Kyocera Wireless Corp.
KWC 5135

SPECIFIC ABSORPTION RATE (SAR)

REPORT

CONTENT

1 INTRODUCTION

This test report describes an environmental evaluation measurement of specific absorption rate (SAR) distribution in simulated human head tissues exposed to radio frequency (RF) radiation from a wireless portable device manufactured by Kyocera Wireless Corp. (KWC). These measurements were performed for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC). The testing was performed in July 2002 in the KWC SAR Test Facility. The wireless device is described as follows;

EUT Type:	*Trimode, CDMA(PCS), CDMA and Analog (Cellular) Phone*
Trade Name:	*Kyocera Wireless Corp.*
Model:	*KWC-5135*
Tx Frequency :	*824.04 – 848.97 and 1851.25 – 1908.75 MHz*
Modulation:	*CDMA and Analog*
Antenna:	*Retracting whip w/ helix*
FCC Classification:	*Non-Broadcast Transmitter Held to Ear*
Application Type:	*Certification*
Serial Number :	*3X-X----0302TC*
FCC ID:	*OVFKWC-5135*
Place of Test:	*KWC, 10300 Campus Point Drive, Lab AA-136, San Diego, CA, USA*
Date of Test:	*July 17-23, 2002*
FCC Rule Part:	*47 CFR 2.1093; OET Bulletin 65, Sup. C; 47 CFR 22; 47 CFR 24*

Testing has been carried out in accordance with:
IEEE P1528-200X Draft 6.4

2 SAR TEST RESULT SUMMARY

This device has been tested for localised specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE Std. C95.1 ~ 1992 and has been tested in accordance with the measurement procedures specified in IEEE P1528-200X Draft 6.4. Normal antenna operating positions were incorporated, with the device transmitting at frequencies consistent with normal usage of the device. The device has been shown to be capable of compliance for localised specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE std. C95.1-1992 The Kyocera 5135 cellular phone is in compliance with the FCC Part 2.1093 RF exposure limits.

2.1 Maximum Results Found during SAR Evaluation

The equipment is deemed to fulfil the requirements if the measured values are less than or equal to the limit.

2.1.1 Head Configuration

Mode/Ch/f(MHz)	Conducted Power	Antenna Position	Device Position	Limit (mW/g)	Measured (mW/g)	Result
CDMA/383/836.49	24.89 dBm	Extended	Right Cheek	1.6	1.31	**PASSED**

Mode/Ch/f(MHz)	Conducted Power	Antenna Position	Device Position	Limit (mW/g)	Measured (mW/g)	Result
PCS/25/1851.25	22.01 dBm	Retracted	Right Cheek	1.6	0.832	**PASSED**

2.1.2 Body Worn Configuration (with KWC body worn accessories)

Mode/Ch/f(MHz)	Conducted Power	Antenna Position	Device Position	Limit (mW/g)	Measured (mW/g)	Result
FM/383/836.49	25.03 dBm	Extended	Waist level	1.6	0.648	**PASSED**

2.1.3 Measurement Uncertainty

Combined Uncertainty (Assessment & Source)	**± 10.32 %**
Extended Uncertainty (k=2)	**± 20.6 %**

3 DESCRIPTION OF TESTED DEVICE

The test sample consisted of a KWC 5135 pre-production cellular phone. This model will operate in CDMA PCS, CDMA and analog cellular mode. The CDMA PCS mode is designed to transmit in the 1851.25 – 1908.75 MHz band. The cellular FM AMPS mode is designed to transmit in the 824.04 – 848.97 MHz. The cellular CDMA mode is designed to transmit in the 824.04 – 848.97 MHz band.

The KWC-5135 is a tri-mode and dual band cellular/PCS phone. The antenna is a standard retracting whip antenna tuned for dual frequency, with a top loaded helix antenna that is activated when the whip is retracted. See pictures below. Since either position is possible during use, both retracted and extended were tested, at the low, mid, and high frequencies of each band.

There is only one battery option available to operate KWC-5135. The battery part number is CV90-G8196, model number TXBAT10003. All measurements were done with production batteries.

The KWC-5135 has provision for headset to allow hands-free operation. The following body worn accessories are available for KWC-5135: Holster CV90-B1680, Leather Case CA90-B1691M and Leather Case CA90-B1691S. SAR measurements for hands-free operating condition were done at the low, mid, and high frequencies of each band.

The SAR levels were also tested with 13.5mm air space in all modes for the hands-free application with other body-worn holster that contains no metal and provides at least 13.5mm separation from the closest point of the handset to the body.

4 TEST CONDITIONS

4.1 Ambient Conditions

All tests were performed under the following environmental conditions:

Ambient Temperature:	21 ± 1 Degrees C
Tissue simulating liquid temperature:	21 ± 1 Degrees C
Humidity:	48 %
Pressure:	1015 mB

4.2 RF characteristics of the test site

All KWC dosimetry equipment is operated within a shielded screen room manufactured by Lindgren RF Enclosures to provide isolation from external EM fields.

The E-field probes of the DASY 3 system are capable of detecting signals as low as 5μW/g in the liquid dielectric, and so external fields are minimised by the screen room, leaving the phone as the dominate radiation source. The floor of the screen room is reflective, so 2 two-foot square ferrite panels are placed beneath the phantom area of the DASY system to minimise reflected energy that would otherwise re-enter the phantom and combine constructively or destructively with the desired fields. These ferrite panels provide roughly 12 to 13 dB of attenuation in the frequency range of 900 MHz, and 7 to 8 dB of attenuation in the frequency range of 1.9 GHz.

4.3 Test Signal, Frequencies and Output Power

The device was controlled by using Kyocera Wireless Phone Support Toolkit, Test Code Controller.

In all operating bands, the measurements were performed on low, mid and high channels.

The phone was set to nominal maximum power level during all tests and at the beginning of the each test the battery was fully charged. Radiated power output was measured in KWC antenna range, fully an-echoic chamber from the same unit that was used in SAR testing.

DASY3 system measures power drift during SAR testing by comparing E-field in the same location at the beginning and at the end of measurement. These records were used to monitor stability of power output.

5 DESCRIPTION OF THE TEST EQUIPMENT

The measurements were performed with an automated near-field scanning system, DASY3, manufactured by Schmid & Partner Engineering AG (SPEAG) of Zurich, Switzerland.

Test Equipment	Serial Number	Due date
DASY3 DAE3 Version 1	493	01-20-03
E-field Probe ET3DV6	1618	02-21-03
Dipole Validation kit, D835V2	454	02-11-04
Dipole Validation kit, D1900V2	5D003	02-20-04

The calibration records of E-field probe are attached in Appendix C.

Additional equipment needed in validation

Test Equipment	Due date
Signal Generator, HP E4421B	04-12-03
Power meter, Giga-tronics 8541C	02-27-03
Power Sensor, Giga-tronics	02-10-03
Network Analyzer, HP 8753C	02-11-03
HP 85070B Dielectric Probe	--
Thermometer	--

5.1 System Validation

The probes are calibrated annually by the manufacturer. Dielectric parameters of the stimulating liquids are measured with an automated Hewlett Packard 85070B dielectric probe in conjunction with an HP 8753C network analyser.

The SAR measurements of the device were done within 24 hours of system accuracy verification, which was done using the dipole validation kit. Power level of 10dBm was

supplied to a dipole antenna placed under the flat section of SAM phantom. The validation results are in the table below and printouts of the validation test are attached in Appendix A. All the measured parameters were within the specification.
Note since the validation reference in muscle liquid is not available, the system validation with head tissues was done for the device testing in muscle. Based on OET 65 Supplement C EAB Part 22/24 SAR review Reminder Sheet 01/2002, this is a valid test.

Tissue	F (MHz)	Description	Validation SAR (mW/g), 1g	Dielectric Parameters		Temp (°C)	Test date	Comments
				εr	σ (S/m)			Validation testing -
Head	**835**	Measured	0.103	41.2	0.89	21	07-17-02	for device testing in head liquid
		Measured	0.105	41.5	0.89	21	07-18-02	for continuing testing in head liquid
		Measured	0.102	41.7	0.88	21	07-18-02	for device testing in muscle
		Measured	0.107	41.2	0.88	21	07-22-02	for device testing in muscle
		Measured	0.104	41.0	0.89	21	07-23-02	head testing for missed file
		SPEAG Reference	0.104	41.9	0.89	--	02-11-02	
		FCC Reference	--	**41.5**	**0.90**	20-26	--	
Head	**1900**	Measured	0.457	39.9	1.44	21	07-19-02	for device testing in head liquid
		Measured	0.452	39.2	1.44	21	07-19-02	for device testing in muscle
		SPEAG Reference	0.456	39.1	1.47	--	02-20-02	
		FCC Reference	--	**40.0**	**1.40**	20-26	--	
Muscle	**835**	Measured	--	55.89	0.91	21	07-18-02	for device testing in muscle
		Measured		55.98	0.91	21	07-22-02	for device testing in muscle
		FCC Reference	--	**55.2**	**0.97**	--	--	
Muscle	**1900**	Measured	--	54.29	1.48	21	07-19-02	for device testing n muscle
		FCC Reference	--	**53.3**	**1.52**	20-26	--	

FCC reference values are adopted from OET Bulletin 65 (97-01) Supplement C (01-01).

5.2 Tissue Stimulants

All dielectric parameters of tissue stimulants were measured within 24 hours of SAR measurements. The depth of the tissue stimulant in the ear reference point and flat reference point of the phantom were at least 15cm during all the tests.

5.2.1 Head Tissue Stimulant

The composition of the head tissue simulating liquid for 835MHz is

51.07%	Water
0.23%	Cellulose

47.31% Sugar
0.24% Preventol
1.15% Salt

and for 1900MHz is

54% Water
44.91% Glycol monobutyl
0.21% Salt
The ingredients above are adopted from Application Note: Recipes for Head Tissue Simulating Liquid by SPEAG.

5.2.2 Muscle Tissue Stimulant

The composition of the muscle tissue simulating liquid for 835MHz is

65.45% Water
34.31% Sugar
0.1% Preventol
0.62% Salt

and for 1900MHz is

69.91% Water
29.96% Glycol monobutyl
0.13% Salt

The ingredients above are adopted from Application Note: Recipes for Muscle Tissue Simulating Liquid by SPEAG.

5.3 Phantoms

SAM v4.0 phantom, manufactured by SPEAG, was used during the measurement. It has fiberglass shell integrated in a wooden table. The shape of the shell corresponds to the phantom defined by IEEE SCC34-SC2. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. Reference markings on the phantom allow the complete set-up of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

The thickness of phantom shell is 2mm except for the ear, where an integrated ear spacer provides a 6mm spacing from the tissue boundary. Manufacturer reports tolerance in shell thickness to be ± **0.1mm.**

5.4 Isotropic E-Field Probe ET3DV6

Construction Symmetrical design with triangular core
Built-in optical fiber for surface detection system
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol)

Calibration Calibration certificate in Appendix C

Frequency 10MHz to 3GHz (dosimetry); Linearity: ± 0.2dB (30MHz to 3GHz)

Optical Surface ± 0.2mm repeatability in air and clear liquid over diffuse reflecting

Detection surface

Directivity ± 0.2dB in HSL (rotation around probe axis)
± 0.4dB in HSL (rotation normal to probe axis)

Dynamic Range 5 uW/g to > 100 mW/g; Linearity: ± 0.2dB

Dimensions Overall length: 330mm
Tip length: 16mm
Body diameter: 12mm
Tip diameter: 6.8mm
Distance from probe tip to dipole centers: 2.7mm

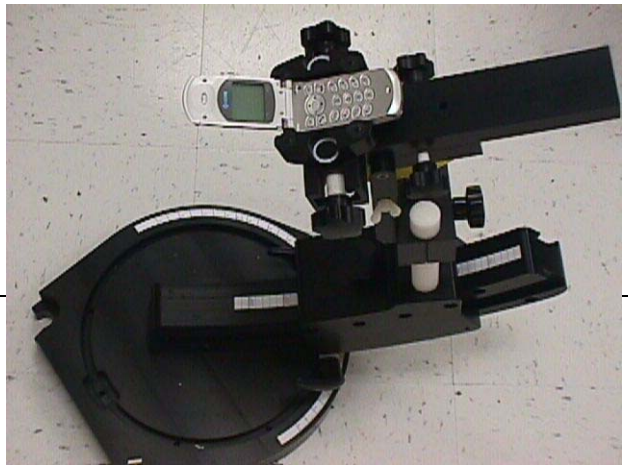
Application General dosimetry up to 3GHz
Compliance tests of mobile phones
Fast automatic scanning in arbitrary phantoms.

6 DESCRIPTION OF THE TEST PROCEDURE

6.1 Test Positions

The device was placed in the holder. The bottom of the device aligns with the bottom of the holder clamp to provide a standard positioning and ensure enough free space for antenna. See picture.

Device holder was provided by SPEAG together with DASY3.



6.1.1 Against Phantom Head

Measurements were made on both left hand side and right hand side of the phantom.

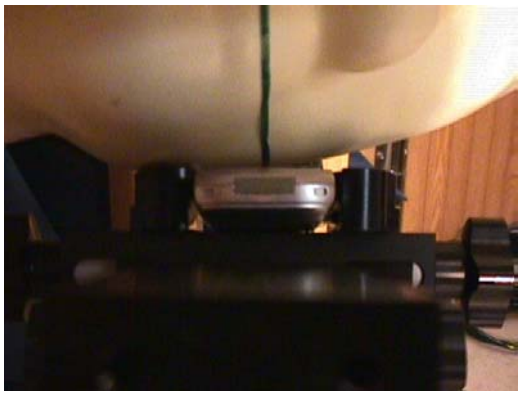
The device was position against phantom according to OET Bulletin 65 (97-01) Supplement C (01-01). Definitions of terms used in aligning the device to a head phantom are available in IEEE Draft Standard P1528-2001 "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

6.1.1.1 Initial Ear Position

The device was initially positioned with the earpiece region pressed against the ear spacer of a head phantom parallel to the "Neck-Front" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".

6.1.1.2 Cheek Position

"Initial ear position" alignments are maintained and the device is brought toward the mouth of the head phantom by pivoting along the "Neck-Front" line until any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom or when any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

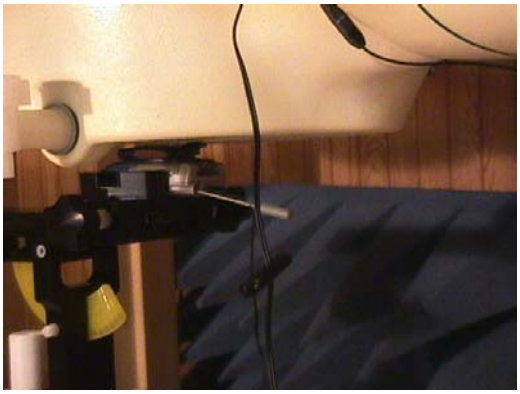


6.1.1.3 Tilt Position

In the "cheek position", if the earpiece of the device is not in full contact with the phantom's ear spacer and the peak SAR location for the "cheek position" is located at the ear spacer region or corresponds to the earpiece region of the handset, the device is returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer. Otherwise, the device is moved away from the cheek perpendicular to the line passes through both "ear reference points" for approximate 2-3cm. While it is in this position, the device is tilted away from the mouth with respect to the "test device reference point" by 15^{o}. After the tilt, it is then moved back toward the head perpendicular to the line passes through both "ear reference point" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process is repeated with a tilt angle less than 15^{o} so that the device and its antenna would touch the phantom simultaneously.

6.1.2 Body Worn Configuration

KWC body worn accessories were tested for the FCC RF exposure compliance. The phone was positioned into the carrying case and placed below the flat phantom. Headset was connected during measurements.



The SAR levels were also measured with 13.5mm air space for the hands-free application, which allow user can use other body-worn holster that contains no metal and provides at least 13.5mm separation from the closest point of the handset to the body.

6.2 Scan Procedures

First coarse scans are used for quick determination of the field distribution. Next a cube scan, 7x7x7 points; spacing between each point 5x5x5mm, is performed around the highest E-field value to determine the averaged SAR-distribution over 1g.

6.3 SAR Averaging Methods

The maximum SAR value is average over its volume using interpolation and extrapolation.

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot" –condition [W. Gander, Computermathematik, p. 141-150] (x, y and z – directions) [numerical Recipes in C, Second Edition, p 123].

The extrapolation is based on least square algorithm [W. Gander, Computermathematik, p. 168-180]. Through the points in the first 30mm in all z-axis, polynomials of order four are calculated. This polynomial is then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1mm from one another.

7 MEASUREMENT UNCERTAINTY

Description of individual measurement uncertainty

Uncert. description	Uncert. Value %	Probability distribution	Divisor	C_i[1] 1g	Stand. Uncert (1g) %	V_i[2] or V_{eff}
Measurement system						
Probe calibration	± 4.4	normal	1	1	± 4.4	∞
Axial isotropy of the probe	± 4.7	rectangular	√3	$(1-C_p)^{1/2}$	± 1.9	∞
Sph. Isotropy of the probe	± 9.6	rectangular	√3	$(C_p)^{1/2}$	± 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. Constrains of robot	± 0.4	rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	rectangular	√3	1	± 1.7	∞
Extrap. and integration	± 3.9	rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 3.0	normal	√3	1	± 1.7	∞
Power drift	± 5.0	normal	√3	1	± 2.9	∞
Phantom and setup						
Phantom uncertainty	± 4.0	rectangular	1	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (meas.)	± 10.0	rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 5.0	rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					± 10.32	
Extended Standard Uncertainty (k=2)					± 20.6	

8 TEST DATA

For each mode, corresponding SAR distribution printouts of maximum results in every device position (Cheek or Tilt), every antenna position (Extended or Retracted) are shown in Appendix B. The rest of SAR distributions is substantially similar or equivalent to the plots submitted regardless of used channel.

8.1 Head SAR Test Results

The Appendix B includes the SAR distribution plots for all data in the following tables.

Left Head SAR

Mode	Channel # / Frequency (MHz)	Conducted Power (dBm)	SAR, Average over 1g (mW/g)			
			Cheek Position		Tilted Position	
			Antenna Retracted	Antenna Extended	Antenna Retracted	Antenna Extended
FM 835	991/824.04	25.06	0.902	0.838	0.244	0.243
	383/836.49	25.04	0.955	1.15	0.310	0.366
	799/848.97	24.99	0.997	1.11	0.298	0.320
Cellular CDMA 835	1013/824.70	25.05	0.779	0.791	0.281	0.278
	383/836.49	25.01	0.997	1.20	0.323	0.374
	777/848.31	25.03	1.05	1.17	0.320	0.336
PCS CDMA 1900	25/1851.25	22.02	0.634	0.389	0.416	0.295
	600/1880	22.00	0.462	0.344	0.295	0.294
	1175/1908.75	22.06	0.450	0.268	0.322	0.232

Right Head SAR

Mode	Channel # / Frequency (MHz)	Conducted Power (dBm)	SAR, Average over 1g (mW/g)			
			Cheek Position		Tilted Position	
			Antenna Retracted	Antenna Extended	Antenna Retracted	Antenna Extended
FM 835	991/824.04	24.95	1.12	1.11	0.223	0.221
	383/836.49	24.94	1.11	1.29	0.301	0.349
	799/848.97	25.02	1.16	1.25	0.260	0.266
Cellular CDMA 835	1013/824.70	25.05	1.00	1.00	0.300	0.292
	383/836.49	24.98	1.13	1.31	0.276	0.323
	777/848.31	25.00	1.19	1.28	0.311	0.321
PCS CDMA 1900	25/1851.25	22.01	0.832	0.406	0.290	0.210
	600/1880	22.00	0.603	0.330	0.292	0.251
	1175/1908.75	22.03	0.555	0.248	0.401	0.294

The highest measured SAR (at head) in the cellular band is 1.31mW/g. The highest measured SAR (at head) in PCS band is 0.832 mW/g.

8.2 Body Worn SAR Test Result

The Appendix B includes the SAR distribution plots for all data in the following tables.

Waist Level SAR with KWC Body Worn Holster CV90-B1680

Mode	Channel # / Frequency (MHz)	Conducted Power Before Test (dBm)	SAR, Average over 1g (mW/g)	
			Antenna Retracted	Antenna Extended
FM 835	991/824.04	25.01	0.259	0.139
	383/836.49	25.04	0.237	0.516
	799/848.97	25.01	0.282	0.504
Cellular CDMA 835	1013/824.70	24.98	0.234	0.408
	383/836.49	25.02	0.256	0.489
	777/848.31	24.96	0.269	0.466
PCS CDMA 1900	25/1851.25	22.04	0.258	0.172
	600/1880	22.04	0.197	0.136
	1175/1908.75	22.02	0.188	0.107

Waist Level SAR with KWC Body Worn Leather Case CA90-B1691M

Mode	Channel # / Frequency (MHz)	Conducted Power Before Test (dBm)	SAR, Average over 1g (mW/g)	
			Antenna Retracted	Antenna Extended
FM 835	991/824.04	24.93	0.205	0.318
	383/836.49	25.14	0.268	0.511
	799/848.97	25.02	0.312	0.517
Cellular CDMA 835	1013/824.70	25.00	0.192	0.303
	383/836.49	25.03	0.258	0.515
	777/848.31	24.99	0.303	0.514
PCS CDMA 1900	25/1851.25	22.05	0.282	0.188
	600/1880	21.98	0.180	0.140
	1175/1908.75	22.03	0.174	0.108

Waist Level SAR with KWC Body Worn Leather Case CA90-B1691S

Mode	Channel # / Frequency (MHz)	Conducted Power Before Test (dBm)	SAR, Average over 1g (mW/g)	
			Antenna Retracted	Antenna Extended
FM 835	991/824.04	25.09	0.107	0.175
	383/836.49	25.20	0.116	0.254
	799/848.97	25.01	0.137	0.230
Cellular CDMA 835	1013/824.70	24.93	0.083	0.142
	383/836.49	24.97	0.131	0.253
	777/848.31	24.99	0.140	0.251
PCS CDMA 1900	25/1851.25	22.03	0.103	0.090
	600/1880	22.02	0.081	0.075
	1175/1908.75	22.04	0.076	0.063

Waist Level SAR with 13.5mm Air Separation

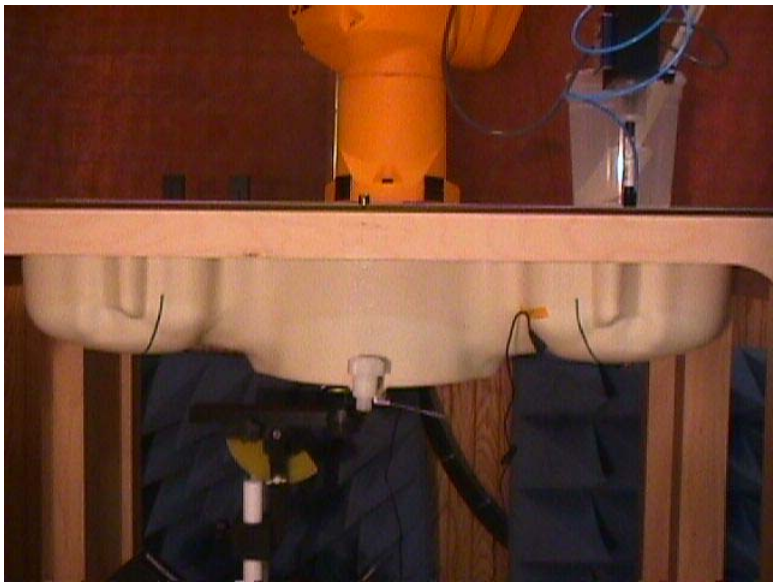
Mode	Channel # / Frequency (MHz)	Conducted Power Before Test (dBm)	SAR, Average over 1g (mW/g)	
			Antenna Retracted	Antenna Extended
FM 835	991/824.04	24.99	0.178	0.310
	383/836.49	25.03	0.319	0.648
	799/848.97	24.98	0.238	0.431
Cellular CDMA 835	1013/824.70	24.98	0.213	0.338
	383/836.49	25.02	0.229	0.494
	777/848.31	24.90	0.381	0.663
PCS CDMA 1900	25/1851.25	22.05	0.306	0.186
	600/1880	22.08	0.198	0.153
	1175/1908.75	22.05	0.204	0.120

With KWC body worn accessories, the highest measured SAR in the cellular band is 0.515mW/g, in PCS band is 0.306 mW/g.

9 TEST SYSTEM PHOTOS

DASY 3 System

SAM Phantom



APPENDIX A: VALIDATION TEST PRINTOUT

07/17/02

Dipole 835MHz

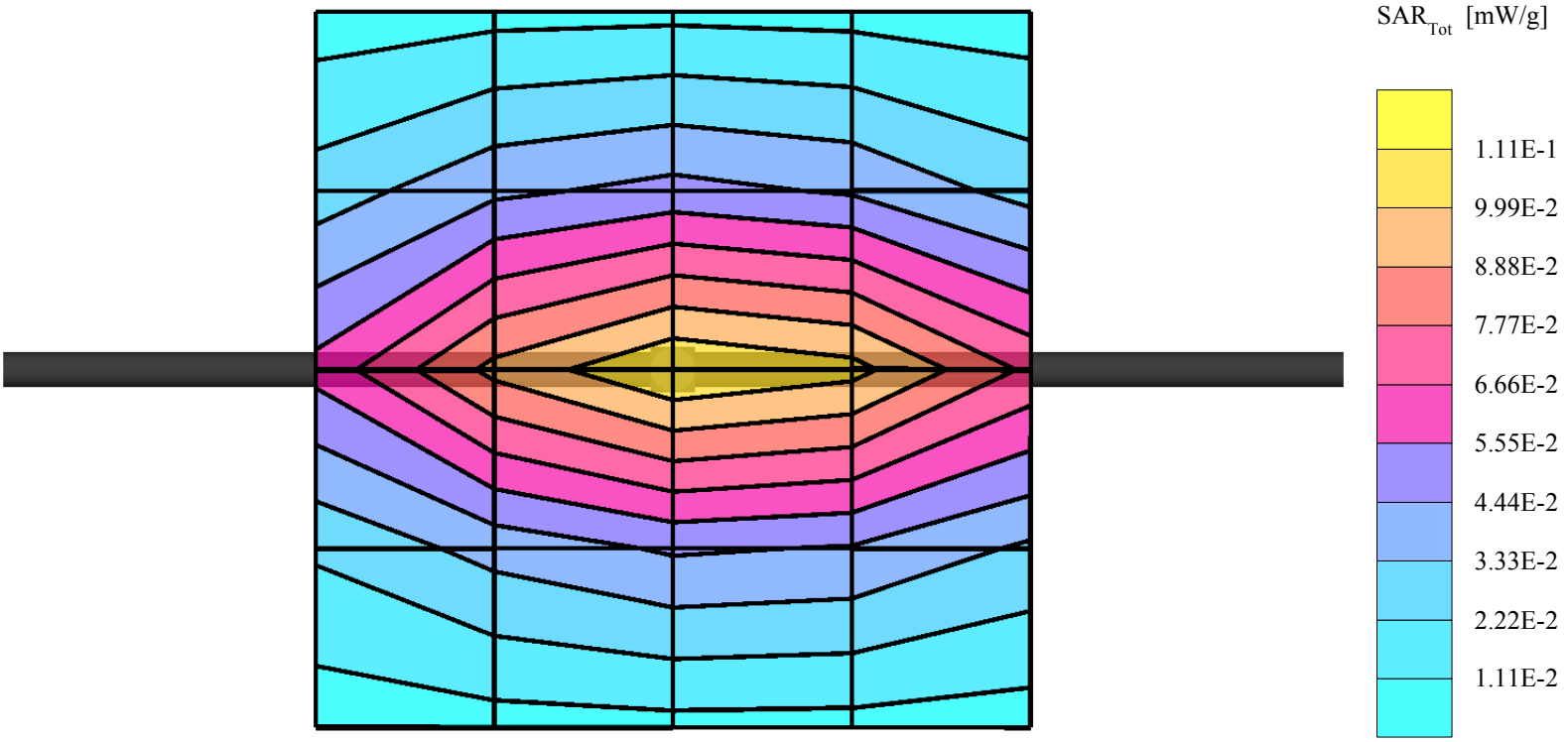
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.2$ $\rho = 1.00$ g/cm^3

Cubes (2): Peak: 0.165 mW/g ± 0.01 dB, SAR (1g): 0.103 mW/g ± 0.02 dB, SAR (10g): 0.0658 mW/g ± 0.02 dB, (Worst-case extrapolation)

Penetration depth: 11.9 (10.6, 13.7) [mm]

Powerdrift: -0.03 dB



Dipole 835MHz

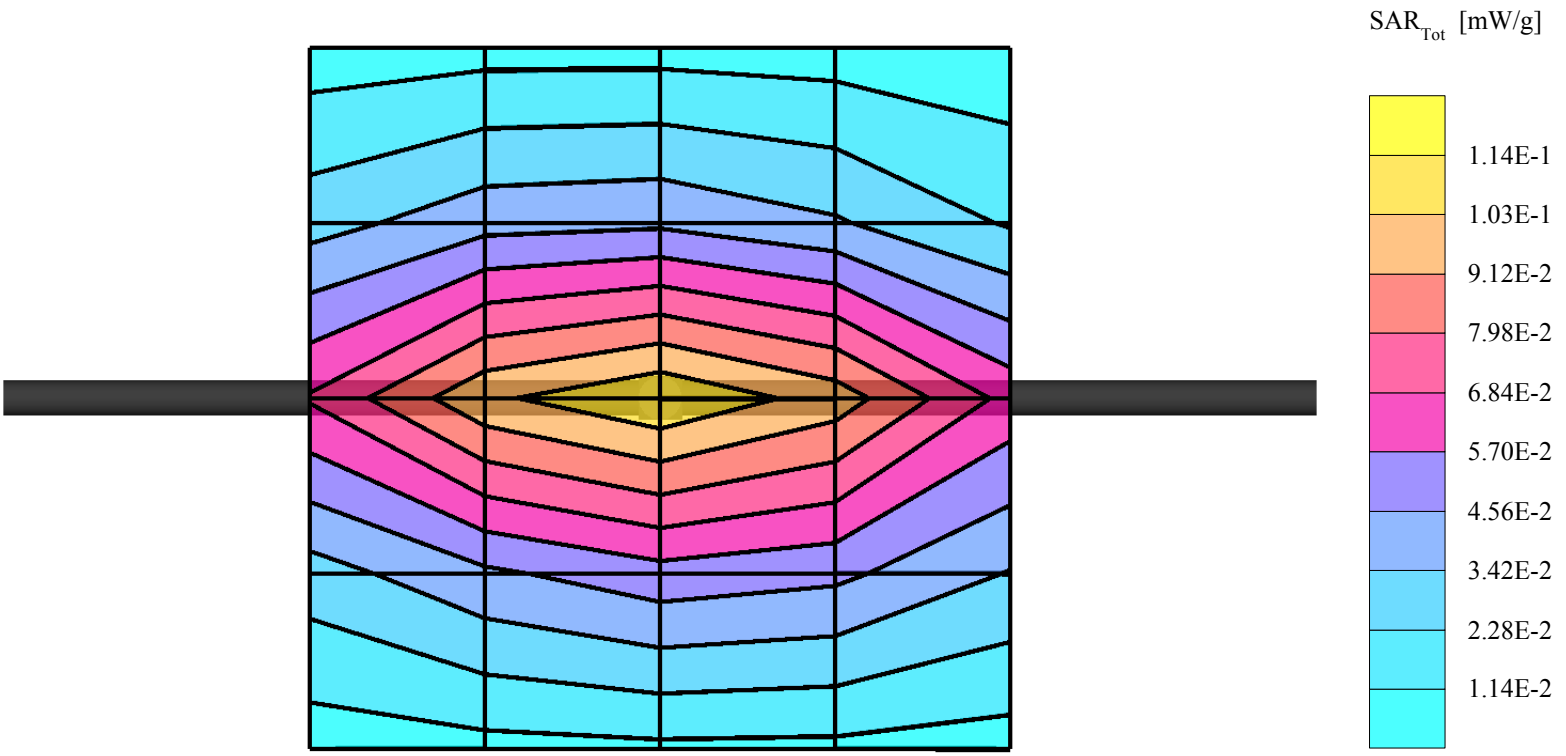
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.5$ $\rho = 1.00$ g/cm^3

Cubes (2): Peak: 0.166 mW/g ± 0.01 dB, SAR (1g): 0.105 mW/g ± 0.02 dB, SAR (10g): 0.0669 mW/g ± 0.02 dB, (Worst-case extrapolation)

Penetration depth: 12.0 (10.7, 13.6) [mm]

Powerdrift: -0.03 dB



07/18/02

Dipole 835MHz

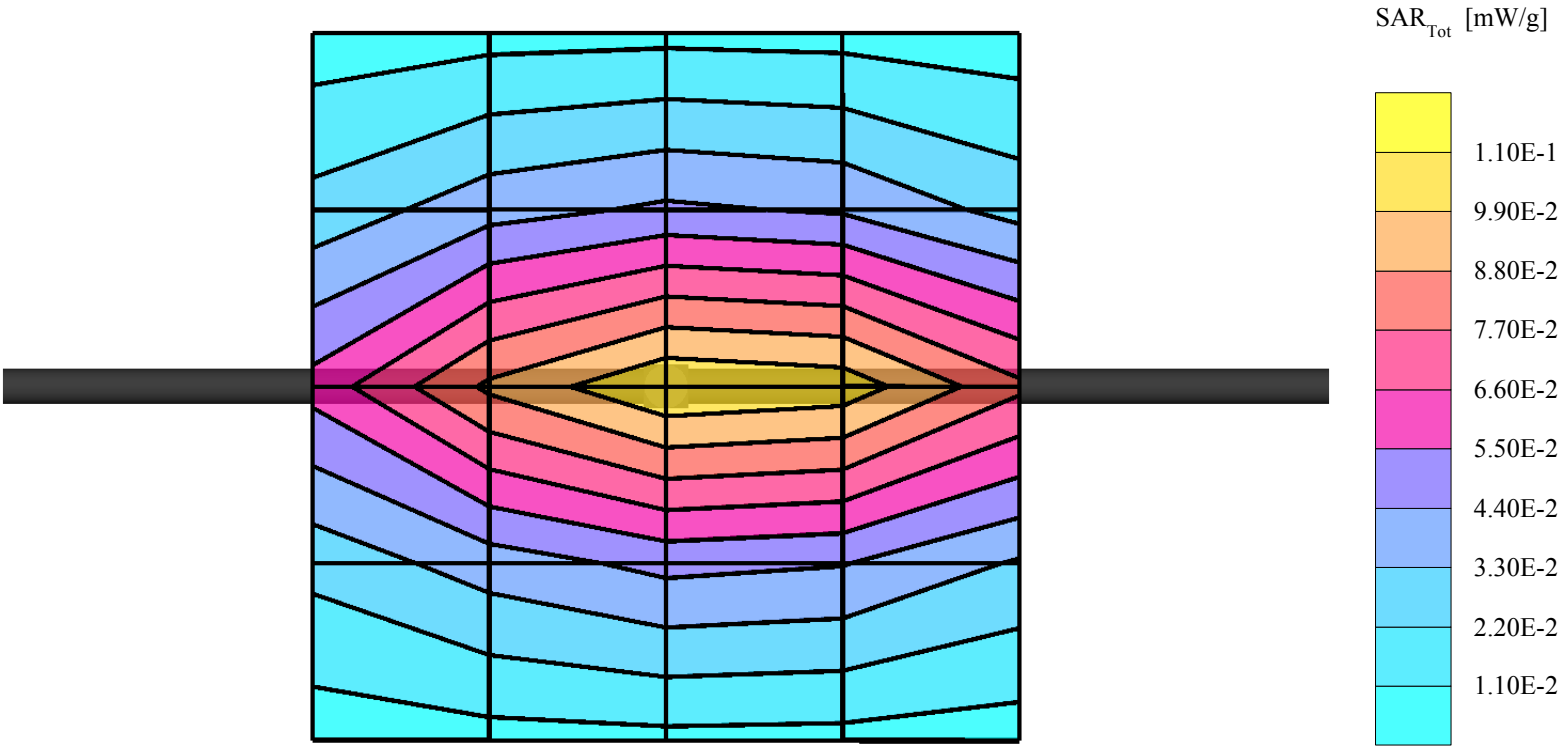
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: $\sigma = 0.88$ mho/m $\varepsilon_r = 41.7$ $\rho = 1.00$ g/cm^3

Cubes (2): Peak: 0.163 mW/g ± 0.02 dB, SAR (1g): 0.102 mW/g ± 0.03 dB, SAR (10g): 0.0650 mW/g ± 0.03 dB, (Worst-case extrapolation)

Penetration depth: 12.0 (10.6, 13.8) [mm]

Powerdrift: -0.06 dB



Dipole 1900MHz

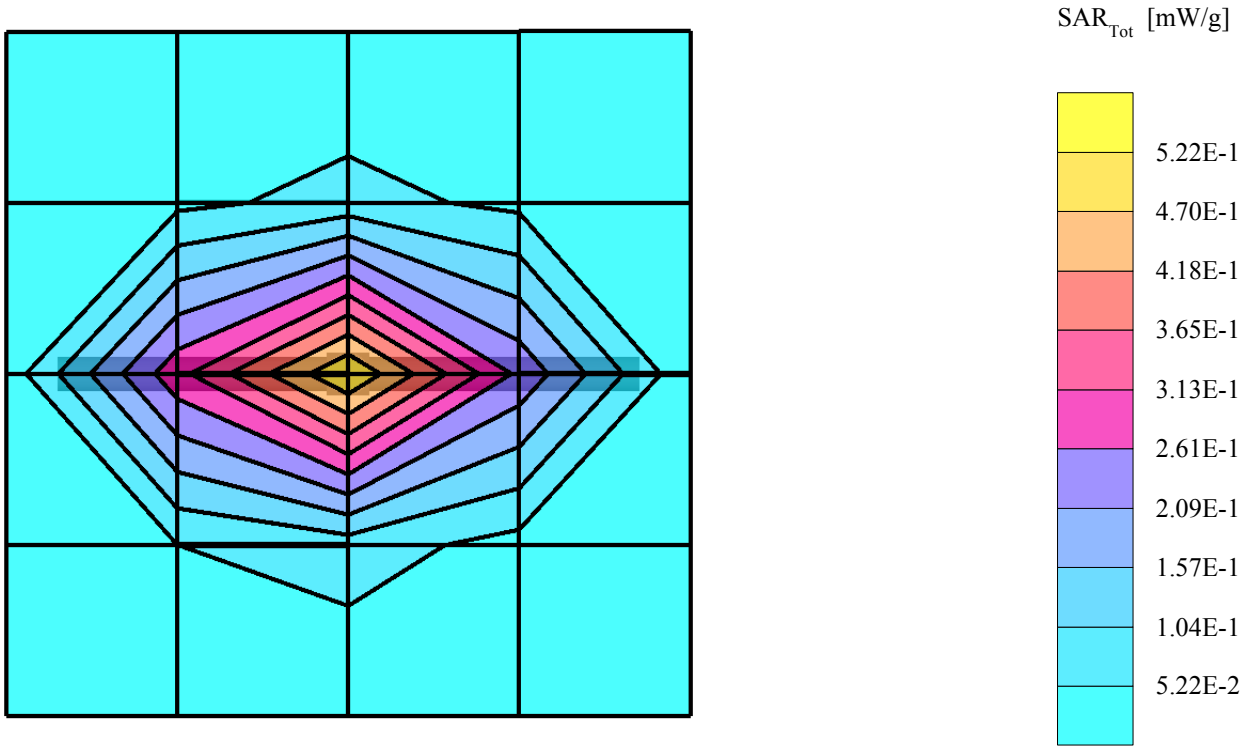
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.44 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3

Cubes (2): Peak: 0.877 mW/g ± 0.07 dB, SAR (1g): 0.457 mW/g ± 0.03 dB, SAR (10g): 0.233 mW/g ± 0.01 dB, (Worst-case extrapolation)

Penetration depth: 7.8 (7.3, 8.9) [mm]

Powerdrift: -0.03 dB



07/19/02

Dipole 1900MHz

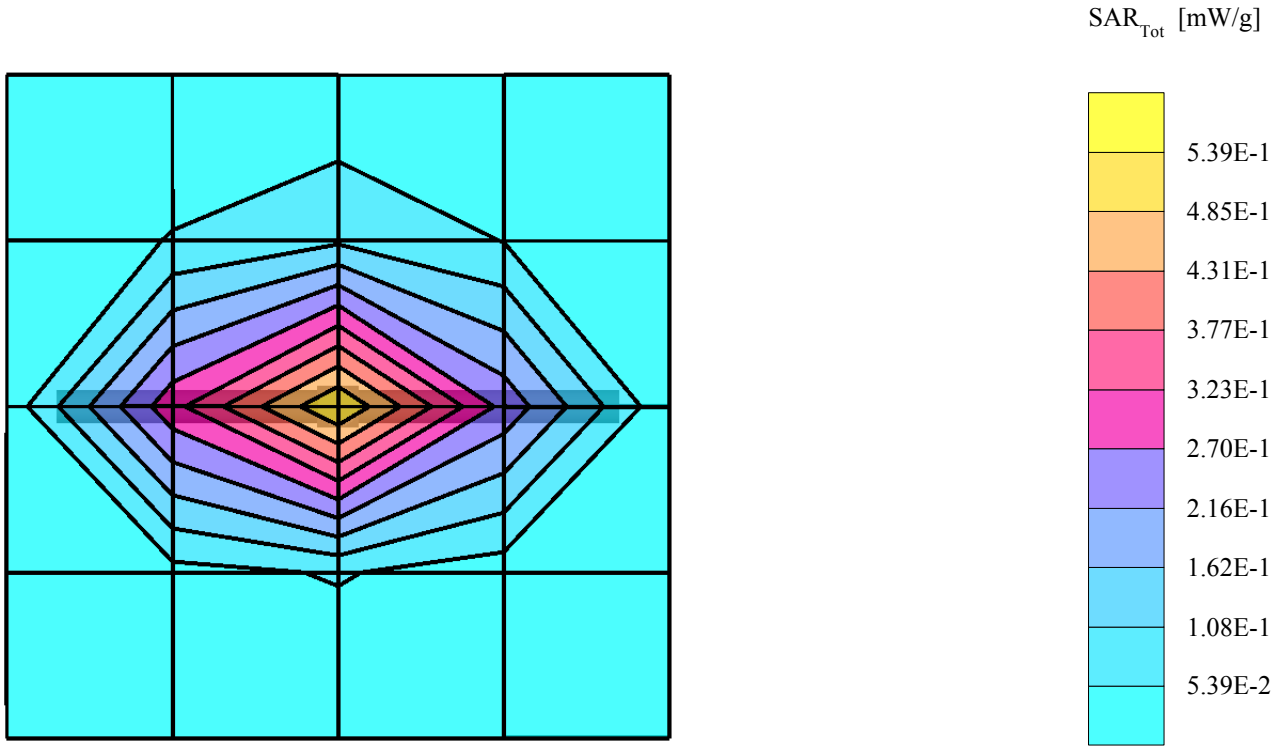
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.44 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3

Cubes (2): Peak: 0.988 mW/g ± 0.07 dB, SAR (1g): 0.452 mW/g ± 0.02 dB, SAR (10g): 0.205 mW/g ± 0.10 dB, (Worst-case extrapolation)

Penetration depth: 7.1 (6.9, 7.6) [mm]

Powerdrift: -0.02 dB

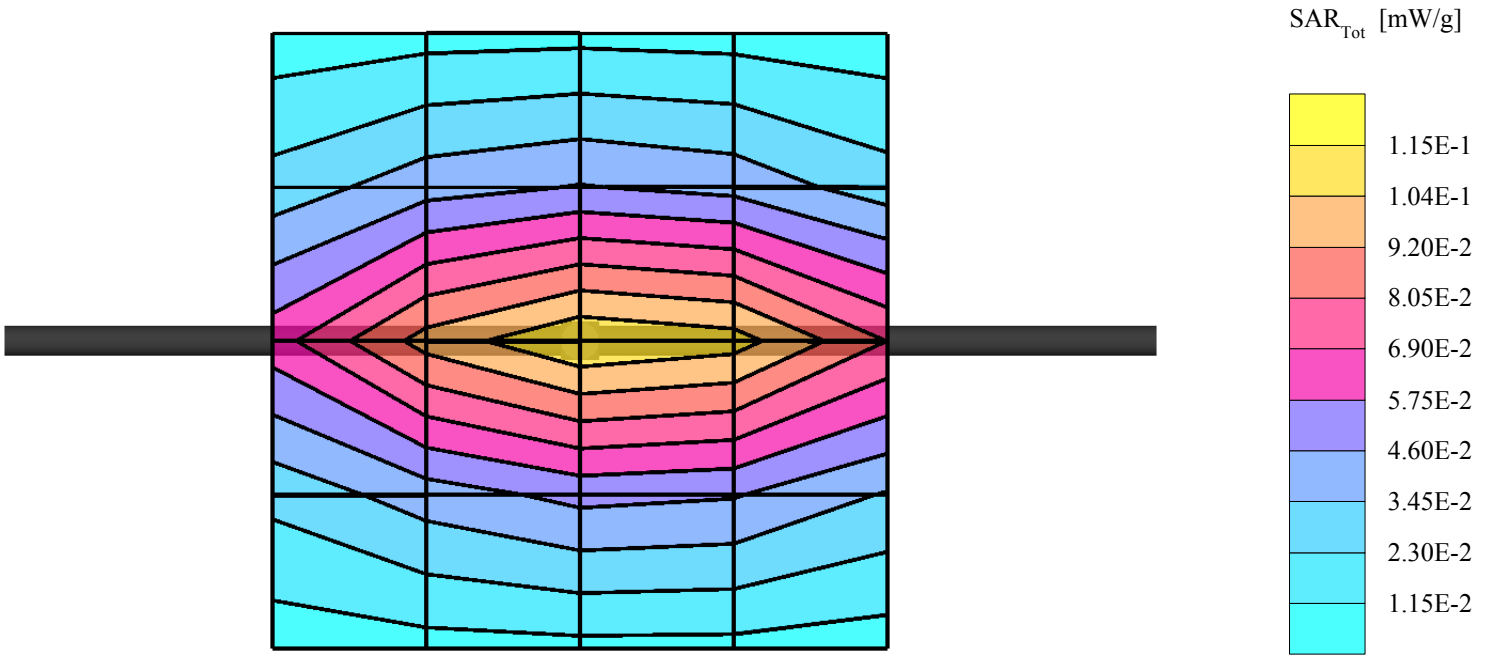


07/22/02

Dipole 835MHz

Dipole validation:

for f < 1 GHz, distance to the liquid d = 10 mm
for f > 1 GHz, distance to the liquid d=15 mm
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 835 MHz
Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: σ = 0.88 mho/m ε_r = 41.2 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 0.107 mW/g ± 0.01 dB, SAR (10g): 0.0683 mW/g ± 0.02 dB, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.02 dB



Dipole 835MHz

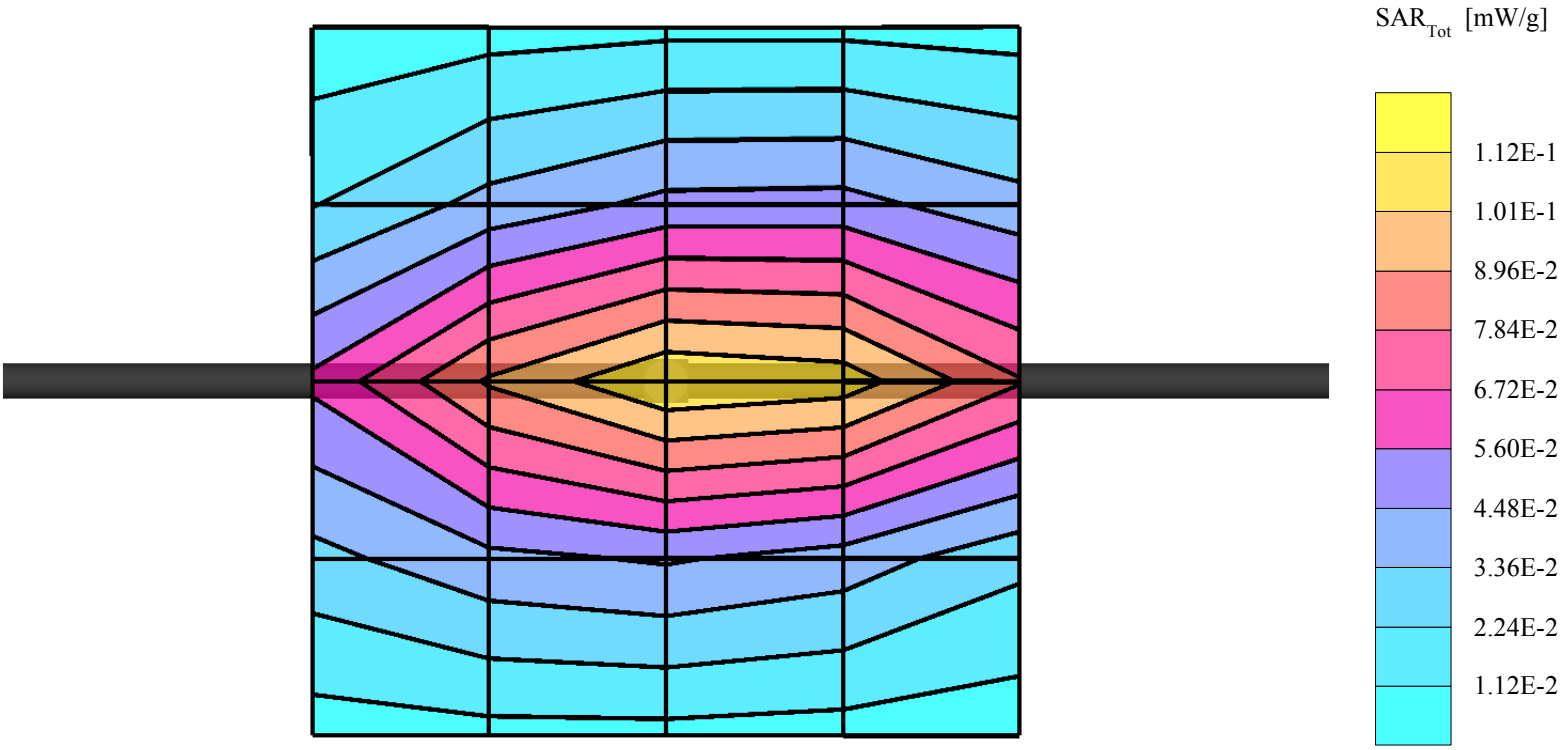
SAM; Flat

Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: $\sigma = 0.89$ mho/m $\varepsilon_r = 41.0$ $\rho = 1.00$ g/cm^3

Cubes (2): Peak: 0.167 mW/g ± 0.03 dB, SAR (1g): 0.104 mW/g ± 0.00 dB, SAR (10g): 0.0669 mW/g ± 0.00 dB, (Worst-case extrapolation)

Penetration depth: 12.1 (10.7, 13.8) [mm]

Powerdrift: 0.01 dB



Reference math : OFF Title: 07-18-02

FCC

835 MHz

SAR = 0.105

ε = 41.49

σ = 0.89

Pt#	Frequency (GHz)	Data real	Data imag
1	0.003000000	181.12	1207.69
2	0.032985000	64.12	119.74
3	0.062970000	60.10	66.78
4	0.092955000	57.89	48.72
5	0.122940000	56.44	40.01
6	0.152925000	55.15	34.40
7	0.182910000	53.94	30.91
8	0.212895000	52.87	28.55
9	0.242880000	51.94	26.71
10	0.272865000	51.09	25.38
11	0.302850000	50.33	24.27
12	0.332835000	49.59	23.43
13	0.362820000	48.93	22.88
14	0.392805000	48.25	22.25
15	0.422790000	47.66	21.72
16	0.452775000	46.97	21.31
17	0.482760000	46.51	21.01
18	0.512745000	45.95	20.79
19	0.542730000	45.44	20.48
20	0.572715000	44.93	20.30
21	0.602700000	44.37	20.15
22	0.632685000	43.98	19.93
23	0.662670000	43.53	19.79
24	0.692655000	43.09	19.63
25	0.722640000	42.65	19.53
26	0.752625000	42.22	19.46
27	0.782610000	41.86	19.34
28	0.812595000	41.49	19.26
29	0.842580000	41.10	19.17
30	0.872565000	40.75	19.08
31	0.902550000	40.40	19.00
32	0.932535000	40.02	18.91
33	0.962520000	39.69	18.85
34	0.992505000	39.37	18.80
35	1.022490000	39.04	18.74
36	1.052475000	38.72	18.65
37	1.082460000	38.41	18.62
38	1.112445000	38.11	18.57
39	1.142430000	37.81	18.50
40	1.172415000	37.52	18.47
41	1.202400000	37.25	18.39
42	1.232385000	36.98	18.37
43	1.262370000	36.70	18.30
44	1.292355000	36.44	18.21
45	1.322340000	36.17	18.22
46	1.352325000	35.96	18.15
47	1.382310000	35.70	18.12
48	1.412295000	35.47	18.06
49	1.442280000	35.22	18.03
50	1.472265000	34.96	18.01
51	1.502250000	34.76	17.93
52	1.532235000	34.56	17.88
53	1.562220000	34.30	17.86
54	1.592205000	34.12	17.82
55	1.622190000	33.90	17.73
56	1.652175000	33.73	17.69
57	1.682160000	33.56	17.63
58	1.712145000	33.33	17.63
59	1.742130000	33.17	17.60
60	1.772115000	32.99	17.53
61	1.802100000	32.78	17.53
62	1.832085000	32.61	17.47
63	1.862070000	32.45	17.43
64	1.892055000	32.29	17.40
65	1.922040000	32.13	17.34
66	1.952025000	31.98	17.35
67	1.982010000	31.84	17.34
68	2.011995000	31.66	17.28
69	2.041980000	31.48	17.28
70	2.071965000	31.33	17.27

145	4.320840000	23.32	15.66
146	4.350825000	23.21	15.60
147	4.380810000	23.15	15.62
148	4.410795000	23.09	15.60
149	4.440780000	23.01	15.57
150	4.470765000	22.95	15.58
151	4.500750000	22.86	15.53
152	4.530735000	22.79	15.54
153	4.560720000	22.73	15.55
154	4.590705000	22.65	15.49
155	4.620690000	22.59	15.52
156	4.650675000	22.53	15.48
157	4.680660000	22.45	15.46
158	4.710645000	22.38	15.47
159	4.740630000	22.30	15.43
160	4.770615000	22.22	15.44
161	4.800600000	22.17	15.42
162	4.830585000	22.09	15.38
163	4.860570000	21.99	15.39
164	4.890555000	21.94	15.37
165	4.920540000	21.86	15.35
166	4.950525000	21.80	15.34
167	4.980510000	21.72	15.32
168	5.010495000	21.65	15.29
169	5.040480000	21.62	15.29
170	5.070465000	21.53	15.26
171	5.100450000	21.46	15.26
172	5.130435000	21.40	15.23
173	5.160420000	21.31	15.22
174	5.190405000	21.27	15.21
175	5.220390000	21.19	15.18
176	5.250375000	21.11	15.18
177	5.280360000	21.06	15.16
178	5.310345000	20.99	15.12
179	5.340330000	20.91	15.11
180	5.370315000	20.86	15.08
181	5.400300000	20.78	15.07
182	5.430285000	20.72	15.06
183	5.460270000	20.67	15.01
184	5.490255000	20.59	15.02
185	5.520240000	20.56	15.00
186	5.550225000	20.48	14.95
187	5.580210000	20.40	14.95
188	5.610195000	20.36	14.93
189	5.640180000	20.28	14.90
190	5.670165000	20.24	14.88
191	5.700150000	20.17	14.86
192	5.730135000	20.11	14.85
193	5.760120000	20.07	14.82
194	5.790105000	20.00	14.79
195	5.820090000	19.94	14.79
196	5.850075000	19.91	14.76
197	5.880060000	19.82	14.75
198	5.910045000	19.77	14.73
199	5.940030000	19.70	14.69
200	5.970015000	19.64	14.69
201	6.000000000	19.61	14.68

71	2.101950000	31.17	17.23
72	2.131935000	31.02	17.23
73	2.161920000	30.86	17.19
74	2.191905000	30.67	17.17
75	2.221890000	30.58	17.17
76	2.251875000	30.43	17.14
77	2.281860000	30.22	17.11
78	2.311845000	30.11	17.11
79	2.341830000	29.95	17.09
80	2.371815000	29.83	17.06
81	2.401800000	29.69	17.03
82	2.431785000	29.50	17.01
83	2.461770000	29.38	17.02
84	2.491755000	29.25	16.95
85	2.521740000	29.09	16.93
86	2.551725000	28.97	16.92
87	2.581710000	28.82	16.87
88	2.611695000	28.69	16.85
89	2.641680000	28.58	16.80
90	2.671665000	28.43	16.79
91	2.701650000	28.31	16.80
92	2.731635000	28.22	16.71
93	2.761620000	28.08	16.70
94	2.791605000	27.96	16.68
95	2.821590000	27.84	16.64
96	2.851575000	27.73	16.63
97	2.881560000	27.64	16.57
98	2.911545000	27.49	16.57
99	2.941530000	27.41	16.56
100	2.971515000	27.31	16.51
101	3.001500000	27.17	16.47
102	3.031485000	27.09	16.47
103	3.061470000	26.96	16.43
104	3.091455000	26.88	16.43
105	3.121440000	26.80	16.39
106	3.151425000	26.65	16.35
107	3.181410000	26.57	16.38
108	3.211395000	26.51	16.34
109	3.241380000	26.39	16.29
110	3.271365000	26.29	16.30
111	3.301350000	26.17	16.25
112	3.331335000	26.07	16.26
113	3.361320000	26.01	16.22
114	3.391305000	25.88	16.19
115	3.421290000	25.79	16.20
116	3.451275000	25.73	16.14
117	3.481260000	25.61	16.15
118	3.511245000	25.53	16.12
119	3.541230000	25.43	16.09
120	3.571215000	25.33	16.11
121	3.601200000	25.27	16.06
122	3.631185000	25.15	16.03
123	3.661170000	25.06	16.04
124	3.691155000	24.98	16.02
125	3.721140000	24.87	16.00
126	3.751125000	24.81	15.97
127	3.781110000	24.69	15.94
128	3.811095000	24.61	15.96
129	3.841080000	24.56	15.93
130	3.871065000	24.45	15.87
131	3.901050000	24.35	15.91
132	3.931035000	24.30	15.85
133	3.961020000	24.20	15.84
134	3.991005000	24.14	15.82
135	4.020990000	24.05	15.79
136	4.050975000	23.97	15.81
137	4.080960000	23.93	15.77
138	4.110945000	23.81	15.76
139	4.140930000	23.74	15.75
140	4.170915000	23.68	15.72
141	4.200900000	23.59	15.71
142	4.230885000	23.52	15.70
143	4.260870000	23.45	15.65
144	4.290855000	23.35	15.66

Reference math : OFF Title: 07-18a-02

FCC
BRAND 835MHz
SAR = 0.102
ϵ = 41.67
σ = 0.88

Pt#	Frequency (GHz)	Data real	Data imag
1	0.003000000	148.15	1133.68
2	0.032985000	63.09	119.76
3	0.062970000	60.10	66.54
4	0.092955000	57.92	48.47
5	0.122940000	56.37	39.92
6	0.152925000	55.07	34.33
7	0.182910000	53.90	30.83
8	0.212895000	52.86	28.50
9	0.242880000	51.93	26.60
10	0.272865000	51.15	25.20
11	0.302850000	50.34	24.17
12	0.332835000	49.57	23.28
13	0.362820000	48.95	22.72
14	0.392805000	48.28	22.03
15	0.422790000	47.69	21.55
16	0.452775000	47.08	21.15
17	0.482760000	46.54	20.85
18	0.512745000	46.01	20.60
19	0.542730000	45.52	20.29
20	0.572715000	45.01	20.12
21	0.602700000	44.52	19.96
22	0.632685000	44.11	19.74
23	0.662670000	43.67	19.64
24	0.692655000	43.23	19.49
25	0.722640000	42.83	19.39
26	0.752625000	42.41	19.29
27	0.782610000	42.03	19.18
28	0.812595000	41.67	19.09
29	0.842580000	41.30	19.02
30	0.872565000	40.95	18.93
31	0.902550000	40.60	18.86
32	0.932535000	40.24	18.79
33	0.962520000	39.90	18.72
34	0.992505000	39.58	18.68
35	1.022490000	39.28	18.63
36	1.052475000	38.92	18.54
37	1.082460000	38.65	18.50
38	1.112445000	38.37	18.43
39	1.142430000	38.12	18.35
40	1.172415000	37.84	18.33
41	1.202400000	37.55	18.29
42	1.232385000	37.29	18.31
43	1.262370000	37.01	18.25
44	1.292355000	36.72	18.17
45	1.322340000	36.47	18.14
46	1.352325000	36.27	18.08
47	1.382310000	36.01	18.05
48	1.412295000	35.78	18.03
49	1.442280000	35.57	17.99
50	1.472265000	35.31	17.98
51	1.502250000	35.12	17.95
52	1.532235000	34.88	17.92
53	1.562220000	34.63	17.87
54	1.592205000	34.45	17.85
55	1.622190000	34.24	17.80
56	1.652175000	34.02	17.77
57	1.682160000	33.84	17.72
58	1.712145000	33.59	17.72
59	1.742130000	33.43	17.69
60	1.772115000	33.25	17.63
61	1.802100000	33.03	17.62
62	1.832085000	32.87	17.58
63	1.862070000	32.68	17.53
64	1.892055000	32.50	17.51
65	1.922040000	32.32	17.43
66	1.952025000	32.13	17.42
67	1.982010000	31.98	17.39
68	2.011995000	31.84	17.31
69	2.041980000	31.67	17.30
70	2.071965000	31.54	17.28

71	2.101950000	31.38	17.26
72	2.131935000	31.23	17.25
73	2.161920000	31.08	17.21
74	2.191905000	30.87	17.19
75	2.221890000	30.77	17.17
76	2.251875000	30.65	17.14
77	2.281860000	30.47	17.11
78	2.311845000	30.35	17.11
79	2.341830000	30.21	17.10
80	2.371815000	30.08	17.07
81	2.401800000	29.96	17.06
82	2.431785000	29.78	17.06
83	2.461770000	29.66	17.07
84	2.491755000	29.52	17.00
85	2.521740000	29.37	17.00
86	2.551725000	29.24	16.99
87	2.581710000	29.10	16.96
88	2.611695000	28.97	16.95
89	2.641680000	28.84	16.90
90	2.671665000	28.69	16.89
91	2.701650000	28.57	16.89
92	2.731635000	28.47	16.83
93	2.761620000	28.31	16.83
94	2.791605000	28.19	16.82
95	2.821590000	28.07	16.77
96	2.851575000	27.96	16.75
97	2.881560000	27.86	16.70
98	2.911545000	27.71	16.68
99	2.941530000	27.62	16.67
100	2.971515000	27.52	16.64
101	3.001500000	27.38	16.61
102	3.031485000	27.29	16.61
103	3.061470000	27.16	16.57
104	3.091455000	27.07	16.57
105	3.121440000	26.99	16.53
106	3.151425000	26.83	16.50
107	3.181410000	26.76	16.50
108	3.211395000	26.67	16.47
109	3.241380000	26.56	16.45
110	3.271365000	26.47	16.44
111	3.301350000	26.35	16.41
112	3.331335000	26.23	16.40
113	3.361320000	26.18	16.36
114	3.391305000	26.04	16.34
115	3.421290000	25.93	16.34
116	3.451275000	25.88	16.28
117	3.481260000	25.76	16.28
118	3.511245000	25.67	16.24
119	3.541230000	25.57	16.21
120	3.571215000	25.46	16.22
121	3.601200000	25.40	16.17
122	3.631185000	25.27	16.13
123	3.661170000	25.21	16.13
124	3.691155000	25.13	16.10
125	3.721140000	25.02	16.08
126	3.751125000	24.95	16.05
127	3.781110000	24.86	16.01
128	3.811095000	24.77	16.03
129	3.841080000	24.72	15.99
130	3.871065000	24.62	15.94
131	3.901050000	24.54	15.97
132	3.931035000	24.49	15.93
133	3.961020000	24.40	15.92
134	3.991005000	24.33	15.90
135	4.020990000	24.25	15.87
136	4.050975000	24.17	15.89
137	4.080960000	24.13	15.86
138	4.110945000	24.02	15.83
139	4.140930000	23.94	15.85
140	4.170915000	23.89	15.83
141	4.200900000	23.79	15.82
142	4.230885000	23.73	15.81
143	4.260870000	23.65	15.79
144	4.290855000	23.56	15.79

145	4.320840000	23.52	15.79
146	4.350825000	23.41	15.75
147	4.380810000	23.34	15.77
148	4.410795000	23.27	15.74
149	4.440780000	23.18	15.71
150	4.470765000	23.12	15.73
151	4.500750000	23.02	15.68
152	4.530735000	22.95	15.69
153	4.560720000	22.89	15.69
154	4.590705000	22.81	15.64
155	4.620690000	22.73	15.67
156	4.650675000	22.66	15.62
157	4.680660000	22.59	15.62
158	4.710645000	22.53	15.61
159	4.740630000	22.45	15.56
160	4.770615000	22.36	15.57
161	4.800600000	22.33	15.55
162	4.830585000	22.23	15.52
163	4.860570000	22.15	15.52
164	4.890555000	22.10	15.51
165	4.920540000	22.01	15.48
166	4.950525000	21.96	15.47
167	4.980510000	21.88	15.44
168	5.010495000	21.79	15.43
169	5.040480000	21.76	15.42
170	5.070465000	21.67	15.39
171	5.100450000	21.59	15.39
172	5.130435000	21.55	15.34
173	5.160420000	21.46	15.34
174	5.190405000	21.42	15.34
175	5.220390000	21.35	15.30
176	5.250375000	21.26	15.30
177	5.280360000	21.20	15.27
178	5.310345000	21.14	15.24
179	5.340330000	21.06	15.25
180	5.370315000	21.02	15.20
181	5.400300000	20.95	15.19
182	5.430285000	20.89	15.18
183	5.460270000	20.83	15.14
184	5.490255000	20.75	15.15
185	5.520240000	20.71	15.12
186	5.550225000	20.63	15.09
187	5.580210000	20.57	15.09
188	5.610195000	20.52	15.06
189	5.640180000	20.44	15.04
190	5.670165000	20.40	15.02
191	5.700150000	20.32	15.00
192	5.730135000	20.28	15.00
193	5.760120000	20.24	14.96
194	5.790105000	20.16	14.94
195	5.820090000	20.11	14.94
196	5.850075000	20.07	14.89
197	5.880060000	19.97	14.88
198	5.910045000	19.93	14.87
199	5.940030000	19.88	14.84
200	5.970015000	19.80	14.83
201	6.000000000	19.78	14.83

Reference math : OFF Title: 07-18a-02

MUSCLE 835 MHZ

ε = 55.89

τ = 0.91

Pt#	Frequency (GHz)	Data real	Data imag
1	0.003000000	214.71	1857.94
2	0.032985000	69.11	190.90
3	0.062970000	66.70	101.25
4	0.092955000	65.28	70.68
5	0.122940000	64.65	55.53
6	0.152925000	64.03	46.03
7	0.182910000	63.40	39.95
8	0.212895000	62.75	35.75
9	0.242880000	62.29	32.60
10	0.272865000	61.89	30.08
11	0.302850000	61.40	28.21
12	0.332835000	60.97	26.67
13	0.362820000	60.67	25.58
14	0.392805000	60.21	24.42
15	0.422790000	59.91	23.64
16	0.452775000	59.48	22.91
17	0.482760000	59.18	22.37
18	0.512745000	58.82	21.96
19	0.542730000	58.51	21.44
20	0.572715000	58.21	21.15
21	0.602700000	57.83	20.87
22	0.632685000	57.61	20.57
23	0.662670000	57.29	20.40
24	0.692655000	56.98	20.17
25	0.722640000	56.71	20.03
26	0.752625000	56.42	19.91
27	0.782610000	56.15	19.77
28	0.812595000	55.89	19.67
29	0.842580000	55.58	19.61
30	0.872565000	55.37	19.51
31	0.902550000	55.07	19.47
32	0.932535000	54.81	19.42
33	0.962520000	54.53	19.38
34	0.992505000	54.28	19.36
35	1.022490000	54.01	19.32
36	1.052475000	53.74	19.27
37	1.082460000	53.51	19.24
38	1.112445000	53.28	19.22
39	1.142430000	53.06	19.17
40	1.172415000	52.87	19.19
41	1.202400000	52.64	19.21
42	1.232385000	52.39	19.28
43	1.262370000	52.16	19.26
44	1.292355000	51.87	19.22
45	1.322340000	51.67	19.24
46	1.352325000	51.50	19.22
47	1.382310000	51.28	19.24
48	1.412295000	51.08	19.27
49	1.442280000	50.87	19.29
50	1.472265000	50.66	19.32
51	1.502250000	50.48	19.36
52	1.532235000	50.23	19.38
53	1.562220000	50.01	19.40
54	1.592205000	49.85	19.43
55	1.622190000	49.65	19.43
56	1.652175000	49.44	19.46
57	1.682160000	49.24	19.45
58	1.712145000	49.02	19.51
59	1.742130000	48.84	19.53
60	1.772115000	48.66	19.51
61	1.802100000	48.45	19.56
62	1.832085000	48.26	19.58
63	1.862070000	48.08	19.58
64	1.892055000	47.91	19.59
65	1.922040000	47.71	19.58
66	1.952025000	47.52	19.61
67	1.982010000	47.38	19.62
68	2.011995000	47.22	19.59
69	2.041980000	47.05	19.62
70	2.071965000	46.93	19.65

71	2.101950000	46.77	19.68
72	2.131935000	46.59	19.73
73	2.161920000	46.43	19.73
74	2.191905000	46.23	19.77
75	2.221890000	46.13	19.79
76	2.251875000	45.98	19.80
77	2.281860000	45.80	19.83
78	2.311845000	45.68	19.85
79	2.341830000	45.53	19.90
80	2.371815000	45.38	19.94
81	2.401800000	45.25	19.97
82	2.431785000	45.04	20.02
83	2.461770000	44.92	20.09
84	2.491755000	44.77	20.06
85	2.521740000	44.60	20.11
86	2.551725000	44.44	20.14
87	2.581710000	44.28	20.16
88	2.611695000	44.14	20.17
89	2.641680000	43.99	20.17
90	2.671665000	43.82	20.22
91	2.701650000	43.69	20.26
92	2.731635000	43.55	20.22
93	2.761620000	43.38	20.28
94	2.791605000	43.25	20.28
95	2.821590000	43.10	20.31
96	2.851575000	42.96	20.31
97	2.881560000	42.84	20.30
98	2.911545000	42.66	20.32
99	2.941530000	42.56	20.34
100	2.971515000	42.43	20.35
101	3.001500000	42.28	20.37
102	3.031485000	42.19	20.40
103	3.061470000	42.01	20.39
104	3.091455000	41.91	20.44
105	3.121440000	41.81	20.42
106	3.151425000	41.62	20.43
107	3.181410000	41.53	20.49
108	3.211395000	41.42	20.47
109	3.241380000	41.28	20.48
110	3.271365000	41.16	20.52
111	3.301350000	41.01	20.53
112	3.331335000	40.90	20.56
113	3.361320000	40.80	20.55
114	3.391305000	40.64	20.57
115	3.421290000	40.51	20.60
116	3.451275000	40.42	20.56
117	3.481260000	40.30	20.61
118	3.511245000	40.17	20.60
119	3.541230000	40.05	20.60
120	3.571215000	39.91	20.65
121	3.601200000	39.83	20.62
122	3.631185000	39.66	20.62
123	3.661170000	39.59	20.64
124	3.691155000	39.47	20.63
125	3.721140000	39.35	20.65
126	3.751125000	39.27	20.64
127	3.781110000	39.13	20.64
128	3.811095000	39.02	20.68
129	3.841080000	38.96	20.67
130	3.871065000	38.82	20.65
131	3.901050000	38.72	20.72
132	3.931035000	38.65	20.68
133	3.961020000	38.55	20.73
134	3.991005000	38.45	20.73
135	4.020990000	38.33	20.72
136	4.050975000	38.26	20.77
137	4.080960000	38.19	20.77
138	4.110945000	38.06	20.79
139	4.140930000	37.97	20.83
140	4.170915000	37.89	20.83
141	4.200900000	37.75	20.87
142	4.230885000	37.67	20.88
143	4.260870000	37.57	20.89
144	4.290855000	37.45	20.93

145	4.320840000	37.40	20.94
146	4.350825000	37.25	20.95
147	4.380810000	37.16	20.99
148	4.410795000	37.06	20.99
149	4.440780000	36.94	21.02
150	4.470765000	36.84	21.05
151	4.500750000	36.72	21.03
152	4.530735000	36.63	21.08
153	4.560720000	36.55	21.09
154	4.590705000	36.41	21.07
155	4.620690000	36.32	21.12
156	4.650675000	36.22	21.10
157	4.680660000	36.12	21.11
158	4.710645000	36.03	21.14
159	4.740630000	35.93	21.12
160	4.770615000	35.80	21.16
161	4.800600000	35.74	21.15
162	4.830585000	35.62	21.16
163	4.860570000	35.51	21.18
164	4.890555000	35.41	21.19
165	4.920540000	35.30	21.20
166	4.950525000	35.24	21.21
167	4.980510000	35.11	21.20
168	5.010495000	35.00	21.21
169	5.040480000	34.93	21.22
170	5.070465000	34.81	21.22
171	5.100450000	34.70	21.23
172	5.130435000	34.63	21.21
173	5.160420000	34.53	21.24
174	5.190405000	34.43	21.24
175	5.220390000	34.33	21.22
176	5.250375000	34.23	21.26
177	5.280360000	34.15	21.24
178	5.310345000	34.03	21.21
179	5.340330000	33.94	21.26
180	5.370315000	33.85	21.23
181	5.400300000	33.75	21.23
182	5.430285000	33.67	21.25
183	5.460270000	33.57	21.21
184	5.490255000	33.46	21.26
185	5.520240000	33.40	21.25
186	5.550225000	33.27	21.22
187	5.580210000	33.20	21.24
188	5.610195000	33.11	21.23
189	5.640180000	33.00	21.24
190	5.670165000	32.93	21.23
191	5.700150000	32.82	21.22
192	5.730135000	32.75	21.25
193	5.760120000	32.69	21.20
194	5.790105000	32.57	21.19
195	5.820090000	32.49	21.22
196	5.850075000	32.42	21.17
197	5.880060000	32.29	21.20
198	5.910045000	32.20	21.21
199	5.940030000	32.13	21.19
200	5.970015000	32.04	21.20
201	6.000000000	31.99	21.18

FCC Validation 1900 mhz

SAR: 0.457

ε = 39.85

σ = 1.44

Reference math : OFF Title: 07-19-02

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	2275.78	946.76
2	0.015298500	67.35	209.29
3	0.030297000	52.92	108.34
4	0.045295500	50.60	72.47
5	0.060294000	49.70	55.18
6	0.075292500	49.12	44.73
7	0.090291000	48.41	37.97
8	0.105289500	48.55	32.93
9	0.120288000	48.24	29.45
10	0.135286500	48.04	26.42
11	0.150285000	47.86	24.31
12	0.165283500	47.61	22.51
13	0.180282000	47.46	20.95
14	0.195280500	47.36	19.82
15	0.210279000	47.19	18.75
16	0.225277500	47.12	17.68
17	0.240276000	46.97	16.99
18	0.255274500	46.94	16.25
19	0.270273000	46.79	15.71
20	0.285271500	46.73	15.20
21	0.300270000	46.62	14.69
22	0.315268500	46.52	14.32
23	0.330267000	46.45	13.91
24	0.345265500	46.38	13.63
25	0.360264000	46.33	13.43
26	0.375262500	46.20	13.08
27	0.390261000	46.11	12.83
28	0.405259500	46.07	12.61
29	0.420258000	46.00	12.44
30	0.435256500	45.92	12.31
31	0.450255000	45.83	12.15
32	0.465253500	45.79	12.02
33	0.480252000	45.70	11.86
34	0.495250500	45.65	11.79
35	0.510249000	45.63	11.74
36	0.525247500	45.51	11.62
37	0.540246000	45.47	11.52
38	0.555244500	45.37	11.46
39	0.570243000	45.32	11.44
40	0.585241500	45.27	11.36
41	0.600240000	45.15	11.35
42	0.615238500	45.11	11.31
43	0.630237000	45.08	11.22
44	0.645235500	45.00	11.20
45	0.660234000	44.95	11.22
46	0.675232500	44.86	11.21
47	0.690231000	44.80	11.15
48	0.705229500	44.76	11.19
49	0.720228000	44.71	11.12
50	0.735226500	44.60	11.16
51	0.750225000	44.57	11.19
52	0.765223500	44.48	11.15
53	0.780222000	44.44	11.17
54	0.795220500	44.35	11.16
55	0.810219000	44.30	11.19
56	0.825217500	44.27	11.18
57	0.840216000	44.18	11.24
58	0.855214500	44.11	11.19
59	0.870213000	44.05	11.26
60	0.885211500	43.99	11.26
61	0.900210000	43.93	11.28
62	0.915208500	43.87	11.30
63	0.930207000	43.79	11.32
64	0.945205500	43.71	11.35
65	0.960204000	43.66	11.39
66	0.975202500	43.61	11.42
67	0.990201000	43.53	11.46
68	1.005199500	43.44	11.49
69	1.020198000	43.39	11.52
70	1.035196500	43.31	11.53

71	1.050195000	43.23	11.57
72	1.065193500	43.17	11.61
73	1.080192000	43.10	11.60
74	1.095190500	43.04	11.59
75	1.110189000	43.00	11.60
76	1.125187500	42.98	11.61
77	1.140186000	42.95	11.68
78	1.155184500	42.91	11.74
79	1.170183000	42.88	11.79
80	1.185181500	42.82	11.86
81	1.200180000	42.76	11.91
82	1.215178500	42.68	11.98
83	1.230177000	42.60	12.04
84	1.245175500	42.52	12.08
85	1.260174000	42.46	12.13
86	1.275172500	42.39	12.17
87	1.290171000	42.31	12.21
88	1.305169500	42.24	12.26
89	1.320168000	42.15	12.30
90	1.335166500	42.10	12.33
91	1.350165000	42.04	12.36
92	1.365163500	41.96	12.41
93	1.380162000	41.88	12.45
94	1.395160500	41.82	12.51
95	1.410159000	41.74	12.52
96	1.425157500	41.68	12.58
97	1.440156000	41.60	12.61
98	1.455154500	41.53	12.63
99	1.470153000	41.44	12.68
100	1.485151500	41.38	12.70
101	1.500150000	41.31	12.73
102	1.515148500	41.26	12.77
103	1.530147000	41.20	12.80
104	1.545145500	41.14	12.84
105	1.560144000	41.05	12.88
106	1.575142500	41.00	12.92
107	1.590141000	40.95	12.95
108	1.605139500	40.87	12.98
109	1.620138000	40.80	13.01
110	1.635136500	40.70	13.05
111	1.650135000	40.64	13.07
112	1.665133500	40.58	13.09
113	1.680132000	40.53	13.09
114	1.695130500	40.47	13.10
115	1.710129000	40.41	13.15
116	1.725127500	40.35	13.14
117	1.740126000	40.31	13.20
118	1.755124500	40.29	13.20
119	1.770123000	40.28	13.22
120	1.785121500	40.23	13.30
121	1.800120000	40.18	13.32
122	1.815118500	40.17	13.38
123	1.830117000	40.11	13.46
124	1.845115500	40.07	13.50
125	1.860114000	40.00	13.57
126	1.875112500	39.89	13.62
127	1.890111000	39.85	13.65
128	1.905109500	39.79	13.72
129	1.920108000	39.72	13.75
130	1.935106500	39.67	13.80
131	1.950105000	39.58	13.85
132	1.965103500	39.50	13.88
133	1.980102000	39.47	13.94
134	1.995100500	39.39	13.95
135	2.010099000	39.32	13.98
136	2.025097500	39.25	14.03
137	2.040096000	39.18	14.03
138	2.055094500	39.15	14.09
139	2.070093000	39.09	14.10
140	2.085091500	39.04	14.15
141	2.100090000	38.96	14.19
142	2.115088500	38.90	14.24
143	2.130087000	38.85	14.28
144	2.145085500	38.79	14.33

145	2.160084000	38.75	14.35
146	2.175082500	38.69	14.39
147	2.190081000	38.56	14.46
148	2.205079500	38.53	14.50
149	2.220078000	38.47	14.54
150	2.235076500	38.40	14.56
151	2.250075000	38.34	14.61
152	2.265073500	38.25	14.63
153	2.280072000	38.16	14.66
154	2.295070500	38.12	14.72
155	2.310069000	38.06	14.73
156	2.325067500	37.98	14.72
157	2.340066000	37.90	14.76
158	2.355064500	37.83	14.77
159	2.370063000	37.78	14.81
160	2.385061500	37.72	14.84
161	2.400060000	37.67	14.83
162	2.415058500	37.61	14.84
163	2.430057000	37.53	14.88
164	2.445055500	37.50	14.89
165	2.460054000	37.46	14.94
166	2.475052500	37.42	14.93
167	2.490051000	37.40	14.94
168	2.505049500	37.32	14.99
169	2.520048000	37.29	15.02
170	2.535046500	37.25	15.09
171	2.550045000	37.20	15.12
172	2.565043500	37.16	15.15
173	2.580042000	37.11	15.19
174	2.595040500	37.02	15.23
175	2.610039000	36.99	15.28
176	2.625037500	36.94	15.33
177	2.640036000	36.88	15.34
178	2.655034500	36.82	15.38
179	2.670033000	36.73	15.44
180	2.685031500	36.68	15.46
181	2.700030000	36.62	15.53
182	2.715028500	36.57	15.54
183	2.730027000	36.52	15.55
184	2.745025500	36.43	15.61
185	2.760024000	36.37	15.63
186	2.775022500	36.31	15.69
187	2.790021000	36.26	15.71
188	2.805019500	36.22	15.73
189	2.820018000	36.13	15.77
190	2.835016500	36.05	15.80
191	2.850015000	36.01	15.82
192	2.865013500	35.94	15.87
193	2.880012000	35.90	15.86
194	2.895010500	35.83	15.90
195	2.910009000	35.75	15.93
196	2.925007500	35.70	15.96
197	2.940006000	35.65	16.00
198	2.955004500	35.59	16.00
199	2.970003000	35.53	16.03
200	2.985001500	35.44	16.04
201	3.000000000	35.38	16.06

Reference math : OFF Title: 07-19-02

Bram 1900MHz

σ = 1.44

ε_r = 39.22

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	2189.86	898.30
2	0.015298500	64.82	200.96
3	0.030297000	52.62	104.87
4	0.045295500	49.81	70.24
5	0.060294000	49.28	53.32
6	0.075292500	48.63	43.30
7	0.090291000	48.12	36.81
8	0.105289500	48.12	31.95
9	0.120288000	47.76	28.65
10	0.135286500	47.56	25.72
11	0.150285000	47.34	23.66
12	0.165283500	47.16	21.85
13	0.180282000	46.97	20.33
14	0.195280500	46.81	19.24
15	0.210279000	46.62	18.23
16	0.225277500	46.61	17.25
17	0.240276000	46.39	16.56
18	0.255274500	46.38	15.86
19	0.270273000	46.29	15.33
20	0.285271500	46.26	14.89
21	0.300270000	46.12	14.35
22	0.315268500	46.04	14.01
23	0.330267000	45.93	13.62
24	0.345265500	45.90	13.36
25	0.360264000	45.79	13.14
26	0.375262500	45.69	12.87
27	0.390261000	45.62	12.60
28	0.405259500	45.59	12.40
29	0.420258000	45.50	12.24
30	0.435256500	45.40	12.14
31	0.450255000	45.28	11.96
32	0.465253500	45.27	11.83
33	0.480252000	45.17	11.70
34	0.495250500	45.12	11.65
35	0.510249000	45.11	11.59
36	0.525247500	44.98	11.48
37	0.540246000	44.92	11.38
38	0.555244500	44.84	11.32
39	0.570243000	44.77	11.28
40	0.585241500	44.71	11.23
41	0.600240000	44.62	11.21
42	0.615238500	44.60	11.20
43	0.630237000	44.50	11.11
44	0.645235500	44.47	11.10
45	0.660234000	44.43	11.11
46	0.675232500	44.35	11.13
47	0.690231000	44.25	11.09
48	0.705229500	44.21	11.10
49	0.720228000	44.15	11.05
50	0.735226500	44.07	11.08
51	0.750225000	44.02	11.10
52	0.765223500	43.93	11.08
53	0.780222000	43.88	11.12
54	0.795220500	43.80	11.10
55	0.810219000	43.76	11.14
56	0.825217500	43.71	11.13
57	0.840216000	43.63	11.19
58	0.855214500	43.55	11.16
59	0.870213000	43.50	11.22
60	0.885211500	43.43	11.22
61	0.900210000	43.37	11.25
62	0.915208500	43.30	11.27
63	0.930207000	43.23	11.29
64	0.945205500	43.16	11.34
65	0.960204000	43.10	11.37
66	0.975202500	43.02	11.39
67	0.990201000	42.97	11.43
68	1.005199500	42.87	11.47
69	1.020198000	42.81	11.50
70	1.035196500	42.73	11.51

145	2.160084000	38.08	14.36
146	2.175082500	38.03	14.39
147	2.190081000	37.91	14.45
148	2.205079500	37.86	14.51
149	2.220078000	37.80	14.54
150	2.235076500	37.74	14.56
151	2.250075000	37.67	14.59
152	2.265073500	37.59	14.62
153	2.280072000	37.50	14.65
154	2.295070500	37.45	14.71
155	2.310069000	37.38	14.72
156	2.325067500	37.31	14.72
157	2.340066000	37.23	14.75
158	2.355064500	37.16	14.77
159	2.370063000	37.10	14.79
160	2.385061500	37.04	14.83
161	2.400060000	36.99	14.82
162	2.415058500	36.93	14.83
163	2.430057000	36.86	14.86
164	2.445055500	36.82	14.87
165	2.460054000	36.78	14.93
166	2.475052500	36.74	14.92
167	2.490051000	36.71	14.94
168	2.505049500	36.64	14.97
169	2.520048000	36.61	15.01
170	2.535046500	36.56	15.06
171	2.550045000	36.51	15.11
172	2.565043500	36.47	15.13
173	2.580042000	36.42	15.17
174	2.595040500	36.33	15.21
175	2.610039000	36.31	15.26
176	2.625037500	36.26	15.30
177	2.640036000	36.19	15.31
178	2.655034500	36.12	15.35
179	2.670033000	36.03	15.41
180	2.685031500	35.99	15.44
181	2.700030000	35.93	15.50
182	2.715028500	35.88	15.51
183	2.730027000	35.83	15.50
184	2.745025500	35.73	15.58
185	2.760024000	35.68	15.60
186	2.775022500	35.62	15.65
187	2.790021000	35.57	15.68
188	2.805019500	35.53	15.68
189	2.820018000	35.44	15.72
190	2.835016500	35.36	15.75
191	2.850015000	35.31	15.78
192	2.865013500	35.25	15.83
193	2.880012000	35.20	15.82
194	2.895010500	35.15	15.86
195	2.910009000	35.05	15.88
196	2.925007500	35.01	15.92
197	2.940006000	34.95	15.94
198	2.955004500	34.89	15.95
199	2.970003000	34.84	15.98
200	2.985001500	34.75	16.00
201	3.000000000	34.69	16.02

71	1.050195000	42.65	11.55
72	1.065193500	42.61	11.59
73	1.080192000	42.54	11.59
74	1.095190500	42.45	11.58
75	1.110189000	42.41	11.60
76	1.125187500	42.39	11.61
77	1.140186000	42.35	11.66
78	1.155184500	42.32	11.73
79	1.170183000	42.29	11.78
80	1.185181500	42.21	11.86
81	1.200180000	42.16	11.90
82	1.215178500	42.08	11.95
83	1.230177000	42.00	12.03
84	1.245175500	41.92	12.07
85	1.260174000	41.86	12.12
86	1.275172500	41.79	12.16
87	1.290171000	41.71	12.20
88	1.305169500	41.62	12.26
89	1.320168000	41.54	12.29
90	1.335166500	41.48	12.34
91	1.350165000	41.41	12.36
92	1.365163500	41.35	12.40
93	1.380162000	41.26	12.44
94	1.395160500	41.20	12.50
95	1.410159000	41.13	12.52
96	1.425157500	41.07	12.58
97	1.440156000	40.99	12.61
98	1.455154500	40.92	12.62
99	1.470153000	40.83	12.69
100	1.485151500	40.77	12.71
101	1.500150000	40.70	12.73
102	1.515148500	40.64	12.77
103	1.530147000	40.58	12.80
104	1.545145500	40.51	12.85
105	1.560144000	40.43	12.89
106	1.575142500	40.40	12.92
107	1.590141000	40.32	12.96
108	1.605139500	40.23	12.97
109	1.620138000	40.16	13.01
110	1.635136500	40.07	13.05
111	1.650135000	40.01	13.08
112	1.665133500	39.95	13.10
113	1.680132000	39.90	13.09
114	1.695130500	39.84	13.11
115	1.710129000	39.78	13.15
116	1.725127500	39.72	13.15
117	1.740126000	39.69	13.20
118	1.755124500	39.65	13.21
119	1.770123000	39.64	13.23
120	1.785121500	39.60	13.31
121	1.800120000	39.56	13.34
122	1.815118500	39.52	13.37
123	1.830117000	39.47	13.47
124	1.845115500	39.42	13.51
125	1.860114000	39.34	13.57
126	1.875112500	39.26	13.63
127	1.890111000	39.22	13.65
128	1.905109500	39.14	13.72
129	1.920108000	39.08	13.75
130	1.935106500	39.02	13.80
131	1.950105000	38.94	13.85
132	1.965103500	38.86	13.88
133	1.980102000	38.82	13.94
134	1.995100500	38.75	13.94
135	2.010099000	38.67	13.97
136	2.025097500	38.60	14.02
137	2.040096000	38.53	14.04
138	2.055094500	38.50	14.09
139	2.070093000	38.43	14.12
140	2.085091500	38.40	14.15
141	2.100090000	38.31	14.19
142	2.115088500	38.24	14.24
143	2.130087000	38.18	14.28
144	2.145085500	38.12	14.33

Reference math : OFF Title: 07-19-02

Muscle 1900MHz
$\sigma = 1.48$
$\varepsilon_r = 54.29$

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	3049.10	1272.12
2	0.015298500	84.33	281.23
3	0.030297000	66.58	145.85
4	0.045295500	62.81	97.34
5	0.060294000	61.88	73.55
6	0.075292500	61.08	59.16
7	0.090291000	60.39	49.91
8	0.105289500	60.52	43.13
9	0.120288000	60.08	38.41
10	0.135286500	59.90	34.19
11	0.150285000	59.92	31.17
12	0.165283500	59.72	28.68
13	0.180282000	59.61	26.49
14	0.195280500	59.45	24.92
15	0.210279000	59.22	23.34
16	0.225277500	59.22	21.92
17	0.240276000	59.11	20.88
18	0.255274500	59.20	19.98
19	0.270273000	59.05	19.16
20	0.285271500	59.01	18.43
21	0.300270000	58.91	17.62
22	0.315268500	58.89	17.09
23	0.330267000	58.82	16.51
24	0.345265500	58.78	16.14
25	0.360264000	58.69	15.77
26	0.375262500	58.67	15.24
27	0.390261000	58.61	14.85
28	0.405259500	58.56	14.53
29	0.420258000	58.52	14.28
30	0.435256500	58.44	14.06
31	0.450255000	58.35	13.78
32	0.465253500	58.37	13.56
33	0.480252000	58.33	13.32
34	0.495250500	58.29	13.17
35	0.510249000	58.25	13.04
36	0.525247500	58.14	12.89
37	0.540246000	58.12	12.69
38	0.555244500	58.06	12.59
39	0.570243000	58.06	12.52
40	0.585241500	58.02	12.37
41	0.600240000	57.92	12.29
42	0.615238500	57.91	12.19
43	0.630237000	57.88	12.10
44	0.645235500	57.85	12.04
45	0.660234000	57.83	11.99
46	0.675232500	57.77	11.93
47	0.690231000	57.72	11.84
48	0.705229500	57.71	11.84
49	0.720228000	57.67	11.77
50	0.735226500	57.59	11.77
51	0.750225000	57.60	11.76
52	0.765223500	57.52	11.73
53	0.780222000	57.52	11.68
54	0.795220500	57.44	11.63
55	0.810219000	57.40	11.65
56	0.825217500	57.39	11.66
57	0.840216000	57.31	11.69
58	0.855214500	57.27	11.65
59	0.870213000	57.25	11.65
60	0.885211500	57.22	11.62
61	0.900210000	57.16	11.65
62	0.915208500	57.10	11.64
63	0.930207000	57.06	11.66
64	0.945205500	57.03	11.66
65	0.960204000	57.00	11.69
66	0.975202500	56.96	11.72
67	0.990201000	56.90	11.73
68	1.005199500	56.80	11.74
69	1.020198000	56.77	11.76
70	1.035196500	56.73	11.77

71	1.050195000	56.66	11.81
72	1.065193500	56.61	11.84
73	1.080192000	56.57	11.79
74	1.095190500	56.51	11.74
75	1.110189000	56.50	11.76
76	1.125187500	56.49	11.77
77	1.140186000	56.49	11.82
78	1.155184500	56.50	11.89
79	1.170183000	56.50	11.92
80	1.185181500	56.46	12.00
81	1.200180000	56.41	12.03
82	1.215178500	56.34	12.11
83	1.230177000	56.28	12.18
84	1.245175500	56.22	12.23
85	1.260174000	56.19	12.28
86	1.275172500	56.12	12.33
87	1.290171000	56.06	12.33
88	1.305169500	55.99	12.39
89	1.320168000	55.93	12.44
90	1.335166500	55.88	12.48
91	1.350165000	55.85	12.52
92	1.365163500	55.80	12.55
93	1.380162000	55.73	12.60
94	1.395160500	55.68	12.63
95	1.410159000	55.62	12.65
96	1.425157500	55.58	12.71
97	1.440156000	55.50	12.75
98	1.455154500	55.46	12.79
99	1.470153000	55.40	12.84
100	1.485151500	55.34	12.85
101	1.500150000	55.30	12.87
102	1.515148500	55.24	12.92
103	1.530147000	55.20	12.96
104	1.545145500	55.16	13.01
105	1.560144000	55.09	13.08
106	1.575142500	55.08	13.10
107	1.590141000	55.03	13.13
108	1.605139500	54.93	13.16
109	1.620138000	54.88	13.21
110	1.635136500	54.79	13.26
111	1.650135000	54.76	13.29
112	1.665133500	54.71	13.30
113	1.680132000	54.68	13.29
114	1.695130500	54.63	13.31
115	1.710129000	54.58	13.34
116	1.725127500	54.53	13.35
117	1.740126000	54.53	13.40
118	1.755124500	54.54	13.43
119	1.770123000	54.54	13.45
120	1.785121500	54.53	13.52
121	1.800120000	54.51	13.54
122	1.815118500	54.50	13.60
123	1.830117000	54.49	13.72
124	1.845115500	54.44	13.80
125	1.860114000	54.39	13.88
126	1.875112500	54.32	13.96
127	1.890111000	54.29	13.99
128	1.905109500	54.23	14.06
129	1.920108000	54.18	14.09
130	1.935106500	54.12	14.18
131	1.950105000	54.04	14.26
132	1.965103500	53.99	14.30
133	1.980102000	53.97	14.36
134	1.995100500	53.91	14.38
135	2.010099000	53.84	14.42
136	2.025097500	53.78	14.48
137	2.040096000	53.70	14.52
138	2.055094500	53.68	14.60
139	2.070093000	53.66	14.63
140	2.085091500	53.63	14.67
141	2.100090000	53.57	14.74
142	2.115088500	53.50	14.79
143	2.130087000	53.43	14.84
144	2.145085500	53.39	14.91

145	2.160084000	53.37	14.96
146	2.175082500	53.33	15.02
147	2.190081000	53.23	15.12
148	2.205079500	53.17	15.17
149	2.220078000	53.11	15.20
150	2.235076500	53.05	15.25
151	2.250075000	52.99	15.30
152	2.265073500	52.92	15.37
153	2.280072000	52.84	15.41
154	2.295070500	52.80	15.47
155	2.310069000	52.73	15.47
156	2.325067500	52.65	15.49
157	2.340066000	52.58	15.56
158	2.355064500	52.50	15.59
159	2.370063000	52.45	15.64
160	2.385061500	52.42	15.66
161	2.400060000	52.36	15.66
162	2.415058500	52.31	15.68
163	2.430057000	52.22	15.71
164	2.445055500	52.20	15.73
165	2.460054000	52.20	15.79
166	2.475052500	52.16	15.81
167	2.490051000	52.14	15.83
168	2.505049500	52.10	15.88
169	2.520048000	52.06	15.93
170	2.535046500	52.02	16.00
171	2.550045000	51.99	16.05
172	2.565043500	51.97	16.11
173	2.580042000	51.93	16.17
174	2.595040500	51.86	16.23
175	2.610039000	51.85	16.26
176	2.625037500	51.80	16.32
177	2.640036000	51.73	16.36
178	2.655034500	51.67	16.45
179	2.670033000	51.60	16.52
180	2.685031500	51.57	16.55
181	2.700030000	51.52	16.63
182	2.715028500	51.48	16.65
183	2.730027000	51.42	16.66
184	2.745025500	51.35	16.76
185	2.760024000	51.27	16.81
186	2.775022500	51.23	16.88
187	2.790021000	51.20	16.92
188	2.805019500	51.16	16.94
189	2.820018000	51.09	17.00
190	2.835016500	51.00	17.05
191	2.850015000	50.96	17.10
192	2.865013500	50.89	17.16
193	2.880012000	50.86	17.18
194	2.895010500	50.81	17.23
195	2.910009000	50.73	17.27
196	2.925007500	50.69	17.31
197	2.940006000	50.64	17.36
198	2.955004500	50.59	17.38
199	2.970003000	50.52	17.44
200	2.985001500	50.43	17.48
201	3.000000000	50.40	17.52

835 MHz Brain Validation

Reference math : OFF Title: 07-22-02

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	6948.19	-572.73
2	0.015298500	67.15	244.27
3	0.030297000	63.65	127.62
4	0.045295500	60.66	87.51
5	0.060294000	59.70	67.95
6	0.075292500	58.80	56.31
7	0.090291000	57.57	48.94
8	0.105289500	56.96	43.53
9	0.120288000	56.10	39.90
10	0.135286500	55.43	36.62
11	0.150285000	54.76	34.16
12	0.165283500	54.20	32.30
13	0.180282000	53.55	30.49
14	0.195280500	53.02	29.46
15	0.210279000	52.56	28.22
16	0.225277500	52.10	27.04
17	0.240276000	51.57	26.40
18	0.255274500	51.17	25.66
19	0.270273000	50.85	25.04
20	0.285271500	50.42	24.48
21	0.300270000	49.95	23.96
22	0.315268500	49.66	23.55
23	0.330267000	49.27	23.06
24	0.345265500	48.93	22.77
25	0.360264000	48.59	22.48
26	0.375262500	48.31	22.14
27	0.390261000	47.93	21.84
28	0.405259500	47.61	21.65
29	0.420258000	47.32	21.36
30	0.435256500	47.00	21.24
31	0.450255000	46.70	21.04
32	0.465253500	46.46	20.90
33	0.480252000	46.20	20.64
34	0.495250500	45.88	20.55
35	0.510249000	45.69	20.46
36	0.525247500	45.37	20.32
37	0.540246000	45.17	20.14
38	0.555244500	44.91	20.05
39	0.570243000	44.67	19.96
40	0.585241500	44.43	19.85
41	0.600240000	44.15	19.80
42	0.615238500	43.97	19.70
43	0.630237000	43.76	19.58
44	0.645235500	43.54	19.54
45	0.660234000	43.35	19.44
46	0.675232500	43.13	19.44
47	0.690231000	42.88	19.31
48	0.705229500	42.71	19.26
49	0.720228000	42.53	19.21
50	0.735226500	42.29	19.16
51	0.750225000	42.09	19.15
52	0.765223500	41.89	19.08
53	0.780222000	41.71	19.01
54	0.795220500	41.52	18.95
55	0.810219000	41.33	18.92
56	0.825217500	41.20	18.88
57	0.840216000	40.99	18.87
58	0.855214500	40.80	18.79
59	0.870213000	40.65	18.81
60	0.885211500	40.47	18.75
61	0.900210000	40.28	18.70
62	0.915208500	40.12	18.70
63	0.930207000	39.94	18.64
64	0.945205500	39.78	18.60
65	0.960204000	39.61	18.60
66	0.975202500	39.45	18.58
67	0.990201000	39.29	18.55
68	1.005199500	39.12	18.52
69	1.020198000	38.98	18.48
70	1.035196500	38.82	18.43

835 MHz Brain Validation

Reference math : OFF Title: 07-22-02

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	6948.19	-572.73
2	0.015298500	67.15	244.27
3	0.030297000	63.65	127.62
4	0.045295500	60.66	87.51
5	0.060294000	59.70	67.95
6	0.075292500	58.80	56.31
7	0.090291000	57.57	48.94
8	0.105289500	56.96	43.53
9	0.120288000	56.10	39.90
10	0.135286500	55.43	36.62
11	0.150285000	54.76	34.16
12	0.165283500	54.20	32.30
13	0.180282000	53.55	30.49
14	0.195280500	53.02	29.46
15	0.210279000	52.56	28.22
16	0.225277500	52.10	27.04
17	0.240276000	51.57	26.40
18	0.255274500	51.17	25.66
19	0.270273000	50.85	25.04
20	0.285271500	50.42	24.48
21	0.300270000	49.95	23.96
22	0.315268500	49.66	23.55
23	0.330267000	49.27	23.06
24	0.345265500	48.93	22.77
25	0.360264000	48.59	22.48
26	0.375262500	48.31	22.14
27	0.390261000	47.93	21.84
28	0.405259500	47.61	21.65
29	0.420258000	47.32	21.36
30	0.435256500	47.00	21.24
31	0.450255000	46.70	21.04
32	0.465253500	46.46	20.90
33	0.480252000	46.20	20.64
34	0.495250500	45.88	20.55
35	0.510249000	45.69	20.46
36	0.525247500	45.37	20.32
37	0.540246000	45.17	20.14
38	0.555244500	44.91	20.05
39	0.570243000	44.67	19.96
40	0.585241500	44.43	19.85
41	0.600240000	44.15	19.80
42	0.615238500	43.97	19.70
43	0.630237000	43.76	19.58
44	0.645235500	43.54	19.54
45	0.660234000	43.35	19.44
46	0.675232500	43.13	19.44
47	0.690231000	42.88	19.31
48	0.705229500	42.71	19.26
49	0.720228000	42.53	19.21
50	0.735226500	42.29	19.16
51	0.750225000	42.09	19.15
52	0.765223500	41.89	19.08
53	0.780222000	41.71	19.01
54	0.795220500	41.52	18.95
55	0.810219000	41.33	18.92
56	0.825217500	41.20	18.88
57	0.840216000	40.99	18.87
58	0.855214500	40.80	18.79
59	0.870213000	40.65	18.81
60	0.885211500	40.47	18.75
61	0.900210000	40.28	18.70
62	0.915208500	40.12	18.70
63	0.930207000	39.94	18.64
64	0.945205500	39.78	18.60
65	0.960204000	39.61	18.60
66	0.975202500	39.45	18.58
67	0.990201000	39.29	18.55
68	1.005199500	39.12	18.52
69	1.020198000	38.98	18.48
70	1.035196500	38.82	18.43

145	2.160084000	30.91	17.47
146	2.175082500	30.84	17.45
147	2.190081000	30.70	17.47
148	2.205079500	30.64	17.47
149	2.220078000	30.58	17.47
150	2.235076500	30.50	17.45
151	2.250075000	30.42	17.44
152	2.265073500	30.33	17.43
153	2.280072000	30.22	17.42
154	2.295070500	30.17	17.42
155	2.310069000	30.09	17.40
156	2.325067500	30.02	17.36
157	2.340066000	29.91	17.37
158	2.355064500	29.83	17.35
159	2.370063000	29.76	17.34
160	2.385061500	29.69	17.36
161	2.400060000	29.64	17.30
162	2.415058500	29.56	17.29
163	2.430057000	29.46	17.29
164	2.445055500	29.39	17.28
165	2.460054000	29.35	17.29
166	2.475052500	29.30	17.24
167	2.490051000	29.23	17.21
168	2.505049500	29.13	17.22
169	2.520048000	29.08	17.22
170	2.535046500	29.03	17.22
171	2.550045000	28.97	17.22
172	2.565043500	28.90	17.18
173	2.580042000	28.84	17.17
174	2.595040500	28.74	17.17
175	2.610039000	28.71	17.18
176	2.625037500	28.65	17.17
177	2.640036000	28.58	17.15
178	2.655034500	28.52	17.14
179	2.670033000	28.43	17.15
180	2.685031500	28.38	17.14
181	2.700030000	28.31	17.16
182	2.715028500	28.27	17.13
183	2.730027000	28.22	17.10
184	2.745025500	28.13	17.13
185	2.760024000	28.07	17.11
186	2.775022500	28.02	17.14
187	2.790021000	27.96	17.12
188	2.805019500	27.92	17.09
189	2.820018000	27.82	17.10
190	2.835016500	27.75	17.10
191	2.850015000	27.72	17.10
192	2.865013500	27.65	17.11
193	2.880012000	27.60	17.08
194	2.895010500	27.54	17.08
195	2.910009000	27.43	17.08
196	2.925007500	27.40	17.07
197	2.940006000	27.34	17.09
198	2.955004500	27.27	17.06
199	2.970003000	27.22	17.06
200	2.985001500	27.13	17.04
201	3.000000000	27.06	17.03

71	1.050195000	38.64	18.37
72	1.065193500	38.52	18.37
73	1.080192000	38.38	18.33
74	1.095190500	38.25	18.26
75	1.110189000	38.14	18.24
76	1.125187500	38.04	18.21
77	1.140186000	37.95	18.20
78	1.155184500	37.80	18.25
79	1.170183000	37.66	18.25
80	1.185181500	37.55	18.26
81	1.200180000	37.37	18.23
82	1.215178500	37.23	18.22
83	1.230177000	37.09	18.24
84	1.245175500	36.94	18.22
85	1.260174000	36.81	18.19
86	1.275172500	36.68	18.18
87	1.290171000	36.54	18.14
88	1.305169500	36.39	18.15
89	1.320168000	36.26	18.13
90	1.335166500	36.16	18.11
91	1.350165000	36.04	18.07
92	1.365163500	35.92	18.07
93	1.380162000	35.80	18.07
94	1.395160500	35.67	18.06
95	1.410159000	35.54	18.03
96	1.425157500	35.44	18.05
97	1.440156000	35.32	18.00
98	1.455154500	35.18	17.95
99	1.470153000	35.06	17.96
100	1.485151500	34.94	17.94
101	1.500150000	34.85	17.90
102	1.515148500	34.75	17.88
103	1.530147000	34.69	17.87
104	1.545145500	34.58	17.86
105	1.560144000	34.46	17.87
106	1.575142500	34.38	17.88
107	1.590141000	34.27	17.88
108	1.605139500	34.16	17.84
109	1.620138000	34.05	17.84
110	1.635136500	33.90	17.85
111	1.650135000	33.80	17.82
112	1.665133500	33.71	17.82
113	1.680132000	33.60	17.77
114	1.695130500	33.50	17.74
115	1.710129000	33.37	17.75
116	1.725127500	33.25	17.71
117	1.740126000	33.19	17.72
118	1.755124500	33.09	17.67
119	1.770123000	33.00	17.62
120	1.785121500	32.90	17.63
121	1.800120000	32.81	17.61
122	1.815118500	32.76	17.55
123	1.830117000	32.67	17.57
124	1.845115500	32.61	17.53
125	1.860114000	32.52	17.53
126	1.875112500	32.42	17.54
127	1.890111000	32.36	17.51
128	1.905109500	32.28	17.53
129	1.920108000	32.19	17.48
130	1.935106500	32.13	17.48
131	1.950105000	32.02	17.49
132	1.965103500	31.94	17.47
133	1.980102000	31.90	17.49
134	1.995100500	31.80	17.46
135	2.010099000	31.74	17.45
136	2.025097500	31.64	17.47
137	2.040096000	31.55	17.45
138	2.055094500	31.50	17.48
139	2.070093000	31.42	17.47
140	2.085091500	31.35	17.46
141	2.100090000	31.25	17.47
142	2.115088500	31.16	17.48
143	2.130087000	31.08	17.47
144	2.145085500	30.99	17.51

835Mhz Muscle

Reference math : OFF Title: 07-22-02

Pt #	Frequency (GHz)	Data real	Data imag
1	0.000300000	9999.00	9999.00
2	0.015298500	76.14	414.10
3	0.030297000	69.85	212.37
4	0.045295500	66.43	142.51
5	0.060294000	66.27	108.00
6	0.075292500	66.19	87.08
7	0.090291000	65.33	73.84
8	0.105289500	65.43	64.38
9	0.120288000	64.66	57.78
10	0.135286500	64.31	51.89
11	0.150285000	64.14	47.47
12	0.165283500	63.80	43.96
13	0.180282000	63.42	40.84
14	0.195280500	63.08	38.71
15	0.210279000	62.79	36.54
16	0.225277500	62.60	34.53
17	0.240276000	62.30	33.17
18	0.255274500	62.21	31.91
19	0.270273000	62.01	30.65
20	0.285271500	61.72	29.69
21	0.300270000	61.43	28.65
22	0.315268500	61.27	27.81
23	0.330267000	61.10	27.00
24	0.345265500	60.92	26.50
25	0.360264000	60.72	25.93
26	0.375262500	60.54	25.20
27	0.390261000	60.32	24.69
28	0.405259500	60.13	24.26
29	0.420258000	59.94	23.87
30	0.435256500	59.74	23.58
31	0.450255000	59.54	23.18
32	0.465253500	59.49	22.89
33	0.480252000	59.28	22.51
34	0.495250500	59.10	22.29
35	0.510249000	58.95	22.09
36	0.525247500	58.77	21.86
37	0.540246000	58.62	21.57
38	0.555244500	58.50	21.40
39	0.570243000	58.35	21.25
40	0.585241500	58.20	21.08
41	0.600240000	57.97	20.94
42	0.615238500	57.86	20.76
43	0.630237000	57.76	20.59
44	0.645235500	57.61	20.55
45	0.660234000	57.50	20.44
46	0.675232500	57.33	20.37
47	0.690231000	57.17	20.19
48	0.705229500	57.04	20.11
49	0.720228000	56.91	20.03
50	0.735226500	56.73	19.96
51	0.750225000	56.63	19.97
52	0.765223500	56.47	19.87
53	0.780222000	56.37	19.75
54	0.795220500	56.22	19.67
55	0.810219000	56.06	19.66
56	0.825217500	55.98	19.62
57	0.840216000	55.83	19.62
58	0.855214500	55.69	19.54
59	0.870213000	55.61	19.54
60	0.885211500	55.45	19.47
61	0.900210000	55.31	19.45
62	0.915208500	55.16	19.44
63	0.930207000	55.02	19.39
64	0.945205500	54.91	19.35
65	0.960204000	54.80	19.37
66	0.975202500	54.69	19.36
67	0.990201000	54.55	19.33
68	1.005199500	54.36	19.30
69	1.020198000	54.27	19.27
70	1.035196500	54.15	19.25

71	1.050195000	53.99	19.25
72	1.065193500	53.88	19.24
73	1.080192000	53.78	19.17
74	1.095190500	53.69	19.07
75	1.110189000	53.62	19.08
76	1.125187500	53.54	19.09
77	1.140186000	53.47	19.11
78	1.155184500	53.37	19.18
79	1.170183000	53.27	19.18
80	1.185181500	53.18	19.22
81	1.200180000	53.01	19.20
82	1.215178500	52.88	19.25
83	1.230177000	52.78	19.27
84	1.245175500	52.65	19.27
85	1.260174000	52.55	19.28
86	1.275172500	52.43	19.29
87	1.290171000	52.29	19.25
88	1.305169500	52.18	19.29
89	1.320168000	52.03	19.29
90	1.335166500	51.97	19.30
91	1.350165000	51.86	19.30
92	1.365163500	51.74	19.31
93	1.380162000	51.66	19.32
94	1.395160500	51.55	19.34
95	1.410159000	51.43	19.32
96	1.425157500	51.32	19.36
97	1.440156000	51.22	19.35
98	1.455154500	51.09	19.34
99	1.470153000	50.98	19.38
100	1.485151500	50.88	19.36
101	1.500150000	50.80	19.32
102	1.515148500	50.70	19.34
103	1.530147000	50.64	19.35
104	1.545145500	50.56	19.38
105	1.560144000	50.47	19.43
106	1.575142500	50.40	19.45
107	1.590141000	50.30	19.47
108	1.605139500	50.18	19.47
109	1.620138000	50.07	19.51
110	1.635136500	49.93	19.55
111	1.650135000	49.83	19.57
112	1.665133500	49.75	19.59
113	1.680132000	49.65	19.54
114	1.695130500	49.53	19.54
115	1.710129000	49.40	19.56
116	1.725127500	49.27	19.54
117	1.740126000	49.23	19.59
118	1.755124500	49.13	19.57
119	1.770123000	49.06	19.55
120	1.785121500	48.96	19.57
121	1.800120000	48.87	19.54
122	1.815118500	48.81	19.52
123	1.830117000	48.74	19.55
124	1.845115500	48.68	19.55
125	1.860114000	48.60	19.58
126	1.875112500	48.51	19.60
127	1.890111000	48.47	19.60
128	1.905109500	48.40	19.63
129	1.920108000	48.30	19.62
130	1.935106500	48.23	19.66
131	1.950105000	48.12	19.71
132	1.965103500	48.05	19.73
133	1.980102000	48.02	19.75
134	1.995100500	47.94	19.74
135	2.010099000	47.86	19.74
136	2.025097500	47.76	19.80
137	2.040096000	47.66	19.83
138	2.055094500	47.62	19.89
139	2.070093000	47.55	19.90
140	2.085091500	47.49	19.91
141	2.100090000	47.40	19.95
142	2.115088500	47.29	20.00
143	2.130087000	47.18	20.02
144	2.145085500	47.09	20.09

145	2.160084000	47.03	20.10
146	2.175082500	46.96	20.12
147	2.190081000	46.83	20.16
148	2.205079500	46.76	20.18
149	2.220078000	46.67	20.17
150	2.235076500	46.58	20.21
151	2.250075000	46.49	20.23
152	2.265073500	46.40	20.26
153	2.280072000	46.28	20.27
154	2.295070500	46.22	20.30
155	2.310069000	46.13	20.28
156	2.325067500	46.05	20.25
157	2.340066000	45.93	20.30
158	2.355064500	45.83	20.33
159	2.370063000	45.77	20.35
160	2.385061500	45.71	20.38
161	2.400060000	45.63	20.34
162	2.415058500	45.55	20.32
163	2.430057000	45.42	20.35
164	2.445055500	45.35	20.36
165	2.460054000	45.30	20.40
166	2.475052500	45.24	20.39
167	2.490051000	45.18	20.38
168	2.505049500	45.09	20.40
169	2.520048000	45.02	20.40
170	2.535046500	44.95	20.43
171	2.550045000	44.87	20.46
172	2.565043500	44.80	20.45
173	2.580042000	44.73	20.47
174	2.595040500	44.64	20.50
175	2.610039000	44.62	20.50
176	2.625037500	44.55	20.48
177	2.640036000	44.48	20.51
178	2.655034500	44.39	20.55
179	2.670033000	44.30	20.59
180	2.685031500	44.23	20.61
181	2.700030000	44.19	20.64
182	2.715028500	44.14	20.62
183	2.730027000	44.07	20.60
184	2.745025500	43.96	20.67
185	2.760024000	43.88	20.68
186	2.775022500	43.83	20.72
187	2.790021000	43.77	20.72
188	2.805019500	43.73	20.71
189	2.820018000	43.63	20.75
190	2.835016500	43.55	20.77
191	2.850015000	43.49	20.79
192	2.865013500	43.40	20.84
193	2.880012000	43.36	20.82
194	2.895010500	43.28	20.85
195	2.910009000	43.18	20.87
196	2.925007500	43.14	20.87
197	2.940006000	43.07	20.91
198	2.955004500	42.99	20.92
199	2.970003000	42.90	20.94
200	2.985001500	42.79	20.96
201	3.000000000	42.73	20.97

835 mhz Validation

Reference math : OFF Title: 07-23-02

Pt#	Frequency (GHz)	Data real	Data imag
1	0.000300000	299.28	8586.71
2	0.015298500	71.03	243.54
3	0.030297000	62.64	126.39
4	0.045295500	60.56	86.92
5	0.060294000	59.69	67.69
6	0.075292500	58.85	56.36
7	0.090291000	57.45	49.03
8	0.105289500	57.07	43.49
9	0.120288000	56.21	39.64
10	0.135286500	55.54	36.56
11	0.150285000	54.81	34.15
12	0.165283500	54.19	32.26
13	0.180282000	53.62	30.59
14	0.195280500	53.08	29.47
15	0.210279000	52.62	28.27
16	0.225277500	52.27	27.18
17	0.240276000	51.73	26.45
18	0.255274500	51.24	25.74
19	0.270273000	50.80	25.08
20	0.285271500	50.44	24.59
21	0.300270000	50.00	24.15
22	0.315268500	49.78	23.68
23	0.330267000	49.33	23.25
24	0.345265500	49.00	22.86
25	0.360264000	48.65	22.62
26	0.375262500	48.28	22.34
27	0.390261000	47.94	22.06
28	0.405259500	47.62	21.91
29	0.420258000	47.37	21.61
30	0.435256500	47.04	21.45
31	0.450255000	46.70	21.23
32	0.465253500	46.46	21.14
33	0.480252000	46.16	20.93
34	0.495250500	45.91	20.83
35	0.510249000	45.68	20.70
36	0.525247500	45.39	20.60
37	0.540246000	45.14	20.40
38	0.555244500	44.87	20.35
39	0.570243000	44.58	20.25
40	0.585241500	44.40	20.15
41	0.600240000	44.13	20.13
42	0.615238500	43.89	20.02
43	0.630237000	43.71	19.91
44	0.645235500	43.45	19.84
45	0.660234000	43.25	19.79
46	0.675232500	43.03	19.77
47	0.690231000	42.80	19.70
48	0.705229500	42.62	19.66
49	0.720228000	42.42	19.60
50	0.735226500	42.17	19.50
51	0.750225000	41.97	19.50
52	0.765223500	41.77	19.43
53	0.780222000	41.59	19.40
54	0.795220500	41.39	19.35
55	0.810219000	41.17	19.33
56	0.825217500	41.02	19.26
57	0.840216000	40.82	19.25
58	0.855214500	40.63	19.19
59	0.870213000	40.44	19.19
60	0.885211500	40.24	19.14
61	0.900210000	40.10	19.12
62	0.915208500	39.93	19.12
63	0.930207000	39.74	19.04
64	0.945205500	39.55	19.01
65	0.960204000	39.35	18.98
66	0.975202500	39.19	18.96
67	0.990201000	39.06	18.97
68	1.005199500	38.87	18.95
69	1.020198000	38.72	18.91
70	1.035196500	38.56	18.85

71	1.050195000	38.37	18.79
72	1.065193500	38.23	18.79
73	1.080192000	38.05	18.79
74	1.095190500	37.92	18.72
75	1.110189000	37.82	18.68
76	1.125187500	37.72	18.65
77	1.140186000	37.63	18.64
78	1.155184500	37.44	18.69
79	1.170183000	37.26	18.68
80	1.185181500	37.13	18.69
81	1.200180000	36.98	18.68
82	1.215178500	36.87	18.68
83	1.230177000	36.71	18.68
84	1.245175500	36.57	18.65
85	1.260174000	36.41	18.62
86	1.275172500	36.26	18.60
87	1.290171000	36.11	18.58
88	1.305169500	35.97	18.59
89	1.320168000	35.85	18.59
90	1.335166500	35.74	18.56
91	1.350165000	35.61	18.51
92	1.365163500	35.44	18.50
93	1.380162000	35.29	18.51
94	1.395160500	35.17	18.51
95	1.410159000	35.04	18.45
96	1.425157500	34.95	18.47
97	1.440156000	34.83	18.43
98	1.455154500	34.69	18.38
99	1.470153000	34.52	18.40
100	1.485151500	34.40	18.39
101	1.500150000	34.31	18.38
102	1.515148500	34.17	18.37
103	1.530147000	34.07	18.32
104	1.545145500	33.97	18.30
105	1.560144000	33.80	18.30
106	1.575142500	33.71	18.27
107	1.590141000	33.56	18.26
108	1.605139500	33.43	18.19
109	1.620138000	33.34	18.17
110	1.635136500	33.20	18.15
111	1.650135000	33.12	18.09
112	1.665133500	33.03	18.06
113	1.680132000	32.94	18.00
114	1.695130500	32.87	17.97
115	1.710129000	32.78	17.98
116	1.725127500	32.70	17.97
117	1.740126000	32.64	17.98
118	1.755124500	32.54	17.95
119	1.770123000	32.47	17.93
120	1.785121500	32.34	17.99
121	1.800120000	32.24	17.99
122	1.815118500	32.15	17.96
123	1.830117000	32.05	17.99
124	1.845115500	31.95	17.94
125	1.860114000	31.85	17.92
126	1.875112500	31.70	17.93
127	1.890111000	31.61	17.91
128	1.905109500	31.51	17.91
129	1.920108000	31.42	17.86
130	1.935106500	31.36	17.83
131	1.950105000	31.25	17.81
132	1.965103500	31.15	17.78
133	1.980102000	31.08	17.79
134	1.995100500	30.99	17.77
135	2.010099000	30.93	17.75
136	2.025097500	30.83	17.77
137	2.040096000	30.74	17.74
138	2.055094500	30.69	17.75
139	2.070093000	30.58	17.74
140	2.085091500	30.47	17.72
141	2.100090000	30.36	17.72
142	2.115088500	30.27	17.73
143	2.130087000	30.22	17.71
144	2.145085500	30.13	17.72

145	2.160084000	30.03	17.67
146	2.175082500	29.94	17.63
147	2.190081000	29.77	17.63
148	2.205079500	29.72	17.64
149	2.220078000	29.68	17.64
150	2.235076500	29.60	17.60
151	2.250075000	29.52	17.58
152	2.265073500	29.41	17.54
153	2.280072000	29.29	17.50
154	2.295070500	29.23	17.52
155	2.310069000	29.14	17.49
156	2.325067500	29.09	17.45
157	2.340066000	29.01	17.45
158	2.355064500	28.93	17.41
159	2.370063000	28.89	17.37
160	2.385061500	28.79	17.38
161	2.400060000	28.73	17.33
162	2.415058500	28.66	17.31
163	2.430057000	28.58	17.31
164	2.445055500	28.54	17.30
165	2.460054000	28.49	17.30
166	2.475052500	28.44	17.24
167	2.490051000	28.38	17.21
168	2.505049500	28.28	17.23
169	2.520048000	28.23	17.24
170	2.535046500	28.17	17.25
171	2.550045000	28.12	17.24
172	2.565043500	28.06	17.22
173	2.580042000	27.99	17.20
174	2.595040500	27.89	17.19
175	2.610039000	27.84	17.22
176	2.625037500	27.77	17.23
177	2.640036000	27.69	17.20
178	2.655034500	27.63	17.18
179	2.670033000	27.54	17.17
180	2.685031500	27.47	17.15
181	2.700030000	27.40	17.17
182	2.715028500	27.32	17.15
183	2.730027000	27.27	17.11
184	2.745025500	27.18	17.14
185	2.760024000	27.12	17.10
186	2.775022500	27.07	17.09
187	2.790021000	27.00	17.07
188	2.805019500	26.94	17.04
189	2.820018000	26.84	17.04
190	2.835016500	26.76	17.04
191	2.850015000	26.72	17.03
192	2.865013500	26.68	17.03
193	2.880012000	26.62	16.96
194	2.895010500	26.54	16.96
195	2.910009000	26.42	16.94
196	2.925007500	26.39	16.95
197	2.940006000	26.31	16.95
198	2.955004500	26.28	16.91
199	2.970003000	26.23	16.88
200	2.985001500	26.14	16.85
201	3.000000000	26.08	16.83

APPENDIX B: SAR DISTRIBUTION PRINTOUT

APPENDIX C: 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:	ET3DV6
Serial Number:	1618
Place of Calibration:	Zurich
Date of Calibration:	February 21, 2002
Calibration Interval:	12 months

asset# 039926

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:

Schmid & Partner
Engineering AG

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

Probe ET3DV6

SN:1618

Manufactured: January 25, 2002
Last calibration: February 21, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1618

Sensitivity in Free Space

Diode Compression

NormX	**1.80**	$\mu V/(V/m)^2$	DCP X	**97**	mV
NormY	**1.75**	$\mu V/(V/m)^2$	DCP Y	**97**	mV
NormZ	**1.88**	$\mu V/(V/m)^2$	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	**6.8**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.8**	± 9.5% (k=2)	Alpha	**0.32**
ConvF Z	**6.8**	± 9.5% (k=2)	Depth	**2.69**

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	**5.3**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.3**	± 9.5% (k=2)	Alpha	**0.45**
ConvF Z	**5.3**	± 9.5% (k=2)	Depth	**2.37**

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	5.4
SAR_{be} [%]	With Correction Algorithm	0.3	0.5

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

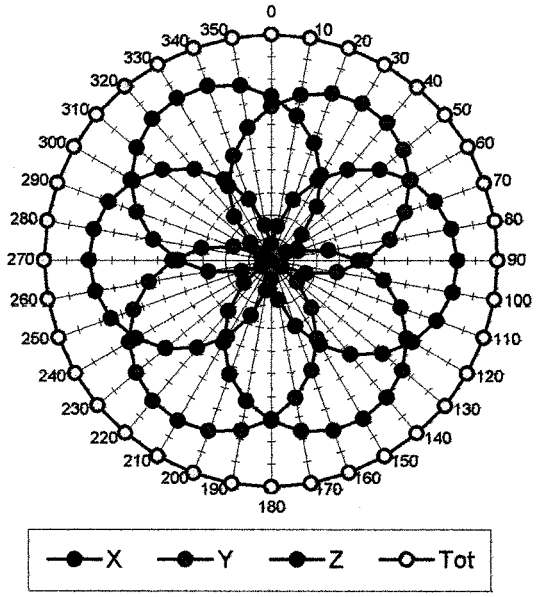
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	10.2	6.7
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

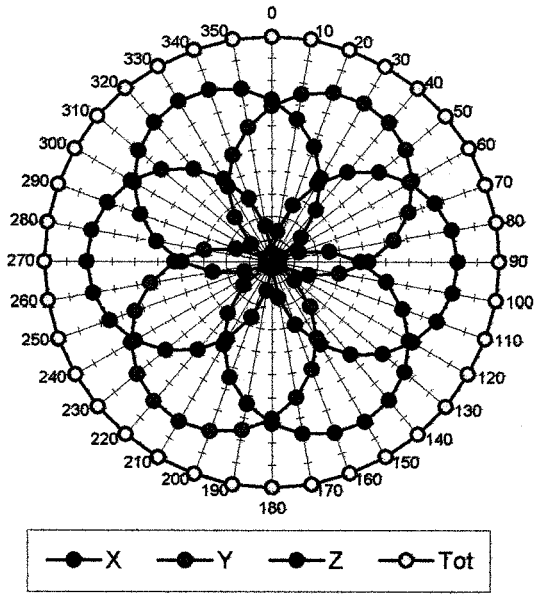
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.3 ± 0.2**	mm

Receiving Pattern (ϕ), θ = 0°

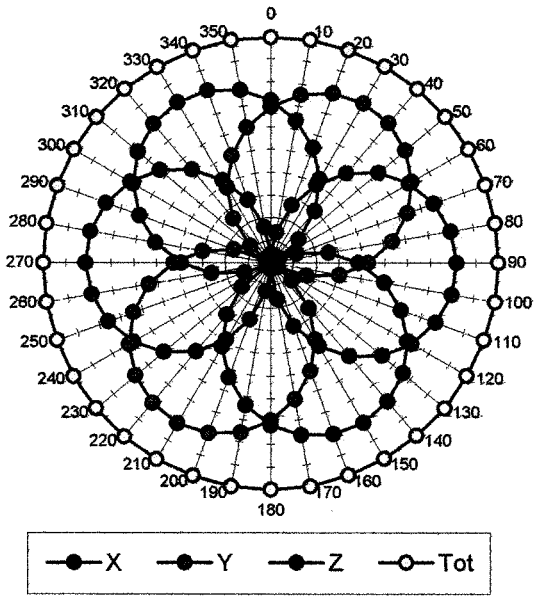
f = 30 MHz, TEM cell ifi110



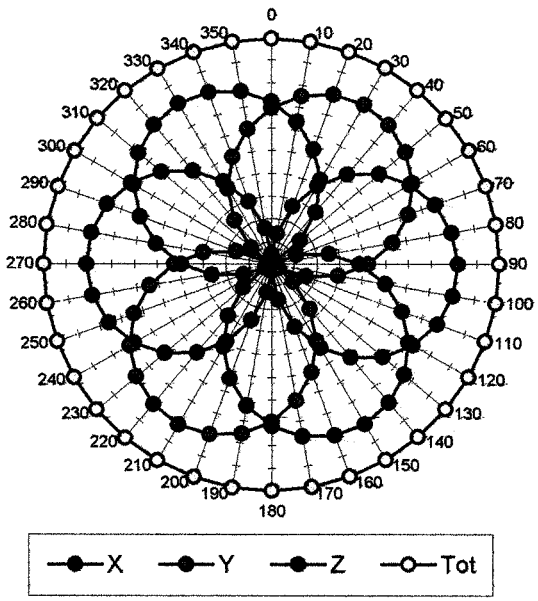
f = 100 MHz, TEM cell ifi110

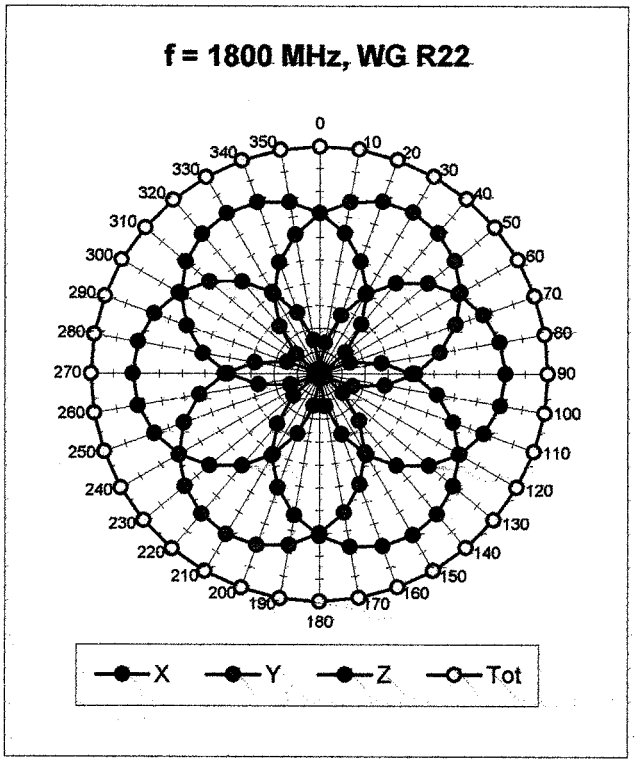


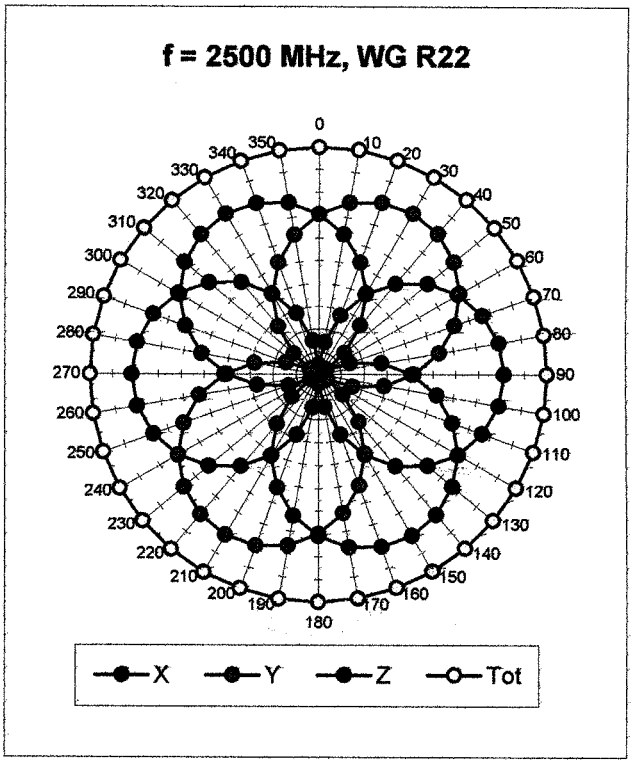
f = 300 MHz, TEM cell ifi110



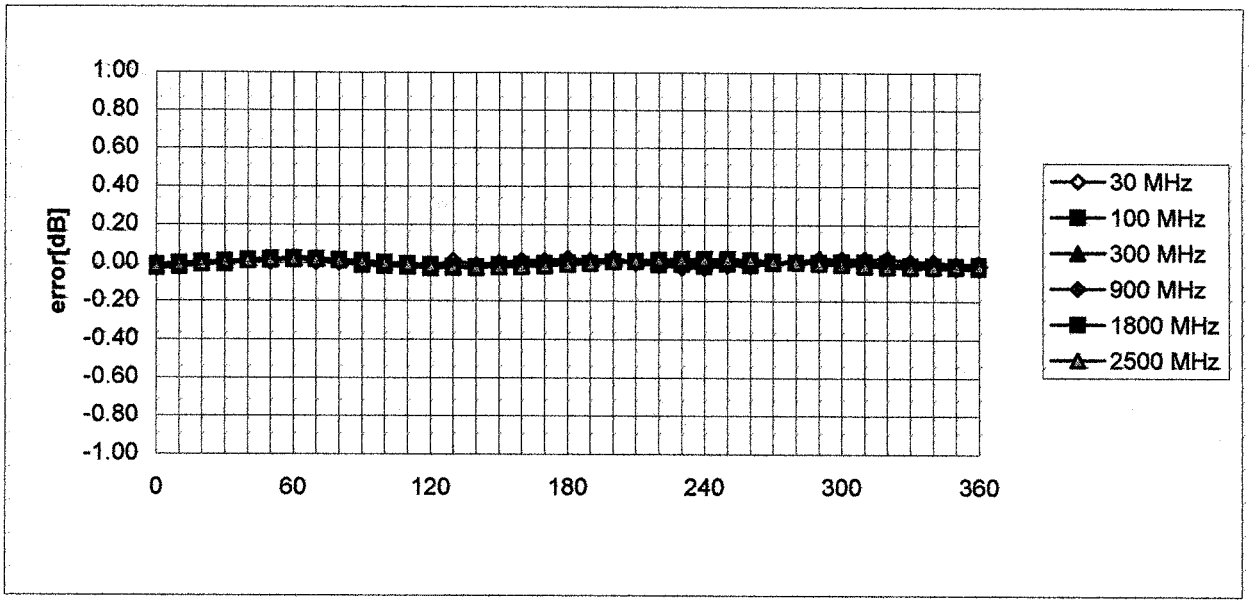
f = 900 MHz, TEM cell ifi110





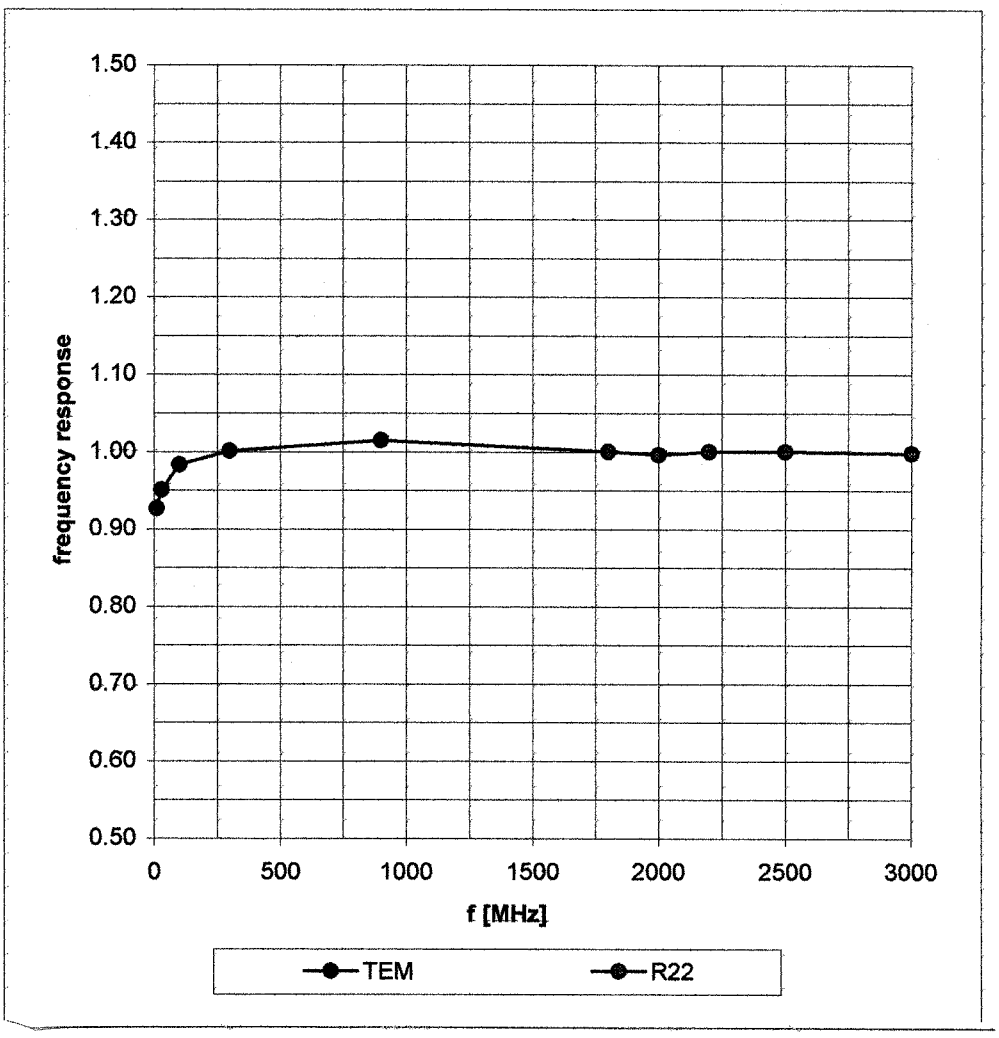


Isotropy Error (ϕ), θ = 0°



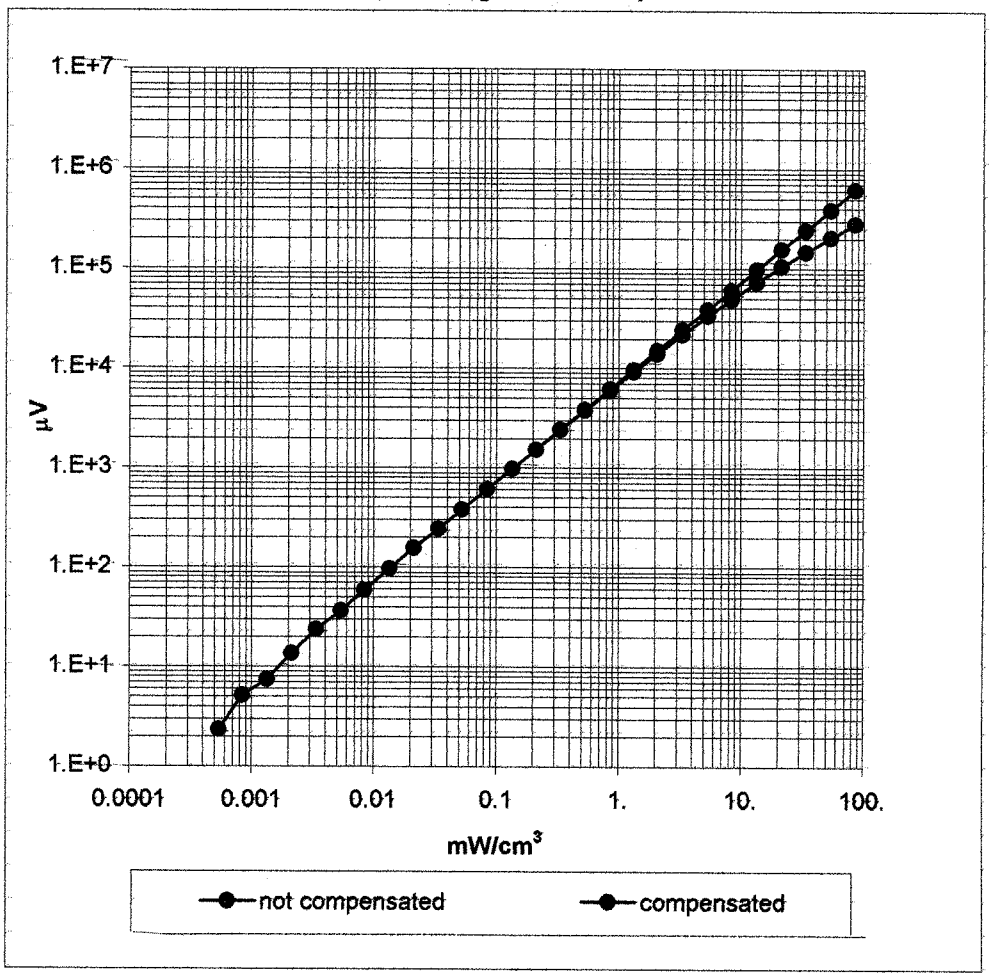
Frequency Response of E-Field

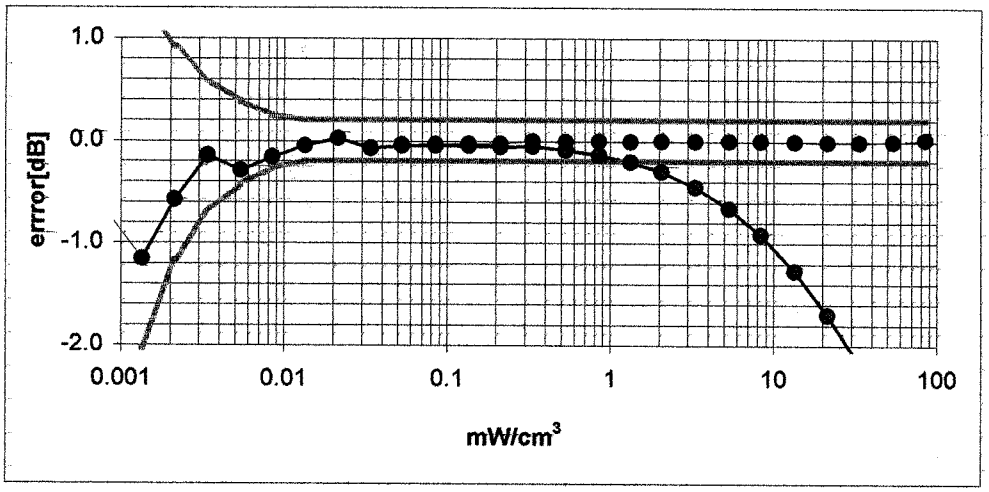
(TEM-Cell:ifi110, Waveguide R22)



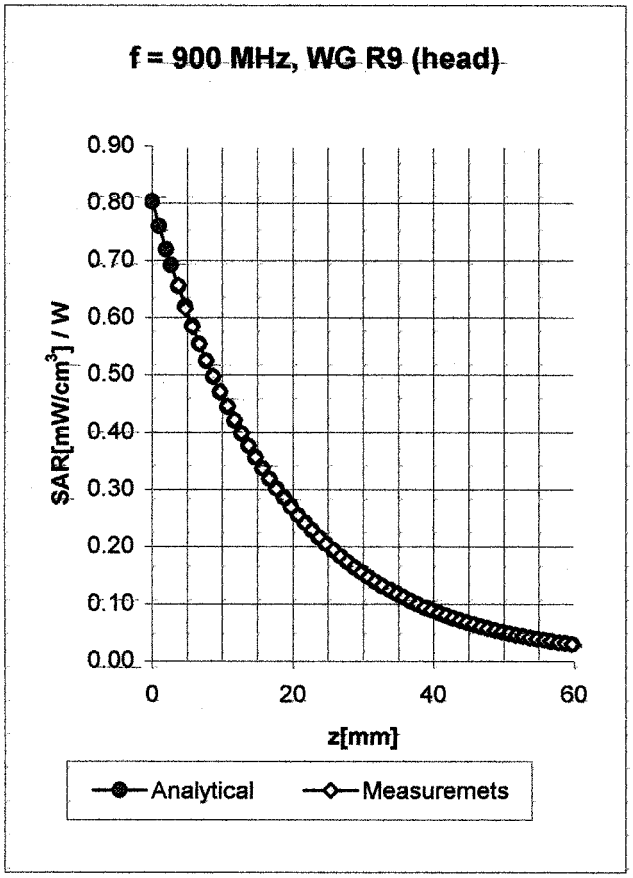
Dynamic Range f(SAR_{brain})

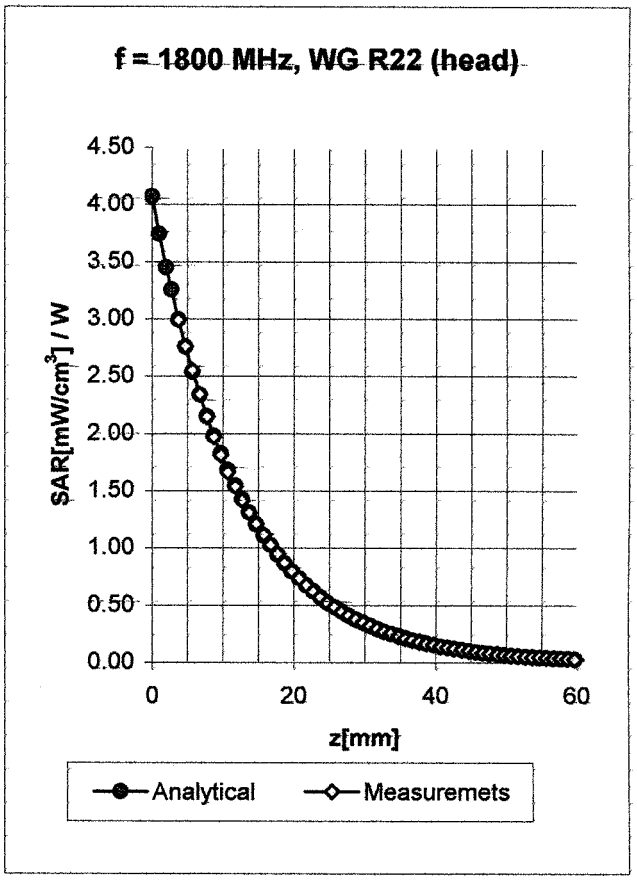
(Waveguide R22)





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	**6.8** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.8** ± 9.5% (k=2)	Alpha	**0.32**
	ConvF Z	**6.8** ± 9.5% (k=2)	Depth	**2.69**

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	**5.3** ± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.3** ± 9.5% (k=2)	Alpha	**0.45**
	ConvF Z	**5.3** ± 9.5% (k=2)	Depth	**2.37**

Deviation from Isotropy in HSL

Error (θ,ϕ), f = 900 MHz