Exhibit 11: Class 2 Permissive Change SAR Test Report IHDT56CE1

Date of test: 15-22 August 2002
Date of Report: 23 August 2002

Laboratory: Motorola Personal Communications Sector Product Safety & Compliance Laboratory
2001 N. Division
Room: AS228
Harvard, Illinois 60033

Test Responsible: Steven Hauswirth
Senior Staff Engineer

Accreditation: This laboratory is accredited to ISO/IEC 17025-1999 to perform the following electromagnetic exposure tests:
System Validation & Interlaboratory Comparison
Simulated Tissue Specifications and Procedure
EME Cellular Phone Testing Procedure

On the following 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 IHDT56CE1 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)

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

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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 IHDT56CE1). 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	Internal Antenna	
Location	Back of Phone	
Dimensions	Length	20mm
	Width	35mm

Device description

FCC ID Number	IHDT56CE1	
Serial number	5A6N519 & 5A6N521	
Mode(s) of Operation	GSM 850	GSM 1900
Modulation Mode(s)	GSM	GSM
Maximum Output Power Setting	30.00 dBm	30.00 dBm
Duty Cycle	1:8	1:8
Transmitting Frequency Rang(s)	824.20 - 848.80 MHz	1850.20 – 1909.80 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. 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 6. The list of calibrated equipment used for the measurements is shown below.

Description	Serial Number	Cal Due Date
DASY3 DAE V1	SN398	26-Sep-02
E-Field Probe ETDV6	SN1513	8-May-03
Dipole Validation Kit, DV900V2	SN094	3-Jan-03
S.A.M. Phantom used for 800MHz	TP-1131	
Dipole Validation Kit, DV1800V2	SN280TR	4-Jan-03
S.A.M. Phantom used for 1900MHz	TP-1105	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04822	14-11-03
Power Meter E4419B	GB39511087	16-11-03
Power Sensor #1 – E9301A	US39211013	19-12-03
Power Sensor #2 - E9301A	US39210930	6-12-03
Network Analyzer HP8753ES	US39171846	2-5-03
Dielectric Probe Kit HP85070B	US99360074	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	Head	**Measured,** 18-Aug-02	42.8	0.92	22
		Recommended Limits	41.5	0.9	20-25
		Measured, 20-Aug-02	42.3	0.91	21.3
		Recommended Limits	41.5	0.9	20-25
	Body	**Measured,** 16-Aug-02	53.7	0.98	22.5
		Recommended Limits	55.2	0.97	20-25
1880	Head	**Measured,** 16-Aug-02	38.1	1.45	22.1
		Recommended Limits	40.0	1.40	20-25
		Measured, 21-Aug-02	38.8	1.46	22.5
		Recommended Limits	40.0	1.40	20-25
	Body	**Measured, 19-Aug-02**	51.6	1.58	21.9
		Recommended Limits	53.3	1.52	20-25
		Measured, 21-Aug-02	51.9	1.56	21.9
		Recommended Limits	53.3	1.52	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	47.0	30.80
DGBE	--	--	52.8	68.91
Water	40.45	53.06	0.2	0.29
Salt	1.45	0.94	--	--
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.

Daily, prior to conducting tests, measurements were made with the RF sources powered off to determine the system noise level. The highest system noise was 0.0003 W/kg, which is below the recommended limit.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambien t Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
900	**Measured,** 16-Aug-02	11.4	40.4	0.95	23	22.5
	Measured, 18-Aug-02	11.8	42.0	0.98	23	22.3
	Measured, 20-Aug-02	11.6	41.6	0.97	23	22.4
	Recommended Limits	11.4	40.3	0.95	20-25	20-25
1800	**Measured,** 16-Aug-02	38.5	38.5	1.37	23	22.0
	Measured, 19-Aug-02	39.0	38.3	1.36	23	22.1
	Measured, 21-Aug-02	38.4	39.2	1.37	23	21.9
	Recommended Limits	38.8	39.6	1.37	20-25	20-25

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

Description	Serial Numbe r	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ETDV6	SN1513	900	6.10	2 of 6
		1800	5.00	2 of 6

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 and 3. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

The Cellular Phone (FCC ID IHDT56CE1) has the SYN9624A (Lithium Ion) – 3.6V 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 Head Adjacent Test Results

The SAR results shown in tables 1 through 6 are 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

The SAR measurements were performed using the SAM phantoms listed in section 3.1. Since same phantoms and tissue simulate are used for the system accuracy verification as the device SAR measurements, the Z-axis scans included in within Appendix 1 are applicable for verification of tissue simulate depth to be 15.0cm ±0.5cm. All other test conditions measured lower SAR values than those included in Appendix 2.

The phone has three different housings: "C331" , the "c332" and the "C333". All the required testes were performed with the "C331". All 3 housings were measured on the same phone using the guideline within FCC Supplement C.

The following probe conversion factors were used on the E-Field probe(s) used for the head adjacent measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ETDV6	SN1513	835	6.20	2 of 2
		1900	5.00	2 of 6

f (MHz)	Description	Conducted Output Power (dBm)	"C331" Housing in the Cheek / Touch Position									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08										
	Channel 189	30.05	0.889	-0.06	0.90	23	21.5	0.886	-0.04	0.89	23	21.0
	Channel 251	29.93										
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	**0.813**	**-0.22**	**0.86**	**23**	**23.8**	0.422	-0.05	0.43	23	23.1
	Channel 810	30.00										

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	**"C331" Housing in the 15° Tilt Position**									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08										
	Channel 189	30.05	0.558	-0.05	0.56	23	21.7	0.53	0.01	0.53	23	20.7
	Channel 251	29.93										
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	0.587	-0.29	0.63	23	23.8	0.414	-0.67	0.48	23	21.4
	Channel 810	30.00										

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	**"C332" Housing in the Cheek / Touch Position**									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08						0.781	0	0.78	23	22.3
	Channel 189	30.05	0.932	-0.03	0.94	23	21.3	1.03	0	1.03	23	21.4
	Channel 251	29.93						**1.09**	**0**	**1.09**	23	**22.3**
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	0.777	-0.08	0.79	23	21.9	0.461	-0.43	0.51	23	21.8
	Channel 810	30.00										

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	**"C332" Housing in the 15° Tilt Position**									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08										
	Channel 189	30.05	**0.601**	**-0.04**	**0.61**	**23**	**21.3**	0.593	-0.02	0.60	23	21.5
	Channel 251	29.93										
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	0.635	-0.17	0.66	23	21.3	0.408	-0.19	0.43	23	21.7
	Channel 810	30.00										

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	"C333" Housing in the Cheek / Touch Position									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08										
	Channel 189	30.05	0.789	-0.02	0.79	23	23.0	0.805	0.05	0.81	23	22.4
	Channel 251	29.93										
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	0.803	-0.12	0.83	23	21.6	0.516	-0.11	0.53	23	21.4
	Channel 810	30.00										

Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	"C333" Housing in the 15° Tilt Position									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08										
	Channel 189	30.05	0.446	-0.02	0.45	23	22.7	0.495	-0.03	0.50	23	22.0
	Channel 251	29.93										
1900 MHz	Channel 512	29.90										
	Channel 661	30.07	**0.673**	**-0.09**	**0.69**	**23**	**21.4**	0.51	-0.19	0.53	23	21.2
	Channel 810	30.00										

Table 6: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

6.2 Body-Worn Test Results

The SAR results shown in tables 7 through 12 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 3. 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 3.

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:
A Plastic Holster and Belt Clip: Model #SYN8763A
A Plastic Holster and Belt Clip: Model #SYN8631A

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 ETDV6	SN1513	835	6.00	2 of 2
		1900	4.60	2 of 2

f (MHz)	Description	Conducted Output Power (dBm)	"C331" Housing in Body Worn Position				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	0.295	-0.02	0.30	23	23.2
	Channel 189	30.05	0.275	0.06	0.28	23	23.2
	Channel 251	29.93	0.231	-0.11	0.24	23	23.3
1900 MHz	Channel 512	29.90	0.224	-0.22	0.24	23	21.7
	Channel 661	30.07	0.240	-0.2	0.25	23	21.7
	Channel 810	30.00	0.224	-0.2	0.23	23	21.8

Table 7: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8763A.

f (MHz)	Description	Conducted Output Power (dBm)	"C331" Housing in Body Worn Position				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	0.492	-0.1	0.50	23	23.3
	Channel 189	30.05	0.460	-0.01	0.46	23	23.2
	Channel 251	29.93	0.415	0.02	0.42	23	23.3
1900 MHz	Channel 512	29.90	**0.320**	**-0.13**	**0.33**	**23**	**21.8**
	Channel 661	30.07	0.267	-0.16	0.28	23	21.7
	Channel 810	30.00	0.210	-0.18	0.22	23	21.9

Table 8: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8631A.

f (MHz)	Description	Conducted Output Power (dBm)	"C332" Housing in Body Worn Position				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	0.243	-0.03	0.24	23	22.5
	Channel 189	30.05	0.276	-0.01	0.28	23	22.5
	Channel 251	29.93	0.203	0.01	0.20	23	22.5
1900 MHz	Channel 512	29.90	0.251	-0.14	0.26	**23**	**21.9**
	Channel 661	30.07	0.257	-0.08	0.26	23	21.9
	Channel 810	30.00	0.136	-0.05	0.14	23	21.9

Table 9: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8763A.

f (MHz)	Description	Conducted Output Power (dBm)	"C332" Housing in Body Worn Position				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	0.478	0.01	0.48	23	22.5
	Channel 189	30.05	0.477	-0.01	0.48	23	22.5
	Channel 251	29.93	0.410	-0.02	0.41	23	22.5
1900 MHz	Channel 512	29.90	0.256	-0.19	0.27	23	22.1
	Channel 661	30.07	0.278	-0.07	0.28	23	22.1
	Channel 810	30.00	0.196	-0.08	0.20	23	22.1

Table 10: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8631A.

f (MHz)	Description	Conducted Output Power (dBm)	"C333" Housing in Body Worn Position				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	0.341	-0.05	0.34	**23**	**22.5**
	Channel 189	30.05	0.299	-0.01	0.30	23	22.5
	Channel 251	29.93	0.265	-0.03	0.27	23	22.5
1900 MHz	Channel 512	29.90	0.286	-0.06	0.29	23	22.2
	Channel 661	30.07	0.190	-0.08	0.19	23	22.2
	Channel 810	30.00	0.168	-0.11	0.17	23	22.3

Table 11: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8763A.

f (MHz)	Description	Conducted Output Power (dBm)	**"C333" Housing in Body Worn Position**				
			Ant Extended				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
850 MHz	Channel 128	30.08	**0.583**	**0.00**	**0.58**	**23**	**22.5**
	Channel 189	30.05	0.558	-0.04	0.56	23	22.5
	Channel 251	29.93	0.453	0.01	0.45	23	22.3
1900 MHz	Channel 512	29.90	0.300	-0.01	0.31	23	22.3
	Channel 661	30.07	0.251	-0.02	0.25	23	22.2
	Channel 810	30.00	0.212	-0.07	0.22	23	22.3

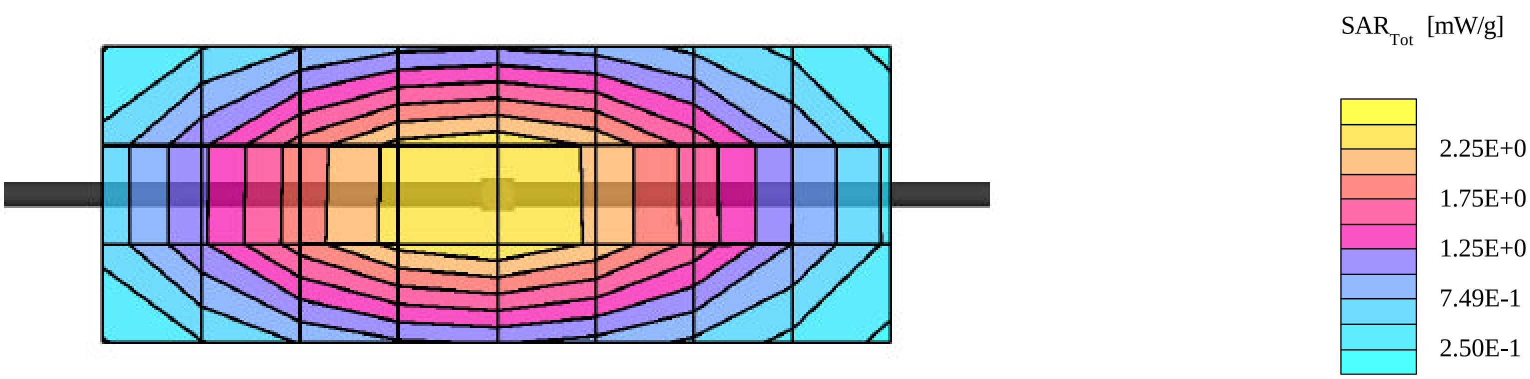
Table 12: SAR measurement results for the portable cellular telephone FCC ID IHDT56CE1 at highest possible output power. Measured against the body with the SYN8631A.

Appendix 1

SAR distribution comparison for the system accuracy verification

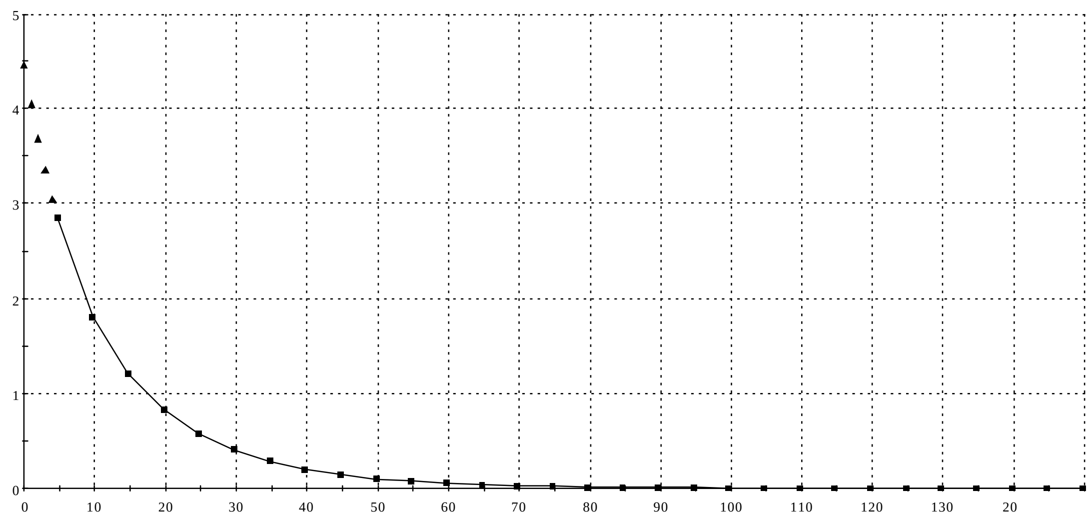
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.5*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.95 mho/m ε_r = 40.4 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 2.85 mW/g ± 0.04 dB, SAR (10g): 1.80 mW/g ± 0.04 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.5 (10.7, 12.7) [mm]
Powerdrift: 0.00 dB



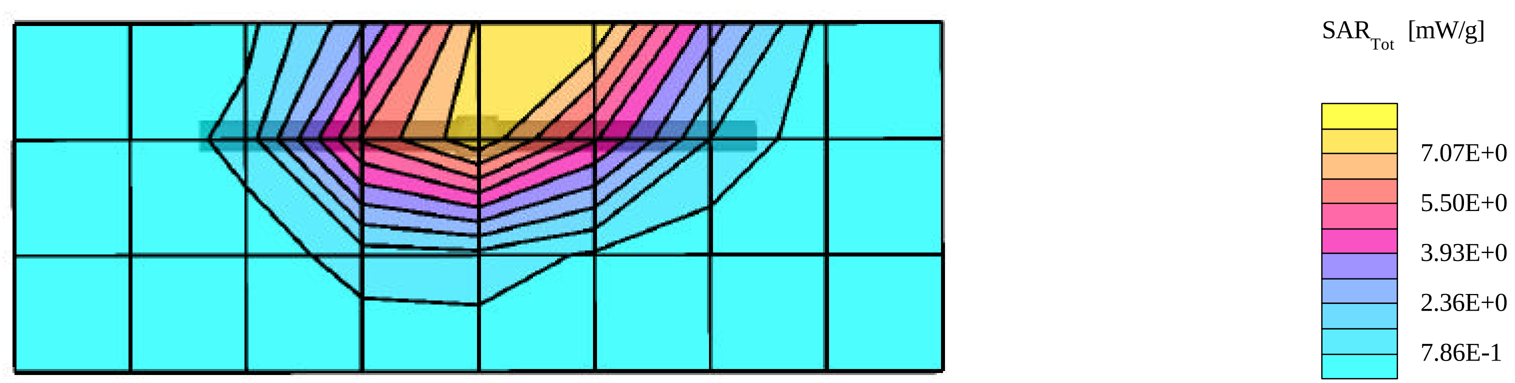
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.5*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.95 mho/m ε_r = 40.4 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.5 (10.7, 12.8) [mm]



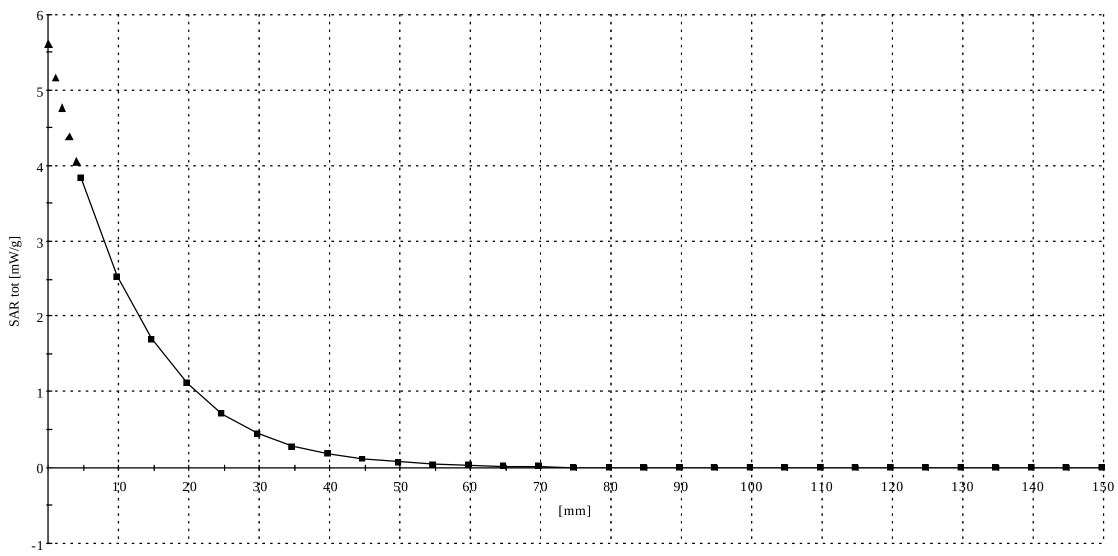
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 247mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 22*C
R4 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (90°,180°); Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.37 mho/m ε_r = 38.5 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 9.50 mW/g ± 0.02 dB, SAR (10g): 5.00 mW/g ± 0.04 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.3 (7.9, 9.1) [mm]
Powerdrift: 0.11 dB



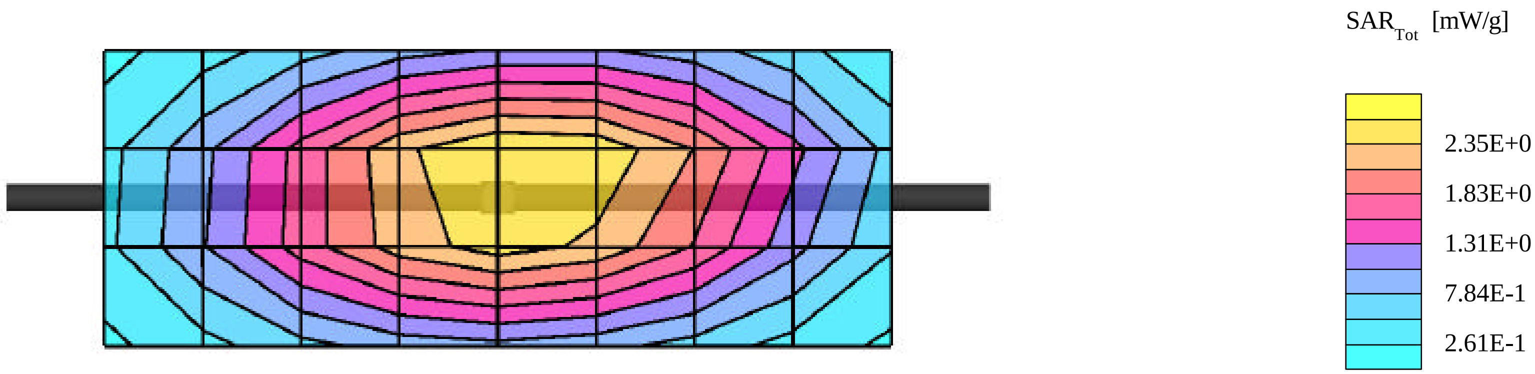
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 247mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 22*C
R4 Amy Twin Phantom Rev.3 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.37 mho/m ε_r = 38.5 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 12.3 (12.2, 12.3) [mm]



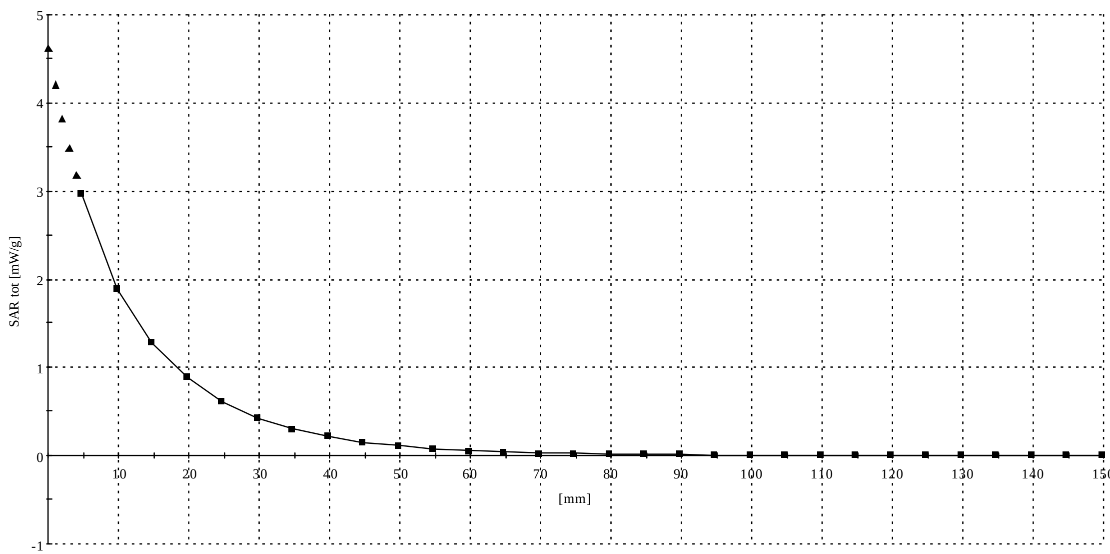
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 251mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.3*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.98 mho/m ε_r = 42.0 ρ = 1.00 g/cm³
Cubes (2): SAR (1g): 2.97 mW/g ± 0.06 dB, SAR (10g): 1.87 mW/g ± 0.07 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.5 (10.7, 12.7) [mm]
Powerdrift: 0.07 dB



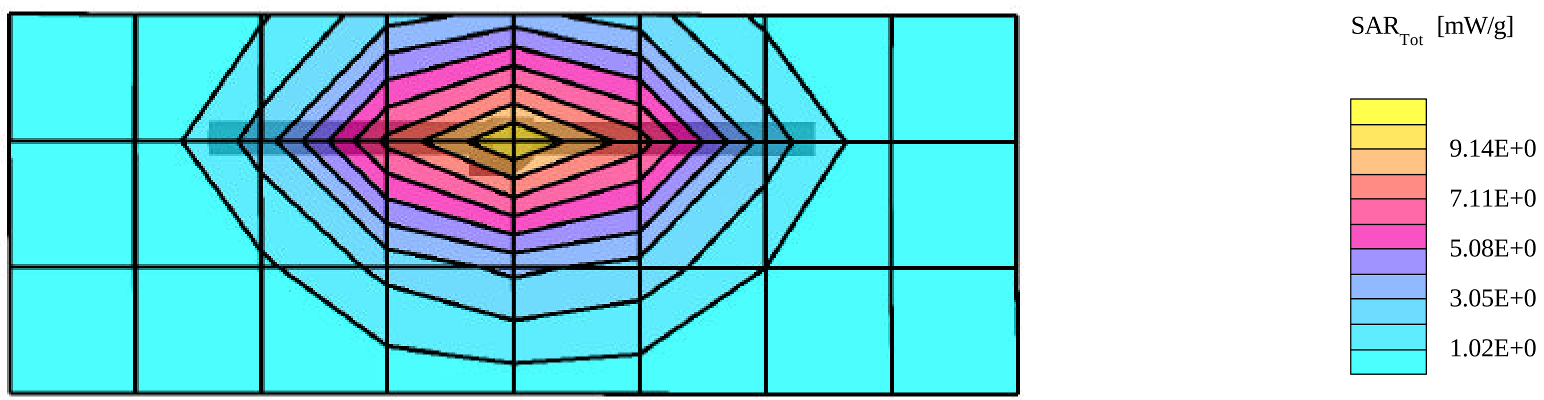
Dipole   900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 251mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.3*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.98 mho/m ε_r = 42.0 ρ = 1.00 g/cm³
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.7 (10.8, 12.9) [mm]



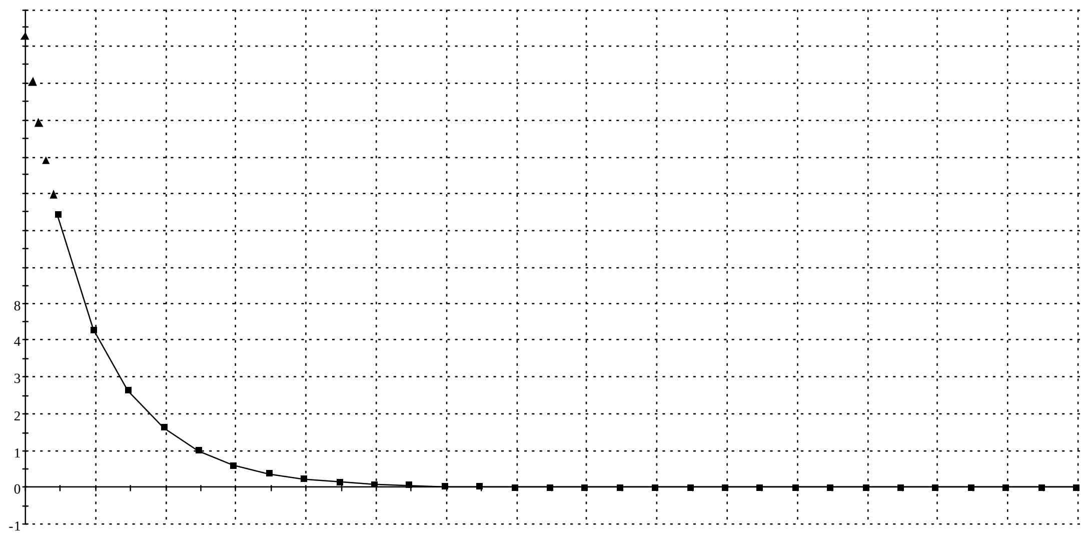
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 248mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 22.1*C
R4 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (90°,180°); Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.36 mho/m ε_r = 38.3 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 9.68 mW/g ± 0.03 dB, SAR (10g): 5.11 mW/g ± 0.03 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.5 (8.2, 9.2) [mm]
Powerdrift: 0.01 dB



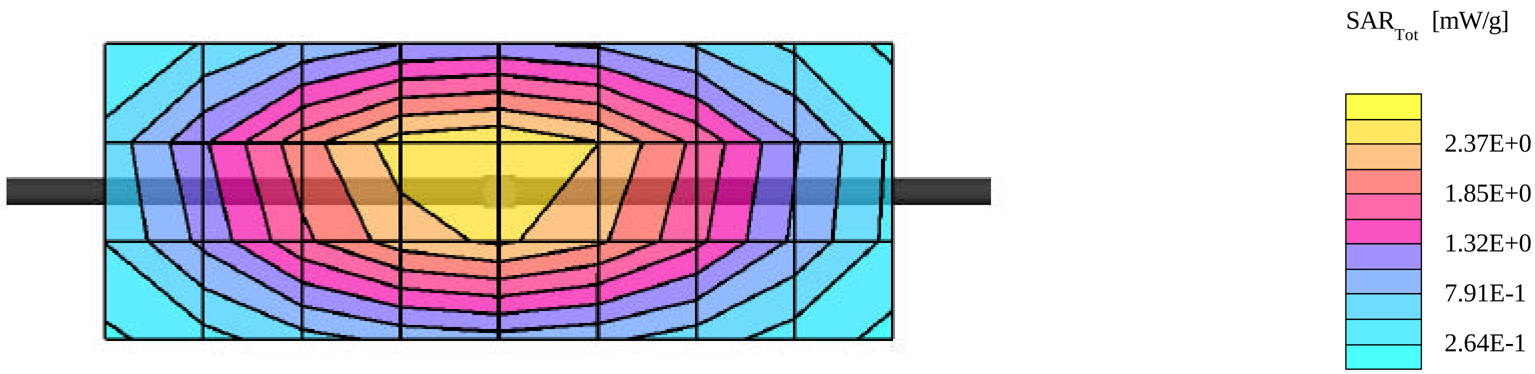
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 248mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 22.1*C
R4 Amy Twin Phantom Rev.3 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.36 mho/m ε_r = 38.3 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 9.5 (9.2, 10.1) [mm]



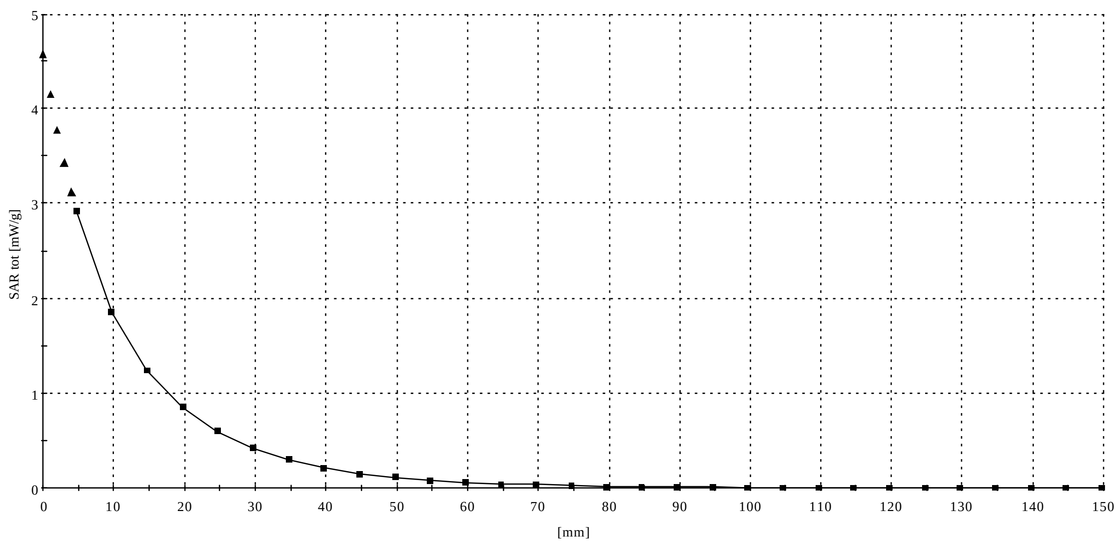
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.4*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.6 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 2.92 mW/g ± 0.03 dB, SAR (10g): 1.84 mW/g ± 0.03 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.6 (10.8, 12.8) [mm]
Powerdrift: 0.05 dB



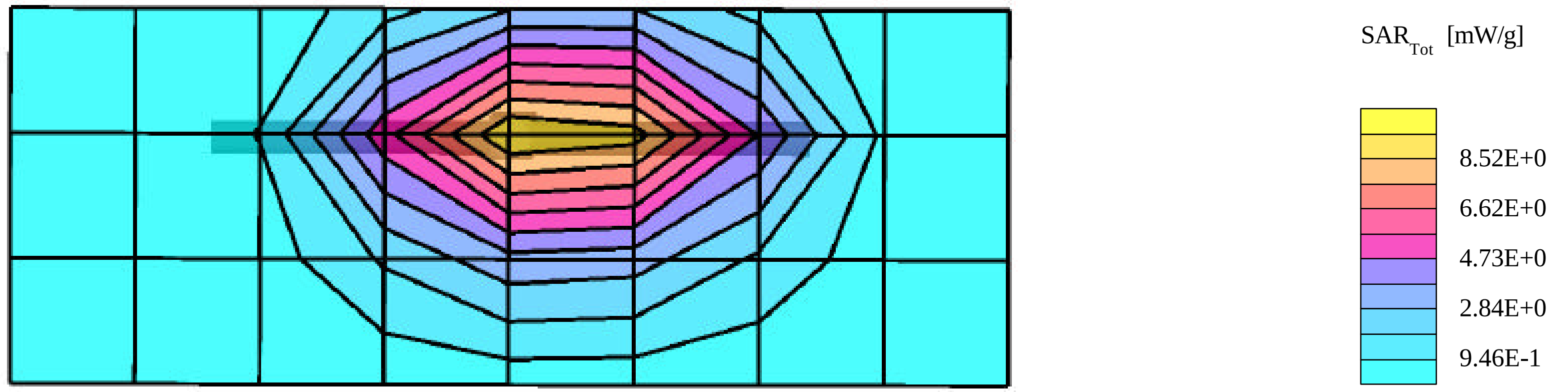
Dipole   900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.4*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.6 ρ = 1.00 g/cm³
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.6 (10.7, 12.8) [mm]



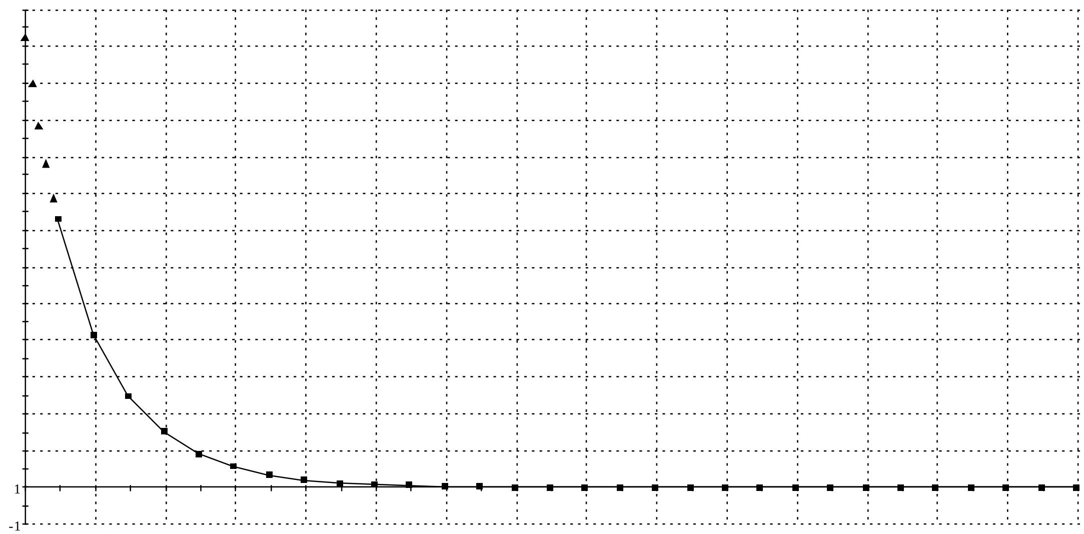
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 248mW / Acceptable Temp Range is 15-25°C / Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 21.9*C
R4 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (90°,180°); Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.37 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 9.53 mW/g ± 0.00 dB, SAR (10g): 4.96 mW/g ± 0.09 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.5 (8.1, 9.3) [mm]
Powerdrift: 0.00 dB



Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# TR280 / Forward Power = 248mW / Acceptable Temp Range is 15-25°C / Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement = 21.9*C
R4 Amy Twin Phantom Rev.3 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(5.00,5.00,5.00); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.37 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 9.2 (8.9, 9.8) [mm]



Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

08/20/02

s/n 5A6N519 "C332"

Ch# 251 / Pwr Step: 7 / Type of Modulation: 850 GSM / Battery Model #: SYN9624A

R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 849 MHz

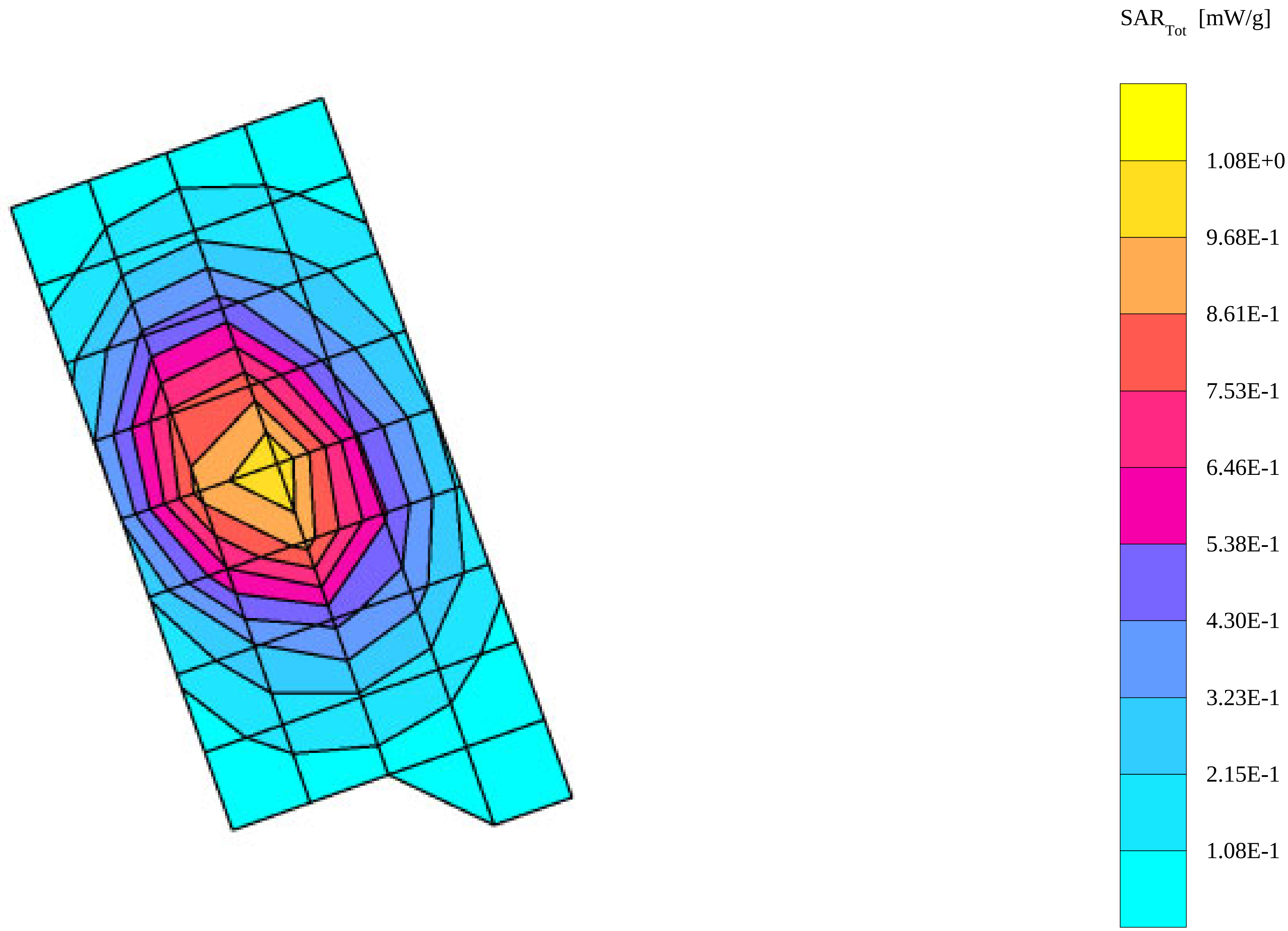
Probe: ET3DV6R - SN1513 - IEEE Head; ConvF(6.20,6.20,6.20); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.91 mho/m ε_r = 42.3 ρ = 1.00 g/cm^3

Cube 7x7x7: SAR (1g): 1.09 mW/g, (Worst-case extrapolation)

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

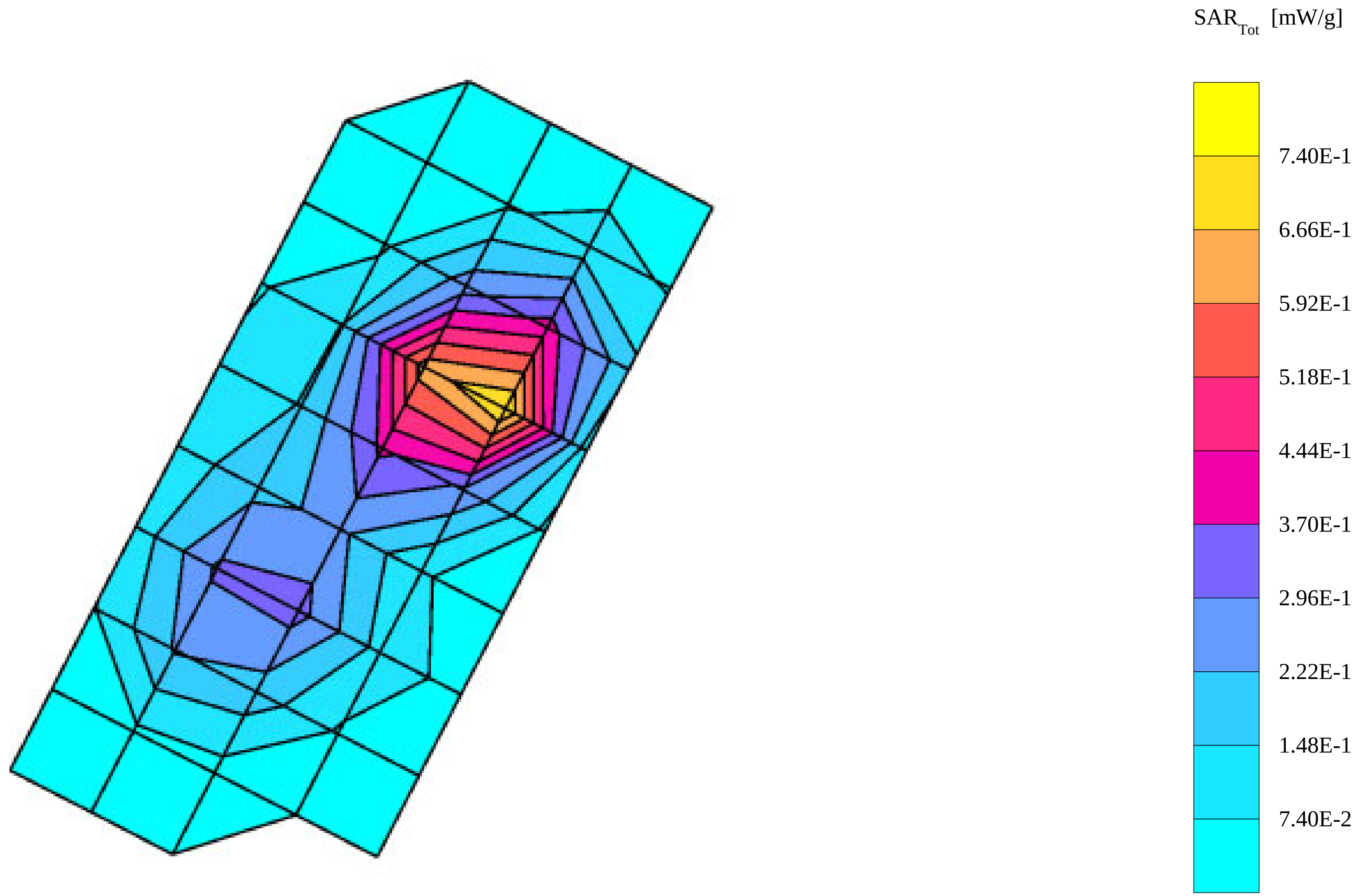
Penetration depth: 13.9 (13.2, 14.7) [mm]

Powerdrift: 0.00 dB



s/n 5A6N521 "C331"

Ch# 661 / Pwr Step: 0 / Type of Modulation: 1900 GSM / Battery Model #: SYN9624A
DEVICE POSITION: CHEEK Touch
R4 TP-1105 Glycol SAM(rev.3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz
Probe: ET3DV6R - SN1513 - IEEE Head; ConvF(5.00,5.00,5.00); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.46 mho/m ε_r = 38.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.813 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 8.5 (8.2, 9.1) [mm]
Powerdrift: -0.22 dB



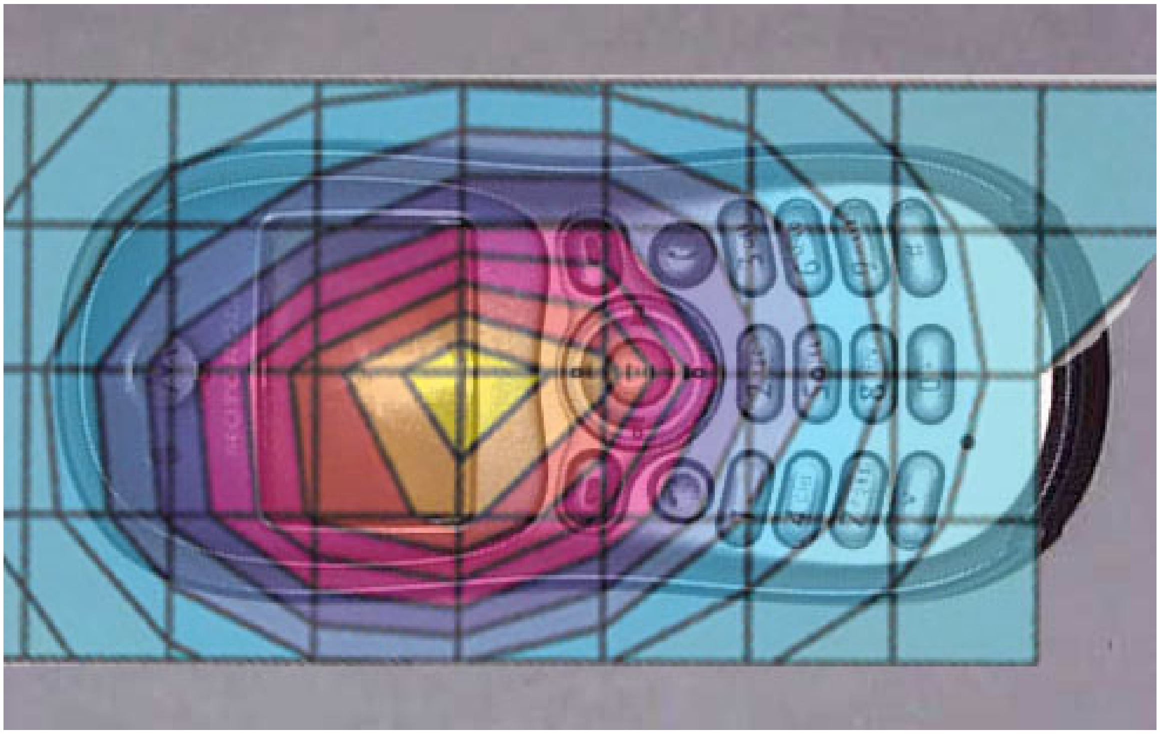


Figure 1. Typical 800MHz Contour Overlaid on Phone (Cheek Touch)

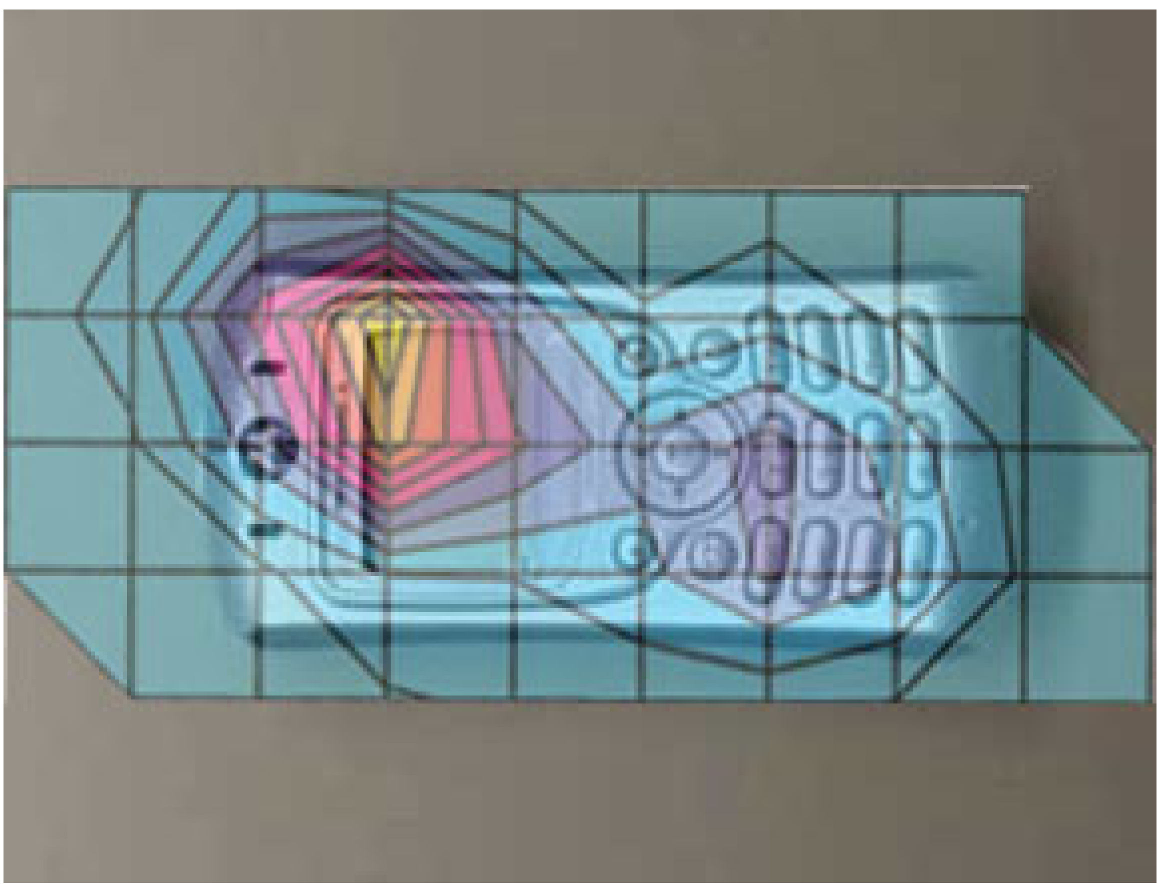


Figure 2. Typical 1900MHz Contour Overlaid on Phone (Cheek Touch)

08/18/02

s/n 5A6N519 "C332"

Ch# 190 / Pwr Step: 7 / Type of Modulation: 850 GSM / Battery Model #: SYN9624A

R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 849 MHz

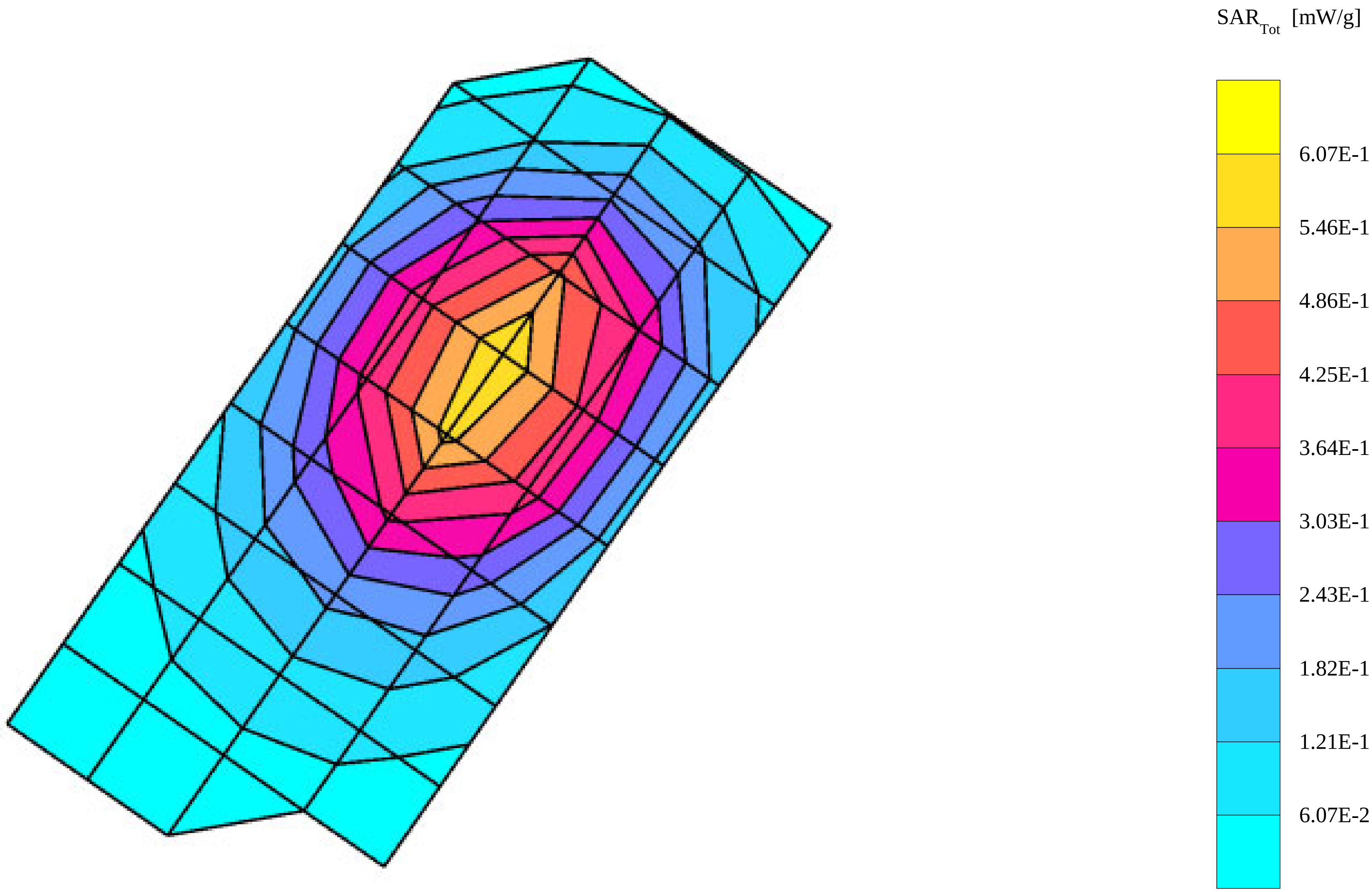
Probe: ET3DV6R - SN1513 - IEEE Head; ConvF(6.20,6.20,6.20); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.92 mho/m ε_r = 42.8 ρ = 1.00 g/cm^3

Cube 7x7x7: SAR (1g): 0.601 mW/g, (Worst-case extrapolation)

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

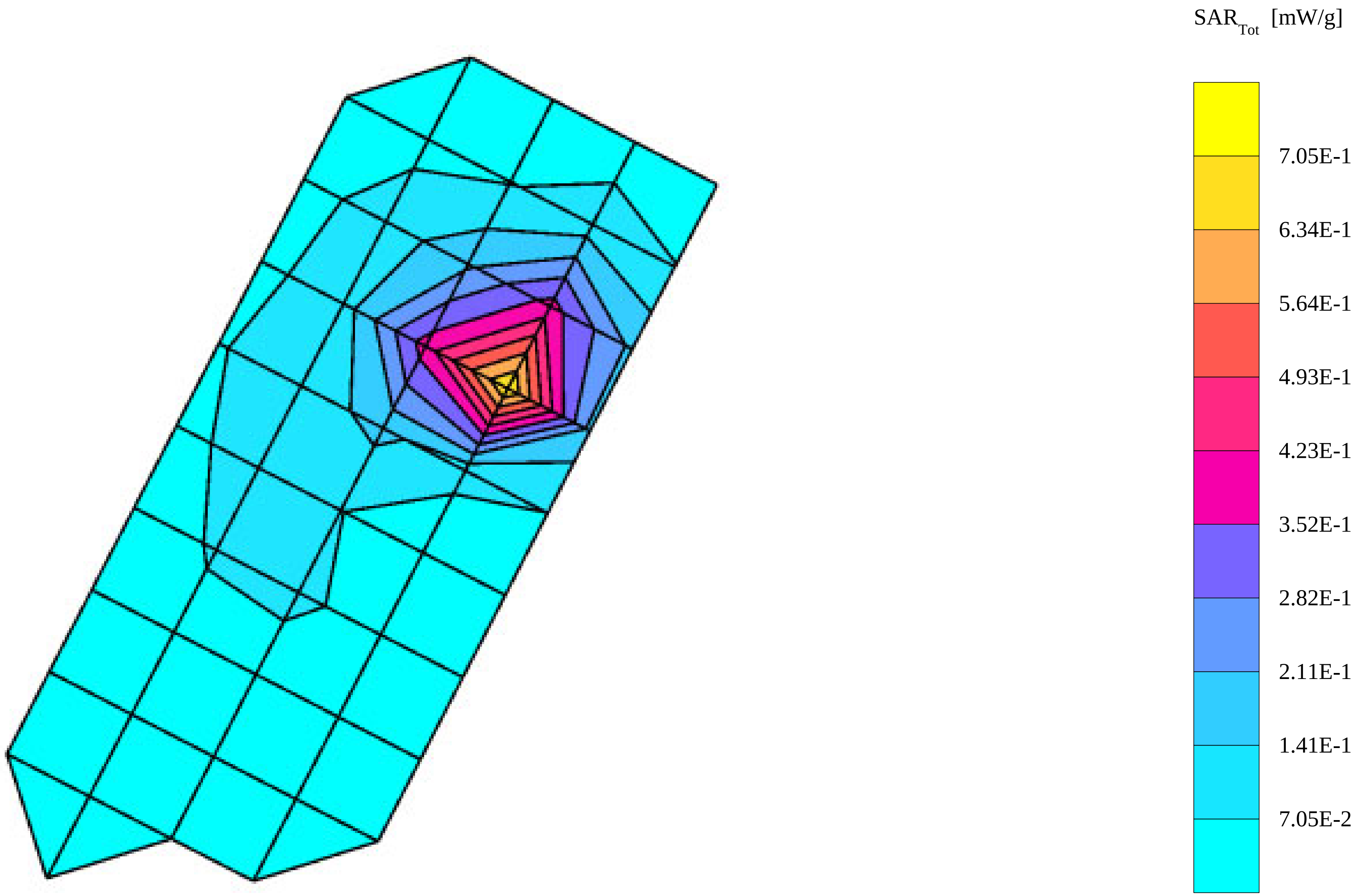
Penetration depth: 13.8 (13.0, 14.7) [mm]

Powerdrift: -0.04 dB



s/n 5A6N519 "C333"

Ch# 661 / Pwr Step: 00 / Type of Modulation: GSM 1900 / Battery Model #: SYN9624A
DEVICE POSITION: 15 Degree Tilt
R4 TP-1105 Glycol SAM(rev.3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz
Probe: ET3DV6R - SN1513 - CENELEC Head; ConvF(5.00,5.00,5.00); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.45 mho/m ε_r = 38.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.673 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 8.6 (8.5, 9.0) [mm]
Powerdrift: -0.09 dB



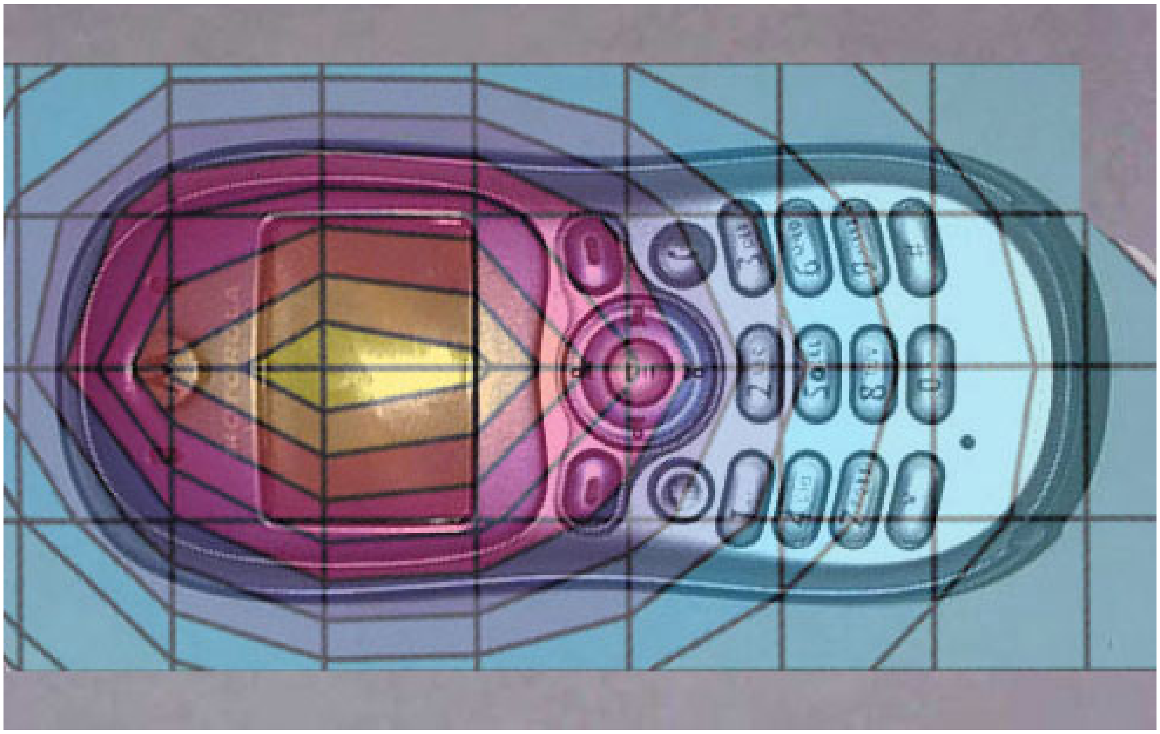


Figure 3. Typical 800MHz Contour Overlaid on Phone (15 ˚ Tilt)

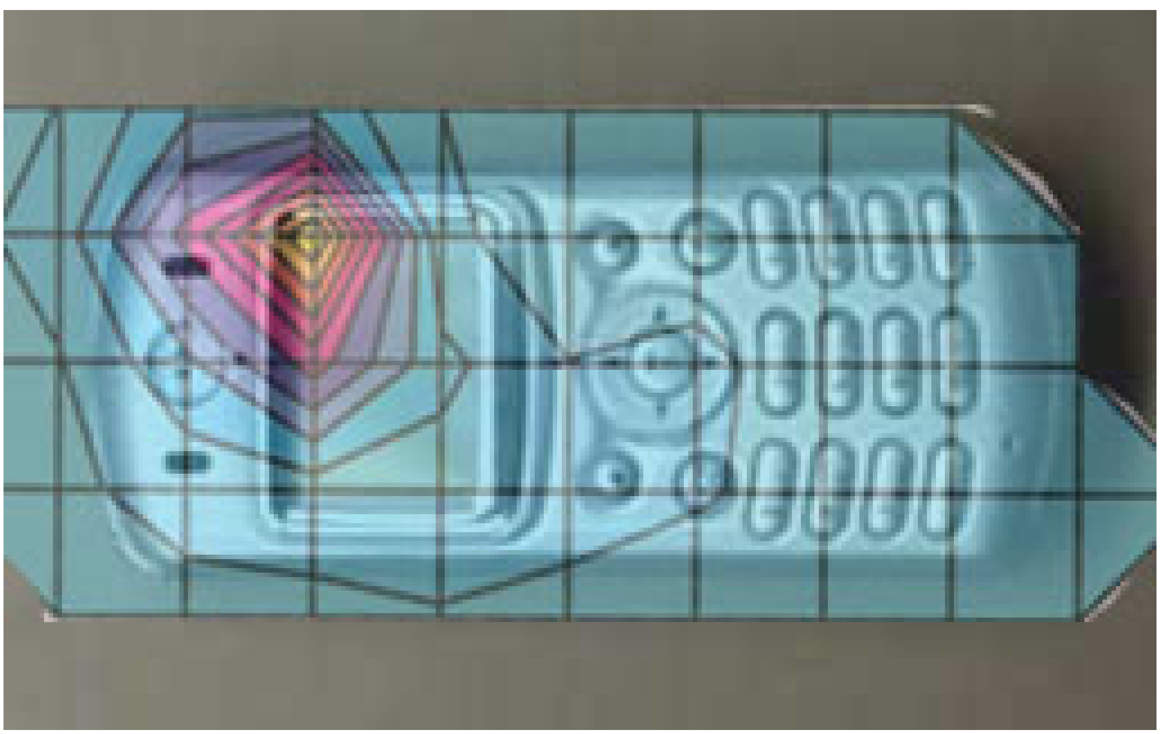


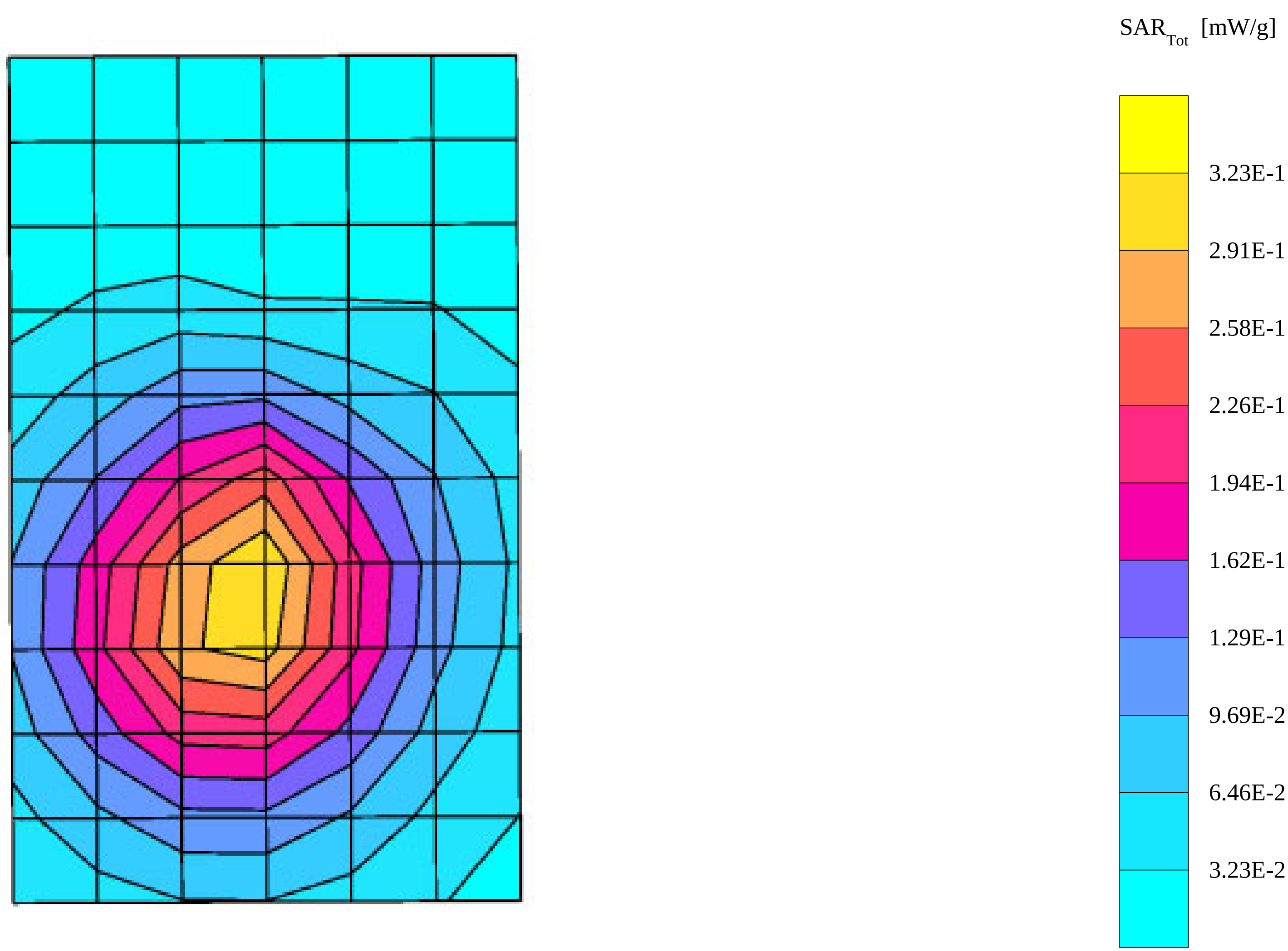
Figure 4. Typical 1900MHz Contour Overlaid on Phone (15 ˚ Tilt)

Appendix 3

SAR distribution plots for Body Worn Configuration

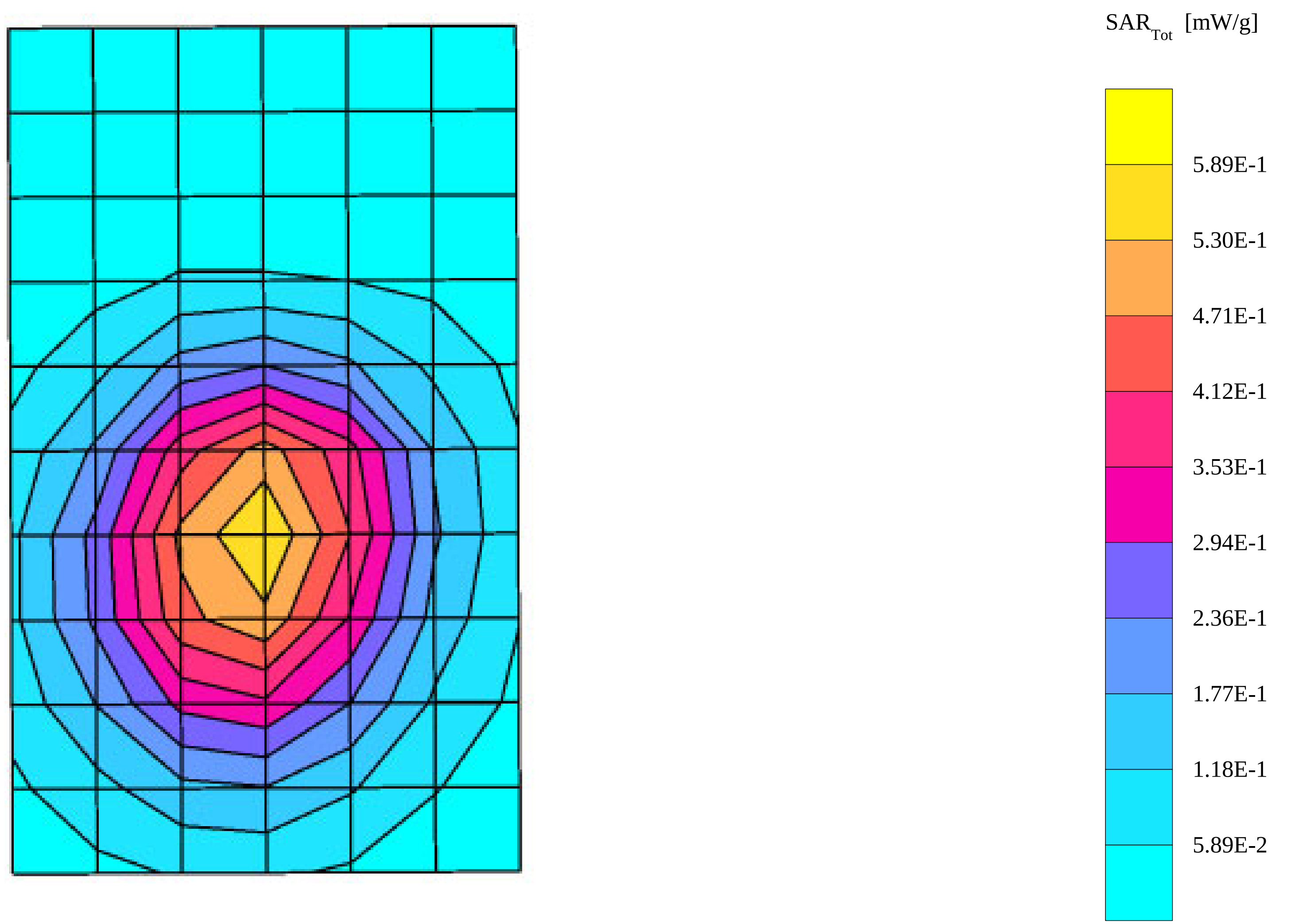
s/n 5A6N521 "C333"

Ch# 128 / Pwr Step: 7 / Type of Modulation: 850 GSM / Battery Model #: SYN9624A
Accessory Model #: SYN8763A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 53.7 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.341 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 15.4 (13.8, 17.3) [mm]
Powerdrift: -0.05 dB



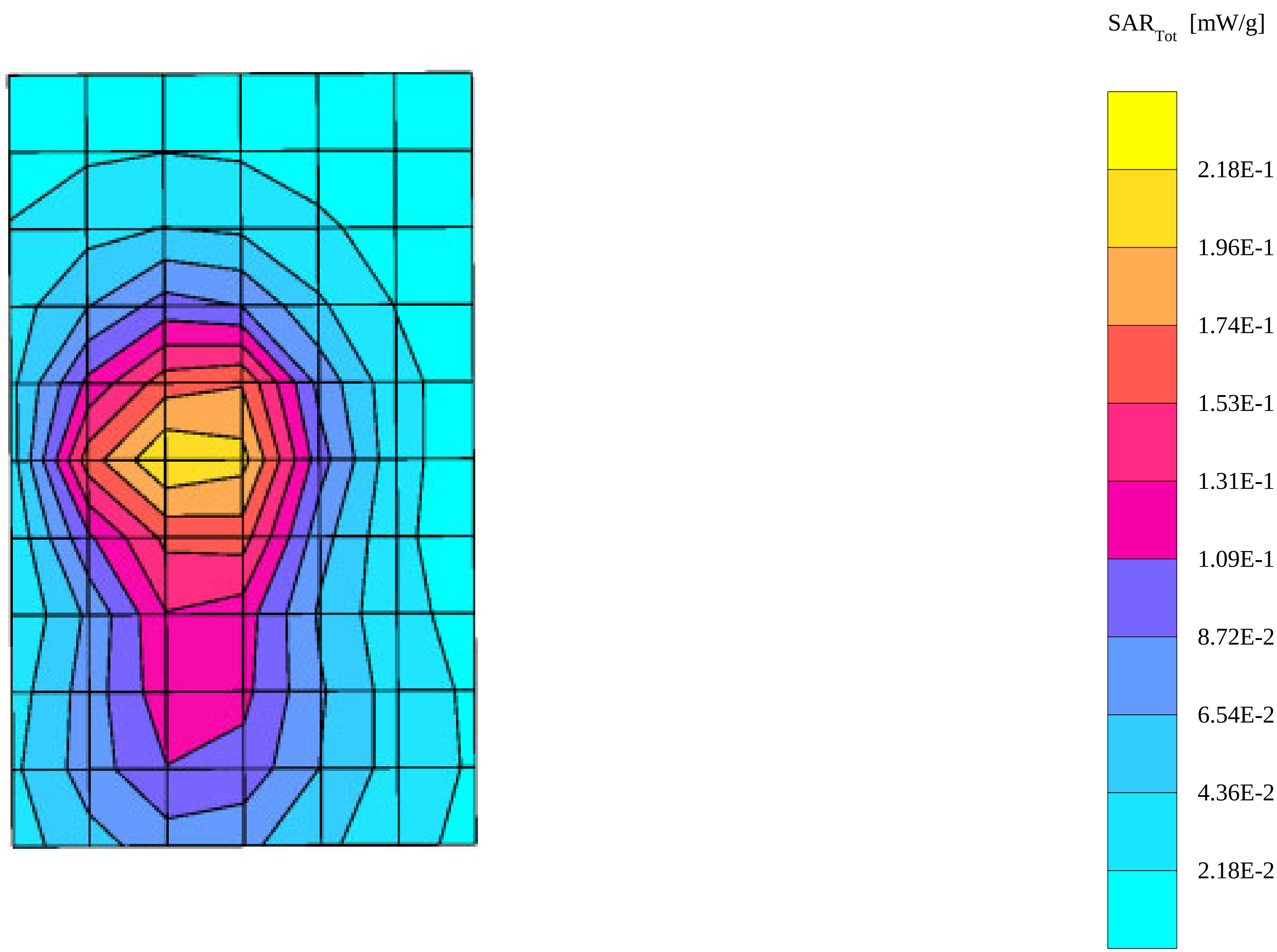
s/n 5A6N521 "C333"

Ch# 128 / Pwr Step: 7 / Type of Modulation: 850 GSM / Battery Model #: SYN9624A
Accessory Model #: SYN8631A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 53.7 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.583 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.1 (14.9, 17.3) [mm]
Powerdrift: -0.00 dB



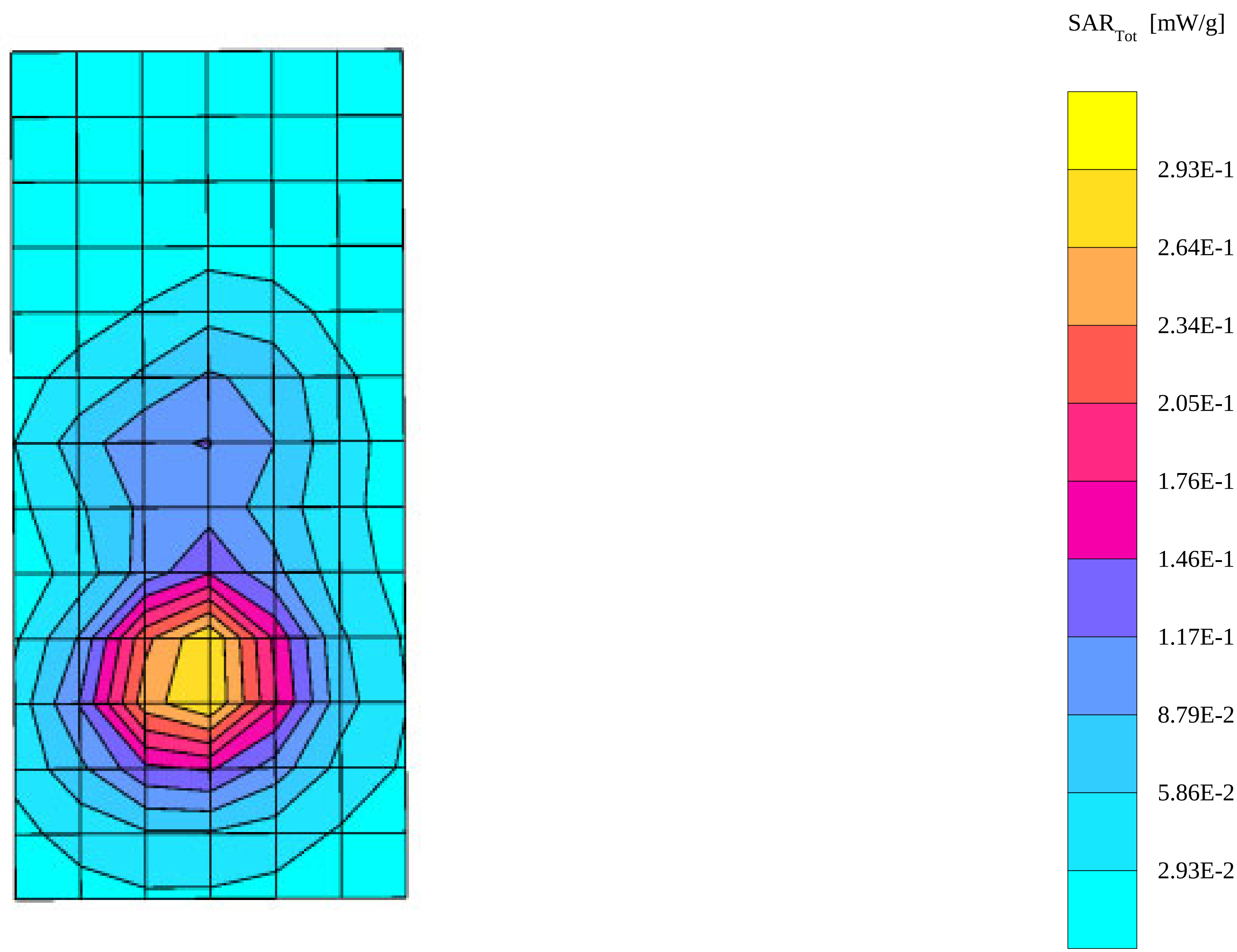
s/n 5A6N521 "C332"

Ch# 512 / Pwr Step: 0 / Type of Modulation: 1900 GSM / Battery Model #: SYN9624A
Accessory Model # SYN8763A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 1850 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.58 mho/m ε_r = 51.6 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.251 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 9.7 (8.5, 11.6) [mm]
Powerdrift: -0.14 dB



s/n 5A6N521 "C331"

Ch# 512 / Pwr Step: 00 / Type of Modulation: GSM 1900 / Battery Model #: SYN9624A
Accessory Model #: SYN8631A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 1850 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.56 mho/m ε_r = 51.9 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.320 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.1 (9.9, 12.8) [mm]
Powerdrift: -0.13 dB



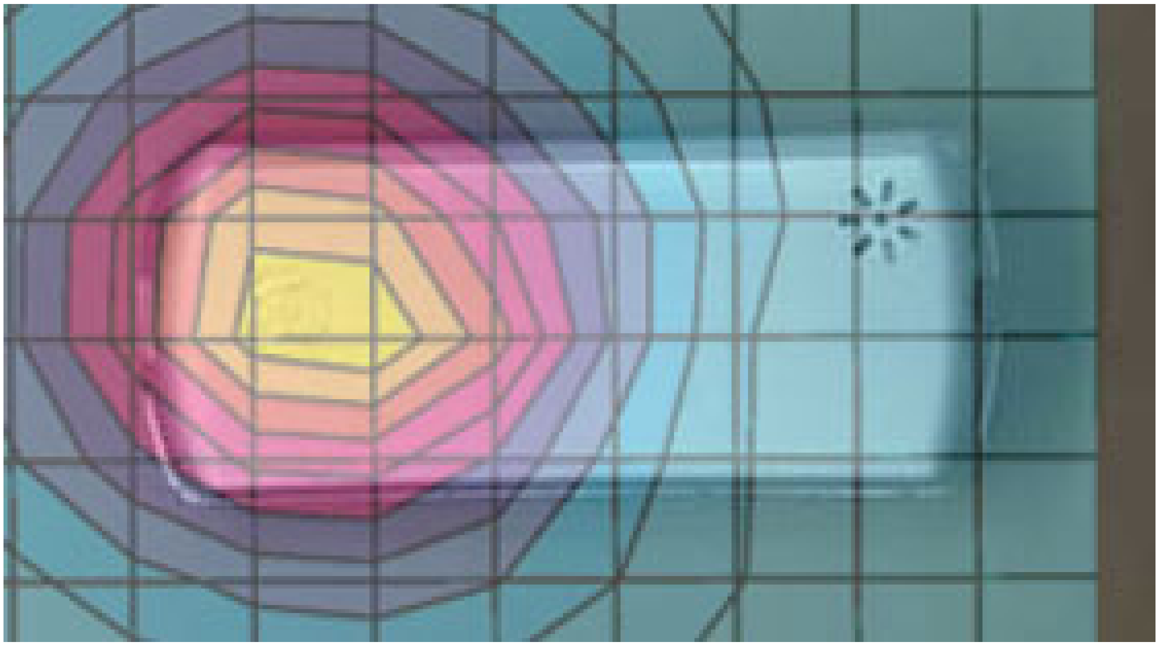


Figure 5.Typical 800 MHz Body-Worn Contour Overlaid on Phone

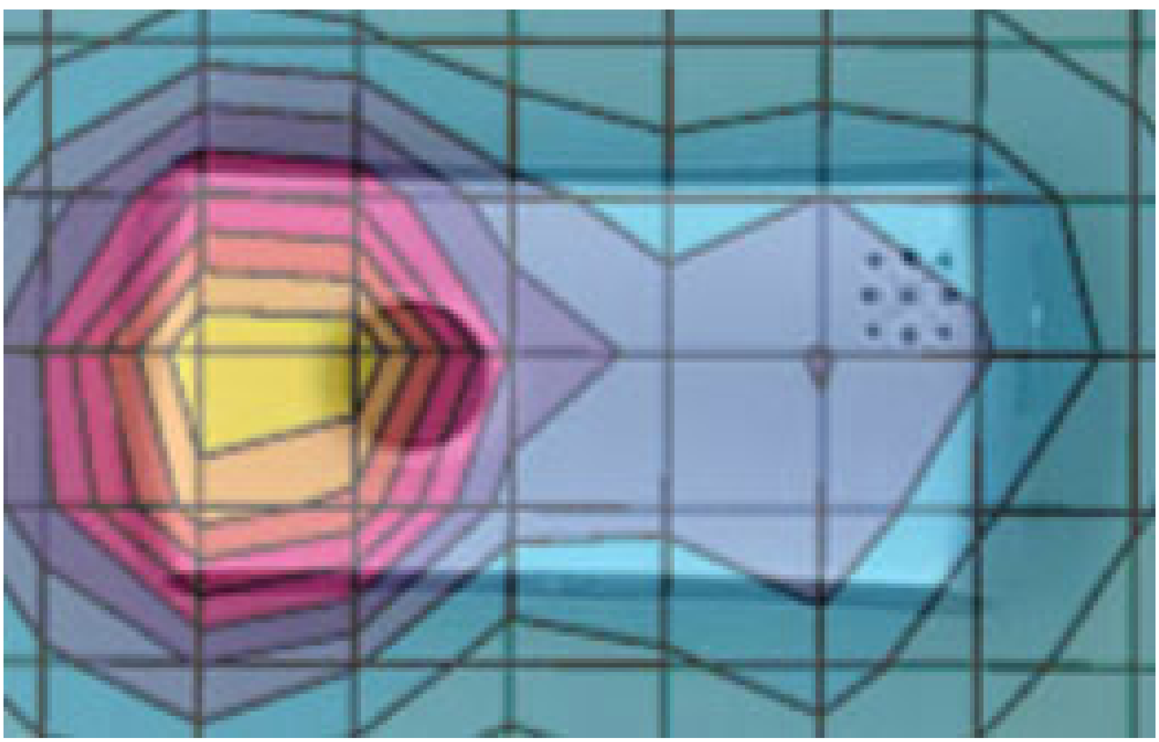


Figure 6. Typical 1900 MHz Body-Worn Contour Overlaid on Phone

Appendix 4

Probe Calibration Certificate

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:	ET3DV6R
Serial Number:	1513
Place of Calibration:	Zurich
Date of Calibration:	May 8, 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:	D.Vetter
Approved by:	[signature]

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:	November 24, 1999
Last calibration:	February 20, 2001
Remake ET3DV6R:	May 3, 2002
Recalibrated:	May 8, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6R SN:1513

Sensitivity in Free Space

NormX	**1.96** $\mu V/(V/m)^2$	
NormY	**2.02** $\mu V/(V/m)^2$	
NormZ	**2.02** $\mu V/(V/m)^2$	

Diode Compression

DCP X	**95**	mV
DCP Y	**95**	mV
DCP Z	**95**	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	**6.1** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)		Alpha	**0.81**
ConvF Z	**6.1** ± 9.5% (k=2)		Depth	**1.64**

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	**5.0** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**5.0** ± 9.5% (k=2)		Alpha	**0.61**
ConvF Z	**5.0** ± 9.5% (k=2)		Depth	**2.13**

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	4.6
SAR_{be} [%] With Correction Algorithm	0.0	0.1

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

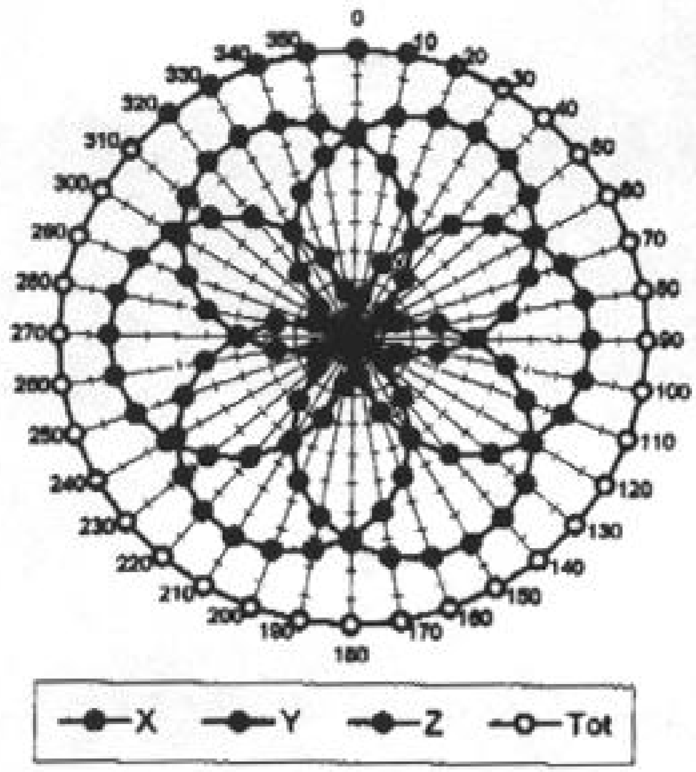
Probe Tip to Boundary	1 mm	2 mm
SAR_{be} [%] Without Correction Algorithm	11.8	7.3
SAR_{be} [%] With Correction Algorithm	0.2	0.1

Sensor Offset

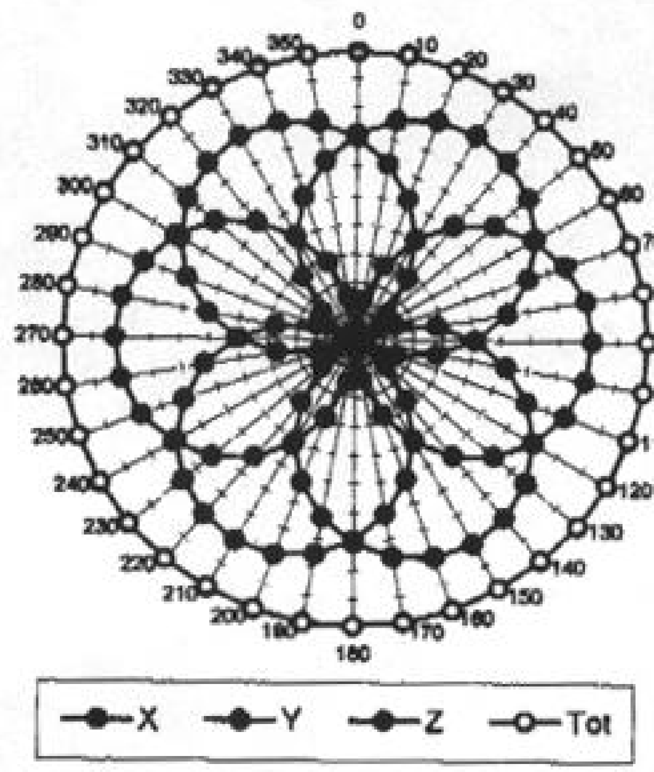
Probe Tip to Sensor Center **2.7** mm

Receiving Pattern (ϕ), $\theta = 0°$

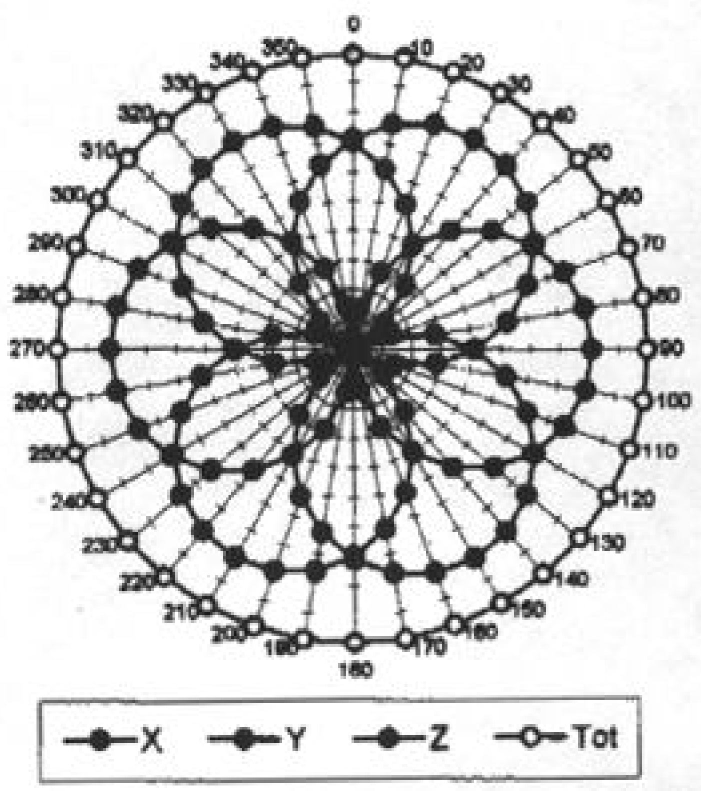
f = 30 MHz, TEM cell ifi110



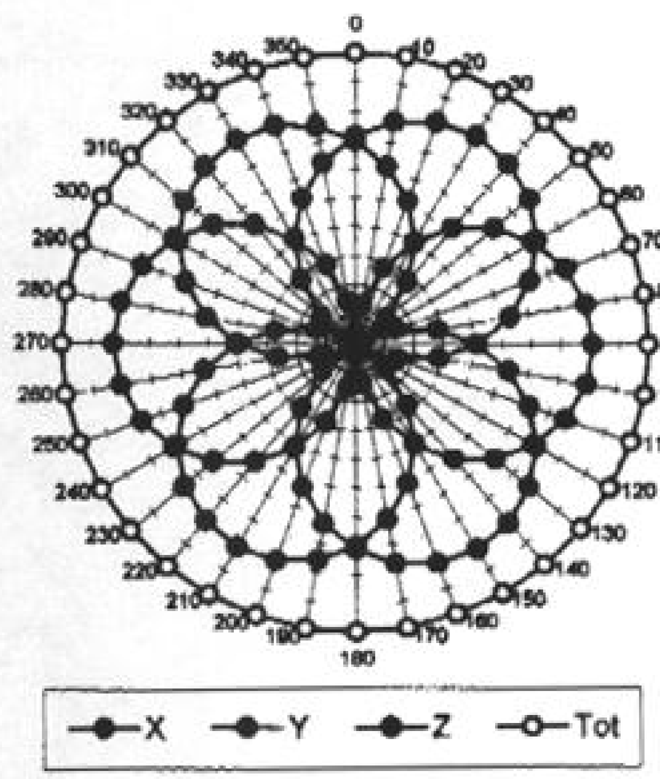
f = 100 MHz, TEM cell ifi110

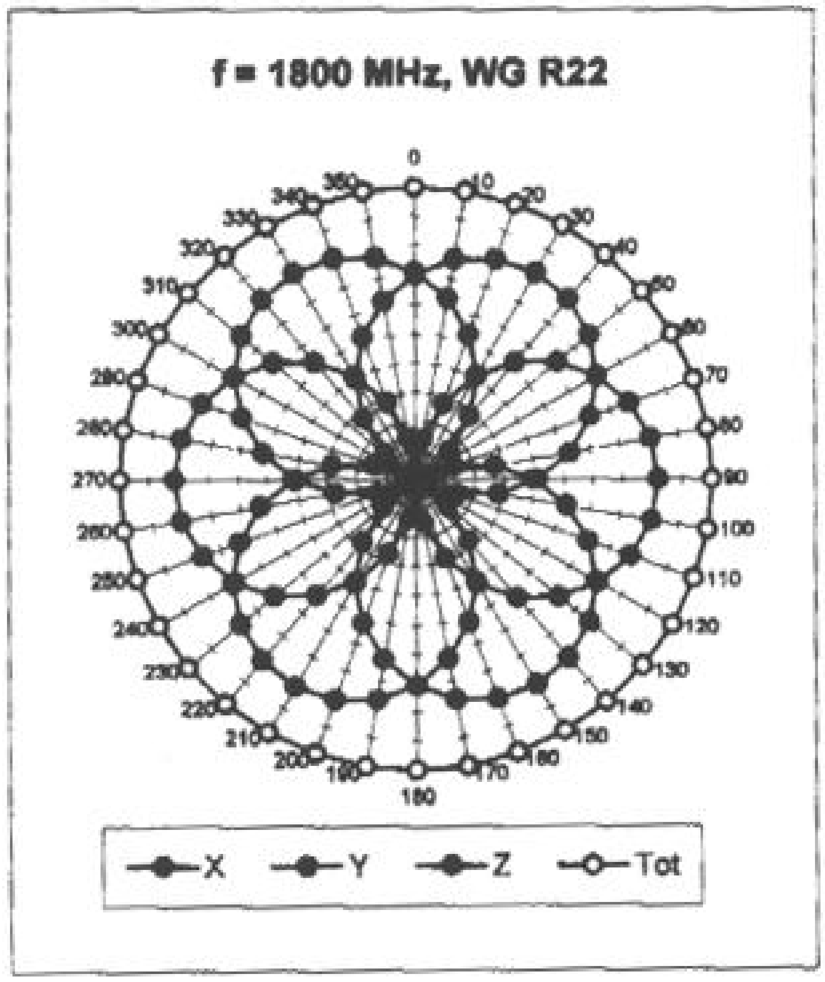


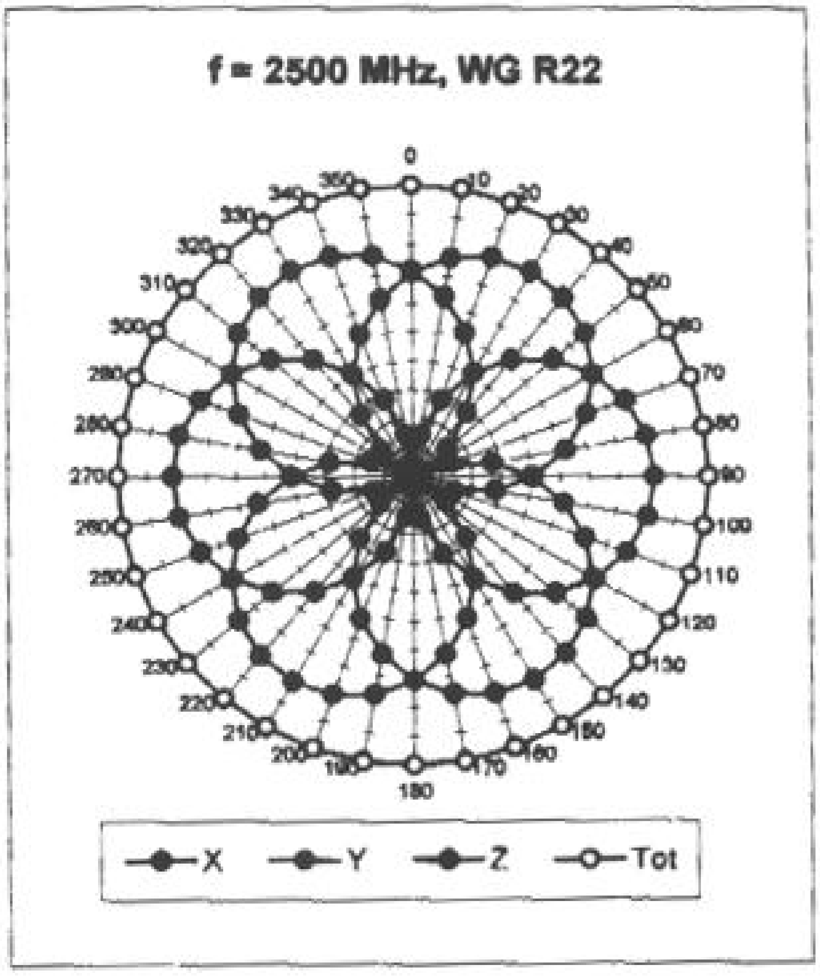
f = 300 MHz, TEM cell ifi110



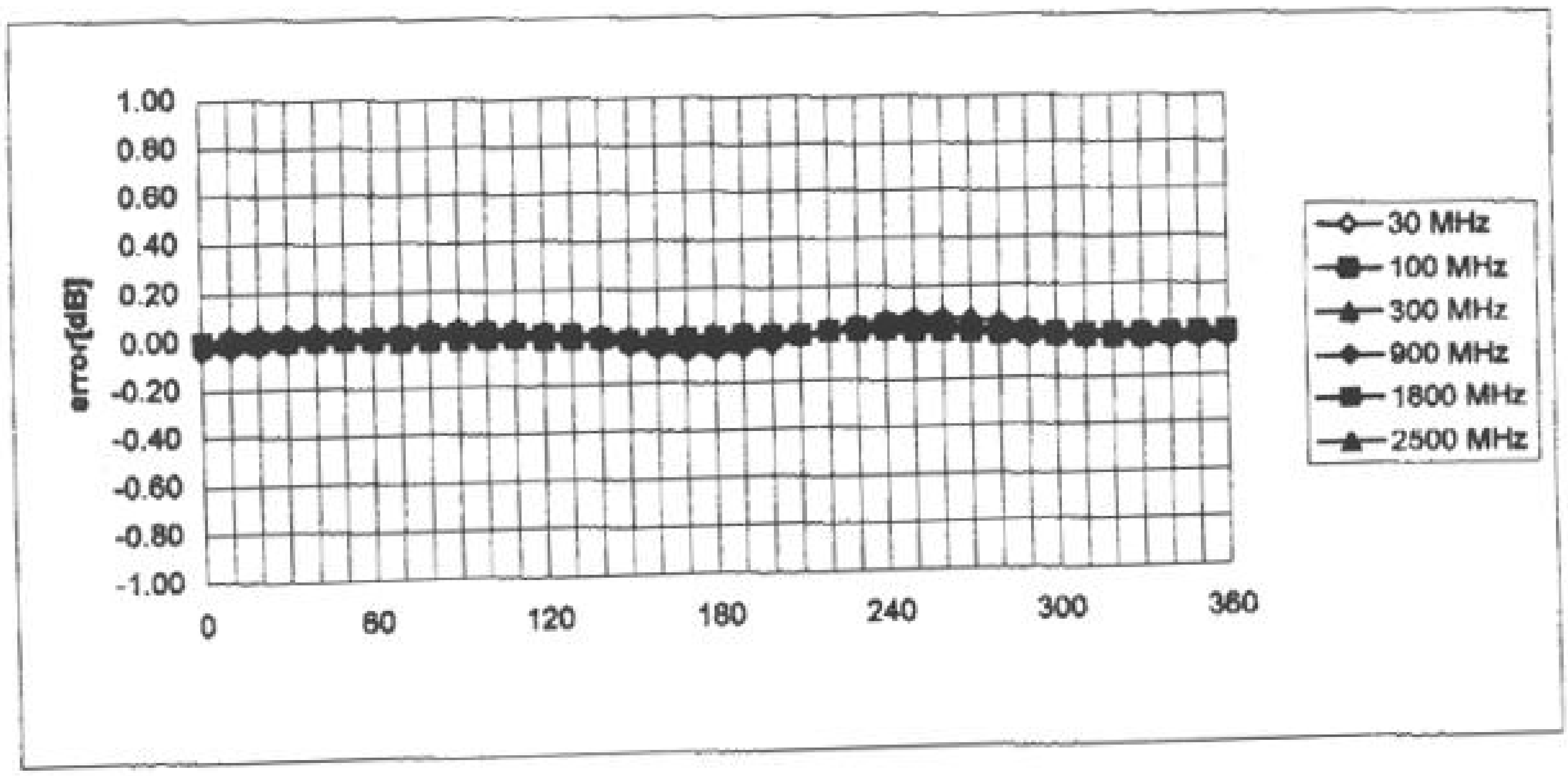
f = 900 MHz, TEM cell ifi110





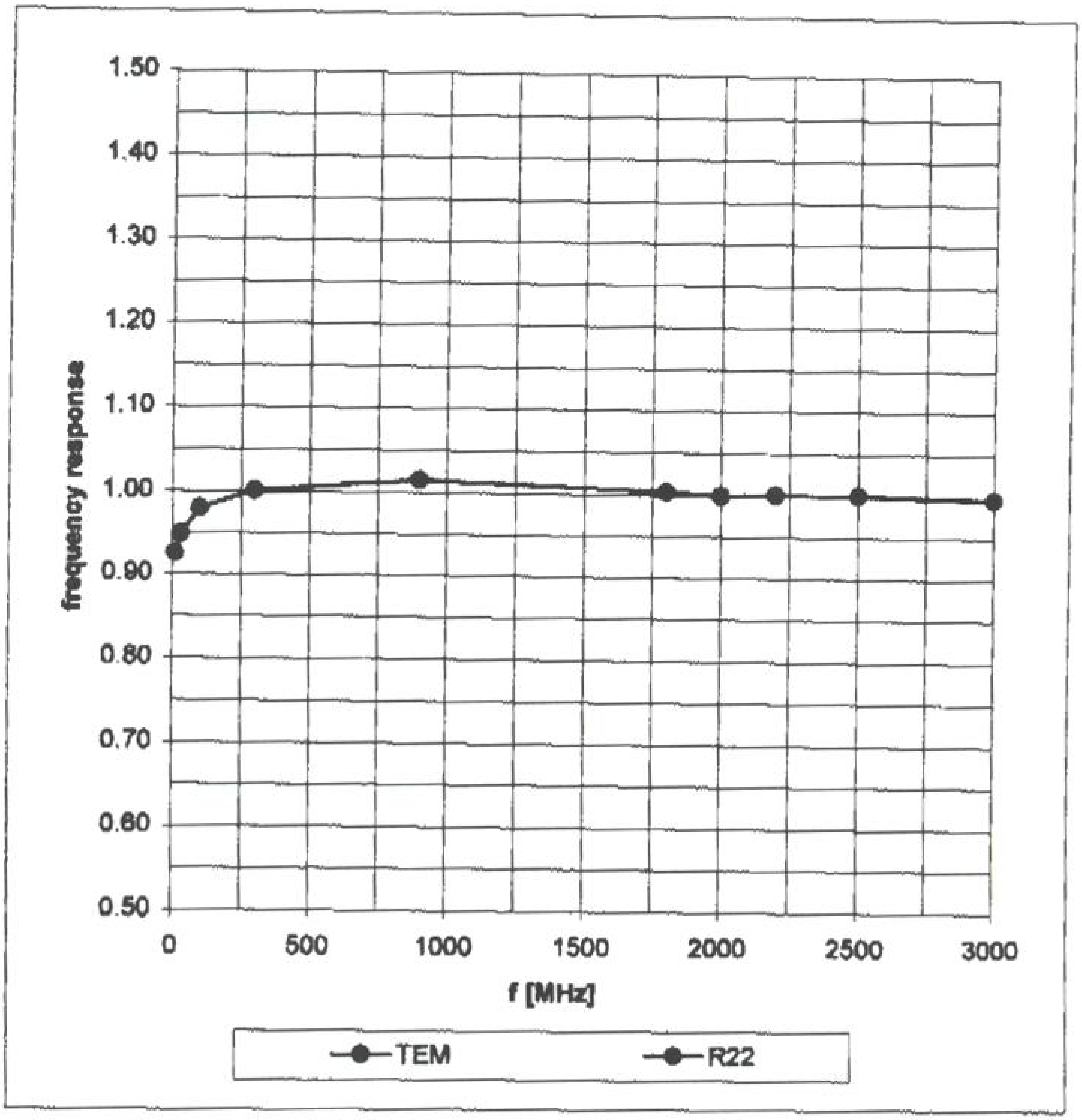


Isotropy Error (ϕ), θ = 0°



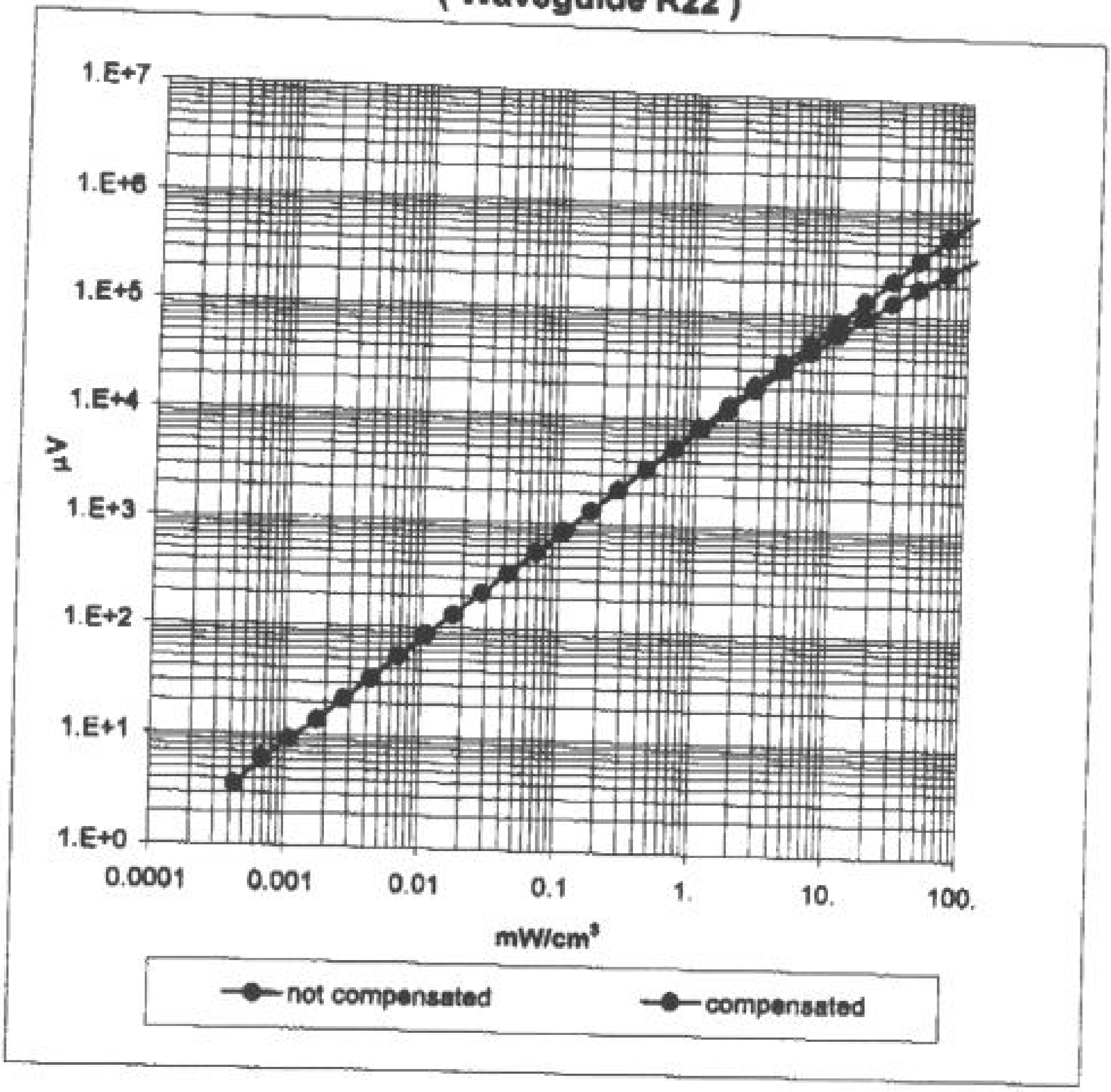
Frequency Response of E-Field

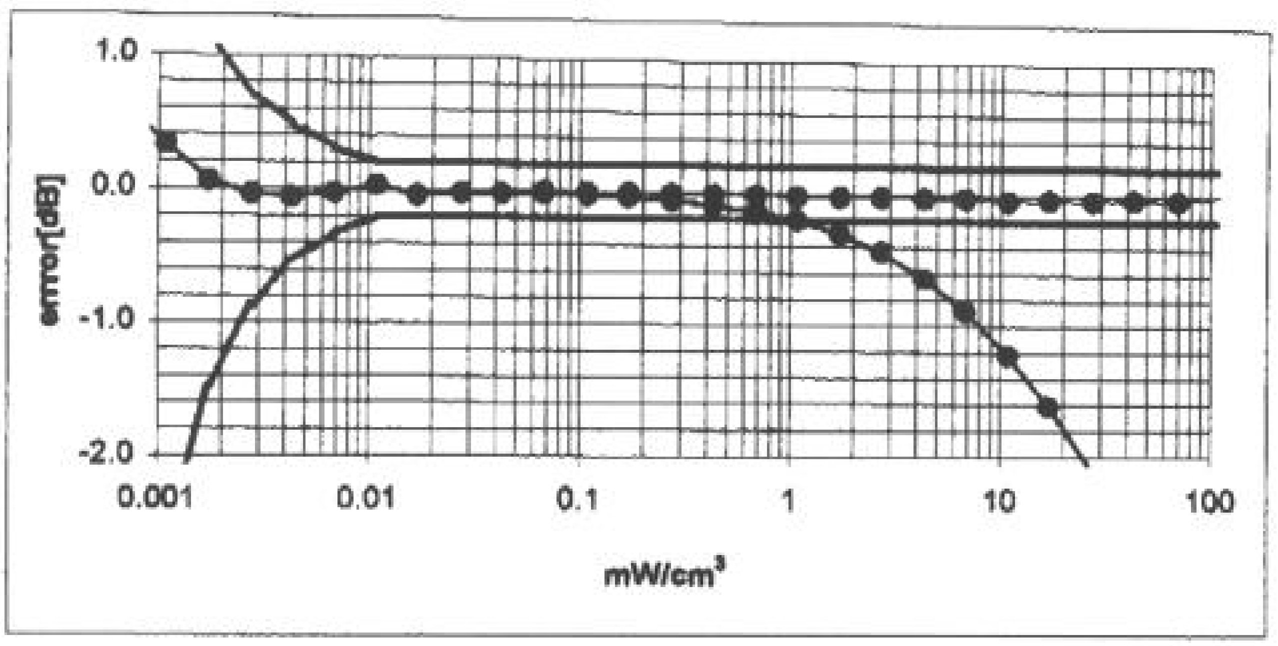
(TEM-Cell:ifi110, Waveguide R22)



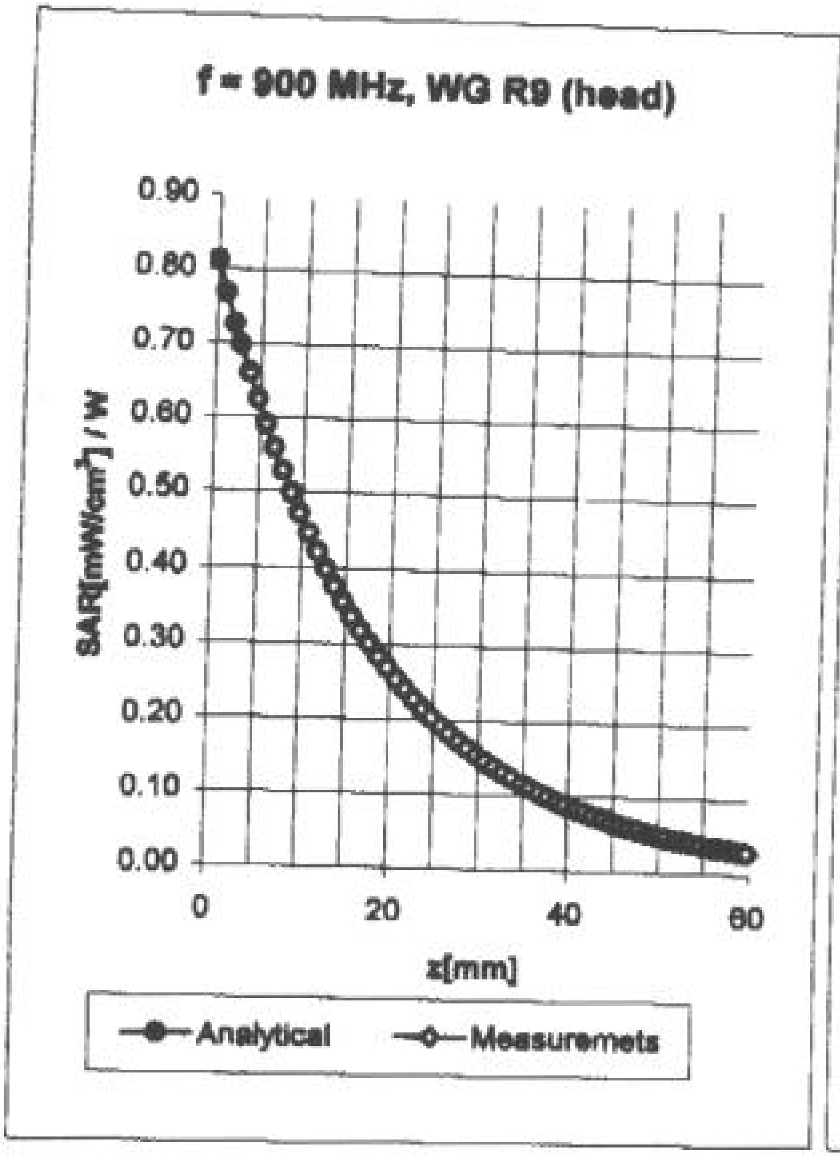
Dynamic Range f(SAR_{brain})

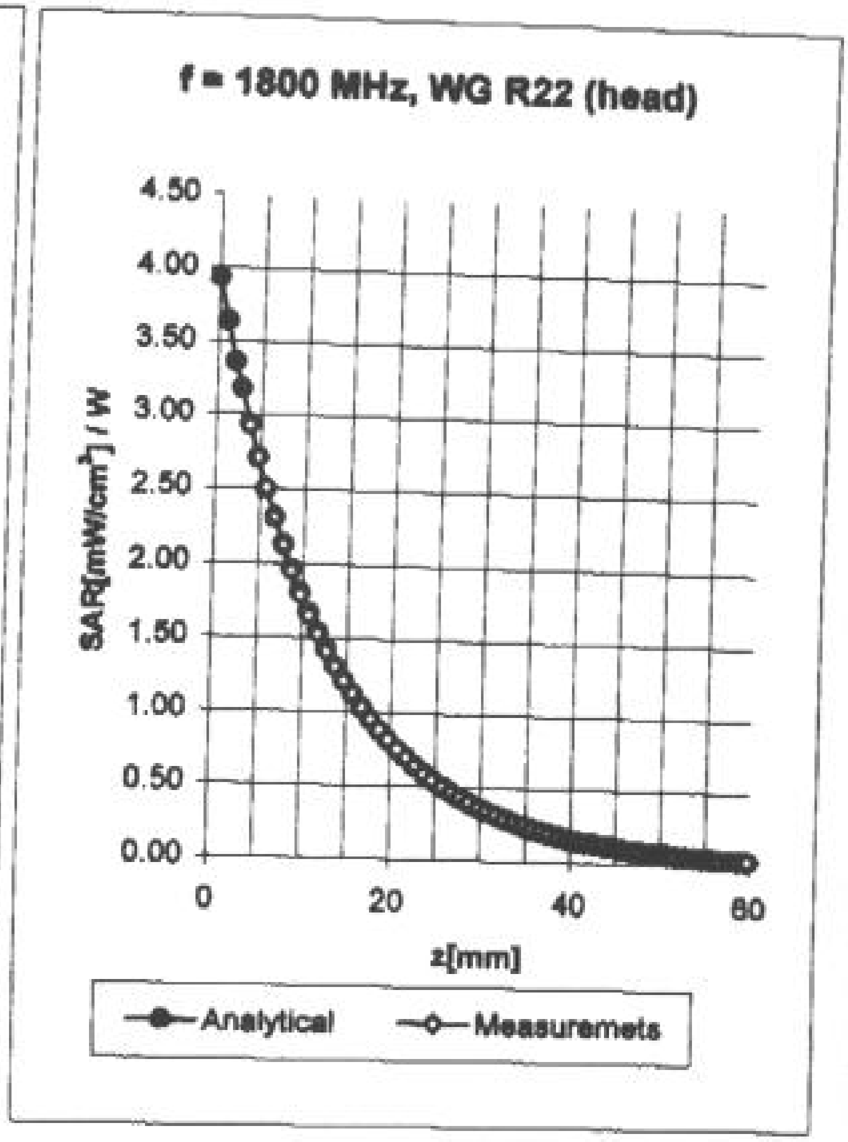
(Waveguide R22)





Conversion Factor Assessment



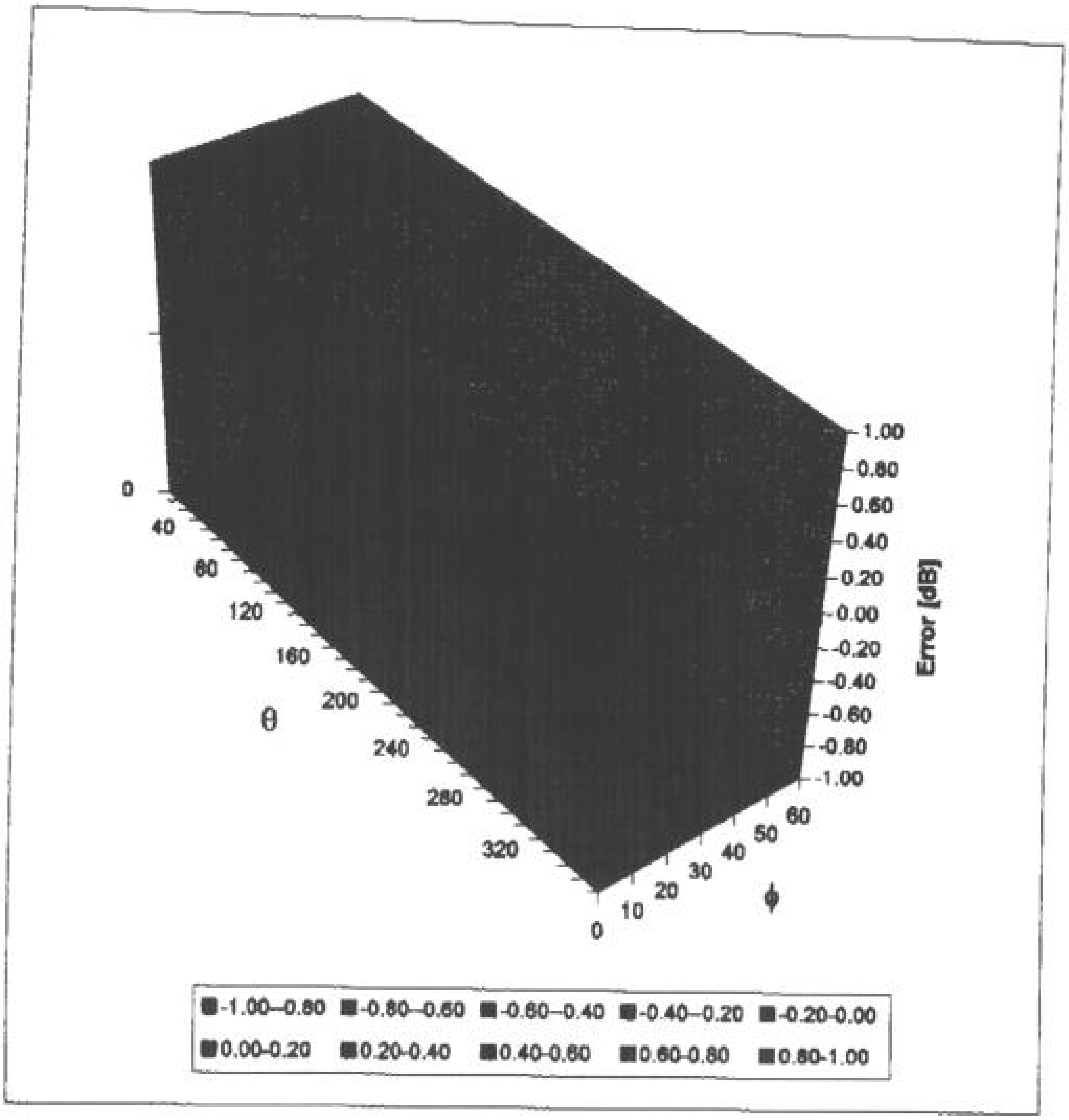


Head	**900 MHz**		ε_r = **41.5 ± 5%**	**σ = 0.97 ± 5% mho/m**	
Head	**835 MHz**		ε_r = **41.5 ± 5%**	**σ = 0.90 ± 5% mho/m**	
	ConvF X	**6.1**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.1**	± 9.5% (k=2)	Alpha	**0.81**
	ConvF Z	**6.1**	± 9.5% (k=2)	Depth	**1.64**

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	**5.0**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.0**	± 9.5% (k=2)	Alpha	**0.61**
	ConvF Z	**5.0**	± 9.5% (k=2)	Depth	**2.13**

Deviation from Isotropy in HSL

Error (θ,ϕ), 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:	**ET3DV6R**
Serial Number:	**1513**
Place of Assessment:	**Zurich**
Date of Assessment:	**May 8, 2002**
Probe Calibration Date:	**May 8, 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 ET3DV6R SN:1513

Conversion factor (± standard deviation)

835 MHz	ConvF	**6.2± 8%**	ε_r = 41.5 ± 5% σ = 0.90 ± 5% mho/m (head tissue)
1950 MHz	ConvF	**4.8 ± 8%**	ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m (head tissue)
835 MHz	ConvF	**6.0 ± 8%**	ε_r = 55.2 ± 5% σ = 0.97 ± 5% mho/m (body tissue)
900 MHz	ConvF	**5.9 ± 8%**	ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m (body tissue)
1800 MHz	ConvF	**4.6 ± 8%**	ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m (body tissue)
1950 MHz	ConvF	**4.4 ± 8%**	ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m (body tissue)

Appendix 5

Dipole Characterization Certificate

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:	#094	Last Calibration Date:	3-Jan-01
Dipole Type (MHz):	900 MHz	Calibration Due:	3-Jan-03
		Manufacturer:	SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: **[Serial Number: 094]**

1g SAR normalized to 1W forward power (mW/g):	10.24 mW/g
Relative Dielectric:	40.6
Conductivity:	0.85
Probe Serial Number:	SN 1507
Forward Power:	250mW +/-3%

Primary Dipole Referenced: **[Serial Number: 077]**

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95
Probe Serial Number:	SN 1507
Forward Power:	250mW +/-3%

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity: X By Transfer Calibration:

-Measured Data-

Probe S/N:	SN 1515	Conductivity (meas.):	0.97
Robot Cell #:	RVD #8	Permittivity (meas.):	42.5

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

2.875 mW/g	N/R	N/R
	(if required)	(if required)

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

2.81 mW/g	N/R	N/R
	(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: [signature] **Date:** 11/13/2001

Comments: Secondary dipole measured –2.3% from primary dipole.

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:	280(TR)	Last Calibration Date:	4-Jan-01
Dipole Type (MHz):	D1800V2 w/ Teflon Rings	Calibration Due:	4-Jan-03
		Manufacturer:	SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: **[Serial Number: 280(TR)]**

1g SAR normalized to 1W forward power (mW/g):	44.4mW/g
Relative Dielectric:	40.0
Conductivity:	1.71
Probe Serial Number:	1507
Forward Power:	250mW

Primary Dipole Referenced: **[Serial Number: 246(TR)]**

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37
Probe Serial Number:	1507
Forward Power:	250 mW

-Correlation Method Utilized- per DOI-1265
(select one)

By Similarity: X   By Transfer Calibration:

-Measured Data-

Probe S/N:	1375	Conductivity (meas.):	1.38
Robot Cell #:	HVD-4	Permittivity (meas.):	38.4

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

9.515 mW/g		
	(if required)	(if required)

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

9.6 mW/g		
	(if required)	(if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37

Approved by: Antonio Ferreira   **Date:** 3/8/02

Comments: Secondary dipole measured +0.9 % from primary dipole.

Appendix 6

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	

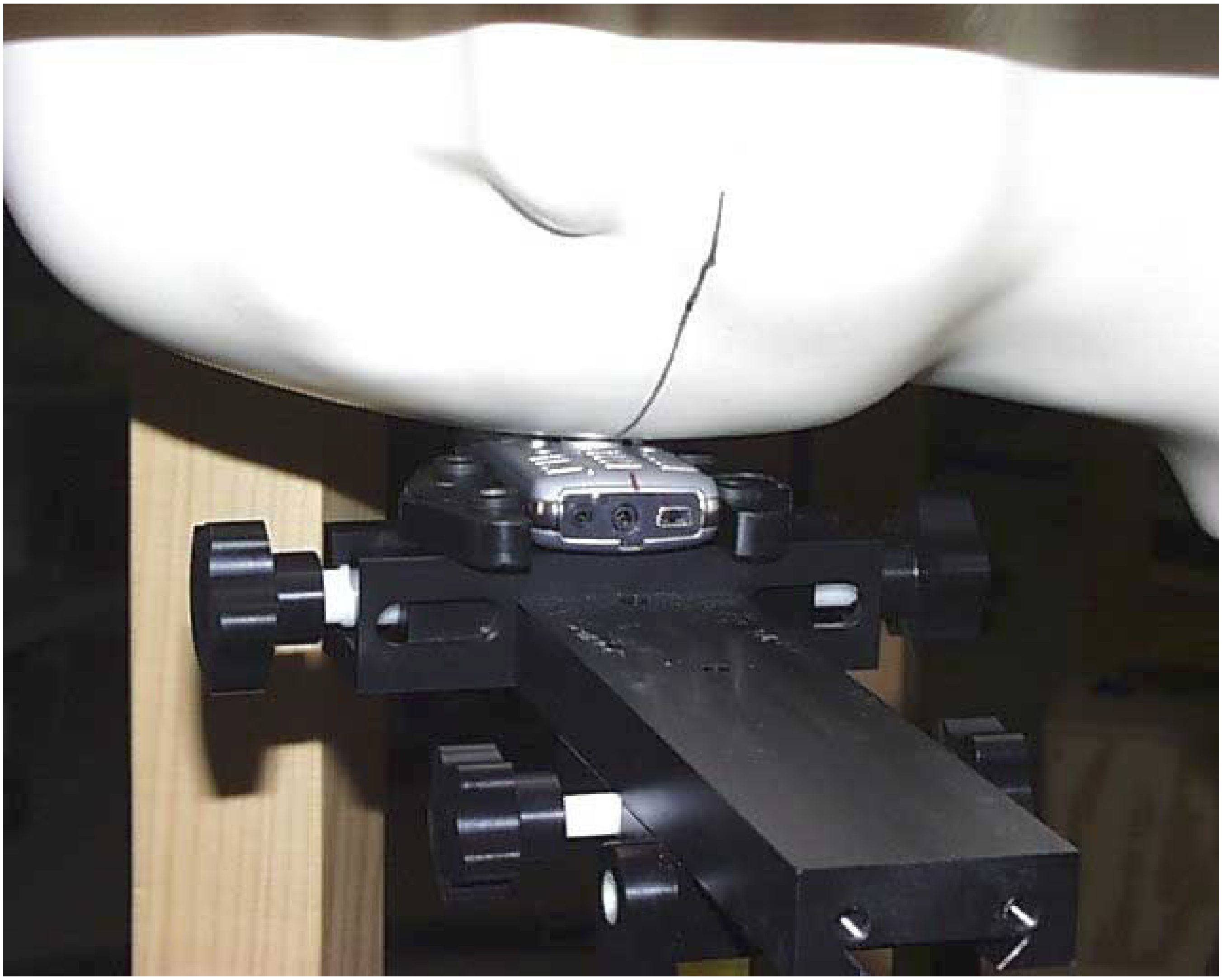
Appendix 7

Photographs of the device under test

Pictures of Front and Back of C331 Housing

Pictures of the Front and Back of the C332 Housing

Pictures of Front and Back of C333 Housing




25 mm