Exhibit 11: SAR Test Report IHDT5DA1

Date of test:	22-May-03
Date of Report:	18-June-03
Laboratory:	Motorola Personal Communications Sector Product Safety & Compliance Laboratory 600 N. US Highway 45 Room: MW113 Libertyville, Illinois 60048
Test Responsible:	Steven Hauswirth Principal Staff Engineer
Accreditation:	This laboratory is accredited to ISO/IEC 17025-1999 to perform the following tests:

Tests:	Procedures:
Electromagnetic Specific Absorption Rate (SAR)	ANSI/IEEE C95.1-1992, 1999 IEEE C95.3-1991 IEEE P1528 (*DRAFT*) FCC OET Bulletin 65 (*including Supplements A, B, C*) Australian Communications Authority Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 1999 CENELEC EN 50361 (2001)
Simulated Tissue Preparation	APP-0247
RF Power Measurement	DOI-0876, 0900, 0902, 0904, 0915

On the following products or types of products:
Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular,
Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers

A2LA certificate #1651-01

Statement of Compliance:

Motorola declares under its sole responsibility that portable cellular telephone FCC ID IHDT5DA1 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)

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.

Motorola encourages all feedback, both positive and negative, on this test report.

Table of Contents

References:

1. Introduction

The Motorola Personal Communications Sector Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone (FCC ID IHDT5DA1). The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with FCC OET Bulletin 65 Supplement C 01-01.

2. Description of the Device Under Test

Antenna description

Type	Helix	
Location	Right	
Dimensions	Length	25 mm
	Width	8 mm
Configuration	Stubby	

Device description

FCC ID Number	IHDT5DA1	
Serial number	42E3075C & 42E3075F	
Mode(s) of Operation	800 AMPS	800 CDMA
Modulation Mode(s)	AMPS	CDMA
Maximum Output Power Setting	26.80 dBm	25.00 dBm
Duty Cycle	1:1	1:1
Transmitting Frequency Rang(s)	824.04-848.97 MHz	824.70-848.31 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 Motorola Personal Communications Sector Product Safety & Compliance Laboratory utilizes a Dosimetric Assessment System (Dasy3™ v3.1d) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. All the SAR measurements are taken within a shielded enclosure. The overall RSS uncertainty of the measurement system is ±11.7% (K=1) with an expanded uncertainty of ±23.0% (K=2). The measurement uncertainty budget is given in Appendix 5. Per IEEE 1528, this uncertainty budget is applicable to the SAR range of 0.4 W/kg to 10 W/kg. The list of calibrated equipment used for the measurements is shown below.

Description	Serial Number	Cal Due Date
DASY3 DAE V1	SN398	17-Sep-03
E-Field Probe ET3DV6	SN1513	17-Jan-04
Dipole Validation Kit, D900V2	SN080	13-Nov-04
S.A.M. Phantom used for 800MHz	TP-1155	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04822	6-Feb-05
Power Meter E4419B	GB39511087	6-Feb-04
Power Sensor #1 - 8481A	US39210929	6-Feb-04
Power Sensor #2 - 8481A	US39210933	6-Feb-04
Network Analyzer HP8753ES	US39172529	18-Jun-03
Dielectric Probe Kit HP85070B	US99360070	N/A

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 HP85070 Dielectric Probe Kit These values, along with the temperature of the tissue simulate are shown in the table below. The recommended limits for maximum permittivity and minimum conductivity are also shown. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. 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)	Temp (°C)
835	**Body**	**Measured,** 22-May-03	54.7	0.98	20.8
		Recommended Limits	55.2	0.97	20-25

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

Ingredient	800MHz Head	800MHz Body	1900MHz Head	1900MHz Body
Sugar	57.0	44.9	--	30.80
DGBE	--	--	47.0	--
Water	40.45	53.06	52.8	68.91
Salt	1.45	0.94	0.2	0.29
HEC	1.0	1.0	--	--
Bact.	0.1	0.1	--	--

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 center 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 900MHz and/or 1800MHz. These frequencies are within 100MHz of the mid-band frequency of the test device. This is within the allowable window given in Supplement C 01-01 *Appendix D System Verification* section item #5. The test was conducted on the same days as the measurement of the DUT. Recommended limits for maximum permittivity, minimum conductivity are shown in the table below. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. The obtained results from the system accuracy verification are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The tissue stimulant depth was verified to be 15.0cm ±0.5cm. Z-axis scans showing the SAR penetration are also included in Appendix 1. SAR values are normalized to 1W forward power delivered to the dipole.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
900	**Measured,** 22-May-03	12.00	42.9	1.00	21	21.5
	Recommended Limits	11.40	40.3	0.95	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used for the system accuracy verification measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	SN1513	835	6.00	2 of 10

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 manually set to the proper channel, transmitter power level and transmit mode of operation. The phone was tested in the configurations stipulated in OET Bulletin 65 Supplement C 01-01. Motorola also followed the requirements in Supplement. C / Appendix D: SAR Measurement Procedures, section titled "*Devices Operating Next To A Person's Ear* ". These directions state "The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s)."

The DASY v3.1d SAR measurement system specified in section 3.1 was utilized within the intended operations as set by the SPEAG™ setup. The phone was positioned into the measurement configurations using the positioner supplied with the DASY 3.1d SAR measurement system. The measured dielectric constant of the material used for the positioner is less than 2.9 and the loss tangent is less than 0.02 (± 30%) at 850MHz. The default settings for the "coarse" and "cube" scans were chosen and use for measurements. The grid spacing of the course scan was set to 15cm as shown in the SAR plots included in appendix 2. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

The Cellular Phone (FCC ID IHDT5DA1) has the SNN5668 as the only available battery option. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

6.1 Body-Worn Test Results

The SAR results shown in table 5 are the maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is New SAR = Old SAR * 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test. The test conditions indicated as bold numbers in the following table are included in Appendix 2. Note that 800MHz digital mode SAR measurements were performed in accordance with OET Bulletin 65 Supplement C 01-01. All other test conditions measured lower SAR values than those included in Appendix 2.

A “flat” phantom was for the body-worn tests. This “flat” phantom is made out of 1” thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories’, testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

There are two Body-Worn Accessories available for this phone:
Leather Case P/N:VLJUP06 with Wishbone Belt Clip P/N:SYN8631A
Leather Case P/N:VLJUP06 with Universal Belt Clip P/N:SYN8763A

Both accessories were used for the SAR measurements. The following probe conversion factors were used on the E-Field probe(s) used for the body worn measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	SN1513	835	5.80	8 of 10

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn with Leather Case P/N:VLJUP06							
			Universal Belt Clip P/N:SYN8763A				Wishbone Belt Clip P/N:SYN8631A			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Analog 800MHz	Channel 991	26.94								
	Channel 384	26.74	**0.67**	**-0.02**	**0.67**	**20.8**	**0.287**	**0.09**	**0.29**	**20.8**
	Channel 799	26.83								
Digital 800MHz	Channel 1013	25.31								
	Channel 384	25.49	**0.29**	**0.24**	**0.29**	**20.8**	**0.569**	**-0.2**	**0.60**	**20.8**
	Channel 779	25.26								

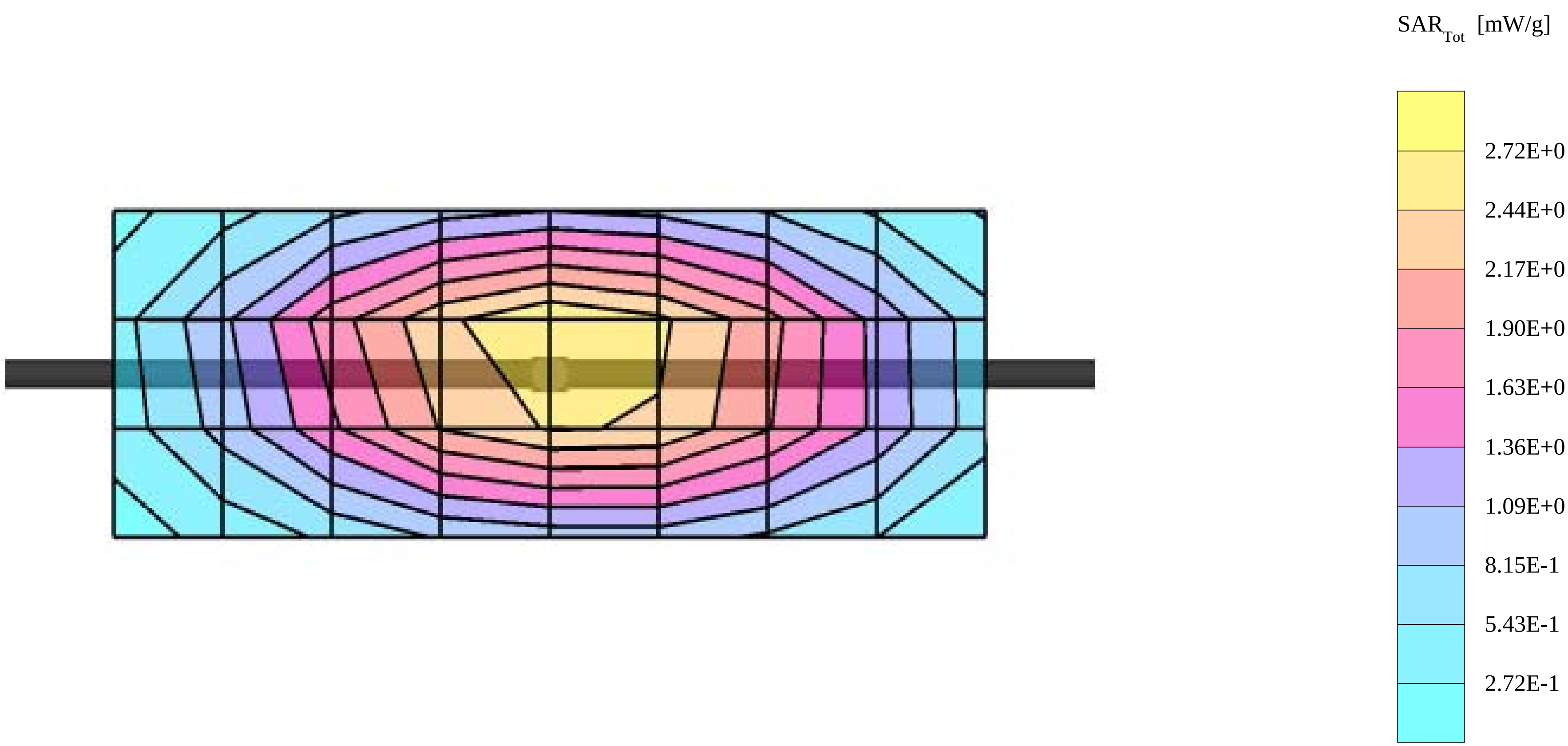
Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT5DA1 at highest possible output power. Measured against the body.

Appendix 1

SAR distribution comparison for the system accuracy verification

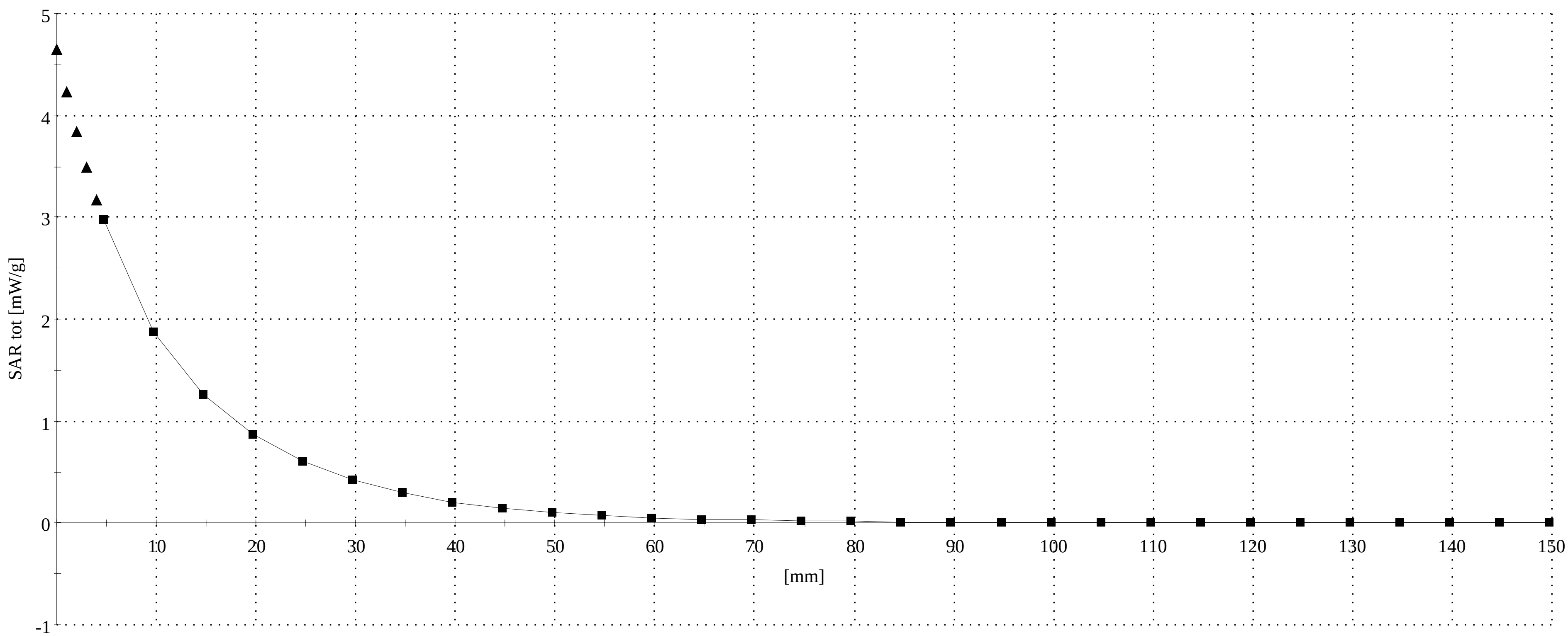
Dipole 900 MHz

900 MHz System Performance Check / Dipole Sn# 80
Forward Power = 249mW   Reflected Power = -21.4dB
Room Temp at time of measurement = 21   Simulant Temp at time of measurement = 21.5
R# 3 TP-1155 SAM SUGAR Expanded (Rev. 2)-9Jan03; Flat
Probe: ET3DV6 - SN1513 - Validation.2; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 900 MHz VALIDATION: σ = 1.00 mho/m ε_r = 42.9 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.74 mW/g ± 0.04 dB, SAR (1g): 2.99 mW/g ± 0.04 dB, SAR (10g): 1.88 mW/g ± 0.05 dB, (Worst-case extrapolation)
Penetration depth: 11.6 (10.7, 12.8) [mm]
Powerdrift: 0.01 dB



Dipole 900 MHz

900 MHz System Performance Check / Dipole Sn# 80
Forward Power = 249mW   Reflected Power = -21.4dB
Room Temp at time of measurement = 21   Simulant Temp at time of measurement = 21.5
R# 3 TP-1155 SAM SUGAR Expanded (Rev. 2)-9Jan03;
Probe: ET3DV6 - SN1513 - Validation.2; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 900 MHz VALIDATION: σ = 1.00 mho/m ϵ_r = 42.9 ρ = 1.00 g/cm^3
: , , ()
Penetration depth: 11.5 (10.6, 12.7) [mm]

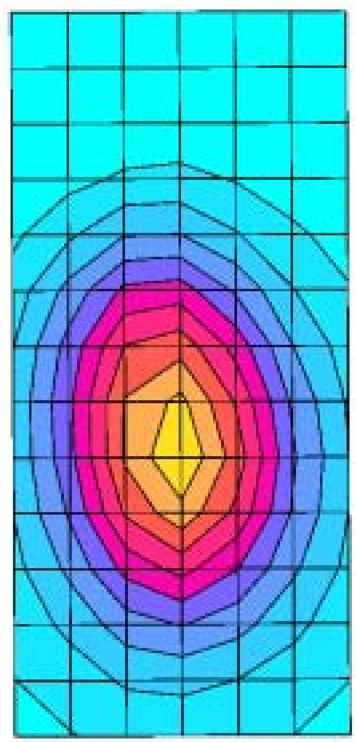


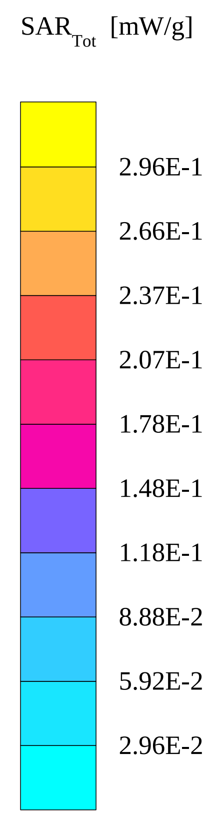
Appendix 2

SAR distribution plots for Body Worn Configuration

s/n: 42E3075F

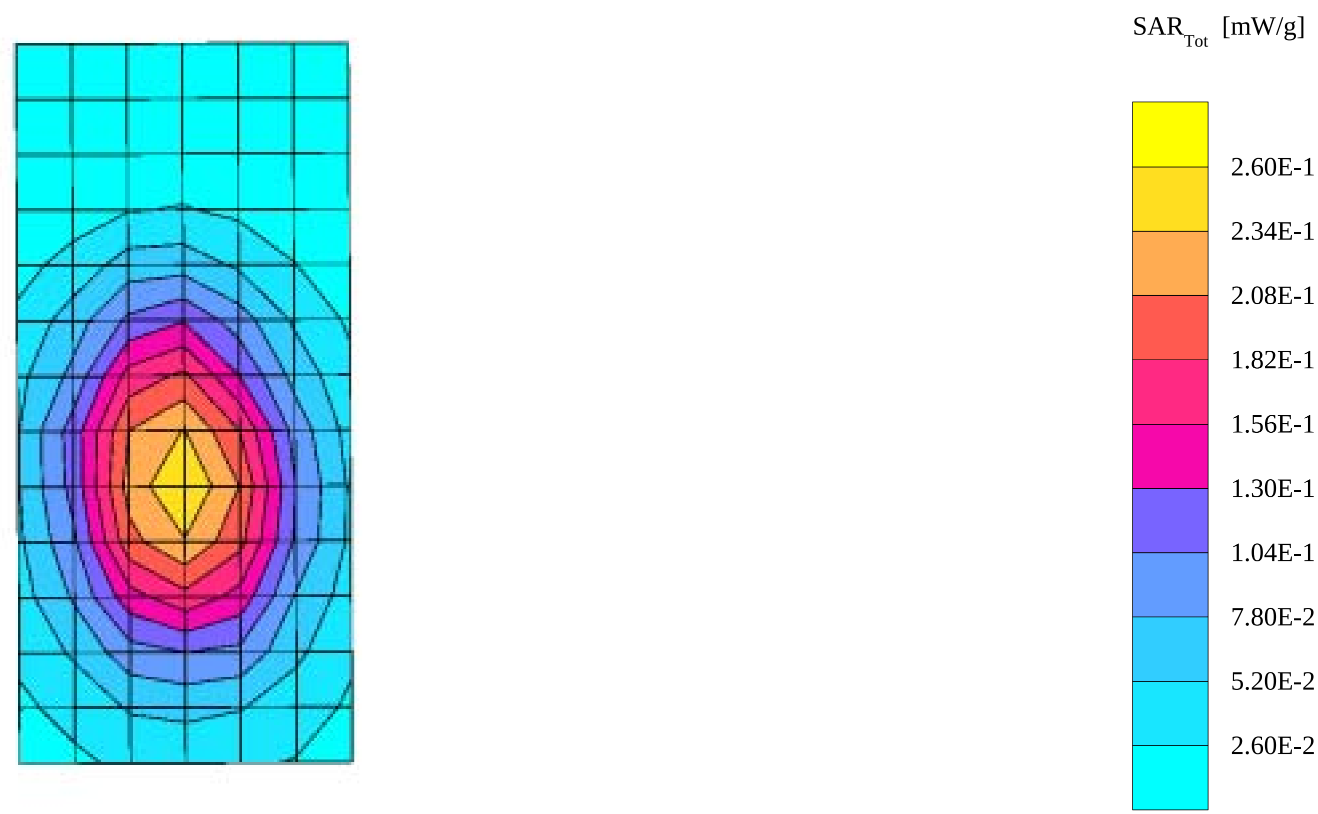
Ch# 384 / Pwr Step: 02 ota
Antenna Position: fxd
Type of Modulation: analog
Battery Model #: snn5668a
Accessory Model #: CEJUP11 Leather Pouch/Universal Clip
R3 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 837 MHz
Probe: ET3DV6 - SN1513 - FCC Body; ConvF(5.80,5.80,5.80); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 54.7 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.287 mW/g, SAR (10g): 0.208 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 17.2 (15.8, 18.6) [mm]
Powerdrift: 0.09 dB





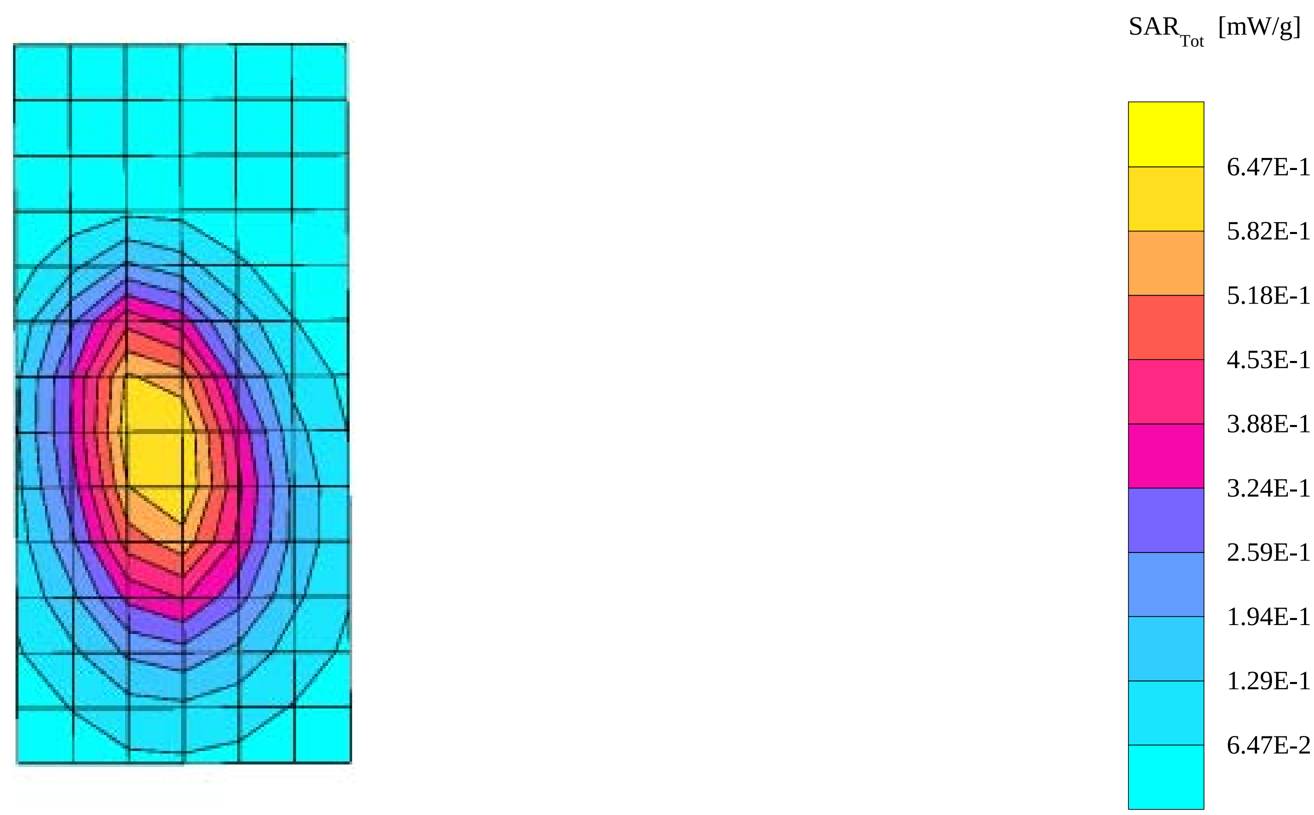
s/n: 42E3075C

Ch# 384 / Pwr Step: 02 ota
Antenna Position: fxd
Type of Modulation: CDMA
Battery Model #: snn5668a
Accessory Model #: CEJUP11 Leather Pouch/UNIV Clip
R3 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 837 MHz
Probe: ET3DV6 - SN1513 - FCC Body; ConvF(5.80,5.80,5.80); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 54.7 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.290 mW/g, SAR (10g): 0.204 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.8 (15.3, 18.4) [mm]
Powerdrift: 0.24 dB



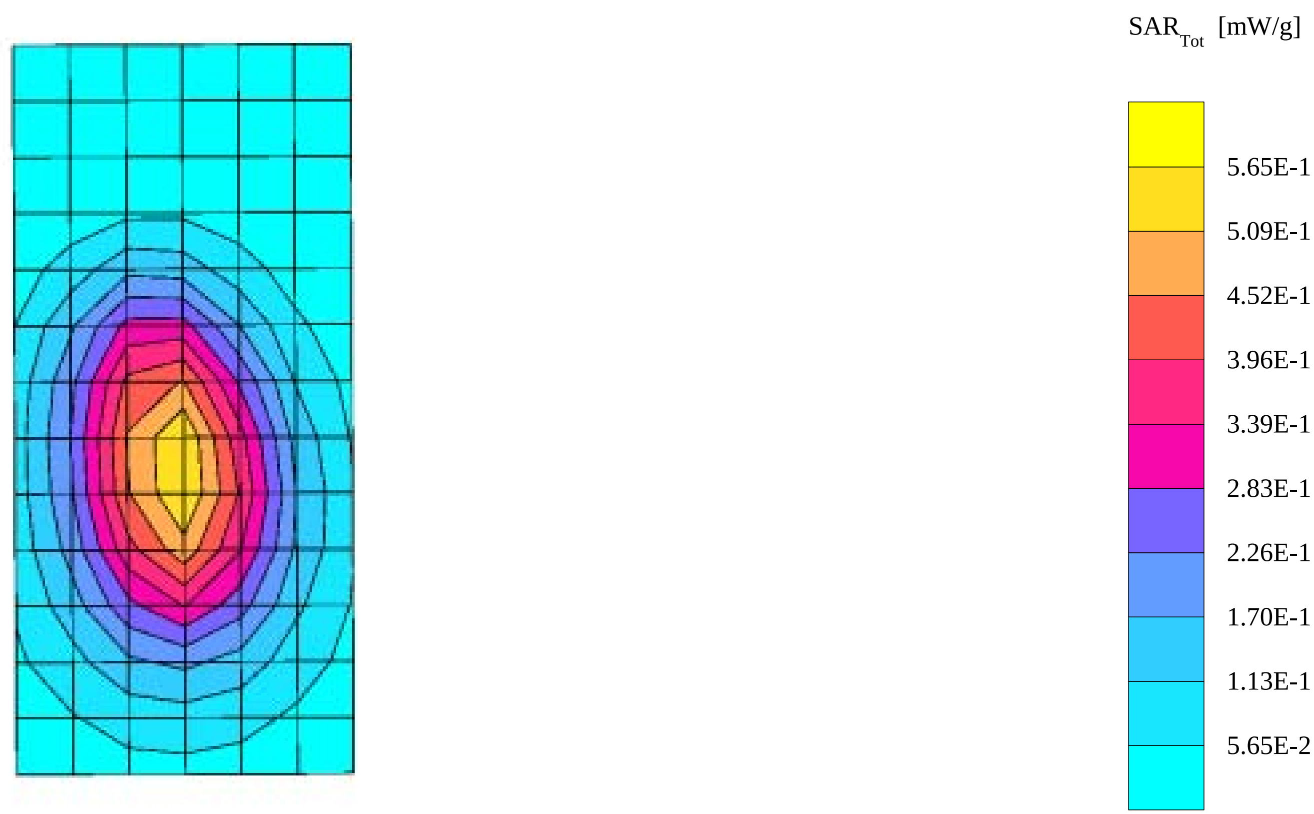
s/n: 42E3075F

Ch# 384 / Pwr Step: 02 ota Antenna Position: fxd
Type of Modulation: analog Battery Model #: snn5668a
Accessory Model #: CEJUP11 Leather Pouch/Wishbone Clip
R3 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 837 MHz
Probe: ET3DV6 - SN1513 - FCC Body; ConvF(5.80,5.80,5.80); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 54.7 ρ = 1.00 g/cm³
Cube 7x7x7: SAR (1g): 0.670 mW/g, SAR (10g): 0.475 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.3 (15.3, 17.4) [mm]
Powerdrift: -0.02 dB



s/n: 42E3075C

Ch# 384 / Pwr Step: 02 ota Antenna Position: fxd
Type of Modulation: CDMA Battery Model #: snn5668a
Accessory Model #: CEJUP11 Leather Pouch/WISHBONE Clip
R3 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 837 MHz
Probe: ET3DV6 - SN1513 - FCC Body; ConvF(5.80,5.80,5.80); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 54.7 ρ = 1.00 g/cm³
Cube 7x7x7: SAR (1g): 0.569 mW/g, SAR (10g): 0.400 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.3 (14.9, 17.8) [mm]
Powerdrift: -0.20 dB



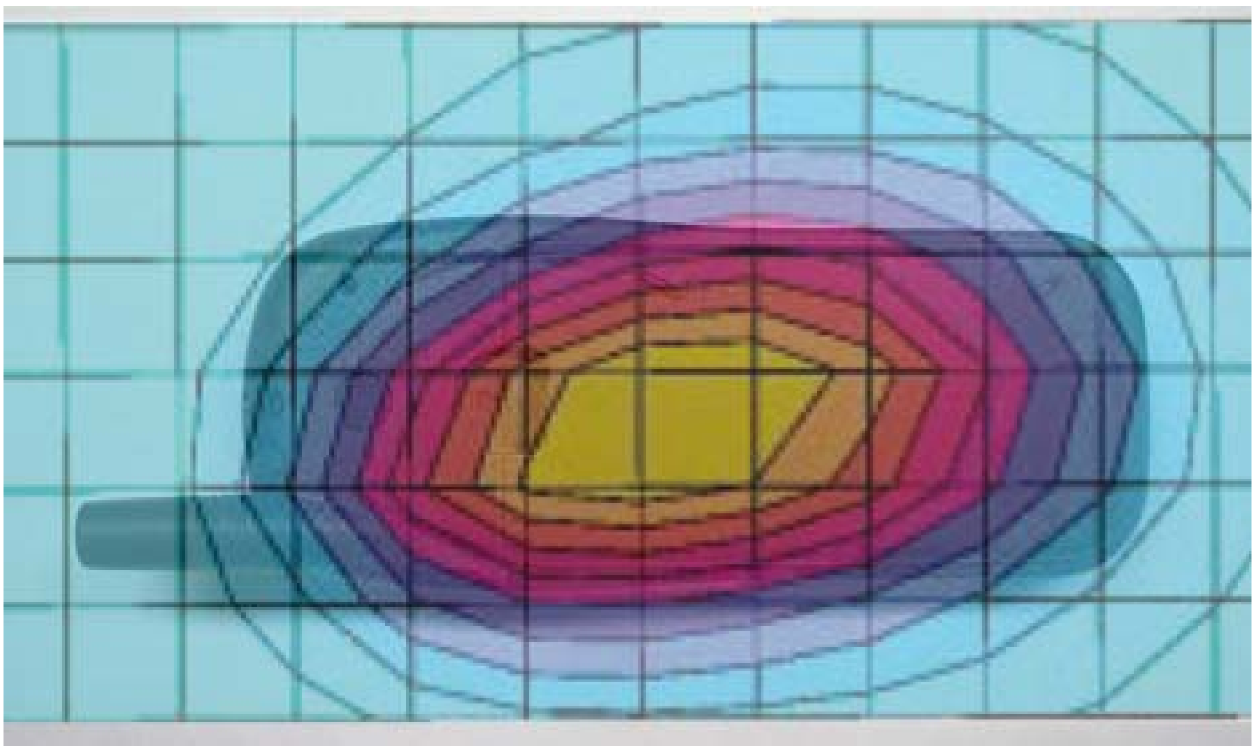


Figure 1.Typical 800 MHz Body-Worn Contour Overlaid on Phone

Appendix 3

Probe Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client Motorola MRO (Harvard)

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1513
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	January 17, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	8-Mar-02	Mar-03
Power sensor HP 8481A	MY41092180	18-Sep-02	Sep-03
Power meter EPM E4419B	GB41293874	13-Sep-02	Sep-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	D.Vetter
Approved by:	Katja Pokovic	Laboratory Director	Pokovic Katja

Date issued: January 17, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Schmid & Partner
Engineering AG

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

Probe ET3DV6R

SN:1513

Manufactured:	May 3, 2002
Last calibration:	May 8, 2002
Repaired:	December 16, 2002
Recalibrated:	January 17, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6R SN:1513

Sensitivity in Free Space

NormX	**2.21**	$\mu V/(V/m)^2$
NormY	**2.00**	$\mu V/(V/m)^2$
NormZ	**2.02**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**94**	mV
DCP Y	**94**	mV
DCP Z	**94**	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	**6.0**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.0**	± 9.5% (k=2)	Alpha	**0.56**
ConvF Z	**6.0**	± 9.5% (k=2)	Depth	**1.95**

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	**4.9**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.9**	± 9.5% (k=2)	Alpha	**0.50**
ConvF Z	**4.9**	± 9.5% (k=2)	Depth	**2.63**

Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	9.3	4.9
SAR_{be} [%]	With Correction Algorithm	0.2	0.4

Head 1800 MHz Typical SAR gradient: 10 % per mm

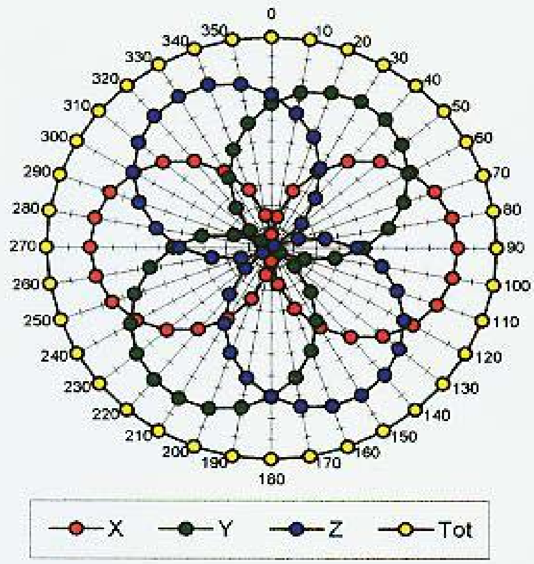
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	13.9	9.3
SAR_{be} [%]	With Correction Algorithm	0.2	0.1

Sensor Offset

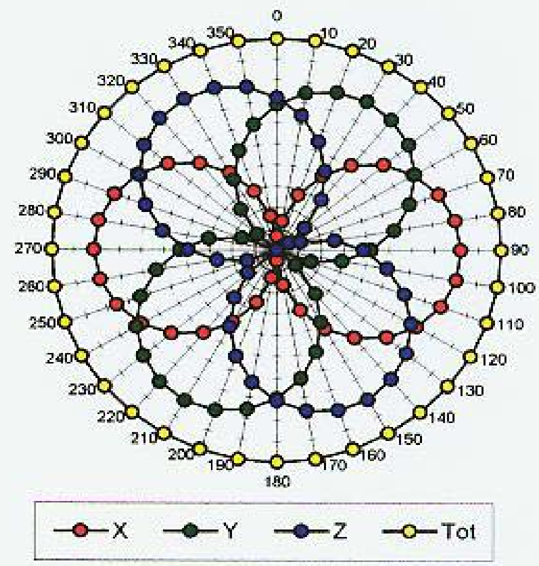
Probe Tip to Sensor Center	**2.7**	mm

Receiving Pattern (ϕ), $\theta = 0°$

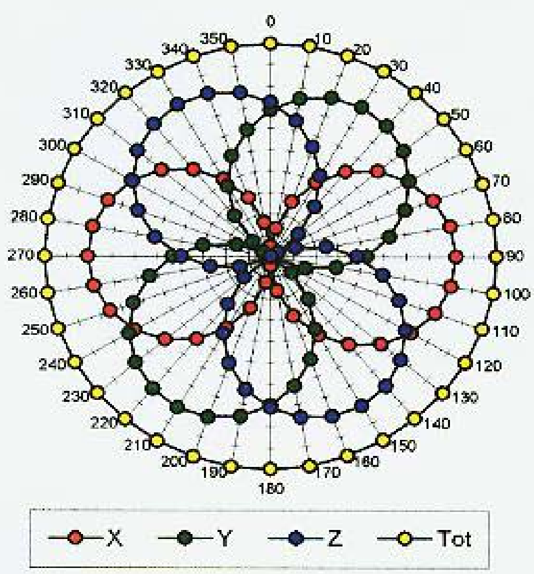
f = 30 MHz, TEM cell ifi110



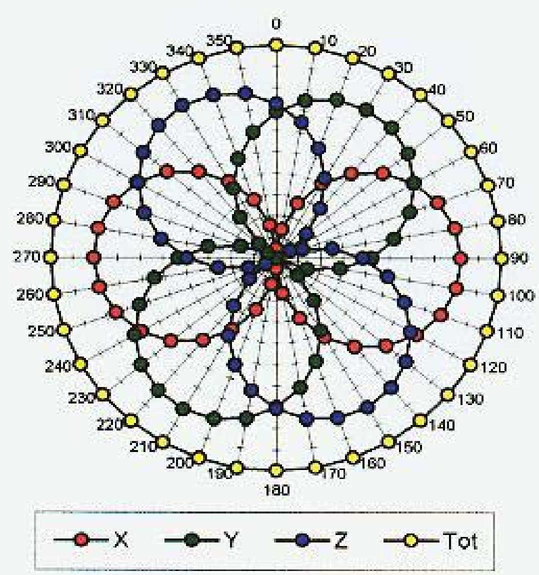
f = 100 MHz, TEM cell ifi110



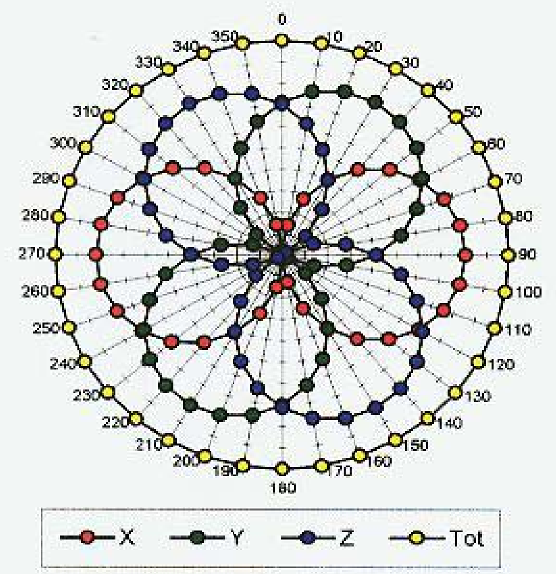
f = 300 MHz, TEM cell ifi110



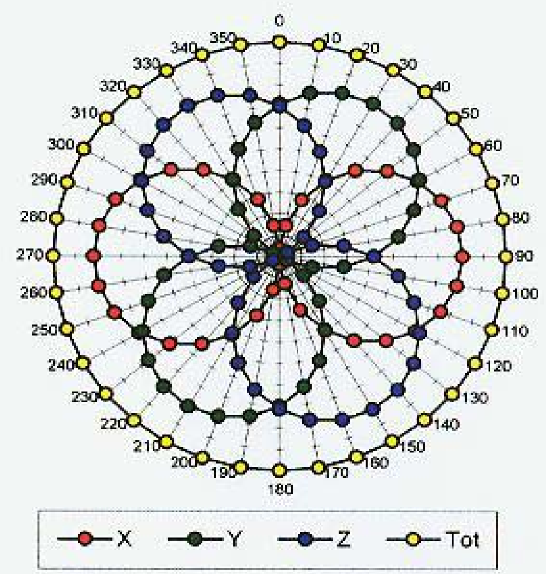
f = 900 MHz, TEM cell ifi110



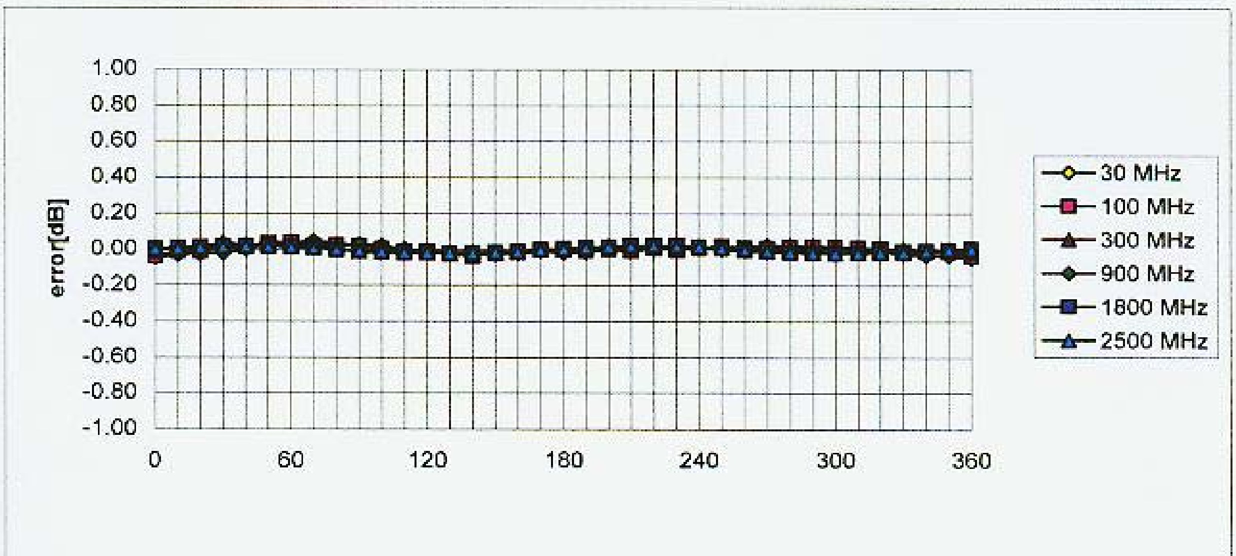
f = 1800 MHz, WG R22



f = 2500 MHz, WG R22

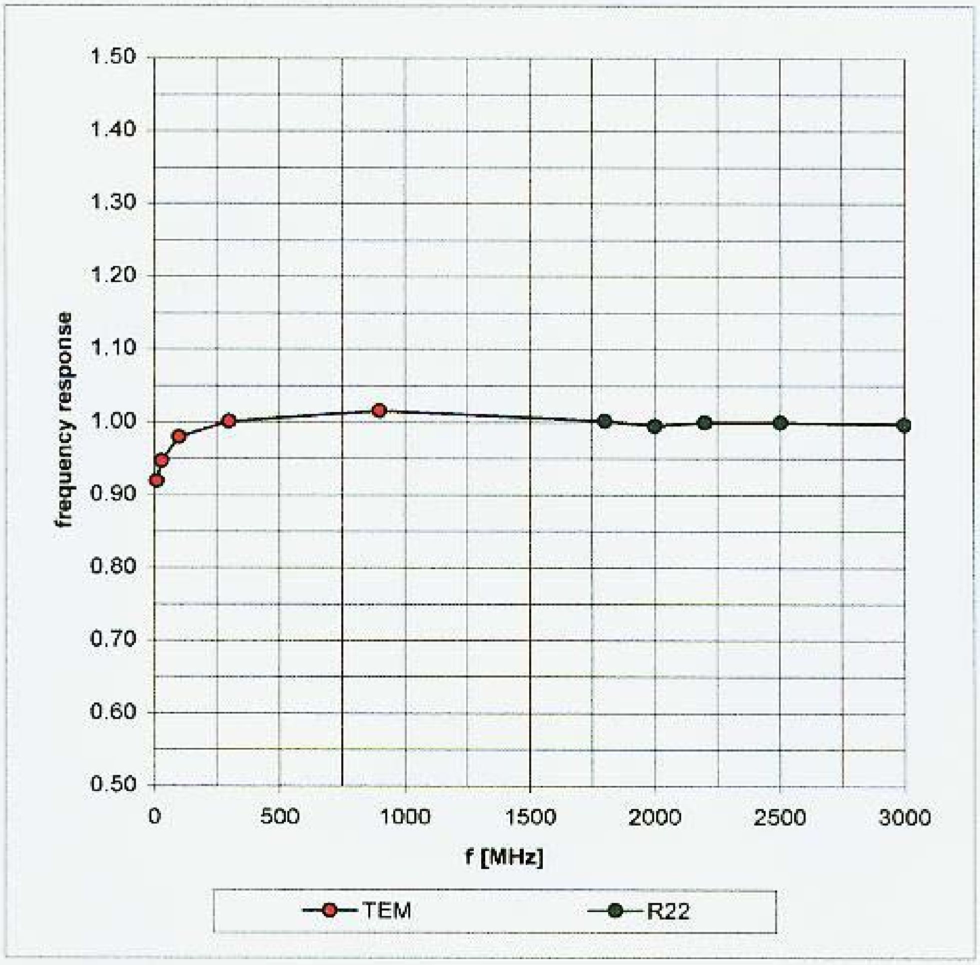


Isotropy Error (ϕ), θ = 0°



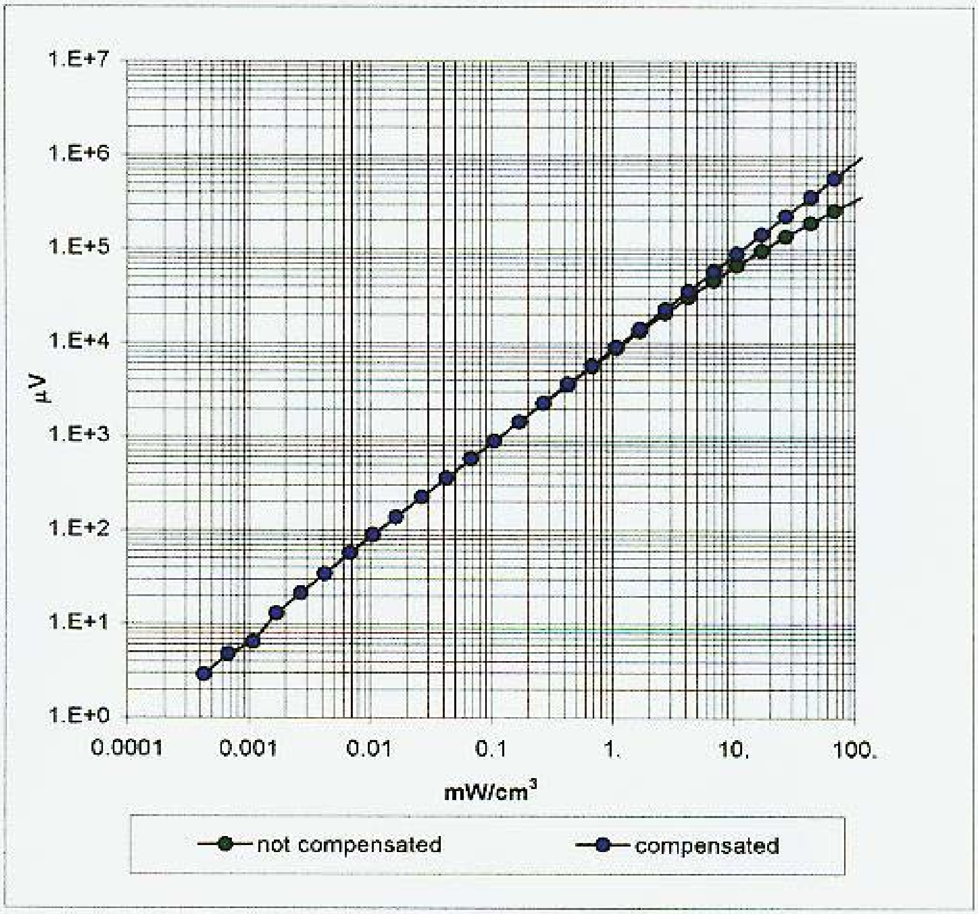
Frequency Response of E-Field

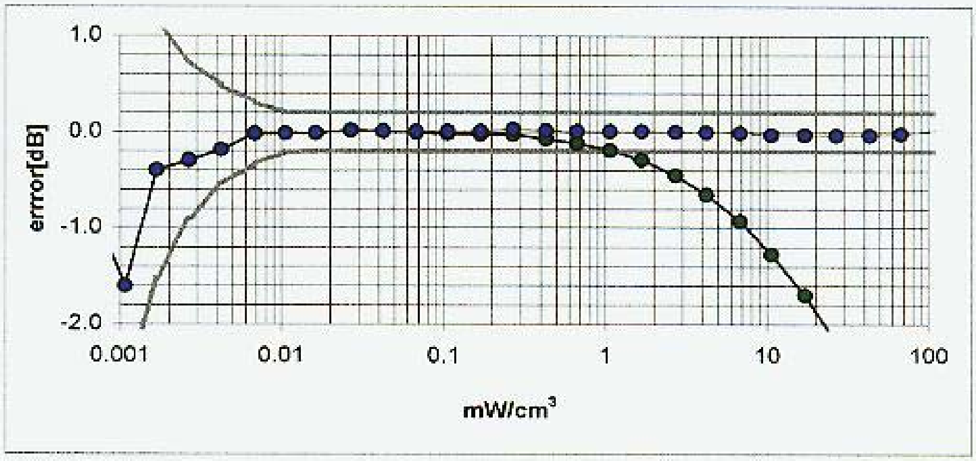
(TEM-Cell:ifi110, Waveguide R22)



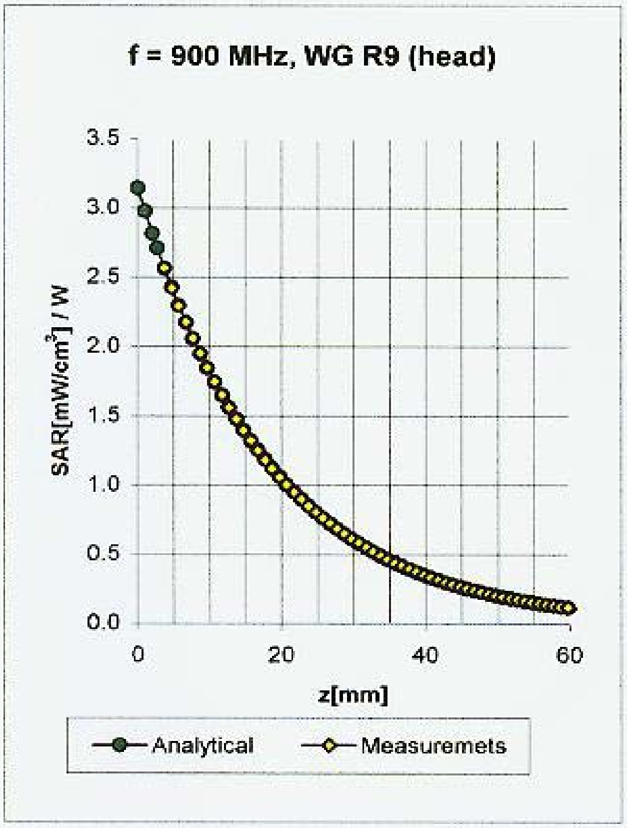
Dynamic Range f(SAR$_{brain}$)

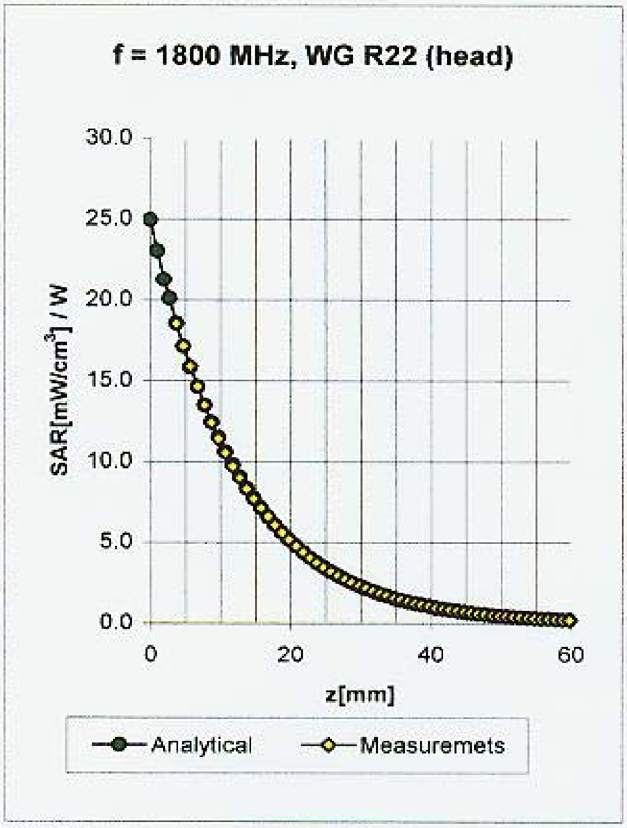
(Waveguide R22)





Conversion Factor Assessment

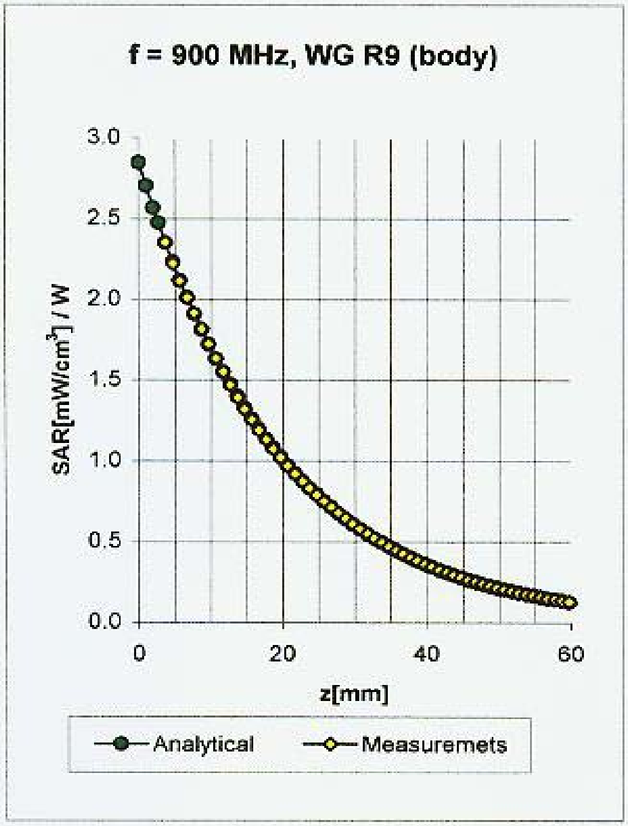


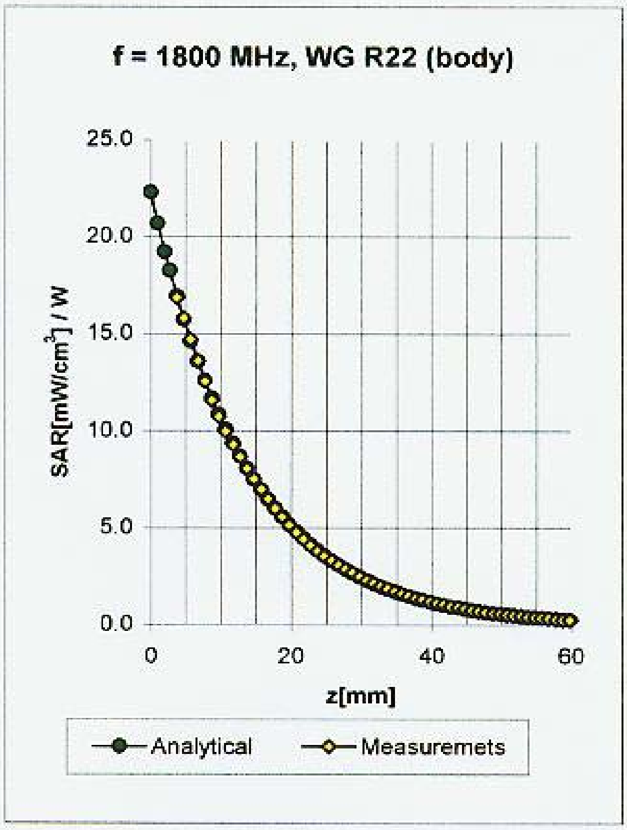


Head	900 MHz		ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m	
Head	835 MHz		ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m	
	ConvF X	**6.0**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.0**	± 9.5% (k=2)	Alpha	**0.56**
	ConvF Z	**6.0**	± 9.5% (k=2)	Depth	**1.95**

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	**4.9**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**4.9**	± 9.5% (k=2)	Alpha	**0.50**
	ConvF Z	**4.9**	± 9.5% (k=2)	Depth	**2.63**

Conversion Factor Assessment

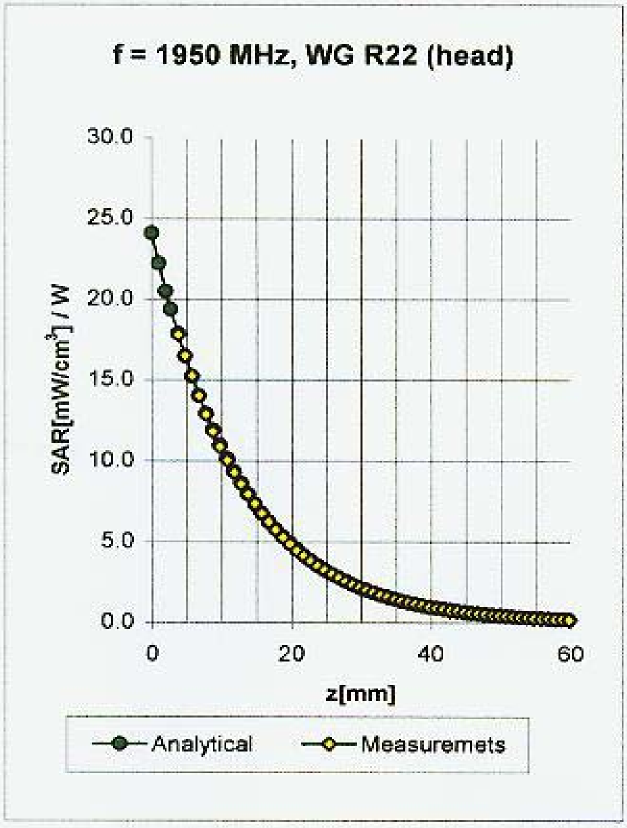


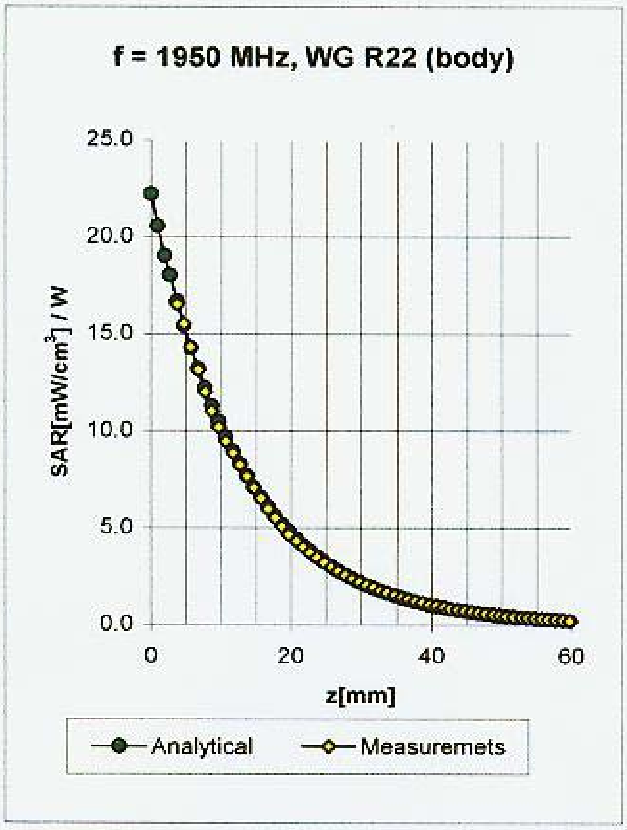


Body	**900 MHz**		ε_r = **55.0 ± 5%**	σ = **1.05 ± 5% mho/m**	
Body	**835 MHz**		ε_r = **55.2 ± 5%**	σ = **0.97 ± 5% mho/m**	
	ConvF X	**5.8**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.8**	± 9.5% (k=2)	Alpha	**0.45**
	ConvF Z	**5.8**	± 9.5% (k=2)	Depth	**2.35**

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	**4.4**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**4.4**	± 9.5% (k=2)	Alpha	**0.57**
	ConvF Z	**4.4**	± 9.5% (k=2)	Depth	**2.66**

Conversion Factor Assessment





Head	**1950**	**MHz**	ε_r **= 40.0 ± 5%**	σ **= 1.40 ± 5% mho/m**

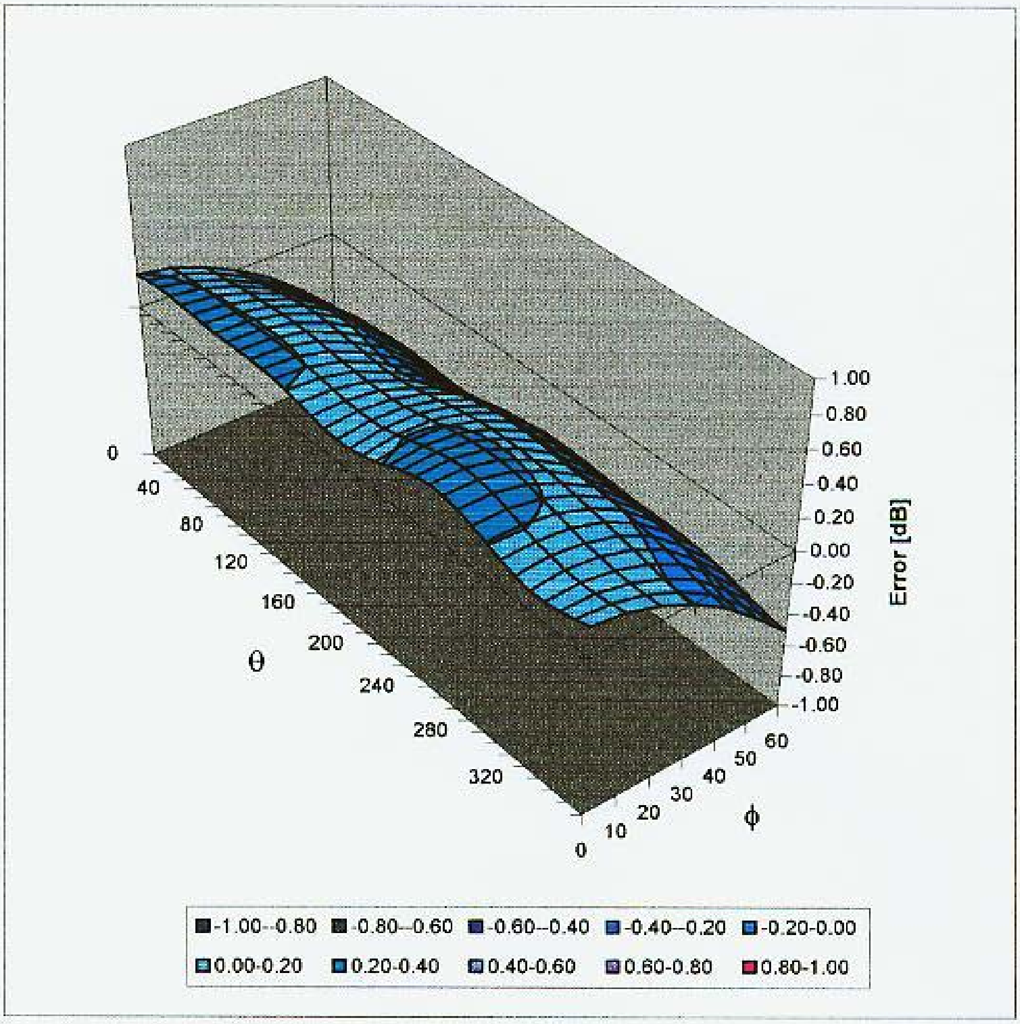
ConvF X	**4.6** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**4.6** ± 8.9% (k=2)	Alpha	**0.55**
ConvF Z	**4.6** ± 8.9% (k=2)	Depth	**2.57**

Body	**1950**	**MHz**	ε_r **= 53.3 ± 5%**	σ **= 1.52 ± 5% mho/m**

ConvF X	**4.2** ± 8.9% (k=2)	Boundary effect:	
ConvF Y	**4.2** ± 8.9% (k=2)	Alpha	**0.80**
ConvF Z	**4.2** ± 8.9% (k=2)	Depth	**2.14**

Deviation from Isotropy in HSL

Error (θ,ϕ), f = 900 MHz



Appendix 4

Dipole Characterization Certificate

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:	080	Last Calibration Date:	13-Nov-02
Dipole Type (MHz):	900MHz dipole	Calibration Due:	13-Nov-04
		Manufacturer:	SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: **[Serial Number: 080]**

1g SAR normalized to 1W forward power (mW/g):	10.4 mW/g
Relative Dielectric:	42.4
Conductivity:	0.97
Probe Serial Number:	1507
Forward Power:	250 mW

Primary Dipole Referenced: **[Serial Number: 77]**

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95
Probe Serial Number:	1507
Forward Power:	250mW

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity: X By Transfer Calibration:

-Measured Data-

Probe S/N:	1398	Conductivity (meas.):	0.96
Robot Cell #:	PCS-1	Permittivity (meas.):	40.0

Primary Standard (average of 0-degree & 90-degree 1g cubes):

3.07 mW/g (1W)		
	(if required)	(if required)

Secondary Standard (average of 0-degree & 90-degree 1g cubes):

3.02 mW/g (1W)		
	(if required)	(if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95

Approved by: Antonio Faraone **Date:** 12/12/2002

Comments: Correlated to get worst case extrapolation targets. Secondary measured within 2% of the primary standard.

Appendix 5

Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test

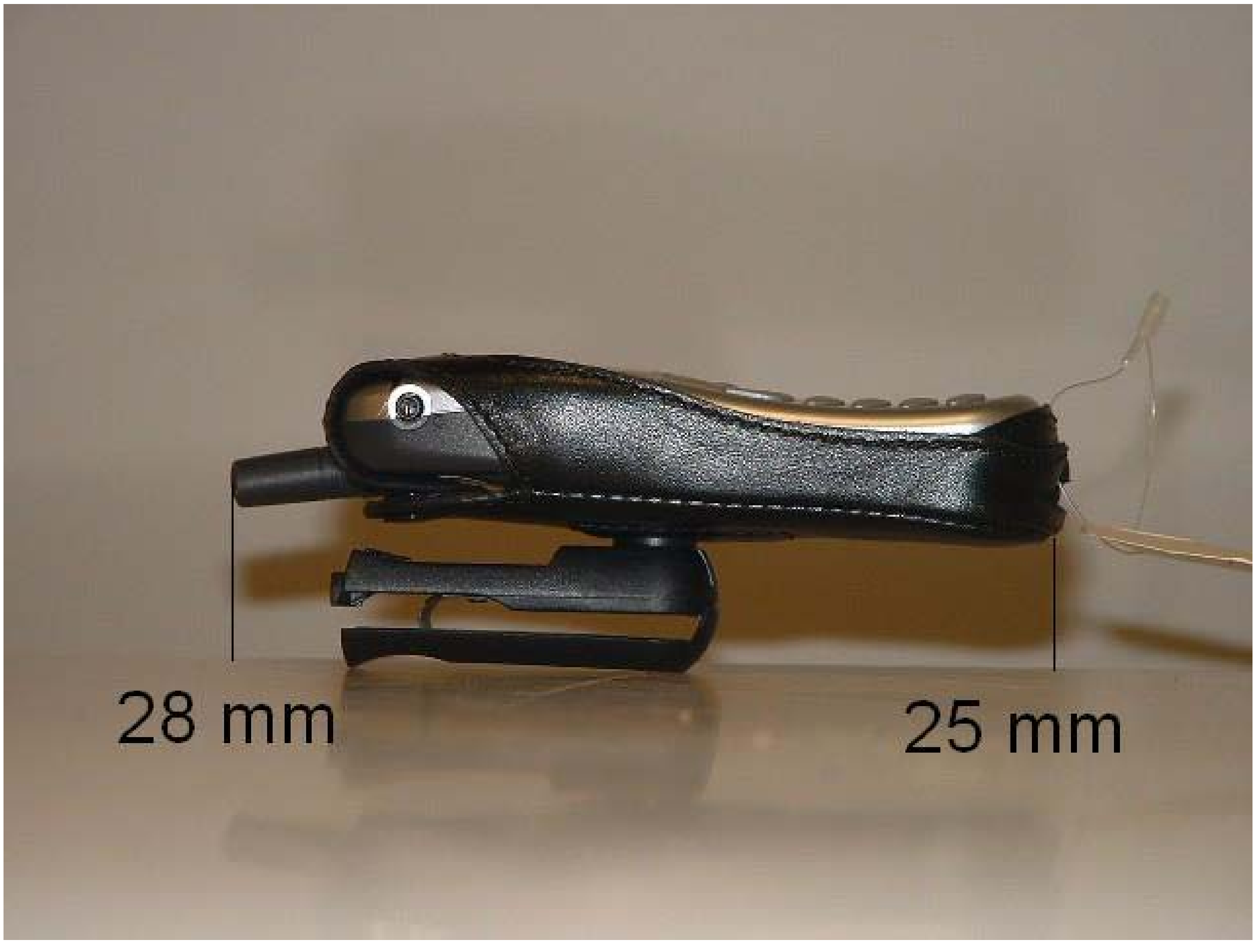
a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration	E.2.1	9.5	N	2.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
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	1.00	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	1.3	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	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
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	3.6	N	1.00	1	1	3.6	3.6	29
Device Holder Uncertainty	E.4.1	2.8	N	1.00	1	1	2.8	2.8	8
Output Power Variation - SAR drift measurement	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	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				11.72	11.09	1363
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k* =2				22.98	21.75	

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	E.2.1	9.5	N	2.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
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	1.00	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	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
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	4.7	R	1.73	1	1	2.7	2.7	∞
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	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				10.16	9.43	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				19.92	18.48	

Appendix 6

Photographs of the device under test


28 mm
25 mm