CERTIFICATE OF COMPLIANCE
SAR EVALUATION

Test Lab:	Applicant Information:
CELLTECH RESEARCH INC. Testing and Engineering Lab 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Phone: 250 - 860-3130 Fax: 250 - 860-3110 e-mail: info@celltechlabs.com web site: www.celltechlabs.com	**HOP-ON WIRELESS, INC.** 12966 Euclid Street Garden Grove, CA 92840

Equipment Classification:	**Licensed Non-Broadcast Transmitter Worn on Body (TNT)**
FCC Rule Part(s):	**2.1093; ET Docket 93-62**
FCC ID:	**QHOHPN1600**
Model Name:	**Dundee**
Model No.:	**HPN1600**
Equipment Type:	**Single-Mode Cellular CDMA Phone**
Modulation:	**CDMA**
Tx Frequency Range(s):	**824.70 - 848.31 MHz**
RF Conducted Power Tested:	**23.1 dBm (Channel 363 - 835.89MHz)**
Antenna Type(s):	**Integral**
Power Supply:	**4.2V Lithium-Ion Battery (550mAh)**

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 and Industry Canada RSS-102 Issue 1 (uncontrolled exposure/general population), 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.

Russell Pipe
Compliance Technician
Celltech Research Inc.

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1.0 INTRODUCTION

This measurement report shows that the HOP-ON WIRELESS INC. Model: HPN1600 Cellular CDMA Phone FCC ID: QHOHPN1600 complies with the requirements and procedures specified in FCC Rule Part 2.1093, ET Docket 93-62 (see Reference [1]) and Industry Canada RSS-102 Issue 1 (see Reference [2]) for mobile and portable devices. The test procedures described in American National Standards Institute C95.1-1992 (see Reference [3]) and FCC OET Bulletin 65, Supplement C, Edition 01-01 (see Reference [4]) 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)

Rule Part(s)	FCC 2.1093; ET Docket 93-62
Equipment Classification	Licensed Non-Broadcast Transmitter Worn on Body (TNT)
EUT Type	Single-Mode Cellular CDMA Phone
FCC ID	QHOHPN1600
Model Name	Dundee
Model No.	HPN1600
Serial No.	Pre-production
Modulation	CDMA
Tx Frequency Range	824.70 - 848.31 MHz
Max. RF Conducted Output Power	23.1 dBm
Antenna Type(s)	Integral
Power Supply	4.2V Lithium-Ion Battery (550mAh)

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, and the test setup photographs are shown in Appendix F.

SAR MEASUREMENT RESULTS									
Freq. (MHz)	**Channel**	**Mode Tested**	**Conducted Power Before (dBm)**	**Conducted Power After (dBm)**	**EUT Test Position**	**Phantom Section**	**Separation Distance (cm)**	**Body SAR 1g (w/kg)**	**Hand SAR 10g (w/kg)**
835.89	363	CDMA	23.14	23.02	Top End	Planar	0.0	0.0700	0.0304
835.89	363	CDMA	23.13	22.96	Front Side	Planar	0.0	0.422	0.253
835.89	363	CDMA	23.12	22.98	Back Side	Planar	0.0	0.574	0.369

ANSI / IEEE C95.1 1992 - SAFETY LIMITS Spatial Peak - Uncontrolled Exposure / General Population			
BODY LIMIT: 1.6 W/kg (averaged over 1 gram)		**HAND LIMIT: 4.0 W/kg (averaged over 10 grams)**	
Mixture Type	Body (835MHz)	**Relative Humidity**	39 %
Measured Dielectric Constant	55.4	**Atmospheric Pressure**	101.9 kPa
Measured Conductivity	0.96	**Fluid Temperature**	≈ 23 °C
Ambient Temperature	23.9 °C	**Fluid Depth**	≥ 15 cm

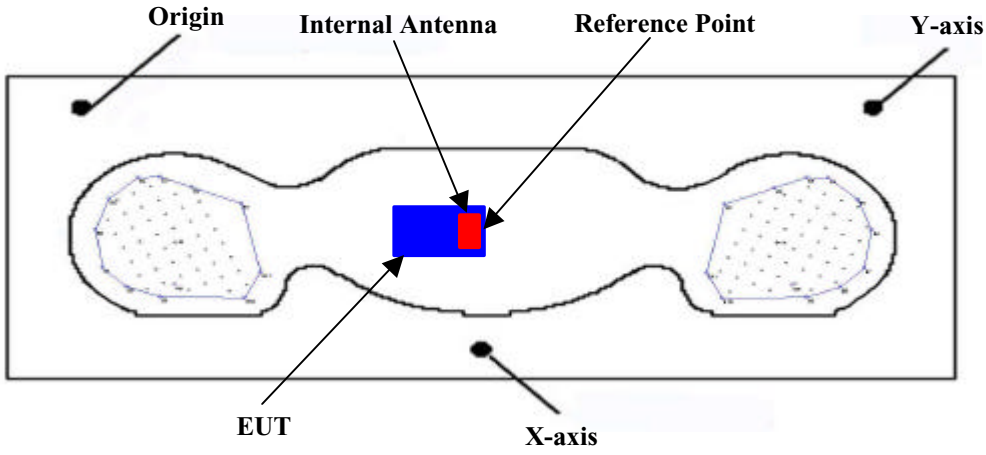
Notes:

1. The SAR values measured for mid channel were 3.0 dB or greater below the SAR limit of 1.6 w/kg, therefore mid channel data only was reported (per OET Bulletin 65 Supplement C - see Reference [4]).
2. The body SAR values measured were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest body SAR value measured was 0.574 w/kg averaged over 1 gram (back of EUT).
4. The highest hand SAR value measured was 0.369 w/kg averaged over 10 grams (back of EUT).
5. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

5.0 DETAILS OF SAR EVALUATION

The HOP-ON WIRELESS INC. Model: HPN1600 Cellular CDMA Phone FCC ID: QHOHPN1600 was found to be compliant for localized Specific Absorption Rate based on the following test provisions and conditions:

1. The EUT was tested for body and hand SAR with the top end of the device (antenna side) placed parallel to, and touching, the outer surface of the planar phantom.
2. The EUT was tested for body and hand SAR with the front side of the device (keypad side) placed parallel to, and touching, the outer surface of the planar phantom.
3. The EUT was tested for body and hand SAR with the back side of the device placed parallel to, and touching, the outer surface of the planar phantom.
4. An ear-microphone accessory was connected to the EUT for the duration of the tests.
5. The unit was operated for an appropriate period prior to the evaluation in order to minimize drift.
6. The conducted power levels were measured before and after each test using the Agilent E8285A CDMA Base Station Simulator, according to the procedures described in FCC Part 2.1046. 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. The device was operated continuously in transmit mode for the duration of the test.
7. The EUT was placed in continuous transmit CDMA test mode using test software from a laptop PC.
8. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
9. The EUT was tested with a fully charged battery.



Phantom Reference Point & EUT Positioning

6.0 EVALUATION PROCEDURES

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 in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.

(ii) For body-worn and face-held 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 with a grid spacing of 20mm x 20mm.

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 planar phantom used for the SAR evaluation and system validation was no less than 15.0 cm.

Top End of EUT (Antenna Side)

Front Side of EUT (Keypad Side)

Back Side of EUT

7.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar section of the SAM phantom with a 900MHz dipole. A forward power of 250 mW was applied to the dipole and system was verified to a tolerance of ±10%. The applicable verifications are shown below (see Appendix B for system validation test plots).

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Ambient Temp.	Fluid Temp.	Fluid Depth	Validation Date
D900V2	2.78	2.71	23.9 °C	˜ 23.0 °C	≥ 15 cm	07/02/02

8.0 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 target and measured dielectric parameters of the fluid are shown below (see Appendix D for printout of measured fluid dielectric parameters).

BRAIN TISSUE PARAMETERS - SYSTEM VALIDATION			
Equivalent Tissue	**Dielectric Constant ε_r**	**Conductivity σ (mho/m)**	**ρ (Kg/m^3)**
900MHz Brain (Target)	**41.5 ±5%**	**0.97 ±5%**	**1000**
900MHz Brain (Measured - 07/02/02)	40.0	0.96	1000

BODY TISSUE PARAMETERS - EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant ε_r**	**Conductivity σ (mho/m)**	**ρ (Kg/m^3)**
835MHz Body (Target)	**55.2 ±5%**	**0.97 ±5%**	**1000**
835MHz Body (Measured - 07/02/02)	55.4	0.96	1000

9.0 EQUIVALENT TISSUES

The 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).

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

10.0 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.

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.:	1387
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
Shell Material:	Fiberglass
Thickness:	2.0 ±0.1 mm
Volume:	Approx. 20 liters

12.0 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

13.0 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

14.0 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

15.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	**SERIAL NO.**	**DATE CALIBRATED**
DASY3 System -Robot -ET3DV6 E-Field Probe -300MHz Validation Dipole -450MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -2450MHz Validation Dipole -SAM Phantom V4.0C	 599396-01 1387 135 136 054 247 150 N/A	 N/A Feb 2002 Oct 2001 Oct 2001 June 2001 June 2001 Oct 2001 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Feb 2002 Feb 2002 Mar 2002
E4408B Spectrum Analyzer	US39240170	Nov 2001
8594E Spectrum Analyzer	3543A02721	Feb 2002
8753E Network Analyzer	US38433013	Feb 2002
8648D Signal Generator	3847A00611	Feb 2002
5S1G4 Amplifier Research Power Amplifier	26235	N/A
Agilent E8285A CDMA Base Station Simulator	US40332926	Feb 2002

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	± 4.8	Normal	1	1	± 4.8	∞
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	∞
Extrapolation & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	√3	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	√3	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					**± 13.7**	
Expanded Uncertainty (k=2)					**± 27.5**	

Measurement Uncertainty Table in accordance with IEEE Std 1528 (Draft - see reference [5])

17.0 REFERENCES

[1] Federal Communications Commission, ET Docket 93-62, "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation", Aug. 1996.

[2] Industry Canada, "Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields", Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.

[3] 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.

[4] 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.

[5] IEEE Standards Coordinating Committee 34, Std. P1528, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft, December 2001.

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

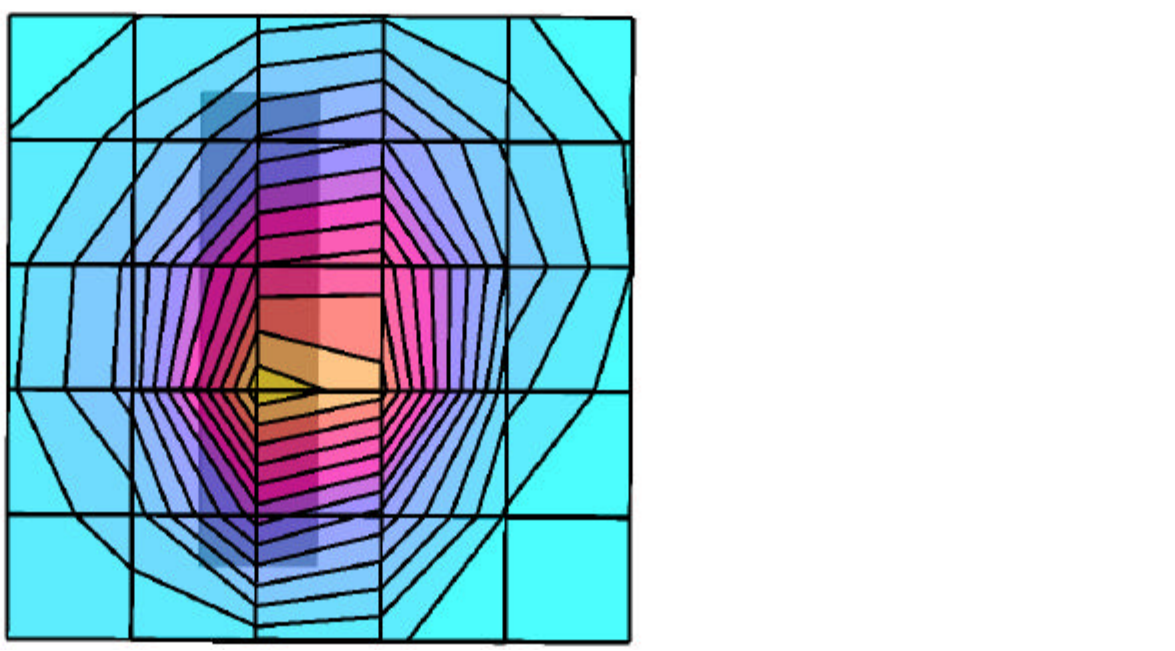
[7] Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645-652: May 1997.

APPENDIX A - SAR MEASUREMENT DATA

Hop-On Wireless Inc. FCC ID: QHOHPN1600

SAM Phantom; Flat Section; Position: (180°,270°)
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.96$ mho/m $\varepsilon_r = 55.4$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 0.0700 mW/g, SAR (10g): 0.0304 mW/g

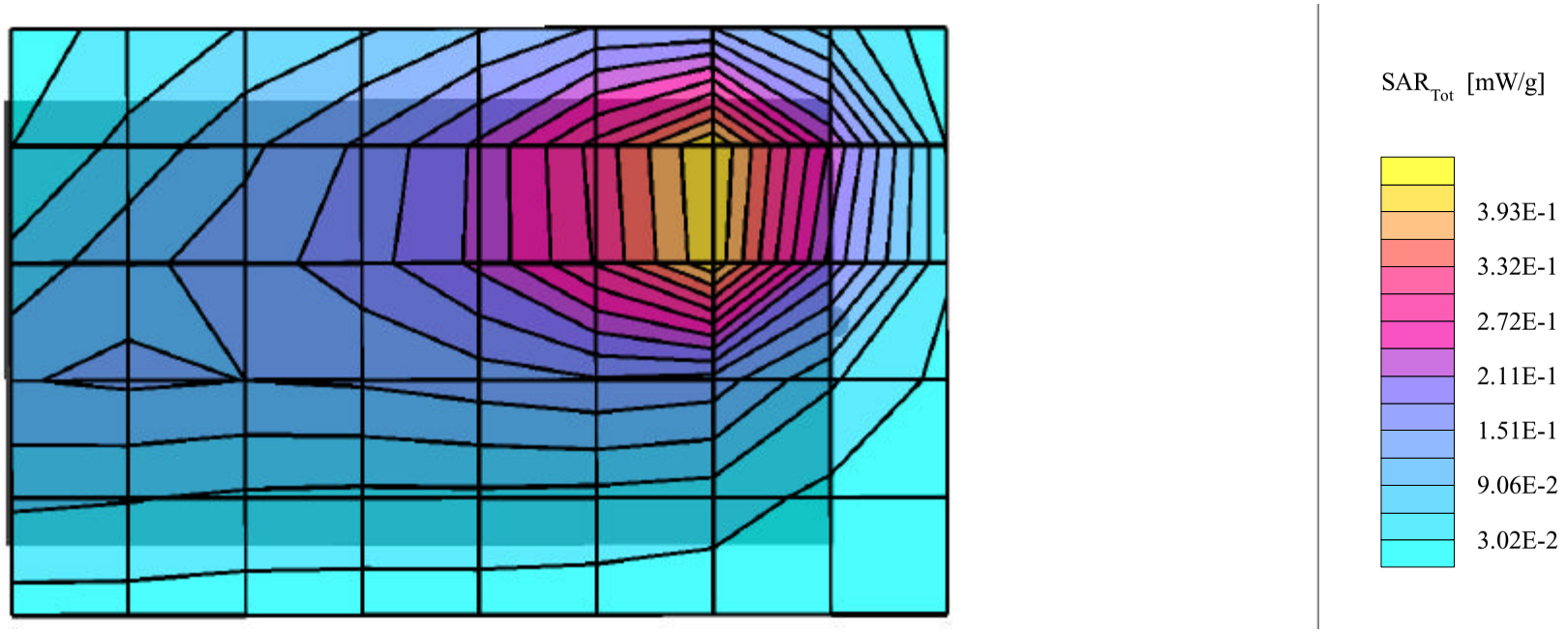
Body SAR - Top End of EUT - 0.0cm Separation Distance
(Antenna End of EUT)
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.14 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.0 °C
Date Tested: July 2, 2002



Hop-On Wireless Inc. FCC ID: QHOHPN1600

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.96$ mho/m $\varepsilon_r = 55.4$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 0.422 mW/g, SAR (10g): 0.253 mW/g

Body SAR - Front of EUT - 0.0cm Separation Distance
(Keypad Side of EUT)
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.13 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.0 °C
Date Tested: July 2, 2002



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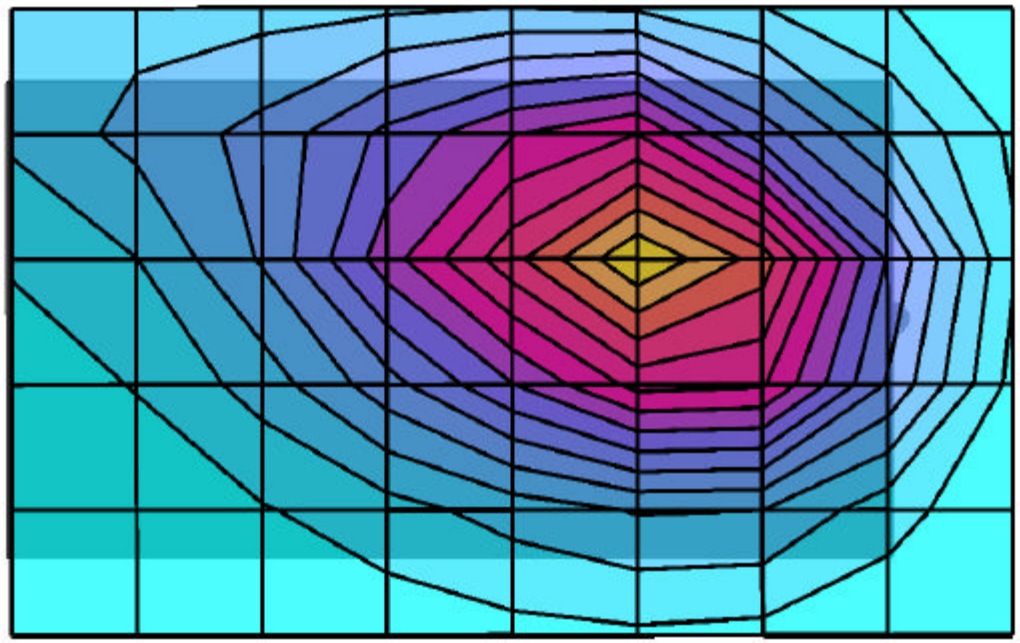
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 0.574 mW/g, SAR (10g): 0.369 mW/g

Body SAR - Back of EUT - 0.0cm Separation Distance
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.12 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.4 °C
Date Tested: July 2, 2002



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SAM Phantom; Flat Section
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
835 MHz Muscle: σ = 0.96 mho/m ε_r = 55.4 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

Body SAR - Back of EUT - 0.0cm Separation Distance
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.12 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.4 °C
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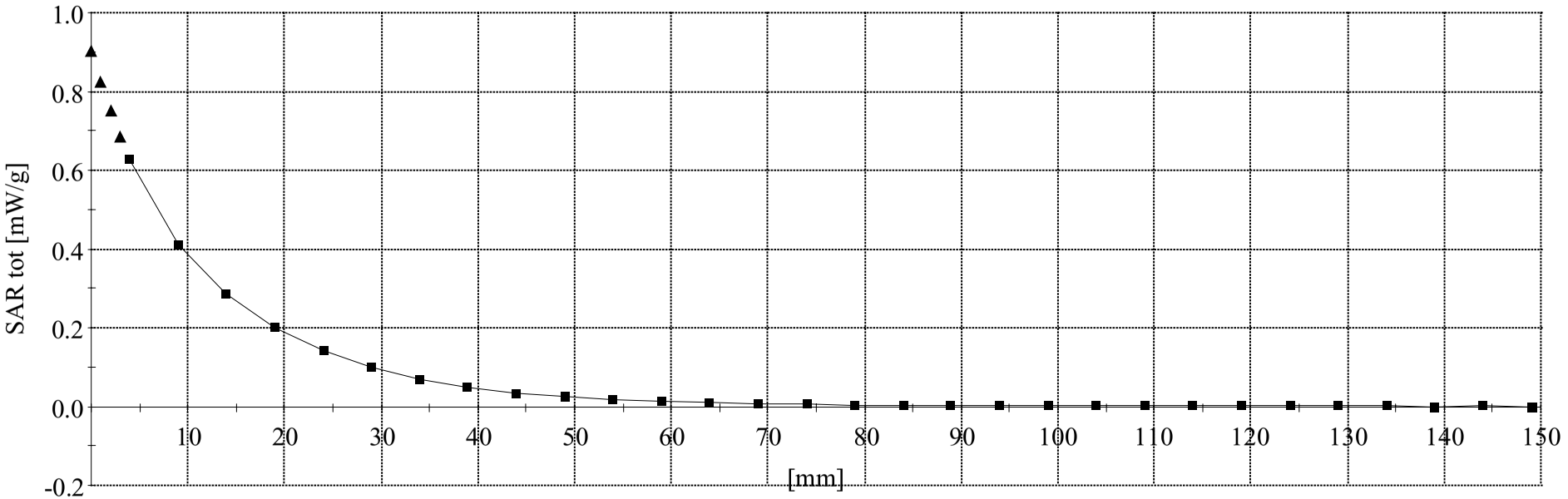

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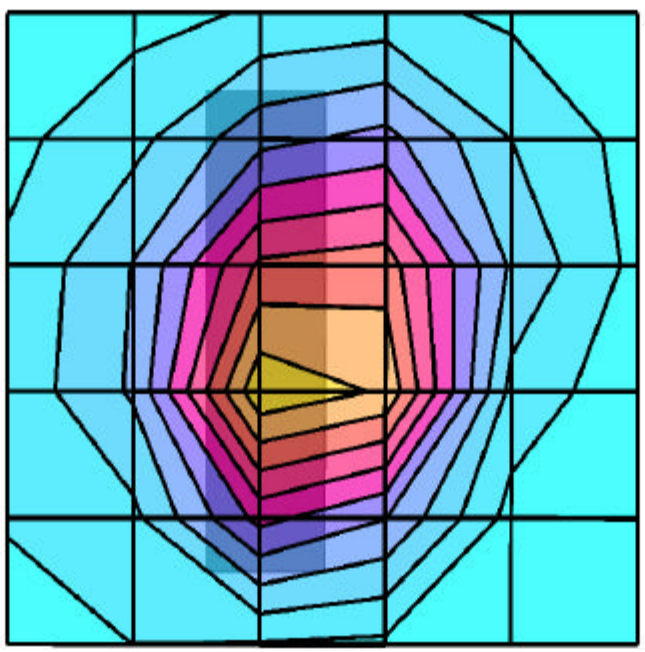
835 MHz Muscle: $\sigma = 0.96$ mho/m $\varepsilon_r = 55.4$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (10g): 0.0304 mW/g

Hand SAR - Top End of EUT - 0.0cm Separation Distance
(Antenna End of EUT)
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.14 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.0 °C
Date Tested: July 2, 2002



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SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
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Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (10g): 0.253 mW/g

Hand SAR - Front of EUT - 0.0cm Separation Distance
(Keypad Side of EUT)
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.13 dBm
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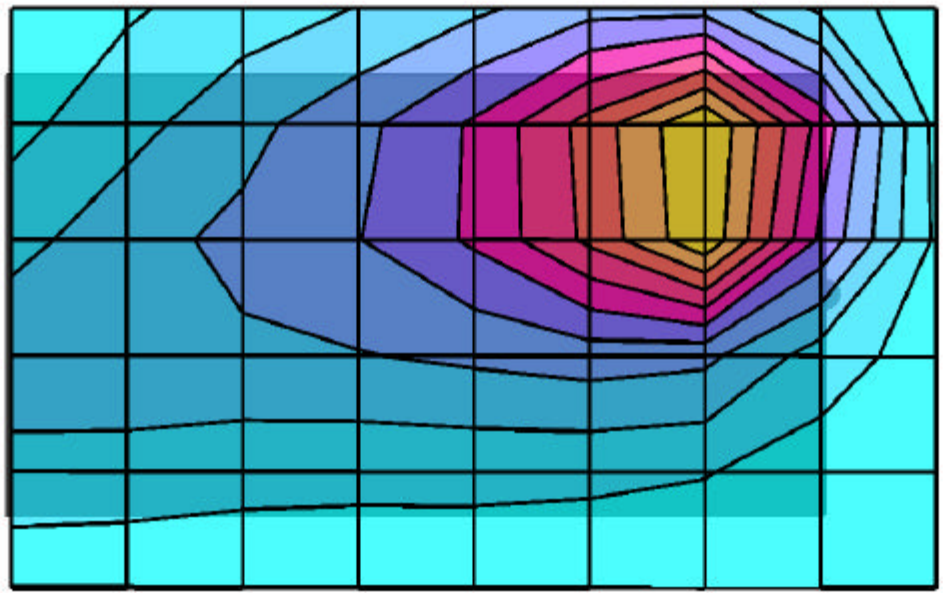
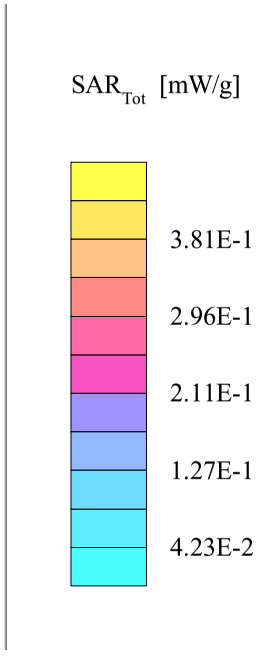
Date Tested: July 2, 2002

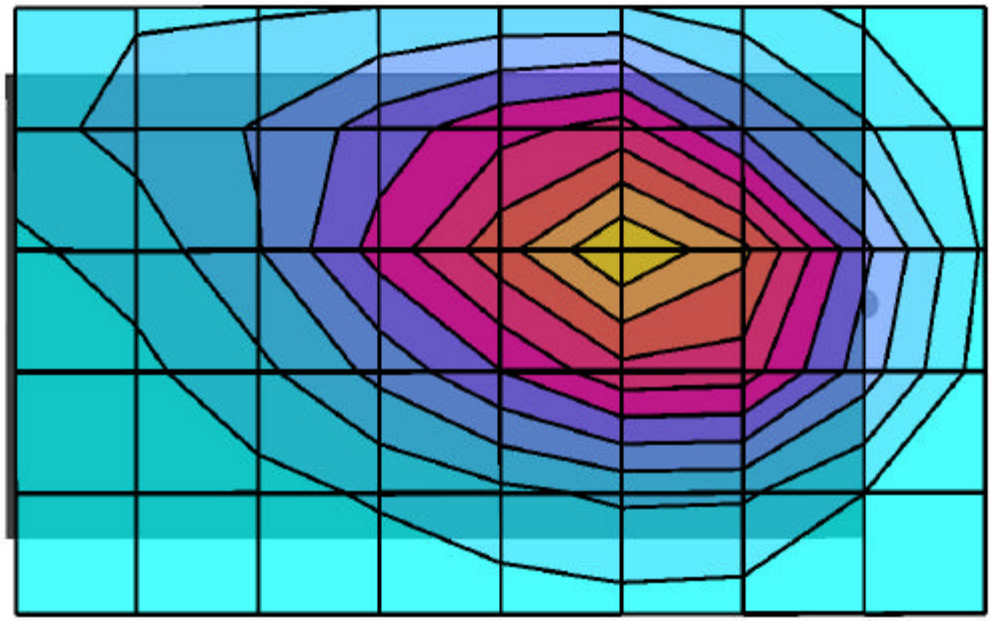


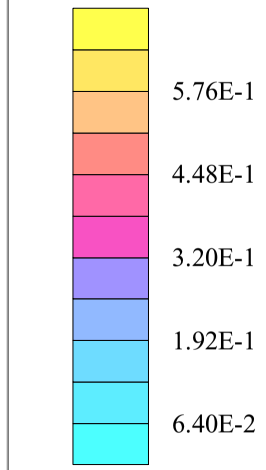


Hop-On Wireless Inc. FCC ID: QHOHPN1600

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.96$ mho/m $\varepsilon_r = 55.4$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (10g): 0.369 mW/g

Hand SAR - Back of EUT - 0.0cm Separation Distance
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.12 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.4 °C
Date Tested: July 2, 2002



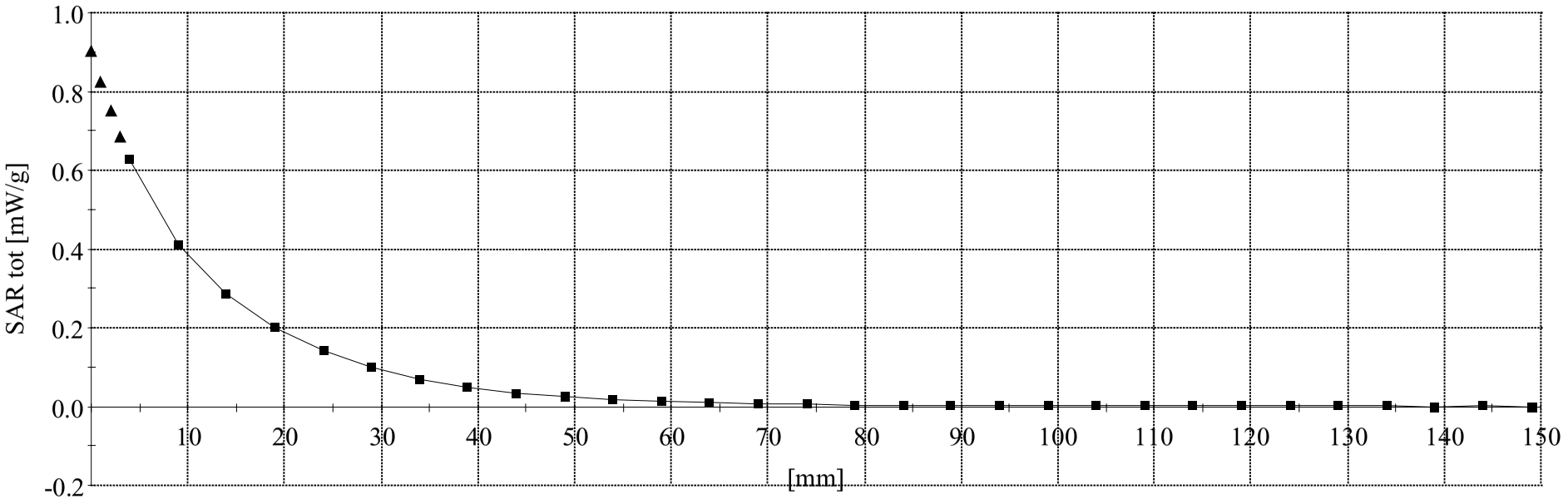


Hop-On Wireless Inc. FCC ID: QHOHPN1600

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1387; ConvF(6.30,6.30,6.30); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.96$ mho/m $\varepsilon_r = 55.4$ $\rho = 1.00$ g/cm^3

Z-Axis Extrapolation at Peak SAR Location

Hand SAR - Back of EUT - 0.0cm Separation Distance
Cellular CDMA Phone Model: HPN1600
CDMA Mode
Channel 363 [835.89 MHz]
Conducted Power: 23.12 dBm
Ambient Temp. 23.9 °C; Fluid Temp. 23.4 °C
Date Tested: July 2, 2002



APPENDIX B - SYSTEM VALIDATION

Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(6.60,6.60,6.60); Crest factor: 1.0; 900 MHz Brain: $\sigma = 0.96$ mho/m $\varepsilon_r = 40.0$ $\rho = 1.00$ g/cm^3

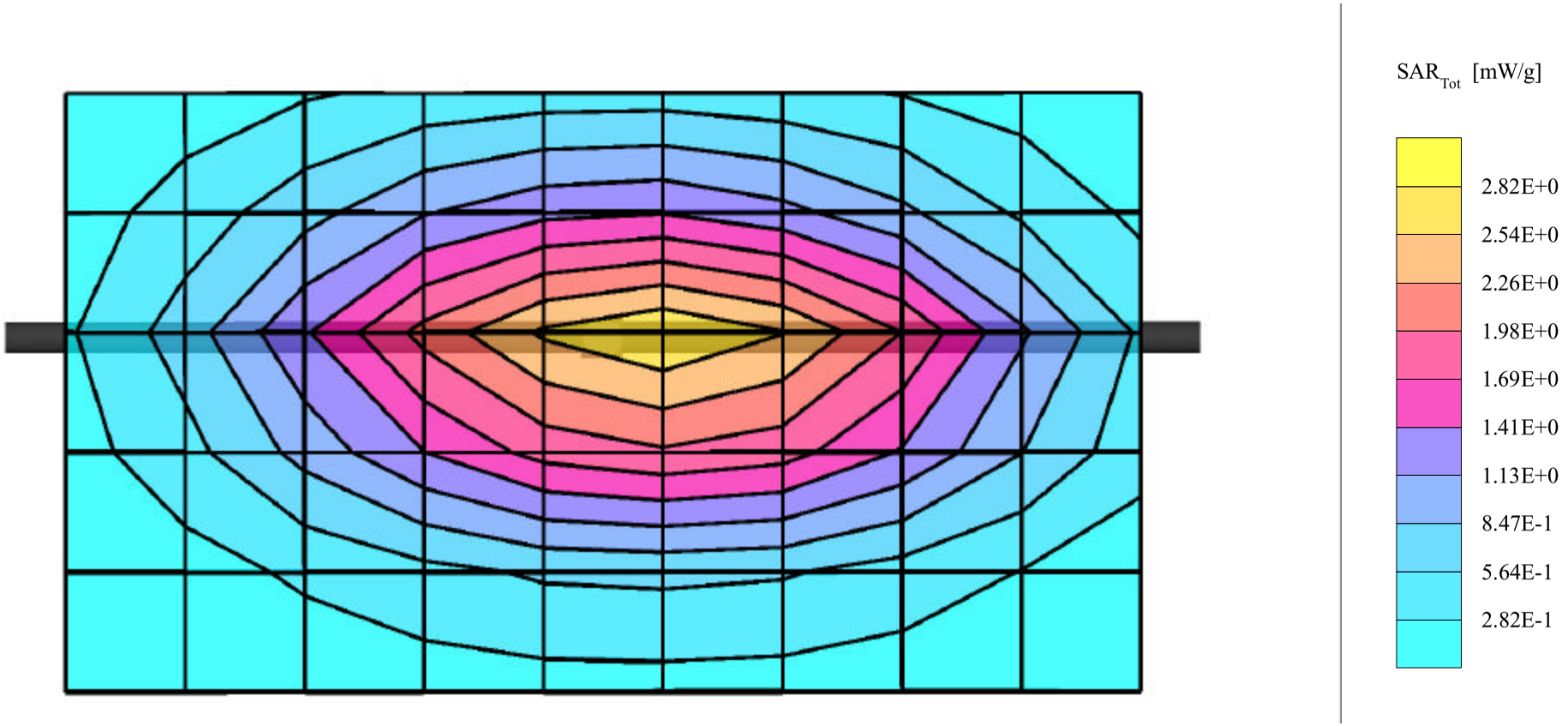
Cube 5x5x7: Peak: 4.50 mW/g, SAR (1g): 2.71 mW/g, SAR (10g): 1.68 mW/g, (Worst-case extrapolation)

Penetration depth: 10.9 (9.7, 12.7) [mm]; Ambient Temp: 23.9°C; Fluid Temp: 23.0°C

Powerdrift: -0.04 dB

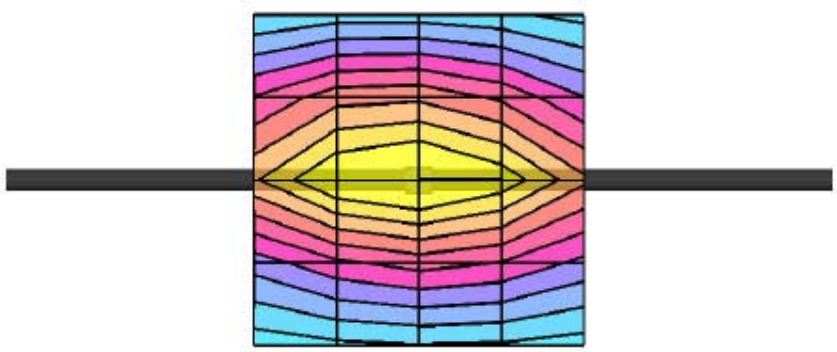
900MHz System Validation

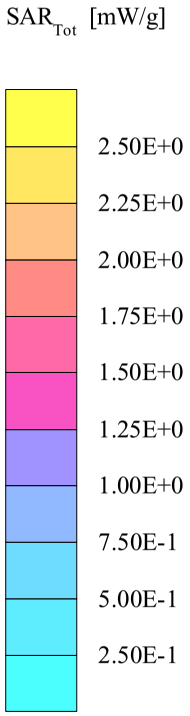
Validation Date: July 02, 2002



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





APPENDIX C - PROBE CALIBRATION

Schmid & Partner
Engineering AG

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

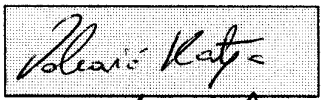
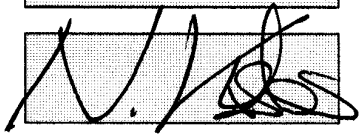
Calibration Certificate

Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1387**
Place of Calibration:	**Zurich**
Date of Calibration:	**February 22, 2002**
Calibration Interval:	**12 months**

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:	
Approved by:	

Probe ET3DV6

SN:1387

Manufactured:	September 21, 1999
Last calibration:	September 22, 1999
Recalibrated:	February 22, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space

Diode Compression

NormX	**1.58** $\mu V/(V/m)^2$		DCP X	**97**	mV
NormY	**1.67** $\mu V/(V/m)^2$		DCP Y	**97**	mV
NormZ	**1.67** $\mu V/(V/m)^2$		DCP Z	**97**	mV

Sensitivity in Tissue Simulating Liquid

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

ConvF X	**6.6** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.6** ± 9.5% (k=2)		Alpha	**0.40**
ConvF Z	**6.6** ± 9.5% (k=2)		Depth	**2.38**

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

ConvF X	**5.4** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**5.4** ± 9.5% (k=2)		Alpha	**0.57**
ConvF Z	**5.4** ± 9.5% (k=2)		Depth	**2.18**

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	9.7	5.4
SAR_{be} [%]	With Correction Algorithm	0.3	0.6

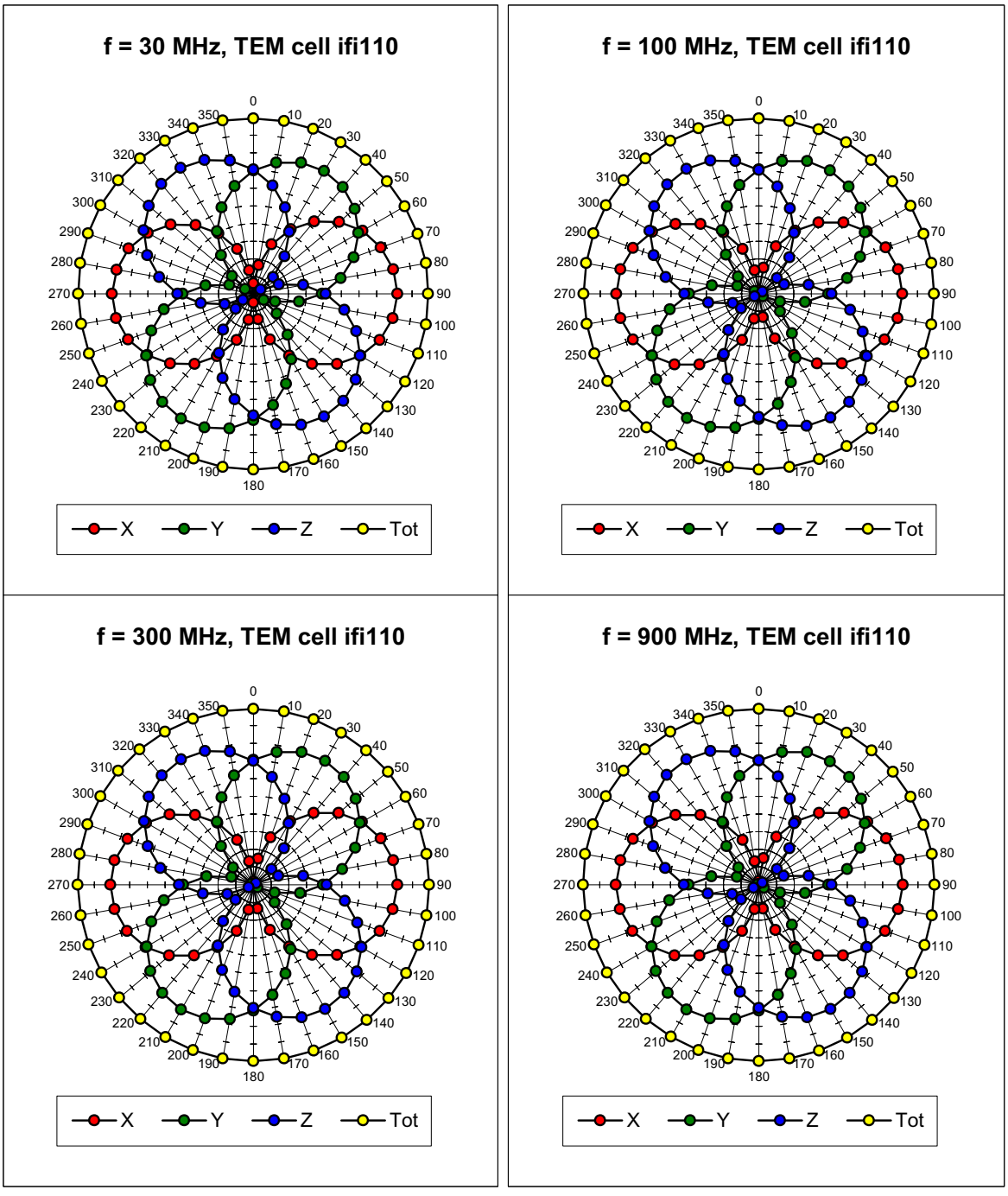
Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

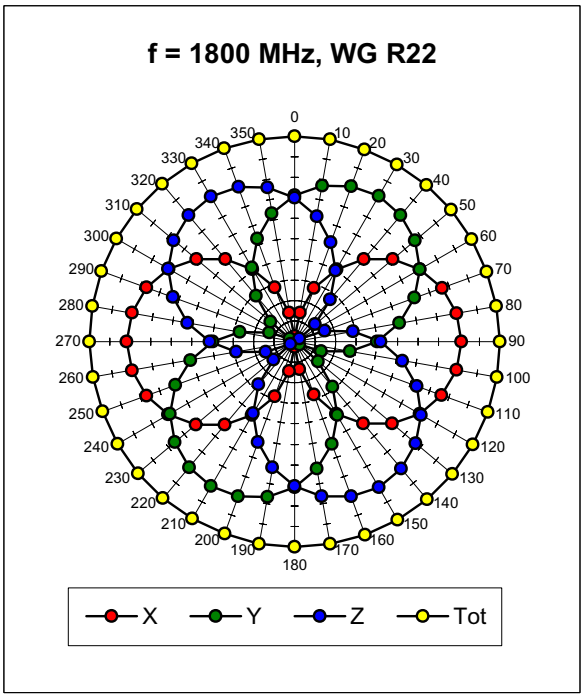
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	11.5	7.3
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

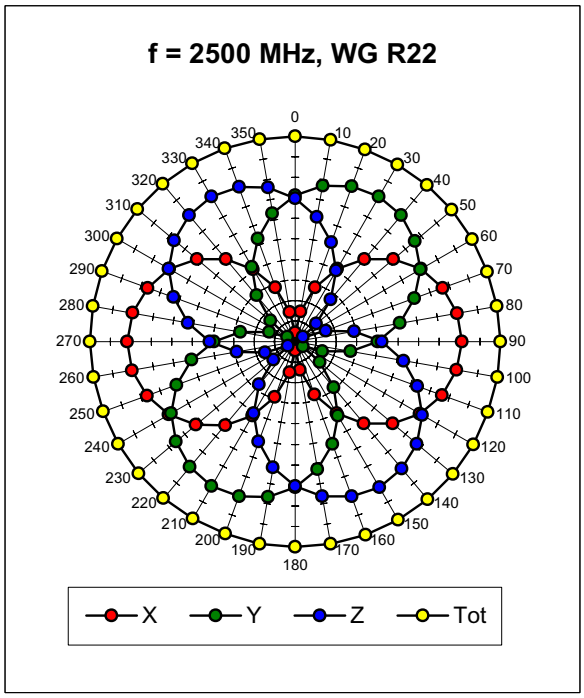
Sensor Offset

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

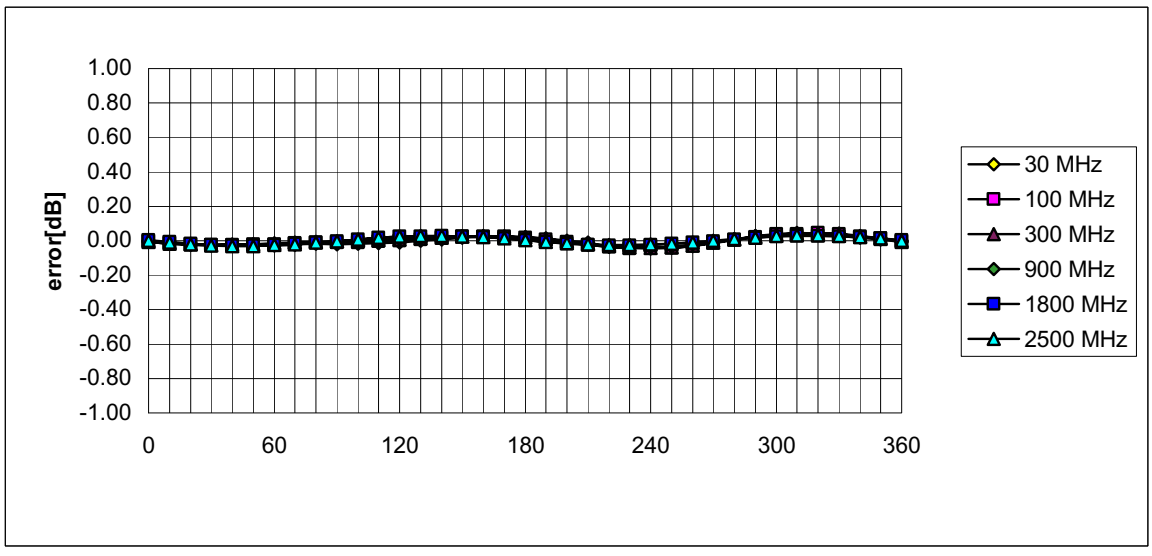
Receiving Pattern (ϕ , θ = 0°





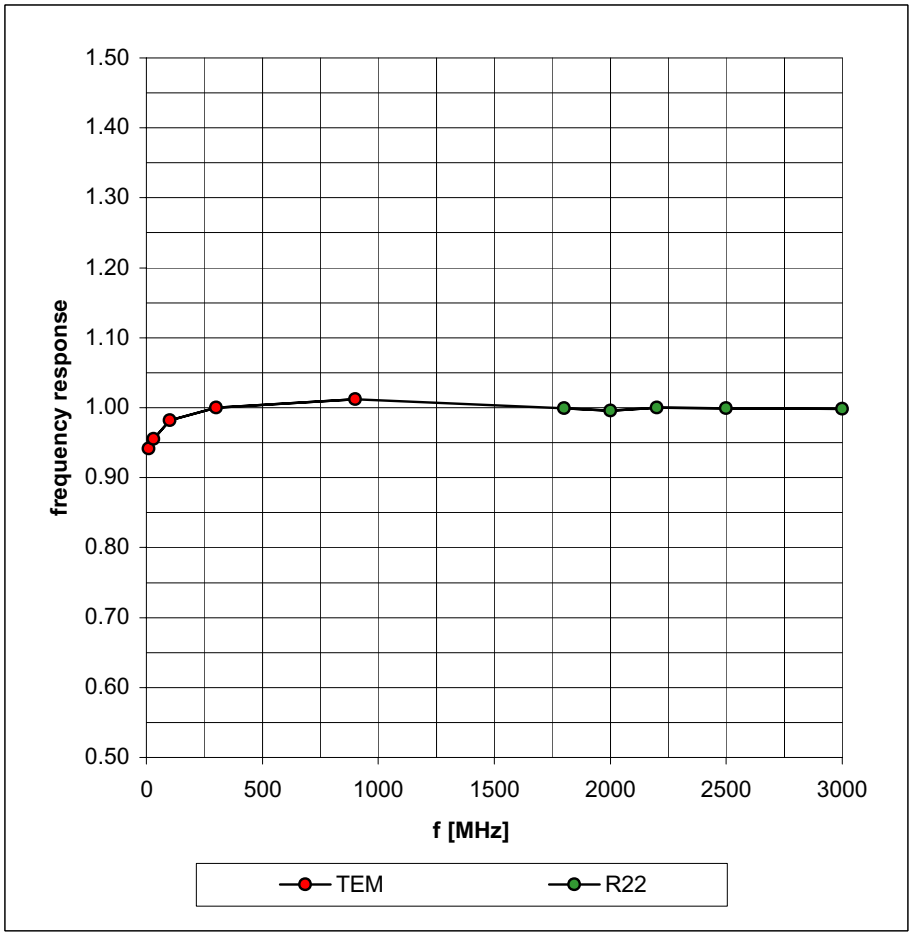


Isotropy Error (ϕ), θ = 0°



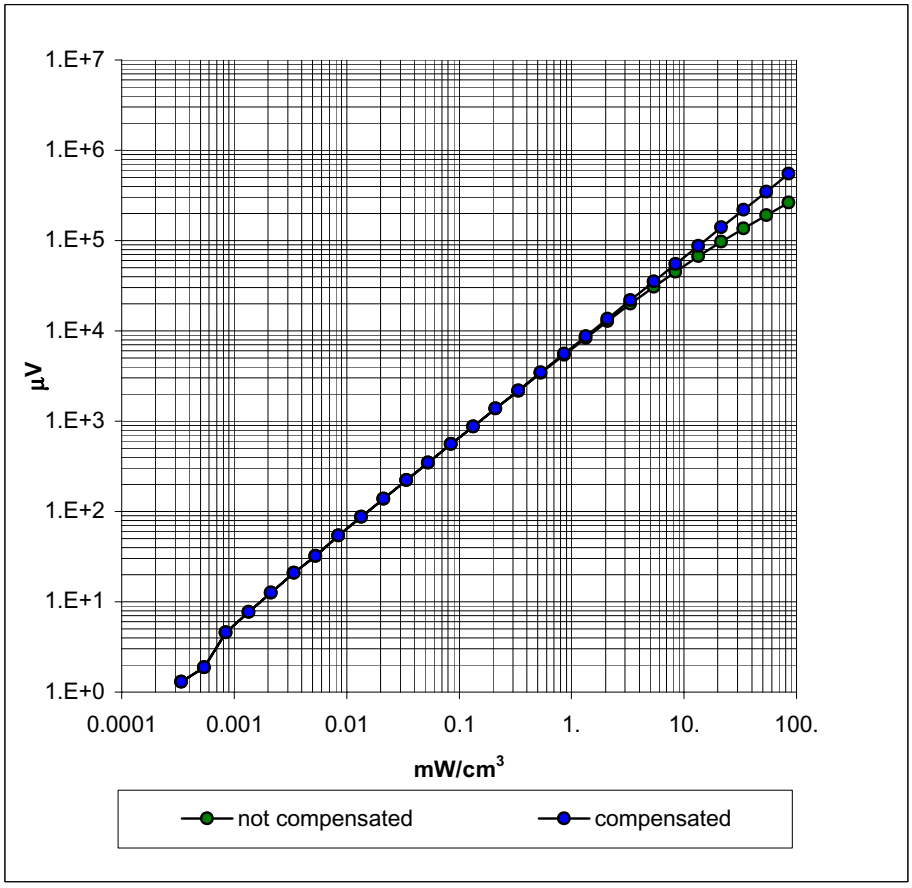
Frequency Response of E-Field

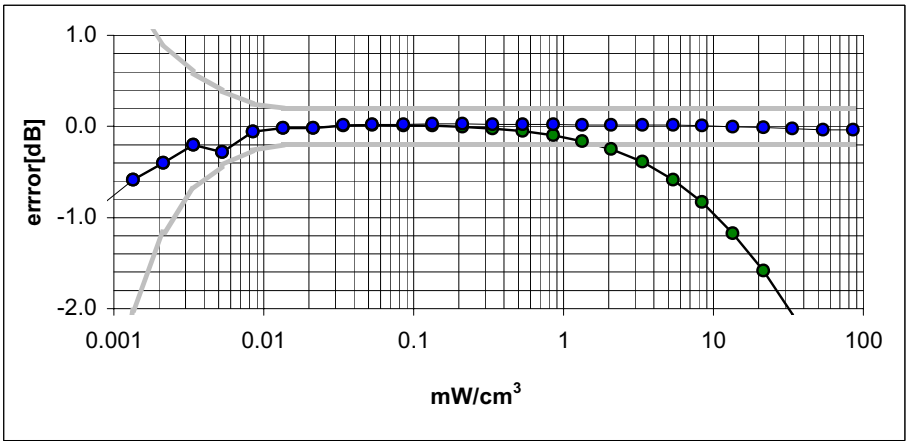
(TEM-Cell:ifi110, Waveguide R22)



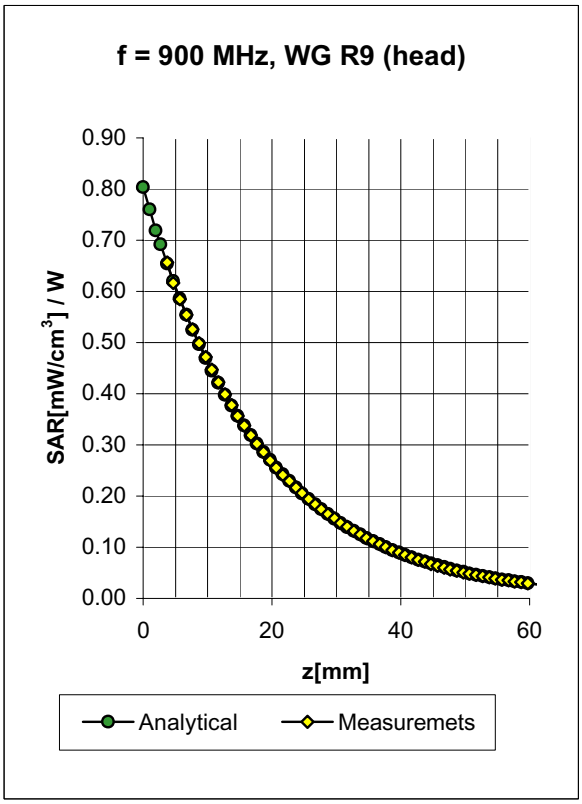
Dynamic Range f(SAR_{brain})

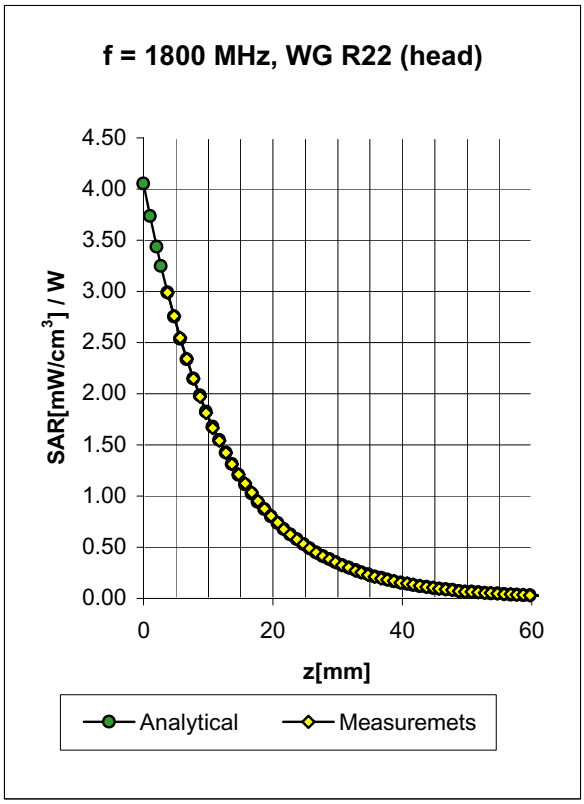
(Waveguide R22)





Conversion Factor Assessment



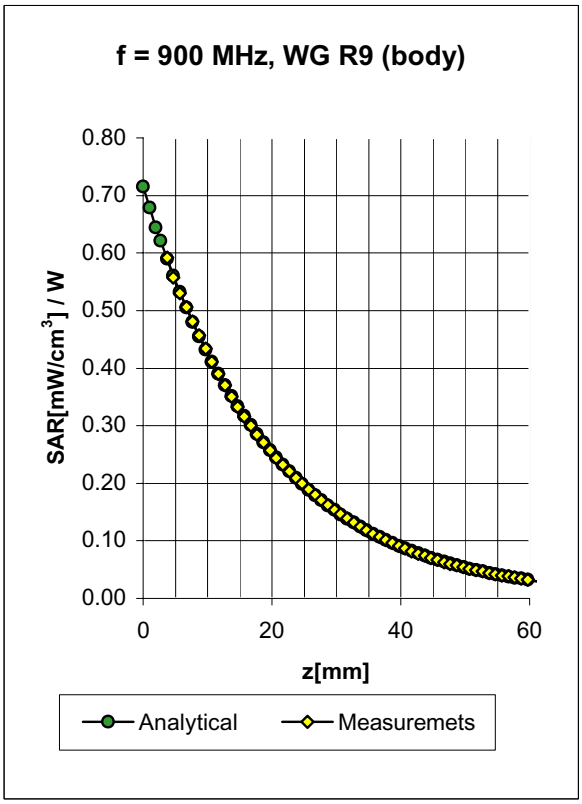


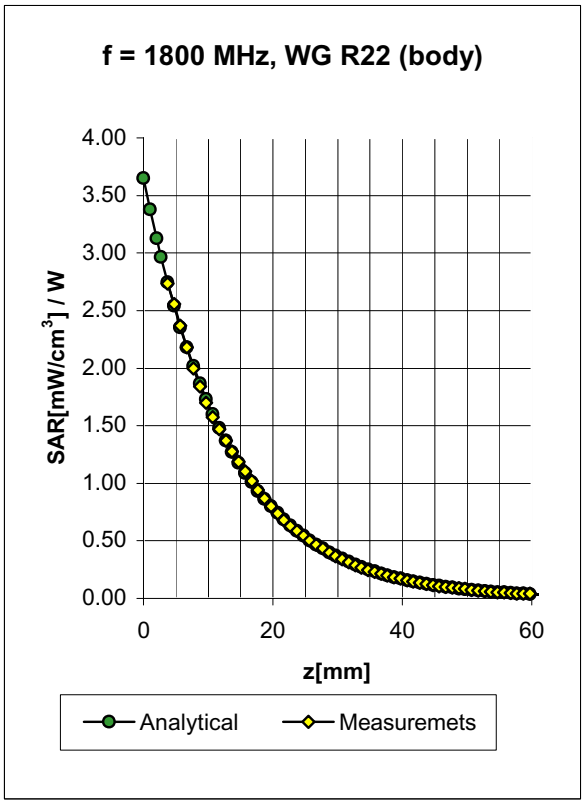
Head	**900 MHz**		**ε_r = 41.5 ± 5%**	**σ = 0.97 ± 5% mho/m**	
Head	**835 MHz**		**ε_r = 41.5 ± 5%**	**σ = 0.90 ± 5% mho/m**	
	ConvF X	**6.6** ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**6.6** ± 9.5% (k=2)		Alpha	**0.40**
	ConvF Z	**6.6** ± 9.5% (k=2)		Depth	**2.38**

Head	**1800 MHz**		**ε_r = 40.0 ± 5%**	**σ = 1.40 ± 5% mho/m**	
Head	**1900 MHz**		**ε_r = 40.0 ± 5%**	**σ = 1.40 ± 5% mho/m**	
	ConvF X	**5.4** ± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**5.4** ± 9.5% (k=2)		Alpha	**0.57**
	ConvF Z	**5.4** ± 9.5% (k=2)		Depth	**2.18**

ET3DV6 SN:1387 **February 22, 2002**

Conversion Factor Assessment





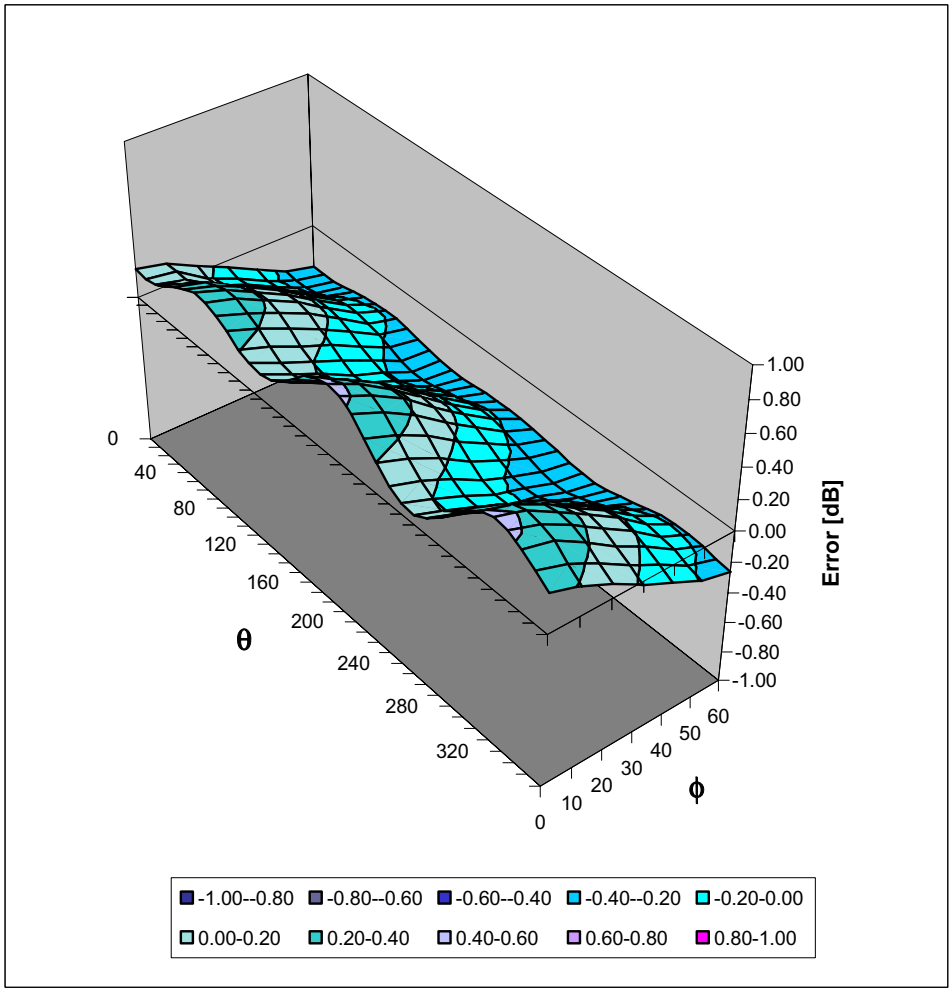
Body	**900 MHz**	ε_r **= 55.0 ± 5%**	**σ = 1.05 ± 5% mho/m**	
Body	**835 MHz**	ε_r **= 55.2 ± 5%**	**σ = 0.97 ± 5% mho/m**	
	ConvF X	**6.3** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.3** ± 9.5% (k=2)	Alpha	**0.42**
	ConvF Z	**6.3** ± 9.5% (k=2)	Depth	**2.44**

Body	**1800 MHz**	ε_r **= 53.3 ± 5%**	**σ = 1.52 ± 5% mho/m**	
Body	**1900 MHz**	ε_r **= 53.3 ± 5%**	**σ = 1.52 ± 5% mho/m**	
	ConvF X	**5.0** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.0** ± 9.5% (k=2)	Alpha	**0.76**
	ConvF Z	**5.0** ± 9.5% (k=2)	Depth	**2.01**

ET3DV6 SN:1387 **February 22, 2002**

Deviation from Isotropy in HSL

Error ($\theta\phi$), f = 900 MHz



Schmid & Partner
Engineering AG

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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1387**
Place of Assessment:	**Zurich**
Date of Assessment:	**February 25, 2002**
Probe Calibration Date:	**February 22, 2002**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:

Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion Factor (± standard deviation)

150 MHz	ConvF	**9.2 ± 8%**	**ε_r = 52.3** **σ = 0.76 mho/m** (head tissue)
300 MHz	ConvF	**8.0 ± 8%**	**ε_r = 45.3** **σ = 0.87 mho/m** (head tissue)
450 MHz	ConvF	**7.3 ± 8%**	**ε_r = 43.5** **σ = 0.87 mho/m** (head tissue)
2450 MHz	ConvF	**4.7 ± 8%**	**ε_r = 39.2** **σ = 1.80 mho/m** (head tissue)
150 MHz	ConvF	**8.8 ± 8%**	**ε_r = 61.9** **σ = 0.80 mho/m** (body tissue)
450 MHz	ConvF	**7.7 ± 8%**	**ε_r = 56.7** **σ = 0.94 mho/m** (body tissue)
2450 MHz	ConvF	**4.3 ± 8%**	**ε_r = 52.7** **σ = 1.95 mho/m** (body tissue)

APPENDIX D - MEASURED FLUID DIELECTRIC PARAMETERS

900MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

July 02, 2002

Frequency	e'	e"
750.000000 MHz	41.8576	19.8570
760.000000 MHz	41.6912	19.8146
770.000000 MHz	41.5750	19.7723
780.000000 MHz	41.4344	19.7490
790.000000 MHz	41.3164	19.7100
800.000000 MHz	41.1896	19.6638
810.000000 MHz	41.0957	19.6051
820.000000 MHz	40.9794	19.5699
830.000000 MHz	40.8334	19.5283
840.000000 MHz	40.7028	19.4894
850.000000 MHz	40.5650	19.4851
860.000000 MHz	40.4398	19.4371
870.000000 MHz	40.2860	19.4192
880.000000 MHz	40.1951	19.3947
890.000000 MHz	40.0810	19.3479
900.000000 MHz	40.0027	19.2774
910.000000 MHz	39.8876	19.2240
920.000000 MHz	39.7861	19.1731
930.000000 MHz	39.6658	19.1629
940.000000 MHz	39.5471	19.1150
950.000000 MHz	39.4370	19.0849

835MHz EUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

July 02, 2002

Frequency	e'	e''
750.000000 MHz	56.2781	21.1506
755.000000 MHz	56.2176	21.1115
760.000000 MHz	56.1767	21.1257
765.000000 MHz	56.1007	21.0689
770.000000 MHz	56.0754	21.0186
775.000000 MHz	55.9919	21.0010
780.000000 MHz	55.9448	20.9827
785.000000 MHz	55.9127	20.9708
790.000000 MHz	55.8780	20.9483
795.000000 MHz	55.8377	20.9395
800.000000 MHz	55.7939	20.8861
805.000000 MHz	55.7538	20.8719
810.000000 MHz	55.7301	20.8062
815.000000 MHz	55.6346	20.7901
820.000000 MHz	55.6192	20.7730
825.000000 MHz	55.5733	20.7168
830.000000 MHz	55.4945	20.6902
835.000000 MHz	55.4391	20.6775
840.000000 MHz	55.3907	20.6513
845.000000 MHz	55.3374	20.6383
850.000000 MHz	55.2971	20.5987
855.000000 MHz	55.2231	20.5832
860.000000 MHz	55.1657	20.5508
865.000000 MHz	55.1522	20.5452
870.000000 MHz	55.0665	20.5460
875.000000 MHz	55.0158	20.5227
880.000000 MHz	54.9846	20.4919
885.000000 MHz	54.9191	20.5070
890.000000 MHz	54.8860	20.4668
895.000000 MHz	54.8783	20.3956
900.000000 MHz	54.8421	20.3837
905.000000 MHz	54.7886	20.3788
910.000000 MHz	54.7432	20.3395
915.000000 MHz	54.6953	20.3432
920.000000 MHz	54.6482	20.3207

APPENDIX E - SAM PHANTOM CERTIFICATE OF CONFORMITY

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

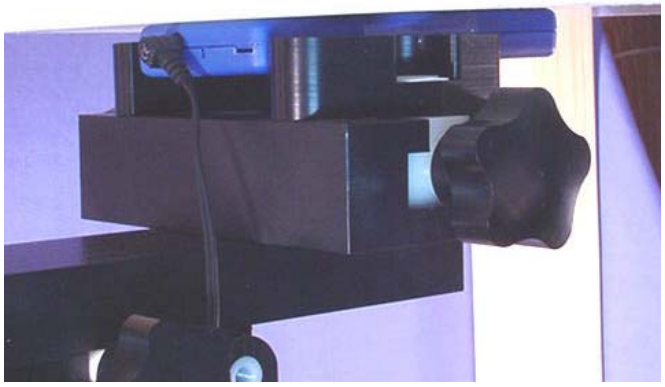
APPENDIX F - SAR TEST SETUP PHOTOGRAPHS

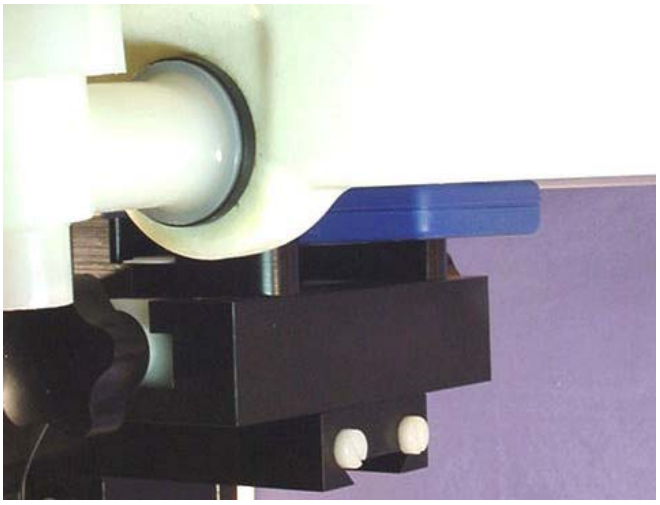
SAR TEST SETUP PHOTOGRAPHS

Top End of EUT (Antenna Side)
0.0 cm Separation Distance

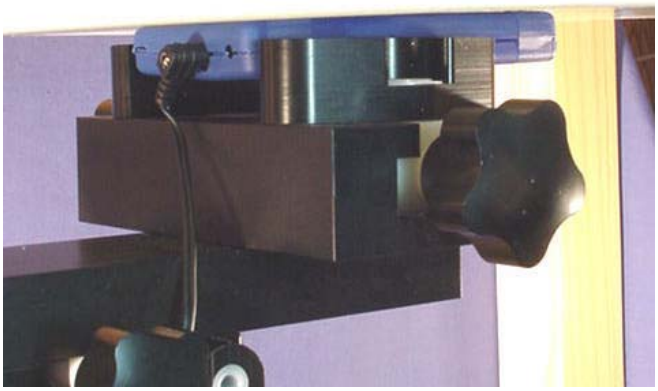
SAR TEST SETUP PHOTOGRAPHS

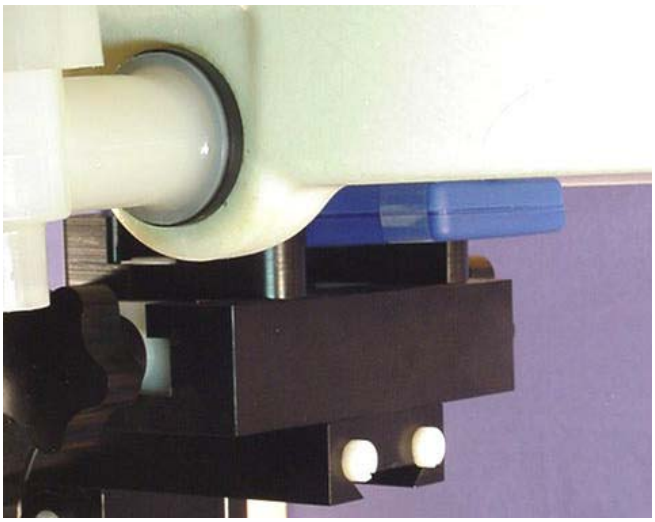
Front of EUT (Keypad Side)
0.0 cm Separation Distance





SAR TEST SETUP PHOTOGRAPHS
Back of EUT
0.0 cm Separation Distance





APPENDIX G - EUT PHOTOGRAPHS

EUT PHOTOGRAPHS