CERTIFICATE OF COMPLIANCE
SAR EVALUATION

Test Lab:	**Applicant Information:**
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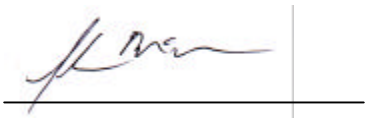
FCC ID:	**POQWCE-200**
Model(s):	**WCE-200**
Equipment Type:	**Dual-Mode AMPS/CDMA Cellular Phone**
Classification:	**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**
Tx Frequency Range:	**824.04 - 848.97 MHz (AMPS)** **824.70 - 848.31 MHz (CDMA)**
Rx Frequency Range:	**869.04 - 893.97 MHz (AMPS)** **869.70 - 893.31 MHz (CDMA)**
Max. RF Output Power:	**0.473 Watts ERP (AMPS)** **0.320 Watts ERP (CDMA)**
FCC Rule Part(s):	**2.1093; ET Docket 96.326**

Celltech Research Inc. declares under its sole responsibility that this device was found to be in compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in OET Bulletin 65, Supplement C, Edition 01-01 (General Population/Uncontrolled Exposure), and was tested in accordance with the appropriate measurement standards, guidelines, and recommended practices specified in American National Standards Institute C95.1-1992.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc. The results and statements contained in this report pertain only to the device(s) evaluated.



Shawn McMillen
General Manager
Celltech Research Inc.

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1.0 INTRODUCTION

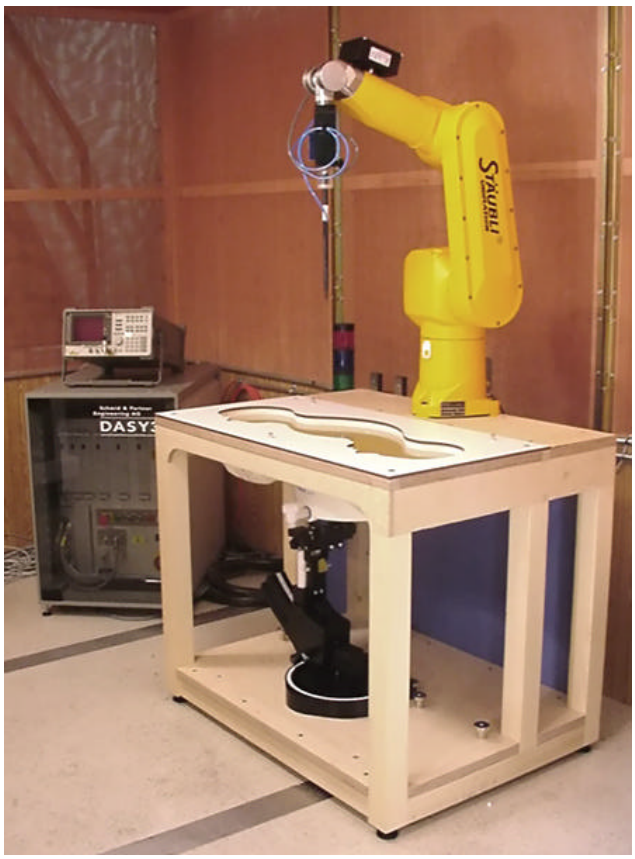
This measurement report shows that the WITHUS IT CO., LTD. Model: WCE-200 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: POQWCE-200 complies with FCC Part 2.1093, ET Docket 96-326 Rules for mobile and portable devices. The test procedures, as described in American National Standards Institute C95.1-1992 (see reference [1]), and FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [2]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 DESCRIPTION of Equipment Under Test (EUT)

EUT Type	Dual-Mode AMPS/CDMA Cellular Phone	**FCC ID**	POQWCE-200
Equipment Class	Licensed Non-Broadcast Transmitter Held to Ear (TNE)	**Model No.(s)**	WCE-200
FCC Rule Part(s)	§ 2.1093, Docket 96-326	**Application Type**	FCC Part 22 Certification
Tx Frequency Range (MHz)	824.04 - 848.97 (AMPS) 824.70 - 848.31 (CDMA)	**Serial No.**	Pre-production Unit
Rx Frequency Range (MHz)	869.04 - 893.97 (AMPS) 869.70 - 893.31 (CDMA)	**Battery Type(s)**	Lithium-Ion Battery Standard: 3.7V 950mA/h Extended: 3.7V 1700mA/h
Max. RF Output Power	0.473 Watts ERP (AMPS) 0.320 Watts ERP (CDMA)	**Antenna Type**	Retractable Whip (1/4λ)
Modulation(s)	AMPS (Analog) CDMA (Digital)	**Antenna Length**	111 mm

3.0 SAR MEASUREMENT SYSTEM

Celltech Research SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.



DASY3 SAR Measurement System with SAM phantom

4.0 MEASUREMENT SUMMARY

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the EUT are reported in Appendix A.

HEAD SAR MEASUREMENT RESULTS - AMPS Mode - Left Head Section

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.04	991	AMPS	26.76	26.58	Standard	Retracted	Left Ear	Cheek/Touch	0.654
824.04	991	AMPS	26.71	26.67	Standard	Extended	Left Ear	Cheek/Touch	1.42
824.04	991	AMPS	26.78	26.71	Extended	Extended	Left Ear	Cheek/Touch	1.30
836.49	383	AMPS	26.75	26.71	Standard	Retracted	Left Ear	Cheek/Touch	0.920
836.49	383	AMPS	26.73	26.68	Standard	Extended	Left Ear	Cheek/Touch	1.36
836.49	383	AMPS	26.72	26.68	Extended	Extended	Left Ear	Cheek/Touch	1.43
848.97	799	AMPS	26.73	26.82	Standard	Retracted	Left Ear	Cheek/Touch	0.799
848.97	799	AMPS	26.72	26.55	Standard	Extended	Left Ear	Cheek/Touch	1.16
848.97	799	AMPS	26.72	26.62	Extended	Extended	Left Ear	Cheek/Touch	1.47
836.49	383	AMPS	26.72	26.71	Standard	Retracted	Left Ear	Ear/Tilt	0.249
836.49	383	AMPS	26.70	26.72	Standard	Extended	Left Ear	Ear/Tilt	0.445
Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure - General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 8, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode head SAR value found (left head section) was 1.47 w/kg (cheek/touch position, high channel, antenna extended, with extended-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 21.5°C
   Relative HUMIDITY: 43.3 %
   Atmospheric PRESSURE: 101.2 kPa
6. Fluid Temperature ≈ 23 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (CONT.)

HEAD SAR MEASUREMENT RESULTS - AMPS Mode - Right Head Section

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.04	991	AMPS	26.70	26.47	Standard	Retracted	Right Ear	Cheek/Touch	0.672
824.04	991	AMPS	26.70	26.48	Standard	Extended	Right Ear	Cheek/Touch	1.41
824.04	991	AMPS	26.70	26.69	Extended	Extended	Right Ear	Cheek/Touch	1.39
836.49	383	AMPS	26.74	26.79	Standard	Retracted	Right Ear	Cheek/Touch	0.922
836.49	383	AMPS	26.70	26.67	Standard	Extended	Right Ear	Cheek/Touch	1.46
836.49	383	AMPS	26.75	26.80	Extended	Extended	Right Ear	Cheek/Touch	1.48
848.97	799	AMPS	26.74	26.58	Standard	Retracted	Right Ear	Cheek/Touch	0.877
848.97	799	AMPS	26.70	26.71	Standard	Extended	Right Ear	Cheek/Touch	1.36
848.97	799	AMPS	26.72	26.70	Extended	Extended	Right Ear	Cheek/Touch	1.42
836.49	383	AMPS	26.74	26.69	Standard	Retracted	Right Ear	Ear/Tilt	0.230
836.49	383	AMPS	26.71	26.70	Standard	Extended	Right Ear	Ear/Tilt	0.462
Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 8, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode head SAR value found (right head section) was 1.48 w/kg (cheek/touch position, mid channel, antenna extended, with extended-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 21.5 °C
   Relative HUMIDITY: 43.3 %
   Atmospheric PRESSURE: 101.2 kPa
6. Fluid Temperature ≈ 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (CONT.)

HEAD SAR MEASUREMENT RESULTS - CDMA Mode - Left Head Section

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.70	1013	CDMA	25.13	25.16	Standard	Retracted	Left Ear	Cheek/Touch	0.506
824.70	1013	CDMA	25.04	25.03	Standard	Extended	Left Ear	Cheek/Touch	0.870
824.70	1013	CDMA	25.05	25.00	Extended	Extended	Left Ear	Cheek/Touch	0.954
835.89	363	CDMA	25.10	25.00	Standard	Retracted	Left Ear	Cheek/Touch	0.500
835.89	363	CDMA	25.06	24.89	Standard	Extended	Left Ear	Cheek/Touch	0.849
835.89	363	CDMA	25.06	24.97	Extended	Extended	Left Ear	Cheek/Touch	0.973
848.31	777	CDMA	25.19	25.17	Standard	Retracted	Left Ear	Cheek/Touch	0.562
848.31	777	CDMA	25.00	24.90	Standard	Extended	Left Ear	Cheek/Touch	0.941
848.31	777	CDMA	25.00	24.98	Extended	Extended	Left Ear	Cheek/Touch	0.980
835.89	363	CDMA	25.04	24.92	Standard	Retracted	Left Ear	Ear/Tilt	0.208
835.89	363	CDMA	25.12	25.06	Standard	Extended	Left Ear	Ear/Tilt	0.299
Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 9, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode head SAR value found (left head section) was 0.980 w/kg (cheek/touch position, high channel, antenna extended, with extended-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 21.3 °C
   Relative HUMIDITY: 43.6 %
   Atmospheric PRESSURE: 101.5 kPa
6. Fluid Temperature ≈ 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (CONT.)

HEAD SAR MEASUREMENT RESULTS - CDMA Mode - Right Head Section

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.70	1013	CDMA	25.07	25.10	Standard	Retracted	Right Ear	Cheek/Touch	0.547
824.70	1013	CDMA	25.02	25.11	Standard	Extended	Right Ear	Cheek/Touch	0.974
824.70	1013	CDMA	25.00	25.10	Extended	Extended	Right Ear	Cheek/Touch	0.990
835.89	363	CDMA	25.02	24.98	Standard	Retracted	Right Ear	Cheek/Touch	0.485
835.89	363	CDMA	25.07	24.91	Standard	Extended	Right Ear	Cheek/Touch	0.907
835.89	363	CDMA	25.03	24.92	Extended	Extended	Right Ear	Cheek/Touch	1.01
848.31	777	CDMA	25.08	24.90	Standard	Retracted	Right Ear	Cheek/Touch	0.593
848.31	777	CDMA	25.10	25.00	Standard	Extended	Right Ear	Cheek/Touch	0.981
848.31	777	CDMA	25.04	25.00	Standard	Extended	Right Ear	Cheek/Touch	1.02
835.89	363	CDMA	25.15	24.99	Standard	Retracted	Right Ear	Ear/Tilt	0.196
835.89	363	CDMA	25.05	24.93	Standard	Extended	Right Ear	Ear/Tilt	0.356
Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak: Uncontrolled Exposure/General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 9, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode head SAR value found (right head section) was 1.02 w/kg (cheek/touch position, high channel, antenna extended, with extended-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 21.3 °C
   Relative HUMIDITY: 43.6 %
   Atmospheric PRESSURE: 101.5 kPa
6. Fluid Temperature ≈ 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (CONT.)

BODY SAR MEASUREMENT RESULTS - AMPS Mode

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Separation Distance (cm)	SAR 1g (w/kg)
824.04	991	AMPS	26.92	26.71	Standard	Retracted	Planar	2.0	0.329
824.04	991	AMPS	26.90	26.89	Standard	Extended	Planar	2.0	1.12
824.04	991	AMPS	26.90	26.80	Extended	Extended	Planar	2.0	0.827
836.49	383	AMPS	26.93	26.91	Standard	Retracted	Planar	2.0	0.428
836.49	383	AMPS	26.96	26.85	Standard	Extended	Planar	2.0	1.01
848.97	799	AMPS	26.99	26.85	Standard	Retracted	Planar	2.0	0.389
848.97	799	AMPS	26.98	26.87	Standard	Extended	Planar	2.0	0.917
Mixture Type: Body (Measured) Dielectric Constant: 54.8 Conductivity: 0.97				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak: Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 10, 2002.
2. The body SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode body SAR value found was 1.12 w/kg (low channel, antenna extended, with standard-life battery).
4. The EUT was tested for body SAR with ear-microphone connected.
5. The EUT was tested for body SAR with the clamshell closed, which is the only intended body-worn operating configuration for this phone. A 2.0cm separation distance was maintained between the back of the phone and the outer surface of the SAM planar phantom.
6. Ambient TEMPERATURE: 23.6 °C
   Relative HUMIDITY: 43.7 %
   Atmospheric PRESSURE: 101.6 kPa
7. Fluid Temperature ≈ 23.0 °C
8. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (CONT.)

BODY SAR MEASUREMENT RESULTS - CDMA Mode

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Separation Distance (cm)	SAR 1g (w/kg)
824.70	1013	CDMA	25.11	24.99	Standard	Retracted	Planar	2.0	0.345
824.70	1013	CDMA	25.02	24.90	Standard	Extended	Planar	2.0	0.685
824.70	1013	CDMA	25.10	25.14	Extended	Extended	Planar	2.0	0.700
835.89	363	CDMA	25.16	25.03	Standard	Retracted	Planar	2.0	0.292
835.89	363	CDMA	25.03	24.90	Standard	Extended	Planar	2.0	0.680
848.31	777	CDMA	25.20	25.00	Standard	Retracted	Planar	2.0	0.335
848.31	777	CDMA	25.13	25.01	Standard	Extended	Planar	2.0	0.678
Mixture Type: Body (Measured) Dielectric Constant: 54.8 Conductivity: 0.97				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak: Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)**					

Notes:

1. Test Date(s): January 10, 2002.
2. The body SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode body SAR value found was 0.700 w/kg (low channel, antenna extended, with extended-life battery).
4. The EUT was tested for body SAR with ear-microphone connected.
5. The EUT was tested for body SAR with the clamshell closed, which is the only intended body-worn operating configuration for this phone. A 2.0cm separation distance was maintained between the back of the phone and the outer surface of the SAM planar phantom.
6. Ambient TEMPERATURE: 23.6 °C
   Relative HUMIDITY: 43.7 %
   Atmospheric PRESSURE: 101.6 kPa
7. Fluid Temperature ≈ 23.0 °C
8. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

5.0 DETAILS OF SAR EVALUATION

The WITHUS IT CO., LTD. Model: WCE-200 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: POQWCE-200 was found to be compliant for localized Specific Absorption Rate (SAR) based on the following test provisions and conditions:

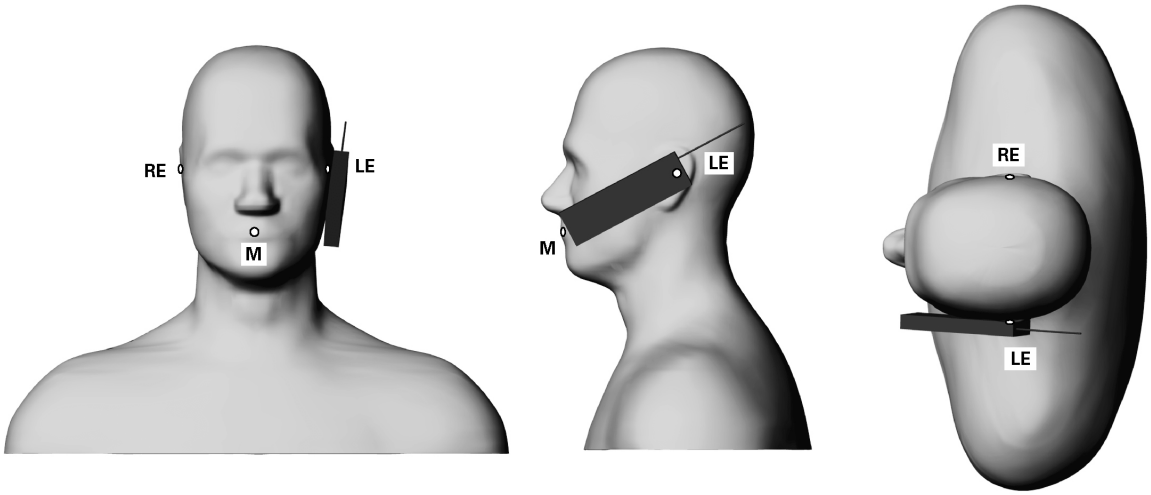
1) The EUT was tested in an ear-held configuration on both the left and right sections of the phantom with the device antenna in both the extended and retracted positions as follows:

a) The handset was placed in the device holder in a normal operating position with the test device reference point located along the vertical centerline on the front of the device aligned to the ear reference point, with the center of the earpiece touching the center of the ear spacer of the SAM phantom.

b) With the handset positioned parallel to the cheek, the test device reference point was aligned to the ear reference point on the head phantom, and the vertical centerline was aligned to the phantom reference plane (initial ear position).

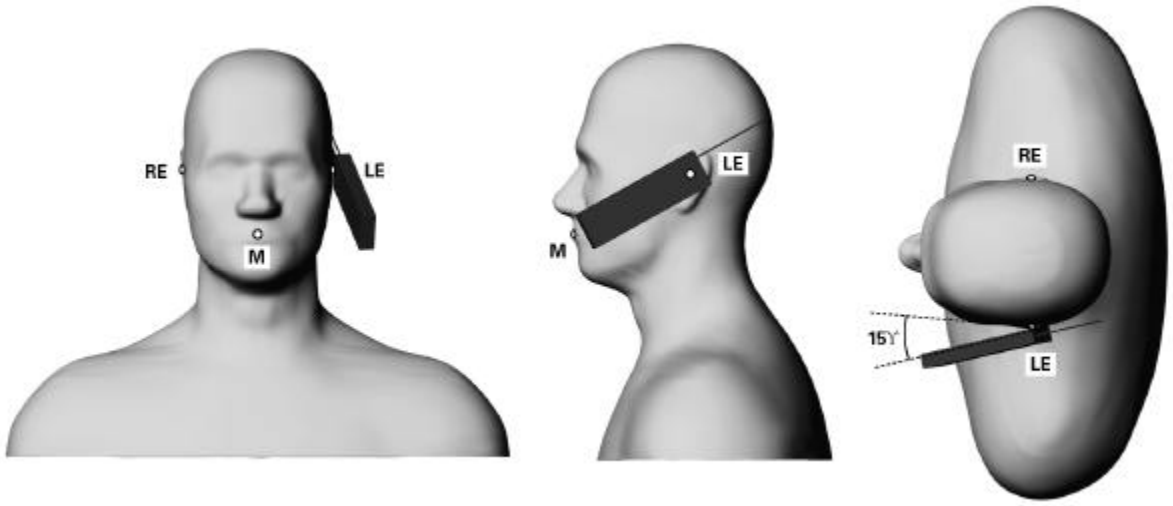
c) While maintaining the three alignments, the body of the handset was gradually adjusted to each of the following test positions:

- Cheek/Touch Position: The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.



Phone position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning, are indicated (Shoulders are shown for illustration only).

- Ear/Tilt Position: With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning, are indicated (Shoulders are shown for illustration only).

2) The EUT was tested in a body-worn configuration with the device in the clamshell-closed position and the back of the device placed parallel to the outer surface of the planar phantom at a separation distance of 1.5 cm. Both antenna extended and antenna retracted modes were tested. (Note: A body-holster or belt-clip were not available at the time of evaluation)
3) The EUT was tested for body SAR with ear-microphone connected.
4) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift. The conducted power levels were checked before and after each test. If the conducted power level deviated more than 5% of the initial power level, then the EUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
5) The conducted power was measured according to the procedures described in FCC Part 2.1046.
6) The EUT was placed into test mode via keypad access at a full data rate in the "always up" power control mode.
7) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
8) The EUT was tested with a fully charged battery.

6.0 EVALUATION PROCEDURES

The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation both the left and right ear positions were evaluated at the low, middle, and high frequencies of the band at maximum power, and with the device antenna in both the extended and extracted positions as applicable. The positioning of the ear-held device relative to the phantom was performed in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.

(ii) For face-held and body-worn devices, a planar phantom was used.

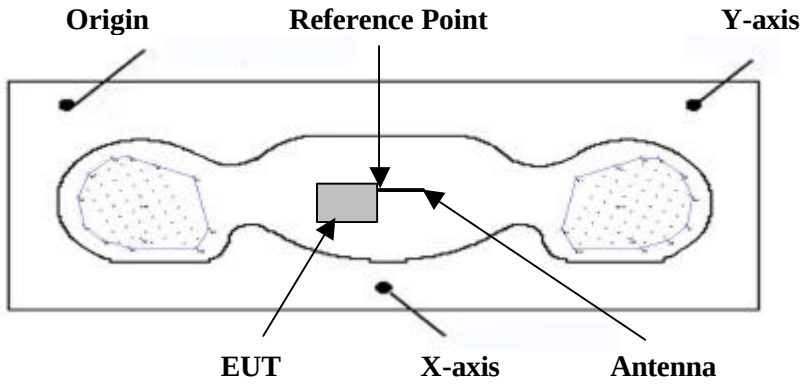
b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface using a uniform grid spacing.

c. A 5x5x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d. The depth of the simulating tissue in the phantom used for the system validation and SAR evaluation was no less than 15cm.

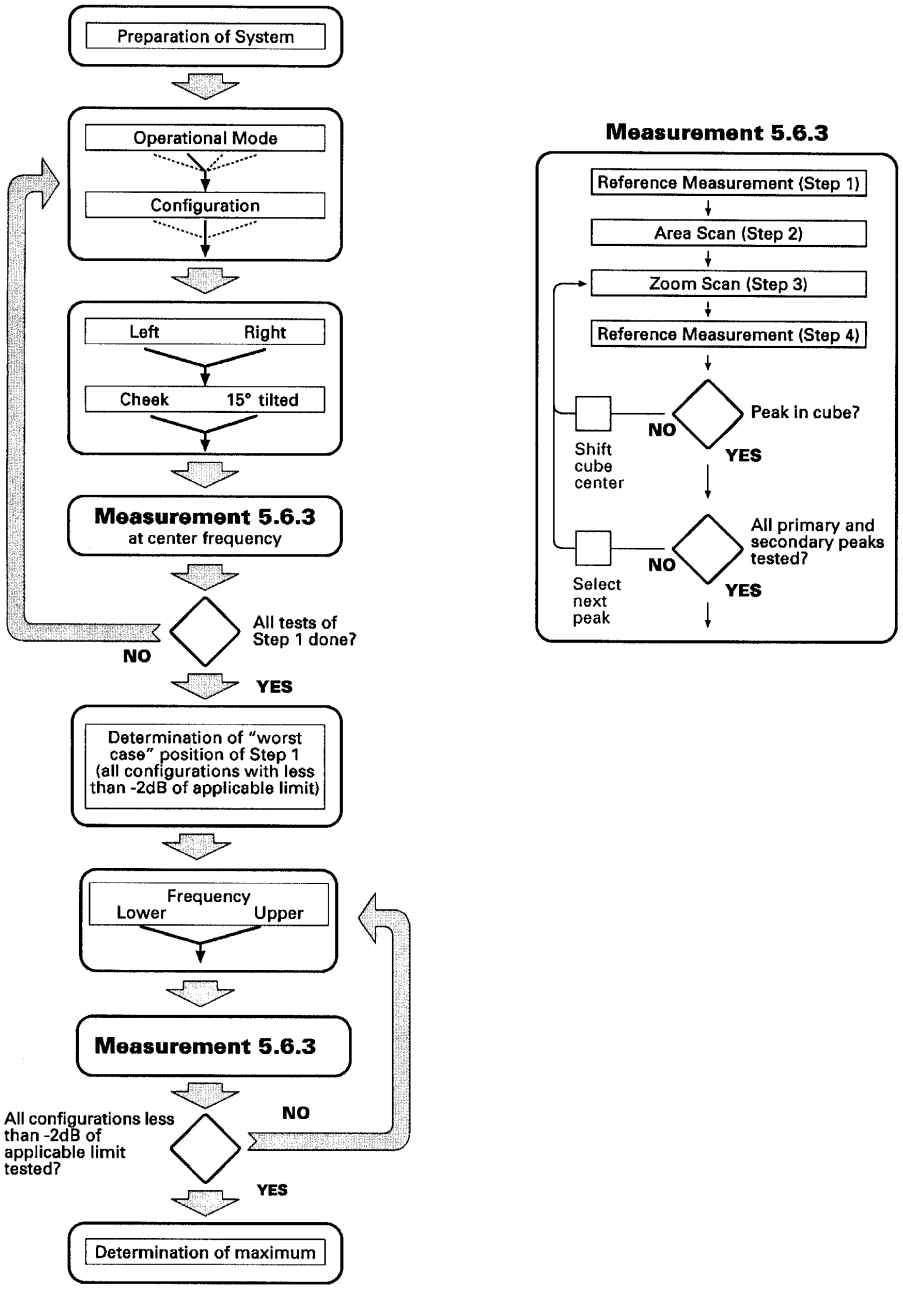
e. The E-field probe conversion factors for 835MHz were determined as follows:

- In brain and muscle tissue between 750MHz and 1GHz, the conversion factor decreases approximately 1.3% per 100MHz frequency increase.
- In brain and muscle tissue between 1.6GHz and 2GHz, the conversion factor decreases approximately 1% per 100MHz frequency increase.



Device Positioning & Reference Point (Body SAR)

EVALUATION PROCEDURES (Cont.)



Flow Chart of the recommended practices and procedures per IEEE Std 1528 (Draft) [5]

7.0 SAR SAFETY LIMITS

EXPOSURE LIMITS	SAR (W/Kg)	
	(General Population / Uncontrolled Exposure Environment)	**(Occupational / Controlled Exposure Environment)**
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

8.0 SIMULATED TISSUES

The 835MHz and 900MHz brain and body mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to ensure air bubbles are not trapped during the mixing process. The fluid was prepared according to standardized procedures, and measured for dielectric parameters (permitivity and conductivity).

835MHz & 900MHz TISSUE MIXTURE - DIPOLE VALIDATION & EUT EVALUATION			
INGREDIENT	**900MHz Brain Mixture (Validation)**	**835MHz Brain Mixture (EUT Evaluation)**	**835MHz Body Mixture (EUT Evaluation)**
Water	40.71 %	40.71 %	53.70 %
Sugar	56.63 %	56.63 %	45.10 %
Salt	1.48 %	1.48 %	0.97 %
HEC	1.00 %	1.00 %	0.13%
Bactericide	0.18 %	0.18 %	0.10 %

9.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are shown in the table below. See Appendix D for printout of measured tissue dielectric parameters.

TISSUE PARAMETERS - DIPOLE VALIDATION & EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant** e_r	**Conductivity** s **(mho/m)**	r **(Kg/m^3)**
900MHz Brain (Target)	41.5 ±5%	0.97 ±5%	1000
900MHz Brain (Validation - Measured: 01/08/02)	40.5	0.96	1000
900MHz Brain (Validation - Measured: 01/09/02)	40.4	0.96	1000
900MHz Brain (Validation - Measured: 01/10/02)	42.1	0.97	1000
835MHz Brain (Target)	41.5 ±5%	0.90 ±5%	1000
835MHz Brain (Evaluation - Measured: 01/08/02)	41.2	0.90	1000
835MHz Brain (Evaluation - Measured: 01/09/02)	41.2	0.90	1000
835MHz Body (Target)	55.2 ±5%	0.97 ±5%	1000
835MHz Body (Evaluation - Measured: 01/10/02)	54.8	0.97	1000

10.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar section of the SAM phantom using a 900MHz dipole. A forward power of 250mW was applied to the dipole, and the system was verified to a tolerance of ±10%. The applicable verification is as follows (see Appendix B for validation test plots):

Dipole Validation Kit	**Target SAR 1g (w/kg)**	**Measured SAR 1g (w/kg)**	**Fluid Temperature**	**Validation Date**
D900V2	2.78	2.71	≈23.0 °C	01/08/02
		2.73	≈23.0 °C	01/09/02
		2.74	≈23.0 °C	01/10/02

11.0 ROBOT SYSTEM SPECIFICATIONS

Specifications

POSITIONER:	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability:	0.02 mm
No. of axis:	6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor:	Pentium III
Clock Speed:	450 MHz
Operating System:	Windows NT
Data Card:	DASY3 PC-Board

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter, and control logic
Software:	DASY3 software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock

PC Interface Card

Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16-bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot

E-Field Probe

Model:	ET3DV6
Serial No.:	1590
Construction:	Triangular core fiber optic detection system
Frequency:	10 MHz to 6 GHz
Linearity:	± 0.2 dB (30 MHz to 3 GHz)

Phantom

Type:	SAM V4.0C
Configuration:	Left Head, Right Head, Planar Section
Shell Material:	Fiberglass
Thickness:	2.0 ±0.1 mm
Volume:	Approx. 20 liters

12.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections.

SAM Phantom V4.0C

13.0 DEVICE HOLDER

The DASY3 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

Device Holder

14.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. glycol)
Calibration:	In air from 10 MHz to 2.5 GHz In brain simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy ± 8%)
Frequency:	10 MHz to >6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)
Directivity:	±0.2 dB in brain tissue (rotation around probe axis) ±0.4 dB in brain tissue (rotation normal to probe axis)
Dynam. Rnge:	5 µW/g to >100 mW/g; Linearity: ±0.2 dB
Srfce. Detect.	±0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions:	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application:	General dosimetry up to 3 GHz Compliance tests of mobile phone

ET3DV6 E-Field Probe

15.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***SERIAL NO.***	***DATE CALIBRATED***
DASY3 System -Robot -ET3DV6 E-Field Probe -900MHz Validation Dipole -1800MHz Validation Dipole -SAM Phantom V4.0C	 599396-01 1590 054 247 N/A	 N/A Mar 2001 June 2001 June 2001 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Oct 2001 Jan 2002 Jan 2002
E4408B Spectrum Analyzer	US39240170	Nov 2001
8594E Spectrum Analyzer	3543A02721	Mar 2001
8753E Network Analyzer	US38433013	Nov 2001
8648D Signal Generator	3847A00611	Aug 2001
5S1G4 Amplifier Research Power Amplifier	26235	N/A

16.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.4	Normal	1	1	± 4.4	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrap. & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	0.89	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	0.84	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 10.0	Rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					± 13.6	
Extended Standard Uncertainty (k=2)					± **27.1**	

17.0 REFERENCES

[1] ANSI, ANSI/IEEE C95.1: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 Ghz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY: 1992.

[2] Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.

[3] Thomas Schmid, Oliver Egger, and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on Microwave Theory and Techniques, Vol. 44, pp. 105 – 113: January 1996.

[4] Niels Kuster, Ralph Kastle, and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652: May 1997.

[5] IEEE Standards Coordinating Committee 34, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft 6.1, November 2000.

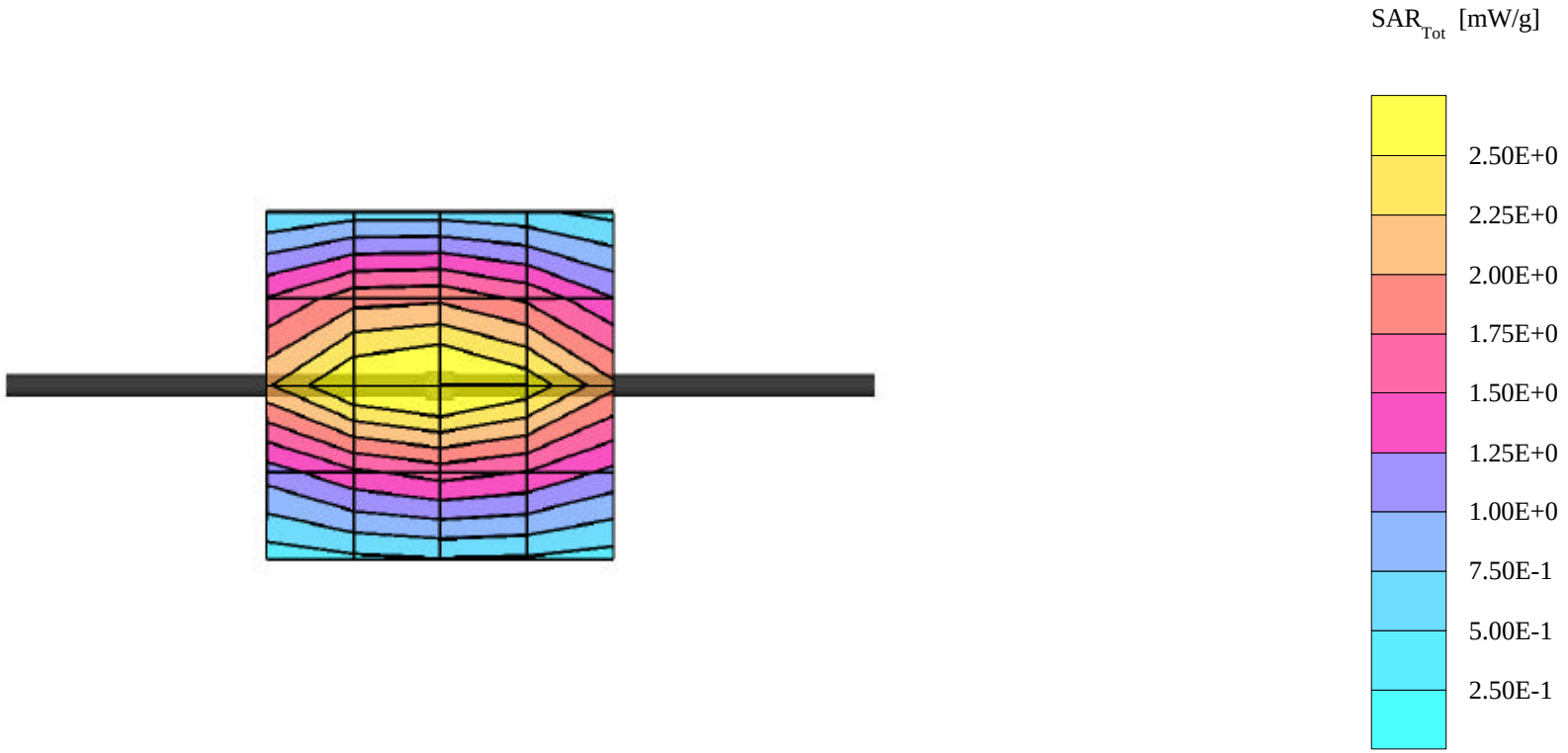
APPENDIX A - SAR MEASUREMENT DATA

Due to an error in the DASY3 software the device positioning stated on the SAR test plots is not reflective of the actual device test position. The actual placement of the device relative to the phantom head is indicated in section 5.0.

APPENDIX B - DIPOLE VALIDATION

Validation Dipole D900V2 SN:054, d = 15 mm

Frequency: 900 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing:Dx = 15.0, Dy = 15.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.27,6.27,6.27); Crest factor: 1.0; IEEE1528 900 MHz: σ = 0.97 mho/m ε_r = 42.4 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.47 mW/g ± 0.05 dB, SAR (1g): 2.78 mW/g ± 0.04 dB, SAR (10g): 1.76 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.5 (10.3, 13.2) [mm]
Powerdrift: -0.00 dB



Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: $\sigma = 0.96$ mho/m $\varepsilon_r = 40.5$ $\rho = 1.00$ g/cm^3

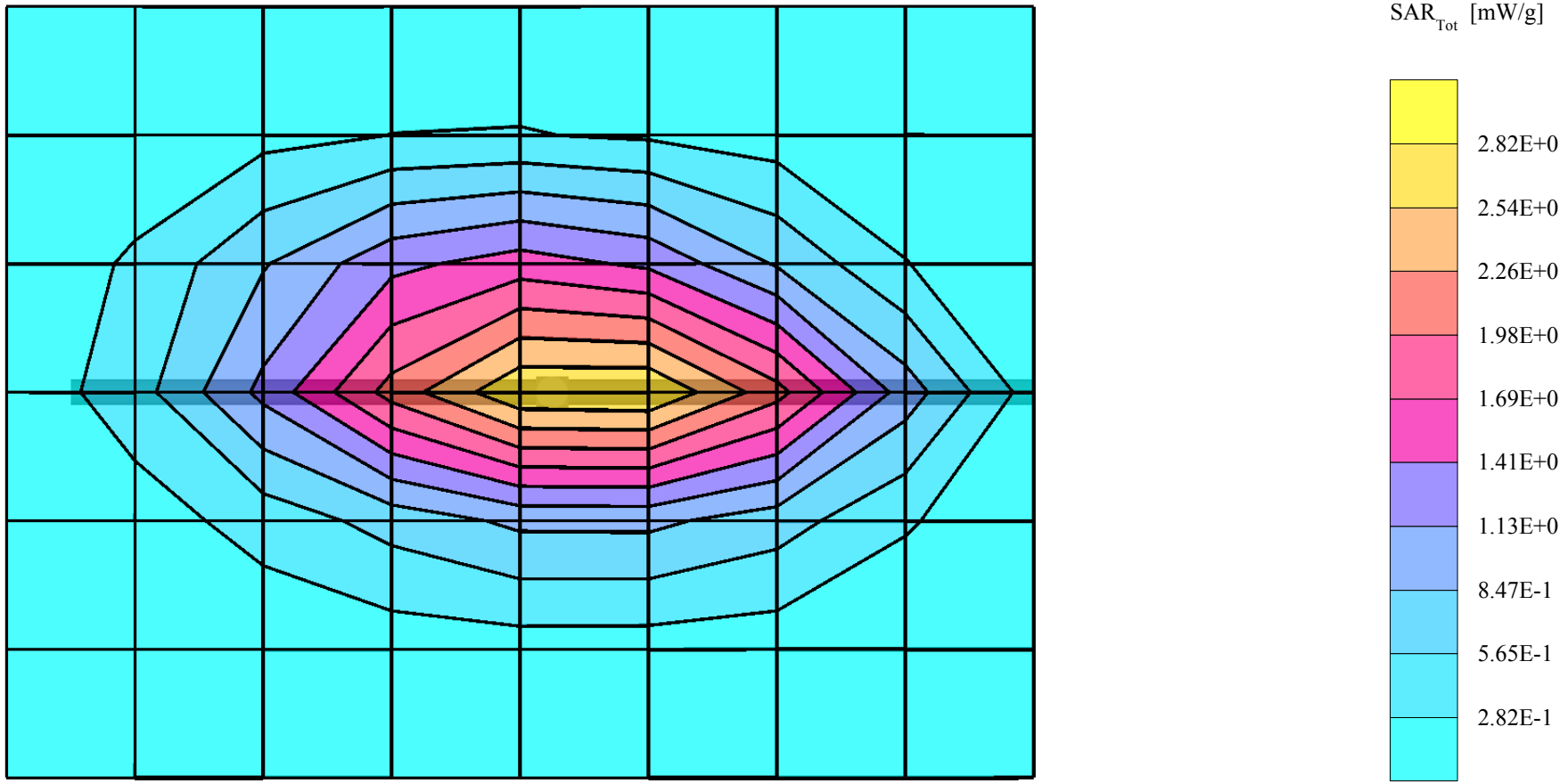
Cube 5x5x7: Peak: 4.38 mW/g, SAR (1g): 2.71 mW/g, SAR (10g): 1.70 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.03 dB

Conducted Power: 250.0 mW

Date Tested: January 8, 2002



Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: $\sigma = 0.96$ mho/m $\varepsilon_r = 40.4$ $\rho = 1.00$ g/cm^3

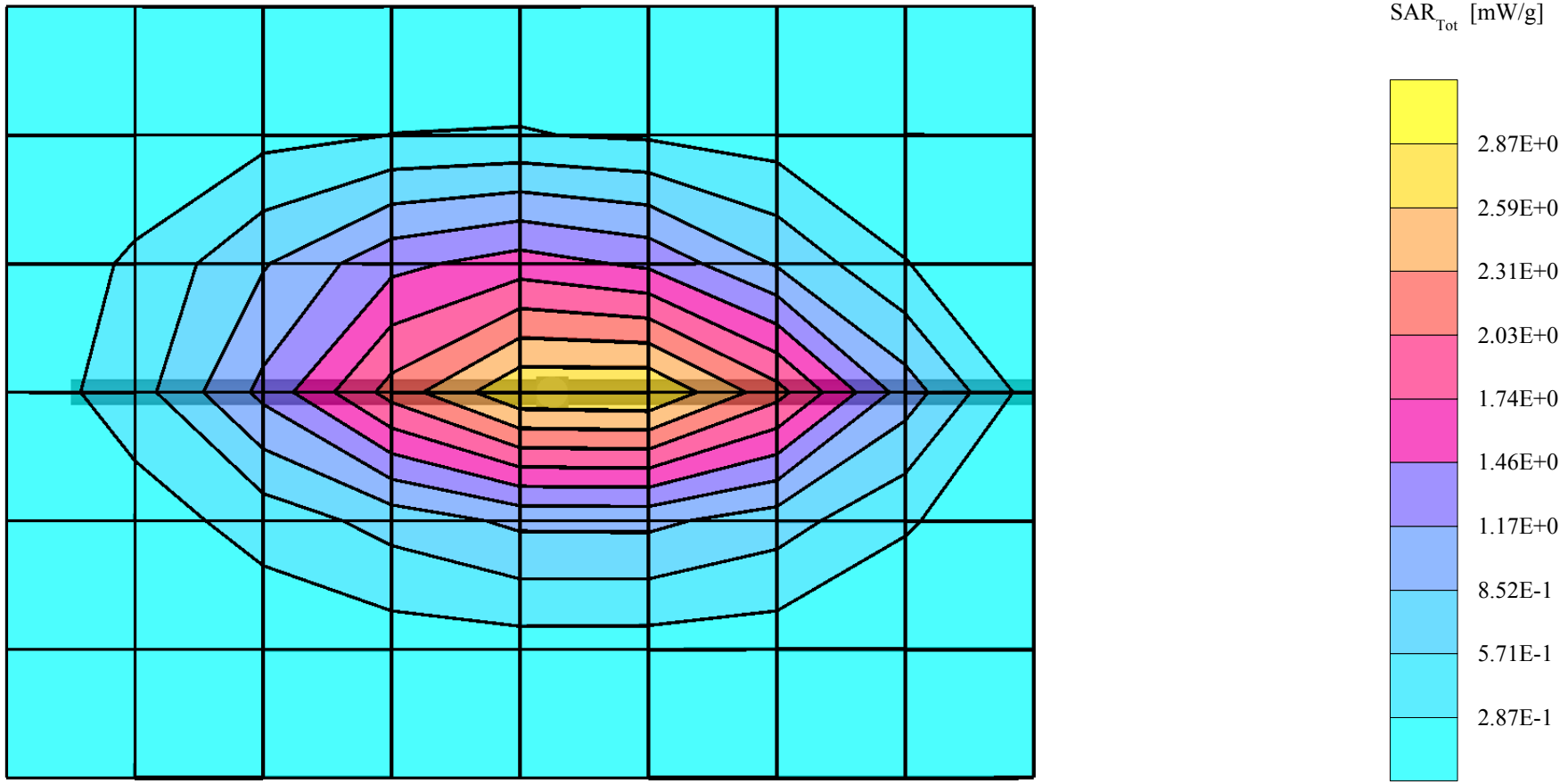
Cube 5x5x7: Peak: 4.40 mW/g, SAR (1g): 2.73 mW/g, SAR (10g): 1.72 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.03 dB

Conducted Power: 250.0 mW

Date Tested: January 9, 2002



01/10/02

Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: $\sigma = 0.97$ mho/m $\varepsilon_r = 42.1$ $\rho = 1.00$ g/cm^3

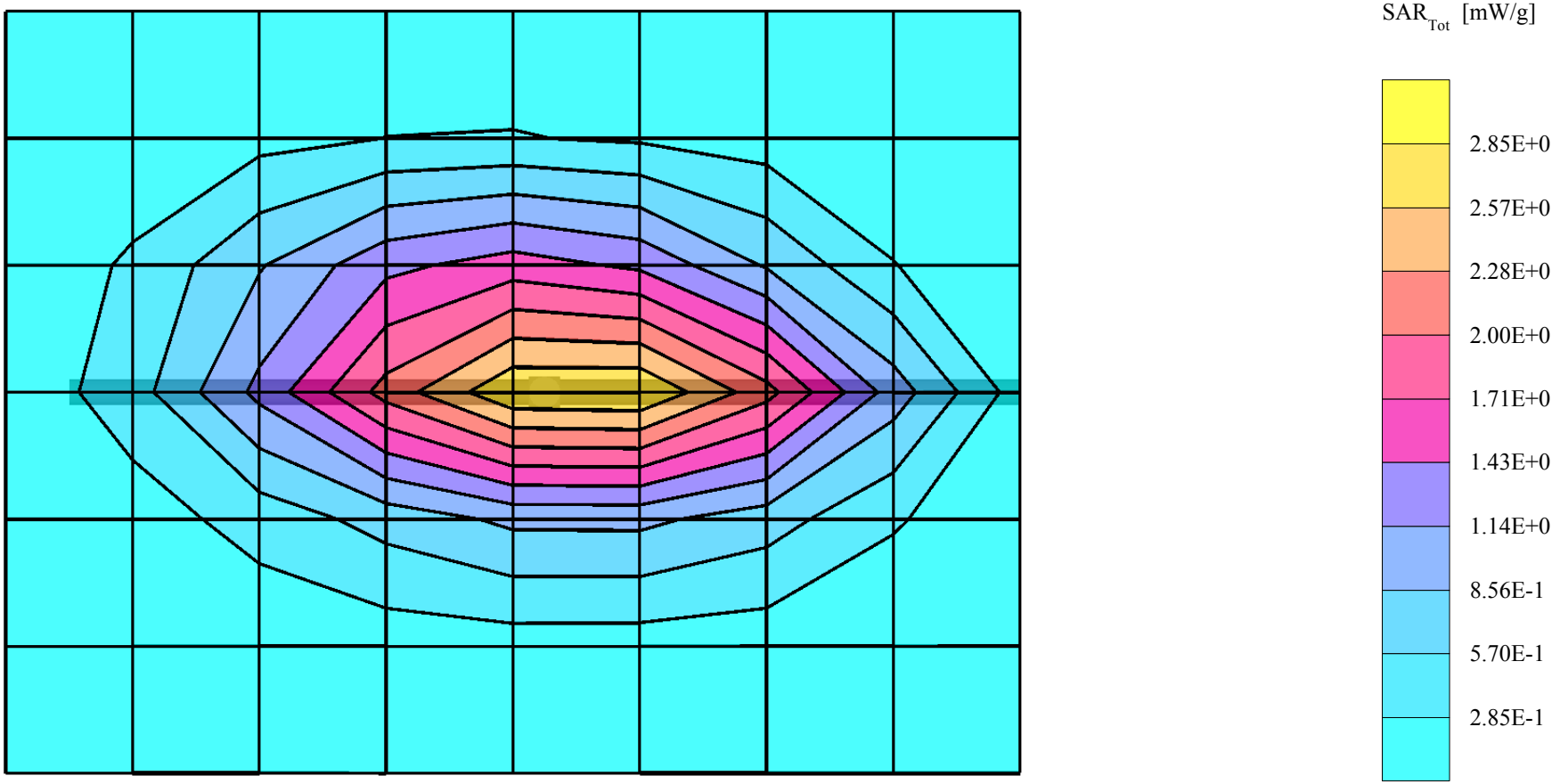
Cube 5x5x7: Peak: 4.43 mW/g, SAR (1g): 2.74 mW/g, SAR (10g): 1.72 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.03 dB

Conducted Power: 250.0 mW

Date Tested: January 10, 2002



APPENDIX C - PROBE CALIBRATION

Probe ET3DV6

SN:1590

Manufactured:	March 19, 2001
Calibrated:	March 26, 2001

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1590

Sensitivity in Free Space

NormX	**1.77**	$\mu V/(V/m)^2$
NormY	**1.91**	$\mu V/(V/m)^2$
NormZ	**1.67**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**100**	mV
DCP Y	**100**	mV
DCP Z	**100**	mV

Sensitivity in Tissue Simulating Liquid

Head **450 MHz** e_r **= 43.5 ± 5%** s **= 0.87 ± 10% mho/m**

ConvF X	**7.36**	extrapolated	Boundary effect:	
ConvF Y	**7.36**	extrapolated	Alpha	**0.29**
ConvF Z	**7.36**	extrapolated	Depth	**2.72**

Head **900 MHz** e_r **= 42 ± 5%** s **= 0.97 ± 10% mho/m**

ConvF X	**6.83**	± 7% (k=2)	Boundary effect:	
ConvF Y	**6.83**	± 7% (k=2)	Alpha	**0.37**
ConvF Z	**6.83**	± 7% (k=2)	Depth	**2.48**

Head **1500 MHz** e_r **= 40.4 ± 5%** s **= 1.23 ± 10% mho/m**

ConvF X	**6.13**	interpolated	Boundary effect:	
ConvF Y	**6.13**	interpolated	Alpha	**0.47**
ConvF Z	**6.13**	interpolated	Depth	**2.17**

Head **1800 MHz** e_r **= 40 ± 5%** s **= 1.40 ± 10% mho/m**

ConvF X	**5.78**	± 7% (k=2)	Boundary effect:	
ConvF Y	**5.78**	± 7% (k=2)	Alpha	**0.53**
ConvF Z	**5.78**	± 7% (k=2)	Depth	**2.01**

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.2 ± 0.2**	mm

DASY3 - Parameters of Probe: ET3DV6 SN: 1590

Body **450 MHz** e_r **= 56.7 ± 5%** σ **= 0.94 ± 10% mho/m**

ConvF X	**7.23**	extrapolated
ConvF Y	**7.23**	extrapolated
ConvF Z	**7.23**	extrapolated

Body **900 MHz** e_r **= 55.0 ± 5%** σ **= 1.05 ± 10% mho/m**

ConvF X	**6.61**	± 7% (k=2)
ConvF Y	**6.61**	± 7% (k=2)
ConvF Z	**6.61**	± 7% (k=2)

Body **1500 MHz** e_r **= 54.0 ± 5%** σ **= 1.30 ± 10% mho/m**

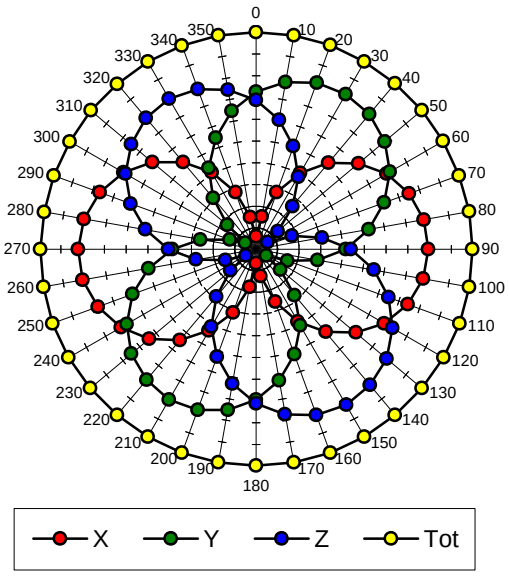
ConvF X	**5.78**	interpolated
ConvF Y	**5.78**	interpolated
ConvF Z	**5.78**	interpolated

Body **1800 MHz** e_r **= 53.3 ± 5%** σ **= 1.52 ± 10% mho/m**

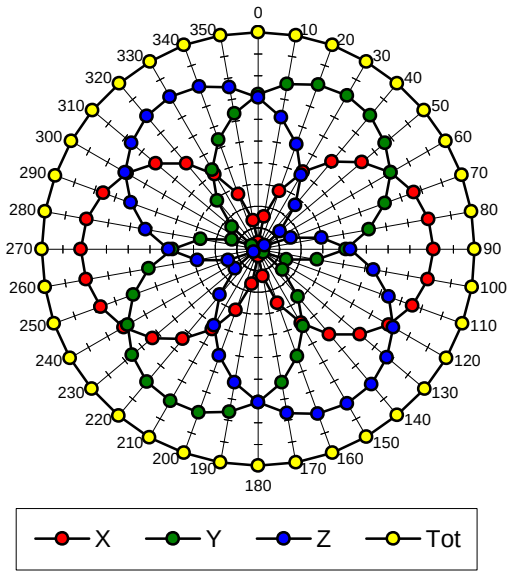
ConvF X	**5.36**	± 7% (k=2)
ConvF Y	**5.36**	± 7% (k=2)
ConvF Z	**5.36**	± 7% (k=2)

Receiving Pattern (ϕ , θ = 0°

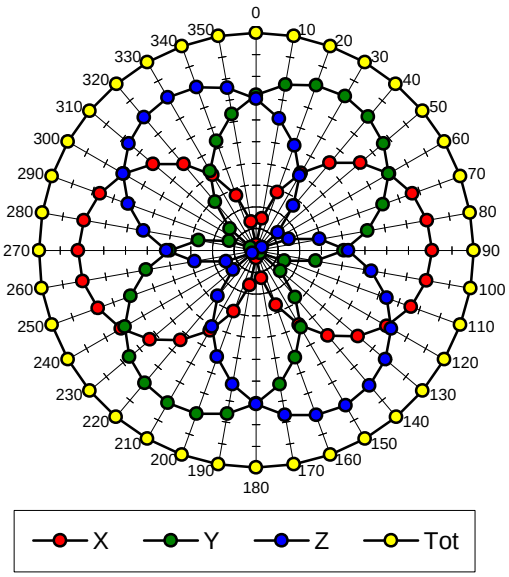
f = 30 MHz, TEM cell ifi110



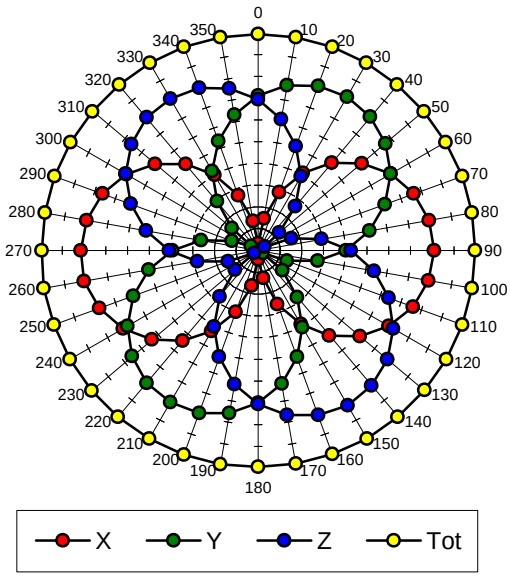
f = 100 MHz, TEM cell ifi110



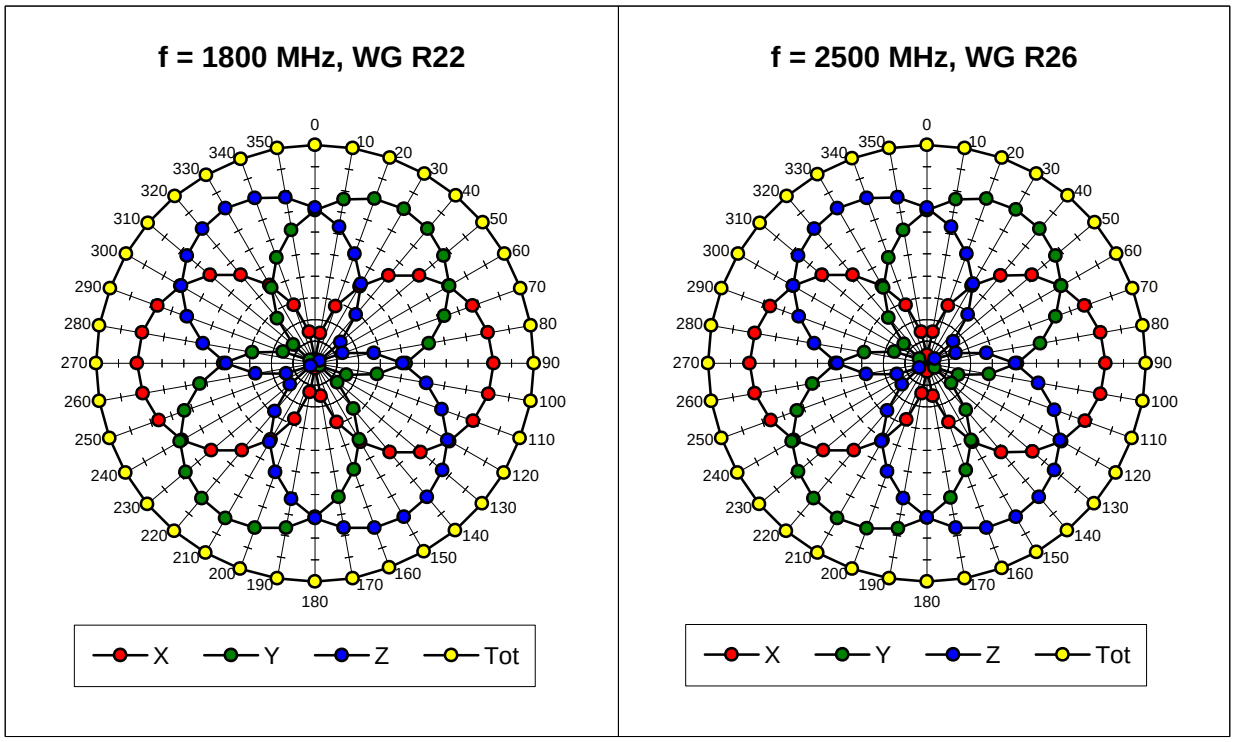
f = 300 MHz, TEM cell ifi110



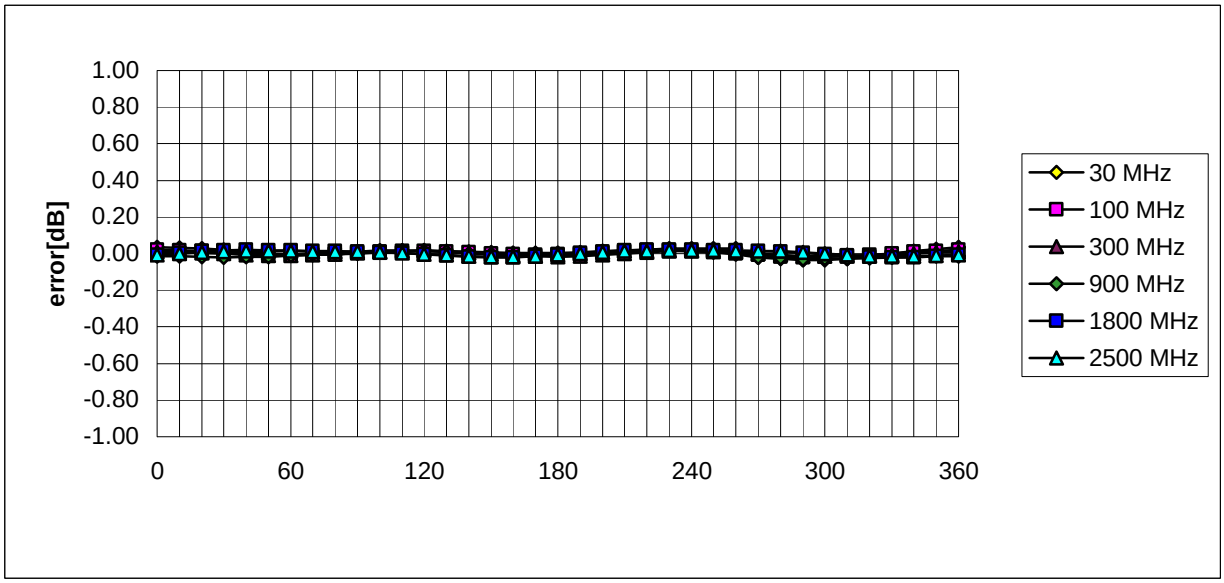
f = 900 MHz, TEM cell ifi110



ET3DV6 SN:1590

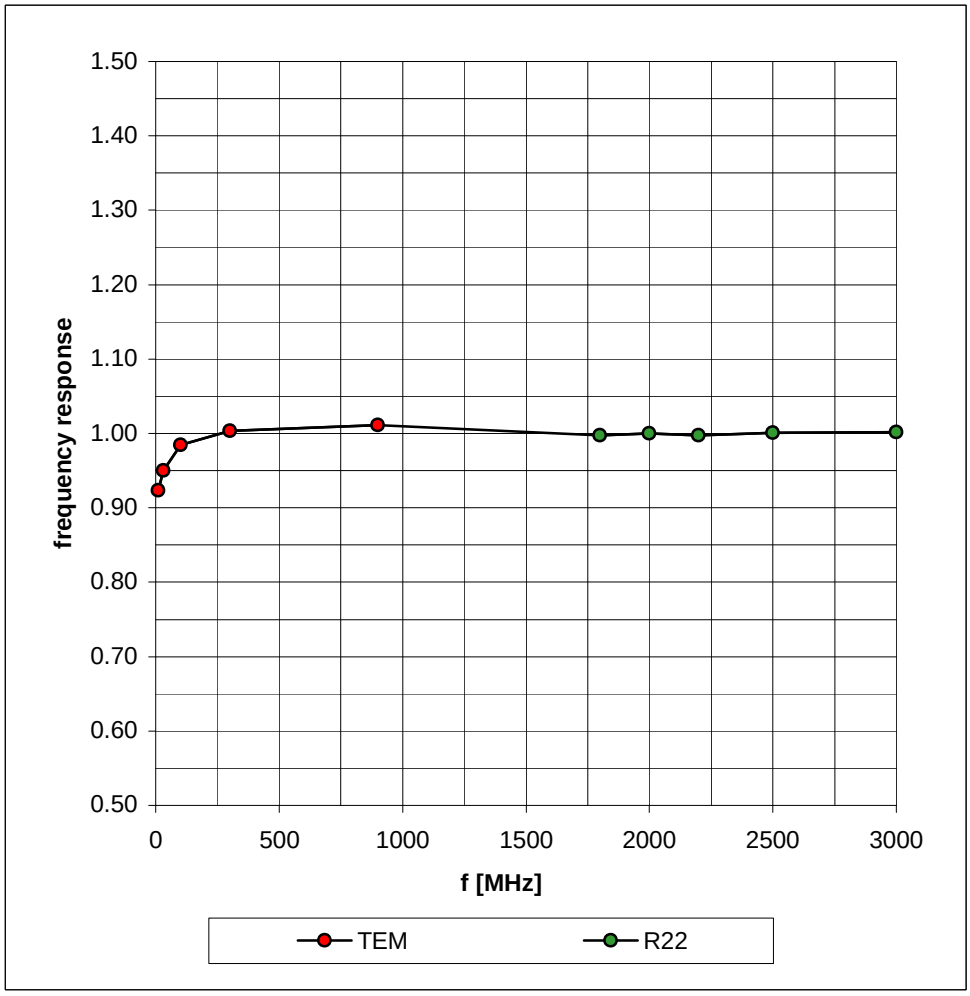


Isotropy Error (f), q = 0°



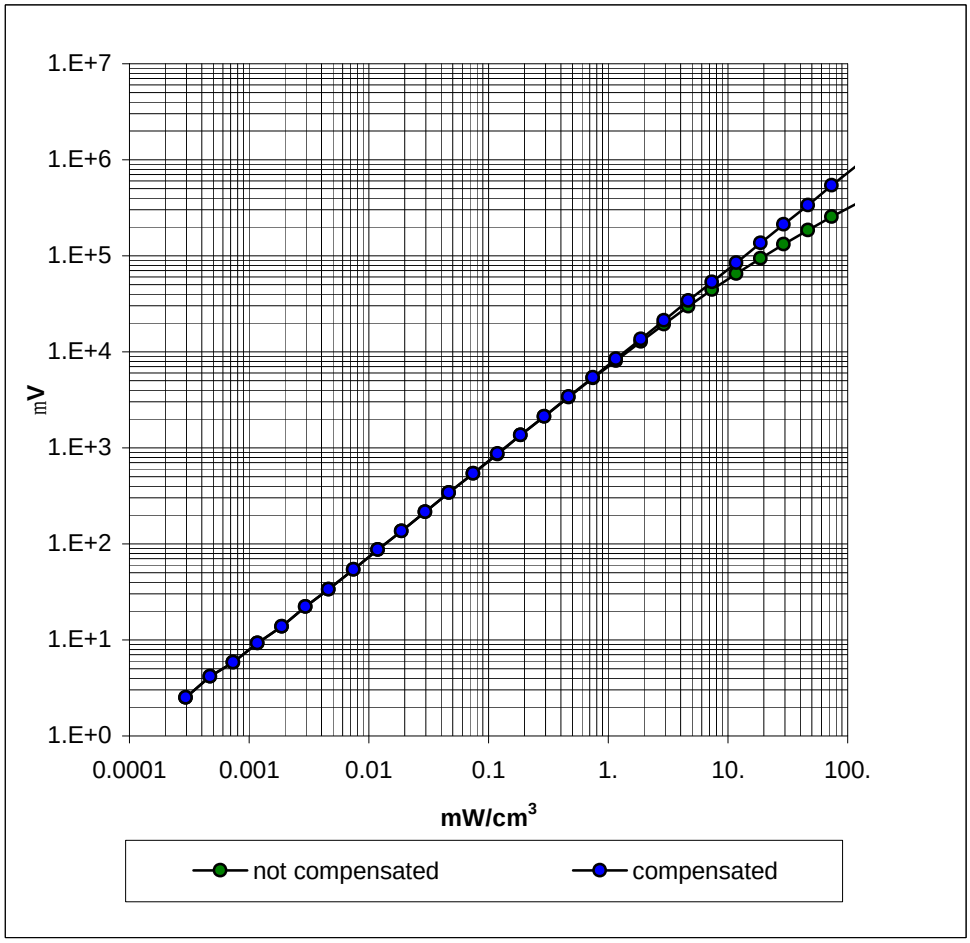
Frequency Response of E-Field

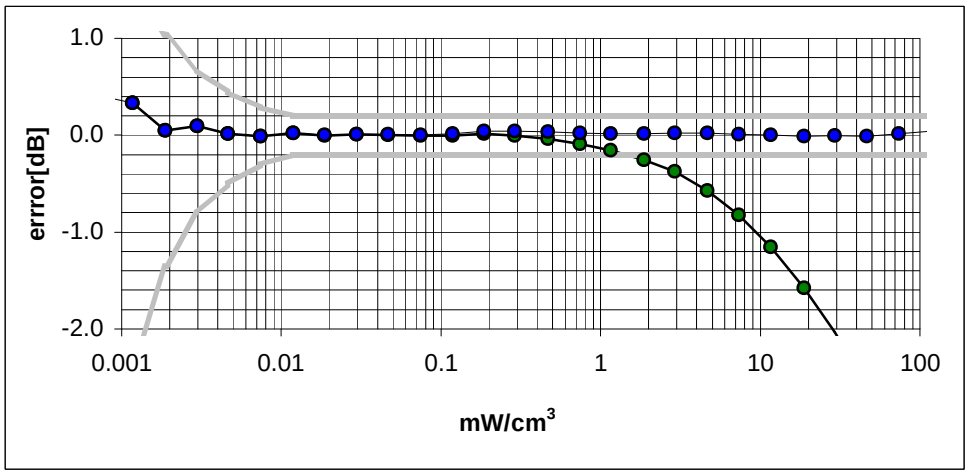
(TEM-Cell:ifi110, Waveguide R22)



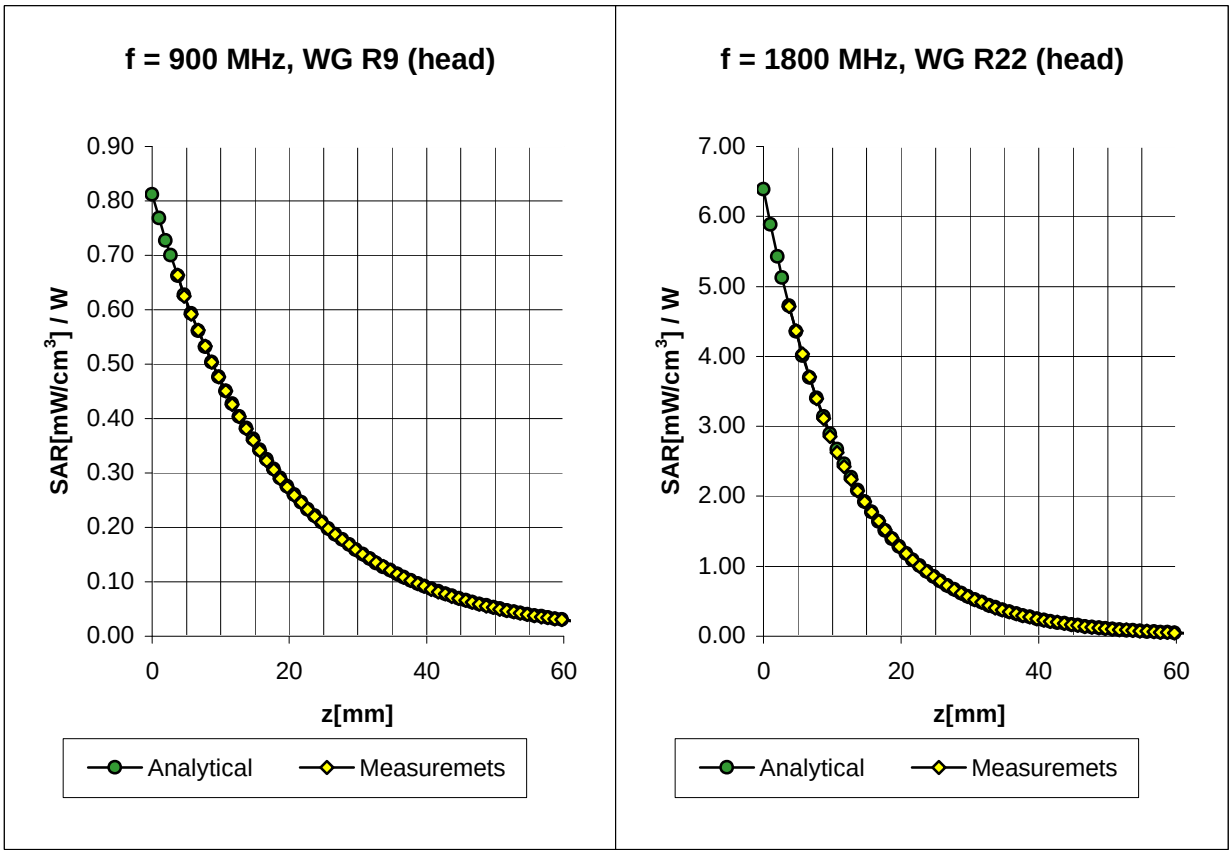
Dynamic Range f(SAR_{brain})

(TEM-Cell:ifi110)





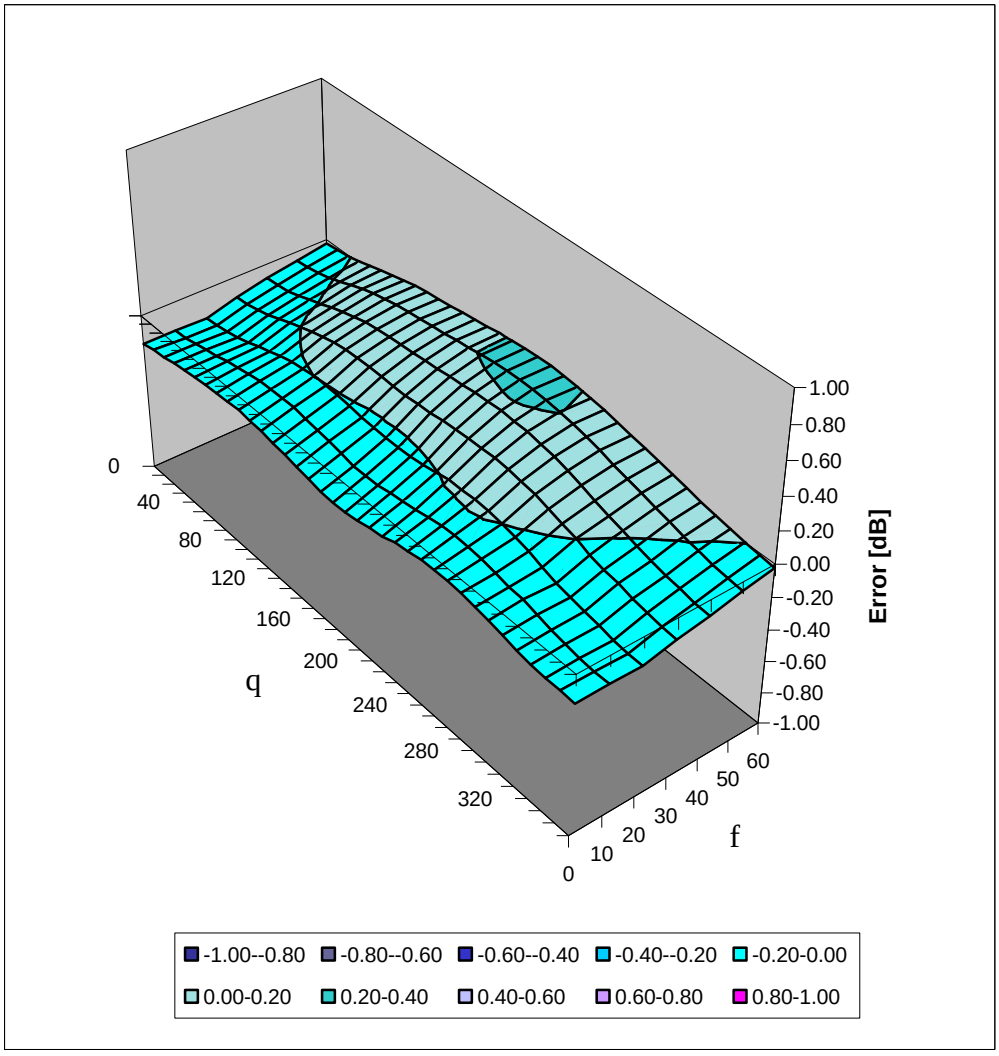
Conversion Factor Assessment



ET3DV6 SN:1590

Deviation from Isotropy in HSL

Error (q,f), f = 900 MHz



APPENDIX D - MEASURED TISSUE DIELECTRIC PARAMETERS

900MHz Validation & 835MHz Evaluation

Measured Liquid Dielectric Parameters (Brain)

January 8, 2002

Frequency	e'	e''
800.000000 MHz	41.6687	19.4597
805.000000 MHz	41.5833	19.4213
810.000000 MHz	41.5457	19.4352
815.000000 MHz	41.4554	19.4098
820.000000 MHz	41.4278	19.3945
825.000000 MHz	41.3375	19.3807
830.000000 MHz	41.2744	19.3650
835.000000 MHz	41.1861	19.3304
840.000000 MHz	41.1513	19.3339
845.000000 MHz	41.0389	19.3174
850.000000 MHz	40.9952	19.2822
855.000000 MHz	40.9412	19.2812
860.000000 MHz	40.8868	19.2395
865.000000 MHz	40.8009	19.2276
870.000000 MHz	40.7336	19.2414
875.000000 MHz	40.6993	19.2255
880.000000 MHz	40.6631	19.2003
885.000000 MHz	40.5920	19.2256
890.000000 MHz	40.5270	19.1992
895.000000 MHz	40.5243	19.1451
900.000000 MHz	40.4635	19.1283
905.000000 MHz	40.4062	19.1205
910.000000 MHz	40.3660	19.1178
915.000000 MHz	40.2916	19.0960
920.000000 MHz	40.2484	19.0945
925.000000 MHz	40.2096	19.0724
930.000000 MHz	40.1537	19.0558
935.000000 MHz	40.0723	19.0471
940.000000 MHz	40.0007	19.0359
945.000000 MHz	39.9561	19.0167
950.000000 MHz	39.8802	19.0169
955.000000 MHz	39.8173	18.9945
960.000000 MHz	39.7578	18.9807
965.000000 MHz	39.7077	18.9645
970.000000 MHz	39.6577	18.9764

900MHz Validation & 835MHz Evaluation

Measured Liquid Dielectric Parameters (Brain)

January 9, 2002

Frequency	e'	e''
800.000000 MHz	41.6300	19.4374
805.000000 MHz	41.5612	19.4597
810.000000 MHz	41.5102	19.4233
815.000000 MHz	41.4214	19.4030
820.000000 MHz	41.3826	19.3855
825.000000 MHz	41.2792	19.3808
830.000000 MHz	41.2199	19.3589
835.000000 MHz	41.1568	19.3385
840.000000 MHz	41.1292	19.3295
845.000000 MHz	41.0142	19.3035
850.000000 MHz	40.9295	19.2695
855.000000 MHz	40.9125	19.2893
860.000000 MHz	40.8461	19.2407
865.000000 MHz	40.7834	19.2020
870.000000 MHz	40.7255	19.2132
875.000000 MHz	40.6566	19.2175
880.000000 MHz	40.6259	19.2110
885.000000 MHz	40.5496	19.2178
890.000000 MHz	40.4967	19.1980
895.000000 MHz	40.4850	19.1467
900.000000 MHz	40.4335	19.1272
905.000000 MHz	40.3742	19.0955
910.000000 MHz	40.3363	19.1167
915.000000 MHz	40.2580	19.0815
920.000000 MHz	40.2182	19.0743
925.000000 MHz	40.1635	19.0475
930.000000 MHz	40.1104	19.0399
935.000000 MHz	40.0204	19.0340
940.000000 MHz	39.9516	19.0316
945.000000 MHz	39.8899	19.0178
950.000000 MHz	39.8316	19.0127
955.000000 MHz	39.7801	18.9964
960.000000 MHz	39.7324	18.9745
965.000000 MHz	39.6538	18.9717
970.000000 MHz	39.6184	18.9699

900MHz Validation

Measured Liquid Dielectric Parameters (Brain)

January 10, 2002

Frequency	e'	e''
800.000000 MHz	43.2421	19.7823
805.000000 MHz	43.1814	19.7421
810.000000 MHz	43.1395	19.7459
815.000000 MHz	43.0544	19.7080
820.000000 MHz	43.0222	19.6826
825.000000 MHz	42.9484	19.6586
830.000000 MHz	42.8884	19.6417
835.000000 MHz	42.8224	19.6375
840.000000 MHz	42.7907	19.6025
845.000000 MHz	42.6700	19.5833
850.000000 MHz	42.6141	19.5667
855.000000 MHz	42.5866	19.5731
860.000000 MHz	42.5334	19.5251
865.000000 MHz	42.4462	19.4981
870.000000 MHz	42.4106	19.5380
875.000000 MHz	42.3404	19.5269
880.000000 MHz	42.2926	19.5195
885.000000 MHz	42.2207	19.5297
890.000000 MHz	42.1664	19.4945
895.000000 MHz	42.1495	19.4483
900.000000 MHz	42.0906	19.4104
905.000000 MHz	42.0309	19.3832
910.000000 MHz	41.9938	19.3790
915.000000 MHz	41.9115	19.3692
920.000000 MHz	41.8730	19.3707
925.000000 MHz	41.8385	19.3515
930.000000 MHz	41.8046	19.3323
935.000000 MHz	41.7246	19.3181
940.000000 MHz	41.6572	19.3101
945.000000 MHz	41.5907	19.3020
950.000000 MHz	41.5366	19.2998
955.000000 MHz	41.4550	19.2685
960.000000 MHz	41.4054	19.2607
965.000000 MHz	41.3454	19.2470
970.000000 MHz	41.3000	19.2617

835MHz Evaluation

Measured Liquid Dielectric Parameters (Body)

January 10, 2002

Frequency	e'	e''
800.000000 MHz	55.1498	21.0192
805.000000 MHz	55.1047	21.0075
810.000000 MHz	55.0597	20.9618
815.000000 MHz	55.0202	20.9596
820.000000 MHz	54.9831	20.9453
825.000000 MHz	54.9200	20.9184
830.000000 MHz	54.8228	20.8712
835.000000 MHz	54.7765	20.8831
840.000000 MHz	54.7459	20.8452
845.000000 MHz	54.7064	20.8109
850.000000 MHz	54.6451	20.7742
855.000000 MHz	54.5862	20.7696
860.000000 MHz	54.5284	20.7647
865.000000 MHz	54.4832	20.7337
870.000000 MHz	54.4404	20.7342
875.000000 MHz	54.3729	20.7230
880.000000 MHz	54.3634	20.7213
885.000000 MHz	54.3070	20.7061
890.000000 MHz	54.2772	20.7018
895.000000 MHz	54.2693	20.6048
900.000000 MHz	54.2245	20.6119
905.000000 MHz	54.1933	20.5720
910.000000 MHz	54.1386	20.5625
915.000000 MHz	54.0823	20.5590
920.000000 MHz	54.0269	20.5296
925.000000 MHz	53.9989	20.5150
930.000000 MHz	53.9454	20.5110
935.000000 MHz	53.9190	20.4960
940.000000 MHz	53.8255	20.4885
945.000000 MHz	53.8007	20.4731
950.000000 MHz	53.7423	20.4718
955.000000 MHz	53.6949	20.4461
960.000000 MHz	53.6578	20.4313
965.000000 MHz	53.5793	20.4341
970.000000 MHz	53.5464	20.4130

APPENDIX E - CERTIFICATE OF CONFORMANCE: SAM PHANTOM

Schmid & Partner
Engineering AG

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

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

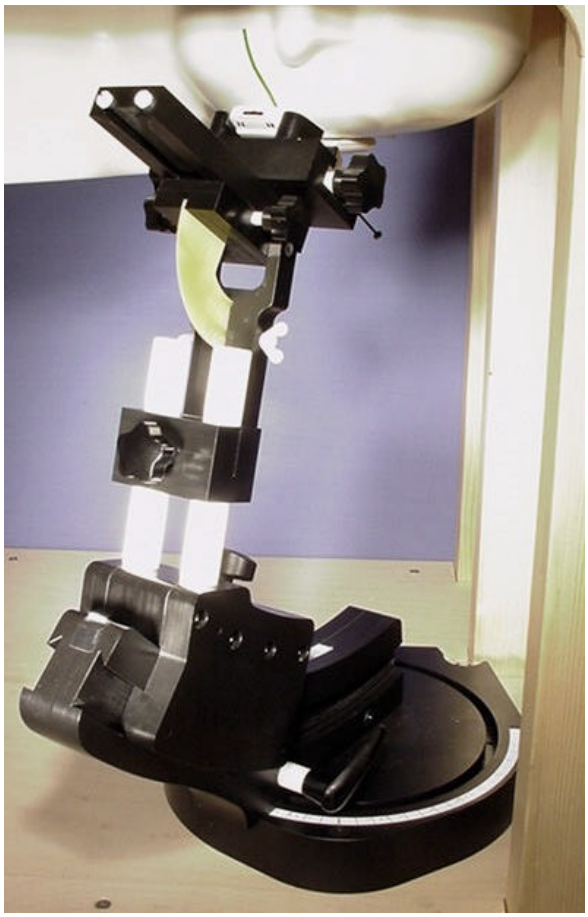
Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

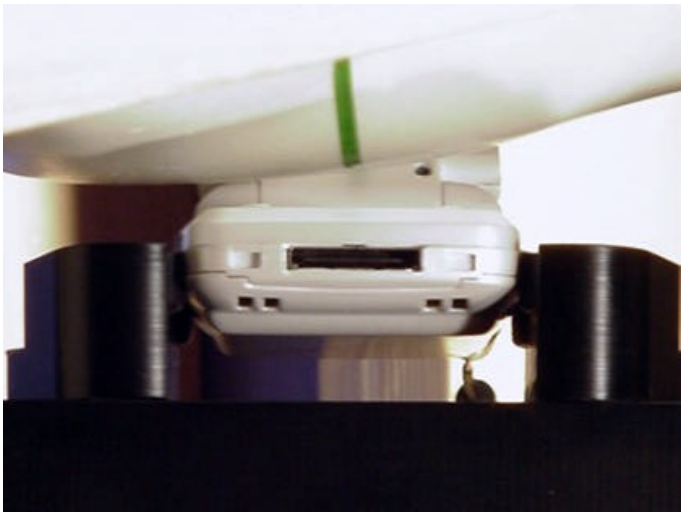
Date 18.11.2001

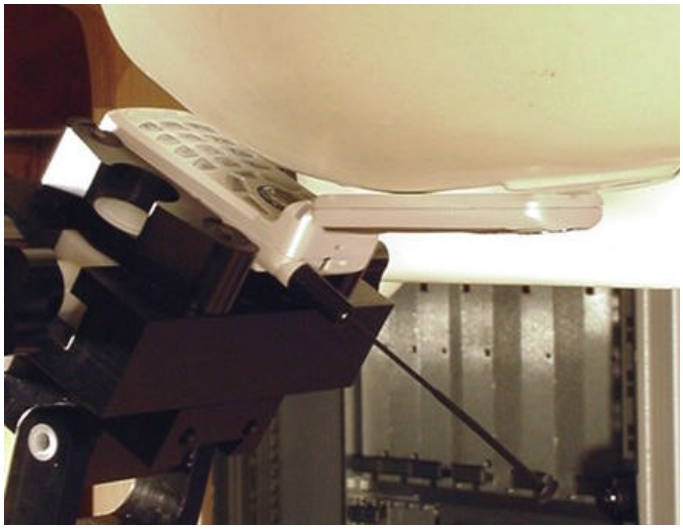
Signature / Stamp Schmid & Partner Engineering AG
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

APPENDIX F - SAR TEST SETUP PHOTOGRAPHS

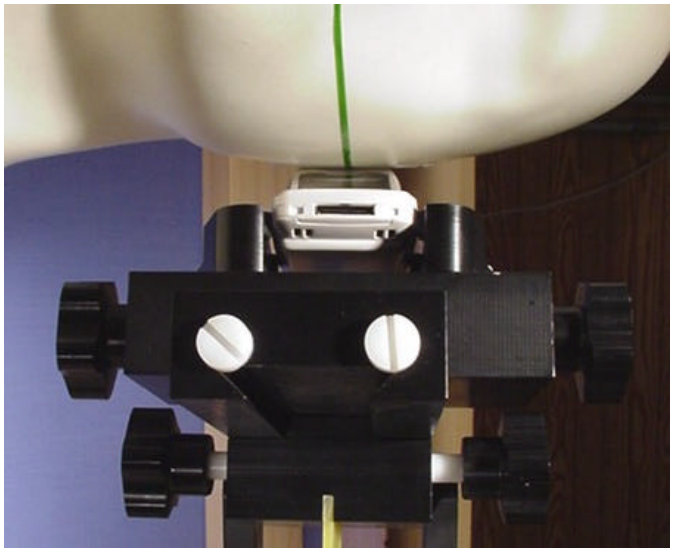
SAR TEST SETUP PHOTOGRAPHS
Left Head Section – Cheek/Touch Position

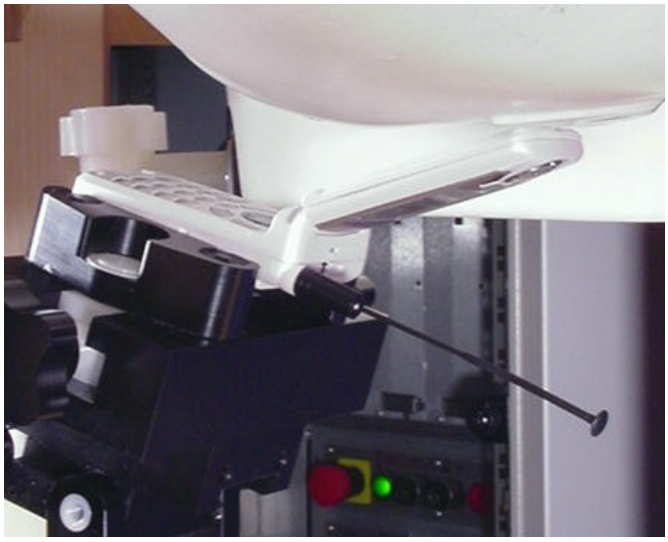




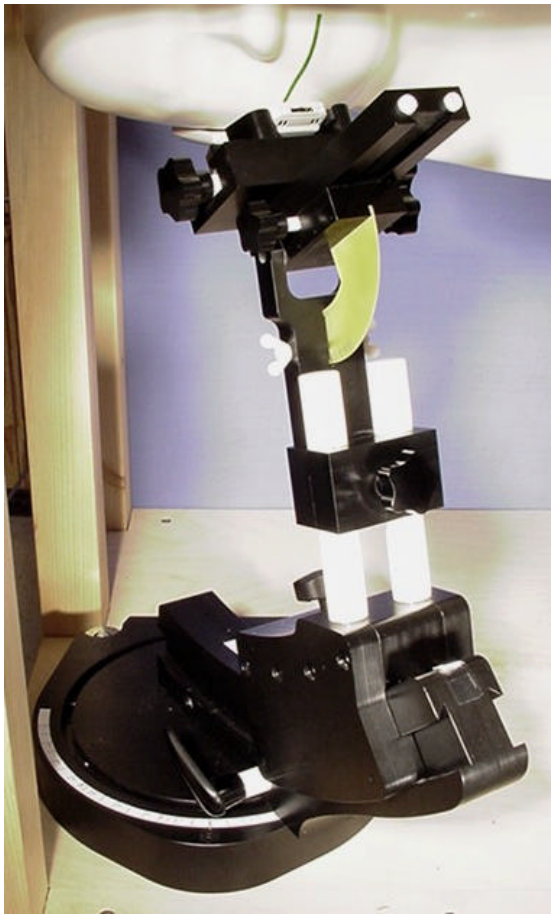


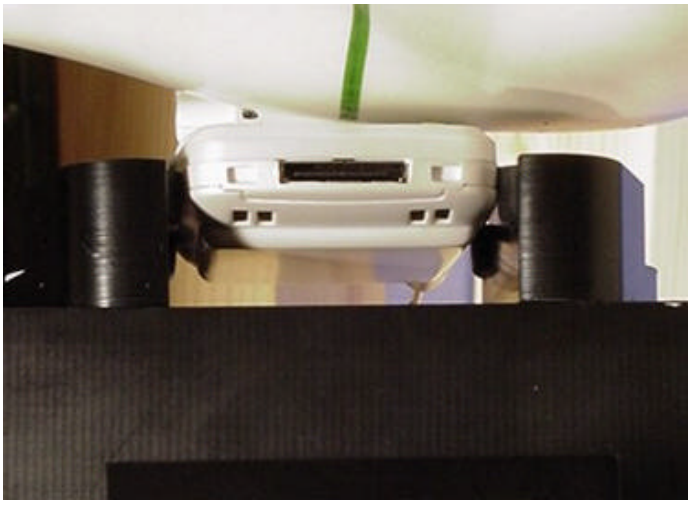
SAR TEST SETUP PHOTOGRAPHS
Left Head Section – Ear/Tilt Position

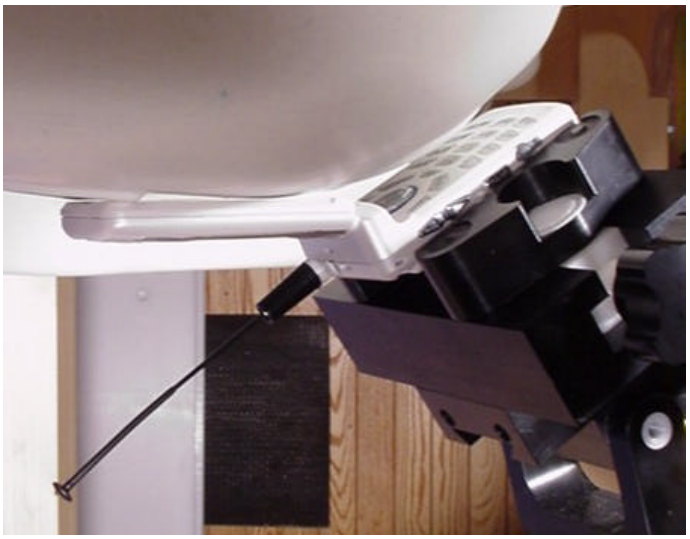




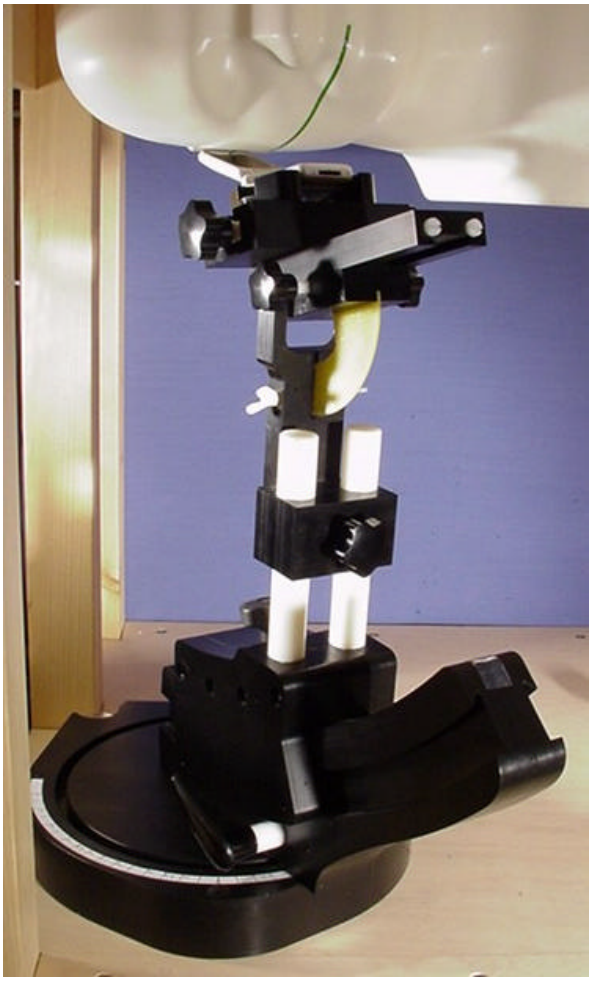
SAR TEST SETUP PHOTOGRAPHS
Right Head Section – Cheek/Touch Position



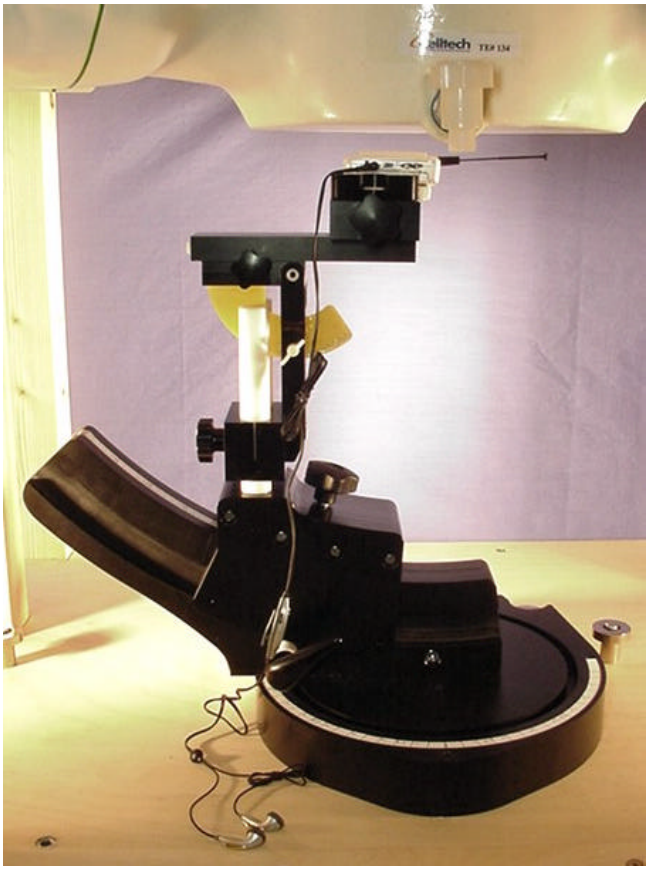


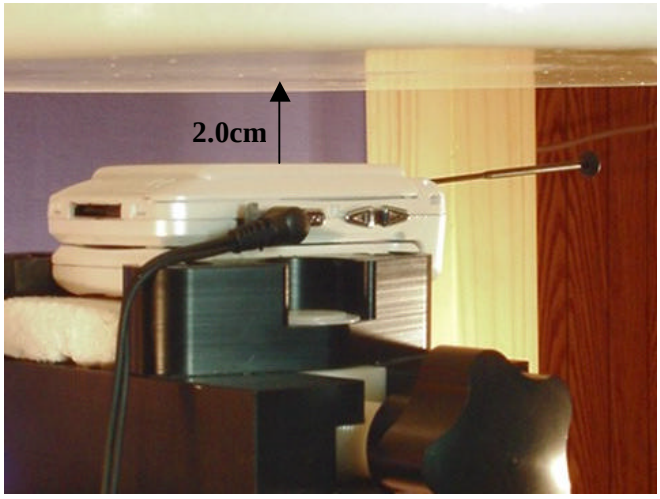


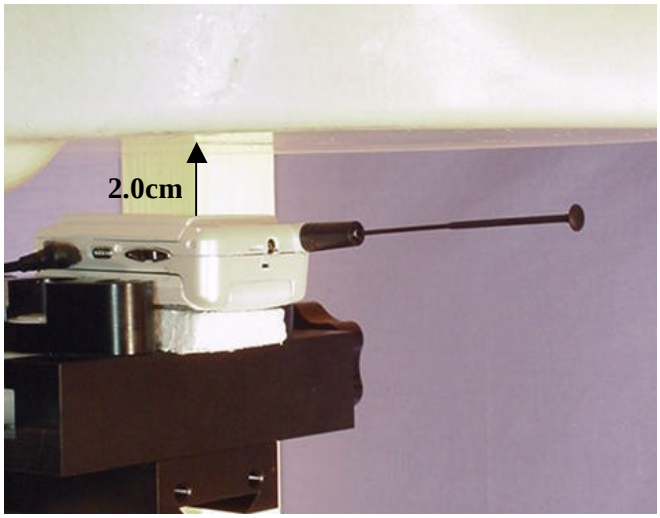
SAR TEST SETUP PHOTOGRAPHS
Right Head Section – Ear/Tilt Position



SAR TEST SETUP PHOTOGRAPHS
Planar Section - Body-Worn Configuration
2.0 cm Separation Distance - with Standard Battery







SAR TEST SETUP PHOTOGRAPHS
Planar Section - Body-Worn Configuration
2.0 cm Separation Distance - with Extended Battery