SAR EVALUATION REPORT

For

Haier Telecommunication Co., Ltd

No. 1, Haier Road, Hi-tech Zone,Qingdao, 266101,P.R.China

FCC ID: SG7Z3000B

2004-10-22

This Report Concerns:	Equipment Type:
☒ Original Report	Phone, Mobile, GSM, GPRS, 1900 MHz

Test Engineer:	Daniel Deng / Eric Hong
Report No.:	R0403294S
Test Date:	2004-04-12 / 2004-04-25
Reviewed By:	Ming Jing
Prepared By:	Bay Area Compliance Laboratory Corporation (BACL) 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

Note: This test report is specially limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

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SUMMARY

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996 [1].

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

There was no SAR of any concern measured on the device for any of the investigated configurations.

1 - REFERENCE

[1] Federal Communications Commission, \Report and order: Guidelines for evaluating the environmental effects of radiofrequency radiation", Tech. Rep. FCC 96-326, FCC, Washington, D.C. 20554, 1996.

[2] David L. Means Kwok Chan, Robert F. Cleveland, \Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields", Tech. Rep., Federal Communication Commission, O_ce of Engineering & Technology, Washington, DC, 1997.

[3] Thomas Schmid, Oliver Egger, and Niels Kuster, \Automated E-_eld scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp. 105{113, Jan. 1996.

[4] Niels Kuster, Ralph K.astle, and Thomas Schmid, \Dosimetric evaluation of mobile communications equipment with known precision", IEICE Transactions on Communications, vol. E80-B, no. 5, pp. 645{652, May 1997.

[5] CENELEC, \Considerations for evaluating of human exposure to electromagnetic fields (EMFs) from mobile telecommunication equipment (MTE) in the frequency range 30MHz - 6GHz", Tech. Rep., CENELEC, European Committee for Electrotechnical Standardization, Brussels, 1997.

[6] ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.

[7] Katja Pokovic, Thomas Schmid, and Niels Kuster, \Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies", in ICECOM _ 97, Dubrovnik, October 15{17, 1997, pp. 120-24.

[8] Katja Pokovic, Thomas Schmid, and Niels Kuster, \E-field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23{25 June, 1996, pp. 172-175.

[9] Volker Hombach, Klaus Meier, Michael Burkhardt, Eberhard K. uhn, and Niels Kuster, \The depen-dence of EM energy absorption upon human head modeling at 900 MHz", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1865-1873, Oct. 1996.

[10] Klaus Meier, Ralf Kastle, Volker Hombach, Roger Tay, and Niels Kuster, \The dependence of EM energy absorption upon human head modeling at 1800 MHz", IEEE Transactions on Microwave Theory and Techniques, Oct. 1997, in press.

[11] W. Gander, Computermathematik, Birkhaeuser, Basel, 1992.

[12] W. H. Press, S. A. Teukolsky,W. T. Vetterling, and B. P. Flannery, Numerical Recepies in C, The Art of Scientific Computing, Second Edition, Cambridge University Press, 1992.Dosimetric Evaluation of Sample device, month 1998 9

[13] NIS81 NAMAS, \The treatment of uncertainity in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddington, Middlesex, England, 1994.

[14] Barry N. Taylor and Christ E. Kuyatt, \Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994. Dosimetric Evaluation of Sample device, month 1998 10

2 - TESTING EQUIPMENT

2.1 Equipments List & Calibration Info

Type / Model	Cal. Date	S/N:
DASY3 Professional Dosimetric System	N/A	N/A
Robot RX60L	N/A	F00/5H31A1/A/01
Robot Controller	N/A	F01/5J72A1/A/01
Dell Computer Optiplex GX110	N/A	N/A
Pentium III, Windows NT	N/A	N/A
SPEAG EDC3	N/A	N/A
SPEAG DAE3	2004-06-01	456
SPEAG E-Field Probe ES3DV2	2004-10-09	3019
SPEAG Generic Twin Phantom	N/A	N/A
SPEAG Light Alignment Sensor	N/A	278
Aprel Validation Dipole D-1800-S-2	2004-04-09	BCL-049
Brain Equivalent Matter (1900MHz)	Each Use	N/A
Muscle Equivalent Matter (1900MHz)	Each Use	N/A
Robot Table	Each Use	N/A
Phone Holder	Each Use	N/A
Phantom Cover	Each Use	N/A
HP Spectrum Analyzer HP8566A	N/A	2240A01930
Microwave Amp. 8349A	N/A	2644A02662
Power Meter Agilent E4919B	2004-04-29	18485-66
Power Sensor Agilent E4412A	2004-05-07	US38488542
Network Analyzer HP-8752C	2002-08-11	820079
Dielectric Probe Kit HP85070A	Each Use	US99360201
Signal Generator HP-83650B	2004-02-29	3614A002716
Amplifier, ST181-20	N/R	E012-0101
Antenna, Horn DRG-118A	2004-02-06	A052704
Analyzer, Communication, Agilent E5515C	2003-12-12	6100210612

2.2 Equipment Calibration Certificate

Please see the attached file.

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

Client Bay Area Comp. Lab (BACL)

CALIBRATION CERTIFICATE

Object(s)	ES3DV2 - SN:3019
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	October 9, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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

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

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Reference 20 dB Attenuator	SN: 5086 (20b)	3-Apr-03 (METAS No. 251-0340	Apr-04
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (Agilent, No. 20020918)	In house check: Oct 03
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (Agilent, No. 24BR1033101)	In house check: Oct 03

	Name	Function	Signature
Calibrated by:	[redacted]		
Approved by:	[redacted]		

Date issued: October 9, 2003

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

880-KP0301061-A Page 1 (1)

Schmid & Partner Engineering AG s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ES3DV2

SN: 3019

Manufactured: December 5, 2002
Last calibration: July 12, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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DASY - Parameters of Probe: ES3DV2 SN: 3019

Sensitivity in Free Space

NormX	**1.03** $\mu V/(V/m)^2$
NormY	**1.12** $\mu V/(V/m)^2$
NormZ	**0.98** $\mu V/(V/m)^2$

Diode Compression

DCP X	99
DCP Y	99
DCP Z	99

Sensitivity in Tissue Simulating Liquid

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

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**6.4** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.4** ± 9.5% (k=2)	Alpha	**0.68**
ConvF Z	**6.4** ± 9.5% (k=2)	Depth	**1.11**

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

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.0** ± 9.5% (k=2)	Alpha	**0.21**
ConvF Z	**5.0** ± 9.5% (k=2)	Depth	**2.78**

Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

Probe Tip to Boundary	**1 mm**	**2 mm**
SAR_{be} [%] Without Correction Algorithm	4.3	1.8
SAR_{be} [%] With Correction Algorithm	0.0	0.1

Head 1800 MHz Typical SAR gradient: 10 % per mm

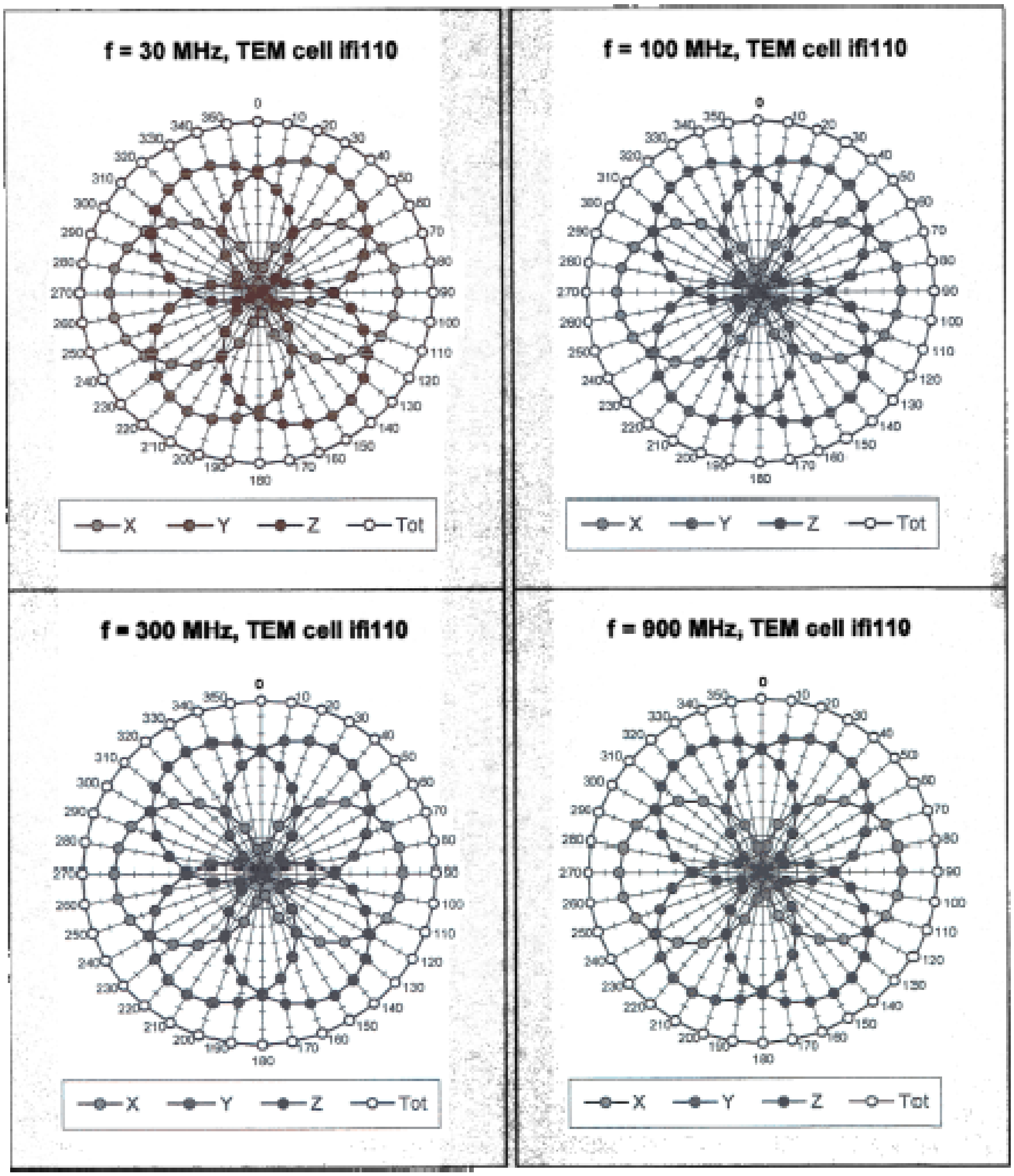
Probe Tip to Boundary	**1 mm**	**2 mm**
SAR_{be} [%] Without Correction Algorithm	7.4	5.0
SAR_{be} [%] With Correction Algorithm	0.0	0.1

Sensor Offset

Probe Tip to Sensor Center **2.1** mm

ES3DV2 SN: 3019 July 12, 2003

Receiving Pattern (ϕ), θ = 0°



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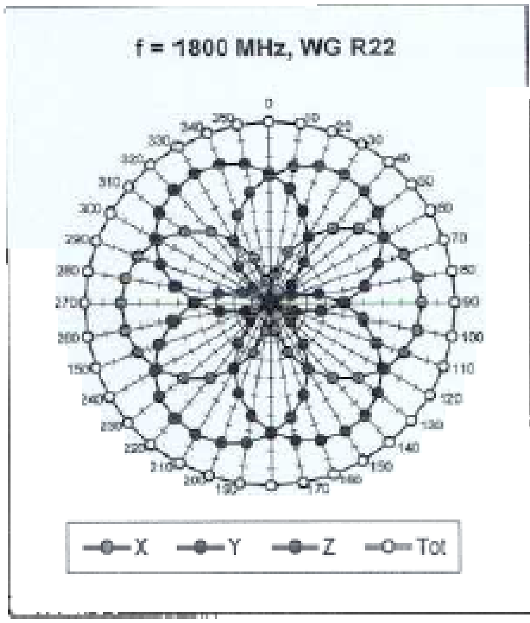
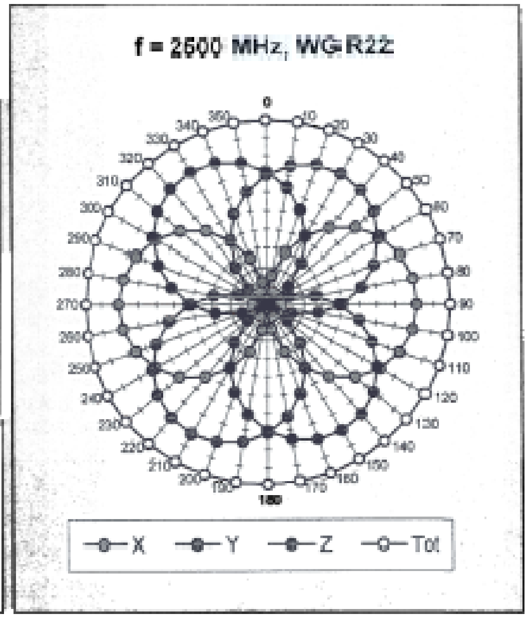
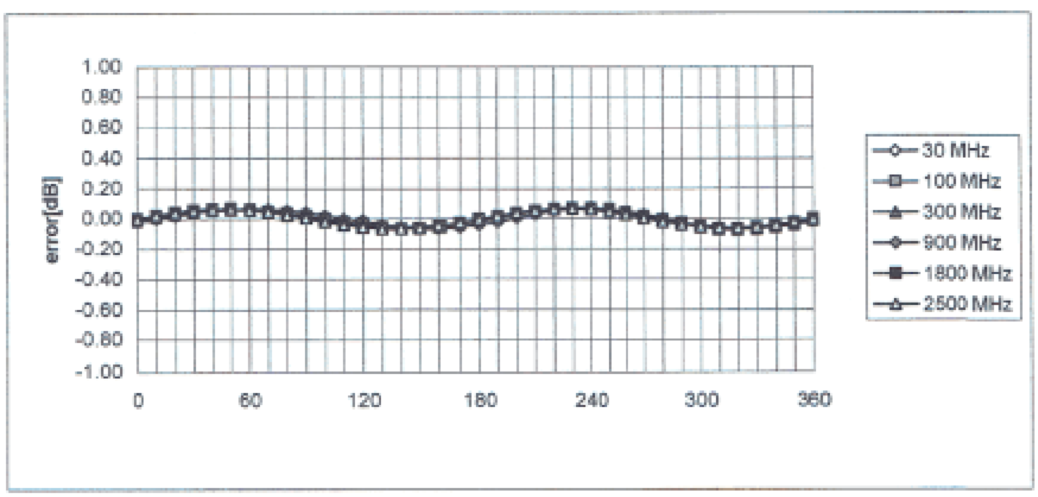




Isotropy Error (ϕ), θ 0°



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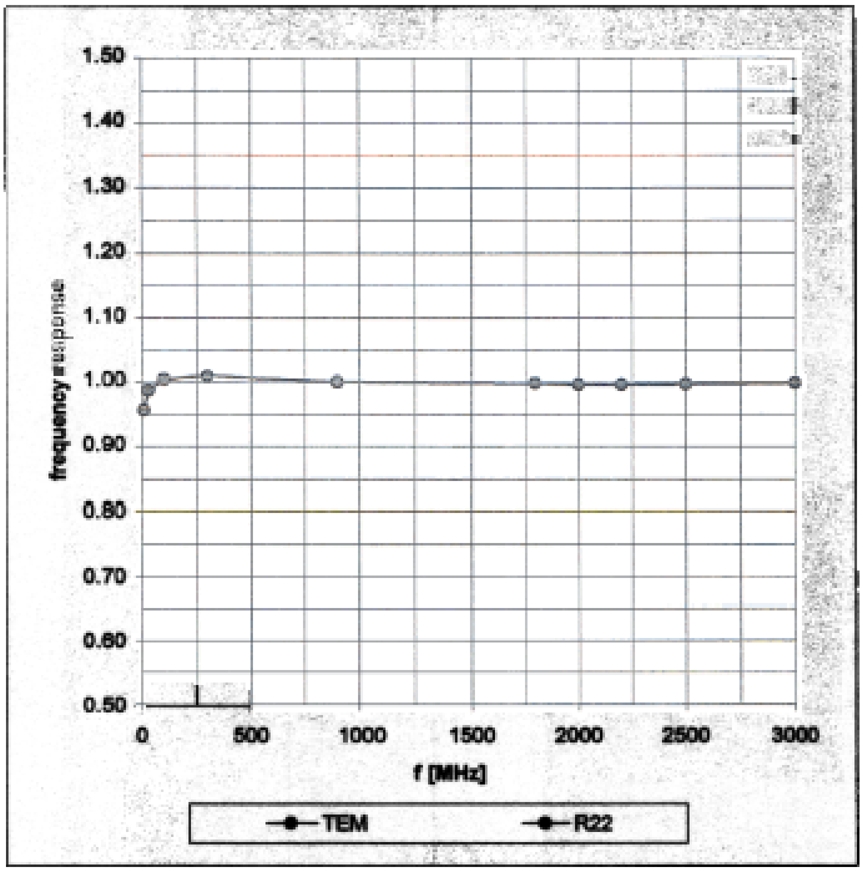
ES3DV2 SN: 3019 July 12, 2003

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)



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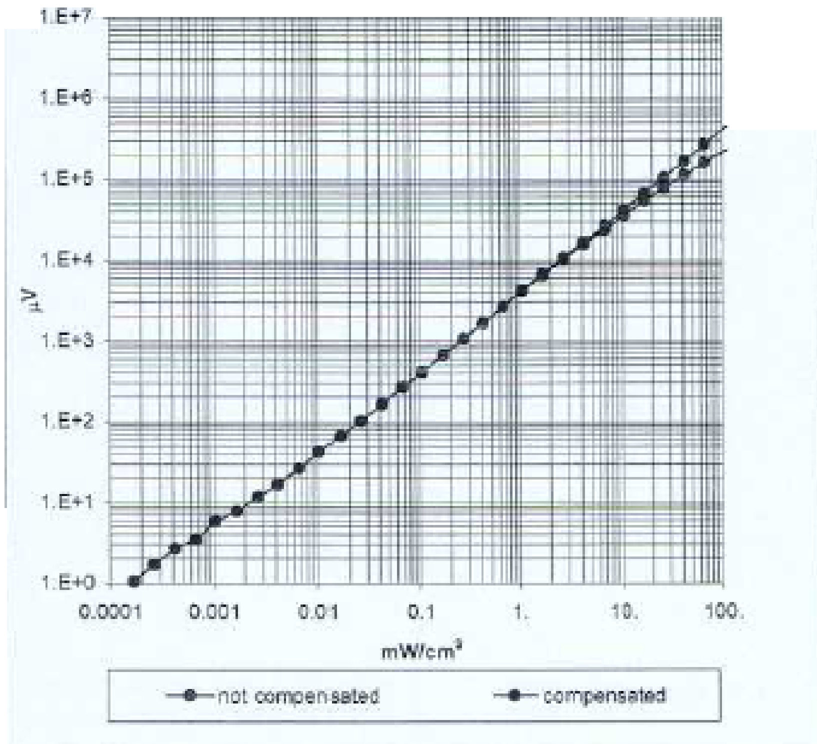
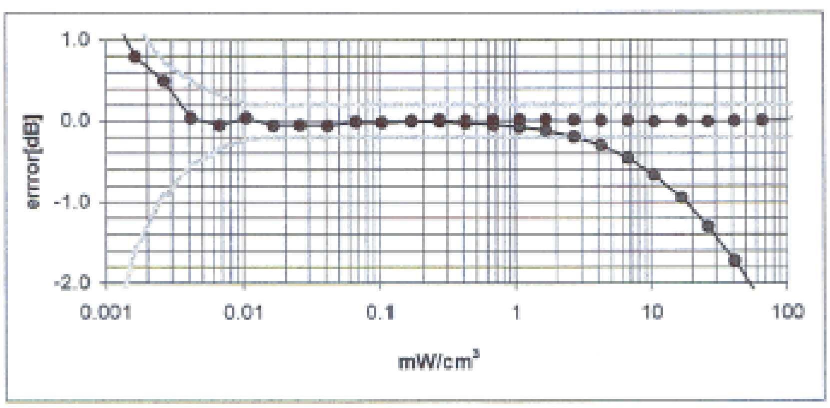
Dynamic Range f(SAR_{brain})

(Waveguide R22)





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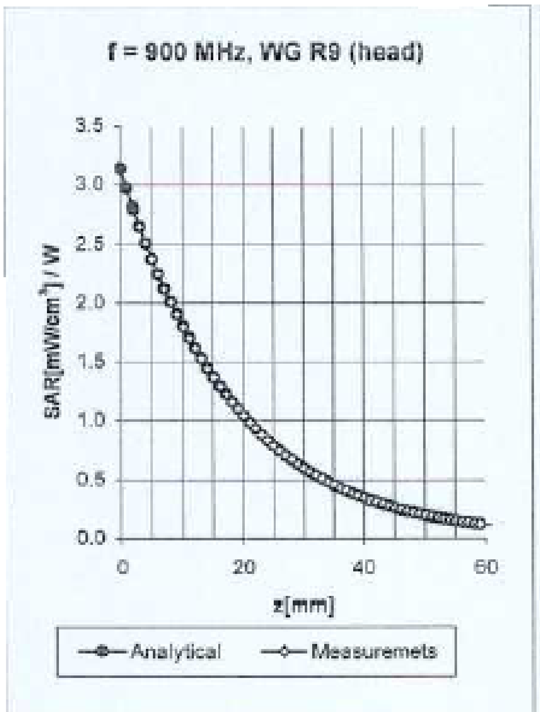
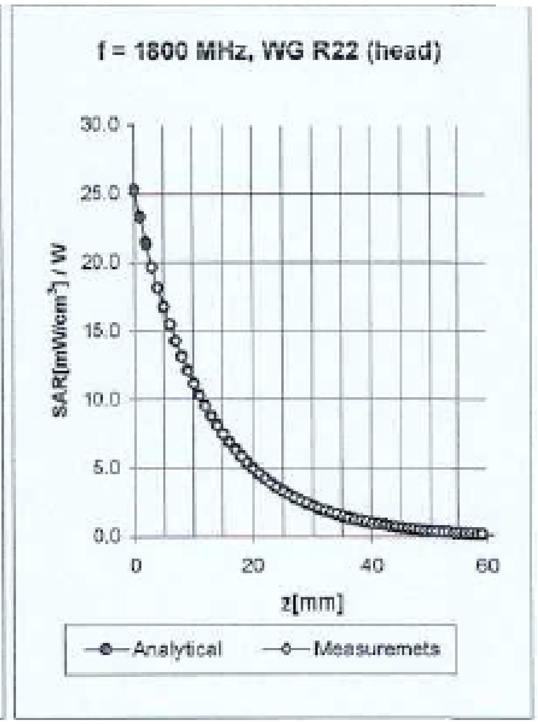
Conversion Factor Assessment





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

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**6.4** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.4** ± 9.5% (k=2)	Alpha	**0.68**
ConvF Z	**6.4** ± 9.5% (k=2)	Depth	**1.11**

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

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.0** ± 9.5% (k=2)	Alpha	**0.21**
ConvF Z	**5.0** ± 9.5% (k=2)	Depth	**2.78**

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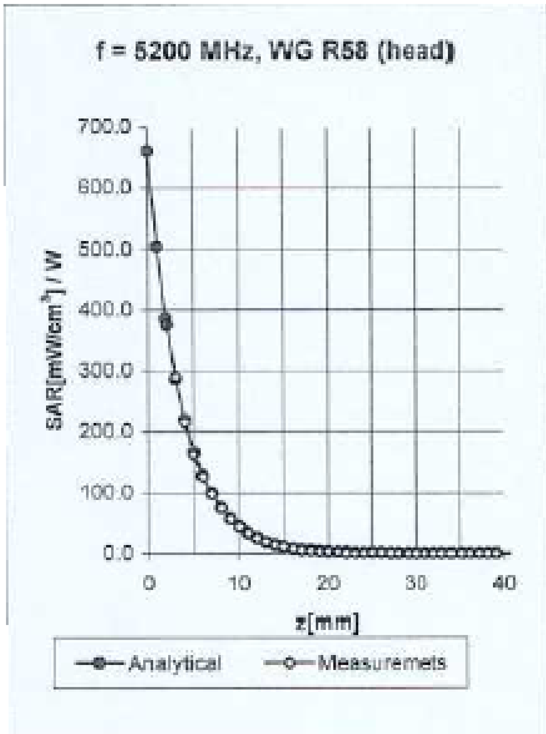
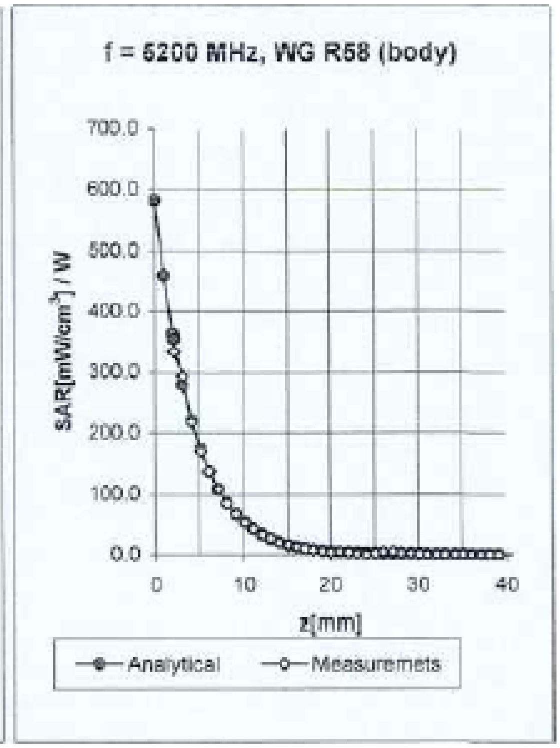
Conversion Factor Assessment





Head 5200 MHz ε_r = 36.0 ± 5% σ = 4.66 ± 5% mho/m

Valid for f=4940-5460 MHz with Head Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**2.3** ± 14.6% (k=2)	Boundary effect:	
ConvF Y	**2.3** ± 14.6% (k=2)	Alpha	**1.05**
ConvF Z	**2.3** ± 14.6% (k=2)	Depth	**1.50**

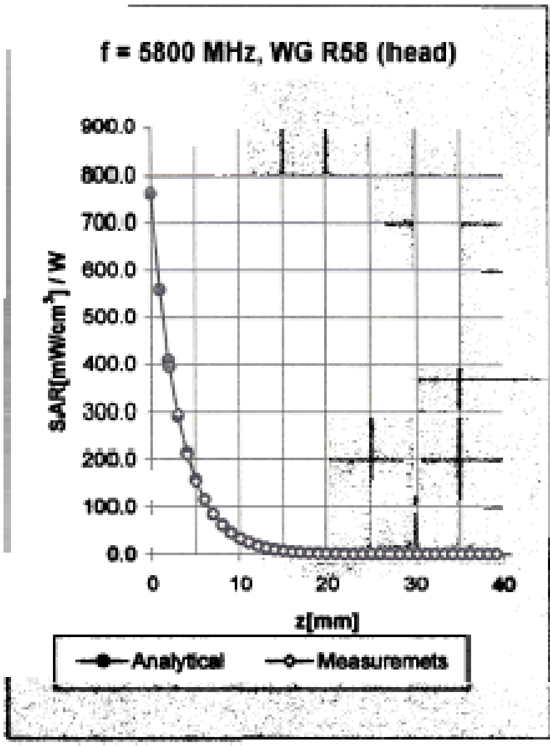
Body 5200 MHz ε_r = 49.0 ± 5% σ = 5.30 ± 5% mho/m

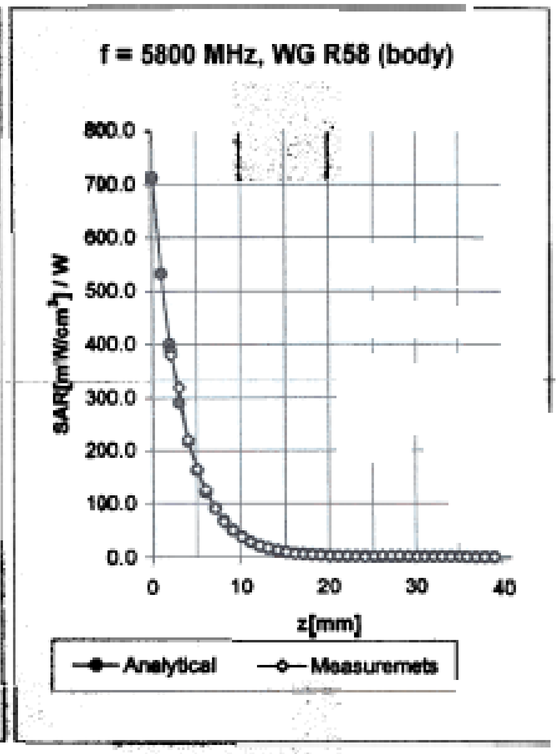
Valid for f=4940-5460 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**1.4** ± 14.6% (k=2)	Boundary effect:	
ConvF Y	**1.4** ± 14.6% (k=2)	Alpha	**1.01**
ConvF Z	**1.4** ± 14.6% (k=2)	Depth	**1.85**

ES3DV2 SN: 3019 July 12, 2003

Conversion Factor Assessment





Head **5800** **MHz** ε_r **= 35.3 ± 5%** σ **= 5.27 ± 5% mho/m**

Valid for f=5510-6090 MHz with Head Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**1.8** ± 14.6% (k=2)	Boundary effect:	
ConvF Y	**1.8** ± 14.6% (k=2)	Alpha	**0.90**
ConvF Z	**1.8** ± 14.6% (k=2)	Depth	**1.90**

Body **5800** **MHz** ε_r **= 48.2 ± 5%** σ **= 6.00 ± 5% mho/m**

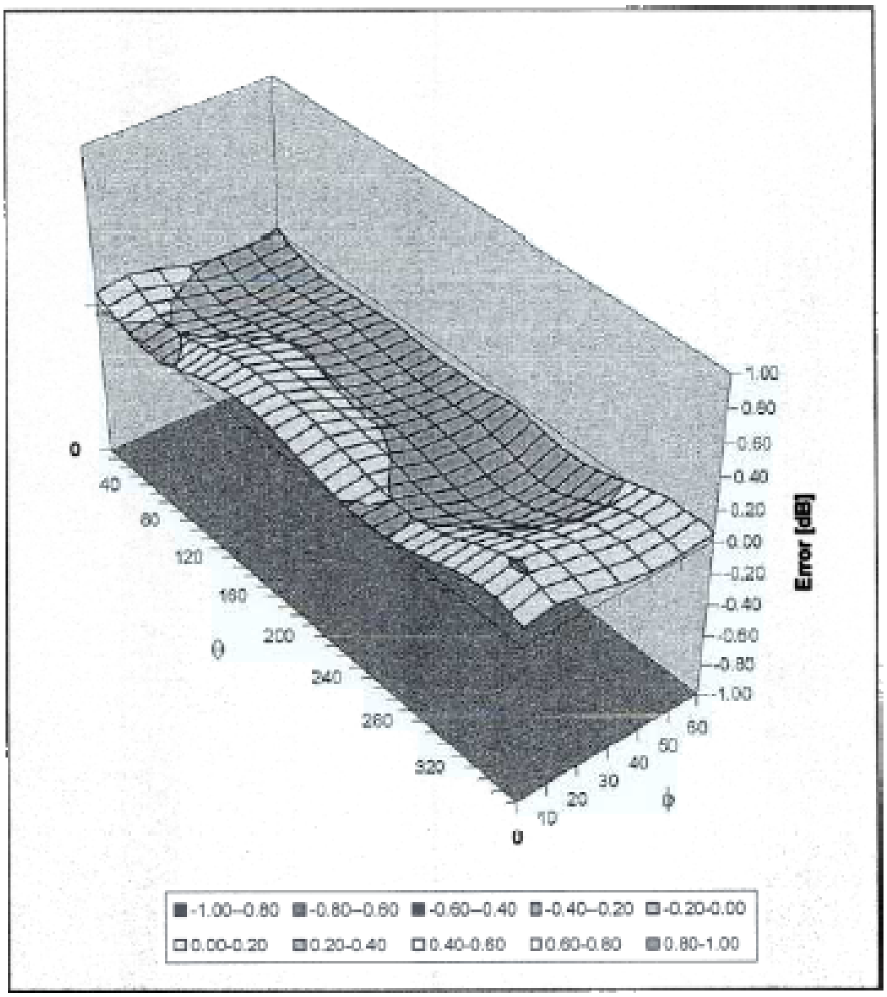
Valid for f=5510-6090 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**1.2** ± 14.6% (k=2)	Boundary effect:	
ConvF Y	**1.2** ± 14.6% (k=2)	Alpha	**1.18**
ConvF Z	**1.2** ± 14.6% (k=2)	Depth	**1.65**

ES3DV2 SN: 3019 July 12, 2003

Deviation from Isotropy in HSL

Error (θϕ), f = 900 MHz



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Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ES3DV2

SN:3019

Additional Conversion Factors

Manufactured: December 5, 2002
Last calibration: July 12, 2003
Add. calibration: October 9, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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DASY - Parameters of Probe: ES3DV2 SN:3019

Sensitivity in Free Space

NormX	**1.05** $\mu V/(V/m)^2$
NormY	**1.14** $\mu V/(V/m)^2$
NormZ	**0.98** $\mu V/(V/m)^2$

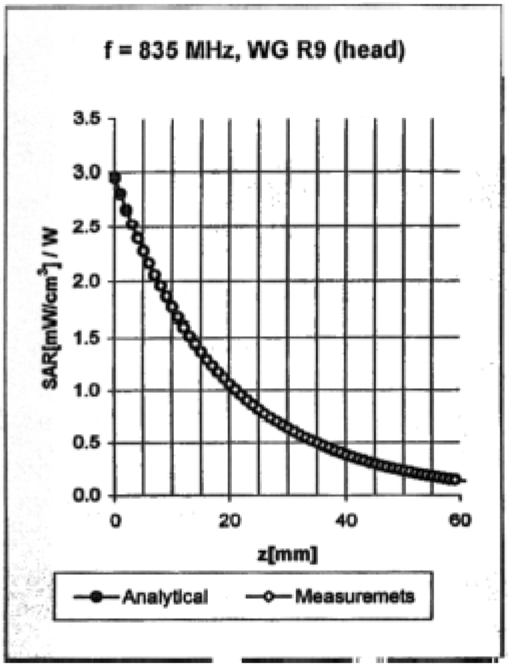
Diode Compression

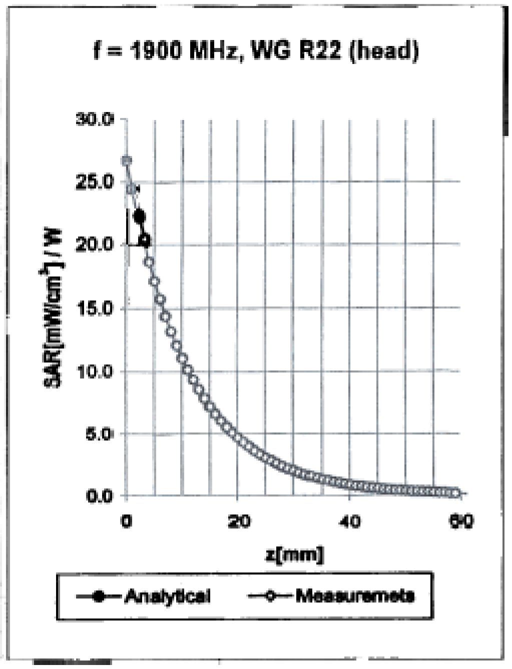
DCP X	**99**
DCP Y	**99**
DCP Z	**99**

Sensor Offset

Probe Tip to Sensor Center	**2.1**	mm

Conversion Factor Assessment





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

Valid for f=793-877 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

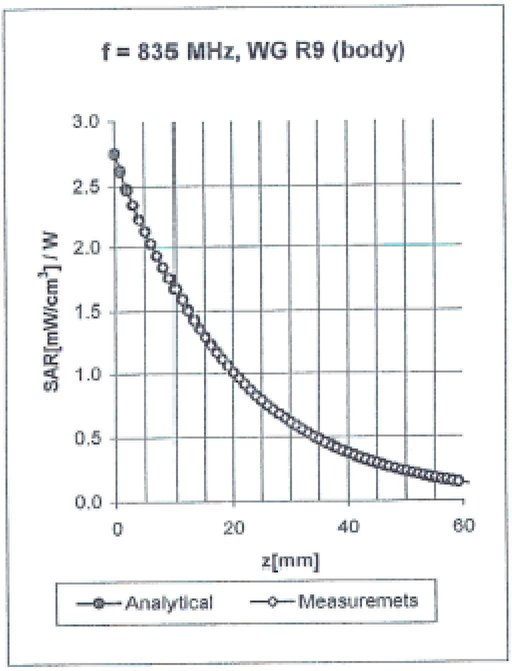
ConvF X	**6.5**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.5**	± 9.5% (k=2)	Alpha	**0.35**
ConvF Z	**6.5**	± 9.5% (k=2)	Depth	**1.46**

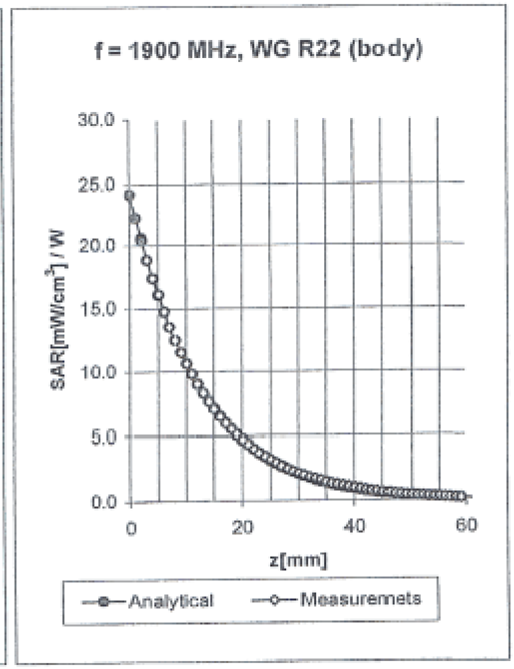
Head **1900 MHz** ε_r **= 40.0 ± 5%** **σ = 1.40 ± 5% mho/m**

Valid for f=1805-1995 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**4.7**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.7**	± 9.5% (k=2)	Alpha	**0.22**
ConvF Z	**4.7**	± 9.5% (k=2)	Depth	**3.48**

Convers ion Factor Assessment





Body **835 MHz** **ε_r = 55.2 ± 5%** **σ = 0.97 ± 5% mho/m**

Valid for f=793-877 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**6.1** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)		Alpha	**0.24**
ConvF Z	**6.1** ± 9.5% (k=2)		Depth	**2.00**

Body **1900 MHz** **ε_r = 53.3 ± 5%** **σ = 1.52 ± 5% mho/m**

Valid for f=1805-1995 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.6** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**4.6** ± 9.5% (k=2)		Alpha	**0.24**
ConvF Z	**4.6** ± 9.5% (k=2)		Depth	**2.64**

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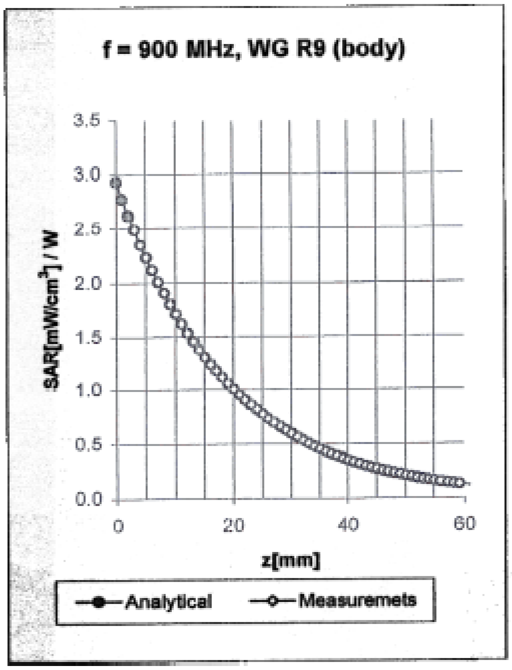
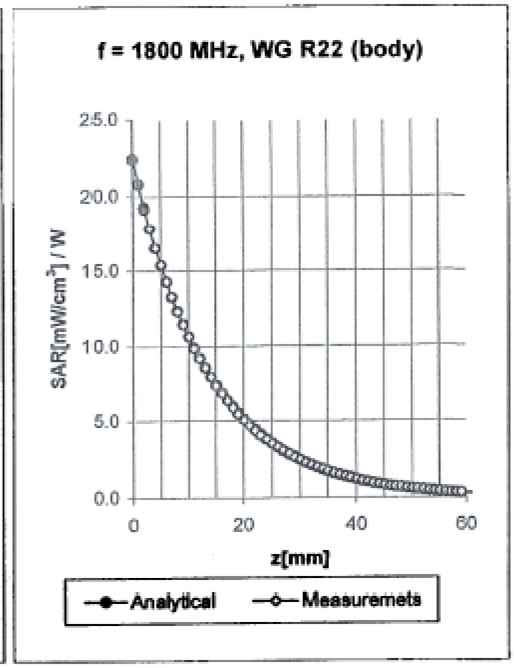
Conversion Factor Assessment





Body 900 MHz ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m

Valid for f=855-945 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**6.1** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)		Alpha	**0.27**
ConvF Z	**6.1** ± 9.5% (k=2)		Depth	**1.82**

Body 1800 MHz ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m

Valid for f=1710-1890 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.7** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**4.7** ± 9.5% (k=2)		Alpha	**0.23**
ConvF Z	**4.7** ± 9.5% (k=2)		Depth	**2.99**

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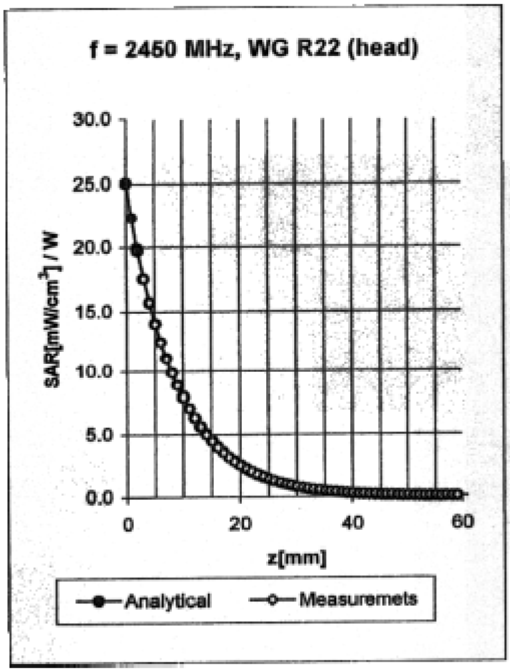
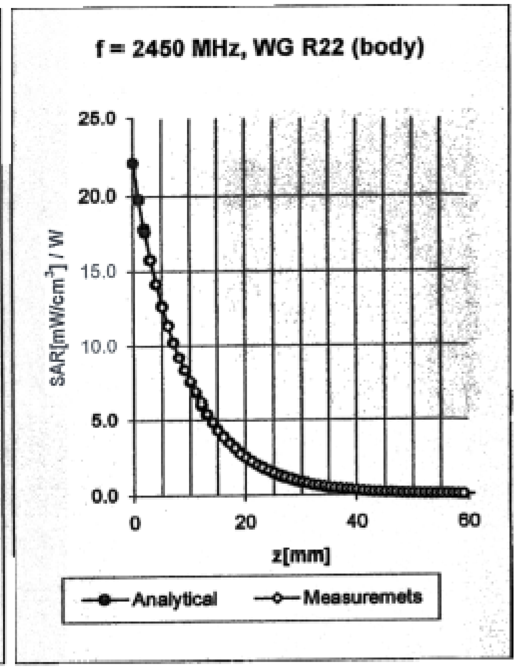
Conversion Factor Assessment





Head **2450 MHz** ε_r **= 39.2 ± 5%** σ **= 1.80 ± 5% mho/m**

Valid for f=2400-2500 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**4.5** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**4.5** ± 9.5% (k=2)		Alpha	**0.40**
ConvF Z	**4.5** ± 9.5% (k=2)		Depth	**1.62**

Body **2450 MHz** ε_r **= 52.7 ± 5%** σ **= 1.95 ± 5% mho/m**

Valid for f=2400-2500 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.2** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**4.2** ± 9.5% (k=2)		Alpha	**0.32**
ConvF Z	**4.2** ± 9.5% (k=2)		Depth	**1.98**

Page 6 of 6

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Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Additional Conversion Factors

for Dosimetric E-Field Probe

'ype:	ES3DV2
Serial Number:	3019
Place of Assessment:	Zurich
Date of Assessment:	October 13, 2003
Probe Calibration Date:	October 9, 2003

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:

ES3DV2-SN:3019 October 13, 2003

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV2 SN:3019

Conversion factor (± standard deviation)

150 MHz	ConvF	8.7 ± 8%	ε_r = 52.3 ± 5% σ = 0.76 ± 5% mho/m (head tissue)
150 MHz	ConvF	8.3 ± 8%	ε_r = 61.9 ± 5% σ = 0.80 ± 5% mho/m (body tissue)
450 MHz	ConvF	7.4 ± 8%	ε_r = 43.5 ± 5% σ = 0.87 ± 5% mho/m (head tissue)
450 MHz	ConvF	7.3 ± 8%	ε_r = 56.7 ± 5% σ = 0.94 ± 5% mho/m (body tissue)

ES3DV2-SN:3019 October 13, 2003

Certificate of Calibration Verification

Description of EUT	Tuned Dipole Antenna
EUT Model Number	D-1800-S-1
EUT Serial Number	BCL-049
Center Frequency	1800 MHz

Calibration Date: 12 April 2004

Testing conditions:

per P1528/D1.2:2003:

Ambient Temperature (18-25 °C)	23 °C
Ambient Humidity	43%
Liquid Temperature at start of measurements:(≤2°C)	21 °C
Liquid temperature at end of measurements:	21 °C
Date and time at beginning of test:	2004-04-09-16:20 PST
Date and time at beginning of test:	2004-04-09-19:40 PST

Equipment used for measurements

Network Analyzer	HP	8752C	1 Nov 2002
Impedance adapter	AGILENT	43961A	31 Oct 2003
Short Reference	HP	04191-85300	31 Oct 2003
Open Reference	HP	04191-85302	31 Oct 2003
Load Reference	HP	04191-85301	31 Oct 2003
Signal Generator	HP	83650B	29 Feb 2004

Calibration Cable: SMA Utiflex, 3.05 meter cable S/N 99E1206 (Number 8)

Phantom Model:	SAM
Liquid:	1800 MHz, Head Liquid
Liquid Validation Date:	12 April 2004
Quantity of Liquid in Phantom:	19.8 Liters

Measurement Procedure

In accordance with IEEE P1528/D1.2:2003, 8.3.4, 8.2.3 through 8.2.4

Liquid Validation

Instrument	Manufacturer	Model	Calibrated
Network Analyzer	HP	4396B	1 Nov 2002
Dielectric Probe Kit,	Agilent	85070C	Each Use
H_2O, 18 M-Ohm	BACL		Each Use
Probe, SAR 10 kHz - 6 GHz	SPEAG	ES3DV2	9 Oct 2003

Attestation:

I hereby attest that the equipment are suitable for the performance requirements of IEEE P1528/D1.2:2003 and the personnel operating the test equipment and measurements are properly trained to perform the verification of this calibration procedure set forth in IEEE P1528/D1.2:2003.

The validation antenna herein meets the minimum requirements of 20 dB insertion loss

2004-04-12

Hans T. Mellberg
Engineering Manager

Date

1800 MHz Head Liquid validation

Date :12APR2004

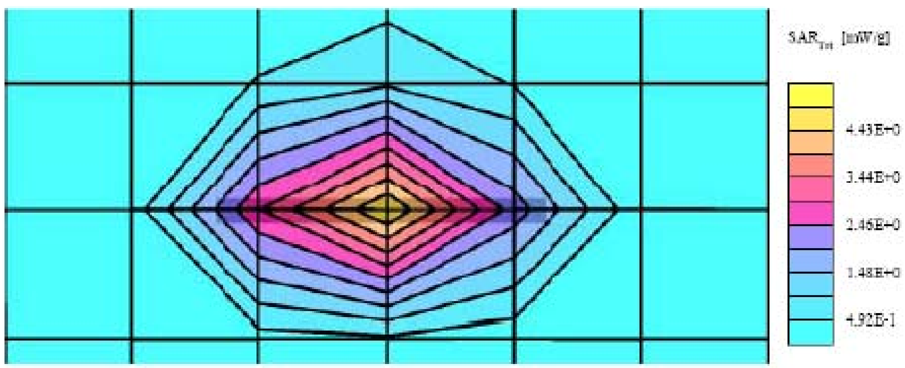
Ambient Temp = 23 °C

Liquid Temp = 22 °C

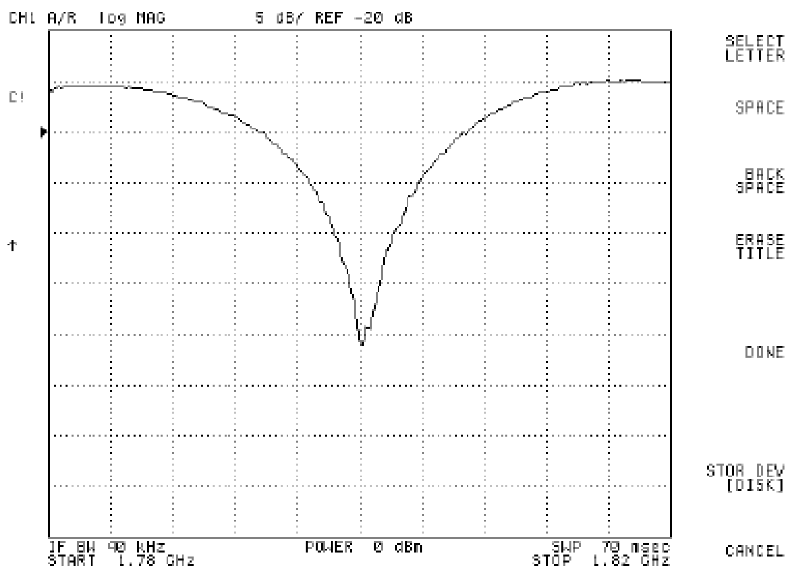
Frequency	e'	e"	σ ($\sigma = 2\pi f \varepsilon_o \varepsilon''$)
1850000000.0000	38.8246	13.2534	
1852000000.0000	38.7736	13.2429	
1854000000.0000	38.8400	13.2576	
1856000000.0000	38.8463	13.2425	
1858000000.0000	38.8167	13.2672	
1860000000.0000	38.8129	13.2552	
1862000000.0000	38.8118	13.2476	
1864000000.0000	38.7654	13.2345	
1866000000.0000	38.7686	13.2633	
1868000000.0000	38.7997	13.2690	
1870000000.0000	38.7262	13.2308	
1872000000.0000	38.7413	13.2642	
1874000000.0000	38.7458	13.2802	
1876000000.0000	38.7127	13.2833	
1878000000.0000	38.7145	13.2799	
1880000000.0000	38.7380	13.2633	
1882000000.0000	38.7086	13.2820	
1884000000.0000	38.7111	13.2991	
1886000000.0000	38.7184	13.2656	
1888000000.0000	38.7086	13.2724	
1890000000.0000	38.6697	13.2703	
1892000000.0000	38.6773	13.3051	
1894000000.0000	38.6729	13.2817	
1896000000.0000	38.6377	13.2805	
1898000000.0000	38.6113	13.2648	
1900000000.0000	38.6019	13.2714	1.40
1902000000.0000	38.5554	13.2951	
1904000000.0000	38.5535	13.2851	
1906000000.0000	38.5103	13.3424	
1908000000.0000	38.5402	13.3692	
1910000000.0000	38.5162	13.3760	
1912000000.0000	38.4971	13.3857	
1914000000.0000	38.5126	13.3651	
1916000000.0000	38.4920	13.3817	
1918000000.0000	38.5463	13.3665	
1920000000.0000	38.5063	13.3804	
1922000000.0000	38.4973	13.3868	
1924000000.0000	38.5244	13.3470	
1926000000.0000	38.5362	13.3583	
1928000000.0000	38.5352	13.3774	
1930000000.0000	38.5427	13.3676	
1932000000.0000	38.5433	13.3562	
1934000000.0000	38.5374	13.3814	
1936000000.0000	38.5717	13.4048	
1938000000.0000	38.5057	13.4235	
1940000000.0000	38.5314	13.4375	
1942000000.0000	38.5104	13.4338	
1944000000.0000	38.4827	13.4285	
1946000000.0000	38.4545	13.4411	
1948000000.0000	38.4227	13.4385	
1950000000.0000	38.3682	13.4325	

System Validation for 1900 MHz Head Liquid (Ambient Temp = 23 C, Liquid Temp = 22 C, Forward Power = 20.42 dBm, 4/12/2004)

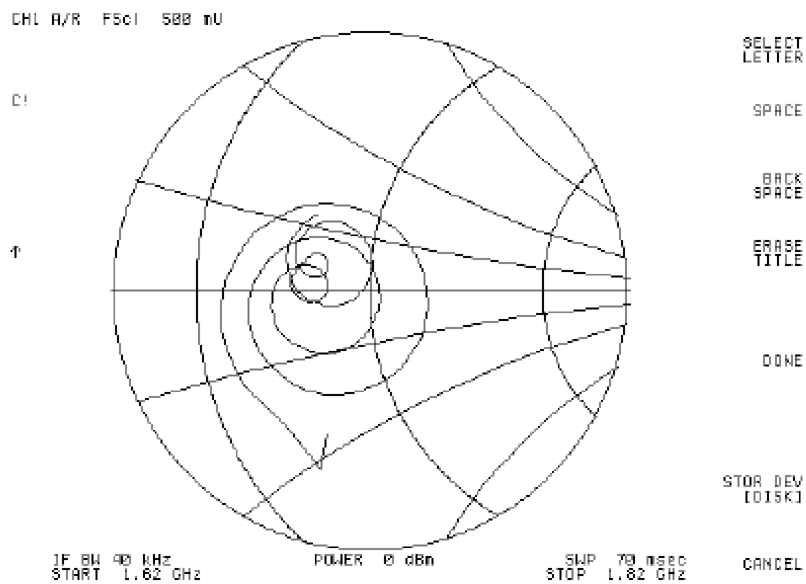
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ES3DV2 - SN3019; ConvF(4.70,4.70,4.70); Crest factor: 1.0; Head Liquid 1900 MHz: σ = 1.40 mho/m ε_r = 40.0 ρ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 4.38 mW/g, SAR (10g): 2.21 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: 0.01 dB



Insertion Loss Plot
S11



Smith Chart


CH1 A/R FScl 500 mU
SELECT LETTER
SPACE
BACK SPACE
ERASE TITLE
DONE
STOR DEV [DISK]
CANCEL
IF BW 90 kHz
START 1.62 GHz
POWER 0 dBm
SWP 70 msec
STOP 1.82 GHz

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

Client **Bay Area Comp. Lab (BACL)**

CALIBRATION CERTIFICATE

Object(s)	D900V2 - SN:122
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	October 3, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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

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

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power sensor HP 8481A	MY41092317	18-Oct-02 (Agilent, No. 20021018)	Oct-04
Power sensor HP 8481A	US37292783	30-Oct-02 (METAS, No. 252-0236)	Oct-03
Power meter EPM E442	GB37480704	30-Oct-02 (METAS, No. 252-0236)	Oct-03
RF generator R&S SML-03	100698	27-Mar-2002 (R&S, No. 20-92389)	In house check: Mar-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (Agilent, No. 24BR1033101)	In house check: Oct 03

	Name	Function	Signature
Calibrated by:	Judith Mueller	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: October 9, 2003

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

Schmid & Partner Engineering AG
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DASY

Dipole Validation Kit

Type: D900V2

Serial: 122

Manufactured: July 4, 2001
Calibrated: October 3, 2003

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **head simulating solution** of the following electrical parameters at 900 MHz:

Relative Dielectricity	**42.3**	± 5%
Conductivity	**0.96 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.6 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**10.2 mW/g** ± 16.8 % (k=2)[1]
averaged over 10 cm^3 (10 g) of tissue:	**6.60 mW/g** ± 16.2 % (k=2)[1]

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.409 ns**	(one direction)
Transmission factor:	**0.983**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance spacer was in place during impedance measurements.

Feedpoint impedance at 900 MHz:	Re{Z} = **50.8 Ω**
	Im {Z} = **-5.7 Ω**
Return Loss at 900 MHz	**-24.8 dB**

4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **body simulating solution** of the following electrical parameters at 900 MHz:

Relative Dielectricity	**54.4**	± 5%
Conductivity	**1.04 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.3 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

5. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**10.7 mW/g** ± 16.8 % $(k=2)^2$
averaged over 10 cm^3 (10 g) of tissue:	**6.92 mW/g** ± 16.2 % $(k=2)^2$

6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance spacer was in place during impedance measurements.

Feedpoint impedance at 900 MHz:	Re{Z} = **47.1 Ω**
	Im {Z} = **-6.7 Ω**
Return Loss at 900 MHz	**-22.6 dB**

7. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

8. Design

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

9. Power Test

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN122

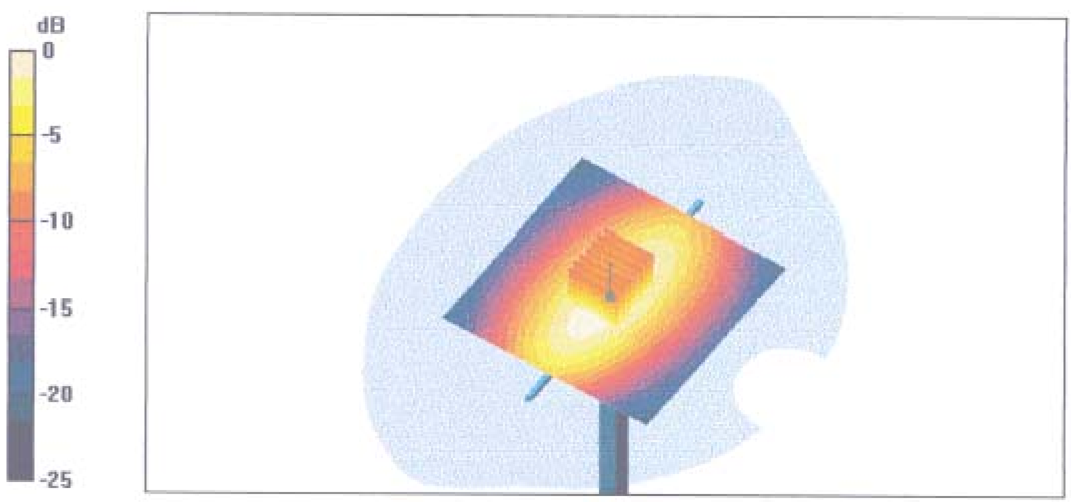
Communication System: CW-900; Frequency: 900 MHz;Duty Cycle: 1:1
Medium: HSL 900 MHz (σ = 0.96 mho/m, ε_r = 42.26, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

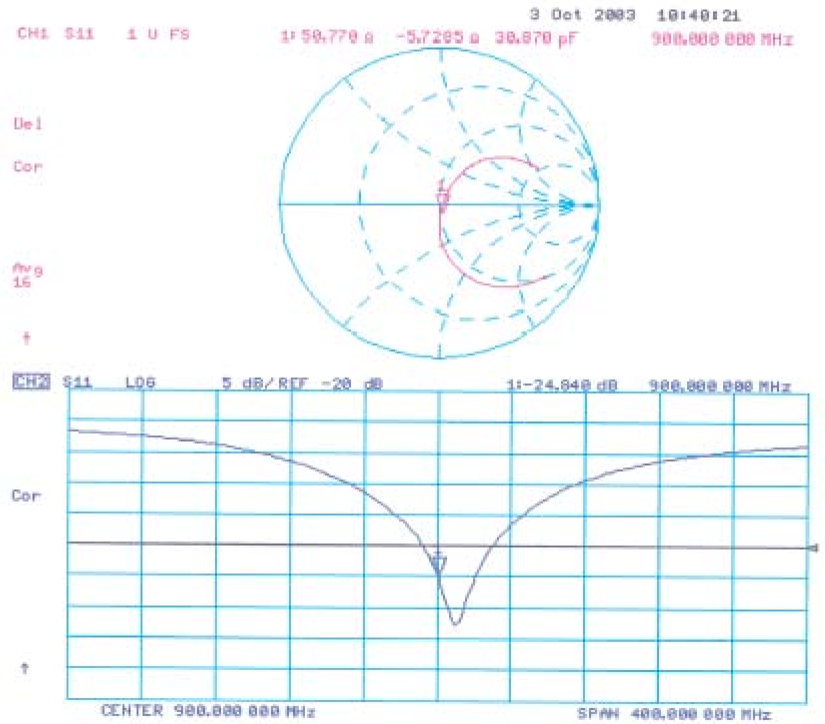
- Probe: ET3DV6 - SN1507; ConvF(6.6, 6.6, 6.6); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- *Electronics: DAE3 - SN411; Calibrated: 1/16/2003*
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 60

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): *Measurement grid: dx=15mm, dy=15mm*
Reference Value = 55.6 V/m
Power Drift = 0.003 dB
Maximum value of SAR = 2.75 mW/g

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 3.81 W/kg
SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.65 mW/g
Reference Value = 55.6 V/m
Power Drift = 0.003 dB
Maximum value of SAR = 2.76 mW/g



0 dB = 2.76mW/g


3 Oct 2003 10:40:21
CH1 S11 1 U FS
1: 50.770 Ω -5.7205 Ω 30.870 pF
900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF -20 dB
1:-24.040 dB 900.000 000 MHz
Cor
CENTER 900.000 000 MHz
SPAN 400.000 000 MHz

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN122

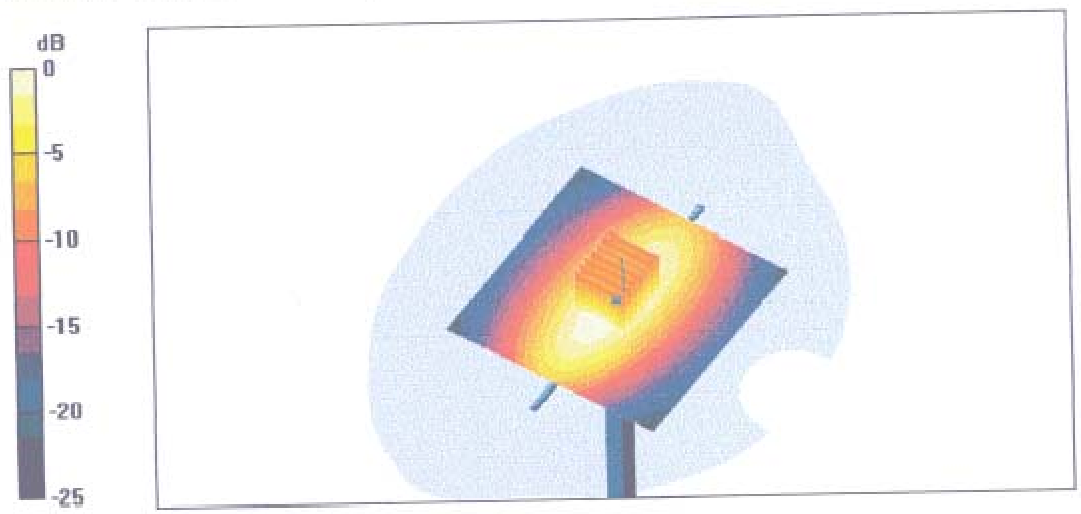
Communication System: CW-900; Frequency: 900 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz (σ = 1.04 mho/m, ε_r = 54.38, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.3, 6.3, 6.3); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: *DAE3 - SN411; Calibrated: 1/16/2003*
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 60

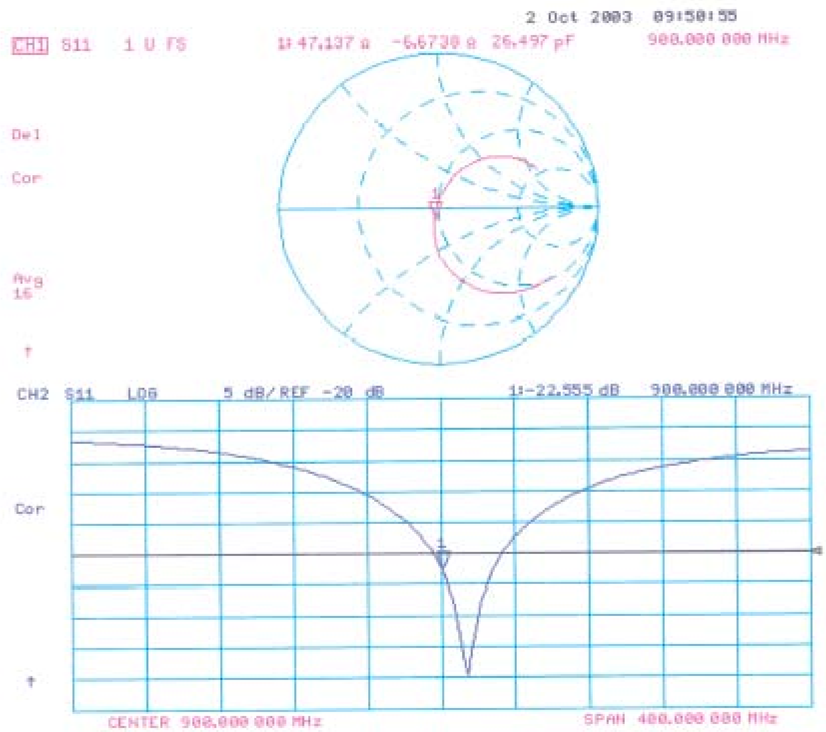
Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 55 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 2.87 mW/g

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 3.92 W/kg
SAR(1 g) = 2.67 mW/g; SAR(10 g) = 1.73 mW/g
Reference Value = 55 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 2.88 mW/g



0 dB = 2.88mW/g

Body


2 Oct 2003 09:50:55
CH1 S11 1 U FS
1: 47.137 Ω -6.6730 Ω 26.497 pF
900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF -20 dB
1:-22.555 dB 900.000 000 MHz
Cor
CENTER 900.000 000 MHz
SPAN 400.000 000 MHz

1900MHz Head Liquid Validation

Liquid Temp = 22 Deg C, Ambient Temp = 23 Deg C, 4/12/2004

Frequency	e'	e''
1850000000.0000	38.8246	13.2534
1852000000.0000	38.7736	13.2429
1854000000.0000	38.8400	13.2576
1856000000.0000	38.8463	13.2425
1858000000.0000	38.8167	13.2672
1860000000.0000	38.8129	13.2552
1862000000.0000	38.8118	13.2476
1864000000.0000	38.7654	13.2345
1866000000.0000	38.7686	13.2633
1868000000.0000	38.7997	13.2690
1870000000.0000	38.7262	13.2308
1872000000.0000	38.7413	13.2642
1874000000.0000	38.7458	13.2802
1876000000.0000	38.7127	13.2833
1878000000.0000	38.7145	13.2799
1880000000.0000	38.7380	13.2633
1882000000.0000	38.7086	13.2820
1884000000.0000	38.7111	13.2991
1886000000.0000	38.7184	13.2656
1888000000.0000	38.7086	13.2724
1890000000.0000	38.6697	13.2703
1892000000.0000	38.6773	13.3051
1894000000.0000	38.6729	13.2817
1896000000.0000	38.6377	13.2805
1898000000.0000	38.6113	13.2648
1900000000.0000	38.6019	13.2714
1902000000.0000	38.5554	13.2951
1904000000.0000	38.5535	13.2851
1906000000.0000	38.5103	13.3424
1908000000.0000	38.5402	13.3692
1910000000.0000	38.5162	13.3760
1912000000.0000	38.4971	13.3857
1914000000.0000	38.5126	13.3651
1916000000.0000	38.4920	13.3817
1918000000.0000	38.5463	13.3665
1920000000.0000	38.5063	13.3804
1922000000.0000	38.4973	13.3868
1924000000.0000	38.5244	13.3470
1926000000.0000	38.5362	13.3583
1928000000.0000	38.5352	13.3774
1930000000.0000	38.5427	13.3676
1932000000.0000	38.5433	13.3562
1934000000.0000	38.5374	13.3814
1936000000.0000	38.5717	13.4048
1938000000.0000	38.5057	13.4235
1940000000.0000	38.5314	13.4375
1942000000.0000	38.5104	13.4338
1944000000.0000	38.4827	13.4285
1946000000.0000	38.4545	13.4411
1948000000.0000	38.4227	13.4385
1950000000.0000	38.3682	13.4325

$\sigma = \omega\, \varepsilon_o\, \varepsilon'' = 2\, \pi f\, \varepsilon_o\, \varepsilon''=1.4028$

where $f = 1900 \times 10^6$

$\varepsilon_o = 8.854 \times 10^{-12}$

$\varepsilon'' = 13.2714$

1900MHz Body Liquid Validation

Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, 4/12/2004

Frequency	e'	e''
1850000000.0000	52.8945	14.1786
1852000000.0000	52.8418	14.1652
1854000000.0000	52.8804	14.1724
1856000000.0000	52.8515	14.1674
1858000000.0000	52.8623	14.1894
1860000000.0000	52.8524	14.1909
1862000000.0000	52.8036	14.1473
1864000000.0000	52.8080	14.1582
1866000000.0000	52.7740	14.1742
1868000000.0000	52.7557	14.1867
1870000000.0000	52.7491	14.1687
1872000000.0000	52.7602	14.1757
1874000000.0000	52.7727	14.1848
1876000000.0000	52.7495	14.1752
1878000000.0000	52.7401	14.1958
1880000000.0000	52.7210	14.1616
1882000000.0000	52.7196	14.1967
1884000000.0000	52.6973	14.2117
1886000000.0000	52.7543	14.1617
1888000000.0000	52.7044	14.1697
1890000000.0000	52.6988	14.1777
1892000000.0000	52.6751	14.1849
1894000000.0000	52.5986	14.1677
1896000000.0000	52.5629	14.1938
1898000000.0000	52.5998	14.2087
1900000000.0000	52.5918	14.1830
1902000000.0000	52.5598	14.2099
1904000000.0000	52.5596	14.2118
1906000000.0000	52.5389	14.2671
1908000000.0000	52.5172	14.2819
1910000000.0000	52.4553	14.2975
1912000000.0000	52.4145	14.2946
1914000000.0000	52.4025	14.3007
1916000000.0000	52.4134	14.2960
1918000000.0000	52.4367	14.2926
1920000000.0000	52.4189	14.2936
1922000000.0000	52.4783	14.3063
1924000000.0000	52.4286	14.2449
1926000000.0000	52.4067	14.2775
1928000000.0000	52.4025	14.2527
1930000000.0000	52.4322	14.2453
1932000000.0000	52.3877	14.2451
1934000000.0000	52.4216	14.2351
1936000000.0000	52.4566	14.2506
1938000000.0000	52.3463	14.2615
1940000000.0000	52.3527	14.2827
1942000000.0000	52.2892	14.2651
1944000000.0000	52.2804	14.2609
1946000000.0000	52.2495	14.2585
1948000000.0000	52.2655	14.2854
1950000000.0000	52.2418	14.2758

$\sigma = \omega \varepsilon_o \varepsilon'' = 2 \pi f \varepsilon_o \varepsilon''=1.4991$
where $f = 1900 \times 10^6$
$\varepsilon_o = 8.854 \times 10^{-12}$
$\varepsilon'' = 14.1830$

1900MHZ Head Liquid Validation

Ambient Temp=23 Deg C , Liquid Temp=22 Deg C , 4/25/2004

frequency	e'	e''
1850000000.0000	38.9805	13.0699
1852000000.0000	38.9574	13.0555
1854000000.0000	38.9555	13.0547
1856000000.0000	38.9546	13.0438
1858000000.0000	38.9539	13.0195
1860000000.0000	38.9525	13.0238
1862000000.0000	38.9507	13.0138
1864000000.0000	38.9435	12.9969
1866000000.0000	38.9214	12.9617
1868000000.0000	38.9265	12.9629
1870000000.0000	38.9099	12.9564
1872000000.0000	38.8739	12.9760
1874000000.0000	38.8743	12.9403
1876000000.0000	38.8762	12.9188
1878000000.0000	38.8515	12.9395
1880000000.0000	38.8689	12.9307
1882000000.0000	38.8213	12.9295
1884000000.0000	38.7884	12.9214
1886000000.0000	38.7872	12.9331
1888000000.0000	38.7799	12.9777
1890000000.0000	38.7709	12.9398
1892000000.0000	38.7425	12.9460
1894000000.0000	38.7360	12.9696
1896000000.0000	38.7205	12.9576
1898000000.0000	38.6673	12.9920
1900000000.0000	38.6559	12.9817
1902000000.0000	38.6392	12.9834
1904000000.0000	38.6022	13.0248
1906000000.0000	38.6019	13.0156
1908000000.0000	38.5642	13.0222
1910000000.0000	38.5790	13.0587
1912000000.0000	38.5559	13.0584
1914000000.0000	38.5003	13.0799
1916000000.0000	38.5287	13.1355
1918000000.0000	38.5077	13.1285
1920000000.0000	38.5017	13.1545
1922000000.0000	37.4882	13.1716
1924000000.0000	37.4952	13.1919
1926000000.0000	37.4908	13.2166
1928000000.0000	37.4531	13.2438
1930000000.0000	37.4568	13.2416
1932000000.0000	37.4362	13.2648
1934000000.0000	37.4359	13.2759
1936000000.0000	37.4288	13.3031
1938000000.0000	37.4237	13.3386
1940000000.0000	37.4500	13.3328
1942000000.0000	37.4271	13.3225
1944000000.0000	37.4450	13.3489
1946000000.0000	37.4401	13.3844
1948000000.0000	37.4341	13.3701
1950000000.0000	37.4631	13.3973

$\sigma = \omega \varepsilon_o \varepsilon'' = 2 \pi f \varepsilon_o \varepsilon'' = 1.3722$

where $f = 1900 \times 10^6$

$\varepsilon_o = 8.854 \times 10^{-12}$

$\varepsilon'' = 12.9817$

1900MHZ Body Liquid Validation

Ambient Temp=23 Deg C , Liquid Temp=22 Deg C , 4/25/2004

Frequency	e'	e''
1850000000.0000	52.4321	13.9473
1852000000.0000	52.4198	13.9852
1854000000.0000	52.4436	14.0622
1856000000.0000	52.4452	14.0960
1858000000.0000	52.4475	14.1686
1860000000.0000	52.4495	14.1941
1862000000.0000	52.4737	14.2514
1864000000.0000	52.4854	14.3110
1866000000.0000	52.5256	14.3295
1868000000.0000	52.5089	14.3746
1870000000.0000	52.5152	14.4023
1872000000.0000	52.5087	14.4487
1874000000.0000	52.5153	14.5041
1876000000.0000	52.5486	14.5170
1878000000.0000	52.5552	14.5528
1880000000.0000	52.5644	14.5406
1882000000.0000	52.5312	14.5625
1884000000.0000	52.5472	14.5685
1886000000.0000	52.5362	14.5780
1888000000.0000	52.5388	14.5637
1890000000.0000	52.5166	14.5736
1892000000.0000	52.5048	14.5603
1894000000.0000	52.4533	14.5008
1896000000.0000	52.4694	14.4789
1898000000.0000	52.4183	14.4554
1900000000.0000	52.3974	14.4358
1902000000.0000	52.3991	14.3989
1904000000.0000	52.3759	14.3507
1906000000.0000	52.3245	14.3322
1908000000.0000	52.3413	14.2730
1910000000.0000	52.2964	14.2455
1912000000.0000	52.2410	14.1974
1914000000.0000	52.2327	14.1917
1916000000.0000	52.2246	14.1055
1918000000.0000	52.1892	14.0683
1920000000.0000	52.1607	14.0249
1922000000.0000	52.1507	14.0181
1924000000.0000	52.1320	13.9921
1926000000.0000	52.0671	13.9435
1928000000.0000	52.0776	13.9341
1930000000.0000	52.0707	13.9107
1932000000.0000	52.0146	13.8654
1934000000.0000	52.0228	13.8916
1936000000.0000	52.0097	13.8456
1938000000.0000	51.9800	13.8732
1940000000.0000	52.0174	13.8551
1942000000.0000	51.9879	13.8987
1944000000.0000	51.9617	13.8968
1946000000.0000	51.9704	13.9388
1948000000.0000	51.9409	13.9664
1950000000.0000	51.9493	13.9764

$\sigma = \omega\, \varepsilon_o\, \varepsilon'' = 2\, \pi f\, \varepsilon_o\, \varepsilon''=1.5259$

where $f = 1900 \times 10^{6}$

$\varepsilon_o = 8.854 \times 10^{-12}$

$\varepsilon'' = 14.4358$

3 - EUT DESCRIPTION

Applicant:	Haier Telecommunication Co., Ltd.
Product Description:	Phone, Mobile, GSM, GPRS, 1900 MHz
Product Model Number:	Z3000B
FCC ID:	SG7Z3000B
Serial Number:	Z3000B-001
Maximum RF Output Power:	30 dBm
RF Exposure environment:	General Population/Uncontrolled
Applicable Standard	FCC CFR 47, Part 24
Application Type:	Certification

4 - SYSTEM TEST CONFIGURATION

4.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

4.2 EUT Exercise Procedure

The EUT exercising program used during SAR testing was designed to exercise the various system components in a manner similar to a typical use.

4.3 Equipment Modifications

No modification(s) were made to ensure that the EUT complies with the applicable limits.