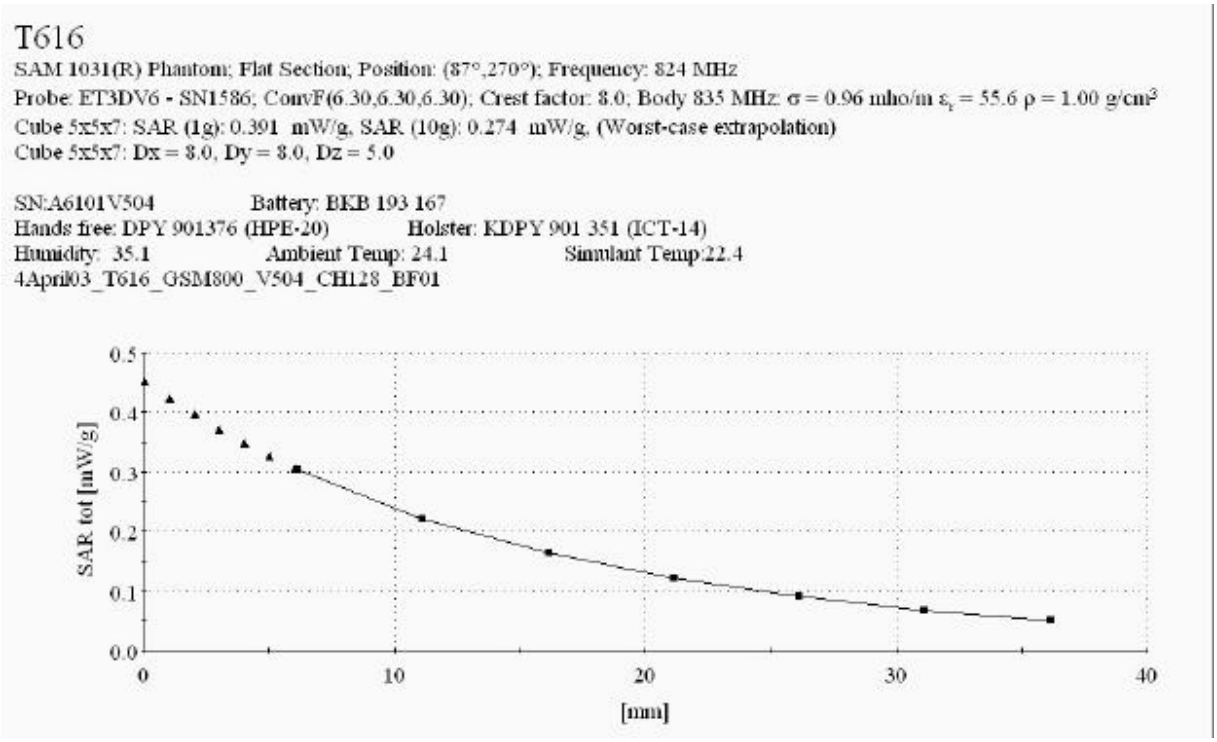
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 800 GSM band, while phone is against the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

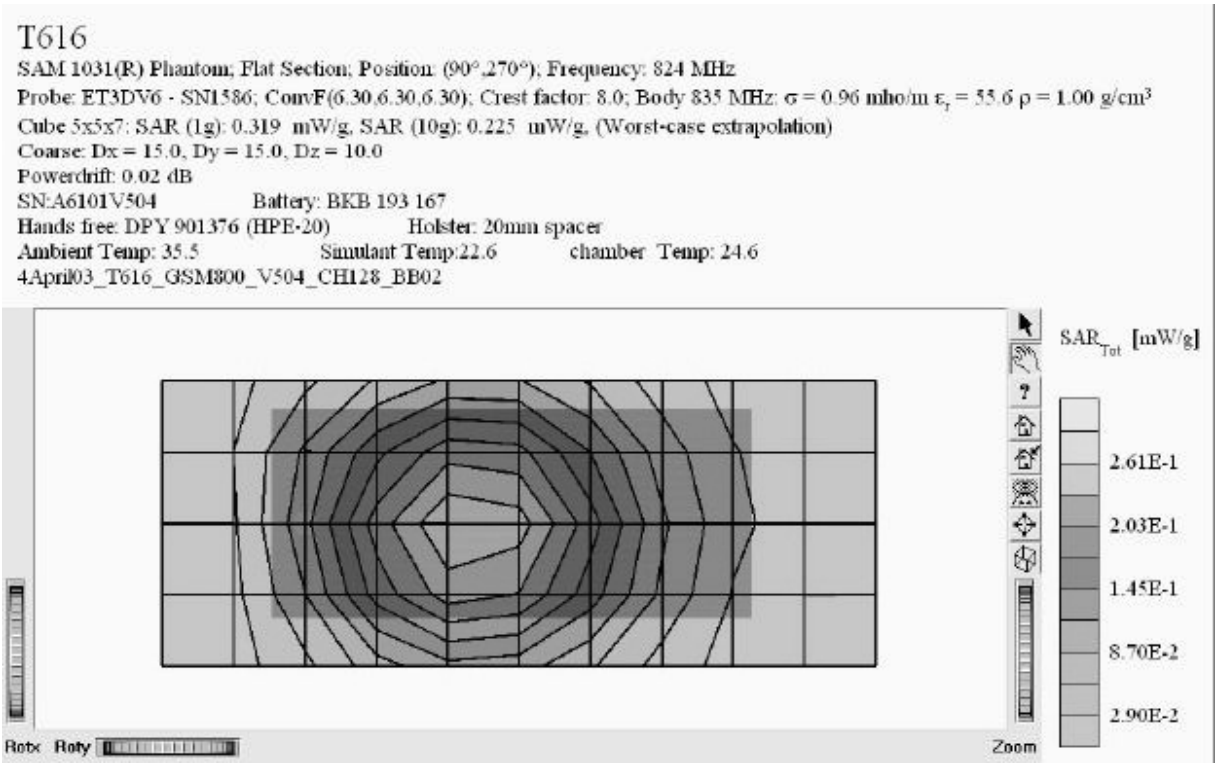


Distribution of maximum SAR in 800 GSM band. Measured with front of device facing the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

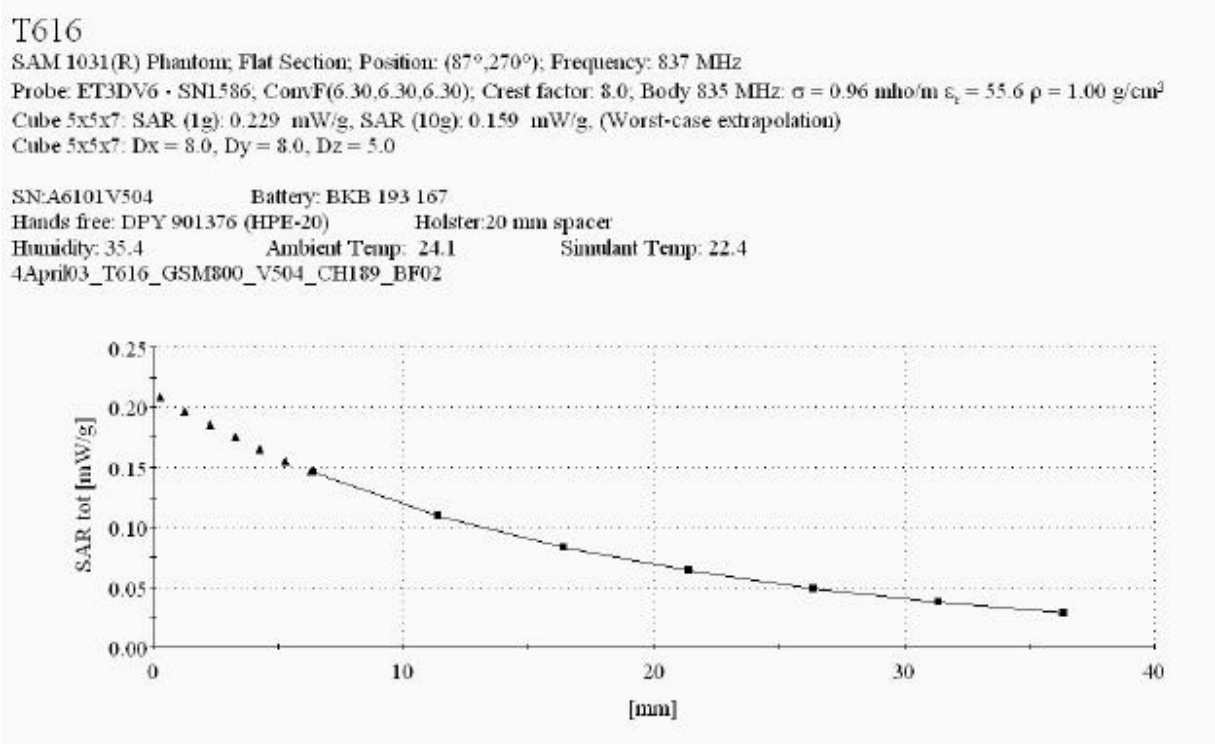


SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 800 GSM band, while phone is against the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).



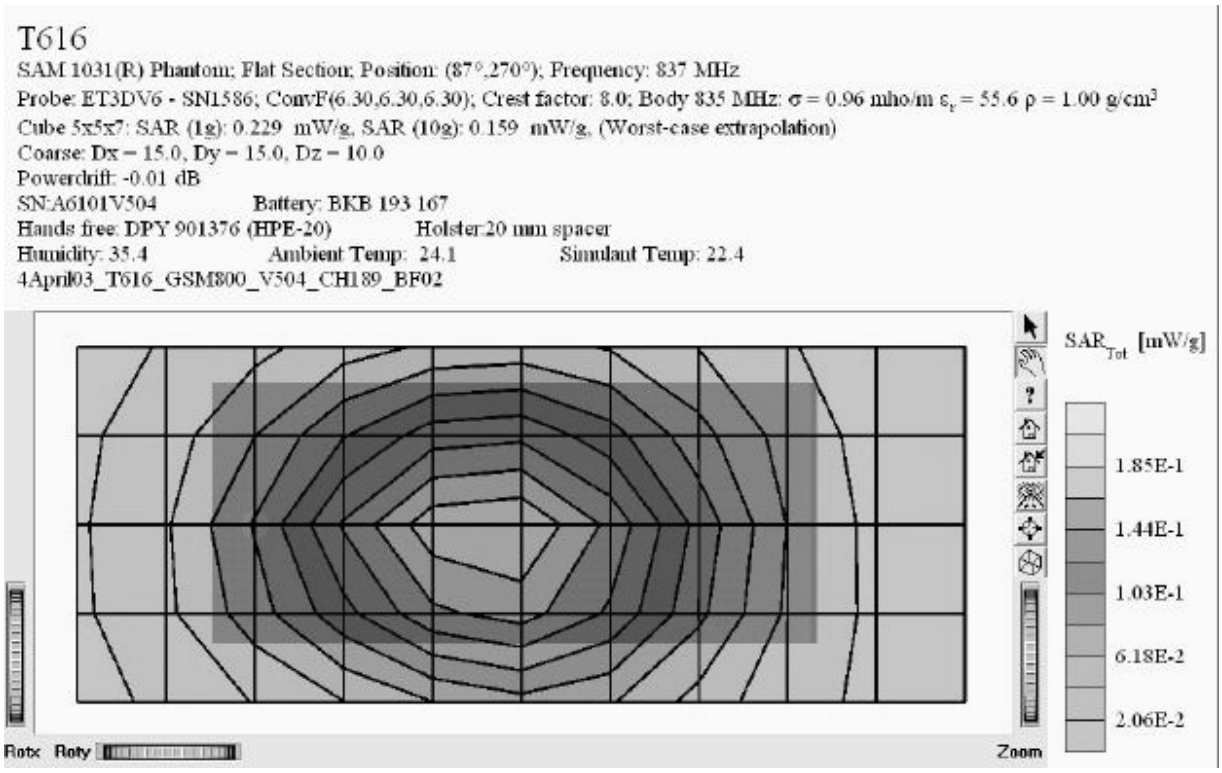
Distribution of maximum SAR in 800 GSM band. Measured with back of device facing the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



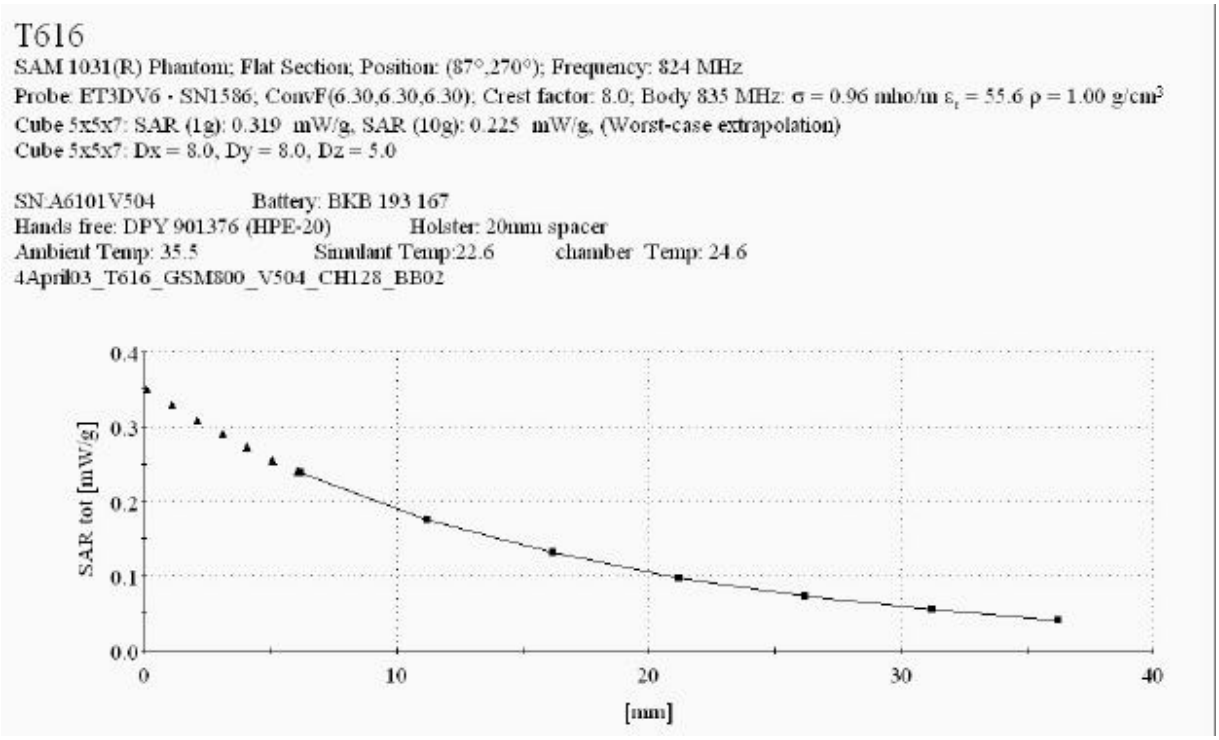
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 800 GSM band, while phone is against the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



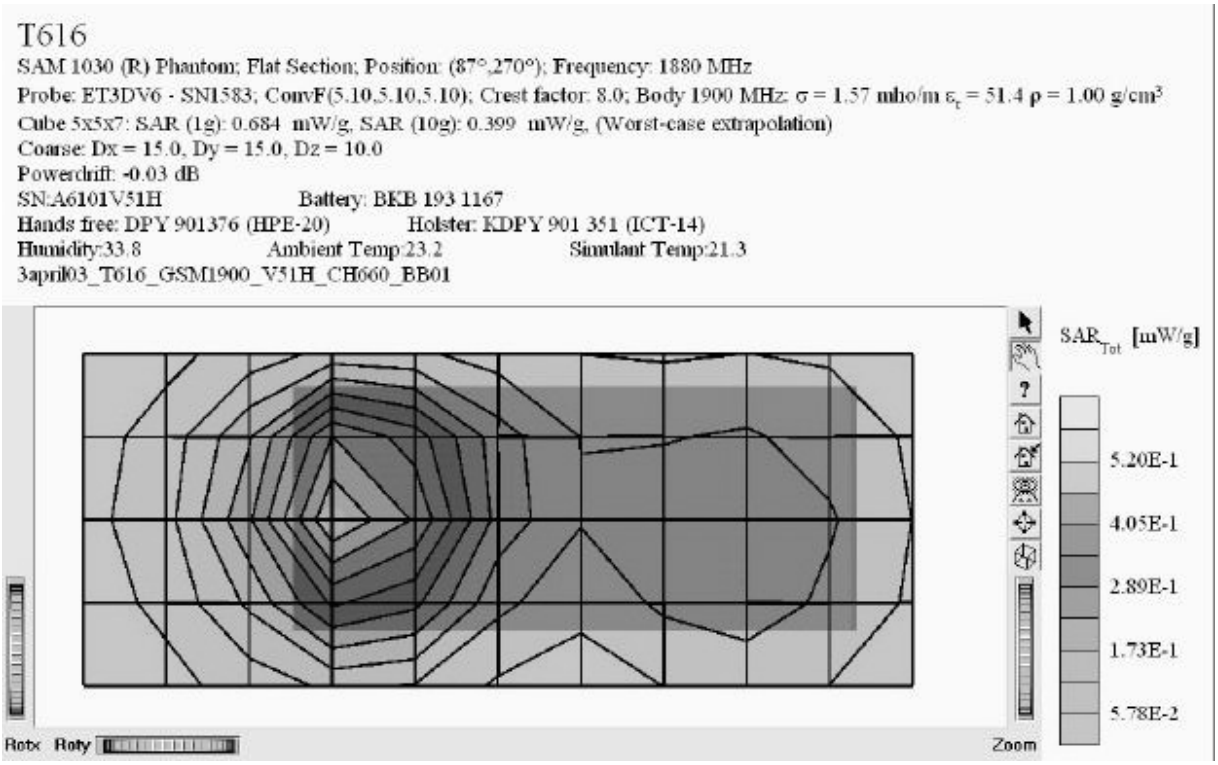
Distribution of maximum SAR in 800 GSM band. Measured with front of device facing the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



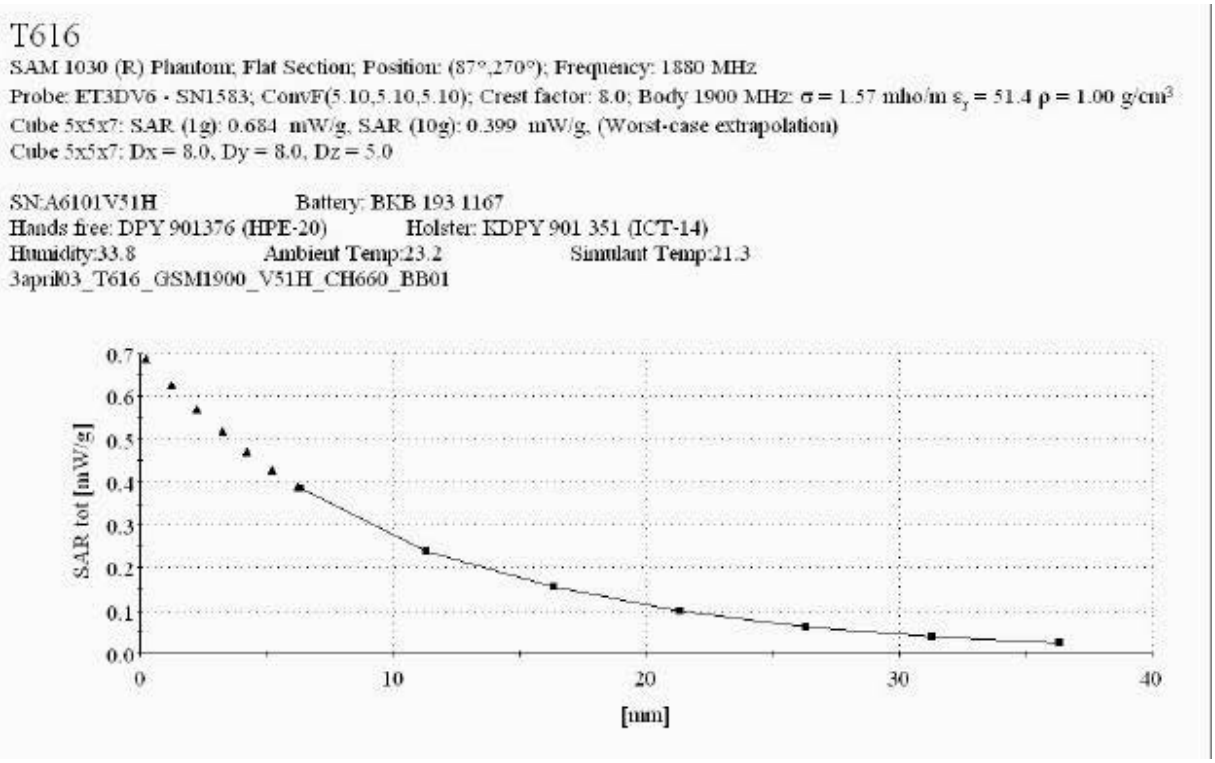
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 800 GSM band, while phone is against the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



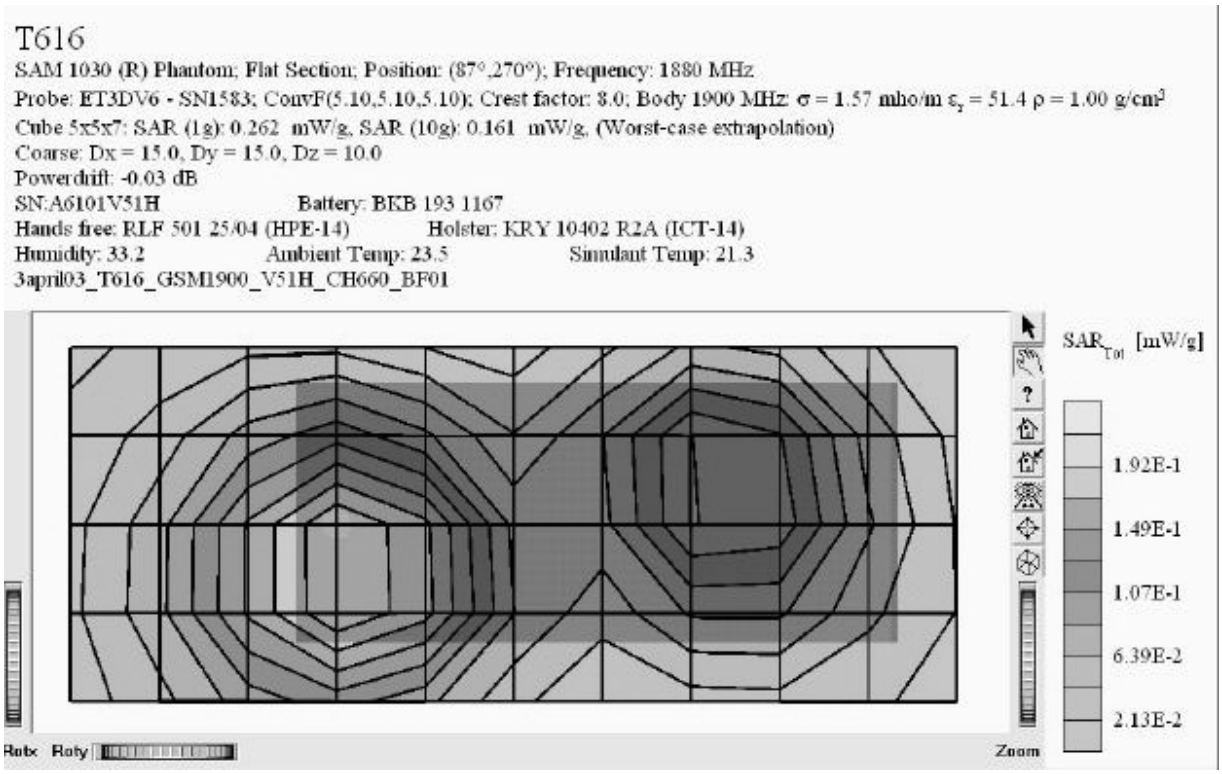
Distribution of maximum SAR in 1900 GSM band. Measured with back of device facing the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



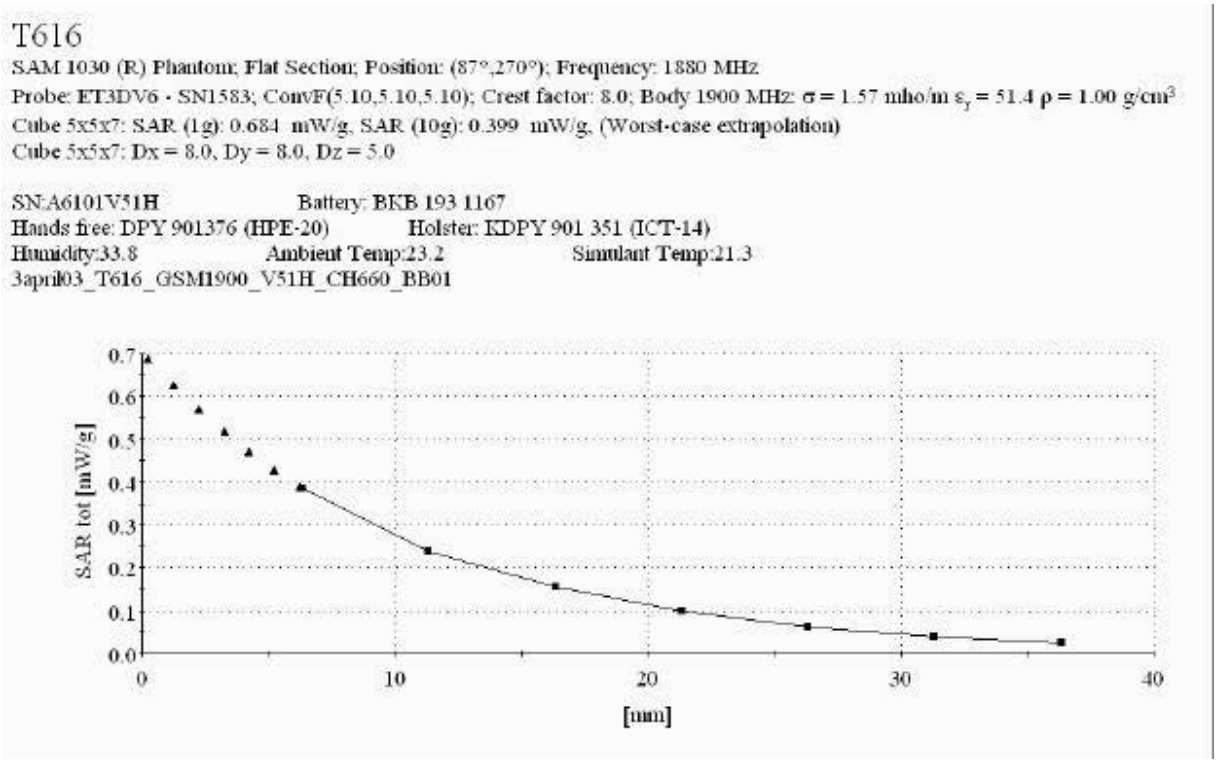
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 1900 GSM band, while phone is against the body using carry case ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



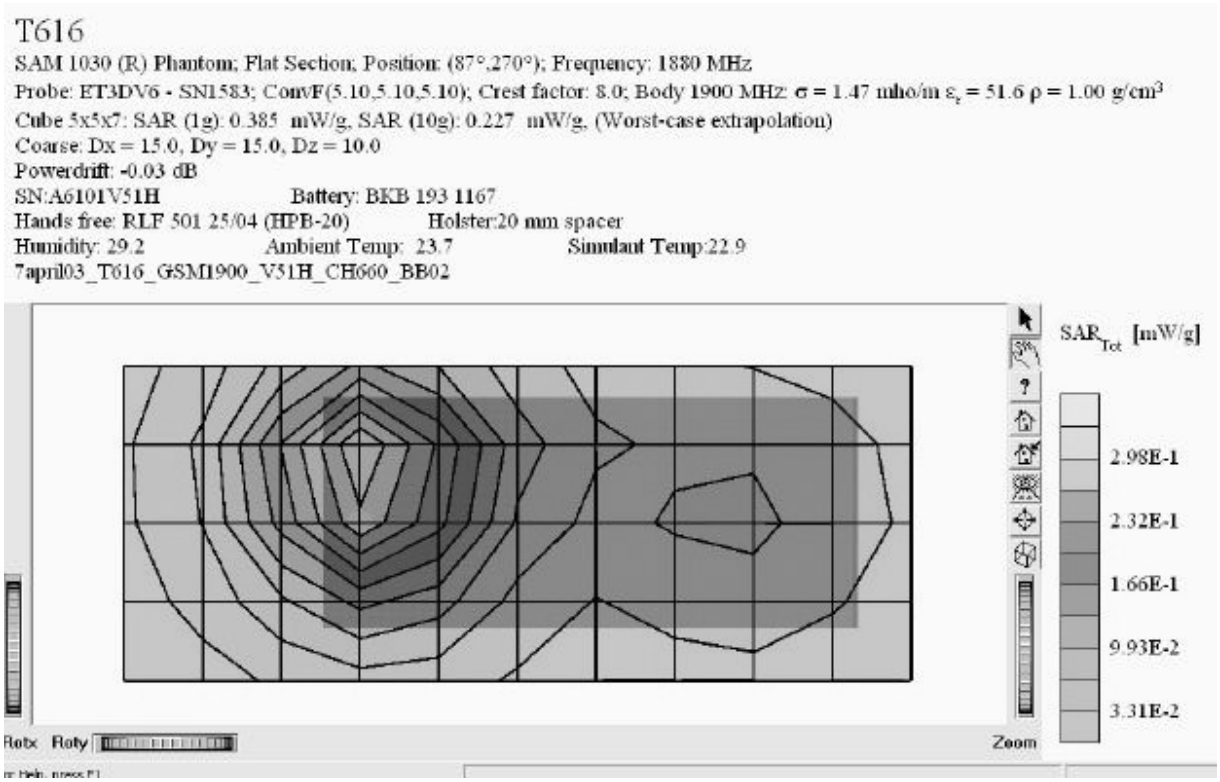
Distribution of maximum SAR in 1900 GSM band. Measured with front of device facing the body using carry accessory ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



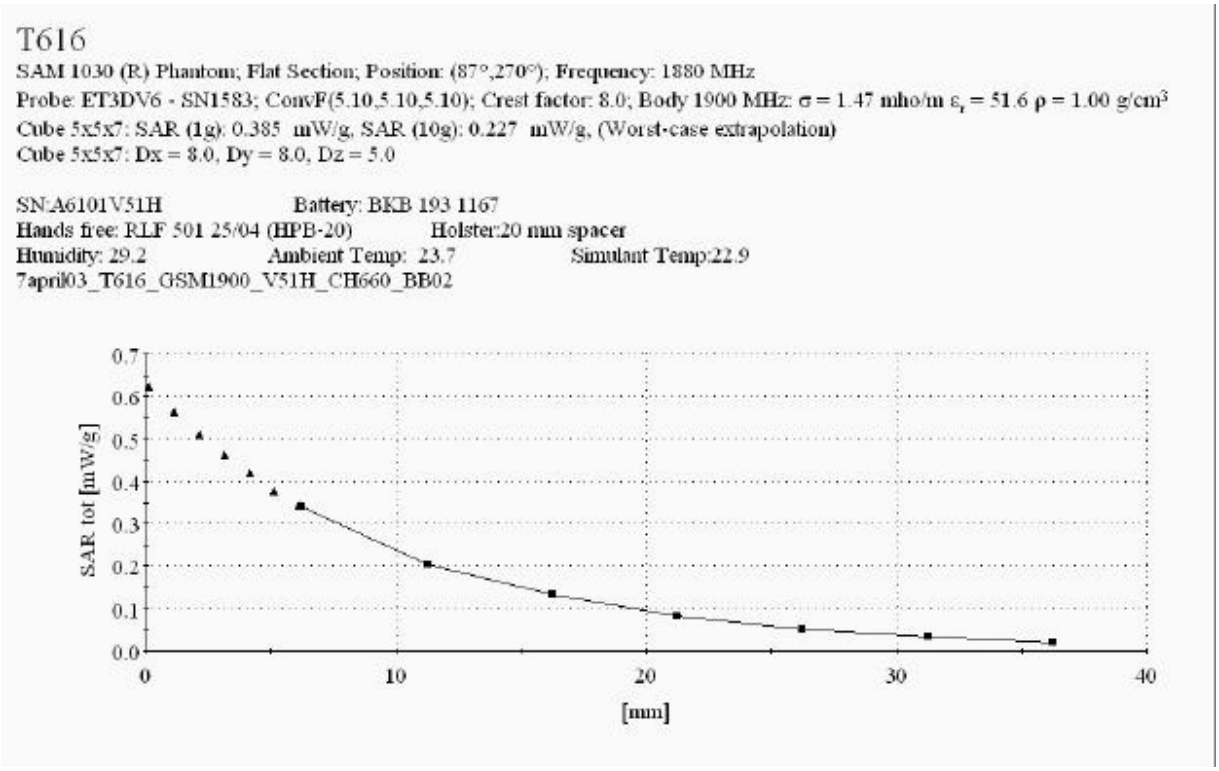
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 1900 GSM band, while phone is against the body using carry case ICT-14 and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc



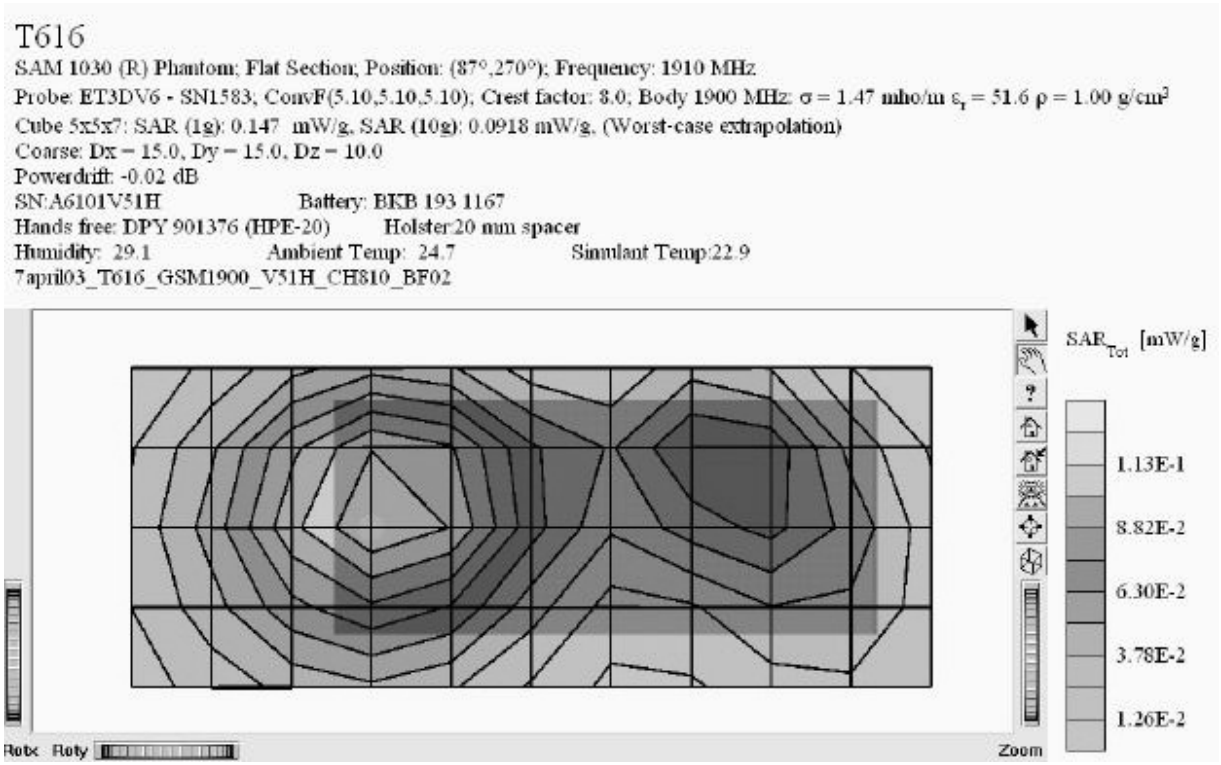
Distribution of maximum SAR in 1900 GSM band. Measured with back of device facing the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



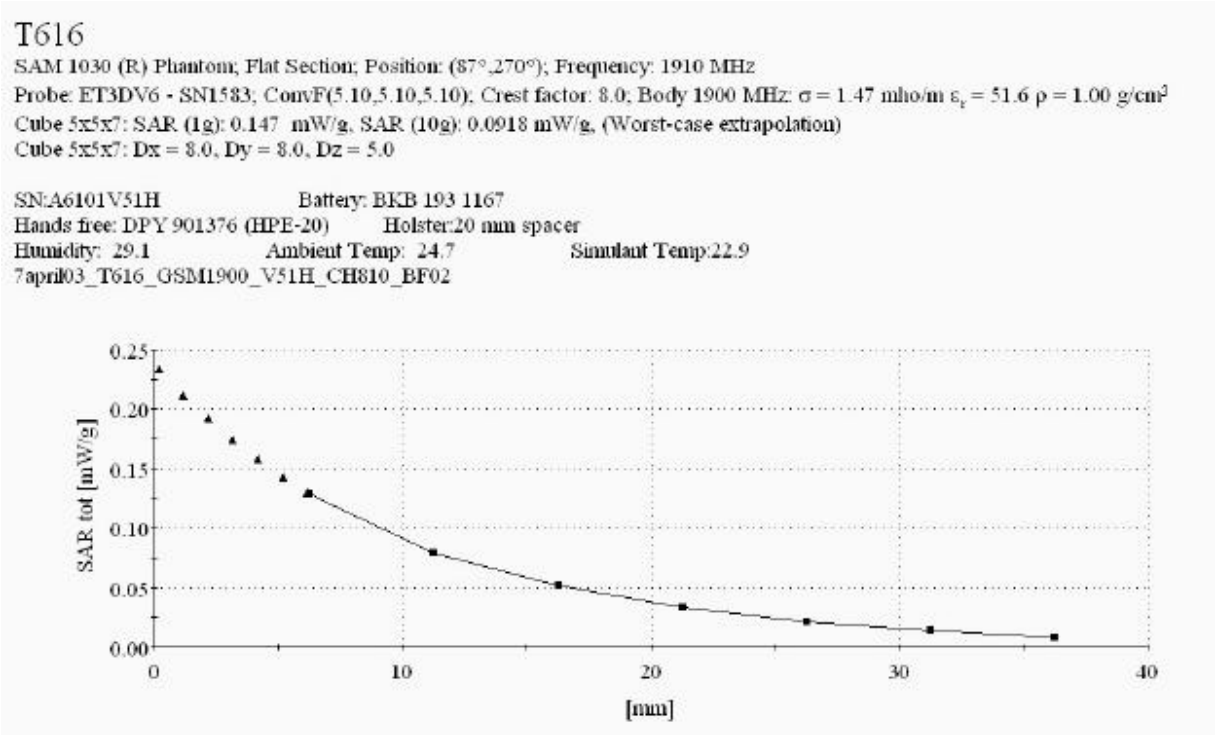
SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 1900 GSM band, while phone is against the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



Distribution of maximum SAR in 1900 GSM band. Measured with back of device facing the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



SAR Extrapolation to the phantom inner surface. Measured for maximum SAR in 1900 GSM band, while phone is against the body using a 20 mm spacer and hands free accessory DPY 901376 (HPE-20).

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Appendix 4

Probe Calibration Certificate

ET3DV6 SN:1586 June 20, 2002

DASY3 - Parameters of Probe: ET3DV6 SN:1586

Sensitivity in Free Space

Diode Compression

NormX	1.81 $\mu V/(V/m)^2$	DCP X	97	mV
NormY	1.78 $\mu V/(V/m)^2$	DCP Y	97	mV
NormZ	1.72 $\mu V/(V/m)^2$	DCP Z	97	mV

Sensitivity in Tissue Simulating Liquid

Head	**835 MHz**	ε_r = **41.5 ± 5%**	σ = **0.90 ± 5% mho/m**
Head	**900 MHz**	ε_r = **41.5 ± 5%**	σ = **0.97 ± 5% mho/m**
ConvF X	**6.6** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.6** ± 9.5% (k=2)	Alpha	**0.33**
ConvF Z	**6.6** ± 9.5% (k=2)	Depth	**2.61**
Head	**1900 MHz**	ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**
Head	**1800 MHz**	ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**
ConvF X	**5.1** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.1** ± 9.5% (k=2)	Alpha	**0.51**
ConvF Z	**5.1** ± 9.5% (k=2)	Depth	**2.40**

Boundary Effect

Head **835 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	9.1	5.0
SAR_{be} [%]	With Correction Algorithm	0.4	0.6

Head **1900 MHz** **Typical SAR gradient: 10 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	11.9	8.1
SAR_{be} [%]	With Correction Algorithm	0.3	0.3

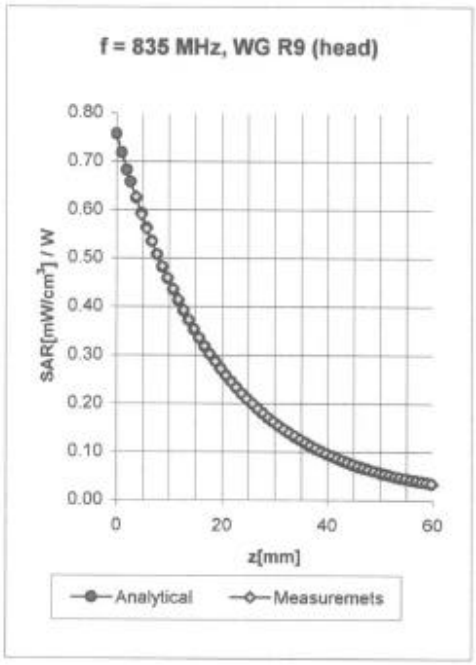
Sensor Offset

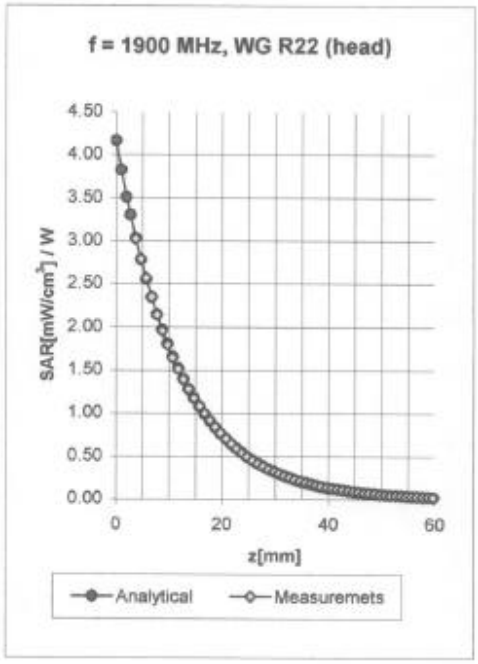
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.7 ± 0.2**	mm

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

ET3DV6 SN:1586 June 20, 2002

Conversion Factor Assessment





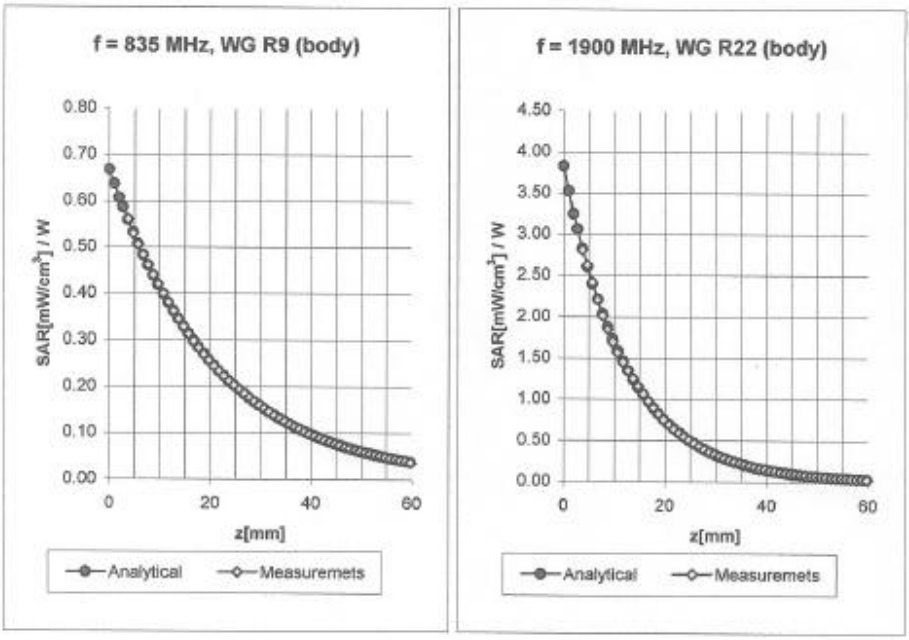
Head	835 MHz		ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m	
Head	900 MHz		ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m	
	ConvF X	6.6 ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	6.6 ± 9.5% (k=2)		Alpha	0.33
	ConvF Z	6.6 ± 9.5% (k=2)		Depth	2.61

Head	1900 MHz		ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
Head	1800 MHz		ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
	ConvF X	5.1 ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	5.1 ± 9.5% (k=2)		Alpha	0.51
	ConvF Z	5.1 ± 9.5% (k=2)		Depth	2.40

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

ET3DV6 SN:1586 June 20, 2002

Conversion Factor Assessment



Body	**835 MHz**		ε_r = 55.2 ± 5%	σ = 0.97 ± 5% mho/m	
Body	**900 MHz**		ε_r = 55.0 ± 5%	σ = 1.05 ± 5% mho/m	
	ConvF X	**6.3** ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**6.3** ± 9.5% (k=2)		Alpha	**0.34**
	ConvF Z	**6.3** ± 9.5% (k=2)		Depth	**2.67**

Body	**1900 MHz**		ε_r = 53.3 ± 5%	σ = 1.52 ± 5% mho/m	
Body	**1800 MHz**		ε_r = 53.3 ± 5%	σ = 1.52 ± 5% mho/m	
	ConvF X	**4.8** ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**4.8** ± 9.5% (k=2)		Alpha	**0.72**
	ConvF Z	**4.8** ± 9.5% (k=2)		Depth	**2.08**

Page 8 of 10

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

ET3DV6 SN:1583 December 19, 2002

DASY - Parameters of Probe: ET3DV6 SN:1583

Sensitivity in Free Space

Diode Compression

NormX	1.72 μV/(V/m)^2	DCP X	93	mV
NormY	1.92 μV/(V/m)^2	DCP Y	93	mV
NormZ	1.86 μV/(V/m)^2	DCP Z	93	mV

Sensitivity in Tissue Simulating Liquid

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

ConvF X	**7.1** ± 9.5% (k=2)	Boundary effect:		
ConvF Y	**7.1** ± 9.5% (k=2)	Alpha	**0.36**	
ConvF Z	**7.1** ± 9.5% (k=2)	Depth	**2.31**	

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

ConvF X	**5.6** ± 9.5% (k=2)	Boundary effect:		
ConvF Y	**5.6** ± 9.5% (k=2)	Alpha	**0.49**	
ConvF Z	**5.6** ± 9.5% (k=2)	Depth	**2.42**	

Boundary Effect

Head **835 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	8.2	4.5
SAR_{be} [%]	With Correction Algorithm	0.3	0.4

Head **1900 MHz** **Typical SAR gradient: 10 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	11.7	8.0
SAR_{be} [%]	With Correction Algorithm	0.3	0.4

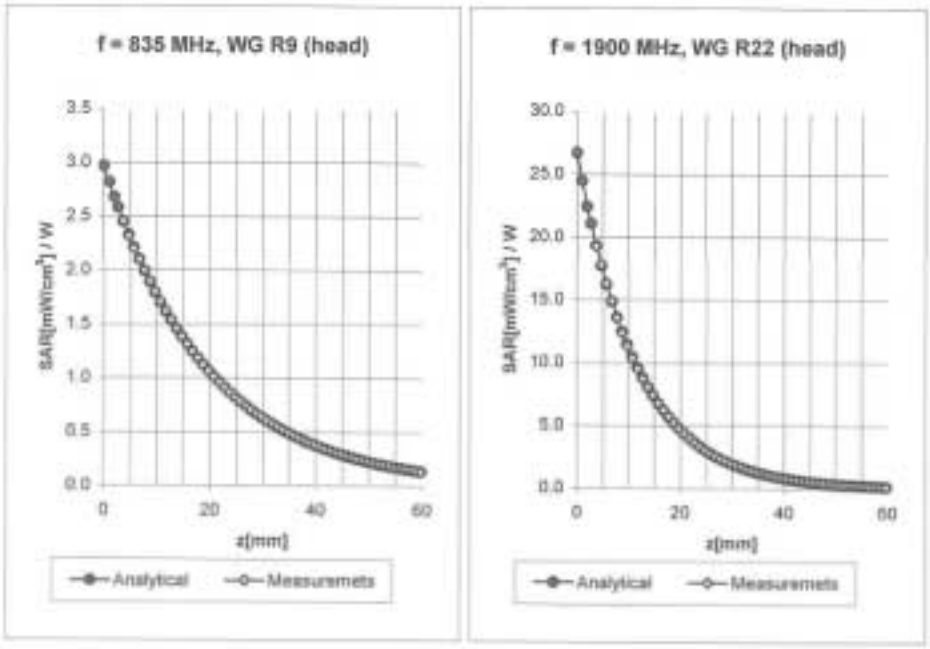
Sensor Offset

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

Prepared (also subject responsible if other)		No.		
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP		
Approved	Checked			
SEM/CV/PF/P Dulce Altabella	DA		A	I:\Dulce\FCCT616.doc

ET3DV6 SN:1583 December 19, 2002

Conversion Factor Assessment



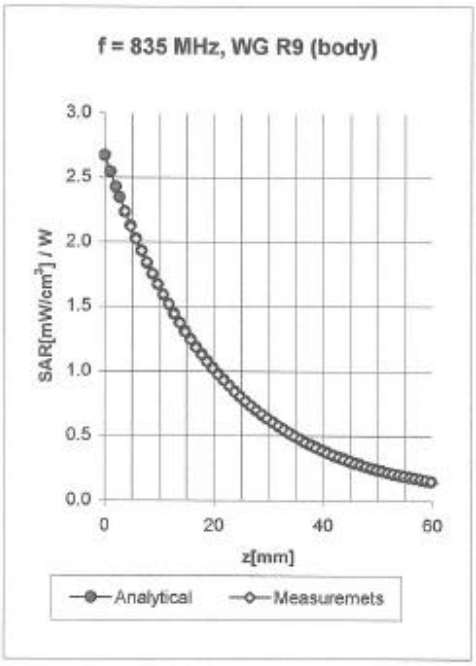
Head	835 MHz	ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m	
Head	900 MHz	ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m	
ConvF X	7.1 ± 9.5% (k=2)		Boundary effect:	
ConvF Y	7.1 ± 9.5% (k=2)		Alpha	0.36
ConvF Z	7.1 ± 9.5% (k=2)		Depth	2.31

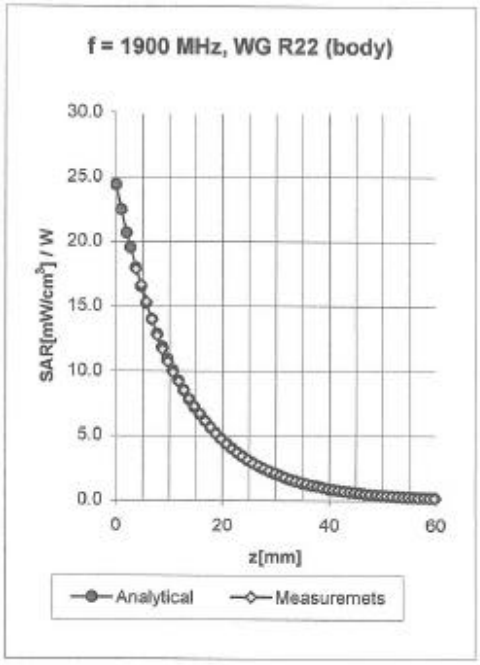
Head	1900 MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
Head	1800 MHz	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m	
ConvF X	5.6 ± 9.5% (k=2)		Boundary effect:	
ConvF Y	5.6 ± 9.5% (k=2)		Alpha	0.49
ConvF Z	5.6 ± 9.5% (k=2)		Depth	2.42

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

ET3DV6 SN:1583 December 19, 2002

Conversion Factor Assessment





Body	**835 MHz**		ε_r = 55.2 ± 5%	σ = 0.97 ± 5% mho/m	
Body	**900 MHz**		ε_r = 55.0 ± 5%	σ = 1.05 ± 5% mho/m	
	ConvF X	**6.8** ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**6.8** ± 9.5% (k=2)		Alpha	**0.35**
	ConvF Z	**6.8** ± 9.5% (k=2)		Depth	**2.46**

Body	**1900 MHz**		ε_r = 53.3 ± 5%	σ = 1.52 ± 5% mho/m	
Body	**1800 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	**0.69**
	ConvF Z	**5.1** ± 9.5% (k=2)		Depth	**2.11**

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Appendix 5

Measurement Uncertainty Budget

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

1. Table 1. Uncertainty Budget for System Performance Check (Dipole & flat phantom)

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1-g)**	**c_i (10-g)**	**1-g u_i (±%)**	**10-g u_i (±%)**	**v_i**
Measurement System									
Probe Calibration (*k*=1)	E2.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	8.3	R	1.73	1	1	4.8	4.8	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1	1	1	1.0	1.0	∞
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance(corresponds to the mechanical constrains of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty - shell thickness tolerance	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values (5)	E.3.2	4.2	R	1.73	0.64	0.43	1.55	1.04	∞
Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.29	1.54	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.3	R	1.73	0.6	0.49	1.14	0.93	∞
Liquid Permittivity - measurement	E.3.3	6.08	R	1.73	0.6	0.49	2.11	1.72	∞

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

uncertainty (6)									
Combined Standard Uncertainty			RSS				10.59	10.29	
Expanded Uncertainty (95% CONFIDENCE LEVEL)							21.17	20.59	

2. Table 2. Uncertainty Budget for the Device Under Test

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1-g)**	**c_i (10-g)**	**1-g u_i (±%)**	**10-g u_i (±%)**	**v_i**
Measurement System									
Probe Calibration (*k*=1)	E2.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	8.3	R	1.73	1	1	4.8	4.8	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.4	R	1.73	1	1	0.8	0.8	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance(corresponds to the mechanical constrains of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w ith respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Test sample Related									
Test Sample Positioning	E.4.2	1.2	N	1	1	1	1.2	1.2	4
Device Holder Uncertainty	E.4.1	1.2	R	1.73	1	1	0.7	0.7	4
Output Power Variation - SAR drift measurement (4)	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞

Liquid Conductivity - deviation from target values (5)	E.3.2	4.2	R	1.73	0.64	0.43	1.6	1.0	∞
Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.3	1.5	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.3	R	1.73	0.6	0.49	1.1	0.9	∞
Liquid Permittivity - measurement uncertainty (6)	E.3.3	6.08	R	1.73	0.6	0.49	2.1	1.7	∞
Combined Standard Uncertainty			RSS				10.71	10.40	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			K=2				21.41	20.80	

Table 4a. Values for ε'

Uncertainty Component	Tolerance (±%)	Probability Distribution	Divisor	c_i	Standard Uncertainty (±%)	v_i or v_{eff}
Repeatability (n repeats)	0.97	N	1	1	0.97	4
Network analyzer uncertainty sources	8.38	R	1.73	1	4.83	∞
Dielectric Error Sources	5.93	R	1.73	1	3.42	∞
Combined standard uncertainty					6.08	

Table 4b. Values for σ

Uncertainty Component	Tolerance (±%)	Probability Distribution	Divisor	c_i	Standard Uncertainty (±%)	v_i or v_{eff}
Repeatability (n repeats)	1.85	N	1	1	1.85	4
Network analyzer uncertainty sources	8.38	R	1.73	1	4.83	∞
Dielectric Error Sources	5.93	R	1.73	1	3.42	∞
Combined standard uncertainty					6.20	

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Appendix 6

Photographs of the device under test

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Front view of device

Back view of device

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

Side view of device

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

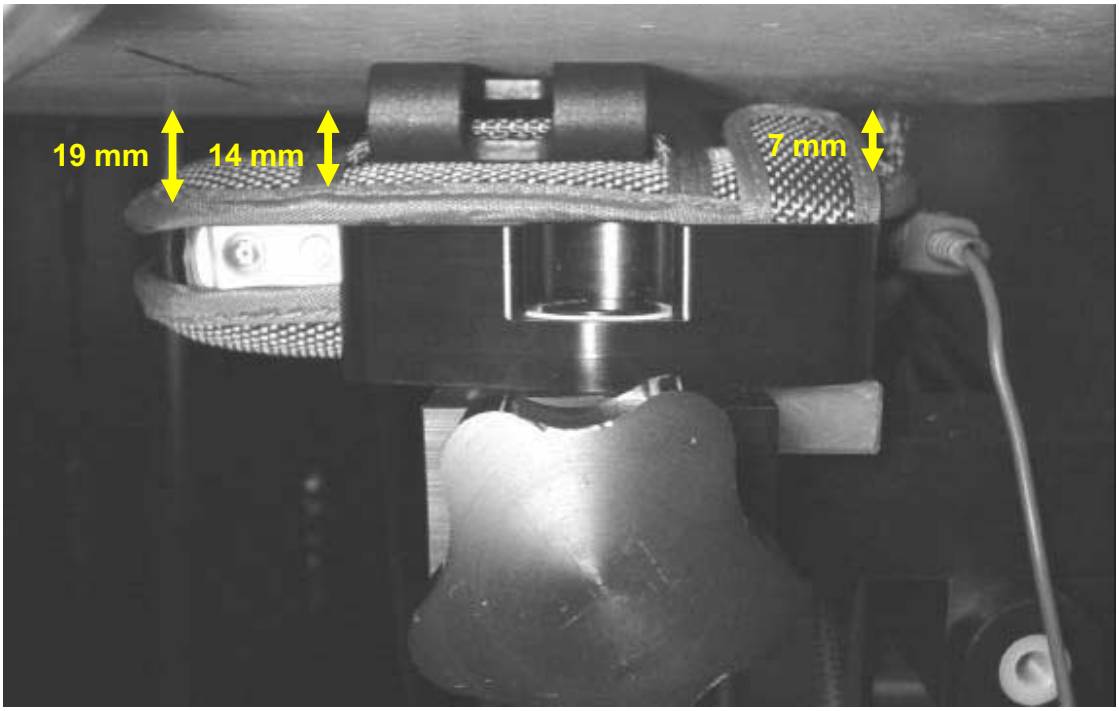
Front, back, and side views of carry accessory model ICT-14.

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

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc

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

Prepared (also subject responsible if other)		No.	
SEM/CV/PF/P Dulce Altabella		SEM/CB/Q-03:0065/REP	
Approved	Checked		
SEM/CV/PF/P Dulce Altabella	DA	A	I:\Dulce\FCCT616.doc



Position of device against flat phantom using carry accessory ICT-14 with hands free accessory DPY 901376 (HPE-20).